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MASTER PLAN UPDATE
FINAL

BILL AND HILLARY CLINTON NATIONAL AIRPORT

Prepared for

Little Rock Municipal Airport Commission
Little Rock, Arkansas

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FIGURES

Chapter 1

1.1 INTRODUCTION

This chapter provides background data on the Airport and a comprehensive inventory of existing facilities and conditions. The information will provide the basis for determining future facility requirements and the formulation of Airport development alternatives. The chapter covers the following technical categories:

- Airfield and Airspace
- Passenger Terminal Complex
- Ground Transportation and Parking
- Air Cargo
- General Aviation
- Airline and Airport Support
- Environmental Conditions

1.1.1 Airport Overview

Bill and Hillary Clinton National Airport, or the Airport, is located in Little Rock, Arkansas and is the largest commercial service airport in the State of Arkansas. Little Rock is the state capital and is the thriving hub of central Arkansas – an economic region alive with progress and vitality. The metropolitan area encompasses an economy made up of 730,000 people.

Clinton National Airport is not only a busy commercial service airport, serving both passenger and cargo needs; it is also a regional center for general aviation activity. In its general aviation role, the Airport provides a safe and efficient environment for business/corporate aircraft, flight training activity, aircraft manufacturing and fabrication support, as well as recreational flying. Clinton National Airport is a critical component of the regional and national transportation systems.

The initial land for the present day airport was purchased in 1930, with commercial passenger service being initiated in 1931. In 1937, the Airport was renamed Adams Field, in honor of Captain George G. Adams. Adams was a prominent citizen of the area, who as a member of Little Rock based 154th Observation Squadron, was tragically killed in an aircraft accident. In that same year, the north-south runway (Runway 18/36) was constructed as the airfield's first hard surface runway. The first master plan for the Airport was adopted in 1939. The latest master planning effort for Clinton National Airport was completed in 2007. Since that time, changes have transpired on a local, regional, and national level that have influenced and will continue to influence the aviation facilities and services provided at the Airport. These changes, coupled with the continued population growth and economic expansion occurring within the region, necessitate a reevaluation of the Airport's Master Plan as a means of analyzing current and forecast operational characteristics and facilities, as well as updating the goals, objectives, and assumptions that will guide future Airport development.

1.1.2 Airport Setting

As shown on Figure 1-1 and Figure 1-2, Clinton National Airport is located in central Arkansas, approximately four miles southeast of downtown Little Rock, in Pulaski County. The Airport Reference Point (ARP) is located at Latitude 34° 43' 45.96" N, and Longitude 92° 13' 27.50" W. Clinton National Airport, classified as a small-hub commercial service airport by the Federal Aviation Administration's (FAA's) National Plan of Integrated Airport Systems (NPIAS), has an elevation of 266 feet above mean sea level (AMSL) and property consisting of approximately 2,000 acres.

As of March 2018, the Airport is served by seven airlines: American Airlines, Delta Airlines, Southwest Airlines, United Airlines, Allegiant Air, Frontier Airlines, and Via Airlines. Combined, these airlines provide daily non-stop flights to 15 destinations: Austin, Texas; Atlanta, Georgia; Charlotte, North Carolina; Dallas (Love), Texas; Washington, DC; Denver, Colorado; Dallas/Fort Worth (DFW), Texas; Detroit, Michigan; Houston (Bush/Intercontinental), Texas; Las Vegas, Nevada; Los Angeles, California; Chicago (O'Hare), Illinois; Phoenix, Arizona; Orlando, Florida; and St. Louis, Missouri.

1.1.3 Airport Site

Clinton National Airport lies on approximately 2,000 acres roughly bounded by Interstate 440 to the south, Bond Avenue to the west, the Arkansas River to the north, and Fourche Dam Pike to the east. The primary components of the site are the Airfield, Passenger Terminal, Ground Transportation, and Support Facilities.

The Airport is operated with three runways (Runway 4L/22R, Runway 4R/22L and Runway 18/36), parallel taxiway systems serving each of those runways, a variety of aircraft parking aprons, a passenger terminal complex, air cargo facilities, general aviation hangars and related facilities, aircraft manufacturing and repair facilities, and support facilities [Air Traffic Control Tower (ATCT), Aircraft Rescue and Fire Fighting (ARFF) facility, maintenance facilities, etc.]. Figure 1-3 shows the existing Airport facilities and land uses.

Figure 1-1
Airport Location Map

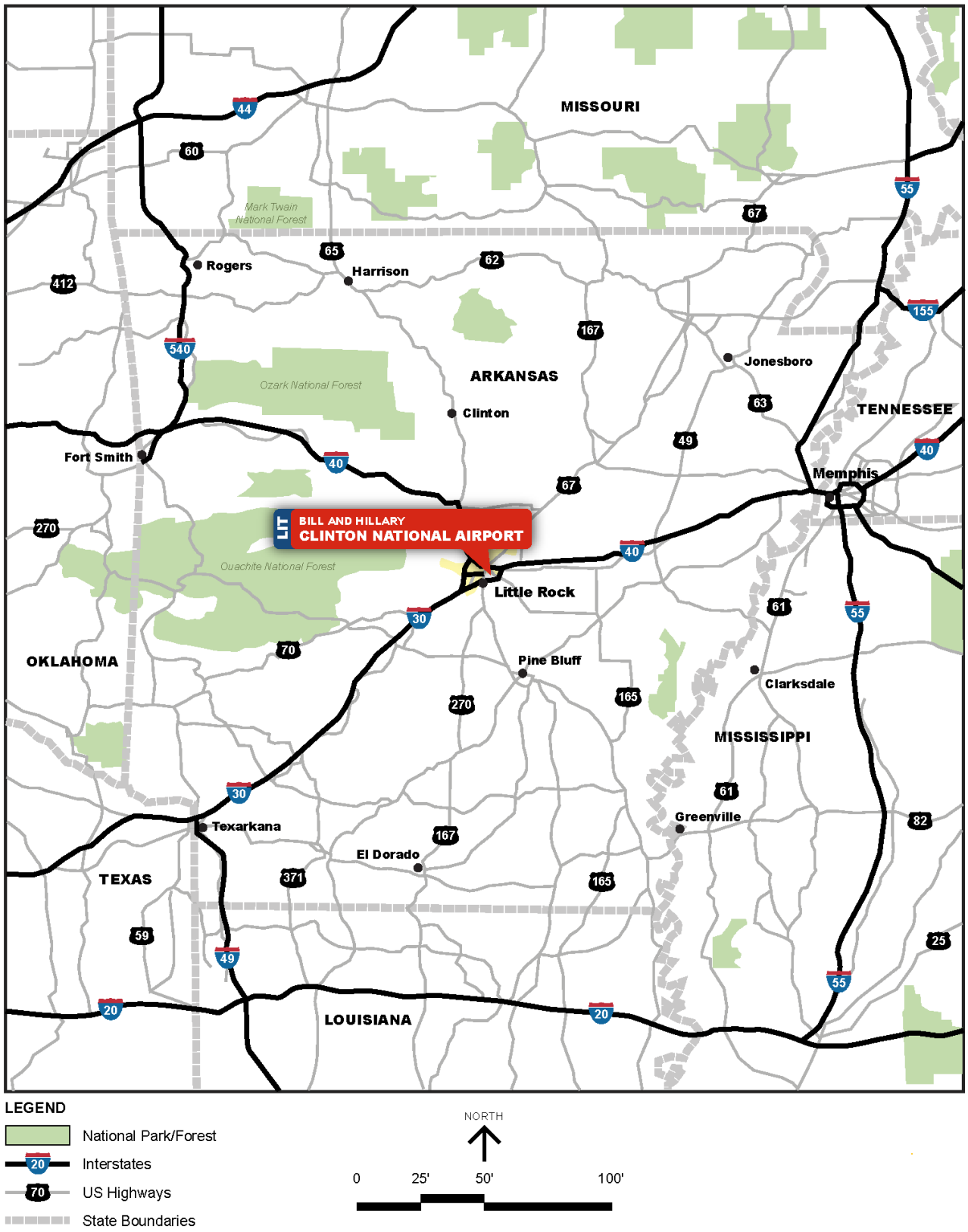


Figure 1-2
Airport Vicinity Map

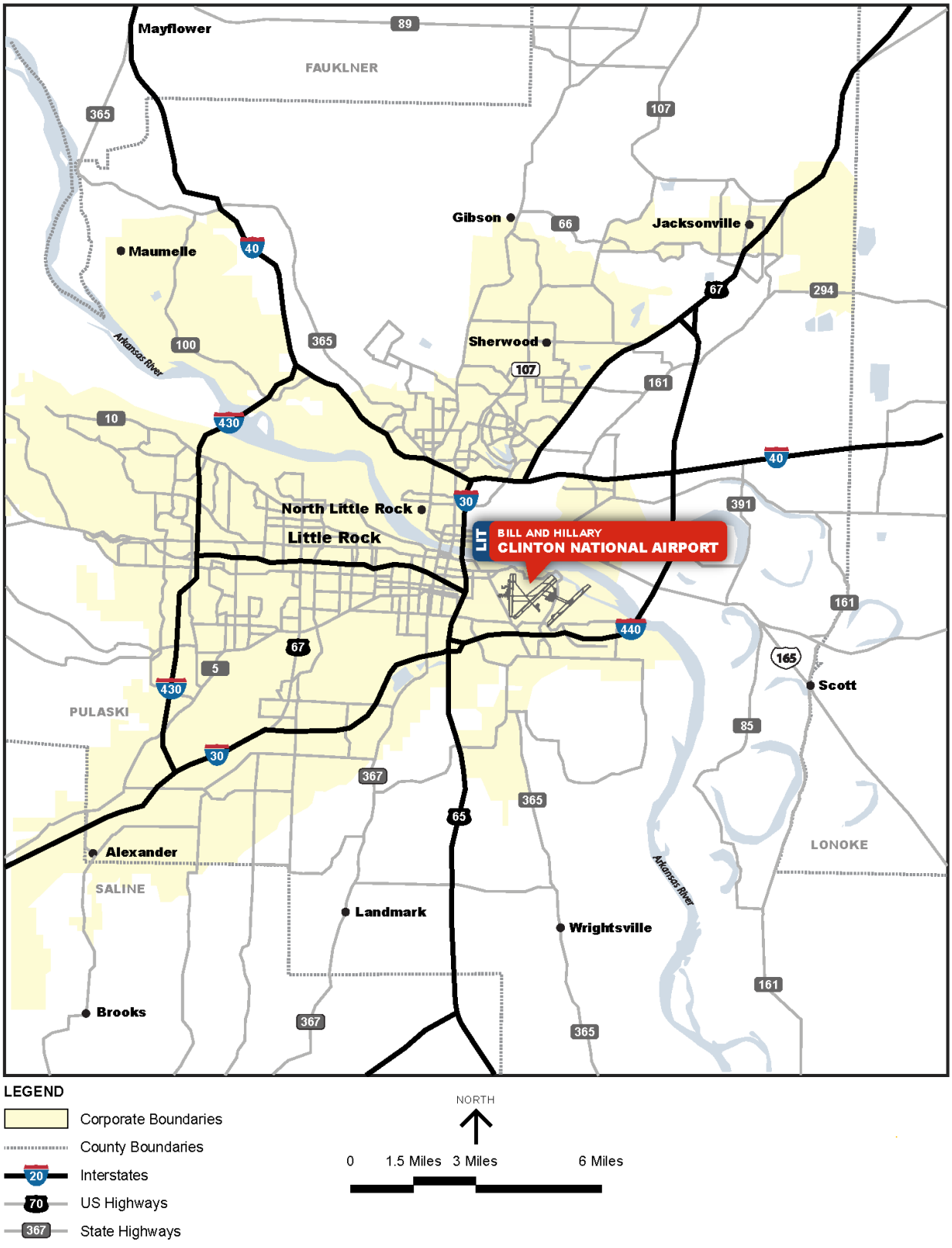
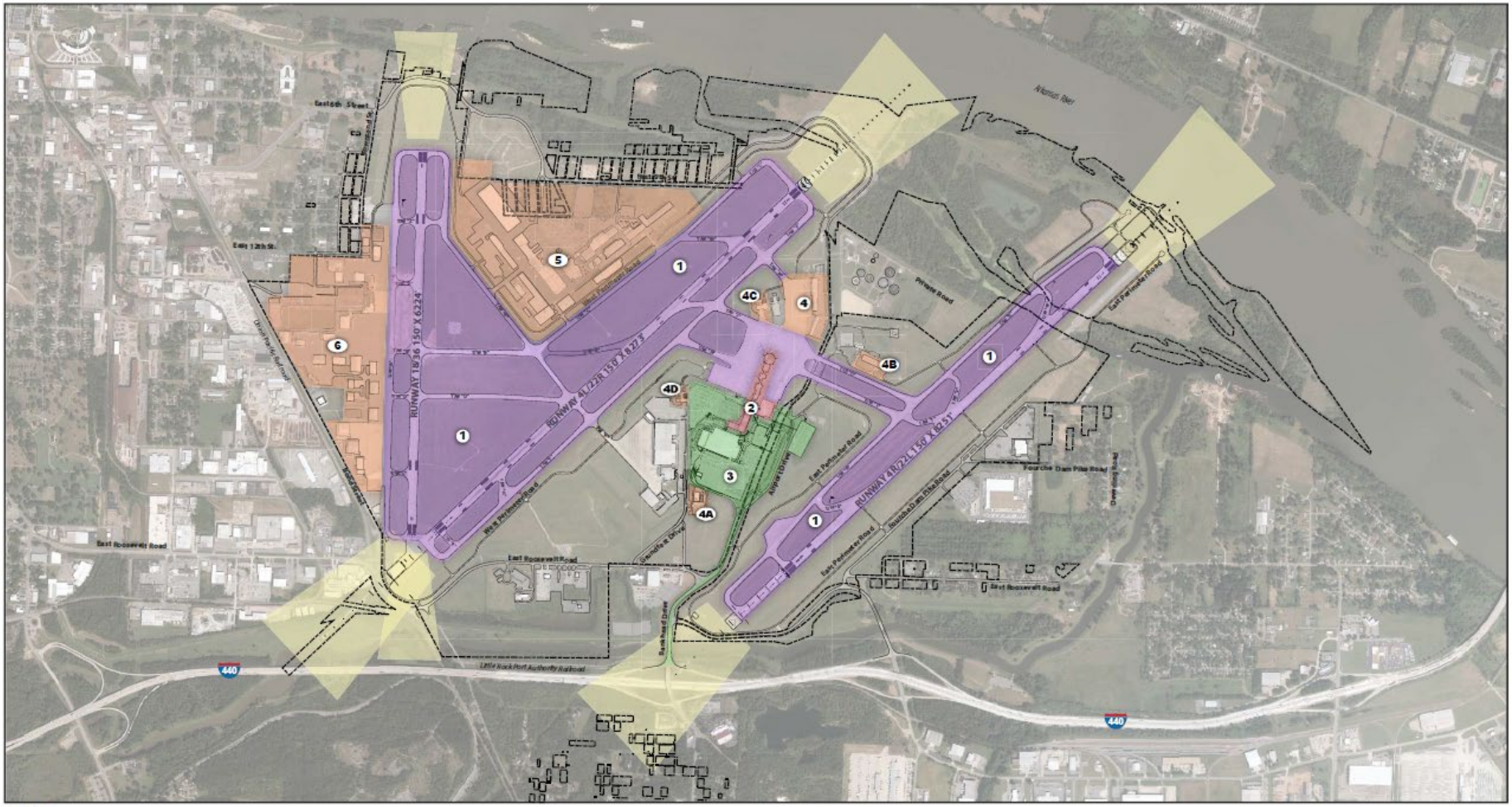


Figure 1-3
Existing Airport Layout



1.2 AIRFIELD

1.2.1 Runways

Runway 4R/22L is 8,251 feet in length and 150 feet in width, is constructed of concrete, and has a gross weight bearing capacity of 75,000 pounds single wheel, 200,000 pounds dual wheel, and 350,000 pounds dual tandem wheel main landing gear configuration. This runway is equipped with High Intensity Runway Lights (HIRL) and Centerline Lights (CL). A Precision Approach Path Indicator (PAPI) system serves Runway 22L. Additionally, Instrument Landing Systems (ILS), which are composed of localizer and glide slope antennas, along with approach lighting systems [a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) serves Runway 4R; a Medium Intensity Approach Lighting System with Sequenced Flashers (MALSF) serves Runway 22L], equip this runway and support its precision instrument approach capabilities. The approach threshold on Runway 4R is displaced 1,050 feet because of obstructions. See Table 1 for additional Runway 4R-22L information.

Runway 4L/22R is 8,273 feet in length and 150 feet in width, is constructed of concrete, and has a gross weight bearing capacity of 75,000 pounds single wheel, 200,000 pounds dual wheel, and 350,000 pounds dual tandem wheel main landing gear configuration. This runway is equipped with HIRL and CL. Touchdown Zone Lights serve Runway 22R. Both runway ends have full ILS, including localizer and glide slope antennas, along with approach lighting systems [a MALSR serves Runway 4L; a High Intensity Approach Lighting System with Sequenced Flashers, Category II/III Configuration (ALSF-2) serves Runway 22R]. The approach threshold on Runway 4L is displaced 297 feet because of the proximity of the Union Pacific Railroad tracks. See Table 1-2 for additional Runway 4L-22R information.

Runway 18/36 is 6,224 feet in length and 150 feet in width, is constructed of concrete, and has a gross weight bearing capacity of 75,000 pounds single wheel, 100,000 pounds dual wheel, and 135,000 pounds dual tandem wheel main landing gear configuration. This runway is equipped with MIRL, a Visual Approach Slope Indicator (VASI) system serves Runway 36, and a PAPI serves Runway 18. Due to the proximity of an existing roadway, trees and poles; the approach threshold on the Runway 36 end is displaced 100 feet. See Table 1-3 for additional Runway 18-36 information.

Table 1-1
Runway 4R-22L Data
Airport Master Plan
Bill and Hillary Clinton National Airport

Item	Runway 4R	Runway 22L
Elevation (feet)	266.0	259.4
Runway Pavement Length (feet)	8,251	8,251
Runway Pavement Width (feet)	150	150
Runway Surface	Concrete/Grooved	Concrete/Grooved
Displaced Threshold (feet)	1,050	N/A
Approach Slope	50:1	50:1
Runway Marking	Precision	Precision
Runway Lighting	HIRL and Centerline Lighting	HIRL and Centerline Lighting
Visual Approach Aids	MALSR WC	MALSF PAPI-4L WC
Instrument Approach Aids	ILS/DME (Localizer and Glide Slope) Non-Directional Beacon RNAV (GPS) RVR VORTAC	ILS/DME (Localizer and Glide Slope) Non-Directional Beacon RNAV (GPS) RVR VORTAC
Instrument Runway Status	Precision	Precision
Pavement Strength (pounds at maximum takeoff weight)	Single Wheel: 75,000 Dual Wheel: 200,000 Dual Tandem: 350,000	Single Wheel: 75,000 Dual Wheel: 200,000 Dual Tandem: 350,000
Traffic Pattern	Right	Left

DME = Distance Measuring Equipment
HIRL = High Intensity Runway Lights
ILS = Instrument Landing System
MALSF = Medium Intensity Approach Lighting System with Sequenced Flashers
MALSR = Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
PAPI = Precision Approach Path Indicator
RNAV (GPS) = Area Navigation (Global Positioning System)
RVR = Runway Visual Range
VORTAC = VHF Omni Directional Radio Range / Tactical Air Navigation System
WC = Windcone

Source: Little Rock Airport Staff.

Table 1-2
Runway 4L-22R Data
Airport Master Plan
Bill and Hillary Clinton National Airport

Item	Runway 4L	Runway 22R
Elevation (feet)	253.0	261.5
Runway Pavement Length (feet)	8,273	8,273
Runway Pavement Width (feet)	150	150
Runway Surface	Concrete/Grooved	Concrete/Grooved
Displaced Threshold (feet)	297	N/A
Approach Slope	50:1	50:1
Runway Marking	Precision	Precision
Runway Lighting	HIRL and Centerline Lighting	HIRL, Centerline and Touchdown Zone Lighting
Visual Approach Aids	MALSR WC	ALSF-2 WC
Instrument Approach Aids	ILS/DME (Localizer and Glide Slope) Non-Directional Beacon RNAV (GPS) RVR VORTAC	ILS/DME (Localizer and Glide Slope) Non-Directional Beacon RNAV (GPS) RVR VORTAC
Instrument Runway Status	Precision	Precision
Pavement Strength (pounds at maximum takeoff weight)	Single Wheel: 75,000 Dual Wheel: 200,000 Dual Tandem: 350,000	Single Wheel: 75,000 Dual Wheel: 200,000 Dual Tandem: 350,000
Traffic Pattern	Left	Right

ALSF-2	=	High Intensity Approach Lighting System with Sequenced Flashing Lights
DME	=	Distance Measuring Equipment
HIRL	=	High Intensity Runway Lights
ILS	=	Instrument Landing System
MALSR	=	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
RNAV (GPS)	=	Area Navigation (Global Positioning System)
RVR	=	Runway Visual Range
VORTAC	=	VHF Omni Directional Radio Range / Tactical Air Navigation System
WC	=	Windcone

Source: Little Rock Airport Staff, Airport Layout Plan.

Table 1-3
Runway 18-36 Data
Airport Master Plan
Bill and Hillary Clinton National Airport

Item	Runway 18	Runway 36
Elevation (feet)	258.9	253.3
Runway Pavement Length (feet)	6,224	6,224
Runway Pavement Width (feet)	150	150
Runway Surface	Concrete/Grooved	Concrete/Grooved
Displaced Threshold (feet)	N/A	164
Approach Slope	34:1	34:1
Runway Marking	Non-Precision	Non-Precision
Runway Lighting	HIRL	HIRL
Visual Approach Aids	PAPI-4L WC	VASI-4L WC
Instrument Approach Aids	DME Non-Directional Beacon RNAV (GPS) VORTAC	DME Non-Directional Beacon RNAV (GPS) VORTAC
Instrument Runway Status	Non-Precision	Non-Precision
Pavement Strength (pounds at maximum takeoff weight)	Single Wheel: 75,000 Dual Wheel: 100,000 Dual Tandem: 135,000	Single Wheel: 75,000 Dual Wheel: 100,000 Dual Tandem: 135,000
Traffic Pattern	Left	Left

DME	=	Distance Measuring Equipment
HIRL	=	High Intensity Runway Lights
PAPI	=	Precision Approach Path Indicator
RNAV (GPS)	=	Area Navigation (Global Positioning System)
VASI	=	Visual Approach Slope Indicator
VORTAC	=	VHF Omni Directional Radio Range / Tactical Air Navigation System
WC	=	Windcone

(a) Upon completion of threshold relocation, estimated for August 2018
Source: Little Rock Airport Staff.

1.2.2 Taxiways

Numerous taxiways provide access from the runways to the various landside aircraft use areas as shown on the Existing Airport Layout Plan, Figure 1-3. Information and data on each taxiway is provided in Table 1-4.

Table 1-4
Taxiway Data
Airport Master Plan
Bill and Hillary Clinton National Airport

Taxiway	Purpose	Width[(a)] (feet)	Type of Construction
A	Parallel taxiway on west side of Runway 18-36	75	Concrete/Asphalt
B	Midfield taxiway connector that provides access between Runway 18-36 and the west/north side development areas to Runway 4L-22R	75	Concrete/Asphalt
C	Partial parallel taxiway on the northwest side of Runway 4L-22R that connects the midfield area with the approach end of Runway 22R	75	Concrete/Asphalt
D	Midfield taxiway connector that provides access between Runway 18-36 and the west development areas to Runway 4L-22R	75	Concrete
E	Connects Runway 4L-22R to Taxiway F	90	Concrete
F	Parallel taxiway on east side of Runway 4L-22R	75	Concrete
G	Connects Runway 4L-22R to Taxiway F	107	Concrete
H	Connects Taxiway F to the terminal apron	75	Concrete
J	Connects Taxiway F to the terminal apron	75	Concrete
K	Connects Runway 18-36 to Taxiway A	75	Concrete
L	Connects Runway 18-36 to Taxiway A	75	Concrete
M	Connects Runway 4L-22R to Taxiway C, Taxiway F, and cargo apron	75	Concrete/Asphalt
P	Partial parallel taxiway on the northeast side of Runway 18-36 and midfield taxiway connector that Connects Runway 18-36 and the west/north side development areas to Runway 4L-22R	75	Concrete/Asphalt
R	Parallel taxiway on west side of Runway 4R-22L	75	Concrete
S	Connects Runway 4R-22L to Taxiway R	110	Concrete
T	Connects Taxiway R to the terminal apron	75	Concrete
U	Connects Taxiway R to the terminal apron	75	Concrete
V	Connects Runway 4R-22L to Taxiway R	82	Concrete
W	Connects Runway 4R-22L to Taxiway R	110	Concrete
Y	Connects Runway 4R-22L to Taxiway R	92	Concrete
Z	Connects Runway 18-36 to Taxiway A and Taxiway P	75	Concrete

(a) Width of Taxiway at narrowest point

Source: Garver Archive Survey Data, March 2017

1.2.3 Airspace System/Navigation and Communication Aids

1.2.3.1 Air Traffic Service Areas and Aviation Communications

Within the continental United States, there are some 22 geographic areas that are under Air Traffic Control (ATC) jurisdiction. Within each area, air traffic controllers in Air Route Traffic Control Centers (ARTCC) provide air traffic services. The airspace overlying Clinton National Airport is contained within the Memphis ARTCC service area and includes the airspace in portions of Arkansas, Oklahoma, Missouri, Louisiana, Tennessee, Mississippi, Alabama, and Kentucky.

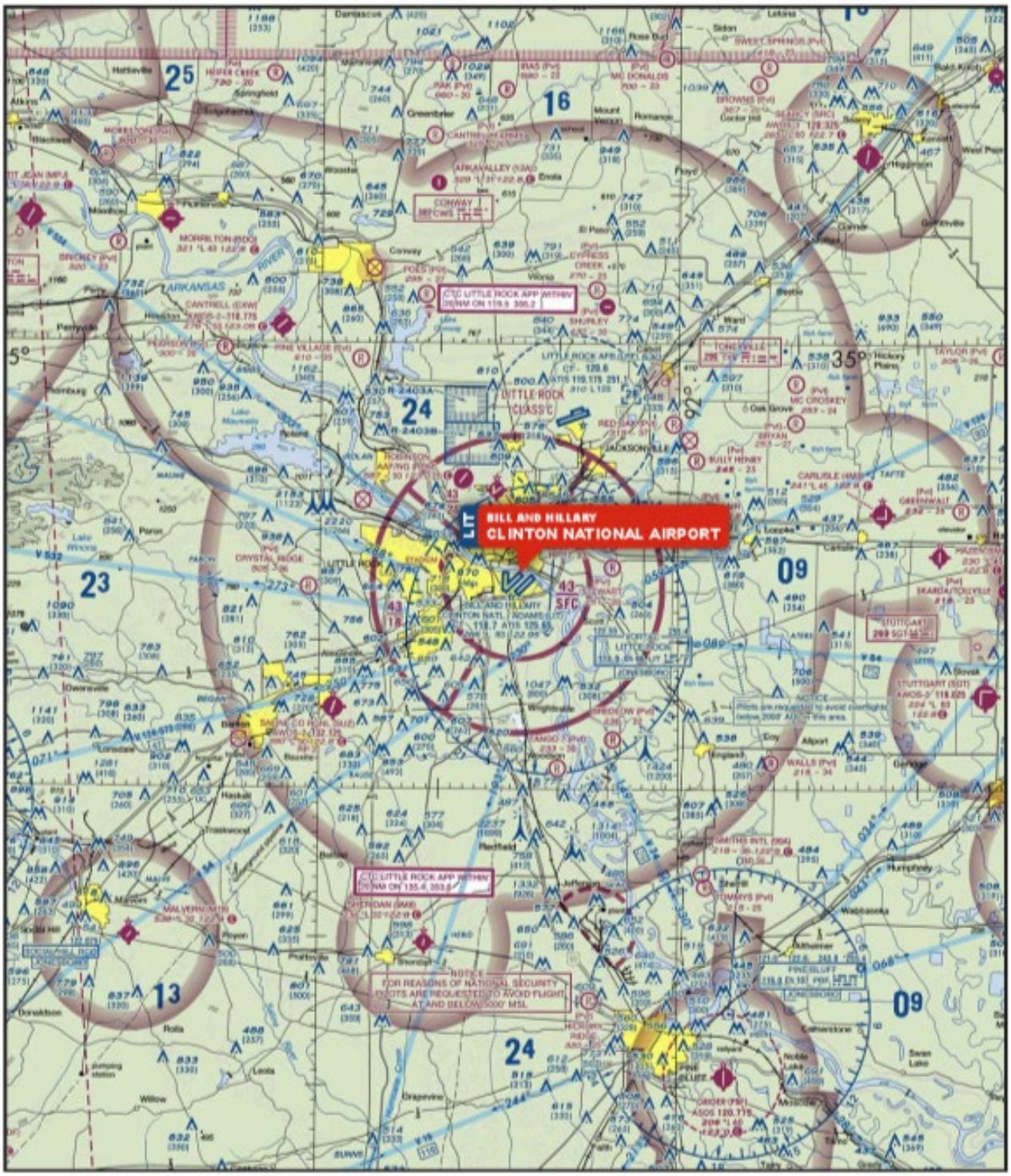
Aviation communication facilities associated with the Airport include the Air Traffic Control Tower on frequency 118.7, Ground Control on frequency on 121.9, Approach/Departure Control on frequency 135.4/119.5, ATIS on frequency on 125.65, and an Aeronautical Advisory Station (UNICOM) on frequency 122.95.

1.2.3.2 Airspace

The following illustration, Figure 1-4 depicts the airports, local airspace, and navigational facilities in the vicinity of Clinton National Airport. The local airspace surrounding Clinton National Airport is designated as Class C airspace, which is tailored to individual airports. Class C airspace is generally that airspace from the surface to 4,000 feet above the ground level (AGL) surrounding those airports that have an operational control tower, are serviced by a radar approach control, and that have a certain number of Instrument Flight Rules (IFR) operations or passenger enplanements. Although the configuration of each Class C airspace area is individually tailored, the airspace usually consists of a five-nautical mile (NM) radius circle surrounding the Airport that includes the airspace from the ground surface up to 4,000 feet AGL, and an outer area with a ten-NM radius that extends from 1,200 feet AGL to 4,000 feet AGL. As indicated in the following illustration, the Class C airspace surrounding Clinton National Airport is consistent with these generalized criteria. Each person operating an aircraft must establish two-way radio communication with the ATCT facility providing air traffic services prior to entering Class C airspace and, thereafter, must maintain those communications within the airspace. Around Clinton National Airport, the Class C airspace, within the inner five-NM radius circle, extends from the surface (the airport elevation is 262 feet AMSL) to an elevation of 4,300 feet AMSL. That airspace within the ten-NM radius circle, extends from varying floor elevations (1,500, 1,800, and 2,100 feet AMSL) to the same 4,300-foot AMSL altitude cap at the inner circle.

Military airports, military operations areas, and restricted areas can also impact airspace use in the vicinity of a civil airport. There are two military airport within a 25-NM radius of Clinton National Airport, the Little Rock Air Force Base, which is located approximately 12 NM to the north and the Robinson Army Airfield/National Guard Airport located approximately 8.5-NM to the northwest.

Figure 1-4
Airspace/NAVAIDS Summary



SOURCE: Memphis Sectional Aeronautical Chart, March 2017

Military Operations Areas (MOAs) in the vicinity of Clinton National Airport include the Shirley A, Shirley B, and Shirley C MOAs located north of the Airport; the Hog Low North, Hog High North, Hog Low South, and Hog High South MOAs all located west of the Airport; and the Anne High and Anne Low MOAs located southwest of the Airport. Table 1-5 provides information on the military operation areas (MOAs).

Table 1-5
Military Operation Areas (MOA)
Airport Master Plan
Bill and Hillary Clinton National Airport

MOA	Proximity to LIT	Altitude	Time of Use
Shirley A	41 NM Northwest	11,000' AMSL to 17,999' AMSL	7AM to 12PM and 1PM to 5PM Monday - Friday NOTAM Only Other Times
Shirley B	35 NM North	11,000' AMSL to 17,999' AMSL	7AM to 12PM and 1PM to 5PM Monday - Friday NOTAM Only Other Times
Shirley C	36 NM Northeast	11,000' AMSL to 17,999' AMSL	NOTAM Only
Hog A	59 NM West	100’ AGL to 17,999’ AMSL	NOTAM Only Other Times
Hog B	64 NM West	100' AGL to 5,900’ AMSL	NOTAM Only Other Times
Anne High	87 NM Southwest	7,000' AMSL to 17,999’ AMSL	Sunrise to Sunset, Monday - Friday NOTAM Only Other Times
Anne Low[(a)]	87 NM Southwest	100' AGL to 6,999’ AMSL	Sunrise to Sunset, Monday - Friday NOTAM Only Other Times

(a) Altitude excludes airspace 1,500 feet AGL and below within the Magnolia Municipal Airport, Magnolia, Arkansas
(b) Proximity to LIT is measured to the nearest boundary point of each MOA in nautical miles.

Source: Little Rock Airport staff.

In addition to the MOAs, there are seven Restricted Areas within the vicinity of the Airport: R-2401A, R-2401B, R-2402A, R-2402B, R-2402C, R-2403A, and R-2403B. R-2403A and R-2403B are located approximately 12 NM north of Clinton National Airport, R-2401A and R-2401 are located approximately 125 NM Northwest of the Airport, and R-2402A, R-2402B, and R-2402C are located approximately 108 NM Northwest of the Airport. Table 1-6 provides information on the restricted areas.

Table 1-6
Restricted Areas
Airport Master Plan
Bill and Hillary Clinton National Airport

Restricted Area	Proximity to LIT	Altitude	Time of Use
R-2401A	104 NM Northwest	Surface to 30,000' AMSL	Sunrise to Sunset, Daily NOTAM Only Other Times
R-2401B	107 NM Northwest	Surface to 30,000' AMSL	Sunrise to Sunset, Daily NOTAM Only Other Times
R-2402A	96 NM Northwest	Surface to 30,000' AMSL	Sunrise to Sunset, Daily NOTAM Only Other Times
R-2402B	96 NM Northwest	10,000' AMSL to 21,999' AMSL	Sunrise to Sunset, Daily NOTAM Only Other Times
R-2402C	96 NM Northwest	13,000' AMSL to 21,999' AMSL	Sunrise to Sunset, Daily NOTAM Only Other Times
R-2403A	13 NM North	Surface to 16,000' AMSL	NOTAM Only - 24 hours in Advance
R-2403B	10 NM North	Surface to 16,000' AMSL	NOTAM Only - 24 hours in Advance

Source: Little Rock Airport staff.

1.2.3.3 Navigational Aids

The navigational aids (NAVAIDS) available for use by pilots in the vicinity of Clinton National Airport are VORTAC facilities, VOR-DME facilities, and Non-Directional Beacon (NDB) facilities. A VORTAC (VHF Omnidirectional Range/Tactical Air Navigation) is a navigational aid providing VOR azimuth, TACAN Azimuth, and TACAN distance measuring equipment (DME) at a single site. A VOR-DME system is a Very High Frequency Omnidirectional Range Station with Distance Measuring Equipment transmitting very high frequency signals, 360 degrees in azimuth oriented from magnetic north. This equipment is used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigation aid. NDBs are general purpose low- or medium-frequency radio beacons that an aircraft equipped with a loop antenna can home in on or determine its bearing relative to the sending facility.

The Little Rock VORTAC (113.90 LIT) is located approximately four NM southeast of Little Rock National Airport and the Pine Bluff VOR/DME (116.00 PBF) is located approximately 33 NM southeast of the Airport. The Toneyville NDB (290 TYV) is located approximately 17 NM to the northeast of the Airport and the Lasky NDB (353 LI) is located approximately 5.5 miles southwest of the airport.

A network of low-altitude published airways (victor airways) in the vicinity of Clinton National Airport also traverses the area. Victor airways span between the regional ground based VOR/DME and VORTAC equipment and include the airspace within parallel lines located four NM on either side of the airway and extend 1,200 feet AMSL to, but not including, 18,000 feet AMSL.

1.2.3.4 Approach Aids

There are presently several published instrument approach procedures at Clinton National Airport, which are listed in Table 1-7.

Table 1-7
Instrument Approach Procedures
Airport Master Plan
Bill and Hillary Clinton National Airport

Runway End	Approach Type	Visibility Minimums	Ceiling Minimums
4L	ILS (Category I)	S-ILS: Categories A, B, C, & D - 3/4-mile	508' MSL/300' AGL
		S-LOC: Categories A & B - 3/4-mile	960' MSL/700' AGL
		S-LOC: Categories C & D - 1 5/8-miles	960' MSL/700' AGL
		Circling: Category A - 1-mile	960' MSL/700' AGL
		Circling: Category B - 1-mile	1,000’ MSL/800' AGL
		Circling: Category C - 2 3/4-miles	1,180’ MSL/1,000 AGL
		Circling: Category D - 3-miles	1,180’ MSL/1,000 AGL
		S-LOC: Categories A & B - 3/4-mile[(a)]	720' MSL/500' AGL
		S-LOC: Categories C & D - 1-mile[(a)]	720' MSL/500' AGL
		Circling: Category A - 1-mile[(a)]	820' MSL/600' AGL
		Circling: Category B - 1-mile[(a)]	1,000' MSL/800' AGL
		Circling: Category C - 2 3/4-miles[(a)]	1,180' MSL/1,000' AGL
		Circling: Category D - 3-miles[(a)]	1,180' MSL/1,000' AGL
4L	RNAV (GPS)	LPV DA: Categories A, B, C, & D - 3/4-mile	544' MSL/300' AGL
		LNAV/VNAV DA: Categories A, B, C, & D - 1 1/2-miles	824' MSL/600' AGL
		LNAV MDA: Categories A & B - 3/4-mile	780' MSL/600' AGL
		LNAV MDA: Categories C & D - 1 1/4-miles	780' MSL/600' AGL
		Circling: Category A - 1-mile	820' MSL/600' AGL
		Circling: Category B – 1-mile	1,000’ MSL/800’ AGL
		Circling: Category C – 2 3/4-miles	1,180' MSL/1000' AGL
		Circling: Category D - 3-miles	1,180' MSL/1,000' AGL
22R	ILS (Category I)	S-ILS: Categories A, B, C, & D - 1/2-mile	462' MSL/200' AGL
		S-LOC: Categories A & B - 1/2-mile	680' MSL/500' AGL
		S-LOC: Categories C & D - 3/4-mile	680' MSL/500' AGL
		Circling: Category A - 1-mile	800' MSL/600' AGL
		Circling: Category B - 1-mile	1,000' MSL/800' AGL
		Circling: Category C - 2 3/4-miles	1,180' MSL/1,000' AGL
		Circling: Category D - 3-miles	1,180' MSL/1,000' AGL
22R[(c)]	ILS (SA Category I)	S-ILS: Categories A, B, C, & D - 1,400 feet	182' AGL
22R[(c)]	ILS (Category II)	S-ILS: Categories A, B, C, & D - 1,200 feet	128' AGL

Table 1-7 *(continued)*
INSTRUMENT APPROACH PROCEDURES
Airport Master Plan
Bill and Hillary Clinton National Airport

Runway End	Approach Type	Visibility Minimums	Ceiling Minimums
22R[(c)]	ILS (Category III)	S-ILS: Categories A, B, C, & D - 600 feet	0' AGL
22R	RNAV (GPS)	LPV DA: Categories A, B, C, & D - 1/2-mile	462' MSL/200' AGL
		LNAV/VNAV DA: Categories A, B, C, & D - 1-mile	727' MSL/500' AGL
		LNAV MDA: Categories A & B - 1/2-mile	740' MSL/500' AGL
		LNAV MDA: Categories C & D - 1-mile	740' MSL/500' AGL
		Circling: Category A - 1-mile	820' MSL/600' AGL
		Circling: Category B – 1-mile	1,000’ MSL/800’ AGL
		Circling: Category C – 2 3/4-miles	1,180' MSL/1,000' AGL
		Circling: Category D - 3-miles	1,180' MSL/1,000' AGL
4R	ILS (Category I)	S-ILS: Categories A, B, C, & D - 3/4-mile	510' MSL/300' AGL
		S-LOC: Categories A & B - 3/4-mile	880' MSL/700' AGL
		S-LOC: Categories C & D - 1 3/8-miles	880' MSL/700' AGL
		Circling: Category A - 1-mile	820' MSL/600' AGL
		Circling: Category B – 1-mile	1000’ MSL/800’ AGL
		Circling: Category C – 2 3/4-miles	1,180' MSL/1,000' AGL
		Circling: Category D - 3-miles	1,180' MSL/1,000' AGL
		S-LOC: Categories A & B - 3/4-mile[(b)]	780' MSL/600' AGL
		S-LOC: Categories C & D - 1 mile[(b)]	780' MSL/600' AGL
		Circling: Categories A / B - 1-mile[(b)]	820'/ 1,000’ MSL/600' / 800’ AGL
		Circling: Category C – 2 3/4-miles[(b)]	1,180' MSL/1,000' AGL
		Circling: Category D - 3-miles[(b)]	1,180' MSL/1,000' AGL
4R	RNAV (GPS)	LPV DA: Categories A, B, C, & D - 3/4-mile	574' MSL/400' AGL
		LNAV/VNAV DA: Categories A, B, C, & D - 1 1/4-miles	728' MSL/500' AGL
		LNAV MDA: Categories A & B - 3/4-mile	760' MSL/500' AGL
		LNAV MDA: Categories C & D - 1-mile	760' MSL/500' AGL
		Circling: Category A - 1-mile	820' MSL/600' AGL
		Circling: Category B – 1-mile	1,000’ MSL/800’ AGL
		Circling: Category C – 2 3/4-miles	1,180' MSL/1,000' AGL
		Circling: Category D - 3-miles	1,180' MSL/1,000' AGL

Table 1-7 *(continued)*
INSTRUMENT APPROACH PROCEDURES
Airport Master Plan
Bill and Hillary Clinton National Airport

Runway End	Approach Type	Visibility Minimums	Ceiling Minimums
22L	ILS (Category I)	S-ILS: Categories A, B, C, & D - 3/4-mile	509' MSL/300' AGL
		S-LOC: Categories A, B, C, & D - 3/4-mile	640' MSL/400' AGL
		Circling: Category A - 1-mile	820' MSL/600' AGL
		Circling: Category B – 1-mile	1,000’ MSL/800’ AGL
		Circling: Category C – 2 3/4-miles	1,180' MSL/1,000' AGL
		Circling: Category D - 3-miles	1,180' MSL/1,000' AGL
22L	RNAV (GPS)	LPV DA: Categories A, B, C, & D - 1-mile	542' MSL/300' AGL
		LNAV/VNAV DA: Categories A, B, C, & D - 1 3/4-miles	773' MSL/600' AGL
		LNAV MDA: Categories A & B - 3/4-mile	680' MSL/500' AGL
		LNAV MDA: Categories C & D - 1 1/4-miles	680' MSL/500' AGL
		Circling: Category A - 1-mile	820' MSL/600' AGL
		Circling: Category B – 1-mile	1,000’ MSL/800’ AGL
		Circling: Category C – 2 3/4-miles	1,180' MSL/1,000' AGL
		Circling: Category D - 3-miles	1,180' MSL/1,000' AGL
18	RNAV (GPS)	LP MDA: Categories A & B - 1-mile	720' MSL/500' AGL
		LP MDA: Categories C & D - 1 3/8-miles	720' MSL/500' AGL
		LNAV MDA: Categories A & B - 1-mile	820' MSL/600' AGL
		LNAV MDA: Categories C & D - 1 5/8-miles	820' MSL/600' AGL
		Circling: Category A - 1-mile	820' MSL/600' AGL
		Circling: Category B – 1-mile	1,000’ MSL/800’ AGL
		Circling: Category C – 2 3/4-miles	1,180' MSL/1,000' AGL
		Circling: Category D - 3-miles	1,180' MSL/1,000' AGL
36	RNAV (GPS)	LNAV MDA: Categories A & B - 1-mile	760' MSL/500' AGL
		LNAV MDA: Categories C & D - 1 1/2-miles	760' MSL/500' AGL
		Circling: Category A - 1-mile	820' MSL/600' AGL
		Circling: Category B – 1-mile	1000’ MSL/800’ AGL
		Circling: Category C – 2 3/4-miles	1,180' MSL/1,000' AGL
		Circling: Category D - 3-miles	1,180' MSL/1,000' AGL
N/A	VOR-A	Circling: Categories A & B - 1-mile	800' MSL/600' AGL
		Circling: Category C - 2-miles	940' MSL/700' AGL
		Circling: Category D - 3-miles	1,180' MSL/1,000' AGL

(a) JIRUR Fix Minimums (Dual VOR Receivers or DME Required)
(b) OGRAY Fix Minimums
(c) Special Aircrew and Aircraft Certification Required

Source: U.S. Terminal Procedures, South Central, Volume 1 of 5, March 2017.

1.2.4 Wind and Weather Analysis

Climate conditions specific to the location of an airport not only influence the layout of the airfield, but also affect the use of the runway system. Surface wind conditions have a direct impact on the operations of an airport; runways not oriented to take the fullest advantage of prevailing winds will restrict the capacity of the airport to varying degrees. When landing and taking off, aircraft are able to operate properly on a runway as long as the wind component perpendicular to the direction of travel (defined as a crosswind) is not excessive. The wind coverage analysis translates the crosswind velocity and direction into a "crosswind component". Smaller aircraft are more easily affected by crosswinds than larger aircraft, so therefore, they have a smaller crosswind component.

1.2.4.1 Wind Conditions

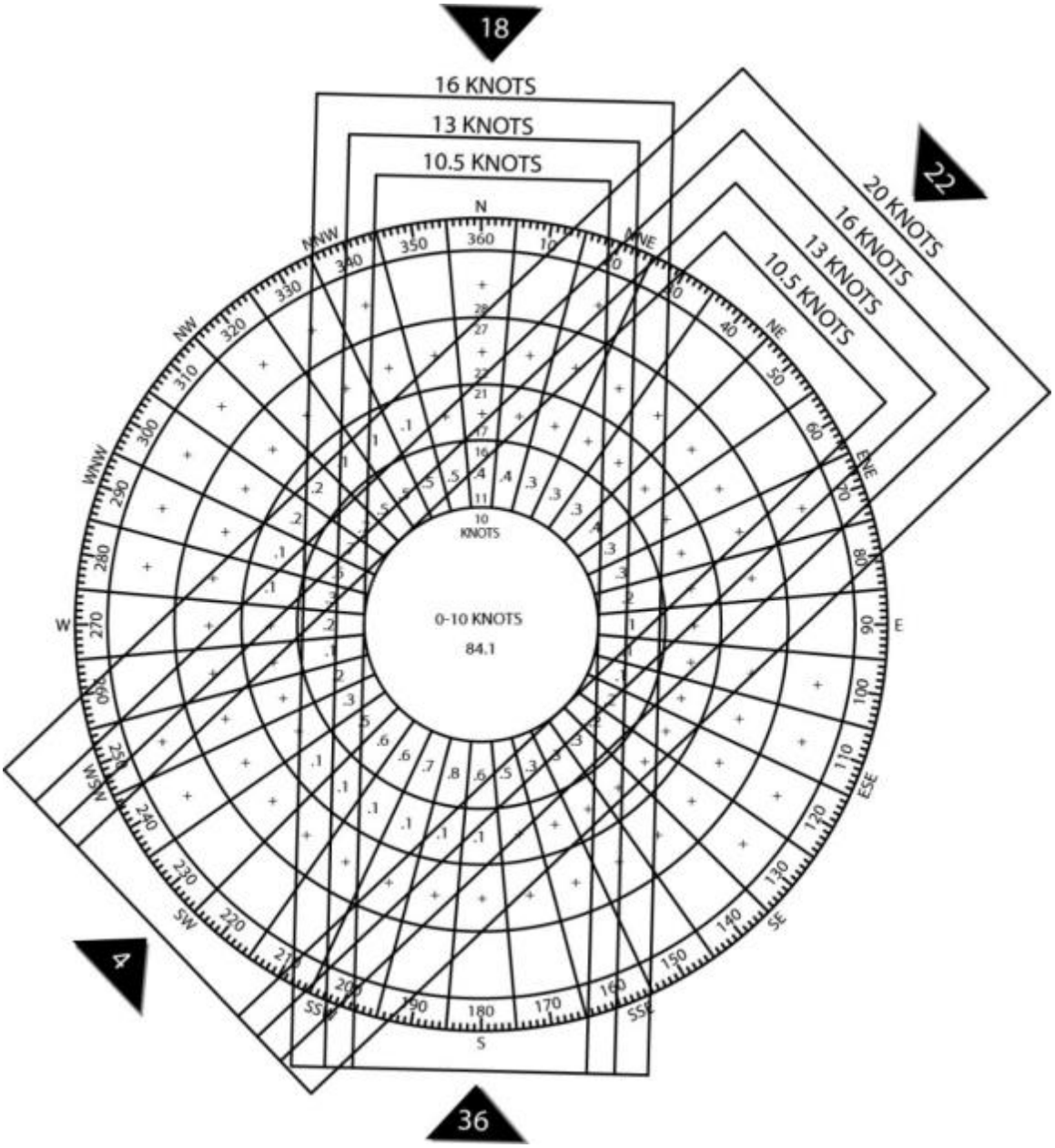
The allowable crosswind component is dependent upon the Runway Design Code (RDC) for the type of aircraft that utilize the Airport on a regular basis. The existing and future RDC for Runways 4L/22R and 4R/22R is D-IV; the existing Runway 18/36 is C-II; the future Runway 18/36 RDC is D-III. In consideration of the RDC D-IV classification for Runways 4L/22R and 4R/22L, standards contained FAA AC 150/5300-13A specify that the 20-knot crosswind component be utilized for the analysis. In consideration of the RDC C-II and D-III classifications for Runway 18/36, these standards specify that the 16-knot crosswind component be utilized for the analysis. In addition, it is known that the Airport will continue to serve small single and multi-engine aircraft for which the 10.5-knot crosswind component is considered maximum. Therefore, depending on runway designation, the 20-knot and 16-knot components, along with 13-knot and 10.5-knot crosswind components, were analyzed.

1.2.4.2 All Weather Wind Conditions

To determine wind velocity and direction at LIT, accurate and timely wind data was obtained for the period between January 1, 2007 and December 31, 2016 from observations taken at the Airport from data gathered by the National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC). There were approximately 104,190 observations available for analysis during this ten-year period. Using this data, an all-weather wind rose was constructed and is presented in Figure 1-5.

The desirable wind coverage for an airport's runway system is 95%. This means that the runway orientation and configuration should be developed so that the maximum crosswind component is not exceeded more than 5% of the time annually. Table 1-8 quantifies the wind coverage offered by the Airport's existing runway system, including the coverage for each runway end. Based on the all-weather wind data for LIT, and utilizing the FAA's Wind Analysis tool, the combined runway configuration provides adequate wind coverage for all crosswind components (i.e., in excess of 96%). However, from an individual runway analysis, no singular runway orientation provides greater than 95% coverage for the 10.5-knot crosswind component.

Figure 1-5
All Weather Wind Rose
Airport Master Plan
Bill and Hillary Clinton National Airport



Source: Wind analysis tabulation provided by Mead & Hunt using the FAA Airport Design Tools, Wind Analysis. Wind data obtained from the National Oceanic and Atmospheric Administration, National Climatic Data Center. Station 723403 Adams Field Airport. Period of Record 2007-2016.

Table 1-8
All Weather Wind Coverage Analysis
Airport Master Plan
Bill and Hillary Clinton National Airport

Runway Designation	10.5-Knot Crosswind Component	13-Knot Crosswind Component	16-Knot Crosswind Component	20-Knot Crosswind Component
Runway 18/36	94.52%	97.26%	99.17%	--
Runway 18 [(a)]	80.36%	81.86%	83.01%	--
Runway 36 [(a)]	76.44%	78.42%	79.99%	--
Runways 4L/22R & 4R/22L	92.70%	96.00%	98.89%	99.76%
Runways 4L and 4R [(a)]	76.86%	79.16%	81.28%	81.87%
Runways 22R and 22L [(a)]	79.60%	82.16%	84.61%	85.36%
Combined	96.91%	98.64%	99.59%	98.86%

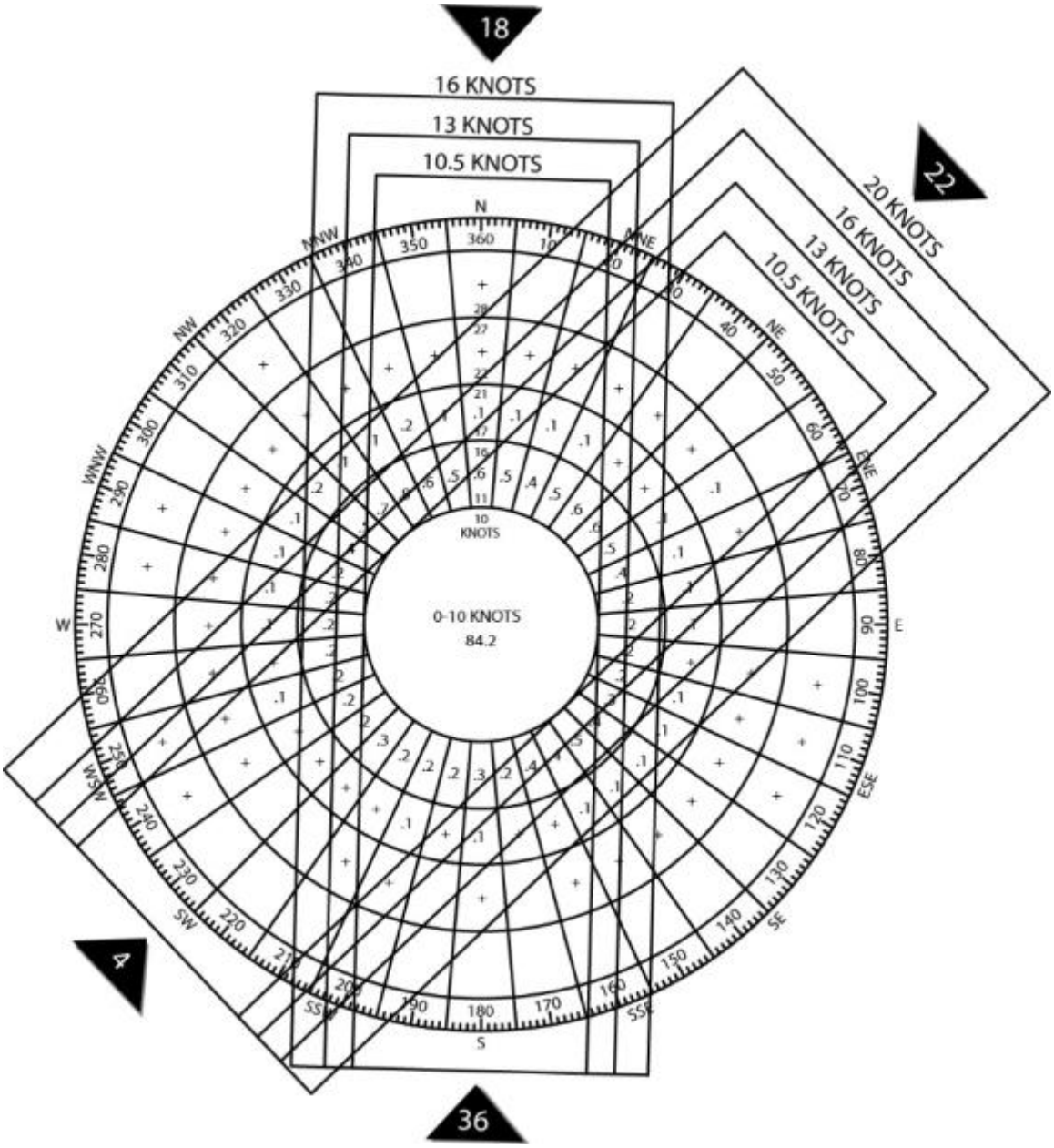
(a) A 5-knot tailwind component was used for the individual runway end analysis.

Source: Wind analysis tabulation provided by Mead & Hunt using the FAA Airport Design Tools, Wind Analysis. Wind data obtained from the National Oceanic and Atmospheric Administration, National Climatic Data Center. Station 723403 Adams Field Airport. Period of Record 2007-2016.

1.2.4.3 IFR Weather Wind Conditions

LIT has thirteen published instrument approach procedures. In an effort to analyze the effectiveness of these approaches, and to document the need for and placement of potential improved procedures, an Instrument Flight Rules (IFR) wind analysis has been conducted. Using the wind data obtained from the NCDC, an IFR wind rose was also constructed and is presented in Figure 1-6.

Figure 1-6
IFR Weather Wind Rose
Airport Master Plan
Bill and Hillary Clinton National Airport



Source: Wind analysis tabulation provided by Mead & Hunt using the FAA Airport Design Tools, Wind Analysis. Wind data obtained from the National Oceanic and Atmospheric Administration, National Climatic Data Center. Station 723403 Adams Field Airport. Period of Record 2007-2016.

Table 1-9 quantifies the wind coverage provided by the individual runway ends and the combined runways during Instrument Flight Rules (IFR) weather conditions at LIT. IFR weather conditions occur when the reported cloud ceiling is less than 1,000 feet above ground level (AGL) and/or visibility is less than 3 statute miles (SM). From this analysis, it is determined that the existing runway configuration at LIT provides more than adequate wind coverage during the IFR weather conditions for all crosswind components (greater than 96%). However, like the all-weather wind analysis, no singular runway orientation provides greater than 95% wind coverage for the 10.5-knot crosswind component. Runway ends 4L and 4R provide the best wind coverage during IFR weather conditions at 89.57% for the 20-knot crosswind component.

Table 1-9
IFR Wind Coverage Analysis
Airport Master Plan
Bill and Hillary Clinton National Airport

Runway Designation	10.5-Knot Crosswind Component	13-Knot Crosswind Component	16-Knot Crosswind Component	20-Knot Crosswind Component
Runway 18/36	93.73%	96.48%	98.48%	--
Runway 18 [(a)]	75.21%	76.71%	77.96%	--
Runway 36 [(a)]	81.40%	83.40%	84.99%	--
Runways 4L/22R & 4R/22L	91.44%	94.81%	98.15%	99.94%
Runways 4L and 4R [(a)]	83.05%	85.77%	88.57%	89.57%
Runways 22R and 22L [(a)]	72.25%	74.61%	77.28%	78.25%
Combined	96.48%	98.25%	99.28%	99.66%

(a) A 5-knot tailwind component was used for the individual runway end analysis.

Source: Wind analysis tabulation provided by Mead & Hunt using the FAA Airport Design Tools, Wind Analysis. Wind data obtained from the National Oceanic and Atmospheric Administration, National Climatic Data Center. Station 723403 Adams Field Airport. Period of Record 2007-2016.

1.2.4.4 Ceiling and Visibility

FAA Advisory Circular 150/5060-5, Airport Capacity and Delay, describes three categories of ceiling and visibility minimums for use in both capacity and delay calculations. Visual Flight Rules (VFR) conditions occur whenever the cloud ceiling is at least 1,000 feet above ground level (AGL) and the visibility is at least 3 statute miles (SM). Instrument Flight Rules (IFR) conditions occur when the reported cloud ceiling is at least 500 feet AGL, but less than 1,000 feet and/or visibility is at least 1 SM, but less than 3 SM. Poor Visibility and Ceiling (PVC) conditions exist whenever the cloud ceiling is less than 500 feet AGL and/or the visibility is less than 1 SM. Meteorological data obtained for LIT from the NCDC (2007 to 2016) for use in this planning effort, have been categorized in more specific terms relating to the existing Instrument Landing System (ILS) approach procedures at the Airport. A summary of this data is presented in Table 1-10.

- **VFR Conditions.** A cloud ceiling equal to or greater than 1,000 feet AGL and the horizontal visibility is equal to or greater than 3 SM. These conditions occur at the Airport approximately 91.3% of the time annually.

- **VFR Minimums to Existing ILS Approach Minimums (Runways 4L, 4R, and 22L).** A cloud ceiling less than 1,000 feet AGL and/or visibility less than 3 SM, but ceiling equal to or greater than 250 feet AGL and visibility equal to or greater than ¾ SM. These conditions occur approximately 7.7% of the time annually.

- **VFR Minimums to Existing Category I ILS Approach Minimums (Runway 22R).** A cloud ceiling less than 1,000 feet AGL and/or visibility less than 3 SM, but ceiling equal to or greater than 200 feet AGL and visibility equal to or greater than ½ SM. These conditions occur approximately 8.2% of the time annually.

- **VFR Minimums to Existing Category II ILS Approach Minimums (Runway 22R).** A cloud ceiling less than 1,000 feet AGL and/or visibility less than 3 SM, but ceiling equal to or greater than 100 feet AGL and visibility equal to or greater than ¼ SM. These conditions occur approximately 8.3% of the time annually.

- **VFR Minimums to Existing Category III ILS Approach Minimums (Runway 22R).** A cloud ceiling less than 1,000 feet AGL and/or visibility less than 3 SM, but ceiling equal to or greater than zero feet AGL and visibility equal to or greater than 1/8 SM. These conditions occur approximately 8.7% of the time annually.

- **Below Runway 22R Instrument Approach Minimums.** A cloud ceiling equal to or greater than zero feet and/or visibility less than 1/8 SM. These conditions occur less than 0.1% of the time annually.

Table 1-10
Existing Meteorological Conditions
Airport Master Plan
Bill and Hillary Clinton National Airport

Runway Designation	Percent	Approximate Days per Year
VFR (Greater Than: 1,000', 3 SM)	91.3%	333.2
IFR (250'-1,000', ¾ SM-3 SM)	7.7%	28.1
IFR (200'-1,000', ½ SM-3 SM)	8.2%	29.9
IFR (100'-1,000', ¼ SM-3 SM)	8.3%	30.3
IFR (0'-1,000', 1/8 SM-3 SM)	8.7%	31.8
Below Minimums (0', 0-1/8 SM)	<0.1%	<0.4

Sources: Weather analysis tabulation provided by Mead & Hunt using the FAA Airport Design Tools, Wind Analysis. Wind data obtained from the National Oceanic and Atmospheric Administration, National Climatic Data Center. Station 723403 Adams Field Airport. Period of Record 2007-2016.

Therefore, in consideration of the existing weather data, it can be noted that the majority of the IFR accessibility benefit (approximately 99% of the existing IFR access) is provided by the ILS approaches to Runways 4L, 4R, and 22L. When the ILS approach to Runway 22R is considered, approximately 99.5% of the existing IFR access is available.

1.3 PASSENGER TERMINAL COMPLEX

This section described the Passenger Terminal building and aircraft parking apron.

Figure 1-7 provides a graphic depiction of the existing facilities in the direct vicinity of the passenger terminal building, including the layout of the terminal access roadway system and the automobile parking facilities. Airport Drive connects with the terminal loop road, which circles through the passenger terminal area, providing access from I-440 to the passenger drop-off/pick-up curb on the south side of the terminal building.

1.3.1 Passenger Terminal

The passenger terminal building, consisting of approximately 291,000 square feet of usable area, is located south of, and adjacent to, the terminal apron. Facilities located in the three-story terminal building include airline ticket counters and offices, baggage claim, passenger departure lounges, concession space, government lease area, along with airport commission space and administrative offices Table 1-11 shows terminal building space allocation information.

Table 1-11
Terminal Building Space Allocation
Airport Master Plan
Bill and Hillary Clinton National Airport
(in square feet)

	Basement	Level 1	Level 2	Level 3	Total
Pre-Security Public Circulation		18,040	7,060	3,370	28,470
Concession Space [(a)]		4,805	16,890		21,690
Service Dock		650			650
Restrooms		2,110	6,055	410	8,580
Airline Offices [(b)]		36,520	22,770		59,290
Rental Car Space		860			860
Baggage Claim		36,130			36,130
Ticketing		8,020			8020
Airport Space [(c)]	4,262	24,805	22,690	1,840	53,600
Security [(d)]		1,350	8,145	5,610	15,110
Airport Administrative Circulation		4,850	3,680		8,530
Post-Security Public Circulation		4,590	20,550		25,140
Baggage Handling System		25,300			25,300
Total	4,262	168,030	107,840	11,230	291,370

(a) Concessions include restaurants, stores, and storage.
(b) Airline offices includes operations space, back-of-house office space behind ticket counters, gate lobbies, and currently non-leased vacant space designated for airline use.
(c) Airport space includes administrative offices, equipment rooms, maintenance facilities, building systems, custodial facilities, and storage.
(d) Security includes passenger screening, immigration processes, customs inspection, security related offices, and national police offices.

Source: Terminal Redevelopment – Phase 1 Record Drawings.

Figure 1-7
Passenger Terminal Area

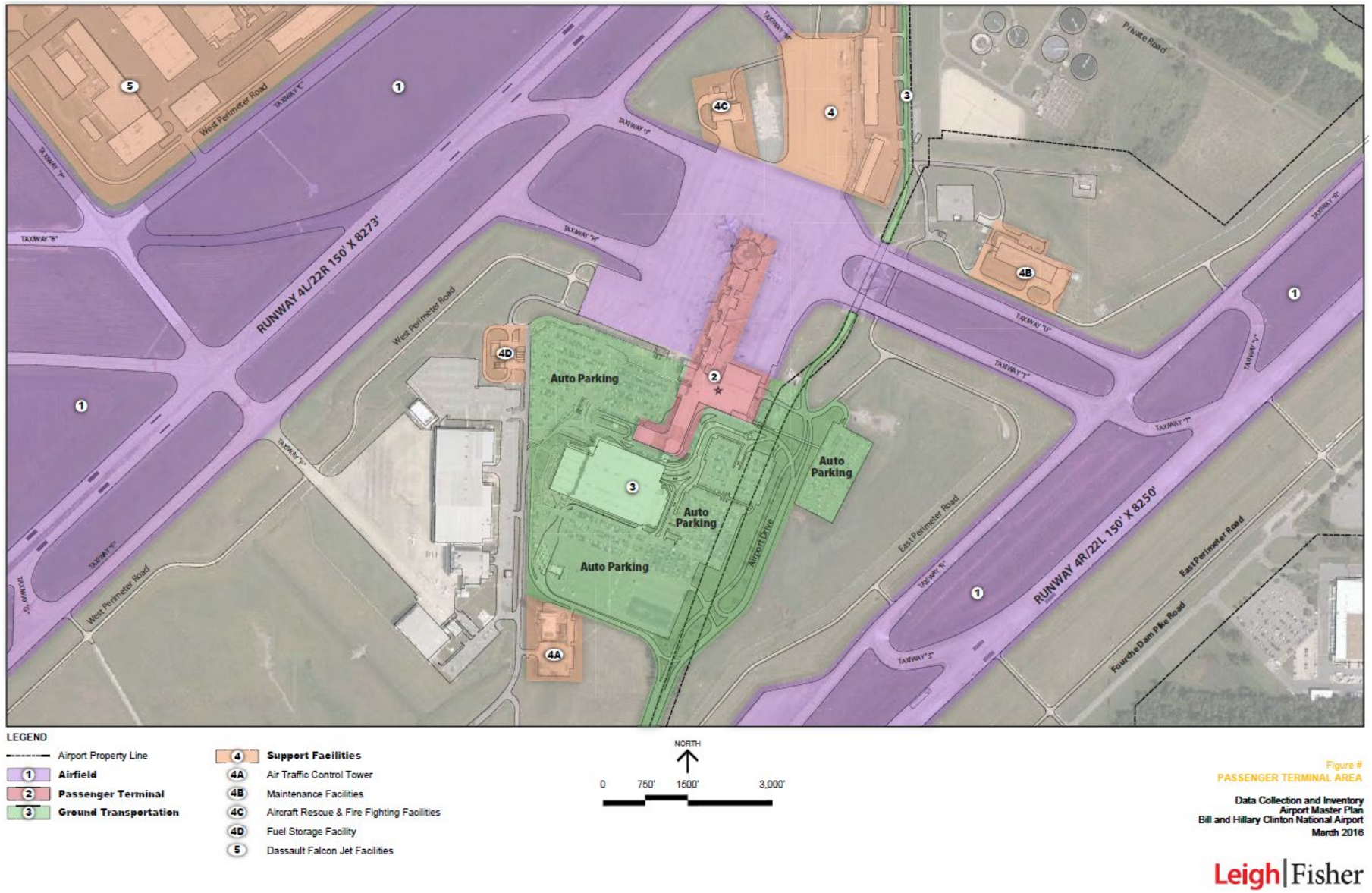
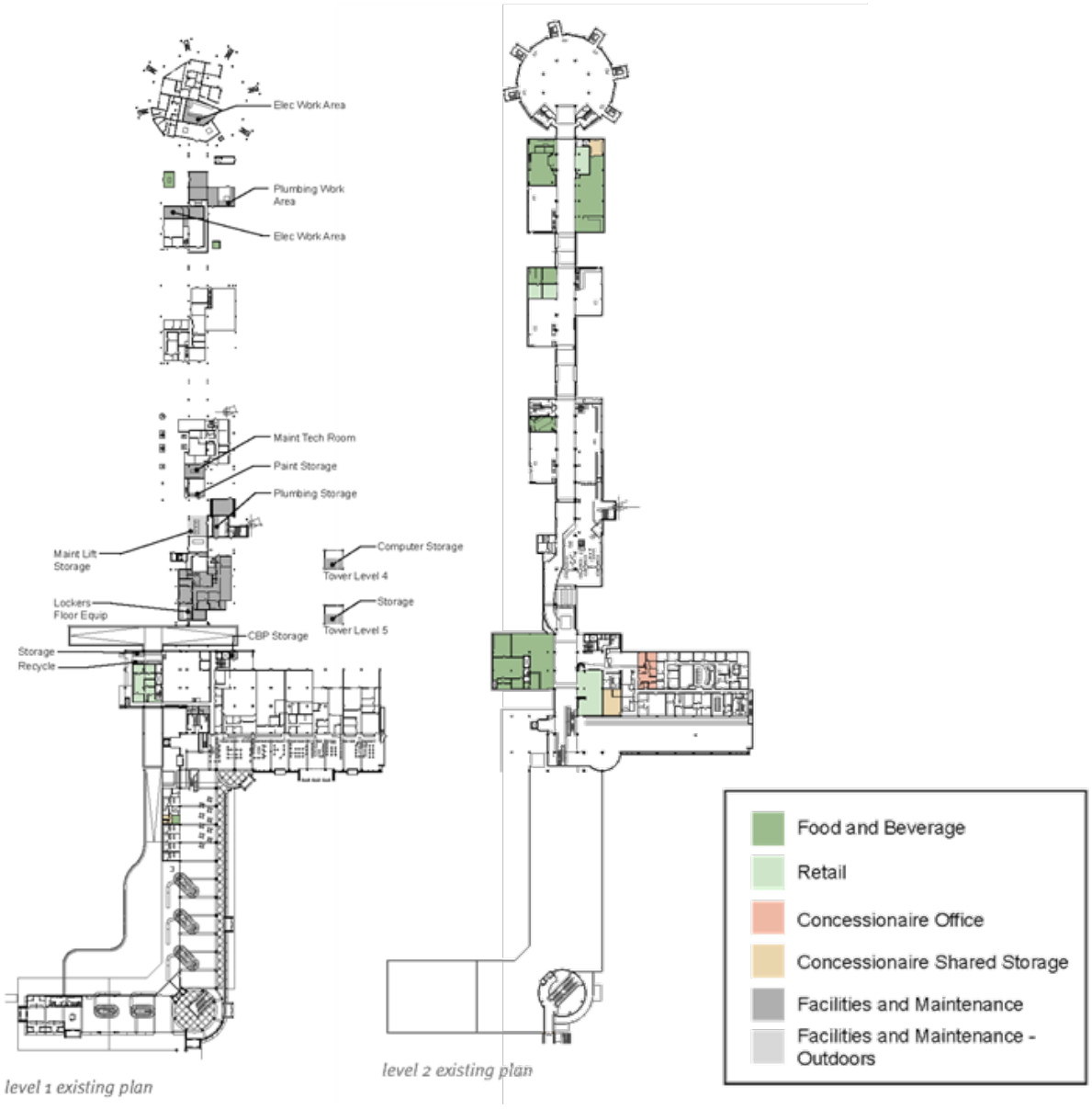


Figure 1-8
Existing Passenger Terminal



Source: Alliance Architecture.

The second level concourse has 12 designated gates which are equipped with passenger boarding bridges (PBB). American Airlines utilizes three of the gate areas (Gates 1, 3, and 8), Delta Airlines utilizes two (Gates 2 and 4), Southwest Airlines utilizes two (Gates 10 and 11), United Airlines utilizes two (Gates 5 and 7), while Allegiant Air (Gate 12) and Via Airlines (Gate 6) occupy one each. See Table 1-12 for additional information.

Table 1-12
Passenger Terminal Gate Assignments
Airport Master Plan
Bill and Hillary Clinton National Airport

Gate	Airline	PBB Ownership
1	American Airlines	Airport
2	Delta Airlines	Delta Airlines
3	American Airlines	Airport
4	Delta Airlines	Delta Airlines
5	United Airlines	Airport
6 *(a)*	Via Airlines	Airport
7	United Airlines	Airport
8	American Airlines	Airport
9 *(a)*	Vacant	Airport
10	Southwest Airlines	Southwest Airlines
11	Southwest Airlines	Southwest Airlines
12 *(a)*	Allegiant Air	Airport

(a) Common Use Gate.

Source: Airport Staff (2016).

1.3.2 Aircraft Parking Apron Development Areas

There are five primary aircraft parking apron areas at Clinton National Airport which have associated structural development.

The primary passenger terminal apron is located between the parallel runways on the north side of the terminal building and surrounds the passenger terminal concourse. This apron area is comprised of approximately 26.8 acres or 130,000 square yards of pavement.

1.4 GROUND TRANSPORTATION

This section summarizes the Airport's ground access and parking facilities.

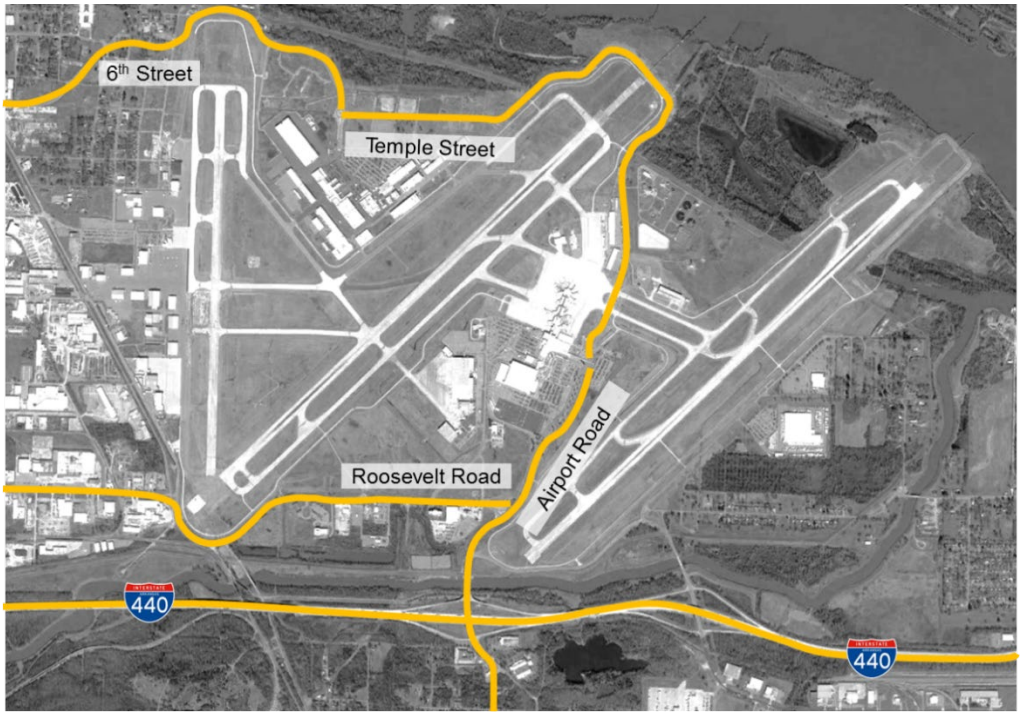
1.4.1 Roadways and Curbsides

Access to the Airport is provided from the regional roadway network and Interstate 440 via Airport Road. Airport Road runs north-south along the east side of the Airport and connects with the passenger Terminal area and Temple Street. Temple Street continues north and loops around the north side of the airport, connecting to East 9th Street and East 6th Street.

The south side of the terminal building is served by a one-way roadway loop road that provides access to public parking, curbside roadways, rental car ready/return, and other landside facilities in the passenger Terminal area. There are two curbsides, each served by a two-lane roadway, on the same level serving both arrivals and departures. The inner curb is used for private vehicle pick-up and drop-off and also connects to the taxi pick-up area on the west side of the Terminal building. The outer curbside is used for commercial vehicles including shuttles, bus services and transportation network companies (TNC's)/rideshare providers. The outer curb is reached from the terminal via several at-grade crosswalks. Some public parking facilities are also accessed via the commercial curbside. Both the inner and outer curbsides are divided into distinct segments, with a mix of linear passenger loading / unloading and pull-through spaces, used for departing and arriving passengers, as shown on Figure 1-9.

The parking deck, rental car return and long-term parking lot are accessed using the outer roadway of the terminal loop road, after the commercial curb section. The east short-term parking lot is also accessed using this roadway, before the commercial curb. The west short-term parking lot and peanut lot are accessed using the inner roadway after the pick-up/drop-off curb and taxi area.

Figure 1-9
Airport Access Roadways



Source: Master Plan Team, 2018.

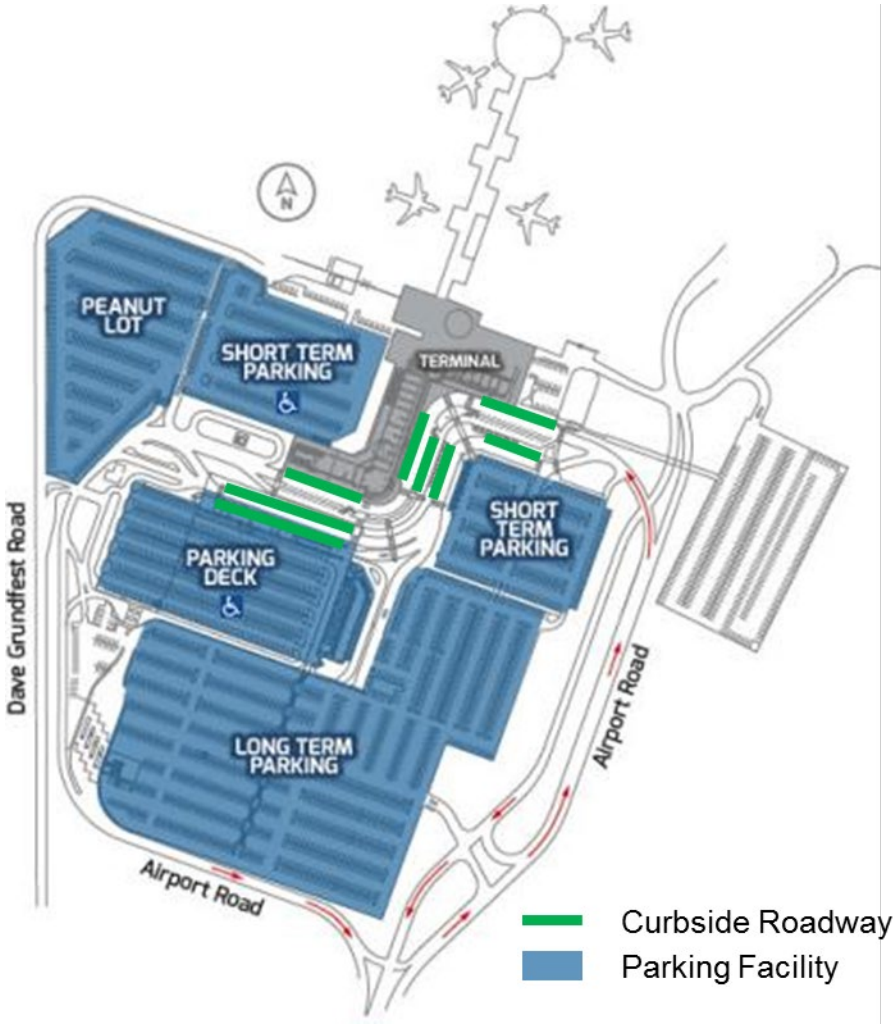
1.4.2 Parking

There are multiple revenue and non-revenue generating public parking areas in the Terminal Area as shown on Figure 1-10 and in Table 1-13 and Table 1-14. Approximately 3,000 parking spaces are available to the public for paid parking with a variety of amenities including covered parking, valet parking, and remote parking with shuttle bus service.

1.4.3 Rental Cars

The rental car companies located at the airport include AVIS, Alamo, Budget, Dollar, Enterprise, Hertz, National, and Thrifty. The rental car return area is located on the ground level of the Parking Deck, accessed using the outer commercial section of the terminal loop road. Remote vehicle storage and servicing sites are located along Roosevelt Boulevard.

Figure 1-10
Public Parking Facilities



Source: Airport Website.

Table 1-13
Revenue Generating Parking Facilities
Bill and Hillary Clinton National Airport

East Short Term:	Per 20 Minutes	$1.00
195 Spaces	Per Day	$13.00
West Short Term (Peanut Lot):	Per 20 Minutes	$1.00
352 Spaces	Per Day	$13.00
Peanut Lot	Per 20 Minutes	$1.00
546 Spaces	Per Day	$8.00
South Long Term	Per 20 Minutes	$1.00
1,570 Spaces	Per Day	$10.00
Parking Deck *(a)*	Per 20 Minutes	$1.00
851 Spaces	Per Day	$13.00
Valet		
84 Spaces	Per Day	$16.00

(a) Parking Deck includes 486 parking spaces on the ground level dedicated for Rental Cars. Smart Park Parking Guidance throughout parking deck.

Source: Airport Staff (2016), Airport Website.

Table 1-14
Non-Revenue Generating Parking Facilities
Bill and Hillary Clinton National Airport

Cell Phone Lot:	41 Spaces
Rental Car:	486 Spaces
Employee Lot:	428 Spaces
East Lot:	49 Spaces
West Employee Lot:	78 Spaces

Source: Airport Staff (2016), Garver Site Visits (2016).

1.5 GENERAL AVIATION AND AIRPORT SUPPORT

This section describes existing general aviation, air cargo, and airport support facilities.

1.5.1 General Aviation and Air Cargo

Air Cargo. The Airport currently has three cargo buildings, used for various activities related to airfreight operations. The air cargo aircraft parking apron is located directly north of the passenger terminal apron. The air cargo apron is located on the west side of the cargo buildings and contains approximately 8.6 acres of paved area.

General Aviation. The general aviation aircraft aprons are located on the west side of the Airport. The southern portion is irregular in shape and extends from Taxiway A to the three SuperTAC hangars. The general aviation apron in this area varies in width (west edge of pavement to west side of Taxiway A) from approximately 330 feet to approximately 580 feet. A 100' x 500' section of the southern ramp in front of SuperTAC was constructed to accommodate heavy aircraft. The central portion of the west side apron is the largest, extending west approximately 1,700 feet from Taxiway A to provide aircraft access to several hangars located along the western edge of Airport property. This area includes a 240' x 345' concrete ramp located in front of the TAC Air FBO that will accommodate heavy aircraft. The northern portion of the west apron area is irregular in shape and extends from the central area to just north of the existing hangars that are located adjacent to Taxiway A at the intersection of Taxiway Z. The northern portion extends west approximately 1,200 feet, providing access to a large maintenance hangar and to the fuel facilities building. Airport documentation indicates that historically, the west side of the Airport produces approximately 46 acres of leasable apron area.

Other Apron Areas. In addition, there are two other apron areas located on the Airport. Lynx FBO and American/Envoy occupy space in the Grundfest Industrial Complex located immediately west of the passenger terminal complex. In addition, to the structural facilities on this site, there is approximately 11.7 acres of associated aircraft apron. On the north side of the Airport (east of Runway 18/36 and west of Runway 4L/22R), Dassault Falcon Jet operates a completion and modification facility that includes 1.5 acres of apron space.

1.5.2 Airport Support Facilities

Fuel Storage Facilities. The Airport has 6 fuel storage facilities located on Airport property. The main fuel storage facility is located between the parallel runways, on the west side of the passenger terminal area, immediately north of the Grundfest Industrial Complex facilities. Table 1-15 provides information on the existing fuel storage facilities.

Aircraft Rescue and Fire Fighting (ARFF) Facility. The ARFF facility is centrally located on the Airport, between the parallel runways, north of the terminal apron. Clinton National Airport maintains a Federal Aviation Regulations (FAR) Part 139 Index C classification.

Air Traffic Control Tower (ATCT). The federal ATCT and approach control facility is located between the parallel runways, on the south side of the terminal complex. This control tower is open 24 hours a day and seven days a week.

Airport Maintenance. The previous Airport Maintenance Facility was located north of the Terminal Apron and adjacent to the ARFF facility. This facility was demolished in 2014 due to a line-of-sight issue between the ATCT and Taxiway Mike. A new Airport Maintenance Facility totaling 37,941 square feet was built in 2012 between the parallel runways, east of the terminal apron, and north of Taxiway "U".

Table 1-15
Fuel Storage Facilities
Airport Master Plan
Bill and Hillary Clinton National Airport

Tenant	Fuel Type	Tank Size (Gallons)	Above/Below Ground
TAC-Air FBO North	Jet A	20,000	Below
	Jet A	20,000	Below
	AvGas (100LL)	10,000	Below
	AvGas (100LL)	10,000	Below
	Unleaded	2,000	Below
	Slop	1,000	Above
TAC-Air Commercial	Jet A	40,000	Above
	Jet A	40,000	Above
	Jet A	40,000	Above
	Jet A	40,000	Above
	Unleaded and Diesel (Split Tank)	40,000	Above
TAC-Air FBO South	Jet A	25,000	Above
	Jet A	25,000	Above
	AvGas (100LL)	12,000	Above
Dassault Falcon Jet	Jet A	20,000	Below
	Jet A	20,000	Below
	Jet A	10,000	Below
	Unleaded	2,500	Below
Lynx FBO	Jet A	20,000	Above
	Jet A	20,000	Above
	AvGas (100LL)	12,000	Above
Airport (AMF)	Unleaded	10,000	Above
	Diesel	10,000	Above

Source: Airport Emergency Plan (2014), Garver Site Visits (2016), Airport Staff (2016).

1.6 LAND USE, ZONING, AND ENVIRONMENTAL

The cities and communities in the vicinity of Clinton National Airport have adopted various land use planning and control documents to guide development. Proper inventories of the existing land uses, zoning patterns and future land use proposals (comprehensive planning recommendations) for the area surrounding the Airport are important elements to consider in the Airport planning process. Land use compatibility with Airport development can be improved with a thorough knowledge of what land uses exist, what land uses are proposed and what, if any, changes can be made. Figure 1-11 shows the city jurisdictional boundaries in the immediate vicinity of the Airport.

1.6.1 Future Land Use

Clinton National Airport is located in the eastern corner of the city limits of Little Rock, as shown on Figure 1-11. The area adjacent to the Airport, north of the Arkansas River, is within the City of North Little Rock. To the south of the Airport, the majority of the area is in unincorporated Pulaski County.

Figure 1-12, provides a graphic representation of the future land use types in the vicinity of the Airport. This map was generated using geographic information system (GIS) data obtained from the City of Little Rock and the City of North Little Rock.

The majority of the land in the vicinity of the Airport consists of industrial and mining land uses. East of the Airport (between Airport property and Fourche Creek), the East Little Rock neighborhood is made up of primarily residential single-family units with some multi-family. West of the Airport, there is residential and institutional development adjacent to I-30.

The Granite Mountain neighborhood, with primarily multi-family residential and commercial land uses, is located southwest of the Airport, south of I-440 and east of Highway 167. The community of College Station is also located south of the Airport. It is developed primarily with single and multi-family residential uses and some commercial land use. The neighborhoods east of the Airport are dominated by single family residential and open space land uses, with some commercial and institutional.

North of the Airport, across the Arkansas River, the land uses in the City of North Little Rock include industrial/mining areas, as well as several multi-family neighborhoods located in the area directly north of Runway 18/36. The Rose City community is located north of the eastern portion of Airport property. Rose City is developed with single-family residential use, as well as industrial/mining and some institutional.

Figure 1-11
Incorporated Areas

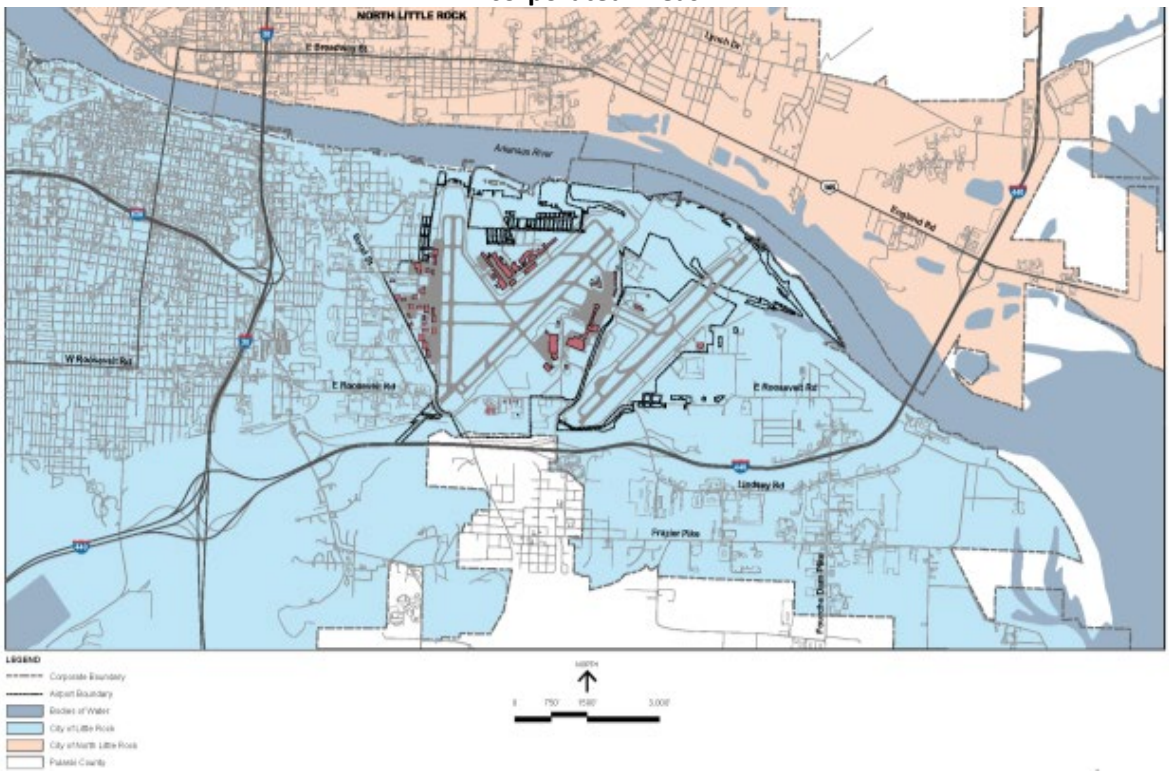
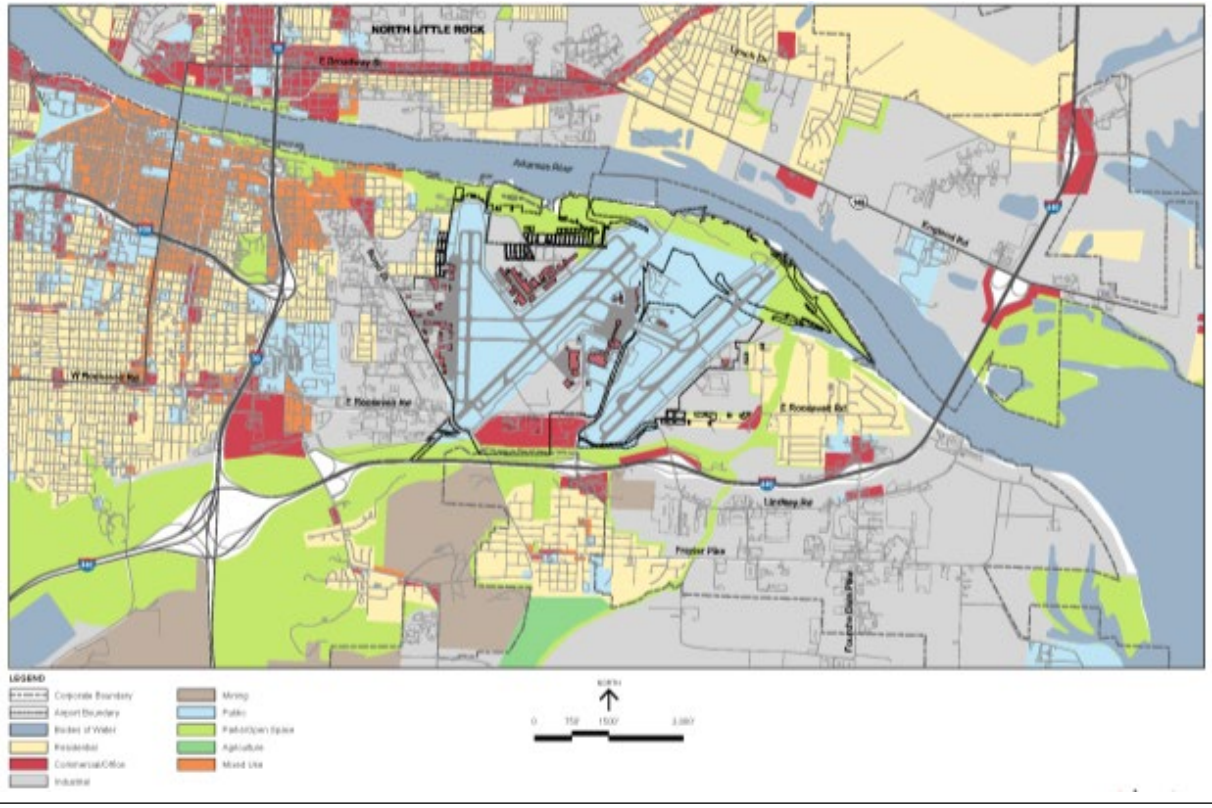


Figure 1-12
Generalized Future Land Use

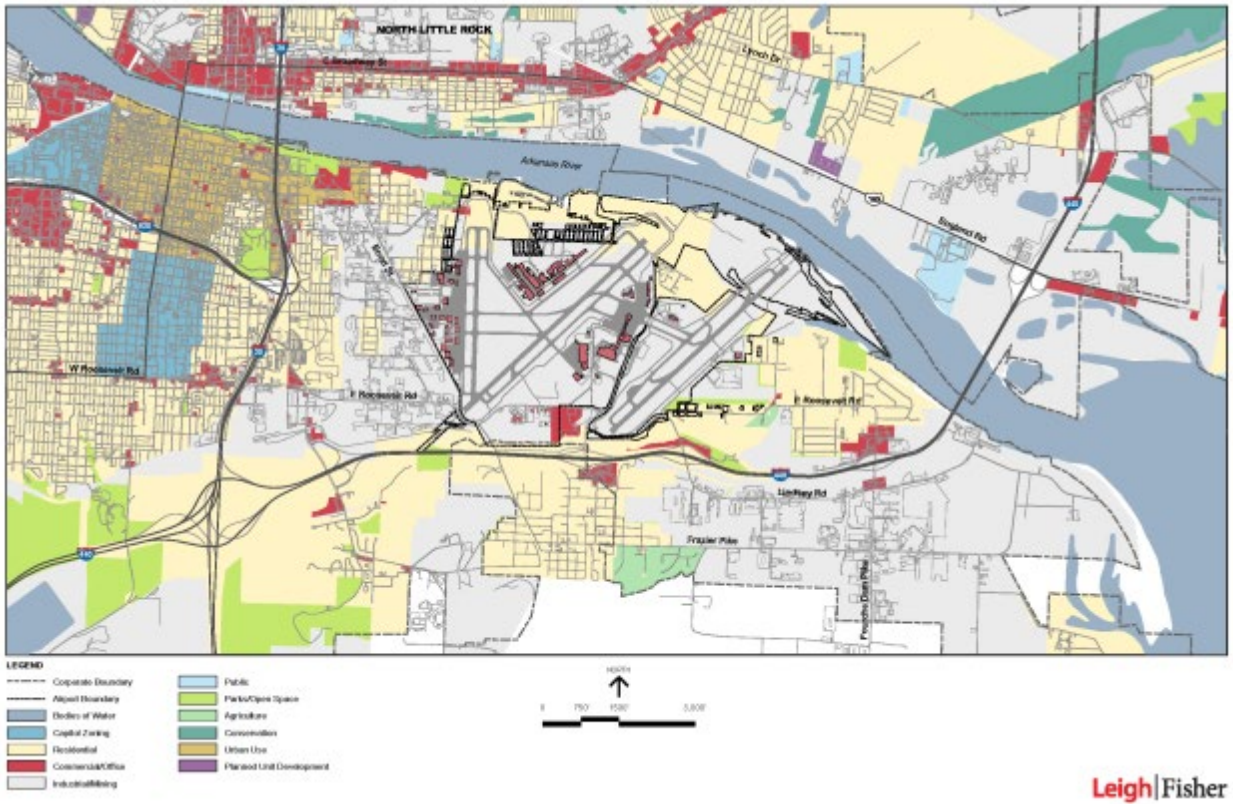


1.6.2 Zoning

Figure 1-13, reflects the land use zoning designations for the area surrounding the Airport. The map was developed with data provided by the City of Little Rock and the City of North Little Rock.

Both the City of Little Rock and the City of North Little Rock utilize land use zoning to control land use within their corporate boundaries. Pulaski County does not have land use zoning powers. The area surrounding the Airport is predominately zoned for industrial/mining use. Much of the area on the north side of the Airport (south of the Arkansas River) is zoned for single family residential. West of the Airport, east of I-30, some land is zoned for single family and multi-family residential. To the south and east of the Airport, much of the land associated with the existing neighborhoods is designated as single family residential.

Figure 1-13
Generalized Existing Zoning



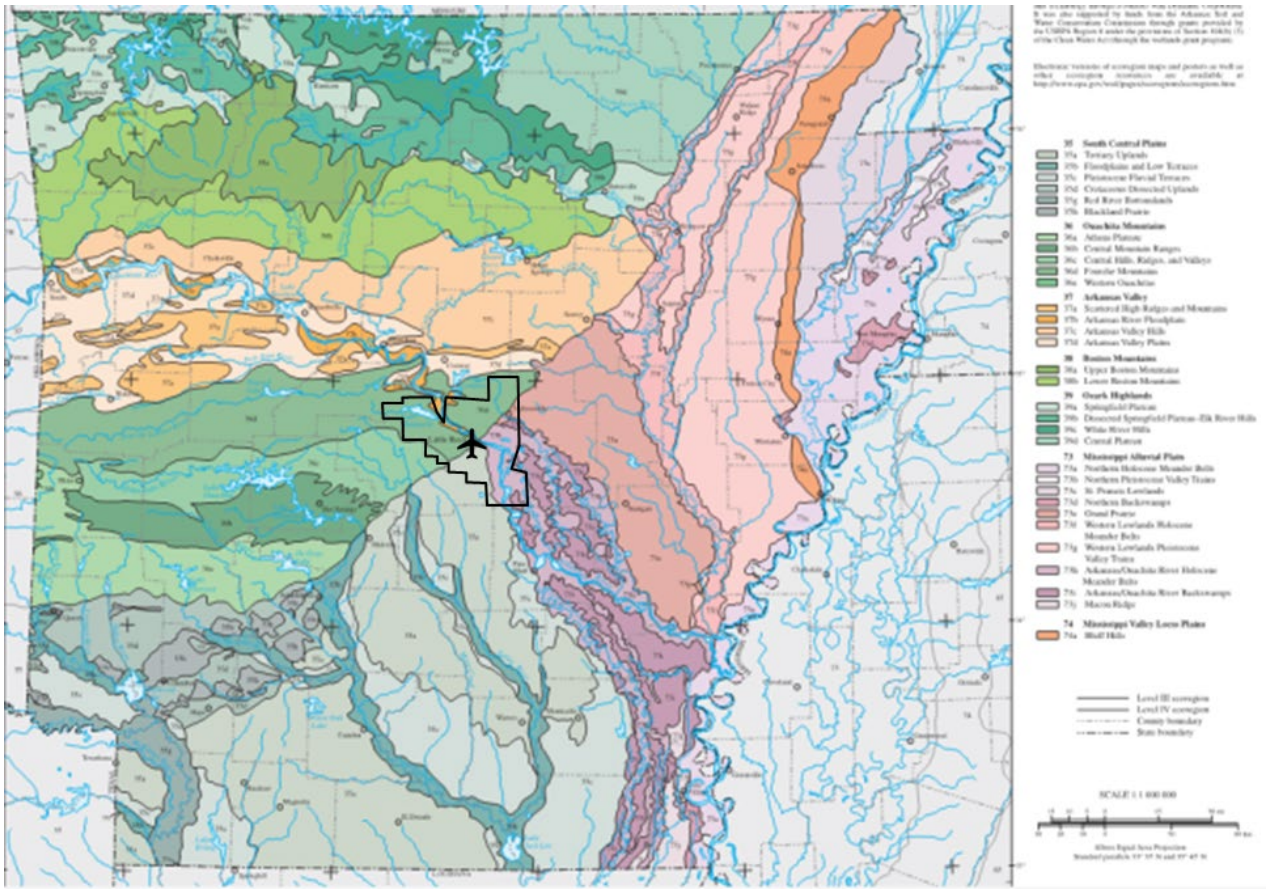
1.6.3 Environmental Conditions

This section describes the ecoregion, climate, soils, historical resources, water resources, and wildlife in the vicinity of the Airport.

1.6.3.1 Ecoregion

Pulaski County, Arkansas falls within the Mississippi Alluvial Plain, South Central Plains, Arkansas Valley, and Ouachita Mountains Eco-regions of Arkansas. More specifically, the Airport site falls on the edge between two sub-regions known as Arkansas/Ouachita River Holocene Meander Belts and Tertiary Uplands, as shown on Figure 1-14.

Figure 1-14
Ecoregions of Arkansas
Airport Master Plan
Bill and Hillary Clinton National Airport



Source: US Department of Agriculture, Natural Resources Conservation Service.

1.6.3.2 Climate

The weather pattern for the area is considered to be a humid, sub-tropical climate, typical of the Southeastern United States. Masses of warm, moist air from the Gulf of Mexico collide with cold, dry air

from the Arctic region to create a wide range of weather year round. The area is characterized by a wide range of yearly mean temperatures and non-uniform precipitation, relatively high humidity, and mild winters with short periods of very cold weather. This provides a long growing season for crops with spring and fall being relatively short. Pulaski County is in the path of a fairly dependable current of moisture-laden air from the Gulf of Mexico. Precipitation occurs throughout the year. Annual rainfall is approximately 50 inches. The average humidity for Little Rock is 84% in the mornings and 53% in the afternoons. The average annual snowfall is 3.5 inches falling between December and March.

1.6.3.3 Soils

A soil survey by the Natural Resources Conservation Service of the USDA identified Keo-Urban land complex and Rill-Urban land complex as the prominent in-situ soil resources within the Airport property. Other soil resource types present within the Airport property in significant amounts include Bruno fine sandy loam, Perry clay, and Perry Urban land complex.

1.6.3.4 Historical, Architectural, Archaeological, and Cultural Resources

The National Historic Preservation Act of 1966 requires that an initial review be made to determine if any properties in or eligible for inclusion in the National Register of Historic Places are within the area of a proposed action's potential environmental impact. The Archaeological and Historic Preservation Act of 1974 provides for the survey, recovery, and preservation of significant scientific, pre-historic, historical, archaeological, or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally funded, or federally licensed project. An online query through the Arkansas Historical Preservation Program revealed that there are no historic site locations in the immediate Airport vicinity.

1.6.3.5 Water Resources

The Airport property borders the Arkansas River to the northeast and the Fourche Creek, a tributary to the Arkansas River, to the east. FEMA FIRM maps show that the Airport property borders Zone AE and Zone X floodplain, due to these waterways; however, the Airport property is protected from flooding by a levee along the east and northeast. A wetland map from the US Fish and Wildlife Service indicates wetlands being present on the Airport property; however, some of the locations shown as wetland coincide with existing airfield pavement. Prior to completing development on the airfield coordination should be completed with the US Army Corps of Engineers to identify and grade wetlands that might exist within the project area.

1.6.3.6 Fish, Wildlife, and Plants

The Endangered Species Act requires each federal agency to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of such species. As provided by the US Fish and Wildlife Service (USFWS), several threatened or endangered species are listed for Pulaski County. As defined by the U.S. Fish and Wildlife (USFW), Endangered Species is any species of wildlife whose continued existence as a viable component of the state's wild fauna is determined to be in jeopardy, and a Threatened Species is any species of wildlife that appears likely, within the foreseeable future, to become an endangered species. Table 1-16 lists the threatened and endangered species for Pulaski County on both a federal and state status regardless of whether they occur at LIT. Research does not show that habitat for any endangered species exists on LIT nor are any endangered plant species known to grow on LIT property. Future coordination with USFWS and Arkansas Game and Fish Commission may be necessary prior to commencing any major construction project at LIT to confirm that no hazard to an endangered or threatened species is being created.

Table 1-16
Pulaski County Threatened and Endangered Species
Airport Master Plan
Bill and Hillary Clinton National Airport

Common Name	Genus/Species	State Status	Federal Status	Critical Habitat
Least Tern	Sterna Antillarum	I	E	No
Piping Plover	Charadrius Melodus		T	No
Northern Long-Eared Bat	Myotis Septentrionalis		T	No
Running Buffalo Clover	Trifolium Stoloniferum		E	No
Arkansas Fatmucket	Lampsilis Powellii	D	T	No
Fat Pocketbook	Potamilus Capax	S	E	No
Pink Mucket	Lampsilis Abrupta	S	E	No
Rabbitsfoot	Quadrula Cylindrical Cylindrical		T	No
Scaleshell Mussel	Leptodea Leptodon	D	E	No
Winged Mapleleaf	Quadrula Fragosa	S	E	No

D = Declining
E = Endangered
I = Improving
S = Stable
T = Threatened

Source: Arkansas Game and Fish Commission and US Fish and Wildlife Service.

1.7 FINANCIAL INVENTORY SUMMARY

LeighFisher has prepared this Technical Memorandum as a component of the Master Plan Update (MPU) for the Bill and Hillary Clinton National Airport (the Airport). The purpose of the report is to provide a financial inventory and high-level summary of certain factors relevant to the Airport's existing financial operations. Certain common airport industry metrics are utilized to compare the financial operations at the Airport with those of other peer airports. In general, the Airport's existing metrics compare favorably when viewed with those from its peers.

In summary, the Airport is in a strong financial position with:

- No outstanding debt
- PFC capacity freeing up in mid-2020
- Airline rates set by resolution, without airline purview over the capital program
- Competitive airline rates and charges
- Diversified revenue streams
- Strong liquidity, as measured by days cash on hand (at 600 days as of January 2017)

1.7.1 Financial Framework

1.7.1.1 Governance

The Airport operates as a self-sustaining component unit of the City of Little Rock, Arkansas under the guidance of the Little Rock Municipal Airport Commission (the Commission) that was created to manage, operate, improve, extend, and maintain the Airport, its related properties and facilities, and to adopt necessary rules and regulations.

The Commission receives no local tax money. As an enterprise fund, operating expenses are funded through user fees and charges. Capital improvements are funded through internally generated funds, FAA Airport Improvement Program (AIP) entitlement and discretionary grants, Transportation Security Administration (TSA) grants, passenger facility charges (PFCs), bond proceeds, and other funds. The Commission operates on a fiscal year (FY) that ends on December 31.

1.7.1.2 Airline Rates and Charges

The airlines operate under month-to-month Airline Operating Permits. Airline rates and charges have been established by resolution since December 2009 as follows.

1.7.1.2.1 Landing Fee Rate

The landing fee rate (per 1,000-pound unit) is based on a cost center residual rate-setting methodology. This methodology results in the Commission fully recovering the costs of constructing, operating, and maintaining the airfield area, including all runways, taxiways, navigational aids, and other airside properties on a basis of landed weight, and that users pay only the cost associated with their proportional use. The rate is determined by taking the annual costs of the airfield and dividing over the landed weight (in 1,000 lbs), yielding a rate per 1,000 lbs of landed weight.

The landing fee rate for 2018 is set at $4.17 per 1,000-pound unit. This is an increase from $4.05 in 2016, due largely to an anticipated decrease in airline landed weight. This rate includes a $3.7 million discretionary credit which the Commission applies. The Commission is under no obligation to provide the credit, but is doing so to provide lower costs and a more competitive operating environment for airlines. The credit may or may not continue in future years and if it does continue, the level of credit may change.

1.7.1.2.2 Terminal Rental Rate

The terminal rental rate (per square foot) for airlines is based on a commercial compensatory methodology, which recovers the costs of constructing, operating, and maintaining the terminal facility and area. Under this methodology, the Commission bears the vacancy risk for unleased terminal space. The rate is calculated by taking the annual costs of operating the terminal building (the terminal requirement) and dividing over the usable space, yielding an annual rental rate per square foot. Revenues are then based upon the space actually leased by airline tenants.

The terminal rental rate for 2017 is $38.90 per square foot. This is an increase from $38.20 in 2016. The Commission is applying a $320,000 discretionary credit to the terminal requirement. As with the airfield credit, the Commission is under no obligation to provide the credit, and it may or may not continue to do so in the future.

1.7.1.2.3 Other Airfield Fees

The Commission has established several other fees for use of the airport facilities. These include:

- Aircraft ramp fees, charged on a per month basis, and are based on a compensatory methodology. The rate for 2017 is $1,500 per month, unchanged from 2016.
- Gate fees, charged on a per use basis, and are based on a compensatory methodology. The rate for 2017 is $81.45, unchanged from 2016.
- Jet bridge use fees, charged on a per use basis, and are based on a compensatory methodology. The rate for 2017 for new jet bridges is $40.00. The fee for 2017 for old jet bridges is $68.50, unchanged from 2016.
- Remain Overnight (RON) parking fees, are charged per event, and are based on market rates. The rate for 2017 is $75 per event, unchanged from 2016.

1.7.1.3 Outstanding Debt and Debt Payoff Plan

In January 2013, the Commission announced a goal to eliminate the Airport's outstanding debt by November 2016 (the Debt Payoff Plan). That year, the Commission defeased and paid off the Series 1999A Bonds six years early.

During FY 2014, the Commission eliminated debt service payments on the Series 2003 Bonds (which were not eligible for call at the time) by depositing sufficient balances with the trustee so that no additional payments were required after April 2014.

The final phase of the Debt Payoff Plan occurred in December 2015 when the Commission deposited $6.9 million with the trustee to pay off the Series 2007A&B Bonds at first call, in November 2016.

After this final defeasance, the Commission is now debt free. The Debt Payoff Plan will save over $7 million in reduced interest payments.

The absence of outstanding debt leaves the Commission with considerable borrowing capacity in the event that bonds are required to fund future major capital programs. Prior to its defeasance, the Commission debt was rated 'A2' by Moody's Investors Services, a category considered upper medium grade.

1.7.1.4 Passenger Facility Charge Program

The Commission has received FAA approval for nine separate PFC applications, as well as several amendments to those applications, dating back to 1995. Applications 1 through 4 have been closed out. The current amounts approved to be collected under all PFC applications are shown in Table 1-17.

Table 1-17
PFC Program
Airport Master Plan
Bill and Hillary Clinton National Airport

Application Number	Amount Approved for Collection [(a)]	Amount Approved for Use [(a)]	Collection Level [(b)]	Status
95-01-I-02-LIT	$ 24,383,919	$ -	$3.00	Closed
96-02-U-01-LIT	-	24,383,919	$3.00	Closed
01-03-C-03-LIT	12,710,134	8,237,062	$4.50	Closed
04-04-U-01-LIT	-	4,473,072	$4.50	Closed
06-05-C-02-LIT	6,284,571	6,284,571	$4.50	Open
07-06-C-02-LIT	38,428,622	38,428,622	$4.50	Open
10-07-C-00-LIT	9,595,910	9,595,910	$4.50	Open
15-08-C-00-LIT	4,601,120	4,601,120	$4.50	Open
16-09-C-00-LIT	18,142,435	18,142,435	$4.50	Open
	$ 114,146,711	$ 114,146,711		
Collections through 9/30/2016		$ 89,982,334		
Interest Earnings		6,871,481		
Total PFC Revenues		$ 96,853,826		
Remaining Approved Collections		$ 16,292,911		

(a) Includes all amendments as of February 2017.
(b) The increase in the PFC level from $3.00 to $4.50 was effective September 1, 2001.

The Commission collected the PFC at the $3.00 level through the first two applications. The increase in the PFC level from $3.00 to $4.50 was effective September 1, 2001. The Commission is currently collecting PFCs under Application #9. Collections are approved at the $4.50 level through the remainder of the approved collection authority, currently estimated to be August 1, 2020.

1.7.2 Capital Improvement Plan

Each year, Airport staff prepares a five-year Capital Improvement Plan (CIP). The CIP is reevaluated and modified as necessary to accommodate traffic activity, security needs, and other needs that could result in additions to or subtractions from the CIP, or changes in the timing of individual projects.

In FY 2013, the Commission completed Phase I of its Vision 2020 Program. The $67 million program phase included the installation of a new Baggage Handling System (BHS) and associated construction, which was funded with a TSA Other Transaction Agreement (OTA), PFC revenues, and internal funds.

1.7.2.1 Current Capital Improvement Plan

The Commission submits a CIP to the FAA annually in support of grant approvals. A primary focus of projects on the most recent CIP is the rehabilitation of airfield facilities, including runway and taxiway pavements, lighting, and navigation aids. Other projects include the replacement of the engineered material arresting system (EMAS) at Runway 22R, a Terminal Ramp Expansion, airfield utility infrastructure improvements, and airport rescue and firefighting (ARFF) vehicles.

1.7.2.2 Projects in Process

Significant capital improvements which the Commission undertook during fiscal year 2015 included:

Concourse Renovation Program

This ongoing $20.6 million project includes upgrades to public restrooms, building finishes, lighting, way finding signage, gate lounge seating, roofing, communications systems, millwork, and a lightning protection system. The program also includes the addition of new restroom facilities located adjacent to Gate 5, which were completed and opened in July 2015. Other work includes new passenger boarding bridges for Gates 1, 3, 5, 7 and 8, mechanical system improvements, and associated site work.

West Airfield Drainage Improvements (Phase I)

This ongoing project provides airfield drainage improvements in the area of the west airfield bounded by Runway 18-36, Taxiway P and the service road south of Runway 4L-22R. The scope of the work consists of removal and replacement of approximately 7,800 linear feet of pipe and drainage structures that have exceeded their useful life. Replacing them with new construction will eliminate sink holes in the aircraft operating area and enhance safety.

Parking Access and Revenue Control System (PARCS)

This project replaces the existing 15 year old Parking Access and Revenue Control System (PARCS) with a new state-of-the-art PARCS while reusing as much of the existing infrastructure and serviceable PARCS components as possible. New features and technology, including License Plate Recognition and a Parking Guidance System, have been implemented to increase revenue security while enhancing the customers' experience.

Rehabilitation of Taxiways Alpha and Bravo

Both Taxiways Alpha and Bravo are primary taxi routes for commercial and cargo aircraft to get to the heavy parking ramps on the west side of the airfield. This project will replace the existing asphalt pavement with stronger Portland cement concrete designed for the heavier loads. Runway 4R Safety Area Improvements The project includes demolition and removal of the existing Engineered Materials Arresting System (EMAS) located off the end of Runway 4R which is past its useful life and generates Foreign Object Debris (FOD) when exposed to jet blast. The demolition and removal will also include the existing asphalt support pavement and an asphalt blast pad at the end of the runway. A new 200' x 200' concrete blast pad will be constructed in the place of the EMAS. Other work includes the construction of a 12' x 850' access drive along the Medium Intensity Approach Lighting System and construction of approximately 3,000 linear feet of 20' wide concrete perimeter road along the east side of the runway.

1.7.2.3 Projects in Passenger Facility Charge Application #9

The Commission's Passenger Facility Charge (PFC) Application #9 sought and received FAA approval for six capital projects. The initiatives are a combination of recently completed projects and new projects which will begin within two years of the approval date of PFC #9 (which was May 26, 2016). The following sections describe the projects which were included in PFC #9.

1.7.2.3.1 Concourse Renovation

This project consists of elements intended to extend the useful life of the concourse, provide restrooms during larger upcoming construction phases, and replace aging infrastructure. Ultimately, the comprehensive effort will result in a facility that is shifted in location from the existing concourse, with approximately 40% overlap in its footprint. Elements of earlier phases had already been approved for PFC funding.

1.7.2.3.2 Replace Passenger Boarding Bridges

This project consists of the planning, design, purchase, and installation of five (5) passenger boarding bridges. These will replace bridges located at Gates 1, 3, 5, 7 and 8, which range in age from 30 to 44 years old. The new boarding bridges will be adjustable to accommodate both large and regional jets which serve the Airport.

The new boarding bridges will be climate controlled, with ground power and preconditioned air (PCA). This will require some modifications to the terminal building infrastructure to accommodate the new power and air conditioning equipment.

1.7.2.3.3 Gate 5 Restrooms

This project includes the planning, design, and construction costs of new public restrooms located on the second level of the terminal concourse adjacent to passenger boarding Gate 5. The project adds 2,288 square feet to the terminal concourse for a new men's and women's public restroom, as well as two family/companion toilet rooms.

1.7.2.3.4 Rehabilitate Tug Tunnel

This project includes planning, design, and construction costs for the rehabilitation of Airport tug tunnels and trench drains. The project will remove and replace existing concrete pavement at the tug tunnel entrance which has begun to show signs of failure.

1.7.2.3.5 Baggage Claim Area Renovation

The baggage claim area improvements are a portion of the Commission's efforts to extend the life of the terminal building at the Airport. This project includes the planning, design, and construction costs associated with improvements to the baggage claim area of the terminal building. Project elements have been grouped into separate stages to reflect improvements to the baggage claim area which were accomplished in 2013-2014 (Stage A) and further improvements to the restrooms by the baggage claim and immediately surrounding areas which are in the planning stage as of November 2015 (Stage B). Upgrades to the restrooms in the public parking garage will also be accomplished concurrently with Stage B.

1.7.2.3.6 Curbside Weather Improvements

This project consists of the planning, design, and installation of weather protection at the existing outdoor terminal curbside check-in area. These improvements include a glass weather protection wall enclosure, skylight cover, soffits, and radiant heaters.

These improvements will protect passengers utilizing the curbside check-in from harsh weather elements. They allow for efficient access to curbside services. These additions provide weather protection that was not previously in place.

1.7.3 Financial Operations

1.7.3.1 Operating Revenues

Figure 1-15 shows the relative proportion of operating revenues at the Airport compared with other United States small hub airports. Revenue categories are generally similar to those of the peer group. The Airport received only 35% of its operating revenues from aeronautical sources, compared with 44% for the small hub group, indicating that the Commission is less reliant upon airlines for revenue than its peers.

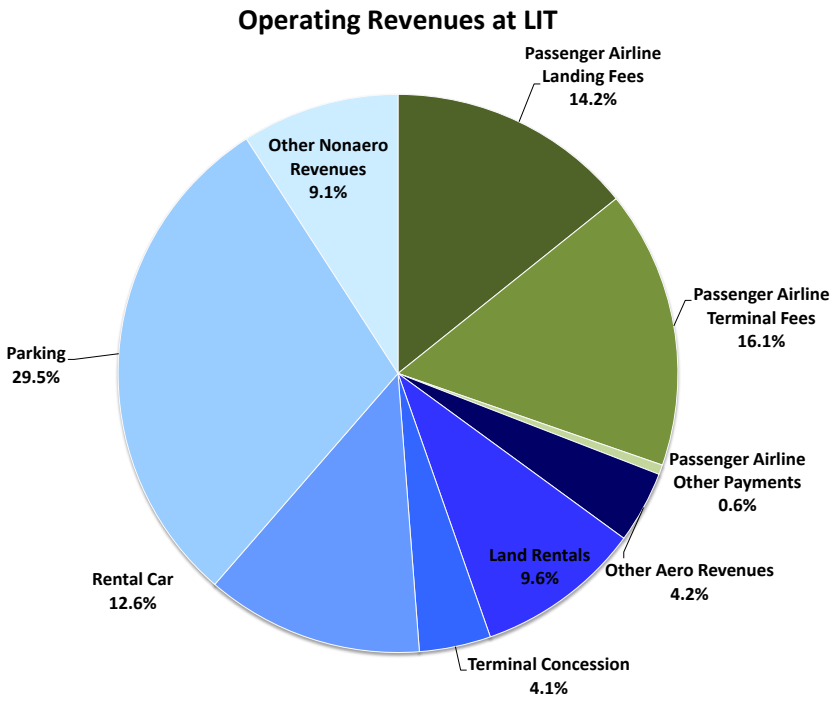
Operating revenues totaled **$31.2 million** in 2015, the detail of which is reflected in Table 1-18. This is approximately a $600,000 increase (1.9%) from 2014.

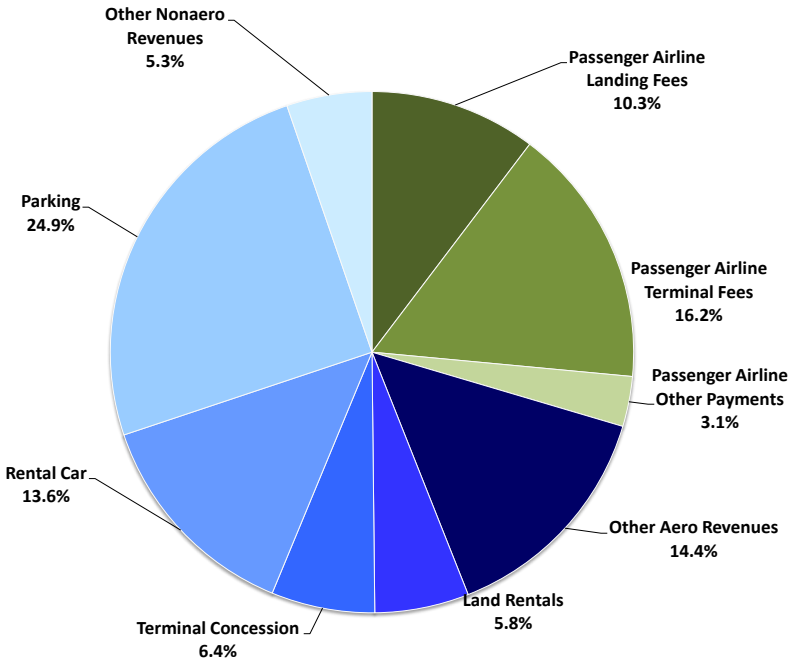
Table 1-18
Operating Revenues
Airport Master Plan
Bill and Hillary Clinton National Airport

	2015	2014	% Chg.
Airline Revenues			
Landing fees	$ 4,992,768	$ 5,132,689	-2.7%
Terminal building rentals	5,028,594	4,592,916	9.5%
Facility use fees	175,125	143,325	22.2%
Airline Revenues	$ 10,196,487	$ 9,868,930	3.3%
Nonairline Revenues			
Parking fees	$ 9,121,334	$ 9,434,927	-3.3%
Rental car operations	6,398,853	6,311,336	1.4%
Facility and ground rentals	3,458,891	3,068,575	12.7%
Concession fees	1,182,673	1,248,579	-5.3%
Other nonairline revenues	879,531	715,949	22.8%
Nonairline Revenues	$ 21,041,282	$ 20,779,366	1.3%
Total Operating Revenues	**$ 31,237,769**	**$ 30,648,296**	**1.9%**

Source: Little Rock Municipal Airport Commission.

Figure 1-15
2015 Operating Revenues by Category
Airport Master Plan
Bill and Hillary Clinton National Airport
Operating Revenues at LIT





Source: Federal Aviation Administration, Form 5100-127 filings.

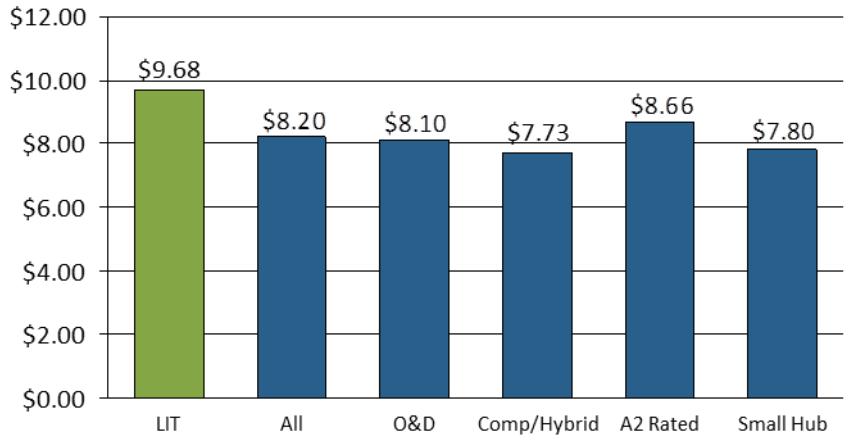
1.7.3.1.1 Airline Revenues and CPE

The Commission collected $4.9 million of landing fees at the Airport in 2015, a 2.7% decrease from 2014. Terminal rentals increased 9.5% from 2014 to $5.0 million, driven in part by the increase in the rental rate due to costs associated with the new in-line baggage handling system.
The cost per enplaned passenger (CPE) incurred by airlines is a common industry metric for comparing the costs to airlines of operating at an airport. It is not a direct charge itself, but rather a calculation intended to represent all charges imposed upon airlines by an airport and present them on a comparable basis across the industry.

According to FAA filings, the CPE at the Airport in 2015 was $9.68 per enplaned passenger. This compares to a median level of $8.20 for airports in general and $7.80 for small hubs (as reported by Moody's Investors Services). These metrics are shown in Figure 1-16.

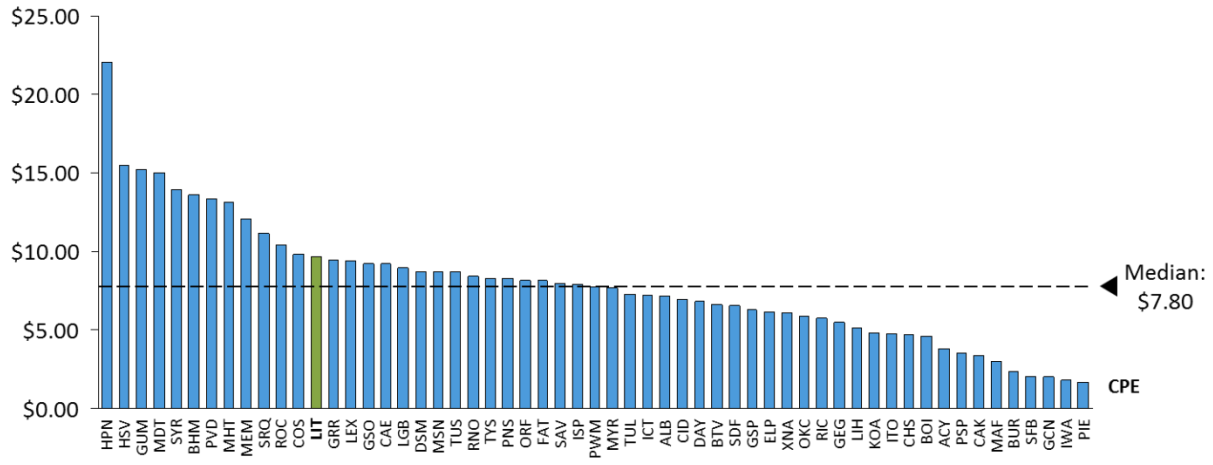
Figure 1-17 shows the relative position of the Airport's CPE compared with peer airports, in this case other United States small hub airports with greater than 500,000 annual enplanements.

Figure 1-16
CPE Medians by Airport Category
Airport Master Plan
Bill and Hillary Clinton National Airport



Sources: Moody's Medians: Moody's Investor Service US Airport Medians, Fiscal 2015. Published 11/2/2016.
LIT CPE: FAA Form 5100-127, filed 6/24/2016.

Figure 1-17
CPE Comparison
Airport Master Plan
Bill and Hillary Clinton National Airport



Source: FAA Form 5100-127, Fiscal Year 2015 filings.
Note: Only small hub airports with greater than 500,000 enplanements reported in calendar year 2015.

1.7.3.1.2 Non-airline Revenues

Parking

The Commission earns parking revenues from Airport customers who park their automobiles in Airport parking facilities. These revenues were $9.1 million in 2015, comprising 29.5% of operating revenue at the Airport. This was a decrease of 3.3% from the prior year. The Airport offers customers various parking options at differing price points, which include:

- **Parking Garage** which provides covered parking for hourly or daily parking in a three-story structure connected to the terminal building via an enclosed, air-conditioned pedestrian bridge.
- **Surface Lot** for hourly customers using the terminal.
- **Economy Lot** with complimentary shuttle bus service to the terminal building.

Rental Car

Airport customers can rent automobiles from any of the major national brands which operate from the consolidated rental car area in the first floor of the parking garage. The Commission currently maintains concession agreements with the rental car companies serving the Airport that authorizes these companies to operate. In return, the companies agree to remit payment to the Commission the greater of a minimum annual guarantee (MAG) or certain percentage of their gross revenues. Additionally, the Commission collects rental charges from the companies relating to space leased for operations and service facilities. Rental car revenues were $6.4 million, comprising 12.6% of operating revenues in 2015. This was an increase of 1.4% from the prior year.

Land and Hangar Rentals

The Commission earns revenues from facility, ground, and hangar rentals to various tenants on Airport property. In 2015, these rentals totaled $3.5 million. Highlight from certain of these leases are in the following sections.

Lynx FBO

In July 2015, the Commission signed a lease with Fly Arkansas, a new fixed-base operator (FBO), to provide direct support of flight related activities at the Airport. However, later in March 2018, the Sterling group, a middle market private equity firm based in Houston, Texas, announced that its platform company, Lynx FBO network acquired the FBO assets of Fly Arkansas at LIT. Lynx FBO occupies Buildings 500 and 500A, approximately 56,000 square feet, and leases an additional 136,000 square feet of ramp and parking areas of the former Hawker Beechcraft Facility. The addition of Lynx as a tenant enhances annual facilities and ground rents by approximately $176,000.

Southwest Reservation Center Reversion

In September 1994, the Commission entered into a lease agreement with Southwest Airlines to construct and operate an airline reservation facility on Airport property. The lease had a term of 20 years; all leasehold improvements reverted to Commission ownership on December 31, 2014. The premises, which had been leased to Arkansas Blue Cross Blue Shield (BCBS) until the company relocated in May 2015, include a 42,800 square-foot building and associated land and parking areas. The Commission actively marketed the facility through their real estate broker, Sage Partners & Jones Lang LaSalle and will enter a new lease agreement with Cantrell Drug in January 2016, enhancing annual facilities and ground rents by approximately $360,000.

Dassault Falcon Jet Expansion

In November 2015, Dassault Falcon Jet completed a major expansion of its Little Rock Completion Center that added 350,000 square feet of production space to the facility. To accommodate the new hangar and expansion, Dassault added approximately 36 acres of airport land to its leasehold, which enhances annual ground rents by approximately $280,000.

1.7.3.2 Operating Expenses

Operating expenses (excluding depreciation) totaled **$21.4 million** in 2015, the detail of which is reflected in Table 1-19. This is a $1.3 million increase (6.4%) from 2014.

Table 1-19
Operating Expenses
Airport Master Plan
Bill and Hillary Clinton National Airport

	2015	2014	% Chg.
Operating Expenses			
Salaries, wages, and employee benefits	$ 11,193,730	$ 10,130,005	10.5%
Professional and contractual services	4,188,836	4,265,209	-1.8%
Buildings and grounds maintenance	523,859	359,459	45.7%
Equipment repair and maintenance	741,257	752,105	-1.4%
Marketing and public affairs	246,543	112,667	118.8%
Utilities	1,867,845	1,974,685	-5.4%
Materials and supplies	839,021	860,154	-2.5%
Insurance	378,709	371,617	1.9%
Other	1,400,493	1,275,608	9.8%
Total Operating Expenses	**$ 21,380,293**	**$ 20,101,509**	**6.4%**

Source: Little Rock Municipal Airport Commission.

1.7.3.1.1 Salaries, Wages, and Benefits

Over half of the Commission's operating expenses are incurred for personnel in the form of salaries, wages, and associated employee benefits. This category increased 10.5% from 2014 to 2015, driven by an average merit increase of 3% and increases in the cost of employee benefits including medical, insurance, and retirement benefits.

1.7.3.1.2 Other Operating Expenses

Excluding the salaries, wages, and benefits category, the remainder of operating expenses increased 2.2% year over year from 2014 to 2015. The largest increase was in the buildings and grounds maintenance category, driven by the reversions of the former Hawker facility and Southwest Airlines Reservation Center to Commission control. These facilities increased the amount of property which required maintenance during the year.

1.7.3.3 Cash Flow and Airport Funds

As revenue is received by the Commission from the various sources, it is deposited into the Commission's Revenue Fund. These balances are able to be utilized by the Commission for any legal purpose and are not subject to approval by the airlines serving the Airport.

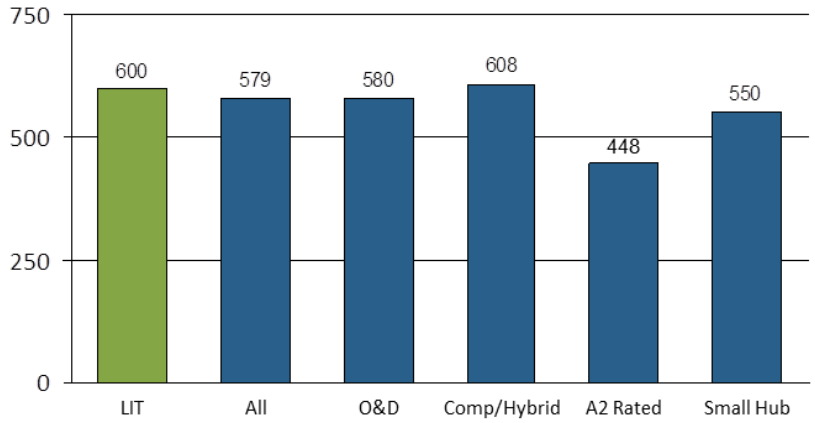
As of January 31, 2017, the Commission held **$35.1 million** in its Revenue Fund. Of this, $12.3 million was in the Terminal Sinking Fund account, which is earmarked for future terminal expansion projects.

Separately, the Commission had $10.1 million in its PFC Fund. These funds are restricted to use on projects which have been approved by the FAA in a PFC application.

Based on the fund balance in the Revenue Fund, the Commission had **600 days cash on hand** as of January 31, 2017. Excluding the Terminal Sinking Fund, the Commission held 389 days cash on hand.

Figure 1-18 shows a comparison of the median days cash on hand metric by airport category.

Figure 1-18
Days Cash on Hand by Airport Category
Airport Master Plan
Bill and Hillary Clinton National Airport



Sources: Moody's Medians: Moody's Investor Service US Airport Medians, Fiscal 2015. Published 11/2/2016.
LIT Days Cash: Little Rock Municipal Airport Commission.

1.7.4 Sources of Capital Funds

1.7.4.1 Federal Grants (AIP)

The Airport Improvement Program (AIP) is a federal program which has been established to provide grants to airport sponsors to aid with funding for the planning and development of public-use airports. LIT is designated as a "small hub," a class for which the AIP program will generally fund up to 90% of the project costs for eligible projects.

The FAA has established formulas for the allocation of Airport Improvement Program (AIP) entitlement funding to airports based on passenger enplanements and cargo volumes. In addition to programmed annual entitlements, airports may receive discretionary AIP funding from the FAA. AIP entitlement and discretionary funds have provided an important source of capital funding for airports in general and specifically at LIT; however there is no guarantee of future availability beyond existing FAA authorized amounts.

A list of AIP grant funds received for use at the Airport in recent years is shown in Table 1-20.

Table 1-20
AIP Grant History
Airport Master Plan
Bill and Hillary Clinton National Airport

Federal Fiscal Year	AIP Grant Number	AIP Grant Funds Received	Project Description
2011	77	$ 761,859	Improve Runway Safety Area - 04R/22L
2011	78	$ 3,614,206	Rehabilitate Taxiway Lighting
2012	79	$ 3,349,204	Acquire Miscellaneous Land, Rehabilitate Aircraft Rescue & Fire Fighting Building
2013	80	$ 5,124,468	Acquire Miscellaneous Land , Rehabilitate Runway Lighting - 04L/22R, Rehabilitate Taxiway Lighting
2014	81	$ 1,823,421	Improve Airport Drainage
2014	82	$ 1,969,089	Acquire Miscellaneous Land
2015	83	$ 12,937,527	Improve Runway Safety Area - 04R/22L, Rehabilitate Taxiway , Rehabilitate Taxiway
2015	84	$ 1,220,456	Update Airport Master Plan Study
2016	85	$ 1,685,790	Rehabilitate Runway - 04R/22L, Rehabilitate Runway Lighting - 04R/22L
2016	86	$ 5,904,333	Rehabilitate Taxiway

Source: Federal Aviation Administration.

1.7.4.2 Entitlement Funds

Based upon the FAA formula for AIP entitlement grants and current traffic activity forecasts, the Commission expects to receive approximately $4.2 million annually for use on eligible projects. It is assumed that the United States Congress will continue to authorize and fund the AIP program in substantially similar form throughout the planning period and therefore that the Commission will continue to receive these grants at levels commensurate with historical receipts.

1.7.4.3 Discretionary Funds

The FAA awards discretionary grants based upon national priority to the aviation system. Due to the uncertainty of this funding source, these grants may not be available in the future as currently planned or anticipated. If discretionary funds do not materialize for projects as planned, those projects which are scheduled to be funded through this source may be subject to delay, deferral, or funding may be sought from alternative sources.

1.7.4.4 State Grants

Historically, grants from the Arkansas Department of Aeronautics have been another funding source for Airport capital projects. Amounts received through the State Airport Aid Grant program (SAAG) during the past several years are shown in Table 1-21.

Table 1-21
State Grant History
Airport Master Plan
Bill and Hillary Clinton National Airport

Calendar Year	State Grant Funds Received
2011	$ 974,318
2012	$ 0
2013	$ 355,811
2014	$ 200,159
2015	$ 756,096
2016	$ 621,659

Source: Arkansas Department of Aeronautics.

SAAG funds have historically been utilized primarily to fund the local matching share of federal AIP grants (recently, 10%). Because the SAAG is authorized on a year-to-year basis, some uncertainty exists as to the amount of future funding available. Due to the uncertainty and limited availability of state funds, the current CIP does not rely substantially on the future receipt of state assistance.

1.7.4.5 Passenger Facility Charges (PFC)

The authority for airport operators to impose a PFC was granted by Congress in the Aviation Safety and Expansion Act of 1990 and the Wendell H. Ford Aviation Investment and Reform Act of 2000. An airport must apply to the FAA for the authority to impose a PFC and for the authority to use the PFC Revenues collected for specific FAA-approved projects. PFCs have become a key funding source for airports, as they are generated by local revenue sources (enplaning passengers).

The Airport's PFC program consists of nine applications. The Commission received initial approval to collect a PFC beginning in February 1995 at a level of $3.00 per eligible enplaned passenger. The PFC level was raised to $4.50 in January 2002. A total of $114 million of PFC revenue has been approved to be collected over the nine applications. At current enplanement levels, the Commission collects approximately $3.9 million of PFC revenue annually.

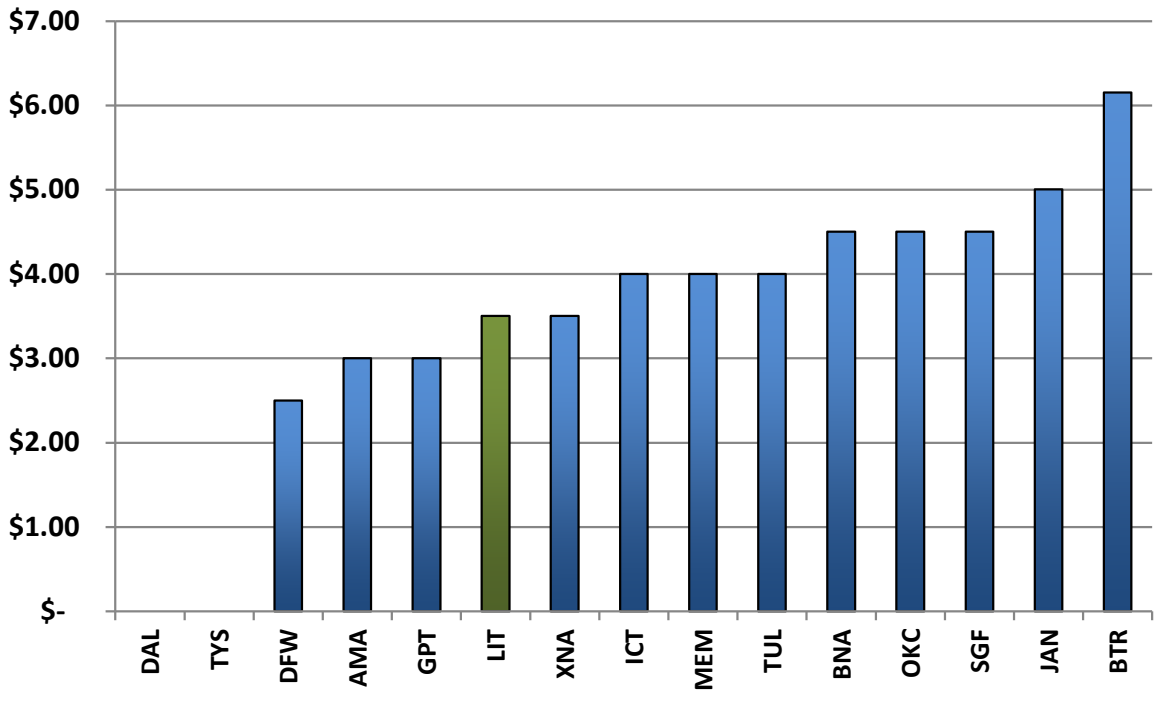
The Commission's authority to collect a PFC extends to the earlier of (1) collecting the total $114 million approved amount, or (2) April 1, 2020. If passenger enplanements drop below forecast levels, the Commission may submit an amendment to the FAA to extend the collection date until such a time as the full authorized amount is collected. The Commission intends to continue submitting PFC applications for future projects so that collections will continue uninterrupted.

1.7.4.6 Customer Facility Charges (CFCs)

At the Airport, a Customer Facility Charge (CFC) has been established by resolution since December 2010 and is imposed for each day of a rental car transaction at $3.50 per transaction day. The Commission currently collects approximately $2.5 million per year in CFC revenue. These funds may be utilized for any legal use including, but not limited to, rental car-related project costs, rental car facility expenses, operating and maintenance costs, facility rent, debt service, and future costs of the rental car facility.

The CFC level is comparable to the Airport's peer airports in the region, as shown in Figure 1-19.

Figure 1-19
CFC Levels at Airports in the Region
Airport Master Plan
Bill and Hillary Clinton National Airport



Source: Avis.com, as compiled by LeighFisher, Q4 2016.

1.7.4.7 Commission Funds

The Commission holds unrestricted cash and cash equivalent balances of approximately $22.8 million as of January 31, 2017. These funds can be utilized for capital projects on a pay-as-you-go basis, including required matching shares for grants, as well as renewals and replacements. These funds are available for the Commission's discretionary use and are not subject to approval by airlines.

Additionally, the Commission holds $12.3 million in the Terminal Sinking Fund account of the Revenue Fund, which are earmarked for future terminal expansion projects.

1.7.4.8 Other Grants and Third Party Funding

Other sources of funding may be available from time to time for capital projects at the Airport. Examples of these sources could be Transportation Security Administration (TSA) grants, Federal Highway Administration (FHA) funding, Department of Homeland Security (DHS), among others. These sources are generally obtained on a case by case basis, depending on the nature of the project, and historically have not been a consistent component of the Airport's capital funding. The TSA provided $9.5 million for the recent in-line baggage screening project and $5.9 million for the recent CCTV project.

Chapter 2

2.1 FORECASTS OF AVIATION ACTIVITY

This chapter presents the findings and methodologies used to project aviation demand at Bill and Hillary Clinton National Airport (the Airport or LIT). Forecasts are a key element in the Airport planning process, as they provide a framework to guide the analysis for future facility needs and alternatives. Forecasting is not an exact science, but it does identify general parameters for development and provides a defined rationale for development strategies and activities. It is common to experience short- and long-term fluctuations in an Airport's activity due to a variety of factors that cannot be anticipated.

Projections of aviation activity for the Airport were prepared for the near-term (2021), mid-term (2026), and long-term (2036) timeframes. These projections are generally unconstrained and assume the Airport will be able to develop the various facilities necessary to accommodate future Airport activity.

2.1.1 Previous Forecasts

Previous aviation activity forecasts used for comparison purposes in this Master Plan include the Little Rock National Airport Master Plan (2003), the LIT Terminal Replacement Study (2006), the LIT Terminal Redevelopment Study (2009), the FAA's Terminal Area Forecast (TAF) (January 2015), and the FAA Aerospace Forecast Fiscal Years 2016-2036 (2016).

2.1.1.1 Previous Enplanement Forecasts

The Little Rock National Airport Master Plan (2003), the LIT Terminal Replacement Study (2006), and the Terminal Redevelopment Study (2009) are the most recent planning documents for which enplanement forecasts were prepared. Table 2-1 presents these previous enplanement forecasts.

2.1.1.2 Previous Aircraft Activity Forecasts

In addition to the enplanements forecast, the Little Rock National Airport Master Plan (2003) provided a comprehensive forecast with 2003 as the base year for projections. It forecast commercial service aircraft operations, air cargo tonnage and aircraft operations, general aviation aircraft operations, military aircraft operations, critical aircraft operations, and based aircraft. Table 2-2 presents the previous aircraft activity forecasts.

Table 2-1
Previous Annual Enplanements Forecasts
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	2003 Master Plan[(a)]	2006 Terminal Replacement Study[(b)]	2009 Terminal Redevelopment Study[(c)]
2003	1,063,023	---	---
2004	1,148,060	---	---
2005	1,262,870	---	---
2006	1,293,180	1,320,000	---
2007	1,324,220	1,360,000	1,274,000
2008	1,356,000	1,400,000	1,194,000
2010	---	1,485,000	1,160,000
2013	1,526,700	1,500,000	1,214,000
2018	1,718,910	1,739,000	1,308,000
2020	---	1,845,000	1,348,000
2023	1,935,320	2,016,000	1,409,000
2028	---	---	1,518,000
Growth Rate	3.0%	2.5%	0.8%

Note: Forecasts not provided.

(a) Little Rock National Airport Master Plan, 2003.
(b) LIT Terminal Replacement Study, 2006.
(c) LIT Terminal Redevelopment Study, 2009.

Table 2-2
Previous Aircraft Activity Forecasts
Airport Master Plan
Bill and Hillary Clinton National Airport

Activity	2003	2008	2013	2018	2023
Commercial Service Operations	**43,064**	**48,650**	**52,200**	**56,650**	**62,000**
Turboprop	5,430	2,000	1,500	750	250
Regional Jet	19,066	25,800	28,750	33,000	37,500
Narrow Body Jet	18,568	20,850	21,950	22,900	24,250
General Aviation Operations	**94,707**	**104,260**	**113,510**	**123,580**	**134,550**
Single Engine	21,783	23,350	25,200	27,190	28,260
Multi-Engine	17,994	17,930	18,840	19,770	17,490
Turboprop	18,941	19,910	21,340	22,860	22,870
Business Jet	35,042	42,020	46,990	52,520	64,580
Helicopter	947	1,040	1,140	1,240	1,350
Air Cargo (Tons)	**12,176**	**13,790**	**15,740**	**18,120**	**21,590**
Air Cargo Aircraft Operations	**2,240**	**2,500**	**2,720**	**3,060**	**3,380**
Turboprop	362	390	410	440	470
Narrow Body Jet	1,870	2,100	2,290	2,590	2,840
Wide Body Jet	8	10	20	30	70
Military Operations	**34,086**	**33,000**	**33,500**	**34,000**	**34,500**
Turboprop	13,294	12,380	12,400	12,580	12,770
Jet	20,792	20,630	21,110	21,420	21,740
Critical Aircraft (B-757)	**820**	**1,010**	**1,210**	**1,550**	**1,780**
Based Aircraft By Type	**156**	**164**	**172**	**180**	**190**
Single Engine	75	79	81	83	86
Multi-Engine	51	53	57	60	63
Business Jet	28	30	33	34	37
Helicopter	2	2	2	3	4

Source: Little Rock National Airport Master Plan, 2003.

2.1.1.3 Previous Airport Activity Forecasts Comparison to Actual Conditions

By comparing the enplanements forecasts contained in Table 2-1 with the actual enplanements in Table 2-3, it can be seen that forecasts were more optimistic than actual enplanement levels. The average margin of error for all three enplanement forecasts was about 9.5% over the time period 2003 to 2013

Comparing the Airport activity forecasts from Table 2-2 with actual conditions presented in Table 2-5 provides the following insights:

- Commercial service aircraft operations were initially (i.e., 2008) below actual levels by almost 10%, but the 2013 projections were well above actual levels by approximately 18%;
- General aviation aircraft operations projections vastly overestimated the actual levels achieved by an average margin of error of approximately 37%;
- While records of air cargo aircraft operations have not historically been tracked, the amount of air cargo tonnage forecasted for LIT exceeded actual amounts by an average margin of error of more than 35%;
- Military aircraft operations forecasts exceeded actual by an average margin of error of more than 48%;
- Based aircraft projections exceeded actual based aircraft by 11 aircraft in 2008 and 12 in 2013, or an average margin of error by roughly 7%.

It is evident that the previous forecasts prepared for LIT have overestimated the activity levels. During the years since the previous forecasts were prepared, many changes have transpired at the local, regional, and national levels and a re-evaluation of projected aviation activity is necessary. Additional insight into these changes will be provided for each forecast category presented later in the chapter.

2.2 HISTORICAL AND CURRENT AVIATION ACTIVITY

Historical activity data for the Airport provides the baseline from which future activity can be projected. While historical trends are not always indicative of future activity, historical data does provide insight into how local, regional, and national demographic and aviation-related trends may affect Airport demand.

2.2.1 Commercial Service

2.2.1.1 Enplanements

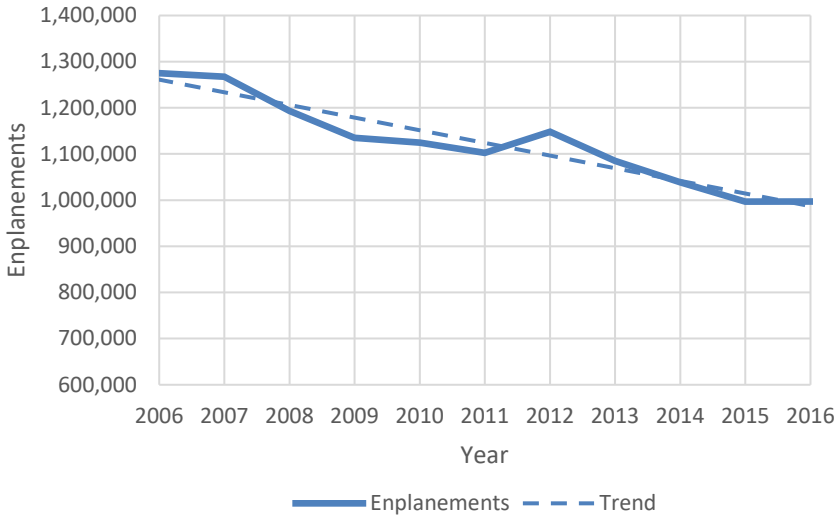
As presented in Table 2-3 and illustrated in Figure 2-1, passenger enplanements at LIT have fluctuated with an overall decrease between 2006 and 2016 representing a compound annual growth rate of -2.4%. Enplanements were at their highest in 2006 and 2007, with over 1.26 million enplaned passengers per year. The economic recession that began in late 2007, cutbacks associated with subsequent carrier mergers (United-Continental, Delta-Northwest, American-US Airways), and the repeal of the Wright Amendment led to a decline in service and enplanements. After three straight years of declines between 2012-2015, enplanements grew slightly in 2016, up 0.02% from 2015. It should be noted that the 2016 enplanements are for the 12-month period from December 2015 through November 2016 (the last month available at the time the forecasts were prepared), while the remaining historical years are calendar years.

Table 2-3
Historical and Existing Enplanements, 2006-2016
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	Enplanements
2006[(a)]	1,275,055
2007[(a)]	1,267,697
2008[(a)]	1,193,502
2009[(a)]	1,134,970
2010[(a)]	1,124,703
2011[(a)]	1,102,739
2012[(a)]	1,147,885
2013[(a)]	1,085,323
2014[(a)]	1,038,307
2015[(a)]	996,837
2016[(b)]	997,085
Growth Rate	-2.4%

(a) LIT records, calendar year.
(a) LIT records, December 1, 2015-November 30, 2016.

Figure 2-1
Historical Passenger Enplanements, 2006-2016
Airport Master Plan
Bill and Hillary Clinton National Airport



Source: LIT records.

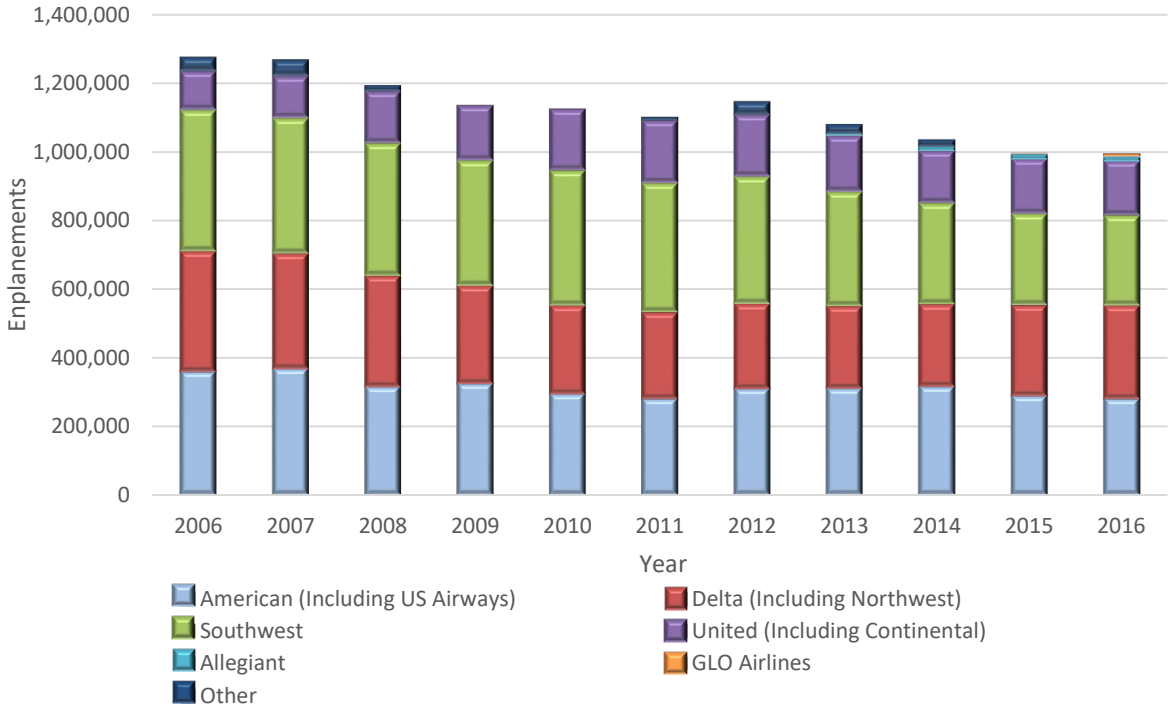
When enplanements are analyzed by carrier, a shift can be seen over the last 10 years as airline mergers have impacted activity levels. Table 2-4 shows the historical enplanements by the major carriers. Figure 2-2 highlights how the airline's shares have shifted since 2006. Southwest Airlines has enplaned the most passengers during the time period, but has also experienced the largest decrease in market share. In 2006, Southwest accounted for 32.1% of LIT enplanements, compared to 26.3% in 2016. United has experienced the largest increase in market share, increasing from 8.8% to 15.9%, in part due to the merger with Continental in 2010. Allegiant entered the LIT market in 2013 and has garnered approximately 1.4% of the market share in 2016. It should be noted that the "Other" category includes charters and airlines no longer serving LIT such as Vision and Frontier.

Table 2-4
Historical and Existing Enplanements by Carrier, 2006-2016
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	American (Including US Airways)	Delta (Including Northwest)	Southwest	United (Including Continental)	Allegiant	GLO	Other	Total
2006	360,199	350,929	409,787	112,673	0	0	41,467	1,275,055
2007	367,729	337,570	392,383	121,870	0	0	48,145	1,267,697
2008	315,679	324,559	384,920	150,388	0	0	17,956	1,193,502
2009	325,052	286,391	363,697	159,512	0	0	318	1,134,970
2010	295,065	259,736	391,882	177,891	0	0	129	1,124,703
2011	281,740	253,302	374,747	182,394	0	0	10,827	1,103,010
2012	310,008	249,214	369,290	179,806	0	0	39,568	1,147,886
2013	311,306	241,756	331,459	162,181	7,613	0	27,842	1,082,157
2014	316,453	241,932	293,489	152,696	12,719	0	21,094	1,038,383
2015	289,675	266,263	265,453	159,098	15,405	338	605	996,837
2016	281,480	273,224	261,796	158,656	13,602	7,117	1,210	997,085
Total	3,454,386	3,084,876	3,838,903	1,717,165	49,339	7,455	209,161	12,361,285
2006 %	28.2%	27.5%	32.1%	8.8%	0.0%	0.0%	3.3%	
2016 %	28.2%	27.4%	26.3%	15.9%	1.4%	0.7%	0.1%	

Source: LIT records.

Figure 2-2
Historical Airline Share of Enplanements, 2006-2016
Airport Master Plan
Bill and Hillary Clinton National Airport

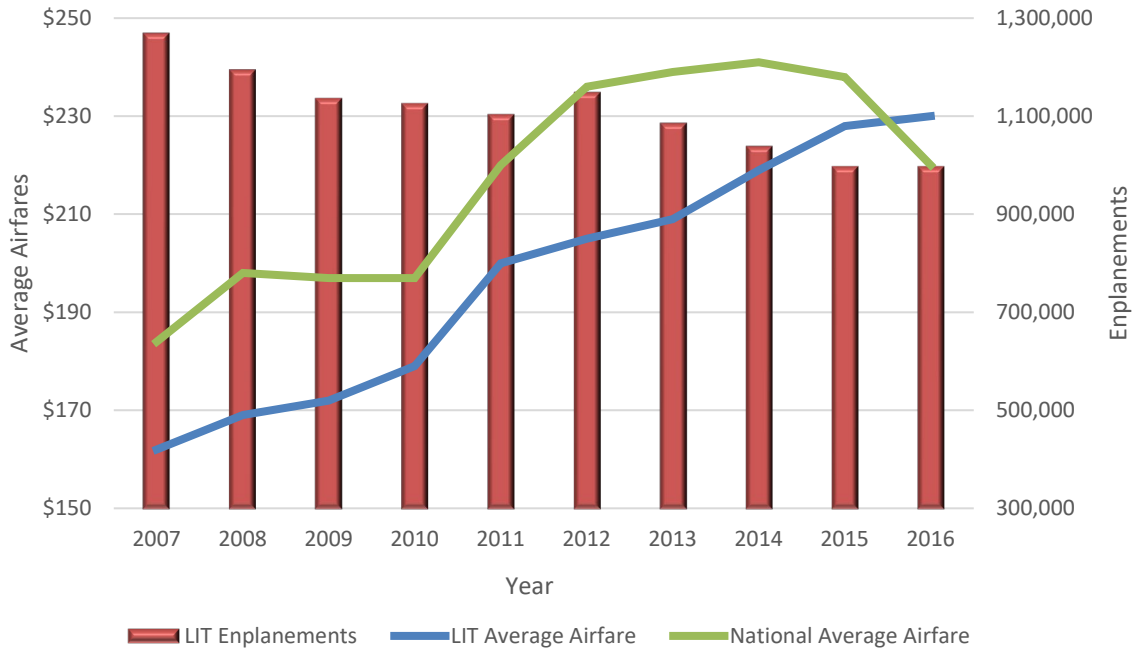


Note: Does not include airlines added since 2016
Source: LIT records.

2.2.1.2 Enplanements and Airfares

Figure 2-3 shows the changes in LIT airfares in nominal terms over time compared to the national average airfares and total LIT enplanements. LIT average airfares increase significantly over the time period with an increase of 42%, but tracked relatively closely with the national average. The 12-month time period ending June 30, 2016 was the first year LIT's airfares surpassed the national average. Airfares reached a 10-year high in 2016 at an average of $230, $10 higher than the national average. While airfares were increasing, LIT enplanements were decreasing, down over 21% during the time period.

Figure 2-3
Enplanements and Average Airfare Trends, 2006-2016
Airport Master Plan
Bill and Hillary Clinton National Airport

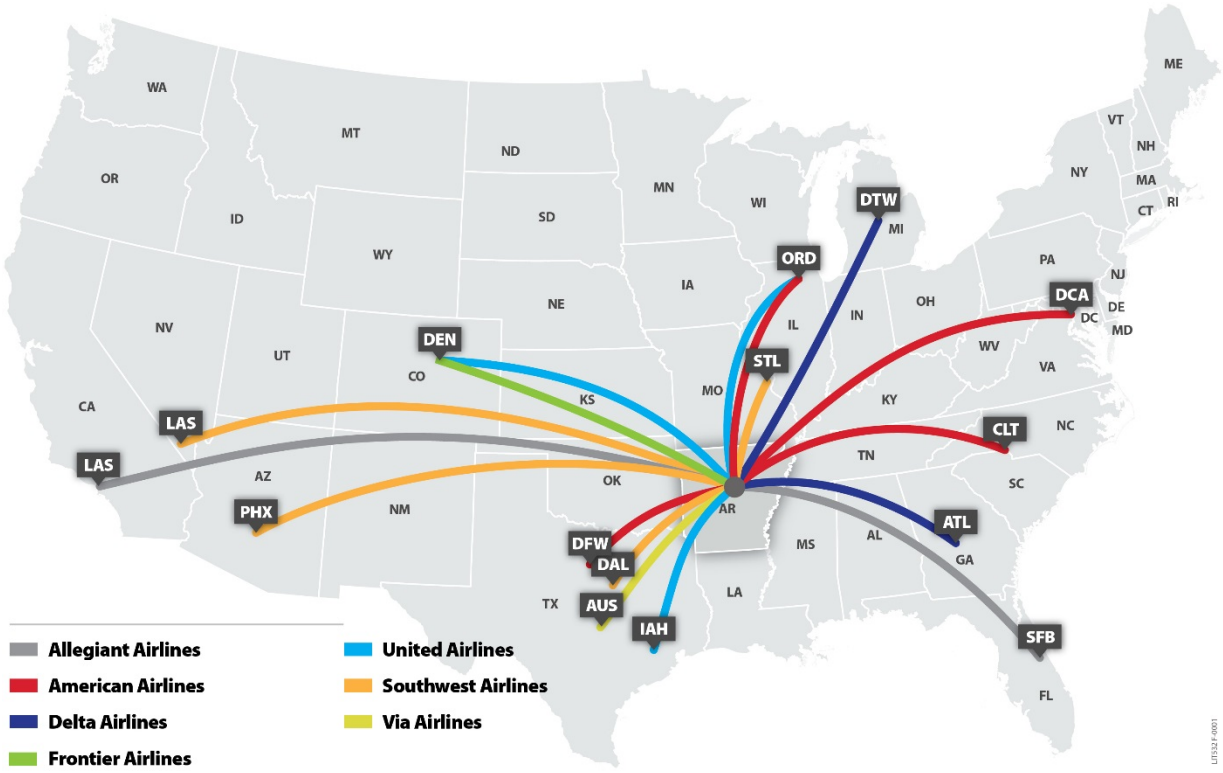


Source: Bill and Hillary Clinton National Airport Air Service Market Research, 2016.
LIT records.

2.2.1.3 Air Carrier Activity

As of March 2018, the Airport is served by seven airlines: American Airlines, Delta Airlines, Southwest Airlines, United Airlines, Allegiant Air, Frontier Airlines, and Via Airlines. Combined, these airlines provide daily non-stop flights to 15 destinations: Austin, Texas; Atlanta, Georgia; Charlotte, North Carolina; Dallas (Love), Texas; Washington, DC; Denver, Colorado; Dallas/Fort Worth (DFW), Texas; Detroit, Michigan; Houston (Bush/Intercontinental), Texas; Las Vegas, Nevada; Los Angeles, California; Chicago (O'Hare), Illinois; Phoenix, Arizona; Orlando (Sanford), Florida; and St. Louis, Missouri. The nonstop routes by carrier from LIT are presented in Figure 2-4.

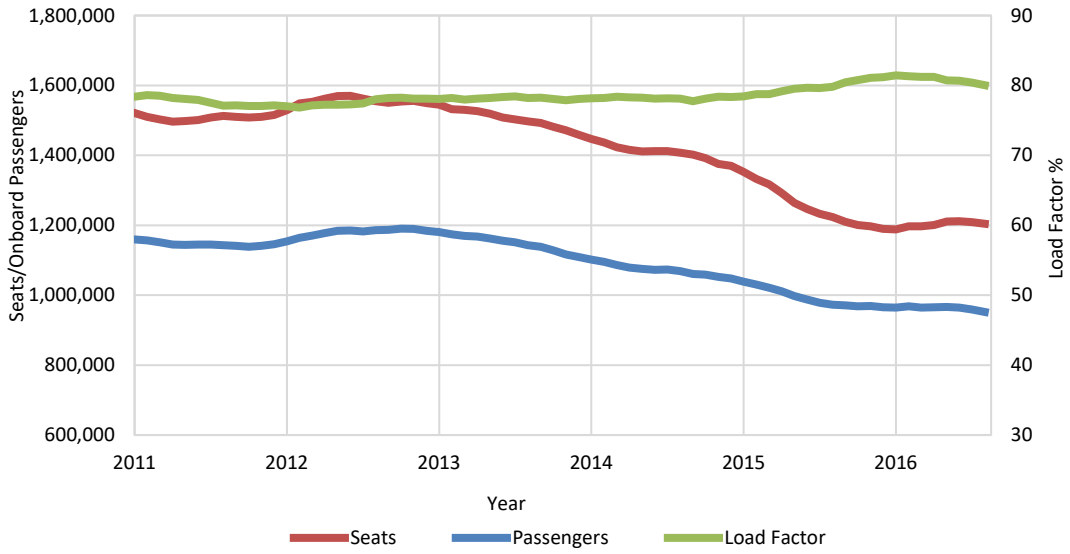
Figure 2-4
Nonstop Routes from Bill and Hillary Clinton National Airport, 2018



Source: Bill and Hillary Clinton National Airport.

As shown in Figure 2-5, LIT's available seats, onboard passengers, and load factors have fluctuated since 2011. The current load factors average 80%, a slight improvement since 2011. Capacity (seats) has declined overall since 2011 while onboard passengers have also decreased slightly, allowing for the load factors to remain strong. Capacity is at its lowest point in many years.

Figure 2-5
Load Factor, Available Seats, and Enplanements, 2011-2016
Airport Master Plan
Bill and Hillary Clinton National Airport



Source: Bill and Hillary Clinton National Airport Air Service Market Research, 2016.

2.2.2 Aircraft Operations

An operation is defined as either a takeoff or a landing, and operations are divided into itinerant and local. The Air Traffic Control Handbook defines a local operation as any operation performed by an aircraft operating in the local traffic pattern or within sight of the tower, an aircraft known to be departing or arriving from a flight in the local practice area, or an aircraft executing practice instrument approaches. Itinerant operations are all other aircraft takeoffs or landings. Historical aircraft operations data are summarized in Table 2-5. In 2016, a total of 108,348 aircraft operations occurred at the Airport. Historical data from 2006 through 2015 represent calendar years, while the report data for 2016 is for the federal fiscal year from October 1, 2015 through September 30, 2016. Thus there is some overlap in data between 2015 and 2016, but the 2016 data represents the most recent 12-month data available at the time of forecast development.

Table 2-5
Historical and Existing Aircraft Operations, 2006-2016
Airport Master Plan
Bill and Hillary Clinton National Airport

	Itinerant						Local			
Year	Air Carrier	Air Taxi	Total Commercial Service	General Aviation	Military	Total All Itinerant	General Aviation	Military	Total All Local	Total Operations
2006[(a)]	23,865	33,309	57,174	55,621	5,248	118,043	7,611	13,454	21,065	139,108
2007[(a)]	27,913	28,842	56,755	53,259	7,211	117,225	7,601	16,018	23,619	140,844
2008[(a)]	24,680	26,136	50,816	47,895	6,973	105,684	6,727	14,649	21,376	127,060
2009[(a)]	23,519	28,054	51,573	39,242	8,760	99,574	5,937	26,904	32,842	132,416
2010[(a)]	19,867	31,451	51,318	41,606	7,636	100,560	3,247	11,186	14,433	114,993
2011[(a)]	19,382	28,273	47,655	40,288	7,662	95,605	4,497	11,668	16,165	111,770
2012[(a)]	20,942	25,030	45,972	41,559	8,791	96,322	4,468	8,871	13,339	109,661
2013[(a)]	19,183	21,606	40,789	38,533	6,693	86,015	4,771	5,878	10,649	96,664
2014[(a)]	20,146	16,905	37,051	39,226	6,614	82,892	4,687	2,856	7,542	90,434
2015[(a)]	20,341	14,272	34,613	43,868	8,995	87,477	5,902	5,661	11,562	99,039
2016[(b)]	21,155	15,044	36,199	36,222	9,296	81,717	15,656	10,975	26,631	108,348

(a) LIT records, calendar year.
(b) LIT records, federal fiscal year (October 1, 2015 –September 30, 2016).

As shown, total annual aircraft operations have declined significantly during the historical period, down 22% overall or an annual rate of -2.5% between 2006 and 2016. This is in line with national trends and an overall industry decrease in commercial service and general aviation activity. The recent increase experienced between 2015 and 2016 is primarily the result of increased training flights by both general aviation and military aircraft. A slight increase in commercial service aircraft operations also contributed to the increase.

2.2.2.1 Commercial Service Operations

Overall, commercial service operations (which include air carrier and air taxi/commuter operations) declined at an average annual rate of -4.5% between 2006 and 2016. Commercial service operations, driven by growth in 50- and 70-seat regional jet service peaked in 2006. The economic recession, mainline air carrier mergers and efforts to right-size, and rapid retirement of the 50-seat regional jet led to the decline.

In 2016, 42% of the commercial operations were operated by aircraft that are recorded in the air taxi category, and this number also includes some general aviation operations by business aircraft as well as all-cargo carriers.

2.2.2.2 General Aviation Operations

Total general aviation aircraft operations (both local and itinerant) have declined over the last 10 years. Operations decreased by 18% from 2006 to 2016, representing an average annual growth rate of -2.0%. This is not a situation unique to LIT and is reflective of the decline in general aviation activity across the nation due to the recession, high fuel prices, and insurance costs for general aviation aircraft.

2.2.2.3 Military Operations

Military aircraft historically have utilized LIT mainly for training operations and cargo transport. Total military operations (local and itinerant) have fluctuated, with a slight overall increase of 8.4% and an average annual growth rate of 0.8%. LIT personnel estimate that typically 85% of the military operations are performed by C-130 aircraft based at Little Rock Air Force Base conducting touch and go training on Runway 04R/22L. However, this runway was closed for three months during 2016 for a rehabilitation project that skewed the numbers artificially lower than normal for training operations. Approximately 1% of military operations are estimated to be military equipment shipment by C-17s or contracted B-747 aircraft. The remaining 14% are estimated to be various transient aircraft such as T-6 Texan II, F/A-18, CH-53, and UH-60 refueling at TacAir, an Airport Fixed Base Operator (FBO).

2.2.2.4 Air Cargo Operations

According to the PASSUR aircraft operations data provided by LIT personnel, all-cargo carriers flew 847 operations in 2016. UPS is the only all-cargo carrier serving LIT, accounting for approximately 835 of the estimated 847 operations, using Airbus A300-600 and Boeing 757-200 aircraft. Federal Express aircraft diversions from Memphis International Airport (MEM) accounted for 12 of the total operations, but they did not deplane or enplane any air cargo. The operations by all cargo carriers are included in the air taxi itinerant operations in Table 2-5.

2.2.3 Based Aircraft

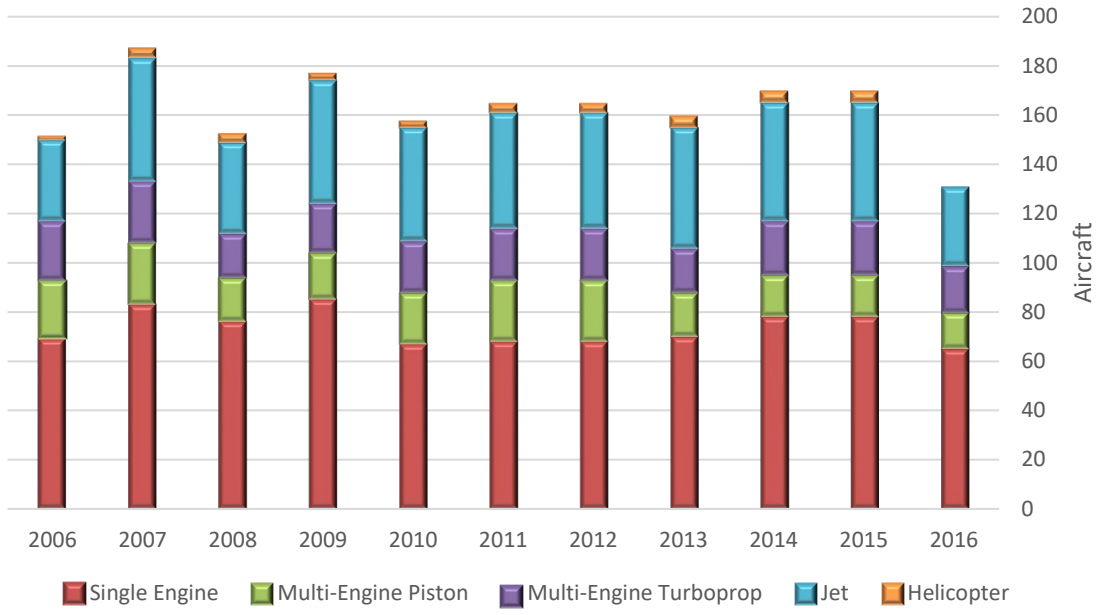
Based aircraft are those permanently stored at the Airport. The number has fluctuated since 2006 as shown in Table 2-6 and Figure 2-6. In 2016, 131 aircraft were based at LIT – (65 single engine, 15 multi-engine piston, 19 multi-engine turboprop, and 32 business jet aircraft). LIT personnel indicated that nine of the based aircraft are stored on apron tie-downs.

Table 2-6
Historical and Existing Based Aircraft, 2006-2016
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	Single Engine	Multi-Engine Piston	Multi-Engine Turboprop	Jet	Helicopter	Total
2006	69	24	24	33	2	152
2007	83	25	25	50	4	187
2008	76	18	18	37	4	153
2009	85	19	20	50	3	177
2010	67	21	21	46	3	158
2011	68	25	21	47	4	165
2012	68	25	21	47	4	165
2013	70	18	18	49	5	160
2014	78	17	22	48	5	170
2015	78	17	22	48	5	170
2016	65	15	19	32	0	131

Source: LIT records.

Figure 2-6
Historical and Existing Based Aircraft, 2006-2016
Airport Master Plan
Bill and Hillary Clinton National Airport



Source: LIT records.

2.2.4 Air Cargo Tonnage

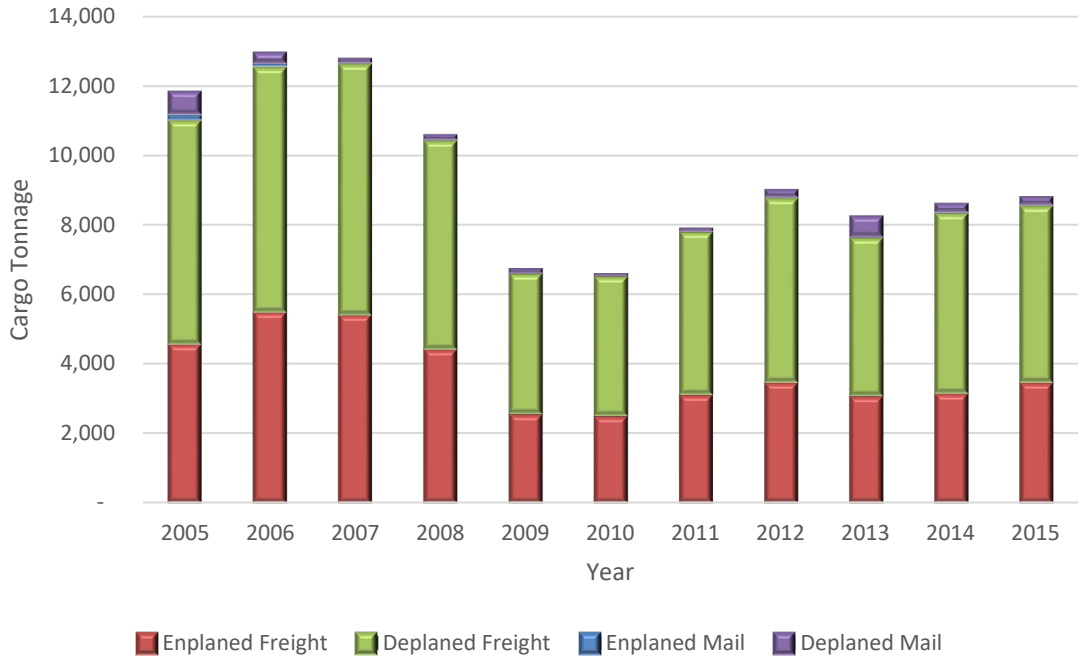
A total of 8,829 tons of air freight and mail were enplaned and deplaned at LIT in 2015 (the latest year data is available). The level of air cargo at the Airport has fluctuated since 2005, with a slight overall decline as shown in Table 2-7 and Figure 2-7. Between 2005 and 2015, total air freight tonnage declined at an average rate of -2.5% per year while air mail declined at a rate of -10.6% per year. Air cargo peaked in 2006 with 12,953 tons. After a dramatic decline in 2009, air cargo has been increasing, with an annual growth rate of 5.9%. UPS carried over 92% of the air cargo in 2015 at the Airport; the remainder was carrier in the belly compartments of the scheduled commercial service air carriers.

Table 2-7
Historical and Existing Air Cargo Tonnage, 2005-2015
Airport Master Plan
Bill and Hillary Clinton National Airport

	Enplaned		Total Enplaned	Deplaned		Total Deplaned	Total	Total	Total
Year	Freight	Mail	Cargo	Freight	Mail	Cargo	Cargo	Freight	Mail
2005	4,553	134	4,687	6,461	688	7,150	11,837	11,015	822
2006	5,479	71	5,550	7,059	344	7,403	12,953	12,538	415
2007	5,393	0	5,393	7,238	146	7,384	12,777	12,631	146
2008	4,407	0	4,407	6,027	160	6,187	10,594	10,434	160
2009	2,557	1	2,558	4,055	154	4,209	6,767	6,612	154
2010	2,503	--	2,503	4,028	91	4,119	6,622	6,531	91
2011	3,105	5	3,110	4,704	106	4,810	7,919	7,809	110
2012	3,453	3	3,456	5,323	249	5,572	9,028	8,776	252
2013	3,067	8	3,075	4,574	623	5,197	8,272	7,641	630
2014	3,148	4	3,152	5,199	277	5,476	8,628	8,347	281
2015	3,454	5	3,459	5,107	264	5,370	8,829	8,561	269

Source: LIT records.

Figure 2-7
Air Cargo Tonnage, 2005-2015
Airport Master Plan
Bill and Hillary Clinton National Airport



Source: LIT records.

2.3 FACTORS AFFECTING AVIATION ACTIVITY

The amount and kind of aviation activity expected to occur at any airport are reflective of the general economic conditions prevalent within the airport's market area, the services available to aircraft operators, and the businesses located on the airport or within the community. Additionally, the expected aviation regulatory climate, national aviation trends, and local issues also factor into the projections of airport activity.

2.3.1 Regional Demographics

Socioeconomic characteristics are examined to derive an understanding of the dynamics of historical and projected growth within the geographic area served by an airport. This information is then typically used as one tool to forecast aviation demand. The types of socioeconomic data that are presented include population, employment, and per capita personal income. A summary of historical and projected socioeconomic trends for the Little Rock Metropolitan Statistical Area (MSA) is presented below, including comparisons with state and national trends.

2.3.1.1 Population

As presented in Table 2-8, between 2006 and 2015, the population of the Little Rock MSA increased at an annual growth rate of 1.3% per year. This rate of growth compares favorably to the growth rates for both

the State of Arkansas and the U.S., which experienced annual growth rates of 0.8%. *(Bill and Hillary Clinton National Airport Comprehensive Annual Financial Report Fiscal Years Ended December 31, 2015 and 2014)*

According to Woods & Poole Economics, 2015, the Little Rock MSA population is projected to grow at 1.3% per year between 2015 and 2035. By 2035, the MSA is expected to have a population of 939,634, an increase of 210,500 over current levels. This compares favorably with the State of Arkansas and the U.S. overall population growth, which are expected to experience annual growth rates of 1.0% and 0.9%, respectively, between 2015 and 2035. *(Woods & Poole Economics, 2015)*

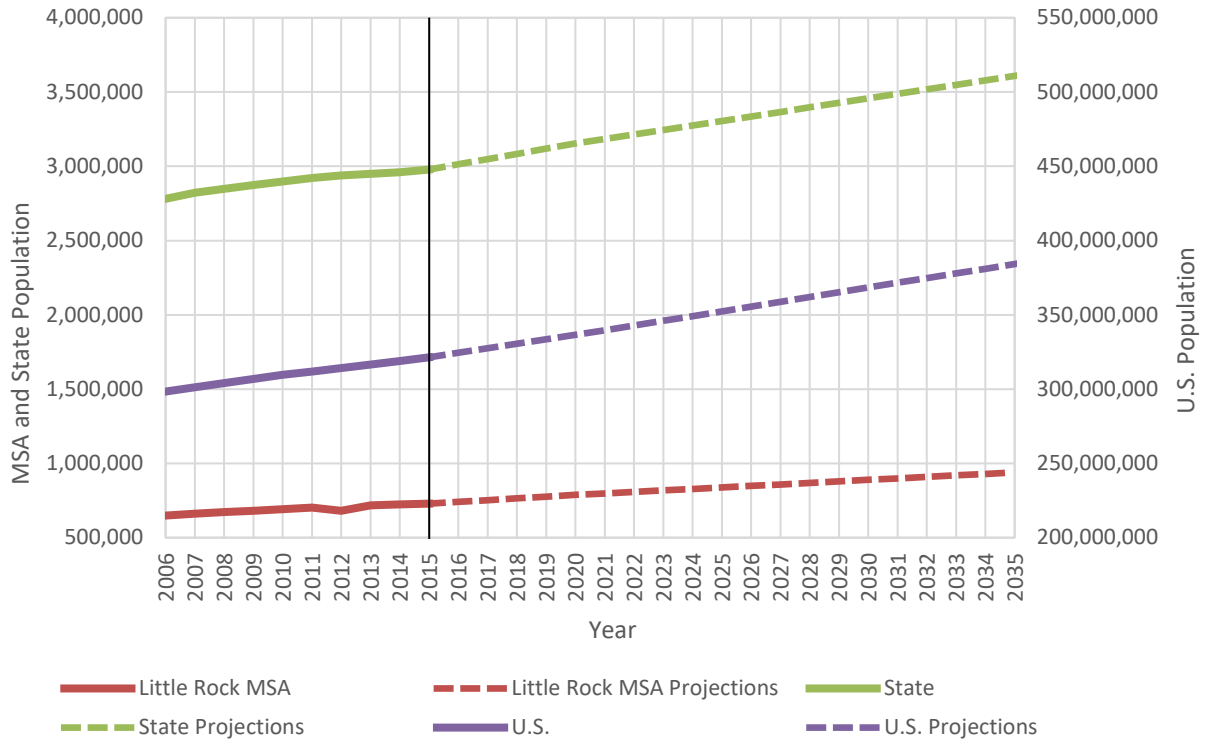
The primary driving factors behind the expected Little Rock MSA population increase throughout the planning period include: the presence of the State Capitol and related state government functions and jobs; continued growth in employment opportunities related to the diversifying private sector economy (presented in Section 2.3.1.3); a favorable cost of living (bestplaces.net indicates Little Rock has a cost of living index of 88.8 – 11.2 points below the national average); low unemployment rate (presented in Section 2.3.1.2); and the presence of leading national and multinational business and organization headquarters such as Acxiom, Dillard's Inc., Heifer International, LM Wind Power (North America), Windstream Communications, and Windrock International.

Table 2-8
Historical and Forecast Population Comparison 2005-2015
Airport Master Plan
Bill and Hillary Clinton National Airport

2006 *(a)*	648,784	2,781,097	298,379,912
2007 *(a)*	661,719	2,821,761	301,231,207
2008 *(a)*	671,441	2,848,650	304,093,956
2009 *(a)*	681,888	2,874,554	306,771,529
2010 *(a)*	691,903	2,896,843	309,647,057
2011 *(a)*	702,305	2,922,280	311,721,632
2012 *(a)*	680,759	2,938,506	314,112,078
2013 *(a)*	717,703	2,949,828	316,497,531
2014 *(a)*	724,335	2,959,373	318,857,056
2015 *(a)*	729,135	2,978,204	321,418,820
Growth Rate	1.3%	0.8%	0.8%
2020 *(b)*	788,274	3,153,845	336,499,600
2025 *(b)*	837,712	3,304,306	352,281,000
2030 *(b)*	888,857	3,458,531	368,462,400
2035 *(b)*	939,634	3,608,663	384,207,800
Growth Rate	1.3%	1.0%	0.9%

(a) Bill and Hillary Clinton National Airport Comprehensive Annual Financial Report Fiscal Years Ended December 31, 2015 and 2014.
(b) Woods & Poole Economics, 2015.

Figure 2-8
Population Comparison, 2006-2035
Airport Master Plan
Bill and Hillary Clinton National Airport



Sources: Bill and Hillary Clinton National Airport Comprehensive Annual Financial Report Fiscal Years Ended December 31, 2015 and 2014.
Woods & Poole Economics, 2015.

2.3.1.2 Employment

Table 2-9 provides a comparison of historical and projected employed persons within the Little Rock MSA, the State of Arkansas, and the U.S., as well as the historical unemployment rates. Between 2006 and 2015, total employment in the Little Rock MSA grew at an annual rate of 1.0%. The employment rate of growth compares favorably with the State of Arkansas and U.S. employment annual growth rates of 0.6% and 1.0%, respectively. In 2015, 451,484 people were employed in the MSA. Projections made by Woods & Poole indicate positive long-term employment growth of 1.5% for the Little Rock MSA, and 1.3% for both the State of Arkansas and U.S. *(Woods & Poole Economics, 2015)*

Table 2-9 also shows the unemployment rate (non-seasonally adjusted) for the Little Rock MSA in 2015 was 5.5%. The MSA historical unemployment rate peaked in 2011 and 2012 at 7.0% and has declined over the last three years. Comparatively, the unemployment rates for the State of Arkansas and the U.S. in 2015 were 6.1% and 6.2%, respectively. The state unemployment rate peaked in 2012 at 8.0% and has declined ever since. The national unemployment rate peaked at 9.6% in 2011 and has fallen during the last four years. *(Bill and Hillary Clinton National Airport Comprehensive Annual Financial Report Fiscal Years Ended December 31, 2015 and 2014).*

Table 2-9
Historical and Forecast Employment and Unemployment Rate Comparison, 2006-2035
Airport Master Plan
Bill and Hillary Clinton National Airport

	Little Rock MSA		State		U.S.	
Year	Employment *(a)*	Unemployment Rate *(b)*	Employment *(a)*	Unemployment Rate *(b)*	Employment *(a)*	Unemployment Rate *(b)*
2006	412,842	4.6%	1,537,363	5.1%	172,654,785	5.1%
2007	414,475	4.7%	1,538,464	5.3%	172,713,279	4.6%
2008	416,652	4.5%	1,539,932	5.2%	172,791,271	4.6%
2009	418,829	4.6%	1,541,399	5.4%	172,869,264	5.8%
2010	423,727	6.4%	1,544,702	7.5%	173,044,746	9.3%
2011	431,622	7.0%	1,565,241	7.9%	176,286,674	9.6%
2012	432,803	7.0%	1,570,400	8.0%	178,846,010	8.9%
2013	435,797	6.7%	1,577,678	7.5%	182,278,133	8.1%
2014	443,614	6.8%	1,602,831	7.5%	185,151,833	7.4%
2015	451,484	5.5%	1,628,091	6.1%	188,032,545	6.2%
Growth Rate	1.0%		0.6%		1.0%	
2020	489,942	---	1,750,369	---	201,959,046	---
2025	528,763	---	1,871,690	---	215,757,262	---
2030	567,125	---	1,988,964	---	229,049,599	---
2035	604,720	---	2,101,911	---	241,724,243	---
Growth Rate	1.5%		1.3%		1.3%	

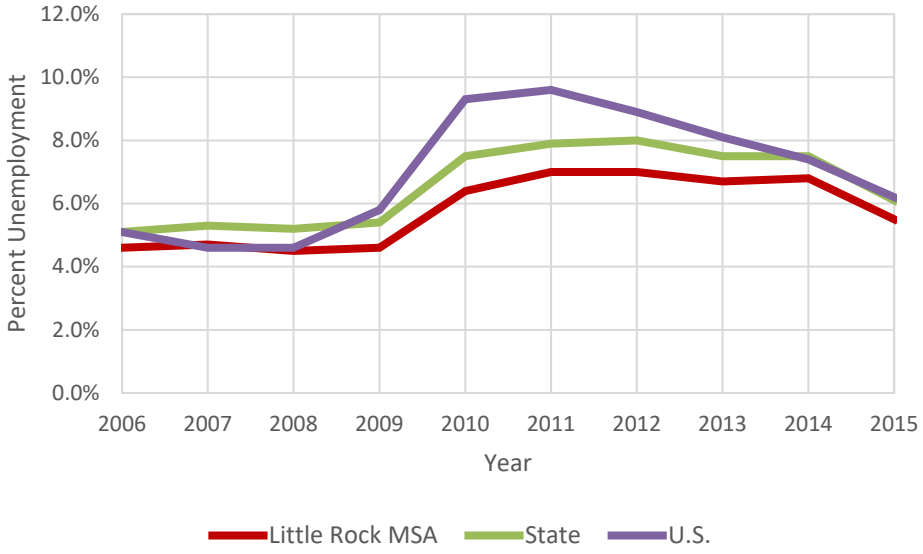
(a) Woods & Poole Economics, 2015.
(b) Bill and Hillary Clinton National Airport Comprehensive Annual Financial Report Fiscal Years Ended December 31, 2015 and 2014.

2.3.1.3 Industry Mix

Table 2-10 presents the top ten employers in the Little Rock MSA, according to the Little Rock Regional Chamber of Commerce. The top three employers in the MSA are state government, local government, and federal government, followed by the University of Arkansas Medical Services, Baptist Health Hospital, Little Rock Air Force Base, Arkansas Children's Hospital, Little Rock School District, Central Arkansas Veterans Health Care, and Entergy Arkansas. *(Little Rock Regional Chamber of Commerce, 2016)*

Figure 2-10 presents the relative percentage of private sector jobs, by industry category within the Little Rock MSA. Health care and social assistance, retail trade, accommodation and food service, manufacturing, and professional and technical services account for the highest percentages of private sector jobs in 2015. (*Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2015)*

Figure 2-9
Unemployment Rate Comparison, 2006-2015
Airport Master Plan
Bill and Hillary Clinton National Airport



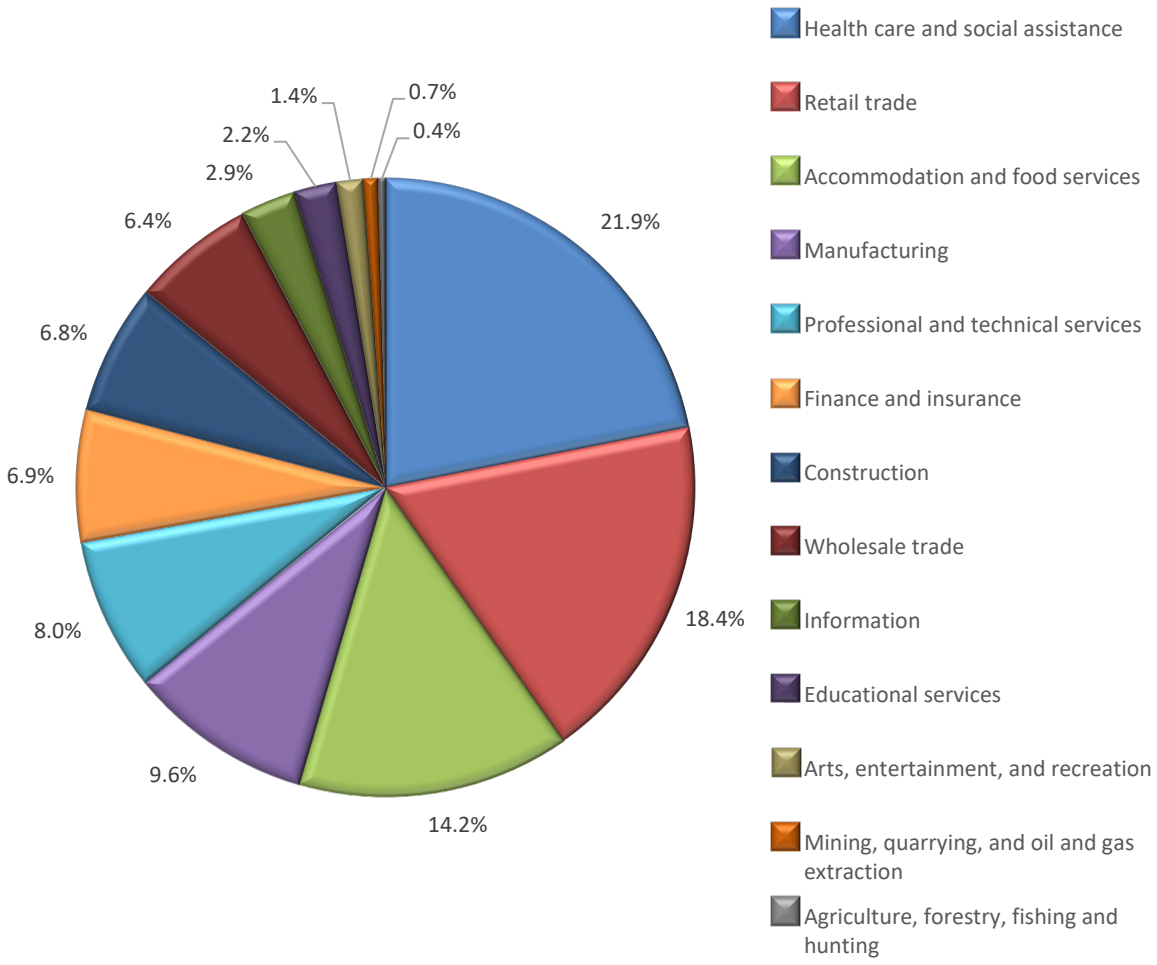
Source: Bill and Hillary Clinton National Airport Comprehensive Annual Financial Report Fiscal Years Ended December 31, 2015 and 2014.

Table 2-10
Little Rock Major Employers
Airport Master Plan
Bill and Hillary Clinton National Airport

Employer	Employees	Percentage
State Government	34,900	22.91%
Local Government	27,200	17.85%
Federal Government	9,900	6.50%
University of Arkansas Medical Services	9,100	5.97%
Baptist Health	5,360	3.52%
Little Rock Air Force Base	4,500	2.95%
Arkansas Children's Hospital	4,000	2.63%
Little Rock School District	3,500	2.30%
Central Arkansas Veterans Health Care	2,800	1.84%
Entergy Arkansas	2,740	1.80%
Total	152,340	

Source: Little Rock Regional Chamber of Commerce, 2015.

Figure 2-10
Little Rock MSA Employment by Industry, 2015
Airport Master Plan
Bill and Hillary Clinton National Airport



Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages, 2015.

The data indicates that the Little Rock economy is becoming increasingly more diversified. The Little Rock Regional Chamber indicates there are several initiatives geared at economic development within the MSA. The Arkansas Regional Innovation Hub creates a collaborative ecosystem of innovation through programs and partnerships that will drive economic development along with unique opportunities for hands-on training and experience. The Little Rock Technology Park is an innovation district designed to enable new forms of enterprise, collaboration, and knowledge sharing, and commercialization of ideas within and between Arkansas' entrepreneur, private, government, and academic sectors. With a mission of innovative economic development, the University of Arkansas Little Rock (UALR) George W. Donaghey Emerging Analytics Center features advanced data visualization systems and campus-wide, cross-discipline approaches to help corporate clients, faculty researchers, and students with data visionary solutions. The Venture

Center promotes and facilitates the growth of entrepreneurial and technology development at the grassroots level in central Arkansas. Finally, Entergy Teamwork Arkansas, the economic development office of Entergy Arkansas, is one of the largest private sector economic development initiatives in the country, offering professional, proactive, and resourceful expertise to companies searching for a new business location, an abundant workforce, innovative incentives, natural resources, and an unsurpassed quality of life.

2.3.1.4 Income

Between 2006 and 2015, the Little Rock MSA per capita personal income (PCPI) increased with an average annual growth rate of 2.5%, as shown in Table 2-11. This compares favorably to the rest of the state, which grew with a 3.4% average annual growth rate. The U.S. PCPI was higher than the MSA and the state, with an annual growth rate of 2.8%. *(Bill and Hillary Clinton National Airport Comprehensive Annual Financial Report Fiscal Years Ended December 31, 2015 and 2014)*

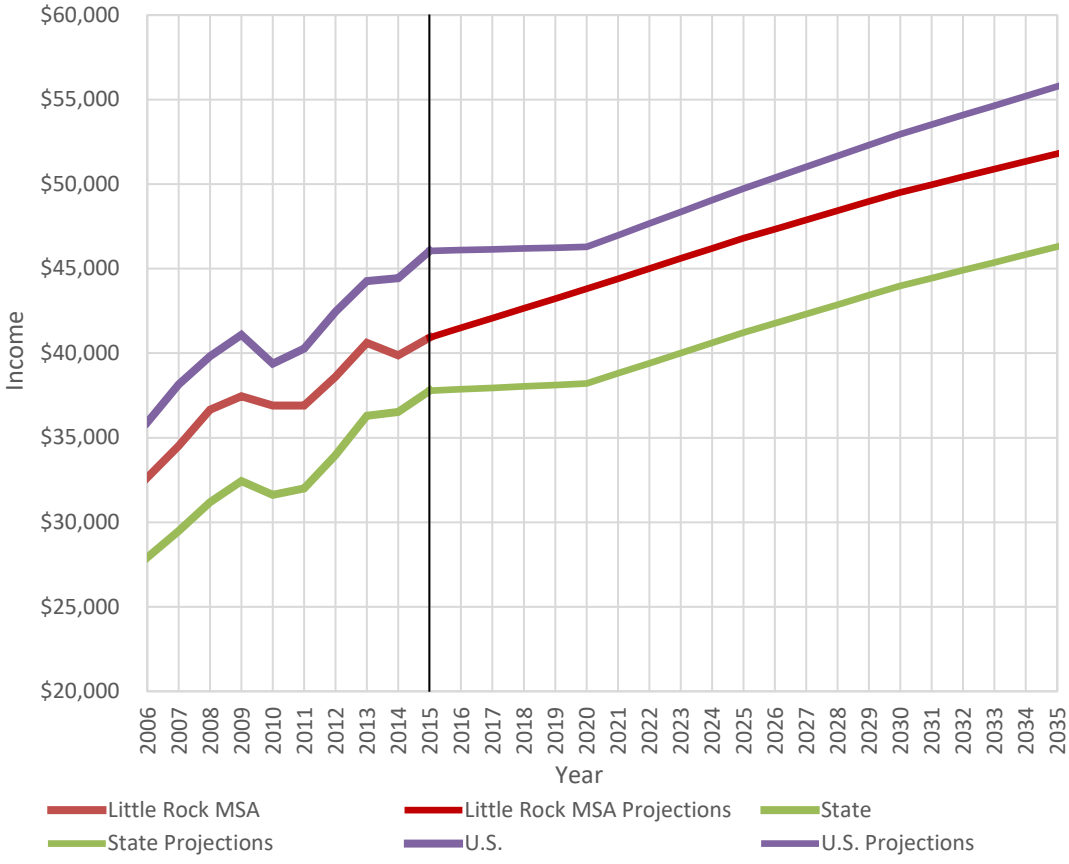
Woods and Poole projections indicate the PCPI of the MSA to increase with an average annual growth rate of 1.2% between 2015 and 2035. The same projections indicate that the state PCPI will increase with an annual growth rate of 1.0%, and the national PCPI with an annual growth rate of 1.0%. *(Woods & Poole Economics, 2015).*

Table 2-11
Per Capita Personal Income Comparison, 2006-2035
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	Little Rock MSA	State	U.S.
2006 *(a)*	$32,641	$27,915	$35,904
2007 *(a)*	$34,524	$29,479	$38,144
2008 *(a)*	$36,649	$31,180	$39,821
2009 *(a)*	$37,443	$32,434	$41,082
2010 *(a)*	$36,912	$31,629	$39,376
2011 *(a)*	$36,896	$31,991	$40,277
2012 *(a)*	$38,602	$33,961	$42,453
2013 *(a)*	$40,619	$36,291	$44,266
2014 *(a)*	$39,880	$36,529	$44,438
2015 *(a)*	$40,925	$37,782	$46,049
Growth Rate	2.5%	3.4%	2.8%
2020 *(b)*	$43,808	$38,204	$46,291
2025 *(b)*	$46,798	$41,220	$49,744
2030 *(b)*	$49,513	$43,975	$52,952
2035 *(b)*	$51,799	$46,302	$55,778
Growth Rate	1.2%	1.0%	1.0%

(a) Bill and Hillary Clinton National Airport Comprehensive Annual Financial Report Fiscal Years Ended December 31, 2015 and 2014**.**
(b) Woods & Poole Economics, 2015.

Figure 2-11
Per Capita Personal Income Comparison, 2006-2035
Airport Master Plan
Bill and Hillary Clinton National Airport



Sources: Bill and Hillary Clinton National Airport Comprehensive Annual Financial Report Fiscal Years Ended December 31, 2015 and 2014.
Woods & Poole Economics, 2015.

2.3.2 Trends/Issues with the Potential to Influence Future Airport Growth

Historical and anticipated trends related to commercial service, general aviation, and air cargo will be important considerations in developing forecasts of demand for LIT. National trends can provide insight into the future of aviation activity and anticipated facility needs, and have a trickle-down effect on the regional level. There are several issues that may influence aviation activity that are independent of Airport activity.

2.3.2.1 Repeal of the Wright Amendment

In October 2014, the Wright Amendment, the federal law banning long-haul flights out of Dallas Love Field (DAL) in Dallas, Texas since 1979, was repealed. The Wright Amendment restricted flights from DAL to airports in the adjoining five states, including LIT. For the Airport, this meant that many of the people on Southwest flights originating at or destined for DAL that stopped at LIT were not going to Little Rock, but were "through passengers," going on to a final destination in a state to which the amendment prohibited

nonstop travel. The repeal led to new nonstop service to markets like Los Angeles, San Diego, and Phoenix from DAL.

When the Wright Amendment Compromise was reached in 2006, it was known that Southwest's flight schedules at LIT would be impacted, but the magnitude was unknown. Since 2012, Southwest has reduced its LIT average daily departures from twelve to seven. Southwest reduced the LIT schedule from six to three daily flights to DAL and eliminated the daily flights to Houston Hobby, Baltimore, and Chicago-Midway. The airline had eliminated one daily flight service to St. Louis, but restored the service in 2016 with two daily flights. This equates to a loss of 576 daily departing seats.

LIT management is in frequent discussions with Southwest Airlines regarding their future plans at the Airport and are hopeful that Southwest will return the dropped frequencies and possibly add new routes. System-wide, Southwest plans to add additional capacity in the near term, but it is anticipated that much of their capacity increases will be achieved through older Boeing 737-300 aircraft with larger Boeing 737-800 aircraft.

2.3.2.2 Commercial Service Industry Trends

While Bill and Hillary Clinton National Airport's future commercial air travel demand will be primarily driven by local demand and regional events, it will also be influenced by industry events, particularly with regard to the type of aircraft utilized by airlines serving the Airport. The following trends impact air service at LIT:

- **Airline rightsizing and capacity discipline.** In response to the recession of 2007-2009, air service trends have shifted in conjunction with airline management attempts to focus on profitability by cutting unprofitable and redundant routes to minimize the number of empty seats. Overall, commercial service operations at all U.S. airports declined 15% between 2007 and 2014, domestic seat capacity was down nearly 6% during the period, and 2% fewer passengers were carried. Additionally, many of the network carriers no longer possess the aircraft needed to cost-effectively service smaller airports as they have transitioned routes once serve by the mainline carrier over to regional partners.

  However, U.S. airlines have been profitable for five consecutive years and the strategy of a conservation approach in their capacity planning will remain. It will likely be a "limited growth" environment in terms of capacity in the near term. While some carriers may try to grow market share by keeping some of their older equipment in service, higher fuel costs will reinforce stated intentions to retire older equipment, leading most airlines to remain capacity disciplined. Longer term, the environment should improve somewhat, as airlines continue to add newer aircraft in the 70-100 seat range that will serve to modernize the existing fleet.

- **Continued airline consolidation and restructuring.** Airline consolidation over the last decade, including the mergers of American and US Airways, Delta and Northwest, and United and Continental, has left the flying public with three legacy carriers. LCCs Southwest and Air Tran also merged in 2011. Consolidation, as well as a focus on yield improvement, led to improved capacity rationalization. It is anticipated that the consolidated airlines will continue to operate based on cost cutting strategies and driven by profit margins.

- **Limited Aircraft.** The trend in strong growth of the 37-50 seat regional jet (RJ) in the 1990s and early 2000s to replace turboprop aircraft in smaller markets and supplement narrow-body jet aircraft in larger markets ended following the spike in jet fuel costs during 2007-2008. It was no longer as economical to fly RJs to provide service in short-haul markets. The cost, coupled with the

economic recession and curtailed demand, led to the rapid retirement of small RJs throughout the network. However, it is anticipated that small RJs will continue to have a presence in carrier's route networks, albeit to a much lesser extent. This migration of network carriers to aircraft with higher seating capacities in search of lower costs has left many smaller communities with few choices in terms of carriers and equipment.

- **Airfares and growth of ancillary revenues.** Generally, airfares are influenced by airline operating costs and by competitive forces. Fares have seen a downward trend over the last decade due largely to both changes in fuel price and the decoupling of ticket price with ancillary air services such as baggage fees, seat fees, reservation changes, and food and drink purchases. U.S. carriers have posted net profits for five consecutive years, due in part to ancillary revenues. According to the *American Express Global Business Travel Forecast 2017*, it is projected that in North America, overcapacity and fierce competition between legacy carriers and LCCs on heavily traveled routes will lead to fare decreases in 2017. However, lower fares will be offset by higher ancillary fees. In the FAA Aerospace Forecast Fiscal Years 2016-2036, airfares are expected to increase slower than inflation during the forecast period.

2.3.2.3 General Aviation Industry Trends

At the national level, fluctuating trends regarding general aviation usage and economic upturns/downturns have impacted general aviation demand. There will likely be slow economic recovery and economic uncertainties which will impact demand for general aviation in the next few years.

- **General aviation fleet changes.** While single engine piston aircraft still account for the majority (61%) of the active U.S. general aviation aircraft fleet in 2015, the national historical trends indicate that multi-engine turboprop and business jet aircraft grew at a faster rate than the single engine and multi-engine piston fleet. The most active growth in the fleet size has been in turbine aircraft and rotorcraft. According to the FAA *General Aviation and Air Taxi Activity Surveys*, as a result of the recent recession, the U.S. general aviation aircraft fleet has declined 12.0% from 231,606 aircraft in 2007 to an estimated 203,880 in 2015. Piston-powered aircraft declined by more than 16%, while turbine-powered aircraft increased by almost 9% during the same timeframe.

- **Decline in active pilots.** There were nearly 590,039 active pilots in the U.S. at the end of 2015. An active pilot is a person with a pilot certificate and a valid medical certificate. This represents a decline of 0.1%in pilot population from 2007. Recreation, private, and commercial pilot certificates accounted for the largest declines.

- **Drop in general aviation operations.** According to FAA air traffic activity, between 2001 and 2015, general aviation operations experienced a decline of -2.7% per year. In 2015, there were 25.6 million general aviation operations at 516 towered airports, 54% of which were itinerant operations. The numbers of hours flown by general aviation aircraft also experienced a decrease of 1.1% per year from 2001 to 2015.

Other national trends that may impact general aviation demand at LIT include movement from 100LL AVGAS to no-lead aviation fuel, changes in manufacturing for new general aviation aircraft, escalating costs for new general aviation aircraft, increases in business reliance on general aviation travel, and growth in alternative general aviation segments such as sport and experimental aircraft.

2.3.2.4 Air Cargo Industry Trends

Total air cargo volumes in the U.S. have declined over the last 10 years as a result of increased jet fuel costs, declines coinciding with the global recession, increased security regulations, market saturation, and improved ground efficiency. The U.S. air cargo industry is not expected to sustain the high growth rates experienced in previous decades, and it is clear that the market for air cargo has changed. Possible reasons for this include:

- **Increased jet fuel costs.** Just as it has impacted passenger airlines, high jet fuel costs over the past 15 years have slowed demand and negatively impacted air cargo carriers. Many carriers are replacing older aircraft with more fuel efficient aircraft and changing route structures to maximize fuel efficiency.

- **Declines coinciding with the global recession.** Air cargo traffic fell dramatically during the recent global recession that began in 2007. There are indicators that the recovery from the recession is occurring, but slowly.

- **Increased shipment security.** In August 2010, new security rules went into effect requiring 100% screening of all cargo transported on U.S. domestic passenger aircraft, creating an additional obstacle for providers of air cargo belly space.

- **Slowing domestic growth resulting in market maturation.** The U.S. air cargo industry is considered a mature industry based on market saturation by vertically-integrated carriers like FedEx and UPS, a modal shift from air to other modes (especially truck) due to improved ground efficiency, declining availability of belly space on U.S. domestic passenger aircraft due to fleet changes and higher load factors, which reduces belly cargo capacity, and the decrease in U.S. Postal Service (USPS) mail volume due to increased use of technology including email and smartphones. Additionally, historically mail that traveled over 500 miles was flown, this has now increased to up to 800 miles.

2.3.2.5 FAA National Projections of Demand

On an annual basis, the FAA publishes aerospace forecasts that summarize anticipated trends in all components of aviation activity. Each published forecast revisits previous aerospace forecasts and updates them after examining the previous year's trends in aviation and economic activity. Many factors are considered in the FAA's development of aerospace forecasts, including U.S. and international economic forecasts and anticipated trends in fuel costs.

The recent projections found in FAA Aerospace Forecast Fiscal Years 2016-2036 are summarized below.

- Between 2016 and 2036, worldwide real Gross Domestic Product (GDP) growth is assumed to grow at an average annual rate of 2.9%, while the U.S. real GDP is projected to grow at 2.4% annually. Real personal consumption expenditure per capita is also projected to grow at an annual rate of 1.7% over the same period.

- With lower energy prices in the short-term, U.S. carrier profitability should remain steady or increase as the economy recovers and leads to strengthening demand and increased revenues, while operation costs are falling or stable. Over the long-term, FAA foresees a competitive and profitable aviation industry characterized by increasing demand for air travel and airfares growing more slowly than inflation, reflecting over the long-term a growing U.S. economy.

- For the 30-year period, the FAA is forecasting total domestic seat capacity to grow 2.1% annually. Domestic load factors are expected to increase just slightly over the forecast period, from 84.5% in 2015 to 86.5% in 2036.

- Domestic enplanements will grow at an annual rate of 2.0% during the 30-year forecast.

- Domestic average seats per aircraft mile is anticipated to grow from 132 in 2015 to 145 in 2036.

- The FAA projects that air carrier aircraft operations will grow at an average annual rate of 2.6% between 2015 and 2036, while air taxi/commuter operations will decline at an annual rate of -1.1% with most of the decrease coming in the next 10 years to coincide with the rapid retirement of the 50-seat RJs.

- Narrow-body passenger jet aircraft are expected to grow at an annual rate of 1.2% between 2015 and 2036. Even with the retirement of the 50-seat aircraft, RJs are projected to increase 3.0% per year over the forecast period.

- The FAA estimates that the U.S. active general aviation aircraft fleet will grow from an estimated 203,880 aircraft in 2015 to 210,695 aircraft in 2036. This is equal to an annual growth rate of 0.2%. Jet aircraft are expected grow at a greater rate than other general aviation aircraft, experiencing an annual growth rate of 2.5% through 2036. Turboprop, sport aircraft, and experimental aircraft are also anticipated to grow.

- General aviation aircraft operations are expected to grow at an annual growth rate of 0.3% through 2036.

- The FAA's national forecast for domestic revenue ton miles (RTMs) by domestic all-cargo carriers is expected to increase at an annual growth rate of 1.0% between 2015 and 2025, but decreasing to an annual growth rate of 0.1% from 2025 to 2036. Growth in RTMs is expected to come primarily from increased rates rather than tonnage. Domestic RTMs on passenger carrier aircraft is expected to slowly increase at an annual rate of 0.2% between 2015 and 2025, but decline at an annual growth rate of -0.7% between 2025 and 2036.

- Air cargo narrow-body jet aircraft for U.S. carriers are expected to increase at an annual growth rate of 0.8% between 2015 and 2036, and wide-body cargo jet aircraft in U.S. carrier's fleets will increase an annual growth rate of 2.1%.

2.3.3 Local Factors Affecting Demand

There are other factors unique to LIT that also have the potential to impact the aviation activity forecasts.

2.3.3.1 Proximity to Competing Airports

The proximity to competing airports is one of the key determinants of the demand and size of an airport's service area, or catchment area. An airport catchment area is the geographic area surrounding an airport from where it reasonable expects to draw passenger traffic and is representative of the local market. MEM, located 130 miles to the east, Northwest Arkansas Regional Airport (XNA), located 160 miles to the northwest, and the Dallas area airports DAL and DFW, located approximately 300 miles to the southwest, are all within close proximity to LIT and impact the ability of the Airport to retain passengers, especially leisure passengers.

The 2016 Bill and Hillary Clinton National Airport Passenger Demand Analysis determined LIT's catchment area has a population of 1,391,964 people and a total number of passengers of 2,211,527 regardless of the airport used. According to this analysis, 84% of the catchment area's air travelers used LIT for their trips, which is a solid retention rate for the market. However, this analysis also indicated there had been a marked increase in leakage to DFW and DAL. In total, LIT's retention rate decreased from 91% to 84% since a previous study was conducted in 2011. The analysis indicates approximately 345,207 passengers a year use competing airports, primarily DAL and DFW, indicating the potential to support additional air service in the future in order to retain more of the demand associated with the market area.

2.3.3.2 Envoy Maintenance Base

Envoy Air, a wholly owned subsidiary of American Airlines Group, recently announced that it would establish a new aircraft maintenance facility at LIT. The new facility will employ 60 persons and provide maintenance support for the airline's growing fleet of 76-seat Embraer 175 RJ aircraft. Plans are to provide scheduled overnight maintenance for up to four E175 aircraft by mid-2017, with a possible fifth overnight aircraft maintenance by 2018. The base will also provide line maintenance for the regular daily American Eagle flights at LIT.

2.4 FORECAST METHODOLOGIES

The three most common methodologies for forecasting aviation demand are described below. The effectiveness depends on the availability and accuracy of relevant data

2.4.1 Regression Analysis

In a regression analysis forecast, the value being estimated or forecast (the dependent variable) is related to other variables (the independent or explanatory variables, which "explain" the estimated value). A relationship for each paring of dependent to independent variables is determined to quantify this link. The correlation coefficient, which ranges from -1 to +1, is the method for determining linkages between variables and how closely the variables change in proportion to one another. A correlation coefficient close to +1 or -1 suggests stronger correlation; a score closer to 0 suggest the two variables are not correlated. One major advantage of regression analysis is that if the independent variables are more readily projected than the forecast or dependent variable, then deriving a forecast is relatively easy.

2.4.2 Market Share Analysis

A market share analysis is a relatively easy method to use and can be applied to any measure for which a reliable higher-level (i.e., larger aggregate) forecast is available. Historical shares are calculated and used as a basis for projecting future shares. This method is a "top-down" approach for forecasting, since forecasts of larger aggregates (i.e., national aviation forecasts) are used to derive forecasts for smaller areas (i.e., individual airport aviation forecasts) for which limited to no forecasts may be available.

2.4.3 Trend Analysis

Trend analysis relies on projecting historical trends into the future. In trend analysis, a regression equation is used with time as the independent variable. It is one of the fundamental techniques used to analyze and forecasts aviation activity. While it is frequently used as a back-up or expedient technique, it is highly valuable because it is simple to apply. Sometimes trend analysis can be used as a reasonable method of projecting variables that would be complicated to project by other means.

2.5 PROJECTIONS OF AVIATION DEMAND

Projections of aviation activity at Bill and Hillary Clinton National Airport for the 20-year planning period are presented here using various methodologies and scenarios. The results of these different methodologies are compared and a preferred forecast is selected.

Typically in a Master Plan, forecasts can be produced from historical trends in passenger enplanements, operations, and air cargo. These factors can often correlate with econometric data such as population, employment, and income. However, the Airport's historical aviation activity indicates no linkage to econometric data due to the declines in enplanements and operations with no corresponding decrease in population, employment, or income. Therefore, regression analysis linked directly to any econometric data is not a viable methodology in this case.

The following assumptions were made in developing the aviation activity forecasts at LIT:

- National and local economies will continue to recover from the recent recession and grow throughout the forecast period.
- Economic disturbances and other factors may cause year-to-year variations, but the long-term projections will be realized.
- Aviation activity at LIT will generally reflect the national aviation industry – the FAA projects growth in all aspects of aviation.
- The Airport will continue air service development efforts aggressively to reduce leakage and obtain additional service and capacity.
- No declines in the current air service schedule are anticipated.
- Southwest Airlines will not reduce capacity any further in reaction to the lifting of the Wright Amendment and the recent service to MEM.
- Enplanement demand will be met with additional flight frequencies and/or capacity on existing routes, service to new destinations, and more fuel efficient aircraft.
- No additional airline mergers are anticipated. It is assumed that the three mainline airlines American, Delta, and United, LCCs Southwest and Allegiant, and regional GLO Airlines will continue to operate at LIT throughout the forecast period.
- The small 50-seat RJs will continue to be phased out of airline fleets and will be replaced by larger 70-100 seat RJs. American will continue to phase out the 140-seat MD-80s and some of the 184-seat Boeing 757s. These aircraft will probably be replaced by the 175-seat Boeing 737-800. These changes will impact the average available seats per flight over the forecast period.
- Due to its proximity to downtown Little Rock and the state capital facilities, LIT will continue to serve a strong base of corporate general aviation travel and business jet operations will continue to grow.
- The military, especially C-130s based at LRAFB, will continue to the use the Airport for touch-and-go training, transport of military equipment from local facilities, and refueling/servicing of transient aircraft.

2.5.1 Passenger Enplanements

Forecasts of passenger enplanements serve as the foundation for other commercial service activity forecasts, and provide a basis for determining future requirements for facilities integral to the accommodation of passengers. Several forecasting sources and methods were evaluated as to their usefulness, reasonableness, and pertinence to LIT.

LIT has experienced declines in service and enplanements that mirrored regional and national trends during the economic recession. However, unlike regional and national trends, which reached their lowest enplanement levels in 2009 and have since rebounded, LIT enplanements have continued to decline despite Little Rock's and the state's growing population base and relatively stable economy. This indicates little to no correlation with LIT's enplanements to the regional or national enplanement trends. However, there was a slight uptick in LIT passenger enplanements in 2016 compared to 2015. Therefore it is believed that the downward enplanement trend at LIT has ended and it is anticipated that the Airport will experience growth, due to the stabilization and recovery of the national economy, aggressive pursuit of air service development opportunities by LIT, and a decline in the leakage rates of passengers to other commercial service airports.

Forecasts of passenger enplanements have been produced for various scenarios using the regression analysis methodology and are presented in Table 2-12. Also presented for comparison are the enplanements forecast prepared in the 2003 Little Rock National Airport Master Plan, forecasts generated in the FAA's TAF, and trend projections based on historical data (2006-2016). The 2003 Master Plan forecast projected an annual growth rate of 3.0%, the TAF expected an annual growth rate of 1.7%, and the trend projection indicates a decreasing annual growth rate of -4.0%. The enplanement forecast scenarios are graphically presented in Figure 2-12.

2.5.1.1 Passenger Enplanement Forecasts Scenarios

The scenarios are based on three components. First, the total population of the catchment area will increase at an annual growth rate represented by the average growth rates of the Little Rock MSA and the state of Arkansas (i.e., 1.4% through 2021, 1.1% from 2021 through 2031, and 1.0% from 2031 through 2036) as projected by Woods and Poole Economics, 2015. Secondly, the ability of the catchment area's economic indicators to generate passenger enplanements, measured as a ratio of O&D passenger enplanements to the total population of the catchment area, will change over time based on assumptions presented for each scenario, but it is anticipated that for the long-term, the anticipated change will be positive as a result of the improvement in the national and local economies. Finally, LIT's on-going inability to retain passengers within the catchment area to surrounding commercial service airports will be reversed according to assumptions presented for each scenario. It is anticipated that this will occur as airfares stabilize and service improvements are made through either additional routes and/or additional capacity added to existing routes. Table 2-12 also shows the projected population of the catchment area, the O&D enplanements to catchment area population ratio, and LIT's retention rate for each scenario. It should be noted that the anticipated rebound in enplanements will be slow to occur in the initial time period, but will eventually increase at the various rates and for various reasons provided below.

- **Scenario One.** This scenario assumes that LIT's retention rate and catchment area's enplanements to population ratio will decline in the short-term, but increase to slightly higher percentages than the existing conditions. It assumes a slow recovery from the downward trend in enplanements experienced by LIT during the past decade. It is assumed that the catchment area's O&D enplanements to population ratio will decline initially from 79.4% to 78.0% in 2021, but will eventually increase to 80.5% by 2036. Additionally, the retention rate is also projected to decrease initially from the existing 84.4% to 83.1% in 2021. However, throughout the remainder of the forecast period, it is also anticipated that the retention rate will increase to approximately 84.8%

by 2036. This scenario results in an overall increase to 1,268,755 enplanements and an annual growth rate of 1.2%.

- **Scenario Two.** This scenario assumes that LIT's retention rate and the catchment area's enplanements to population ratio will also decline in the short-term, but the recovery of both will be quicker and the final percentages will be higher than Scenario One based on an anticipated healthier national and local economies, additional air service improvements, and moderately more competition that will help keep airfares stabilized. The catchment area's O&D enplanement to population ratio will decline from the existing 79.4% to 78.5% in 2020, but will then increase to 80.8% by 2036. The retention rate is expected to decline to 83.4% by 2019, but will begin to increase by 2021, eventually reaching 87.5% by 2036. This results in an overall increase to 1,314,030 enplanements and an annual growth rate of 1.4%.

- **Scenario Three.** This scenario assumes LIT's retention rate and catchment area's enplanements to population ratio will also decline in the short-term, but the recovery will be quicker and the eventual rates will be higher than the previous scenarios. It assumes a faster return to healthier local and national economies, additional air service improvements, and more competition between carriers to further stabilize airfares. The catchment area's O&D enplanement to population ratio will slightly decrease from the existing 79.4% to 78.9% in 2019, but will then increase to 82.0% by 2036. The retention rate will decline from 84.4% in 2016 to 83.6% in 2019, but will increase to approximately 90.0% in 2036. This scenario results in an overall increase to 1,371,645 enplanements and an annual growth rate of 1.6%.

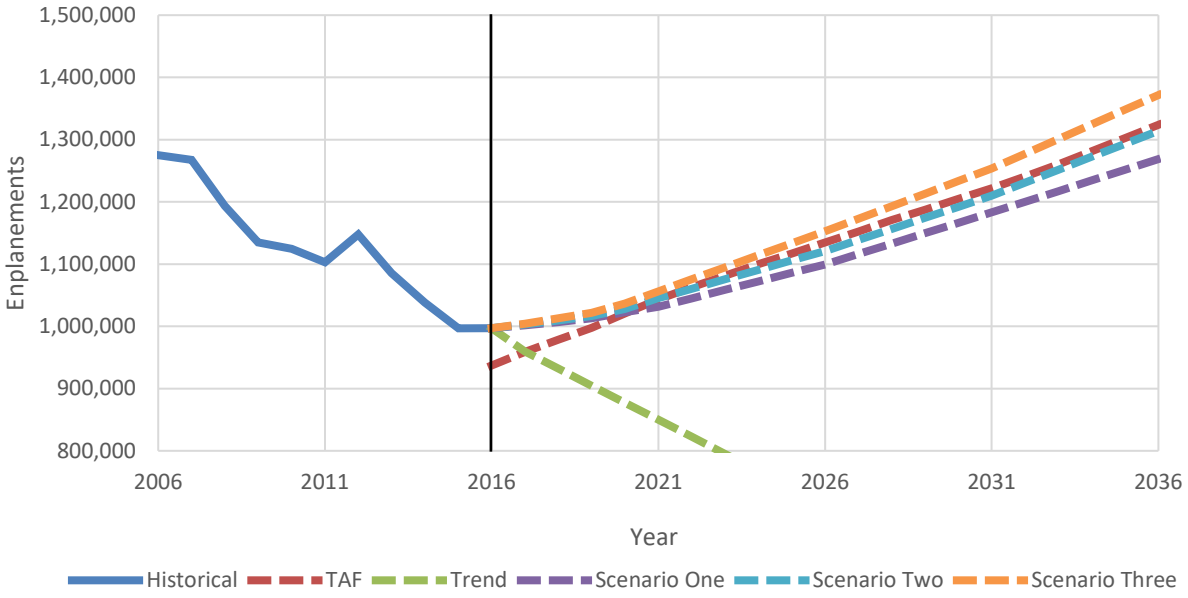
Table 2-12
Passenger Enplanement Forecasts, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	MP *(a)*	TAF *(b)*	Trend *(c)*	Catchment Area Population	Scenario One	Scenario One O&D Enplanements to Population Ratio	Scenario One LIT Retention Rate	Scenario Two	Scenario Two O&D Enplanements to Population Ratio	Scenario Two LIT Retention Rate	Scenario Three	Scenario Three O&D Enplanements to Population Ratio	Scenario Three LIT Retention Rate
2016	---	937,111	997,085 *(d)*	1,391,964	997,085 *(d)*	79.4%	84.4%	997,085 *(d)*	79.4%	84.4%	997,085 *(d)*	79.4%	84.4%
2017	---	959,094	959,556	1,410,927	1,001,840	79.3%	83.8%	1,003,035	79.3%	83.9%	1,004,230	79.3%	84.0%
2018	1,718,910	978,492	932,147	1,430,148	1,006,815	79.0%	83.4%	1,009,230	79.0%	83.6%	1,012,850	79.0%	83.9%
2019	---	997,553	904,738	1,449,631	1,012,855	78.5%	83.3%	1,016,655	78.7%	83.4%	1,021,685	78.9%	83.6%
2020	---	1,020,498	877,329	1,469,379	1,022,810	78.3%	83.2%	1,027,885	78.5%	83.4%	1,036,840	78.9%	83.7%
2021	---	1,043,111	849,920	1,489,396	1,031,530	78.0%	83.1%	1,045,170	78.7%	83.5%	1,056,225	79.2%	83.8%
2023	1,935,320	1,081,254	795,102	---	---	---	---	---	---	---	---	---	---
2026	---	1,134,656	712,875	1,571,597	1,099,395	78.5%	83.4%	1,120,990	79.0%	84.5%	1,152,640	80.0%	85.8%
2031	---	1,221,802	575,830	1,656,218	1,182,935	79.2%	84.4%	1,209,925	79.5%	86.0%	1,253,640	80.5%	88.0%
2036	---	1,323,824	438,785	1,739,442	1,268,755	80.5%	84.8%	1,314,030	80.8%	87.5%	1,371,645	82.0%	90.0%
Growth Rate	3.0%	1.7%	-4.0%	1.1%	1.2%	---	---	1.4%	---	---	1.6%	---	---

(a) Little Rock National Airport Master Plan, 2003.
(b) FAA Terminal Area Forecasts, January 2016.
(c) Trend analysis based on historical data, 2006-2016.
(d) Actual.

Source: Mead & Hunt, January 4, 2017.

Figure 2-12
Passenger Enplanement Forecasts, 2006-2036
Airport Master Plan
Bill and Hillary Clinton National Airport



Sources: LIT records and Mead & Hunt, January 4, 2017.

2.5.1.2 *Preferred Passenger Enplanement Forecast*

It is difficult to predict with any degree of certainty of an airport's ability to retain additional passengers within its catchment area. The travelling public's preference for one airport over another is often as much psychological as practical or financial. However, given the strong correlation of rising airfares and declining enplanements at LIT, it must be considered that LIT passengers have been making a financial decision, especially for the leisure traveler. When also considering the diminished daily departure service at LIT and reduced price of gas, even business travelers are enticed to drive longer distances for cheaper airfares.

Therefore, it is recommended that Scenario Two be selected as the preferred enplanements forecast. The *FAA Aerospace Forecasts Fiscal Years 2016-2036* predicts that airfares will grow more slowly than inflation. If LIT is able to entice additional service improvements through additional airlines, additional routes, or additional daily departures, and stabilize or reduce airfares, then Scenario Two should be an attainable, progressive, and realistic future enplanement growth forecast.

2.5.2 Commercial Service Aircraft Operations

The level of commercial service aircraft operations is an aggregate function of passenger demand and the types of aircraft to be used to accommodate the enplanements forecast. When developing the commercial service aircraft operations projections, it is important to also consider the airline fleet mix that could potentially serve the Airport.

As stated previously, airlines are retiring a significant portion of their small RJ fleet, as it has become economically infeasible for airlines to continue operating the aircraft since oil prices spiked in 2008.

According to the Bill and Hillary Clinton National Airport Air Service Market Research, small RJs made up 32% of the departures at LIT through September 2016. Given this, the Airport will need to produce high load factors with higher yielding passengers on larger aircraft going forward. This, in turn, has the potential to impact long-term forecasts. The airlines are transitioning to larger fleet types in the 70-120 seat range, with an emphasis on the 100-120 seat range. The average seating capacity per aircraft departure at LIT was 87.9 in 2016 (January through September). The FAA predicts that the national average seating capacity of mainline air carrier aircraft used in the domestic market will increase 9.9% by 2036.

The commercial service aircraft operations forecasts were developed using the Boarding Load Factor (BLF) methodology. This methodology calculates a boarding load factor based on the total seats available per departure divided by the total enplanements. The historical BLFs for LIT is presented in Table 2-13 using data from the U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics (BTS) T-100 data. It should be noted that the 2016 activity is for January through September 2016, not a full 12-month time period.

Table 2-13
Historical Commercial Service Aircraft Departures and Boarding Load Factors
Airport Master Plan
Bill and Hillary Clinton National Airport

	2011	2012	2013	2014	2015	2016 *(c)*
Departures *(a)*	18,710	18,097	16,316	15,017	13,819	10,592
Narrow Body Jets *(a)*	6,334	6,969	7,135	6,927	4,939	3,622
50+ Seat RJ *(a)*	2,642 *(d)*	2,857 *(d)*	1,925	2,518	4,584	3,498
37-50 Seat RJ *(a)*	9,731	8,271	7,256	5,572	4,296	3,292
Turboprop *(a)*	3	0	0	0	0	180
Total Departure Seats *(a)*	1,541,216	1,571,787	1,482,687	1,396,429	1,214,180	930,811
Average Seats/Departure	82.4	86.9	90.9	93	87.9	87.9
Enplanements *(b)*	1,102,739	1,147,885	1,085,323	1,038,307	996,837	743,199
Boarding Load Factor (BLF)	71.50%	73.00%	73.20%	74.40%	82.10%	79.80%

(a) U.S. Department of Transportation, Bureau of Transportation Statistics, T-100 data.
(b) LIT records.
(c) Actual, January through September 2016.
(d) Includes departures by turboprop powered aircraft with 50+ seats.

Based on industry trends and FAA projections, commercial service aircraft operations are projected to reach 31,120 by 2036, as presented in Table 2-14. The BLF and the average number of seats per departure will increase just slightly over the forecast period. The average seats per departure is projected to increase from 91.5 in 2016 (extrapolated from the USDOT BTS T-100 data to reflect a full 12-month time period to coincide with the previously presented enplanements and commercial service aircraft operations data) to 99.1 in 2036 based largely on the retirement of the 50-seat RJs and the anticipated replacement with 70+ seat RJs in airline fleets. Most of the retirements will occur in the next five years. The BLF is projected to increase to 85.2% by 2036 as airlines try to keep capacity aligned with demand and add service cautiously.

Table 2-14
Commercial Service Aircraft Operations Forecast, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

	Seats	2016 *(a)*	2021	2026	2031	2036
Departures		13,210	13,365	13,940	14,740	15,560
Narrow Body Jets		*4,518*	*4,925*	*5,400*	*5,900*	*6,420*
717-200/737-500/737-300/ A319/Bombardier C-Series	118	1,088	1,125	1,250	1,500	1,620
MD 88/737-700/A320	146	3,315	3,400	3,600	3,800	4,100
MD 90/737-800/737-900, A321	168	115	400	550	600	700
50+ Seat RJ		*4,410*	*7,900*	*8,300*	*8,600*	*8,900*
CRJ 700/ERJ 170	65	1,270	3,800	4,000	4,200	4,400
CRJ 900/ERJ 175	76	3,140	4,100	4,300	4,400	4,500
37-50 Seat RJ		*4,102*	*300*	---	---	---
ERJ 135	37	20	---	---	---	---
ERJ 140	44	84	---	---	---	---
CRJ200/ERJ 145	50	3,998	300	---	---	---
Turboprop	*30*	*180*	*240*	*240*	*240*	*240*
Total Departure Seats		1,208,845	1,277,150	1,359,500	1,447,200	1,542,560
Average Seat/Departure		91.5	95.6	97.5	98.2	99.1
Enplanements		997,085	1,045,170	1,120,990	1,209,925	1,314,030
Boarding Load Factor (BLF)		82.5%	81.8%	82.5%	83.6%	85.2%
Total Operations		26,420	26,730	27,880	29,480	31,120

(a) Extrapolated from U.S. Department of Transportation, Bureau of Transportation Statistics, T-100 data, January through September 2016.

Source: Mead & Hunt, January 4, 2017.

2.5.3 Air Cargo Operations and Freight/Mail

The recent economic recession dramatically decreased shipping demand nationwide after years of fairly steady growth. The slow economic recovery that started in 2010 has been reflected in slow growth in air cargo operations, similar to the air carrier airlines. FedEx and UPS will continue to rely on trucking to offset the loss of domestic air capacity that has resulted from reduced fleet size and the shift of wide-body airplanes from domestic to international markets as well as the anticipated rise in fuel costs. No discernable trends can be established from the historical LIT air cargo data, except that all categories of air cargo have declined throughout the historical time period.

Although LIT experienced a decline in air cargo during the recession in 2008 and 2009, air cargo has been growing at an annual growth rate of 5.9% since 2010. Due to the maturity of the air cargo market and the FAA-anticipated slower growth in terms of revenue ton miles, the volume of air freight/mail at LIT is projected to grow at an average annual rate of 1.6% during the next five years. However, this growth is expected to moderate throughout the remainder of the forecast period to a more modest annual growth rate of 0.4%. This results in an overall annual growth rate of 0.8%. As shown in Table 2-15, total air cargo at

the Airport is projected to reach 10,382 tons by 2036. This rate of growth is conservative compared to Airbus' *Global Market Forecast for 2016-2035* and Boeing's *World Air Cargo Forecast 2016-2017*, which predict U.S. air cargo to grow at an annual rate of 1.6% and 2.5% respectively through their 20-year forecast.

The amount of air cargo transported by cargo-only carriers (i.e., total cargo at LIT minus the amount transported in the belly compartment of schedule commercial service air carrier aircraft) is also provided in Table 2-15. If the amount of air cargo handled at an airport by cargo-only carriers increases beyond the capacity of the aircraft serving the airport, air cargo carriers either increase the size of the aircraft that serve the market or increase the number of daily flights. If the existing carriers continue to use the same or similar aircraft at LIT (i.e., A300-600 and 757-200), they will not need to increase the number of daily flights as presented in Table 2-15. Since the average maximum payload capacity of the two aircraft equals 41.3 tons (or 82,500 pounds), the existing number of annual flights would be sufficient to accommodate the anticipated increased air cargo volume throughout the planning period. Therefore, for this analysis, the forecast assumes that the air cargo carriers will continue to operate similar aircraft to the existing fleet and maintain the existing daily flight schedules. It is also anticipated that the scheduled commercial service air carriers will continue to transport air cargo in the belly compartments of their aircraft and that the non-scheduled air cargo carriers will continue to serve LIT periodically using a range of turboprop aircraft.

Table 2-15
Air Cargo Activity Forecasts (in tons), 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	MP *(a)* (Tons)	Trend *(b)* (Tons)	Total Air Cargo (Tons)	Total Air Cargo Carried by Cargo-Only Carriers (Tons)	Air Cargo Aircraft Operations	Tons/ Operation
2016	---	6,612	9,002 *(c)*	8,102	835	9.7
2017	---	6,146	9,179	8,261	835	9.7
2018	15,280	5,679	9,337	8,403	835	9.9
2019	---	5,213	9,474	8,527	835	10.1
2020	---	4,746	9,613	8,652	835	10.2
2021	---	4,280	9,731	8,758	835	10.4
2023	21,590	3,347	---	---	---	---
2026	---	1,947	10,130	9,117	835	10.9
2031	---	---	10,320	9,288	835	11.1
2036	---	---	10,382	9,343	835	11.2
Growth Rate	2.9%	-15.5%	0.8%	0.7%	0.0%	0.7%

(a) Little Rock National Airport Master Plan, 2003.
(b) Trend analysis based on historical data, 2005-2015.
(c) Estimated, based on anticipated growth from 2015.

Source: Mead & Hunt, January 4, 2017.

Since 2011, LIT has also experienced an average of 6.6 annual FedEx diversion flights from MEM and 9 annual FedEx pilot training flights. The trend in diversion flights during the past two years has been by larger air cargo aircraft such as the Boeing 777, DC-10, MD-11, as well as the Airbus A300; the pilot training flights

have been by smaller aircraft such as the ATR turboprop aircraft and Canadair business jets. LIT personnel are currently working with FedEx to better accommodate the diversions through designated taxiing routes and parking areas. It is expected that the MEM diversions will increase slightly during the forecast period.

2.5.4 General Aviation Aircraft Operations

Factors which impact the number of general aviation operations at an airport include the total based aircraft, area demographics, activity and policies of neighboring airports, and national trends. Historical general aviation aircraft operations at LIT have demonstrated a strong correlation with general aviation aircraft operations at both the region level (i.e., combined operations within the states of Arkansas, Louisiana, Texas, Oklahoma, and New Mexico), and the national level. Table 2-16 provides the correlation coefficient of historical LIT general aviation aircraft operations with the region's general aviation aircraft operations, national local general aviation aircraft operations, national general aviation itinerant operations, and national total general aviation aircraft operations. As presented, the strongest demonstrated correlation coefficient has been with national total general aviation operations, national local general aviation operations, and total regional general aviation operations, with correlation coefficients of 0.92, 0.90, and 0.89, respectively.

Table 2-16
Historical General Aviation Aircraft Operations Comparison
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	LIT GA Operations *(a)*	Southwest Region GA Operations *(b)*	National Local GA Operations *(c)*	National Itinerant GA Operations *(c)*	National Total GA Operations *(c)*
2006	63,232	10,322,707	18,707,100	17,034,400	39,848,500
2007	60,860	10,320,128	14,556,771	18,575,188	33,131,959
2008	54,622	10,166,996	14,081,157	17,492,653	31,573,810
2009	45,179	9,666,083	12,447,957	15,571,066	28,019,023
2010	44,853	9,418,393	11,716,274	14,863,856	26,580,130
2011	44,785	9,326,978	11,437,028	14,527,903	25,964,931
2012	46,027	9,192,488	11,608,306	14,521,656	26,129,962
2013	43,304	9,226,879	11,688,301	14,117,424	25,805,725
2014	43,913	9,065,847	11,675,040	13,978,996	25,654,036
2015	49,770	9,164,457	11,691,349	13,886,867	25,578,216
Correlation Coefficient		0.89	0.90	0.85	0.92

(a) LIT records.
(b) FAA Terminal Area Forecasts, January 2016.
(c) FAA Aerospace Forecast Fiscal Years 2016-2036.

2.5.4.1 General Aviation Aircraft Operations Forecasts Scenarios

The factors presented above were examined and three regression analysis methodologies were used to develop the general aviation aircraft operations projections, as presented in Table 2-17. Also presented in the table are the forecasts developed in the 2003 Little Rock National Airport Master Plan, the forecast

contained in the FAA's Terminal Area Forecasts, and the trend projection based on historical data (2006-2016) for comparison. The 2003 Master Plan forecast expected an annual growth rate of 1.8%. The TAF projected an annual growth rate of 0.3% for LIT. The trend projection indicates a decreasing annual growth rate of -4.9%.

- **Scenario One.** This scenario uses the same annual growth rate used in the FAA's Aerospace Forecasts Fiscal Years 2016-2036 projections for total general aviation aircraft operations (i.e., 0.3%) . This is the same annual growth rate used in the FAA's TAF for LIT general aviation aircraft operations. This results in an increase to 55,080 operations.

- **Scenario Two.** This scenario applies the growth rate contained in the FAA's Aerospace Forecasts Fiscal Years 2016-2036 used to forecast nationwide local general aviation operations (i.e., 0.4%) . This results in an increase to 56,190 operations.

- **Scenario Three.** This scenario uses the growth rate applied to the southwest region total general aviation operations contained in the FAA's TAF (i.e., 0.5%) . This results in an increase to 57,330 operations.

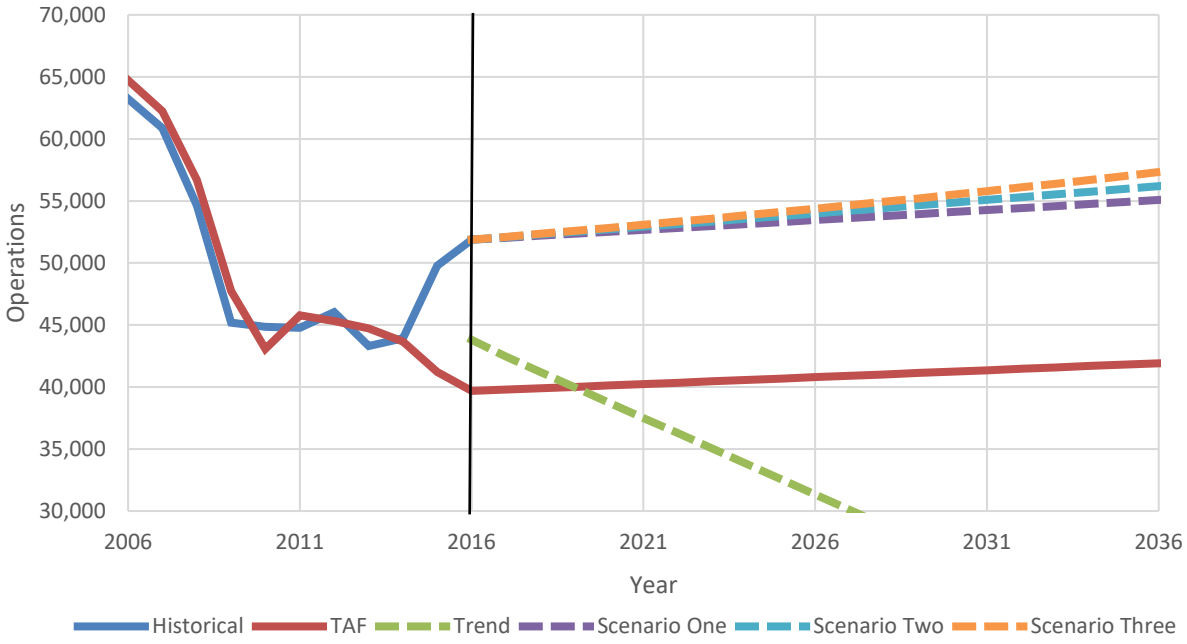
Table 2-17
General Aviation Aircraft Operations Forecasts, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	MP *(a)*	TAF *(b)*	Trend *(c)*	Scenario One	Scenario Two	Scenario Three
2016	---	39,685	51,878 *(a)*	51,878 *(d)*	51,878 *(d)*	51,878 *(d)*
2017	---	39,794	42,448	52,035	52,085	52,110
2018	123,580	39,903	41,213	52,190	52,295	52,345
2019	---	40,012	39,978	52,345	52,500	52,585
2020	---	40,122	38,743	52,500	52,715	52,830
2021	---	40,232	37,508	52,660	52,925	53,075
2023	134,550	40,453	35,038	---	---	---
2026	---	40,787	31,334	53,455	53,990	54,370
2031	---	41,350	25,160	54,260	55,080	55,785
2036	---	41,918	18,986	55,080	56,190	57,330
Growth Rate	1.8%	0.3%	-4.9%	0.3%	0.4%	0.5%

(a) Little Rock National Airport Master Plan, 2003.
(b) FAA Terminal Area Forecasts, 2016.
(c) Trend analysis based on historical data, 2006-2016.
(d) Actual.

Source: Mead & Hunt, January 4, 2017.

Figure 2-13
General Aviation Aircraft Operations Forecasts, 2006-2036
Airport Master Plan
Bill and Hillary Clinton National Airport



Sources: LIT records and Mead & Hunt, January 4, 2017.

2.5.4.2 Preferred General Aviation Aircraft Operations Forecast

It is recommended that Scenario Two be selected as the preferred general aviation aircraft operations forecast. This scenario relates the nationwide expectation regarding the increasing trend in aircraft utilization. However, due to the high level of corporate activity occurring at the Airport and the high number of based business jets, one of the fastest growing segments of the general aviation industry, it is anticipated that LIT's general aviation aircraft operations will experience growth throughout the forecast period slightly higher than nationwide total general aviation operations forecasts contained in the FAA Aerospace Forecasts Fiscal Years 2016-2036.

2.5.5 Air Taxi Aircraft Operations

Air Taxi aircraft operations are generally classified as any company or individual performing air passenger or air cargo transportation service on a nonscheduled basis over unspecified routes. The aircraft conducting air taxi operations at LIT are usually general aviation types, but as stated earlier, the air cargo carriers are also reported as air taxi operations. For purposes of this Master Plan, the air cargo carrier aircraft operations are not included in the analysis. It is expected that the forecast activity by air taxi aircraft will follow the same overall trends as outlined for general aviation aircraft. Table 2-18 shows the air taxi aircraft operations forecast to use LIT.

Table 2-18
Air Taxi Aircraft Operations Forecast, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	TAF *(a)*	Trend *(b)*	Total Operations
2016 *(c)*	8,932	8,932	8,932
2017	11,974	13,451	8,949
2018	11,234	11,669	8,967
2019	10,337	9,887	8,985
2020	9,394	8,105	9,005
2021	8,189	6,323	9,025
2026	5,579	---	9,115
2031	5,904	---	9,210
2036	6,246	---	9,300
Growth Rate	-1.8%	-24.2%	0.2%

(a) FAA Terminal Area Forecasts, 2016, not including forecast air cargo carrier operations.
(b) Trend analysis based on historical data.
(c) Actual, not including air cargo carrier operations.

Source: Mead & Hunt, January 4, 2017.

2.5.6 Military Aircraft Operations

There are three components in determining military aircraft activity at an airport: the amount of Department of Defense (DOD) funding, which can vary from year to year, but has been declining in recent years; a fueling contract the Airport or an FBO may have with the DOD; and the proximity of the Airport location to adjacent aviation-related military bases or training areas.

TacAir, an FBO at LIT, currently has a military contract with the DOD for refueling transient military aircraft. Historically, Air Force C-130s, based at Little Rock Air Force Base (LRAFB), have used LIT extensively for touch and go training due to the proximity of LIT with LRAFB. This is especially true for current activity as the existing runway at the base is undergoing extensive reconstruction that has essentially closed half the 10,000-foot runway. Over the last three years, military aircraft operational levels have fluctuated greatly. It is likely that military operations will continue to fluctuate in response to changing DOD funding, missions, and training levels, but no significant increase or decrease in flight operation is expected at LIT throughout the forecast period. Table 2-19 presents the forecast military aircraft operations at LIT, as well as the forecasts from the 2003 Little Rock National Airport Master Plan, the FAA's TAF, and a trend projection based on historical data (2006-2016) for comparison.

Table 2-19
Military Aircraft Operations Forecast, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	MP *(a)*	TAF *(b)*	Trend *(c)*	Total Operations
2016	---		20,271	20,271 *(d)*
2017	---	11,835	12,019	20,500
2018	34,000	11,835	10,730	20,500
2019	---	11,835	9,441	20,500
2020	---	11,835	8,153	20,500
2021	---	11,835	6,864	20,500
2023	34,500	11,835	5,575	---
2026	---	11,835	421	20,500
2031	---	11,835	---	20,500
2036	---	11,835	---	20,500
Growth Rate	0.1%	0.0%	-32.1%	0.1%

(a) Little Rock National Airport Master Plan, 2003.
(b) FAA Terminal Area Forecasts, 2016.
(c) Trend analysis based on historical data.
(d) Actual.

Source: Mead & Hunt, January 4, 2017.

2.5.7 Operations Forecast by Aircraft Type

With the total number of aircraft operations projected for each category of user, the next step in the forecasting process involves the individual and collective use of the Airport by various types of aircraft. The types of aircraft expected to use the Airport assist in determining the amount and type of facilities needed to meet the aviation demand.

Table 2-20 presents the approximate level of use by aircraft types that are projected to use LIT. As can be noted, total annual aircraft operations are anticipated to increase during the planning period. As a percentage of total operations, commercial service aircraft operations are expected to increase from 24.4% in 2016 to 26.4% in 2036; air cargo aircraft operations are anticipated to decrease slightly from 0.8% to 0.7%; air taxi aircraft operations are forecast to decrease from 8.2% to 7.9%; general aviation aircraft operations are projected to decrease slightly from 47.9% to 47.6%; and military aircraft operations are forecast to decrease from 18.7% to 17.4%.

In the commercial service category of operations, the percentage of narrow body jets and 50+ seat RJs compared to 37-50 seat RJs will increase markedly by the end of the planning period. The largest increase is expected in the 50+ seat RJ category. Regarding general aviation aircraft operations, it is anticipated that LIT will continue to experience a significant amount of business jet operations relative to other aircraft types. This is the result of a higher percentage of use for business-related purposes.

Table 2-20
Summary of Operations by Aircraft Type, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

Aircraft Category	2016 *(a)*	2021	2026	2031	2036
Commercial Service	**26,420**	**26,730**	**27,880**	**29,480**	**31,120**
Narrow Body Jets	9,036	9,850	10,800	11,800	12,840
50+ Seat RJ	8,819	15,800	16,600	17,200	17,800
37-50 Seat RJ	8,203	600	---	---	---
Turboprop	360	480	480	480	480
Cargo	**847**	**847**	**850**	**860**	**865**
Narrow Body Jets	835	835	835	835	835
Wide Body Jets	12	12	20	25	30
Air Taxi	**8,932**	**9,025**	**9,115**	**9,210**	**9,300**
General Aviation	**51,878**	**52,925**	**53,990**	**55,080**	**56,190**
Single Engine Piston	13,738	13,970	14,200	14,485	14,780
Multi-Engine Piston	5,131	5,185	5,185	5,180	5,170
Multi-Engine Turboprop	8,737	8,945	9,175	9,475	9,775
Business Jet	23,059	23,555	24,080	24,565	25,005
Helicopter	1,213	1,270	1,350	1,375	1,460
Military	**20,271**	**20,500**	**20,500**	**20,500**	**20,500**
Fixed Wing Jet	910	910	910	910	910
Fixed Wing Single Engine Turboprop	711	710	710	710	710
Fixed Wing Multi-Engine Turboprop	17,230	17,460	17,460	17,460	17,460
Helicopter	1,420	1,420	1,420	1,420	1,420
Total	**108,348**	**110,027**	**112,335**	**115,130**	**117,975**

(a) Actual.

Source: Mead & Hunt, January 4, 2017.

2.5.8 Local and Itinerant Operations Forecast

Forecasts of aircraft operations have also been categorized accordingly into local and itinerant operations. LIT will certainly remain a principal commercial service airport for central Arkansas, so itinerant operations will continue to be the dominant aircraft activity. Approximately 75.4% itinerant operations were recorded at the Airport in 2016, along with 24.6% local operations. During the historical time period, LIT has experienced an average split of 84.6% itinerant and 15.4% local operations. It appears that 2016 experienced an abnormally high percentage of local operations and the expectation is that this percentage will moderate during the forecast time period. However, the decrease will be tempered somewhat based on the lower than normal C-130 trainings from LRAFB during 2016 when Runway 04R/22L was closed for three months due to major rehabilitation. Additionally, a relatively new FBO, Fly Arkansas, is expected to increase general aviation flight training operations in the future. Flight training tends to drive local operations as students takeoff and land multiple times during a lesson. Based on these assumptions, forecasts of itinerant and local operations are provided in Table 2-21.

Table 2-21
Summary of Itinerant and Local Operations, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	Itinerant	Percentage	Local	Percentage	Total
2016 *(a)*	81,717	75.4%	26,631	24.6%	108,348
2021	83,622	76.0%	26,405	24.0%	110,027
2026	86,500	77.0%	25,835	23.0%	112,335
2031	89,770	78.0%	25,360	22.0%	115,130
2036	94,380	80.0%	23,595	20.0%	117,975

(a) Actual.

Source: Mead & Hunt, January 4, 2017.

2.5.9 Peak Period Forecasts

An additional element in assessing Airport activity and determining various capacity and demand considerations is to ascertain peak activities. According to the LIT records, the peak month for passenger enplanements in 2016 was May, with 95,082 enplanements. According to the airline schedules, there were 396 departure seats available during the peak hour. Using the estimated 79.8% BLF determined earlier, there are approximately 316 peak hour enplanements during an average day during the peak month, or roughly 10.3% of the peak month enplanements. Based on FAA statistics and assumptions from airports with similar activity and operational characteristics, peak period forecasts are presented in Table 2-22.

Table 2-22
Peak Period Enplanements, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	2016	2021	2026	2031	2036
Enplanements	997,085 *(a)*	1,045,170	1,120,990	1,209,925	1,314,030
Peak Month	95,082 *(a)*	99,667	106,897	115,379	125,306
Average Day of Peak Month	3,067	3,215	3,448	3,722	4,042
Peak Hour/Average Day	10.3%	10.3%	10.4%	10.5%	10.6%
Peak Hour	316	331	359	391	428

(a) Actual.

Source: Mead & Hunt, January 4, 2017.

According to the LIT PASSUR data, the peak month for aircraft operations in 2016 was also May, with 10,210 operations. This translates to approximately 329 operations during an average day during the peak month,

and roughly 33 peak hour operations. Based on FAA statistics and assumptions from airports with similar activity and operational characteristics, peak period forecasts are presented in Table 2-23.

Table 2-23
Peak Period Aircraft Operations, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	Annual	Peak Month	Average Day of Peak Month	Peak Hour/ Average Day	Peak Hour
2016	108,348 *(a)*	10,210 *(a)*	329	10.0%	33
2021	110,027	10,368	334	10.0%	33
2026	112,335	10,586	341	10.0%	34
2031	115,130	10,848	350	10.0%	35
2036	117,975	11,116	359	10.0%	36

(a) Actual.

Source: Mead & Hunt, January 4, 2017.

2.5.10 Based Aircraft Forecasts

The number and type of aircraft expected to base at an airport is dependent on factors such as communications, available facilities, airport service, airport proximity and access, aircraft basing capacity available at nearby airports, airspace congestion, and other similar considerations. General aviation aircraft operators are particularly sensitive to both the quality and location of their basing facility, with proximity of home and work often identified as the primary considerations in the selection of an aircraft basing location.

Generally, a relationship exists between based aircraft and general aviation aircraft activity, stated in terms of operations per based aircraft (OPBA). A trend may be established from historical information. The national trend is changing, with more aircraft used for business purposes and less for recreational flying. The OPBA has seen an upward trend as business aircraft are usually flown more often than recreational or pleasure aircraft. Currently, the OPBA at LIT is 396, with an historical average of 309.

Table 2-24 provides the historical (2006-2015) based aircraft data for LIT compared to the based aircraft within the State of Arkansas and the Southwest Region, as well as LIT's market share and correlation coefficient for each area. The table indicates a fairly consistent market share of based aircraft at LIT and based aircraft with the state and region. However, the correlation coefficients are a moderate 0.51 and 0.45, respectively.

Table 2-24
Historical Based Aircraft Comparison, 2006-2015
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	LIT *(a)*	State of Arkansas *(b)*	LIT Market Share	Southwest Region *(b)*	LIT Market Share
2006	152	2,523	6.0%	24,379	0.6%
2007	187	2,633	7.1%	25,210	0.7%
2008	153	2,570	5.9%	20,851	0.7%
2009	177	2,616	6.8%	22,094	0.8%
2010	158	2,398	6.6%	20,432	0.8%
2011	165	2,400	6.9%	20,092	0.8%
2012	165	2,430	6.8%	21,312	0.8%
2013	160	2,496	6.4%	21,537	0.7%
2014	170	2,587	6.6%	22,530	0.8%
2015	170	2,606	6.5%	22,637	0.8%
Average Market Share			6.6%		0.8%
Correlation Coefficient		0.51		0.45	

(a) LIT records.
(b) FAA Terminal Area Forecasts, 2016.

2.5.10.1 Based Aircraft Forecasts Scenarios

Table 2-25 presents the based aircraft forecast scenarios prepared for this Master Plan along with the forecasts developed in the 2003 Little Rock National Airport Master Plan, the forecast generated in the FAA's TAF, and the trend projection based on historical data (2006-2016). The forecast prepared for the 2003 Master Plan indicate an annual growth rate of 1.0%, the TAF projects an annual growth rate of 1.4%, and the trend projection decreases at an annual growth rate of -0.1%.

- **Scenario One.** This scenario is a standard regression analysis applying the existing OPBA (i.e., 396) to the selected general aviation aircraft operations forecast presented earlier. This results in an increase to 142 aircraft and represents an annual growth rate of 0.4%.

- **Scenario Two.** This scenario, a market share forecast, uses a changing LIT market share for the State of Arkansas based aircraft as forecast in the FAA's TAF. While the historical correlation coefficient of based aircraft between LIT and the state is a moderate 0.51, this scenario anticipates an increasing percentage of the state's based aircraft to be located at LIT. Increasing from an initial 2016 market share ratio of 4.95% to an ultimate ratio of 5.25%, this results in an increase to 166 aircraft and represents an annual growth rate of 1.2%.

- **Scenario Three.** This scenario, also a standard regression analysis, anticipates a return to the historical average OPBA (i.e., 309) and applies it to the 2036 selected general aviation aircraft operations forecast as presented earlier. This results in an increase to 182 based aircraft and represents an annual growth rate of 1.7%.

Table 2-25
Based Aircraft Forecasts, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

Year	MP *(a)*	TAF *(b)*	Trend *(c)*	Scenario One	Scenario Two	Scenario Three
2016	---	175	131 *(d)*	131 *(d)*	131 *(d)*	131 *(d)*
2017	---	177	154	132	132	134
2018	180	180	153	132	134	136
2019	---	180	152	133	135	139
2020	---	183	150	133	136	141
2021	---	185	149	134	138	144
2023	190	190	146	---	---	---
2026	---	199	142	136	147	156
2031	---	214	135	139	157	169
2036	---	229	129	142	166	182
Growth Rate	1.0%	1.4%	-0.1%	0.4%	1.2%	1.7%

(a) Little Rock National Airport Master Plan, 2003.
(b) FAA Terminal Area Forecasts, 2016.
(c) Trend analysis based on historical data, 2006-2016.
(d) Actual.

Source: Mead & Hunt, January 4, 2017.

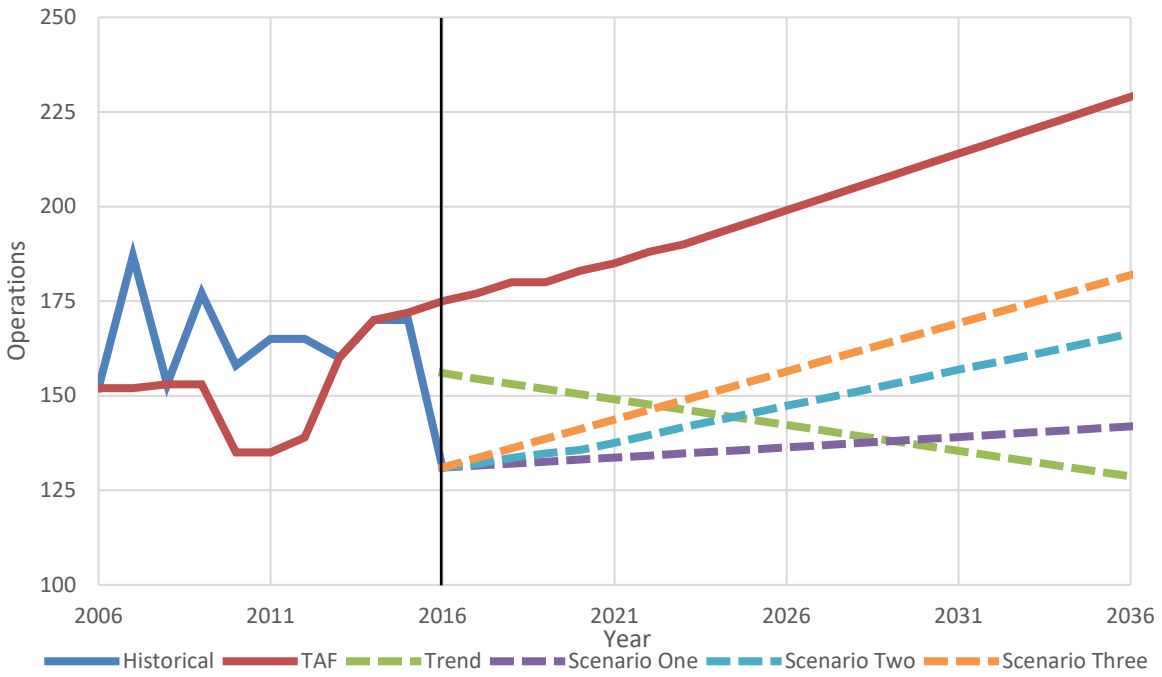
2.5.10.2 Preferred Based Aircraft Operations Forecast

It is recommended that Scenario Two be selected as the preferred based aircraft forecast. The FAA does project much higher growth in turbine-powered aircraft compared to piston-powered aircraft. LIT has a relatively high amount of existing based business jets and turboprops (i.e., combined percentage of 39.8% of the total based aircraft). It can be expected that the increases in expected based aircraft across the state will be attracted to LIT because of the facilities and services available at the Airport, combined with the close proximity of the state capital and the business resources of Little Rock as the state's largest city.

2.5.10.3 Based Aircraft Fleet Mix Forecast

Total based aircraft projections for LIT using the preferred based aircraft projection were allocated to five aircraft categories – single engine, multi-engine piston, multi-engine turboprop, business jet, and helicopter - to develop a projection of the Airport's based aircraft fleet mix through the forecast period. It is expected that the fleet mix projections will somewhat mirror the expectations for active general aviation aircraft presented in the FAA Aerospace Forecast Fiscal Years 2016-2036. Table 2-26 presents the preferred based aircraft fleet mix expected at the Airport. As shown, turboprop and business jet aircraft will continue to remain a sizeable component of the based aircraft fleet. Multi-engine piston aircraft will decline, both as a percentage and in total numbers, following national trends. Single engine based aircraft are expected to remain relatively unchanged, from a percentage standpoint, based on the expected growth of sport aircraft nationwide, as forecasted by the FAA (a national annual growth rate of 4.5% is projected through 2036).

Figure 2-14
Based Aircraft Forecasts, 2006-2036
Airport Master Plan
Bill and Hillary Clinton National Airport



Sources: LIT records and Mead & Hunt, January 4, 2017.

Table 2-26
Forecast Based Aircraft Fleet Mix, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

Based Aircraft	2016 *(a)*	2021	2026	2031	2036
Single Engine	65	69	73	79	84
Multi-Engine Piston	15	14	13	13	12
Multi-Engine Turboprop	19	20	21	23	25
Business Jet	32	34	38	40	42
Helicopter	0	1	2	2	3
Total	131	138	147	157	166

(a) Actual.

Source: Mead & Hunt, January 4, 2017.

2.6 RUNWAY DESIGN CODE (RDC)/CRITICAL AIRCRAFT FORECAST

Knowledge of the types of aircraft currently using, and those that are expected to use LIT provides insight concerning the Runway Design Code (RDC). FAA Advisory Circular 150/5300-1A, Change 1, *Airport Design*, provides guidance for the determination. The RDC is based on the "Design Aircraft" that is determined the most critical aircraft, or group of aircraft, using or projected to use a runway on a regular basis. A number of FAA guidance documents define regular basis as 500 or more annual operations (landings and takeoffs are considered as separate operations). It is important to note that the 500 annual operations "substantial use" threshold is not a cap or limit on aircraft operations, but rather a planning metric for consideration of the appropriate design criteria for airport facilities. The identified design aircraft can either be one aircraft, or a composite of more than one aircraft, representing the highest Aircraft Approach Category (AAC) and Airplane Design Group (ADG).

The selected AAC and ADG are combined to form the RDC of a particular runway, and the RDC determines the dimensional criteria standards that are applicable for that runway. The first component, depicted by a letter, is the AAC and relates to the aircraft approach speed. The second component, depicted by a roman numeral, is the ADG and relates to the aircraft wingspan and tail height. The AAC and ADG are presented in Tables 2-27 and 2-28. An Airport Reference Code (ARC) is determined by the Airport's highest RDC.

Table 2-27
Aircraft Approach Category (AAC)
Airport Master Plan
Bill and Hillary Clinton National Airport

AAC	Approach Speed
A	Approach speed less than 91 knots
B	Approach speed 91 knots or more but less than 121 knots
C	Approach speed 121 knots or more but less than 141 knots
D	Approach speed 141 knots or more but less than 166 knots
E	Approach speed 166 knots or more

Source: FAA AC 150/5300-13A, Change 1, Airport Design, February 2014.

Table 2-28
Airplane Design Group (ADG)
Airport Master Plan
Bill and Hillary Clinton National Airport

ADG	Tail Height	Wing Span
I	Less than 20 Feet	Less than 49 Feet
II	Greater than 20, but less than 30 Feet	Greater than 49, but less than 79 Feet
III	Greater than 30, but less than 45 Feet	Greater than 79, but less than 118 Feet
IV	Greater than 45, but less than 60 Feet	Greater than 118, but less than 171 Feet
V	Greater than 60, but less than 66 Feet	Greater than 171, but less than 214 Feet
VI	Greater than 66, but less than 80 Feet	Greater than 214, but less than 262 Feet

Source: FAA AC 150/5300-13A, Change 1, Airport Design, February 2014.

Using the Bill and Hillary Clinton National Airport PASSUR Aerospace data tool, the relative percentages of aircraft operations can be determined. The PASSUR Aerospace data collection tool records a variety of information (both aircraft specific and operational) on most of the civilian aircraft operating at the Airport. Thus, the PASSUR data collected at LIT provides more detailed information on aircraft operations, compared to the more general data collected by the FAA. However, the PASSUR data is not 100% complete, and the areas where data is missing are noted in the tables below. The LIT PASSUR data used for this Master Plan was compiled from October 1, 2014 through September 30, 2015, as this time frame represents the latest 12-month continuous period that the three runways were operational and not closed for extended periods of time.

2.6.1 Airport Reference Code (ARC)

By applying the relative percentages of the 2014-2015 PASSUR data to the total number of non-military aircraft operations reported by LIT personnel for 2016, the estimate of the breakdown of existing aircraft operations by ARC can be determined and are presented in Table 2-29. This table also presents the forecasted non-military aircraft usage throughout the planning period. As illustrated, it is projected that the most critical aircraft regularly using the Airport will be represented by aircraft with an AAC of D and an ADG of IV. Thus, LIT's ARC is D-IV.

Table 2-29
Summary of Non-Military Aircraft Operations by ARC, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

ARC	Percentage	2016 *(a)*	2021	2026	2031	2036
A-I	14.3%	11,129	11,312	11,604	11,956	12,315
A-II	0.1%	54	55	56	58	59
A-III	0.0%	5	5	5	6	6
B-I	9.1%	7,653	7,779	7,979	8,221	8,468
B-II	15.1%	12,118	12,317	12,635	13,019	13,410
B-III	0.4%	331	336	345	355	366
C-I	0.6%	613	624	640	659	679
C-II	28.9%	24,113	24,510	25,142	25,905	26,683
C-III	17.4%	17,637	17,928	18,390	18,948	19,517
C-IV	1.9%	1,329	1,351	1,386	1,428	1,470
C-V	0.0%	5	5	5	6	6
D-I	2.8%	2,361	2,400	2,462	2,536	2,612
D-II	0.2%	317	322	330	340	350
D-III	0.6%	553	562	577	594	612
D-IV	0.0%	21	21	22	22	23
Helicopter	2.0%	1,065	1,082	1,110	1,144	1,178
Unknown	6.6%	8,774	8,918	9,148	9,426	9,709
Total	100.0%	88,077	89,527	91,835	94,623	97,465

(a) Actual non-military aircraft operations, 2016.

Source: LIT PASSUR data October 1, 2014-September 30, 2015, LIT records, and Mead & Hunt, January 4, 2017.

2.6.2 RDC by Runways

The appropriate RDC for the individual runways at LIT is determined in much the same way as the ARC determination. However, using the PASSUR Aerospace data, individual runway usage can be calculated and the appropriate RDC for each runway can thus be determined. Table 2-30 provides the total number of existing non-military aircraft operations broken down by RDC for each of the three runways at LIT. The information presented in the table is derived from applying the relative percentages of the 2014-2015 PASSUR data to the 2016 aircraft operations at LIT.

Table 2-30
Non-Military Aircraft Operations by RDC, 2016
Airport Master Plan
Bill and Hillary Clinton National Airport

	Runway 18/36		Runway 04L/22R		Runway 04R/22L		Runway Not Assigned	
RDC	Operations	PASSUR Percentage	Operations	PASSUR Percentage	Operations	PASSUR Percentage	Operations	PASSUR Percentage
A-I	5,004	23.9%	1,420	7.3%	526	2.9%	4,179	14.3%
A-II	7	0.0%	5	0.0%	20	0.1%	22	0.1%
A-III	4	0.0%	1	0.0%	0	0.0%	0	0.0%
B-I	3,750	17.9%	1,095	5.6%	152	0.8%	2,656	9.1%
B-II	5,587	26.7%	1,831	9.3%	268	1.5%	4,431	15.1%
B-III	65 *(a)*	0.3%	128	0.7%	27	0.2%	110	0.4%
C-I	306	1.5%	103	0.5%	21	0.1%	183	0.6%
C-II	2,144	10.2%	6,725	34.3%	6,776	37.1%	8,468	28.9%
C-III	135 *(a)*	0.6%	5,693	29.1%	6,704	36.7%	5,105	17.4%
C-IV	30	0.1%	449 *(b)*	2.3%	302 *(c)*	1.7%	548	1.9%
C-V	0	0.0%	1	0.0%	3	0.0%	1	0.0%
D-I	1,130 *(a)*	5.4%	349 *(b)*	1.8%	67 *(c)*	0.4%	815	2.8%
D-II	116 *(a)*	0.6%	67 *(b)*	0.3%	84 *(c)*	0.5%	50	0.2%
D-III	218 *(a)*	1.0%	136 *(b)*	0.7%	27 *(c)*	0.2%	171	0.6%
D-IV	0	0.0%	4 *(b)*	0.0%	7 *(c)*	0.0%	10	0.0%
Helicopter	254	1.2%	140	0.7%	89	0.5%	582	2.0%
Unknown	2,205	10.5%	1,441	7.4%	3,202	17.5%	1,925	6.6%
Total	20,956		19,590		18,274		29,257	

(a) It is estimated there are approximately 527 additional AAC D aircraft operations and 1,963 additional ADG III aircraft operations occurring on Runway 18/36, using existing percentages applied to unknown aircraft and unassigned runway utilization.

(b) It is estimated there are approximately 389 additional AAC D aircraft operations and 219 additional ADG IV and V aircraft operations occurring on Runway 04L/22R, using existing percentages applied to unknown aircraft and unassigned runway utilization.

(c) It is estimated there are approximately 357 additional AAC D aircraft operations and 229 additional ADG IV and V aircraft operations occurring on Runway 04R/22L, using existing percentages applied to unknown aircraft and unassigned runway utilization.

Source: LIT PASSUR data October 1, 2014-September 30, 2015 and LIT records.

2.6.2.1 Runway 04L/22R

Based on the information presented in Table 2-30, it is concluded that Runway 04L/22R, the Airport's primary runway, has approximately 945 operations by aircraft with an AAC of D and 673 operations by aircraft with an ADG of IV or V. These numbers not only include the operations directly attributed to aircraft with an AAC of D or an ADG of IV and V, but also include operations derived from the percentages of unknown aircraft or aircraft not able to be assigned to a runway. Thus, Runway 04L/22R has a RDC of D-IV. The most critical aircraft, or "Design Aircraft" for Runway 04L/22R is a combination of the Learjet family of

business jets, which have an AAC of D, and the Airbus A300 and Boeing 757-200, which have ADGs of IV. The operations for each grouping of aircraft are depicted in Table 2-31.

Table 2-31
Runway 04L/22R Critical Aircraft Operations, 2016
Airport Master Plan
Bill and Hillary Clinton National Airport

RDC	Operations	Design Aircraft	Operations
Aircraft Approach Category D	945	Learjet Family of Business Jets	646
Airplane Design Group IV	673	Airbus A300/Boeing 757-200	662
Total	1,618		1,308

Source: LIT PASSUR data October 1, 2014-September 30, 2015, LIT records, and Mead & Hunt, January 4, 2017.

2.6.2.2 Runway 04R/22L

Based on the information presented in Table 2-30, it is concluded that Runway 04R/22L, the Airport's secondary runway, has approximately 542 operations by aircraft with an AAC of D and 541 operations by aircraft having an ADG of IV or V. These numbers also include operations derived from the percentages of unknown aircraft or aircraft not able to be assigned to a runway, as well as the operations directly attributed to aircraft with an AAC of D or an ADG of IV and V. Thus, Runway 04R/22L also has an RDC of D-IV. The most critical aircraft, or "Design Aircraft" for Runway 04R/22L is a combination of the multiple business jets that have an AAC of D and the Airbus A300 and Boeing 757-200. There is not a singular aircraft or even one family of aircraft that uses Runway 04R/22 for a total of 500 or more annual operations having an AAC of D, but is typified by the Learjet family of business jets. The operations for each grouping of aircraft are provided in Table 2-32.

Table 2-32
Runway 04L/22L Critical Aircraft Operations, 2016
Airport Master Plan
Bill and Hillary Clinton National Airport

RDC	Operations	Design Aircraft	Operations
Aircraft Approach Category D	542	Learjet Family of Business Jets	332
Airplane Design Group IV	541	Airbus A300/Boeing 757-200	523
Total	1,083		855

Source: LIT PASSUR data October 1, 2014-September 30, 2015, LIT records, and Mead & Hunt, January 4, 2017.

2.6.2.3 Runway 18/36

Based on the information presented in Table 2-30, it is determined that Runway 18/36, the Airport's crosswind runway, has approximately 1,992 operations by Aircraft with an AAC of D and 2,386 operations by aircraft with an ADG of III. Like the two previous runways, these numbers also include operations derived

from the percentages of unknown aircraft or aircraft not able to be assigned to a runway, as well as the operations directly attributed to aircraft with an AAC of D or an ADG of III. According to the latest Airport Layout Plan (ALP) for LIT, Runway 18/36 has an existing RDC of C-II and a future RDC of D-III. Using the analysis presented here, it is determined that the appropriate existing RDC for Runway 18/36 is D-III. The most critical aircraft, or "Design Aircraft" for Runway 18/36 is a combination of the Learjet family of business jets and the multiple business jets that have ADGs of III. There is not a singular aircraft or even one family of aircraft that uses Runway 18/36 for a total of 500 or more annual operations having an ADG of III, but is typified by the Gulfstream V/G500/VI family of business jets. The operations for each grouping of aircraft are provided in Table 2-33.

Table 2-33
Runway 18/36 Critical Aircraft Operations, 2016
Airport Master Plan
Bill and Hillary Clinton National Airport

RDC	Operations	Design Aircraft	Operations
Aircraft Approach Category D	1,992	Learjet Family of Business Jets	1,553
Airplane Design Group III	2,386	Gulfstream V/G500/VI	290
Total	4,378		1,843

Source: LIT PASSUR data October 1, 2014-September 30, 2015, LIT records, and Mead & Hunt, January 4, 2017.

2.7 FORECAST APPROVAL

In accordance with language specified in Aviation Forecast Guidance APP-400, local aviation forecasts are approved by regional airports division offices or airports district offices (ADOs). Local forecasts that are consistent with the FAA's Terminal Area Forecast (i.e., the local forecast differs by less than 10% in the first five years, differs by less than 15% in the remaining forecast periods, and does not affect the timing or scale or an airport project) do not need to be coordinated with APP-400 and APO-110. Local forecasts that are not consistent with the TAF, but which do not affect the timing or scale of an airport project and do not impact the analysis of a National Environmental Policy Act (NEPA) document or Benefit Cost Analysis (BCA), may be accepted (not approved) for information purposes by the regional office/ADO without APP/APO coordination.

The enplanements and commercial service aircraft operations forecasts prepared for this Master Plan are less than, or within, the specified TAF thresholds for acceptance, as shown in Tables 2-34 and 2-35. The total Airport operations exceed the specified TAF thresholds within the forecast period. This is primarily the result of the updated aircraft operational numbers supplied by LIT that indicated there were substantially more general aviation and military aircraft operations in 2016 than the TAF (using 2015 data) anticipated for 2016. There were 12,193 more general aviation aircraft operations and 8,436 additional military aircraft operations provided by LIT in 2016 compared to the TAF operations. It is anticipated that when the TAF is published this year, it will incorporate the updated operational numbers from the Airport and the forecasts contained in this Master Plan will be within the TAF thresholds for total aircraft operations. Additionally, Tables 2-34 and 2-25 are representative of the actual FAA templates that will be submitted to the FAA for their approval of the forecasts contained in this Master Plan.

Table 2-34
Summary of Airport and TAF Forecast Comparison, 2016-2031
Airport Master Plan
Bill and Hillary Clinton National Airport

	Year	Airport Forecasts	TAF	AF/TAF (Percent Difference)
Passenger Enplanements				
Base Year	2016	997,085	937,111	6.4%
Base Year + 5 Years	2021	1,045,170	1,043,111	0.2%
Base Year + 10 Years	2026	1,120,990	1,134,656	-1.2%
Base Year + 15 Years	2031	1,209,925	1,221,802	-1.0%
Commercial Operations				
Base Year	2016	36,199	35,425	2.2%
Base Year + 5 Years	2021	36,602	38,227	-4.3%
Base Year + 10 Years	2026	37,845	40,872	-7.4%
Base Year + 15 Years	2031	39,550	43,842	-9.8%
Total Operations				
Base Year	2016	108,348	86,945	24.6%
Base Year + 5 Years	2021	110,027	90,294	21.9%
Base Year + 10 Years	2026	112,335	93,494	20.2%
Base Year + 15 Years	2031	115,130	97,027	18.7%

Source: Mead & Hunt, January 4, 2016.

Table 2-35
Summary of Airport Planning Forecasts
Airport Master Plan
Bill and Hillary Clinton National Airport

	Base Yr. (2016)	Base Yr. +1 yr. (2017)	Base Yr. +5 yrs. (2021)	Base Yr. +10 yrs. (2026)	Base Yr. +15 yrs. (2031)	Base yr. to +1 (2017)	Base yr. to +5 (2021)	Base yr. to +10 (2026)	Base yr. to +15 (2031)
Enplanements									
Air Carrier	542,861	526,394	548,431	589,425	639,015	-3.0%	0.2%	0.8%	1.1%
Commuter	454,224	476,641	496,739	531,565	570,910	4.9%	1.8%	1.6%	1.5%
TOTAL	997,085	1,003,035	1,045,170	1,120,990	1,209,925	0.6%	0.9%	1.2%	1.3%
Operations									
Itinerant									
Air Carrier	21,155	22,514	27,950	31,895	33,455	6.4%	5.7%	4.2%	3.1%
Commuter/Air Taxi	15,044	13,766	8,652	5,950	6,095	-8.5%	-10.5%	-8.9%	-5.8%
Total Commercial Operations	36,199	36,280	36,602	37,845	39,550	0.2%	0.2%	0.4%	0.6%
General Aviation	36,222	36,460	38,794	40,440	41,970	0.7%	1.4%	1.1%	1.0%
Military	9,296	9,086	8,250	8,250	8,250	-2.3%	-2.4%	-1.2%	-0.8%
Local									
General Aviation	15,656	15,626	14,131	13,550	13,110	-0.2%	-2.0%	-1.4%	-1.2%
Military	10,975	11,230	12,250	12,250	12,250	2.3%	2.2%	1.1%	0.7%
Total Operations	**108,348**	**108,682**	**110,027**	**112,335**	**115,130**	**0.3%**	**0.3%**	**0.4%**	**0.4%**
Instrument Operations	**81,260**	**81,515**	**82,520**	**84,250**	**86,342**	**0.3%**	**0.3%**	**0.4%**	**0.4%**
Peak Hour Operations	**33**	**33**	**33**	**34**	**35**	**0.0%**	**0.0%**	**3.0%**	**6.1%**
Cargo/mail (enplaned + deplaned tons)	**9,002**	**9,179**	**9,731**	**10,130**	**10,320**	**2.0%**	**1.6%**	**1.2%**	**0.9%**
Based Aircraft									
Single Engine (Nonjet)	65	66	69	73	79	1.5%	1.2%	1.2%	1.3%
Multi Engine (Nonjet)	15	15	14	13	13	0.0%	-1.4%	-1.4%	-0.9%
Turboprop	19	19	20	21	23	0.0%	1.0%	1.0%	1.3%
Jet Engine	32	32	34	38	40	0.0%	1.2%	1.7%	1.5%
Other	0	0	1	2	2	0	0	0	0
TOTAL	**131**	**132**	**138**	**147**	**157**	**0.8%**	**1.0%**	**1.2%**	**1.2%**
Average aircraft size (seats)									
Air Carrier	106.4	107	110.0	112.0	116.0	---	---	---	---
Commuter	49.0	47	41.0	30.0	30.0	---	---	---	---
Average enplaning load factor									
Air Carrier	82.5%	82.4%	81.8%	82.5%	83.6%	---	---	---	---
Commuter	79.4%	79.1%	78.9%	77.0%	76.0%	---	---	---	---
GA operations per based aircraft	396	395	384	367	351	---	---	---	---

Source: Mead & Hunt, January 4, 2017.

Chapter 3

3.1 INTRODUCTION

In accordance with Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*, the information contained in this chapter represents the third element of and update to the Master Plan for Bill and Hillary Clinton National Airport (the Airport). The purpose of the Master Plan Update is to provide guidance for the continued improvement of the Airport for the 20-year planning horizon and beyond.

This chapter summarizes facilities, land areas, and policies required to accommodate aviation demand throughout the 20-year forecast period. Facility requirements were developed based on assessments of existing capacity and future demand for major aviation-related facilities. This chapter is organized as follows:

1.0 – Introduction
2.0 – Airfield and Airspace
3.0 – Passenger Terminal
4.0 – Ground Transportation and Parking
5.0 –General Aviation

3.1.1 Future Aviation Forecast

Future aviation forecasts described in the previous chapter are referenced thought this chapter. Sometimes called Planning Activity Levels (PALs), this Master Plan refers to future design years as: Existing baseline generally using 2016 data, 2021, 2026, 2031, and 2036, as shown in Table 3-1. While actual passenger and operations could reach the levels forecast sooner or later than the forecast year, it is still useful to the development of requirements and alternatives to consider these future activity levels.

3.1.2 Future Flight Schedules

Aircraft flight schedules can provide a planning-level synopsis of aviation activity that is used to support analytical and simulation modeling. Passenger activity included in the flight schedules was developed based on projected average day peak month (ADPM) passenger activity, which has historically occurred during the month of July. For the purposes of this Master Plan, existing 2016 flight schedules were summarized to derive key aviation activity metrics such as peak periods, time-of-day, departures and arrivals, fleet mix, etc. Future growth could come from increased frequency, direct service to new markets, or the entry of new airlines into the Little Rock market. Given the indeterminate nature of forecast growth, future flight schedules were not developed for the Master Plan Update. Instead, existing metrics such as peak hour passengers were assumed to grow linearly with growth in passenger enplanement growth.

Table 3-1
Summary of Forecast Aviation Demand
Airport Master Plan Update
Bill and Hillary Clinton National Airport

Aircraft Category	2016	2021	2026	2031	2036
Enplaned Passengers	**997,085**	**1,045,170**	**1,120,990**	**1,209,925**	**1,314,030**
Total Departure Seats	1,208,845	1,277,150	1,359,500	1,447,200	1,542,560
Boarding Loading Factor	82.5%	81.8%	82.5%	83.6%	85.2%
Aircraft Operations	**108,348**	**110,027**	**112,335**	**115,130**	**117,975**
Commercial Service	26,420	26,730	27,880	29,480	31,120
Cargo	847	847	850	860	865
Air Taxi	8,932	9,025	9,115	9,210	9,300
General Aviation	51,878	52,925	53,990	55,080	56,190
Military	20,271	20,500	20,500	20,500	20,500

3.1.3 Summary of Facility Requirements

A summary of Airport facility requirements for baseline (2016) and future years organized according to functional areas are provided in Table 1-2. As shown, many Airport facilities provide sufficient capacity to accommodate demand forecast throughout the planning period. However, a few facilities will need to be modified or expanded to accommodate future activity, improve Airport operational capabilities or levels of service, and/or satisfy design standards.

Notable requirements over the course of the forecast period include:

Airfield – The existing airfield layout will provide sufficient capacity to accommodate forecast aviation activity throughout the planning period. Existing air traffic control facilities, navigational aids, and visual aids at the Airport are sufficient to effectively support airfield and airspace operations at the Airport through the end of the planning period. Opportunity exists to modify the taxiway configuration to remove the existing hot spot designation and to incorporate new FAA guidance on runway incursion mitigation (RIM).

Passenger Terminal – An extensive Terminal Redevelopment Plan is underway and this Master Plan seeks to provide trigger points for successive construction phases as well as ensure that physical space requirements within the Terminal are met throughout the planning period. Near-term there may be opportunities to expand hold room seating space to enhance customer level of service. Long-term terminal phasing will be driven by age and condition of facilities and affordability of new facilities rather than forecast aviation demand.

Ground Transportation – Most elements of the ground transportation system are well positioned to accommodate current activity and will not require expansion in the future. However, to accommodate the Terminal Redevelopment Program, existing public parking and curbside roadway will need to be relocated on a temporary or permanent basis. This Master Plan seeks to leverage those relocations as opportunities to expand facilities to accommodate long-term demand.

General Aviation – Forecast GA demand does not necessitate an increase in facilities. However, land will be reserved for future GA expansion on the future Airport Layout Plan.

3.2 AIRFIELD FACILITY REQUIREMENTS

This chapter presents the results of the analysis of the facilities that will be required to meet future aviation demand at the Bill and Hillary Clinton National Airport. Airside facilities examined include the runway, taxiways, runway protection zones, and navigational aids. The primary objectives of this section are to:

Review findings of the prior master plan and assess the need for additional capacity / runways.

Identify potential changes to the airfield layout or new / modified airfield based on the following:

Changes in the future fleet mix

Meeting airport design standards

Eliminating existing modifications to design standards (MOS)

Changes based on new FAA design standards and policies.

Address known conflicts with airfield safety zones and Federal Aviation Regulations (FAR) Part 77 obstacle clearance surfaces.

3.2.1 Airfield Capacity Methodology and Variables

The evaluation method used to determine the capability of the airside facilities to accommodate aviation operational demand is expressed in terms of potential excesses and deficiencies in capacity. Airfield capacity is defined in the following terms:

Hourly Capacity of Runways: The maximum number of aircraft that can be accommodated under conditions of continuous demand during a one-hour period.

Annual Service Volume (ASV): A reasonable estimate of an airport's annual capacity (i.e. level of annual aircraft operations that will result in an average annual aircraft delay of approximately one to four minutes).

The capacity of an airport's airside facilities is impacted by several factors including: runway use configuration, weather conditions, design aircraft, and demand characteristics as described in the following paragraphs.

3.2.1.1 Runway Use Configuration

Runway Use Configuration refers to the arrangement and interaction of airfield components such as runways, taxiways, and ramp entrances. The Clinton National Airport operates in either a south flow or north flow runway configuration:

- Under north flow conditions:

  - Runway 4R is the primary departures runway
  - Runway 4L is the primary arrivals runway
  - Runway 18 serves as a secondary departure or arrival runway for general aviation traffic

- Under south flow conditions:

  - Runway 22R is the primary departures runway
  - Runway 22L is the primary arrivals runway
  - Runway 36 serves as a secondary departure or arrival runway for general aviation traffic

The airfield has historically operated under south flow conditions approximately 66% of the time and under north flow conditions the remaining 34% of the time.

3.2.1.2 Weather Conditions

Variations in the weather resulting in limited cloud ceilings and reduced visibility typically lower airfield capacity, while changes in wind direction and velocity typically dictate runway usage and impact runway capacity.

Meteorological data from the National Climatic Data Center has been used to summarize historical meteorological conditions used in the airfield capacity calculations, shown in Table 3-2.

Table 3-2
Existing Meteorological Conditions
Airport Master Plan
Bill and Hillary Clinton National Airport

Runway Designation	Percent	Approximate Days per Year
VFR (Greater Than: 1,000', 3 SM)	91.3%	333.2
IFR (250'-1,000', ¾ SM-3 SM)	7.7%	28.1
IFR (200'-1,000', ½ SM-3 SM)	8.2%	29.9
IFR (100'-1,000', ¼ SM-3 SM)	8.3%	30.3
IFR (0'-1,000', ⅛ SM-3 SM)	8.7%	31.8
Below Minimums (0', 0-⅛ SM)	<0.1%	<0.4

Sources: Weather analysis tabulation provided by Mead & Hunt using the FAA Airport Design Tools, Wind Analysis. Wind data obtained from the National Oceanic and Atmospheric Administration, National Climatic Data Center. Station 723403 Adams Field Airport. Period of Record 2007-2016.

Wind data were obtained and an all-weather wind rose was constructed, which is presented in the Inventory chapter. The summary of the wind coverage from the Inventory is shown in Table 3-3.

Table 3-3
All Weather Wind Coverage Analysis
Airport Master Plan
Bill and Hillary Clinton National Airport

Runway Designation	10.5-Knot Crosswind Component	13-Knot Crosswind Component	16-Knot Crosswind Component	20-Knot Crosswind Component
Runway 18-36	94.52%	97.26%	99.17%	--
Runway 18 *(a)*	80.36	81.86	83.01	--
Runway 36 *(a)*	76.44	78.42	79.99	--
Runways 4L-22R & 4R-22L	92.70	96.00	98.89	99.76
Runways 4L and 4R *(a)*	76.86	79.16	81.28	81.87
Runways 22R and 22L *(a)*	79.60	82.16	84.61	85.36
Combined	96.91	98.64	99.59	98.86

(a) A 5-knot tailwind component was used for the individual runway end analysis.

Sources: Wind analysis tabulation provided by Mead & Hunt using the FAA Airport Design Tools, Wind Analysis. Wind data obtained from the National Oceanic and Atmospheric Administration, National Climatic Data Center. Station 723403 Adams Field Airport. Period of Record 2007-2016.

3.2.1.3 Design Aircraft

The most critical aircraft in consideration of wingspan and approach speed that will regularly use a runway, or "Design Aircraft", is used in airfield capacity calculations to establish the crosswind component. The Critical Aircraft and Runway Design Code presented in the Forecast chapter is shown in Table 3-4.

Table 3-4
Critical Aircraft/Runway Design Code
Airport Master Plan
Bill and Hillary Clinton National Airport

Runway	Aircraft	RDC
4L-22R	Boeing 757-200/Learjet	D-IV
4R-22L	Boeing 757-200/Learjet	D-IV
18-36	Gulfstream V	D-III

Source: LIT PASSUR data, LIT records, and Mead & Hunt, January 2017.

3.2.1.4 Demand Characteristics

The majority of aircraft operations at LIT are classified as Class C, with a few operations by Class D aircraft. Therefore, the aircraft mix, shown in Table 3-5, is assumed to have little negative impact on runway capacity.

Table 3-5
Aircraft Class Mix Forecast
Airport Master Plan
Bill and Hillary Clinton National Airport

Aircraft Category	2016 VFR Operations	2016 IFR Operations	2036 VFR Operations	2036 IFR Operations
A & B (<12,500 pounds)	29%	23%	27%	22%
C (12,500 – 300,000 pounds)	70%	76%	72%	77%
D (>300,000 pounds)	1%	1%	1%	1%
Mix Index (C+3D)	**73**	**79**	**75**	**80**

Note: FAA established mix index range of 51-80 is expected throughout the planning horizon.

Source: Mead & Hunt Forecast.

The operations mix occurring on the runway system at LIT reflects a general balance of arrivals to departures. Therefore, it was assumed in the capacity calculations that arrivals equal departures during the peak period, which would have little impact on runway capacity.

Touch-and-go operations have remained consistent at approximately 19% and little change is expected during the planning horizon. Runway capacity calculations have been adjusted to consider touch-and-go operations.

The existing exit taxiways serving the runway system at the Airport provide multiple exit points for use by various aircraft types. However, based on the mix index of aircraft operating at the Airport under VFR conditions, the capacity analysis described in the FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, credits only those runway exit taxiways located between 5,000 and 7,000 feet from the landing threshold. Since some existing exit taxiways fall outside of that range, capacity could potentially be increased slightly if new taxiway exits are added. The future location of all taxiway improvements will be evaluated in conjunction with the formulation of airside development alternatives.

Currently there are no special air traffic control rules in effect at LIT that significantly impact operational capacity.

3.2.2 Annual Service Volume

The methodology used for the measurement of airfield capacity in this study is described in Federal Aviation Administration (FAA) Advisory Circular 150/5060-5, *Airport Capacity and Delay*.

3.2.2.1 Hourly Airfield Capacity

Hourly airfield capacity considers separate evaluations of each possible runway-use configuration at the Airport based on the variables described in section 2.1. In its normal operating configurations, the Airport's VFR hourly capacity is potentially as high as 263 operations and the IFR hourly capacity is potentially as high as around 58 operations per hour as shown in Table 3-6.

Table 3-6
Hourly Airfield Capacity
Airport Master Plan
Bill and Hillary Clinton National Airport

Planning Horizon	North Flow VFR Ops/Hour	North Flow IFR Ops/Hour	South Flow VFR Ops/Hour	South Flow IFR Ops/Hour
Current	190	58	260	58
Future	192	58	263	58

Source: Airfield Capacity and Delay AC 150_5060_5 C_wxTxE Calculations for use assumptions.

3.2.2.2 Annual Service Volume

The Annual Service Volume (ASV) is defined as a reasonable estimate of the annual capacity of an airfield. As the level of operations approaches ASV, additional increases in air traffic movements result in disproportionate increases in aircraft delays. However, ASV does not represent a "hard upper limit" on the number of operations that can be accommodated, and it is commonly exceeded at many airports throughout the world. ASV takes into account differences in runway use, weather conditions, and mix of aircraft over a one-year period. ASV is calculated by the following formula provided in FAA Advisory Circular 150/5060-5, Airport Capacity and Delay:

$$ASV = C_w \times D \times H$$

Where:

C_w is the weighted average hourly capacity of the airfield
D is the ratio of annual demand to average daily demand in the peak month
H is the ratio of average daily demand to average peak hour demand in the peak month

The weighted hourly capacity for LIT for 2016 was determined to be 64 operations per hour. With the existing runway configuration and existing use patterns, the Airport has been determined to have a daily ratio (D) of 328 and an hourly ratio (H) of 10, and thus, an **ASV of approximately 211,000 – 215,000** over the planning horizon. The fluctuation occurs as design hour operations change as a function of the average day operations. Conditions that involve the determination of the weighted hourly capacity and the daily demand are not forecast to change significantly at Little Rock National Airport in the future, and those variables are likely to remain fairly constant through the planning period.

Comparing the ASV to the 2036 forecast demand of 117,965 annual operations, or 56% of ASV, it can be concluded that no new runways are required within the planning period covered in this Master Plan Update. Typically, when demand reaches 60%-70% of ASV, planning for additional capacity is often initiated.

3.2.3 Runway Analysis

3.2.3.1 Runway Length Analysis

This section summarizes the assessment of takeoff and landing runway length requirements for the current and future fleet mix at the Airport. The assessment was conducted based on guidance provided in Federal Aviation Administration (FAA) *Advisory Circular 150/5325-4B, Runway Length Requirements for Airport Design*, information from the performance charts published by airplane manufactures' Airport Planning Manuals (APMs), and the following assumptions:

- Airport elevation of 266 feet above mean sea level
- Standard day temperature (SDT) is 59° Fahrenheit (F) or 15° Celsius (C); SDT + 27° F (SDT + 15° C) equals 86° F or 30° C
- Mean daily maximum temperature of hottest month at the Airport is 93° F or 34° C
- Average passenger weight with bags is 220 lb. per person (190 lb. for passenger plus 30 lb. for bags)
- Average cargo weight is 10 pounds per cubic foot
- Anticipated aircraft engine types
- Zero wind and zero runway gradient

3.2.3.1.1 Determining Runway Lengths for Large Airplanes and Light Jets

Runway length is determined by two key components, takeoff distance and landing distance, which are both presented in this section.

Key assumptions for the takeoff length analysis include:

1. Maximum takeoff weight (MTOW) was used to determine the maximum takeoff runway length required for long-haul routes.

2. A reasonable operating takeoff weight was calculated to determine the takeoff runway length required for short-haul routes. It is assumed that longest range is 1,784 miles (1,550 nm), which is equivalent to the distance between Little Rock and Seattle. The typical payload was calculated for each aircraft using either (1) the assumed average weight values for passengers and baggage multiplied by the maximum number of seats (i.e., full passengers and bags), or (2) the assumed average weight values for cargo per cubic foot multiplied by the maximum cubic feet of cargo. Based on the payload and the length of haul that is flown on a regular-use basis, a reasonable operating takeoff weight was then determined using the payload/range charts from airline APMs. For length of haul ranges and payload that equal or exceed the payload break point, the operating takeoff weight was set to the MTOW.

3. The takeoff charts with dry runway conditions were then located for SDT and SDT + 27° F (or + 25° F in some cases), assuming zero wind conditions. The MTOW and the reasonable operating takeoff weight were then located on the weight axis on the takeoff runway charts. An airport elevation curve for 266 ft. was developed by interpolating between curves for sea level and 2,000 feet. With the takeoff weights, the takeoff runway length required was read from the charts by proceeding vertically to the airport elevation curve of 266 ft.

4. APMs provide takeoff runway lengths as a function of airport elevation and standard day temperatures. Since Mean daily maximum temperature of hottest month at the Airport exceeds SDT + 27° F, takeoff runway length required was linearly extrapolated from the takeoff runway lengths at SDT and SDT + 27° F.

5. The takeoff runway lengths obtained using the forgoing procedure were then adjusted for non-zero effective runway gradient by increasing the length by 10 feet for each foot of elevation difference between the high and low points of the runway centerline.

Key assumptions for the landing length analysis include:

1. Maximum landing weight (MLW) was used.

2. The landing runway chart with the highest landing flap setting was located in the APM for each aircraft.

3. An airport elevation curve for 266 ft. was developed by interpolating between curves for sea level and 2,000 feet. With MLW, the landing runway length was read from the charts by proceeding vertically to the airport elevation curve of 266 ft.

4. For aircraft types where only dry runway curves were presented in the landing runway chart, the landing runway length under wet conditions was calculated by increasing the obtained dry runway length by 15%.

Figure 3-1 and Figure 3-2 present the takeoff and landing runway length requirements for the selected aircraft types. The lengths required are represented by bars, which are shaded to indicate the runway length necessary for the aircraft to takeoff at reasonable operating weight (in red) and MTOW (in blue).

Based on the results shown on Figure 3-1, the aircraft types studied that cannot takeoff at MTOW are Boeing 737-700, Boeing 737-800, Boeing 737-900, and Boeing 717-200. Moreover, considering the farthest potential future market assumed to be served by the Airport (Seattle), the only aircraft types that cannot takeoff at reasonable operating weight is Boeing 737-900, assuming the range is 1,784 miles (great-circle distance to Seattle-Tacoma International Airport).

Based on the results shown on Figure 3-2, all of the aircraft analyzed could land well within the minimum Landing Distance Available (LDA) on the parallel runways at the Airport, which is 7,200 feet on both ends of Runway 4R-22L.

Figure 3-1
Takeoff Runway Length Required for Critical Aircraft
Airport Master Plan
Bill and Hillary Clinton National Airport

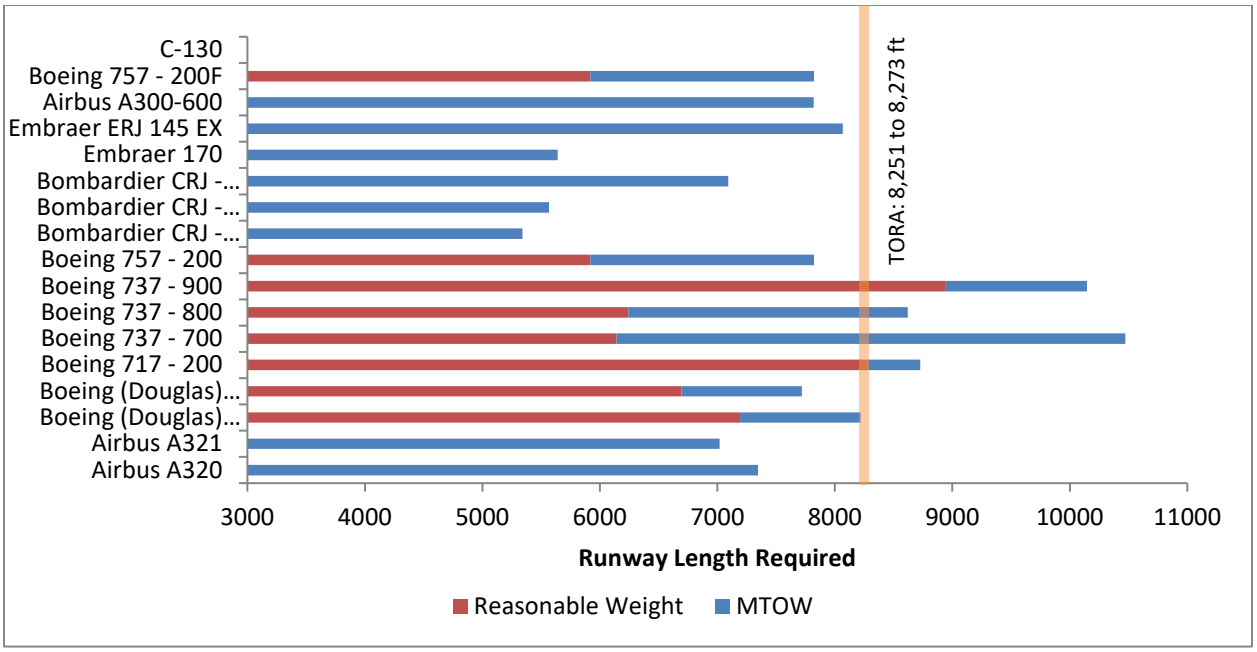
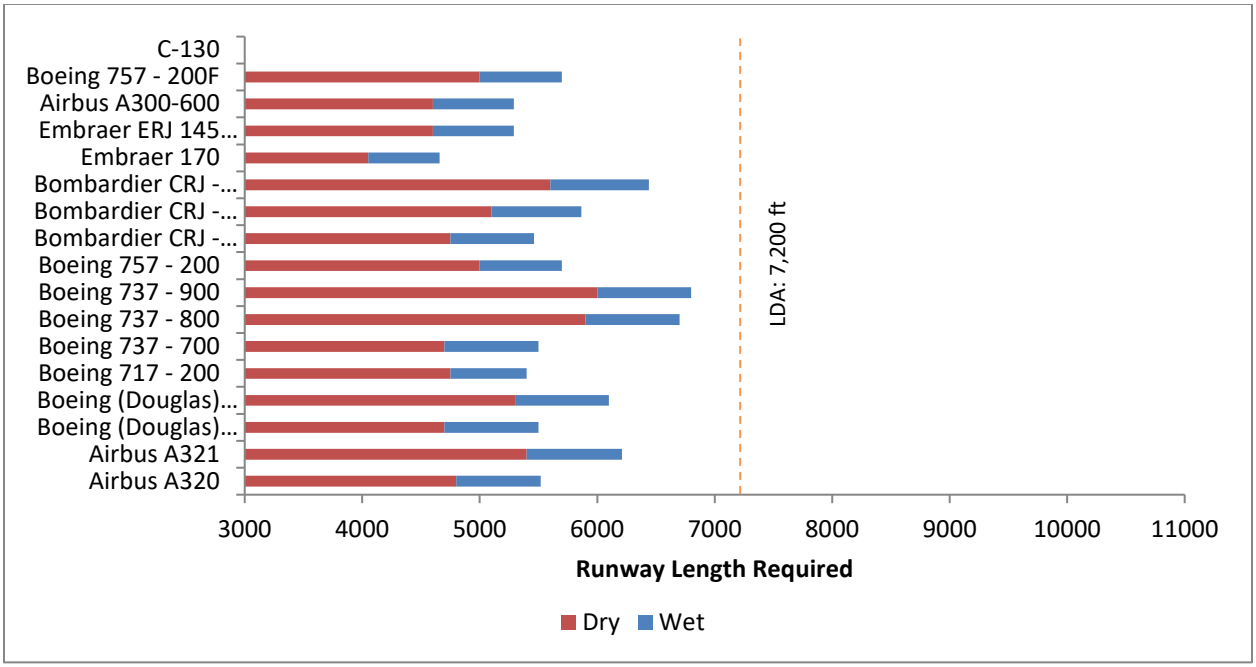


Figure 3-2
Landing Runway Length Required for Critical Aircraft
Airport Master Plan
Bill and Hillary Clinton National Airport



3.2.3.1.2 Methodology for Determining Runway Lengths for Small Propeller-Driven Airplanes

Runway length requirements for planning purposes at commercial service airports are premised upon the specific requirements of the most demanding aircraft that regularly, or will regularly, use the Airport. This information is then supplemented with the information related to the percentage of the large (business jet) general aviation aircraft fleet to be accommodated at the Airport.

For aircraft which weigh less than 60,000 pounds, runway length is measured by two factors: percent of fleet that can be accommodated and % of useful weight. Table 3-7 shows the runway lengths required to accommodate 75% or 90% of the fleet with 60% or 90% useful weight, as prescribed by the FAA *Advisory Circular 150/5325-4B.* Comparing the requirements to the existing facilities, 100% of the fleet up to 60% useful weight can be accommodated using Runway 18-36. At 90% useful weight, more than 75% but less than 100% of the fleet can be accommodated on either of the other longer runways. The aircraft that comprise 75% of the general aviation aircraft fleet between 12,500 and 60,000 pounds include such airplanes as Citations, Falcons, and Learjets.

The Airport is well configured with adequate runway-length to accommodate existing and future takeoffs and landings. Therefore, no runway-extension projects are recommended in this Master Plan.

Table 3-7
Runway Length Requirements for Large Aircraft less than 60,000 pounds
Airport Master Plan
Bill and Hillary Clinton National Airport

Large Aircraft less than 60,000 pounds	Runway Requirement (feet)
75% of fleet at 60% useful loads	4,780
75% of fleet at 90% useful loads	6,780
100% of fleet at 60% useful loads	5,580
100% of fleet at 90% useful loads	9,180

3.2.3.2 Runway and Taxiway Classification and Dimensional Standards

Runway and taxiway dimensions are recommended with respect to the Airport Reference Code (ARC) and the Taxiways Design Group (TDG) designations. The ARC designation for Runways 4L-22R and 4R-22L is D-IV, which accommodates the critical aircraft identified in the current and forecast in the future fleet mix. The Runway designation for 18-36 is currently a C-II, but is has an ultimate designation of D-III and currently serves many D-III category aircraft. The taxiways associated with Runways 4L-22R and 4R-22L are TDG V and the taxiways associated with Runway 18-36 are a mixture of TDG IV and V depending on the traffic specific to each taxiway. Occasionally TDG VI aircraft utilize the airfield.

Each Runway and associated system of taxiways and aprons should be designed to meet the standards for its ARC as explained in the FAA Advisory Circular 150/5300-13, Airport Design. Existing dimensions and the corresponding design criteria applicable to Runways 4L-22R, 4R-22L, and 18-36 and the associated taxiways are contained in Table 3-8. The facilities associated with these runways meet or exceed most of the dimensional and layout requirements. Deficiencies in dimensional standards are shown in the tables in red text.

Air carrier traffic utilizes the taxiways east of 4L-22R. Cargo traffic going to the heavy duty apron in the GA FBO area uses Taxiways D and B. Departing cargo traffic sometimes use Taxiway C enroute to 22R. West of Runway 18-36, the taxiways are utilized exclusively by GA traffic and the cargo traffic going to the heavy duty FBO ramp. All taxiways utilized by air carrier traffic meet Taxiway Design Group 5 standards. West of Runway 18-36 the taxiways meet TDG 4 standards except for the cargo route that meets TDG 5 standards.

Table 3-8
Runway Dimensional Criteria
Airport Master Plan
Bill and Hillary Clinton National Airport

Item	Runway 4L-22R		Runway 4R-22L		Runway 18-36		
	Existing Dim.	ARC D-IV w/ vis > 3/4 mile.	Existing Dim.	ARC D-IV w/ vis > 3/4 mile.	Existing Dim.	ARC C-II w/ vis > 1 mile	ARC D-III w/ vis > 1 mile
Runway Design:							
Width	150	150	150	150	150	100	150
Shoulder Width	25 Paved	25 Paved	25 Paved	25 Paved	10 Unp	10 Unp	25 Unp *(d)*
Blast Pad	200 x 460	200 x 200	200 x 200	200 x 200	**No pad**	150 x 120	200 x 200
	200 x 200	200 x 200	200 x 200	200 x 200	150 x 120	150 x 120	200 x 200
Crosswind Component	10.5 knots	20 knots	10.5 knots	20 knots	10.5 knots	16 knots	16 knots
Runway Safety Area							
Beyond Runway End							
	1,000	1,000	1,000	1,000	**882**	1,000	1,000
	755 *(a)*	1,000	1,000	1,000	1,000	1,000	1,000
Width	500	500	500	500	**500**	500	500
Runway Obj. Free Area							
Beyond Runway End							
Runway 4L	1,000	1,000	1,000	1,000	882	1,000	1,000
Runway 22R	**755 *(a)***	1,000	1,000	1,000	1,000	1,000	1,000
Width	800	800	800	800	800	800	800
Runway Obs. Free Zone							
Length	200	200	200	200	200	200	200
Width	400	400	400	400	400	400	400
Precision Obs. Free Zone							
Beyond Runway End	200	200	200	200	N/A	N/A	N/A
Width	800	800	800	800	N/A	N/A	N/A
TDG 5 Taxiways:							
Width	75	75	75	75	75	75	75
Shoulders	**Varies *(b)***	30 Paved	**Varies *(b)***	30 Paved	**Varies *(b)***	30 Unp	30 Unp *(d)*
Runway Centerline to:							
Holding Position	250	250	250	250	250	250	250
Parallel T/W CL	400	400	400	400	400	300	400
Aircraft Parking Area	1,000+	500	1,000+	500	500+	400	500

(a) RSA undershoot/overrun corrected by standard EMAS installation.
(b) Existing shoulder widths vary. Taxiway shoulders are expected to be paved as taxiways are reconstructed or rehabilitated.
(c) Paved shoulders are recommended for ADG III runways, however they are not required.

Sources: FAA Advisory Circular 150/5300-13A, *Airport Design;* Garver analysis of existing airfield, 2017.

3.2.3.3 Pavement Condition

A Pavement Classification Number (PCN) evaluation was completed as part of the eALP project concurrent with the Master Plan. This evaluation included the following pavements:

- Runways 4L-22R, 4R-22L, and 18-36
- Taxiways R, Y, S, T, V, W, T, and U, associated with Runway 4R-22L
- Taxiways F, E, G, P (East), H, J, and M (East), associated with Runway 4L-22R
- Taxiways B, C, D, P (West), and M (West), west of Runway 4L-22R
- Taxiways A, K, L, and Z, associated with Runway 18-36
- Fly Arkansas Ramp, North TAC-Air Ramp, and South TAC-Air Ramp

The International Civil Aviation Organization (ICAO) requires member states to publish information on pavement strengths using a standard methodology. ICAO has thus adopted the Aircraft Classification Number (ACN) and Pavement Classification Number (PCN) system. This system allows the user to express the effect of an individual aircraft on different pavements with a single standardized number, which varies according to aircraft weight, gear configuration, pavement type, and subgrade strength.

The ACN expresses the relative effect of an aircraft on the pavement for a specified standard subgrade strength. To complement the ACN, the load-carrying capacity of a pavement can be expressed with a single standardized number, the Pavement Classification Number (PCN), without specifying a particular aircraft or detailed information about the pavement's structure. This method is designed so that a pavement with a particular PCN value can support an aircraft that has an ACN value equal to or less than the pavement's PCN.

Based on the evaluation, the pavements on most of the taxiways and ramps are structurally adequate, with PCN values greater than the ACN values of the aircraft in the fleet mix. According to the ACN-PCN system, this means that most of the taxiways and ramps can allow the forecasted traffic operations without limits. A few taxiway sections including portions of Taxiways A, B, and P and the Lynx FBO Ramp, especially sections with thin asphalt pavement, were indicated to have PCN values lower than the ACN values of some of the aircraft.

In 2011, PCN evaluations were completed for all three runways at LIT utilizing existing and forecasted traffic. These existing PCN evaluations were re-evaluated utilizing updated traffic data since it varied significantly from the data in 2011. All three runways are structurally adequate for the current evaluation traffic, except for approximately 5,200 feet of pavement from the Runway 36 end of Runway 18-36.

PCN evaluation results can be affected by the pavement structures, evaluation traffic (including aircraft types and frequencies), and the conditions of the pavement materials. It is recommended that the Runway pavement strength continue to be monitored at regular intervals.

3.2.3.4 Navigational Aid Requirements

Navigational Aids (NAVAIDS) for the majority of the airfield facilities and approaches are sufficient across the airfield. LIT does have a few non-standard conditions that are discussed below:

- The airport does not currently have a primary L-807 wind cone. It is recommended that these items be constructed and installed to the west of the primary Runway 4L-22R, outside both runway object free areas (ROFAs) and taxiway object free areas (TOFAs), to comply with AC 150/5340-30H item 6.6 Wind Cones (a primary wind cone is required at Part 139 airports).

- All runways except Runway 36 have supplemental L-806 wind cones. It is recommended to add a lighted supplemental wind cone west of Runway 36 just outside the runway safety area (RSA) so that pilots have an unobstructed view during either landing or takeoff. Supplemental wind cones provide important wind direction indication to pilots on approach and takeoff at their respective runway end.

- Runways 4L, 22R, and 4R do not currently have visual approach slope guidance. It is recommended to construct and install new FAA owned and maintained 4-box light unit L-880 Precision approach path indicator (PAPI) systems for these three runways. PAPI systems enhance safety by providing beneficial visual approach slope guidance to assist pilots of aircraft in flying a stabilized approach.

- Runway 36 is currently served by a FAA owned and maintained visual approach slope indicator (VASI) system. The VASI system is an older visual approach slope guidance model which is still being supported by the FAA, but local FAA staff have noted that obtaining spare parts for this system has become more difficult due to its age. It is recommended to update this to a new FAA owned and maintained 4-box light unit L-880 PAPI system.

- Runway 4R has a partial in-pavement medium intensity approach lighting system with runway alignment indicator lights (MALSR) system that coincides with the runway in-pavement centerline lighting. The airfield lighting control and monitoring system (ALCMS) is interlocked with the FAA MALSR control equipment such that the centerline lights in this area are de-energized whenever the MALSR approach lighting system is energized. This configuration is acceptable to current FAA advisory circular and order requirements when these systems coincide with each other, so no changes are required.

- Runway 22L has an offset localizer off the south end. The capture effect glideslope and its shelter building are located on the west side of the runway outside the RSA but within the ROFA. This is allowed per case-by-case evaluation by the FAA in accordance with Table 6-1 in AC 150/5300-13A and these locations were constructed as directed by the FAA in order for the localizer and glideslope systems to function properly. In essence, these items are fixed-by-function, therefore no changes are required.

- Runway 4L localizer is 947 feet from the runway end, and inside the 1000 feet RSA. This localizer was constructed as directed by the FAA. The AC 150/5300-13A states the airport owner and the FAA must continually analyze a non – standard RSA with respect to operational, environmental, and technological changes and revise the determination as appropriate. This might involve realigning the access road to create room for moving localizer to 1000’ from the runway end.

- Runway 4R has a localizer located off the north end. The localizer shelter building is outside the RSA but inside the ROFA. This is due to the constraint of the land area developed for the runway safety area past the runway threshold including its width. Typically, these shelters associated with certain NAVAIDs are not considered to be fixed-by-function in regards to the RSA or ROFA unless

operational requirements bear them to be near the NAVAID. These locations were constructed as directed by the FAA, but it is recommended that this shelter building be evaluated with the FAA to verify that operationally it must be this close to the localizer, or if the building and its equipment could be relocated to be adjacent to the MALSF shelter building, which is located outside the RSA and ROFA.

3.2.3.5 Airfield Operational Requirements

Facility Dimensional Characteristics are not the only consideration in the development of facility requirements. An analysis of the operational and layout characteristics of the Airport determines the need for future facility additions or modifications to enhance safety, promote efficient operations on the airfield, and accommodate traffic demands.

- Irregular operations (IRR Ops) for the Airport include occasional diversions of cargo traffic from Memphis of large aircraft. The aircraft typical of these cargo diversion flights are Boeing 777, DC-10, MD-11 and Boeing 757. Flights by these large aircraft use the 4L-22R runway and associated taxiways. Future alternative considerations for 4L-22R should include dimensions, pavement strengths and layouts to continue to accommodate these irregular operations.

- There is currently no dedicated access to the private industry tenant located on the airfield. Alternatives should determine whether developing dedicated access is desirable or advantageous to the Airport.

- Local Air Traffic Control requested that the Master Plan team consider a bypass exit taxiway for Runway 22R, which could allow more flexibility for takeoff sequencing.

- Currently air carrier aircraft overnight at every gate every night, and one aircraft stays overnight on the remain overnight (RON) ramp. There are frequently cargo diversion flights that must remain overnight at the airfield as well. With the terminal ramp and gate area at capacity for RON activity, consideration should be given for additional ramp locations to accommodate diversion and RON activity. Currently the solution for additional large aircraft parking is to close a portion of a taxiway and park the planes there. In the past, Runway 18-36 has been closed and utilized for aircraft parking. The FAA recommends for safety that Airports avoid using taxiways and runways for aircraft parking areas. In addition to diversion and RON activity to be accommodated, there is frequently a need for and area for helicopter parking and aircraft run ups. Alternatives should be considered to develop apron area for these uses.

3.2.4 FAA Design Standards

The following discusses airfield requirements related to existing and new FAA design standards and policies.

3.2.4.1 Modifications of Design Standards

The airfield currently has three FAA approved Modification of Standards (MOS), which are:

- Runway Safety Area (RSA) beyond the stop end of Runway 22R has less than standard length, corrected with Engineered Materials Arresting System (EMAS)

- Taxiways A, B, C, D, K, L, and P do not have paved shoulders as required for surfaces accommodating ADG-IV and higher aircraft.

- The TDG-4 taxiway fillet geometry at the intersections of Taxiway A at Taxiways B, D, L and K modified to accommodate an MD-11 aircraft.

3.2.4.2 Deviations from Design Standards

To the extent practical, the alternatives analysis will review potential improvements to rectify these design deviations. Options include physical geometry changes, operational restrictions (e.g. reduction in ADG/TDG movements, restrictions under certain conditions, or operations escort), and preparing additional MOS for FAA approval.

3.2.4.2.1 Current Non-Standard Conditions

Several non-standard conditions exist on the current airfield:

- Runway Object Free Area beyond the stop end of Runway 22R
- Runway Safety Area beyond the stop end of Runway 18
- Runway Object Free Area beyond the stop end of Runway 18
- Runway Safety Area width for Runway 18-36
- A Blast Pad is required for Runway 18 end
- The five-way intersection of taxiways B, P, and C, is non-standard and not recommended according to the most current FAA airfield design guidance.
- At the south end of Taxiway A wing tip clearance is restricted to less than 79 feet because of the proximity to the perimeter road. To accommodate all GA traffic, alternatives should be considered to increase the wing tip clearance in this area to more than 79 feet.

3.2.4.2.2 Requirements per new FAA AC Guidelines

New guidance from the FAA identifies additional non-standard conditions on the existing airfield:

- Paved shoulders required for taxiways, taxilanes, and aprons for ADG-IV and higher aircraft
- Measures should be taken to eliminated direct aircraft parking ramp to runway access

3.2.4.3 Runway Incursion and Surface Incident History

Historical runway incursion and surface incident data was reviewed for the Airport dating back from 2013 to 2016. Sources included the FAA's Airport Incidents Database System (AIDS) and Airport incident records. A total of 13 incidents were reported during this time including four in the vicinity of the intersections of Taxiway A, Runway 18-36, and Runway 4L-22R, which is currently designated as an FAA Hot Spot. Alternatives for this area of the airfield should be developed and evaluated for safety and operational improvements.

3.2.4.4 Hot Spots

The FAA defines a Hot Spot as a location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and surface vehicle drivers is necessary. Hot Spots are defined from Runway Safety Action Team meetings and from analyzing incursion/incident history.

The close proximity of the ends of Runways 36 and 4L sometimes causes pilot confusion. It is recommended that alternatives be considered to increase the separation of those two runway ends to increase operational safety on the airfield.

3.2.4.5 Runway Incursion Mitigation

FAA's Advisory Circular (AC) 150/5300-13A, consolidates a variety of recent research findings related to airfield safety. Previously airfield safety enhancement bulletins had been published in FAA orders and engineering briefs. The research correlates existing design geometries with incursion history as well as the future potential for an incursion to take place. The FAA found that there are specific airfield geometries that can result in incursions and have broadly identified them as follows:

- Runways – complex or too many runway intersections; runways beginning near the intersection of a crossing runway; misaligned runway arrival thresholds (pilots can misidentify a runway as a taxiway or vise-versa);
- "High energy intersections" – Aircraft should not have runway crossing points in the middle third of a runway to provide enhanced pilot situational awareness
- Taxiways – complex taxiway intersections with greater than two intersecting paths; extra-wide taxiway pavements impacting signage visibility; taxiways that lead directly from a ramp to a runway; direct runway crossings from one runway to another; entrance taxiways to runways (need to visually delineate both the taxiway and runway for approaching aircraft)
- Runway/taxiway and taxiway/taxiway intersections – Right angles provide the best left and right visibility for a pilot at an intersection
- Dual use pavements – Maintaining a single/dedicated use of airport pavements reduces confusion and enhances pilot situational awareness

There are several taxiways that provide direct apron to runway access which is no longer supported by current FAA airfield design guidance *AC 150/5300-13A, Airport Design*. Taxiways M, J, P all provide direct ramp access to 4L-22R. Alternatives should be considered to eliminate direct access between runways and aprons.

3.2.4.6 Runway Safety Areas

Runway Safety Areas are designated to provide clear space in the event that an aircraft overruns runway pavement or veers off the runway surface. At Little Rock, all runway safety areas are compliant with FAA guidance.

3.3 PASSENGER TERMINAL

An extensive Terminal Redevelopment Program (TRP) is underway at the Bill and Hillary Clinton National Airport. This section describes the history of the program and provides context for Terminal requirements calculated as part of this Master Plan.

3.3.1 Background and Historical Context

The existing Terminal building at the Airport opened in 1972, prior to airline deregulation, low-cost carriers, regional jets, passenger and baggage screening, and online or mobile check-in. By the early 2000s, the Terminal had been adapted numerous times to meet the changing demands of the traveling public. Airline traffic grew steadily throughout the late 1990s and early 2000s. Since then the TRP has experienced several evolutions as described below.

- The 2003 Master Plan showed passenger traffic growing to nearly 1.8 million enplanements by 2020. The Commission undertook a study to explore the potential for long-term expansion or replacement of the Terminal building.
- A 2006 Terminal study presented a Terminal replacement option which could accommodate 16 to 20 aircraft parking positions and process 2 million passengers per year. However the investment in new Terminal buildings, airfield facilities, and landside facilities was deemed to be cost prohibitive.
- By 2008, projections for enplanement growth had dropped substantially, as a result of changes in economic conditions. A terminal planning study, known as Vision 2020, forecast 1.3 million annual enplanements in 2020. Accordingly, the planning study explored options for renovating and expanding the existing Terminal building to accommodate passenger growth. Two schemes were finalized which would either expand the Terminal linearly or laterally. Lateral expansion was selected because of several advantages to accommodate long-term passenger growth.
- In 2010, the Airport advanced the TRP with the renovation and expansion of the Departures Hall at the eastern end of the Terminal building. The project included expansion of baggage handling facilities and relocation of Airport administrative offices.

The forecast for this Master Plan shows enplanement levels in 2020 of approximately 1.03 million annual enplanements with growth to 1.31 million annual enplanements by 2036. However, rather than discard the current TRP concepts, this Master Plan seeks to balance passenger level of service, replace aging facilities, and maintain the affordability of new facilities.

3.3.2 Terminal Requirements Methodology and Key Assumptions

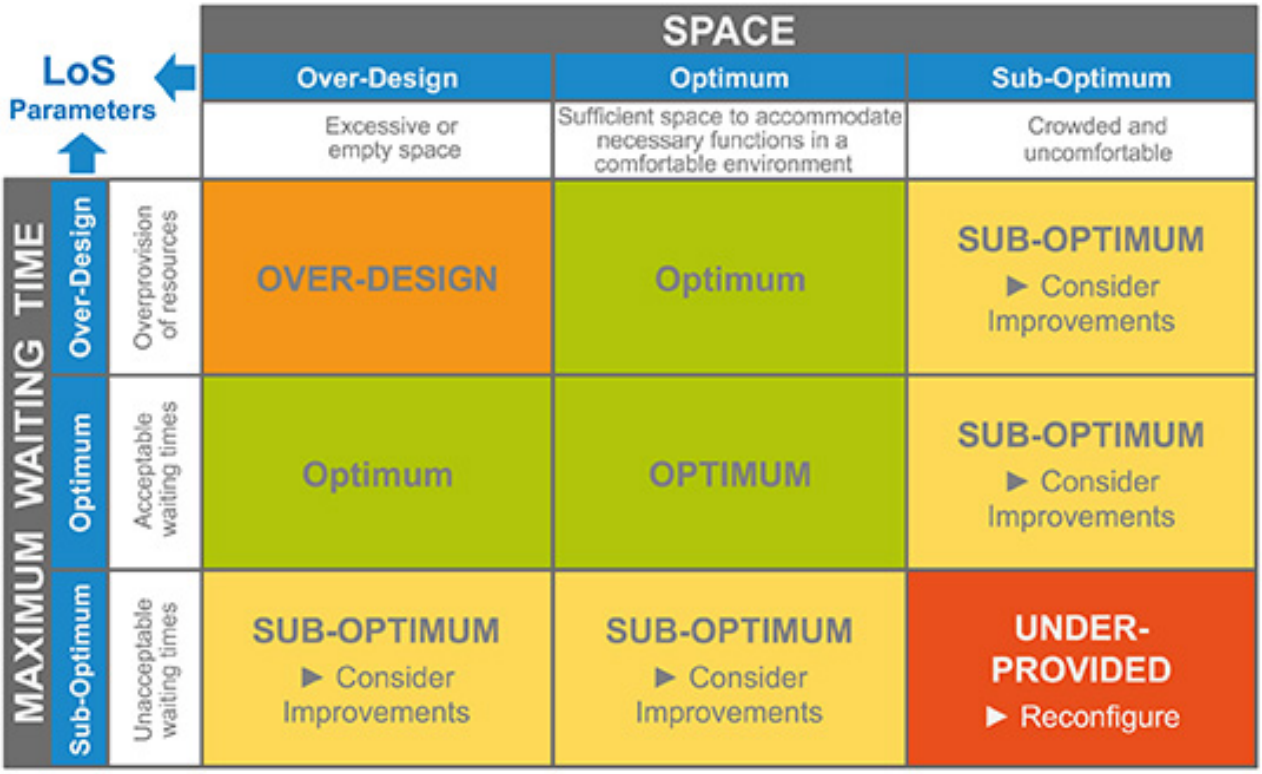
The Master Plan assessment of passenger terminal facility requirements is based on the following primary objectives:

- Addresses which phase of the TRP best address the needs of passengers using the terminal facility.
- Determine demand-based trigger points for next construction phase(s) of the TRP.

Terminal facility requirements were developed using a spreadsheet-based model. This model is based on the planning guidelines published in the Airport Cooperative Research Program (ACRP) Report 25: *Airport Passenger Terminal Planning and Design,* developed by the Transportation Research Board (TRB), and supplemented by benchmarks for comparable airports, industry-wide trends, data and previous planning studies provided by Airport staff, and site observations of existing conditions.

For planning purposes, it is assumed that future terminal facilities will be developed to meet Level of Service (LOS) "Optimum" standard as defined in the 10th edition of the International Air Transport Association's (IATA) Airport Development Reference Manual (ADRM). General planning factors as recommended on the IATA Level of Service framework were assumed in the development of facility requirements. Level of service is a measure of the quality of service provided to customers inside the terminal in terms of ease of flows and delays. LOS "Optimum" corresponds to a situation of overall good levels of service, where flows are stable, delays are acceptable, and a good level of comfort is provided.

Figure 3-3
New Level of Service Guidelines
Airport Master Plan
Bill and Hillary Clinton National Airport



Source: IATA.

3.3.3 Peak Hour Passenger Activity

A summary of the existing flight schedules was used to calculate a peak hour passenger load for the 2016 baseline activity level. Future design day flight schedules were not developed as part of this forecast update. Instead, future peak hour passenger loads were derived by assuming peak hour linear growth matching overall forecast growth of 1.4%, as shown in Table 3-9. Peak hour passenger growth may be higher or lower than this forecast growth depending on whether airlines add flights during the current peak hour or at other less busy times of the day.

Table 3-9
Peak-Hour Passenger Activity
Airport Master Plan Update
Bill and Hillary Clinton National Airport

	2016	2021	2026	2031	2036
1.4% annual growth					
Annual Enplaned	997,085	1,045,170	1,120,990	1,209,925	1,314,030
Peak hour ePAX	316	331	359	391	428
Total peak PAX	631	661	717	780	854

Source: Mead and Hunt, July 2017.

3.3.4 Functional Terminal Space Requirements

The passenger terminal requirements are taken from the Vision 2020 and the TRP. Minimal work was performed in this Master Plan to confirm the required size for certain key functional areas including:

Airline gate and remote aircraft parking requirements

Terminal building configuration, age, and condition

Hold room seating space

Baggage claim frontage length

3.3.4.1 Terminal Redevelopment Program Summary

The Schematic Basis of Design document prepared by Architectural Alliance and dated July 2014 contains a program for key functional spaces within the terminal building. A summary of those requirements is shown in Table 3-10.

Table 3-10
July 2014 Terminal Redevelopment Program Space Requirements
Airport Master Plan Update
Bill and Hillary Clinton National Airport

All areas shown in square feet

Terminal Commons			
Level 1		Level 2	
Commons	36,400	Commons	34,400
		Open Floor/Volume	(17,500)
Arrivals Hall			
Level 1		Level 2	
Public Claim Area	28,800	Office/Support and Public Area	24,600
Office & Circulation	7,200		
Secure Bag Lay-down	15,000		
		Existing Baggage Claim Demo Area	31,000
Federal Inspection Service (FIS)			
Level 1		Level 2	
Co-utilized Baggage Lay-down & Circulation	3,000	New Immigration, Sterile Corridor & Vert. Circ.	6,600
Developed for Customs	8,800	Immigration	8,000
Concourse			
Level 1		Level 2	
Concourse	98,000	Concourse	60,000
		Apron Pavement Replacement	250,000
Ticket Lobby			
Level 1			
Ticket Lobby Expansion	3,200		
Ticket Lobby			
Level 1		Level 2	
Dock	3,200	Building Addition	2,000
Staging	3,000		
		Truck Yard	20,000
		Concourse airside loading docks	500

Source: Vision 2020, Architectural Alliiance

It is not the goal of this Master Plan to revisit the program for the TRP. However, it is recommended that program validation precede any preliminary engineering. Opportunities may exist to reduce the initial construction footprint to reduce cost while meeting level of service standards for the "opening day" of the Arrivals Hall and Concourse facilities.

3.3.4.2 Airline Gate and Remote Aircraft Parking Requirements

The number of airline gates required at an airport is typically a result of the maximum number of simultaneous aircraft loading and unloading operations, or more broadly from the number of simultaneous commercial aircraft on the ground at peak times. Aircraft gate requirements are assessed by analyzing the ADPM flight schedule.

Currently the Bill and Hillary Clinton National Airport does not serve as a hub for a major airline. This has the effect that major airlines with nearby hubs (e.g., American at Dallas, United at Houston, etc.) use Little Rock as a destination for the last flight of the day, and as a starting point for the first flight of the day. Therefore, the highest demand for aircraft parking positions in the current flight schedule is after the last flights arrive at 11 pm until the first flights leave at 6 am. This results in a significant number of aircraft parking at Little Rock overnight. A summary of the existing flight schedule indicates that there are approximately 12 commercial aircraft parking overnight at Little Rock.

The need for contact gates is also closely associated with the number of remote parking positions. At some airports, nearly all aircraft can be simultaneously accommodated by contact gates, which provide a high level of service to airlines and passenger. However, at other airports there are only enough contact gates for the number of aircraft being simultaneously loaded, and remote parking positions provide capacity for those aircraft which are idle or being stored for flights later in the day. Since remote parking positions are typically associated with lower capital and maintenance costs than contact gates, some airports choose to provide remote parking positions to reduce costs while accommodating flight schedules.

Another factor which influences the required number of airline gates is the Airport's gate usage policy. Some airports allow airlines to have "exclusive" gates which cannot be used by other airlines. Other airports encourage or require airlines to share gates designated as "common-use". Many Airports have a mix of dedicated and common use gates, or "Semi-exclusive" policy, to accommodate the unique needs of each airline serving the airport. Ownership of the passenger boarding bridge or other supporting infrastructure can sometimes dictate the airport's gate usage policy. Little Rock Airport now owns 10 out of the existing 12 passenger boarding bridges and has plans to replace the remaining two, which will offer the opportunity for maximum flexibility in the gate allocation policy.

The 2008 Terminal Planning Study, which used a future forecast of 76 commercial departures on the design day, found that 14 gates would be sufficient to accommodate demand under a semi-exclusive or that 10 gates could accommodate demand under a common use policy. By comparison, this Master Plan considers a 2036 demand of the existing 44 departures per day at 1.4% growth, or 58 departures per day.

In conclusion, the existing 12 airline gates are sufficient to accommodate demand throughout the planning horizon. During construction phases, it is likely that the Airport could accommodate demand with only 10 airline gates. Providing an increase in the number and use of remote aircraft parking positions will make it easier to manage overnight aircraft parking demands and provide additional aircraft storage space during construction periods. Alternatives to provide additional remote aircraft parking are explored in this Master Plan.

3.3.4.3 Terminal Building Configuration, Age and Condition

Key considerations for the TRP include the configuration, age and condition of existing infrastructure. The existing configuration is unconventional among modern airport terminal buildings, with departures and

arrivals facilities perpendicular to one another. The ninety degree turns on the curbside roadway are also unique and could present wayfinding challenges to passengers unfamiliar with the Airport.

The age and condition of some building systems, most notably the heating, ventilation, and air conditioning (HVAC) system have reached the end of their useful lives. Some replacements have already been made with new boilers and chillers. However, the TRP proposes to expand the total footprint of the building in both the Arrivals Hall and the Concourse stages of the program. Any expansion of the footprint would put additional strain on the aging HVAC infrastructure. Therefore, one of the first projects needed to advance the TRP is a new Central Utility Plant (CUP) featuring new or relocated HVAC, Electrical, Water, and Wastewater infrastructure.

3.3.4.4 Hold Room Seating Space

Hold rooms are the areas within the secure portion of the terminal where passenger wait to board flights. Size requirements are based on the number of passengers on each flight and are therefore provided by aircraft group size. ACRP Report recommends 2,700 square feet of hold room space per ADG-III aircraft for optimum passenger accommodating. Currently the terminal building features approximately 22,770 square feet of hold room space for 12 gates, or approximately 1,900 square feet per gate. The space is particularly constrained in the north end of the concourse, also called the rotunda, where six gates are served by a single round hold room space. This area is congested when more than three aircraft are loading from or unloading onto the rotunda simultaneously.

3.3.4.5 Baggage Claim Frontage Length

Baggage claim frontage is intended to ensure that passengers have adequate space to stand while waiting for baggage. Requirements are calculated using the peak number of one-way arriving passengers and assuming a luggage retrieval time of 20 minutes. Conservatively, the analysis assumes that all passengers on arriving flights have an average of one checked bag, which accounts for passengers with no checked luggage and for those with multiple pieces of checked baggage. ACRP Report 25 suggests that 3.0 linear feet per passenger provides Level of Service A, or Optimum. Baggage claim frontage requirements are shown in Table 3-11. Additionally, the existing "L-shaped" configuration of bag claim devices does not provide optimal wayfinding for passengers seeking to retrieve their baggage.

Table 3-11
Baggage Claim Frontage Requirements
Airport Master Plan Update
Bill and Hillary Clinton National Airport

	2016	2021	2026	2031	2036
Peak-hour arriving passengers	315	330	358	389	426
Peak 20-minute passengers	105	110	120	130	142
Baggage frontage requirement (lf)	315	330	360	390	426

The existing baggage claim provides five carousels featuring a total of 470 linear feet. Therefore the existing baggage claim facilities are adequate to accommodate demand.

3.4 GROUND TRANSPORTATION AND PARKING

The following summarizes estimated requirements for roadways, curbsides, parking, and rental car facilities. Requirements were developed based on information from Airport staff, experience at similar airports, and industry standards for an acceptable level of service (LOS) throughout the planning period. Existing ground transportation facilities are unique among small hub airports and the unconventional configuration of roadways and parking facilities could result in confusion for passengers unfamiliar with the Airport.

3.4.1 Terminal Roadways

Terminal access roadway requirements are based on an analysis of the estimated and projected future peak hour traffic volumes along individual roadway segments. For each roadway segment the projected peak or design hour vehicle volume was compared to the hourly capacity of the roadway to determine the volume to capacity (v/c) ratio. The capacity is dependent upon the number of lanes and the nature of traffic. Typically, highways that accommodate vehicles at a high rate of speed have a higher capacity than arterial roadways which are subject to slower speeds. As traffic enters the terminal area, the decreased speeds approaching the terminal curbside and the number of decision points (e.g. parking, rental car entrances, etc.) impact the roadway capacity. The Airport's roadways were analyzed using a 30 mph LOS criteria from ACRP Report 40, *Airport Curbside and Terminal Area Roadway Operations*, as summarized in Table 3-12.

Table 3-12
Levels of Service Criteria for Airport Roadways
Master Plan Update
Little Rock National Airport

Volume/Capacity Ratio	Level of Service
0.00-0.26	A
0.26-0.41	B
0.41-0.60	C
0.60-0.79	D
0.79-1.00	E
1.00-5.00	F

Source: ACRP 40, Airport Curbside and Terminal Area Roadway Operations.

ACRP Report 40 uses letters A through F to identify operational performance with LOS A representing free flow conditions with no delay and LOS F representing gridlock situations with a v/c ratio over 1.0. If the LOS of a segment decreases below LOS D additional lanes would be needed.

The existing peak hour volumes are not based on traffic counts, rather are based on a total two-way passenger volume of 631 and an assumed average vehicle occupancy of 1.15, plus additional employee, airport tenant, and other traffic generators. These volumes were assigned to the roadway network based on their origin-destination pair. Future traffic volumes were scaled linearly with the enplanement forecast. Table 3-13 shows that each of the roadway segments analyzed currently perform with LOS B or better and are expected to perform with LOS C or better through the planning horizon. This indicates that no new roadways or roadway expansions are required.

Table 3-13
Levels of Service Results for Airport Roadways
Master Plan Update
Little Rock National Airport

Total two-way peak hour passengers *(a)*	631	661	717	780	854
1) Airport Rd NB (S of signal)	872	931	1,017	1,113	1,222
Lanes	2	2	2	2	2
Capacity / Lane	1,500	1,500	1,500	1,500	1,500
V / C Ratio	0.29	0.31	0.34	0.37	0.41
Level of Service	B	B	B	B	B
2) Airport Rd NB (N of signal)	893	953	1,041	1,139	1,251
Lanes	2	2	2	2	2
Capacity / Lane	1,500	1,500	1,500	1,500	1,500
V / C Ratio	0.30	0.32	0.35	0.38	0.42
Level of Service	B	B	B	B	C
3) Temple St NB, N of Taxiways	318	351	387	427	472
Lanes	1	1	1	1	1
Capacity / Lane	1,500	1,500	1,500	1,500	1,500
V / C Ratio	0.21	0.23	0.26	0.28	0.31
Level of Service	A	A	A	B	B
4) Temple Street southbound	318	351	387	427	472
Lanes	1	1	1	1	1
Capacity / Lane	1,500	1,500	1,500	1,500	1,500
V / C Ratio	0.21	0.23	0.26	0.28	0.31
Level of Service	A	A	A	B	B
5) Curbside Entry Roadway	576	603	654	711	779
Lanes	2	2	2	2	2
Capacity / Lane	1,000	1,000	1,000	1,000	1,000
V / C Ratio	0.29	0.30	0.33	0.36	0.39
Level of Service	B	B	B	B	B
6) Airport Exit Roadway	576	603	654	711	779
Lanes	2	2	2	2	2
Capacity / Lane	1,500	1,500	1,500	1,500	1,500
V / C Ratio	0.19	0.20	0.22	0.24	0.26
Level of Service	A	A	A	A	A
7) Right turn to Airport Rd SB	554	581	630	685	750
Lanes	1	1	1	1	1
Capacity / Lane	1,500	1,500	1,500	1,500	1,500
V / C Ratio	0.37	0.39	0.42	0.46	0.50
Level of Service	B	B	C	C	C

(a) Peak hour passengers from Master Plan Forecast.

Capacity per lane characterized by type of roadway.

3.4.2 Curbside Facilities

Curbside requirement calculations take into account the physical curb layout (length and number of lanes), and operational practices such as dedicated allocation of space to different vehicle types and the duration of time vehicles are stopped on the curbside also known as dwell time. Requirements for this Master Plan Update are based on total two-way peak hour passengers with an assumed 1.15 passenger per trip and a conservative assumption of four-minute dwell time for all vehicles. Note that the curbside is not broken out into public, commercial, or shuttle bus traffic. Therefore, this analysis is agnostic to ground access shifts currently happening at Little Rock and other airports such as the increase in the percentage of vehicles operating as transportation network companies (TNCs). The assumed market share of passengers using the curbsides is assumed to increase at 1% per year. The number of simultaneous loading / unloading spaces on the curbside is shown in Table 3-14.

Table 3-14
Curbside Roadway Space Requirements
Master Plan Update
Little Rock National Airport

Future Forecast Year	2016	2021	2026	2031	2036
Total two-way peak hour passengers	631	661	717	780	854
Assumed curbside market share *(a)*	39.6%	42.6%	45.6%	48.6%	51.6%
Total peak-hour vehicles	208	234	272	316	367
Average dwell time *(b)*	4.0	4.0	4.0	4.0	4.0
Simultaneous positions required *(c)*	20	22	25	29	33
Equivalent linear curbside length *(d)*	500 ft.	550 ft.	625 ft.	725 ft.	825 ft.

(a) Assumes 1% annual growth on top of passenger growth, for new ground transportation providers.
(b) Based on historical data and industry averages, no surveys were conducted.
(c) Calculates average positions occupied and applies factor to ensure available curbside 95% of the time.
(d) Metered spaces on the curbside can also satisfy curbside space requirements, average vehicle length = 25 ft.

Currently the Airport curbside roadway features multiple curbside loading areas which provide a total of 50 simultaneous vehicle loading / unloading spaces. The TRP includes provision for approximately 1,800 linear feet of curbside, or approximately 72 curbside loading positions.

Therefore, both the existing and proposed future curbside have adequate capacity to meet peak demands. The additional space beyond the requirements in the future forecast years means that the Airport will be able to continue allocated curbside to distinct user groups such as private and commercial drop-offs and pickups. These space allocations combined with appropriate signage provide a high level of customer service for passengers entering and leaving the Airport.

3.4.3 Parking

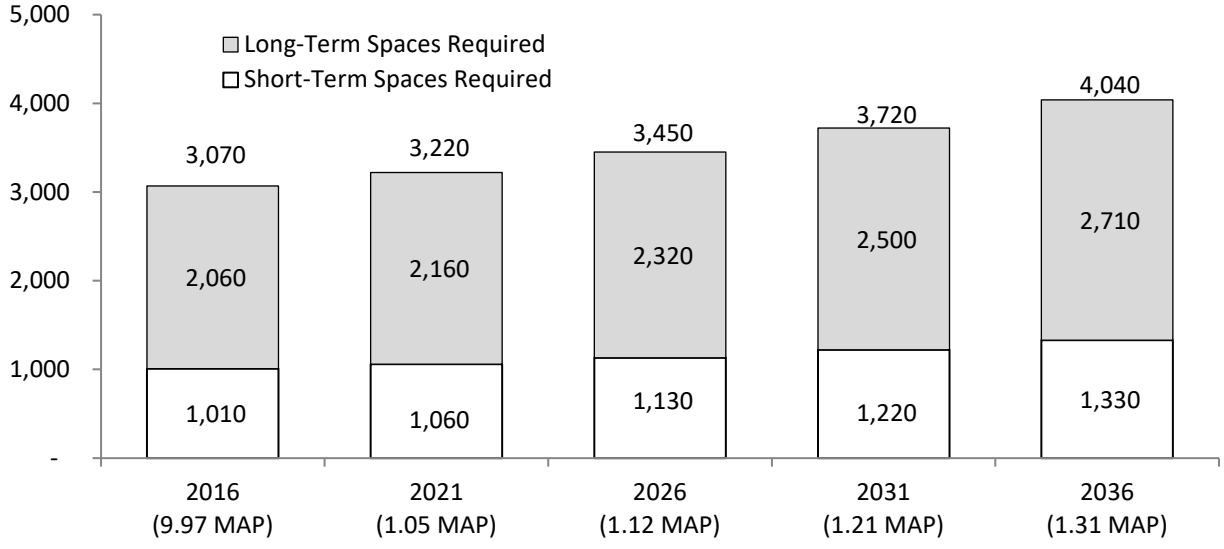
Parking demand presented in this section is analyzed in the aggregate across all parking facilities without regard to individual facility capacity or future development. This unconstrained demand seeks to confirm that the Airport has sufficient land dedicated to parking facilities in the existing condition and at each planning activity level and each phase of the Terminal Redevelopment Program in the future.

3.4.3.1 Public Parking

A parking model was developed to calculate future space requirements using the passenger forecast, public parking transactions, and overnight and peak hour occupancies for each facility. The model converts transactions to spaces by applying a typical number of turns per space (e.g. how many times the space is used throughout the day) for each parking duration period. Daily transactions were increased based on the assumptions below to represent future operations for each PAL.

As is typical when forecasting parking facility total space demand requirements, a search factor was applied to the demand for each facility to calculate the actual number of spaces required including a surplus that will allow vehicles entering the facility to find an open parking space within a reasonable amount of time. A factor of 10% was applied to all public parking facilities to represent the degree of difficulty finding an open space in a large multi-level facility. Historically a 10% factor has been applied but since more technology enhancements are now installed in the current garage, the efficiency and utilization of the facilities by guiding parkers to open spaces. These types of parking system enhancements are also less expensive than constructing new structured parking the circulation factor differential. Figure 3-4 summarizes public parking demand for each of the future design years. The existing parking capacity is approximately 3,600 spaces, which meets demand through 2026. Any construction which displaces public parking should including phasing elements to replace that parking prior to closing any parking facilities. Long-term landside alternatives should seek to provide 4,040 public parking spaces by 2036.

Figure 3-4
Public Parking Requirements
Master Plan Update
Little Rock National Airport



3.4.3.2 Employee Parking

The existing employee parking facility of 428 spaces, is adequately sized for current demand. The number of employees does not typically grow at the same rate as enplanements. Minimal growth is anticipated in the number of employees in the Master Plan planning period. Therefore, any relocation or modification of employee parking facilities should replace the existing space in kind.

3.5 AIRPORT SUPPORT, GENERAL AVIATION, AND AIR CARGO

This section describes requirements for other functional areas of the Airport such as airport support, general aviation, and air cargo.

3.5.1 General Aviation Requirements

General aviation encompasses a variety of users and activities, such as corporate flight departments, recreational flyers, business commuters, flight training, agricultural applications, law enforcement, emergency medical services, firefighting, and Fixed Base Operators (FBOs) providing a wide range of services that can include fueling, storage, rental, maintenance, and flight instruction. As a result, general aviation facility needs determination include aircraft storage facilities, transient aircraft parking aprons, terminal facilities, and vehicle access and parking areas.

The majority of existing general aviation aircraft storage facilities at Bill and Hillary Clinton National Airport are located on the west side of the Airport, west of Runway 18-36 and adjacent to Taxiway A. There is one FBO located southeast of Runway 4L-22R and southwest of the passenger terminal building. Aircraft based at LIT are stored in a variety of large hangars, either in FBO or corporate hangars. Over the course of the 20-year planning period the number of based aircraft is forecast to increase moderately from 131 to 166. It is projected that most of the new based aircraft will be business jets, and it is assumed that future storage space will reflect the same characteristics of current storage patterns, with all the based aircraft fleet stored in hangars. The trend of increasing general aviation aircraft size will also play a role in defining future development needs.

Aircraft tiedowns for based aircraft are generally provided for those aircraft whose owners do not require, or do not want to pay the cost for hangar storage. At present, the Central Flight School fleet are the only aircraft tied down at LIT.

Transient aircraft storage is normally provided in the form of dedicated apron with either tiedowns for longer-term storage or wheel chocks for short-term storage. In calculating the transient aircraft apron storage requirements, an area of 400 square yards per transient aircraft is used. This rule-of-thumb guideline allows for aircraft parking and circulation between rows of parked aircraft and provides additional maneuvering space for users that are not as familiar with the apron layout and circulation patterns. Based upon the existing and projected general aviation itinerant operations, the transient apron requirements at LIT would be expected to increase from about 15,200 square yards to 17,600 square yards throughout the duration of the 20-year planning period, and these requirements can be accommodated within the existing apron facilities. In consideration of future apron tiedown modifications that may be required, several apron design and planning guidelines, which tend to be more “qualitative” than “quantitative”, are presented as follow.

Aprons and associated taxilanes should be designed based on a specific Design Aircraft and/or the combination of aircraft that will use the facilities. Transient aprons should be designed for easy access by the aircraft under power. Aprons designed to handle jet aircraft should consider the effects of jet blast and allow sufficient space for safe maneuvering.

The primary design consideration is to provide adequate wingtip clearance for the aircraft positions and the associated taxilanes. Parked aircraft must remain clear of runway, taxiway, and taxilane Object Free Areas and no part of the parked aircraft should penetrate the runway approach and departure surfaces.

The layout of aprons on the Airport should be grouped according to the aircraft wingspans. This allows the taxilane OFA width to be optimized for the aircraft using the area. It is also a good practice to separate corporate jets and heavy jets from lighter propeller-powered aircraft to minimize the effects of jet blast and prop wash.

Recommended surface gradients have been developed to ease aircraft towing and taxiing while promoting positive drainage. The maximum allowable grade in any direction is 2.0% for Aircraft Approach Categories A and B and 1.0% for Aircraft Approach Categories C, D, and E.

Table 3-15 summarizes the space needs for general aviation apron storage throughout the 20-year planning period. From this analysis, it would seem there is a need for as many as 30 additional tiedowns needed at the Airport. However, FBO and LIT personnel indicate there is ample space provided on the various aprons for aircraft storage and tiedown needs are never exceeded. Therefore, it is concluded that the general aviation apron space provided is adequate to meet the needs throughout the planning period.

Table 3-15
General Aviation Apron Storage Requirements, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

Apron Storage	2016 *(a)*	2021	2026	2031	2036
Total Number of Tiedowns	14	40	41	43	44
Total Square Yards	229,321	16,000	16,400	17,200	17,600

(a) Actual.

Source: Mead & Hunt analysis using the FAA AC 150/5300-13A, Change 1, Airport Design and actual LIT conditions.

Large aircraft hangars are the preferred storage facility for existing based aircraft owners at LIT, and the projected increase in based business jets suggests a continued trend in these storage practices. Therefore, it is important that LIT continue to plan for and reserve space for these facilities, also considering both the vehicular and taxiway/taxilane access requirements associated with each proposed development area.

The focus of future general aviation aircraft storage needs will be large group storage and corporate hangars. Current improvement plans indicate TacAir plans to replace the existing Central North terminal with a group storage hangar.

3.5.2 Air Cargo Analysis

Air cargo at Bill and Hillary Clinton National Airport is transported on dedicated air cargo aircraft and in the belly compartments of passenger airline aircraft. Quantities of air cargo passing through LIT are anticipated to increase during the 20-year planning period, from over 9,000 tons in 2016 to more than 10,300 tons in 2036. The air cargo transported by cargo-only carriers will account for most of the total tonnage (i.e., 8,102 tons in 2016 increasing to 9,343 tons in 2036).

The Airport Cooperative Research Program (ACRP) Report 143, Guidebook for Air Cargo Facility Planning and Development provides a broad discussion of the various issues in planning air cargo facilities, and describes

tools and techniques for sizing facilities. ACRP Report 143 identifies that air cargo throughput rates are the standard measures to define the capacity of air cargo facilities, and these rates are expressed in annual tons of freight per square foot of space ratios. Domestic air cargo building space utilization is based on an annual cargo tonnage throughput ratio of approximately 0.92 annual tons per square foot. Domestic air cargo apron space utilization is based on an annual cargo tonnage throughput ratio of approximately 0.19 annual tons per square foot for aircraft parking, and an approximate throughput ratio of 0.57 annual tons per square foot for Ground Service Equipment (GSE) storage. When applying these throughput ratios to the existing air cargo building and apron spaces, it appears that LIT has ample capacity to meet the existing and future air cargo tonnage throughput needs. Table 3-16 provides the air cargo building and apron space analysis for LIT based on the national average ratios for domestic cargo operations.

Table 3-16
Air Cargo Requirements, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

Air Cargo Facility	2016	2021	2026	2031	2036
Annual Air Cargo (tons)	8,102 *(a)*	8,758	9,117	9,288	9,343
Air Cargo Building (sf)	58,450 *(a)*				
Domestic National Average Ratio (tons/sf)	0.92	0.92	0.92	0.92	0.92
Total Building Requirement (sf)	8,807	9,520	9,910	10,096	10,155
Air Cargo Apron (sf)	339,964 *(b)*				
Domestic Aircraft Apron Average Ratio (tons/sf)	0.19	0.19	0.19	0.19	0.19
Aircraft Apron Requirement (sf)	42,642	46,095	47,984	48,884	49,174
Domestic GSE Storage Average Ratio (tons/sf)	0.57	0.57	0.57	0.57	0.57
Total GSE Storage (sf)	14,214	15,365	15,995	16,295	16,391
Total Air Cargo Apron (sf)	56,856	61,460	63,979	65,179	65,565

(a) Actual.
(b) Actual, includes GSE storage.

Source: Mead & Hunt analysis using the ACRP Report 143, Guidebook for Air Cargo Facility Planning and Development and actual LIT conditions.

Because of its proximity to Memphis International Airport (MEM), LIT has experienced an average of 6.6 diversion flights by FedEx aircraft annually since 2011. The trend recently has been for heavier aircraft such as the Boeing B-777, DC-10, MD-11, and Airbus A300 to be diverted to LIT. Currently, the heavier diversion flights use two specially designed sections of the west-side general aviation aprons for ground service. LIT personnel are currently working with FedEx to better accommodate the diversion flights through dedicated taxiing routes and additional apron more centrally located and closer to the existing air cargo facilities. It is expected that a dedicated apron will be developed on the airfield with sufficient pavement strength that accommodates the peak period diversion flights of heavy air cargo aircraft and provides adequate access capabilities for ground service equipment.

3.5.3 Aviation Industrial Facilities

The aviation industrial facilities at LIT currently consist of the Dassault Falcon Jet complex and the Envoy Air maintenance facility. The Dassault complex is located on approximately 100 acres between Runways 18-36

and 4L-22R on the north side of the Airport, operating from nearly 1.0 million total square feet of completion and service operations dedicated solely to Dassault Falcon Jet business jets. With the recent hangar construction, it is not anticipated that the complex will requirement expansion or improvement in the near term. However, as LIT personnel continue to engage Dassault about facility needs and improvements, ample space should be preserved for expansion of the Falcon Jet facilities or the development of complimentary facilities such as vendors near the existing facilities.

The Envoy Air maintenance facility is located west of the passenger terminal building southeast of Runway 4L-22R, utilizing 37,000 square feet of hangar space. LIT personnel indicate that an engine testing or run-up area at the facility will be required and is exploring potential options for this facility.

3.5.4 Airport Support Facilities Analysis

Airport support facilities encompass a broad range of functions that help ensure the smooth, efficient, and safe operation of an airport. Support facilities at LIT consist of the Airport Traffic Control Tower (ATCT), fuel storage facilities, Aircraft Rescue and Fire Fighting (ARFF) facility, and the airport maintenance facility.

3.5.4.1 Airport Traffic Control Tower

The LIT ATCT is designated as an ATC-8 combined tower and radar approach control facility with Class C airspace that is operated by FAA personnel 24 hours daily. In its present location between the parallel runways and south of the passenger terminal building, the ATCT meets all line-of-sight requirements to enable it to properly function with the existing runway configuration. As any future runway and taxiway system improvements are planned or additional or reconfigured landside development areas are proposed, ATCT line-of-sight and viewing angle concerns and studies should be incorporated to ensure no restricted visibility or “shadow” areas are created on the airfield movement areas.

3.5.4.2 Fuel Storage Facility

There a total of six fuel storage facilities located at LIT, with the primary facility located west of the passenger terminal building at the north end of Grundfest Drive used primarily to supply fuel to commercial aircraft. Three facilities are located at the FBOs, which are used primarily to supply fuel to general aviation and military aircraft. Dassault Falcon Jet has its own fuel storage facility to supply fuel to its production aircraft, and the Airport has a fuel facility for vehicular purposes. According to fuel sales records provided by LIT personnel, there has been an average of 140,093 gallons of AVGAS and 3,629,200 gallons of Jet A fuel sold per year over the past five years, which equates to an approximate average of 6.1 gallons of AVGAS sold per piston-powered aircraft operation and 42.4 gallons of Jet A fuel sold per turbine-powered aircraft operation. Typically, as operations increase, fuel storage requirements can be expected to increase proportionately. National and local trends indicate that the size of the general aviation aircraft fleet is increasing slightly, as more aircraft are used for business purposes and less for recreational purposes. Recent trends at LIT for commercial service aircraft operations have seen decreases in both narrow body jets and smaller RJs, with increases in the 50+ seat RJ fleets. Future trends indicate continued substantial increases in the 50+seat RJ operations, with a focus on the 100 to 120-seat RJs, as well as a slight increase in narrow body jet operations. Therefore, it is expected that the ratio of gallons sold per operation will increase as well, and an estimate of future fuel storage needs can be calculated as a two-week supply during the peak month of operations. Table 3-17 provides an estimate of the future fuel storage requirements at LIT through 2036. It appears that the existing fuel storage capacity is adequate to accommodate the expected demand during the 20-year planning period.

Table 3-17
Fuel Storage Requirements, 2016-2036
Airport Master Plan
Bill and Hillary Clinton National Airport

Aircraft Storage Type	2016 *(a)*	2021	2026	2031	2036
AVGAS					
Average Day of Peak Month Operations	69	70	70	71	72
Two Weeks of Operations	972	981	987	992	1,005
Gallons Sold Per Operation	6.1	6.2	6.3	6.4	6.5
Fuel Storage (gallons)	44,000[2]	6,081	6,218	6,347	6,531
Jet A					
Average Day of Peak Month Operations	260	264	271	279	287
Two Weeks of Operations	3,639	3,702	3,794	3,907	4,016
Gallons Sold Per Operation	42.4	42.5	43.0	43.5	44.0
Fuel Storage (gallons)	290,000[2]	157,321	163,129	169,976	176,682

(a) Actual.
(b) Does not include aviation fuel stored at Dassault Falcon Jet.

Source: Mead & Hunt analysis.
Note: [1]Actual.
[2]Does not include aviation fuel stored at Dassault Falcon Jet.

3.5.4.3 Aircraft Rescue and Fire Fighting Facility

The ARFF facility serving LIT is located north of the passenger terminal building between the parallel runways, just north of Taxiway J. According to Code of Federal Regulations (CFR) Part 139.317, ARFF equipment and staff requirements are based upon the length of the largest air carrier aircraft serving an airport with an average of five or more daily departures. Table 3-18 presents the ARFF Index, length criteria, and representative air carrier aircraft.

Table 3-18
Representative Air Carrier Aircraft Lengths and ARFF Index
Airport Master Plan
Bill and Hillary Clinton National Airport

ARFF Index	Length Criteria	Representative Aircraft
A	<90 Feet	CRJ-200
B	90 Feet < 126 Feet	B 737-700, A319, A320, B 717, CRJ-700
C	126 Feet < 159 Feet	B 757, MD-88, B 737-800, A321
D	159 Feet < 200 Feet	B 767, A300, A330-200
E	>200 Feet	B 747, B 787

Source: CFR Part 139.317.

LIT currently maintains an ARFF Index C classification, which adequately serves the existing and projected runway system and airline operational schedule.

3.5.4.4 Airport Maintenance Facility

The existing airport maintenance facility is located north of Taxiway U, between the parallel runways just east of the cargo buildings. Current improvement plans specify additional storage space through provision of outbuildings and the enclosure of the east end of the building, which is currently a large open bay. If additional facilities or storage is required, then ample space is available in the area for expansion.

3.5.5 Deicing Facilities Analysis

Current deicing procedures on performed on the air carrier apron away from the surface drains. On a limited basis in particularly heavy freezing rain and when short holdover times are required, Type 1 deicers will be stationed near the departure end of runways and aircraft will be deiced on the parallel taxiway for a quick takeoff. LIT personnel report no improvement plans or needs are anticipated.

3.5.6 Utilities

Currently, LIT is provided with adequate utility services and there are no known improvements required at this time.

Chapter 4

4.1 INTRODUCTION

This chapter summarizes the approach, development of concept alternatives, identification of evaluation criteria, and selection of preferred alternatives for the Recommended Development Plan (RDP). Concept alternatives were developed for the airfield, passenger terminal complex, ground access and parking, and aviation support facilities based on assessments of existing capacity and future demand for major aviation-related facilities. This chapter is organized as follows:

1.0 – Introduction
2.0 – Airfield
3.0 – Passenger Terminal
4.0 – Ground Transportation and Parking
5.0 – Recommended Development Plan with Cost Estimates

Master plan project implementation and financial feasibility analysis will be covered in the Chapter 6 of this Master Plan.

4.2 INTRODUCTION TO ALTERNATIVES

Concept alternatives were formulated to meet the requirements associated with the forecast aviation demand at the Airport, as documented in the Facility Requirements chapter. Alternatives for each major component of the Master Plan were developed and refined through a series of interactive workshops, independent work sessions, and stakeholder meetings during which Airport staff and stakeholders collaborated on planning options, challenges, and provided feedback to the Master Plan team. Some of the major interactive workshops, stakeholder meetings, and work sessions include:

- Collaborative small group work sessions – addressing technical viabilities for airfield alternatives and passenger Terminal phasing options were conducted.
- Master Plan Advisory Committee (MPAC) meetings – four MPAC meetings were conducted involving Airport staff, executives, and other stakeholders to approve preferred alternatives as recommended by the master planning team.
- Stakeholder outreach – numerous stakeholder outreach meetings were conducted involving Airport staff, the Master Plan Team, Airport tenants, City officials, and other key stakeholders to address specific technical challenges and brainstorm a wide variety of creative alternatives.
- Public Information Meetings – two meetings were conducted to convey Master Plan milestones (i.e., facility requirements, and recommended development plan) and obtain feedback from the general public. This serves as a sounding board to confirm advisory committee decisions.
- FAA Airport District Office (ADO) meetings – at least two phone calls and one in-person meeting were conducted with the local FAA ADO to identify objectives and expectations of the airfield alternatives, Master Plan Airport Layout Plan, and Exhibit A deliverables for a more streamlined FAA review process.

Feedback from the collaborative planning process was taken into consideration and comments incorporated into the refined concept alternatives, where evaluation criteria were identified for use toward screening down to a Recommended Development Plan (RDP).

4.3 AIRFIELD ALTERNATIVES

The Airport has sufficient airfield capacity to accommodate forecast demand throughout the twenty-year planning horizon, as documented in the Requirements Chapter. As a result, a key focus of the alternatives analysis was to enhance the safety of the airfield by meeting current FAA design standards and incorporating facility recommendations from the FAA's Runway Incursion Mitigation (RIM) program.

As identified in the facility requirements chapter, the airfield design standards that need to be addressed in this section are existing non-standard conditions and taxiway configurations including:

- Direct ramp to runway access at Taxiways Juliet, Mike, and Papa
- 5-way taxiway intersection at Taxiways Bravo, Charlie, and Papa
- The Hot Spot at the intersection of Runways 36 and 4L
- Acute angled exit Taxiways Bravo, Golf, Mike, and Juliet off Runway 4L-22R
- Wingtip clearance restriction on Taxiway Alpha south of Taxiway Lima
- Runway 18 Blast Pad

In addition to addressing the non-standard configurations, the airfield alternatives should consider the following objectives:

- Leverage FAA funding on the current 5-year CIP
- Create opportunities for discretionary funding
- Minimize the impact to current airfield operations
- Minimize impacts on taxi lengths and runway occupancy time

With those aims and objectives in mind, alternatives were developed and evaluated. The following discussion explains the highlights, positive aspects, and negative aspects of the airfield alternatives considered at LIT.

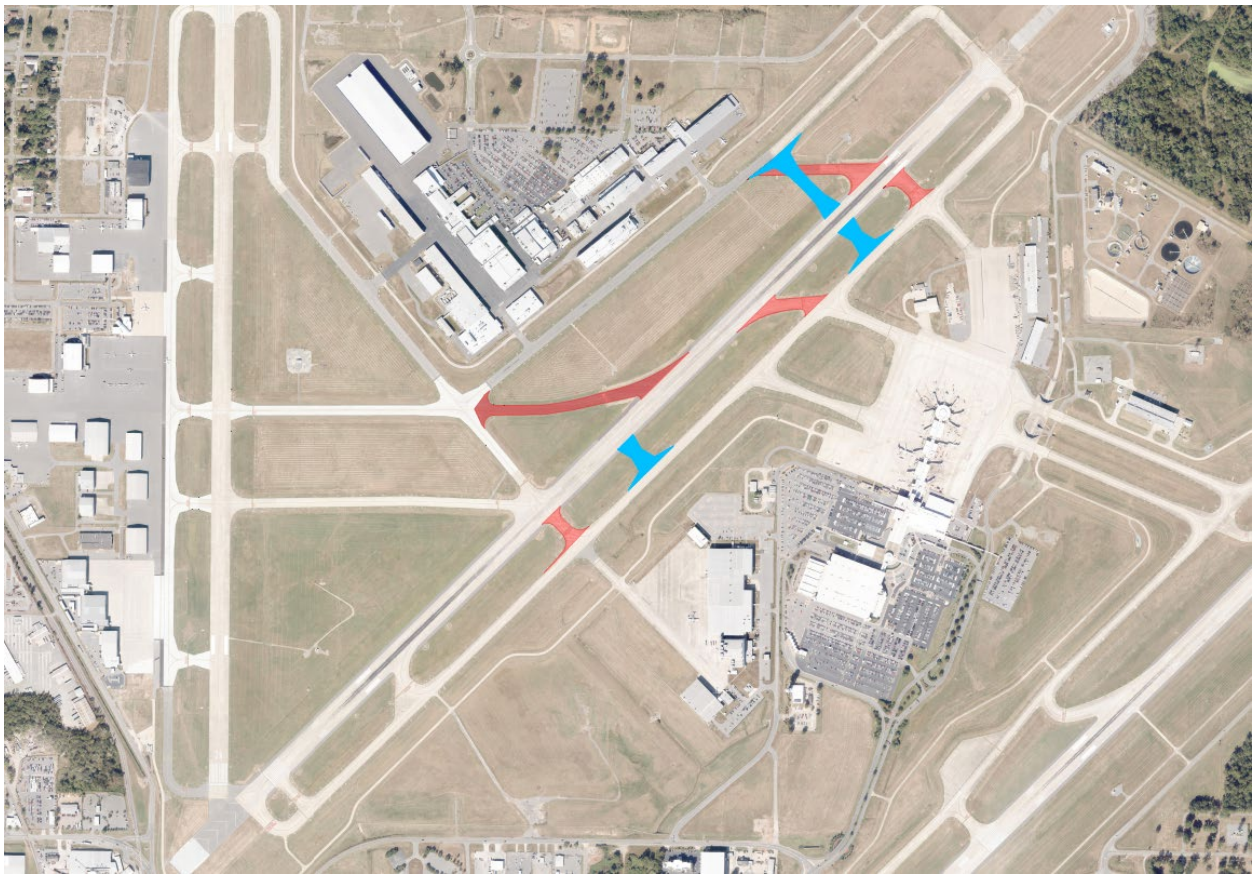
4.3.1 Initial Airfield Alternatives

High-level airfield alternatives were developed with the intention of providing holistic improvement to the flow of taxiing aircraft around the airfield while addressing non-standard design conditions. Initial alternatives did not prioritize the removal of the Hot Spot located between the ends of Runway 36 and 4L, as that is addressed with separate alternatives and integrated into the preferred airfield alternative.

4.3.1.1 Alternative #1 – Eliminate Direct Ramp to Runway Access

The first airfield alternative considers removing the pavement areas that provide direct runway to ramp access and eliminated a portion of the 5-way intersection pavement. The 5-way intersection is formed by intersection of Taxiways Bravo, Papa and Charlie. This alternative eliminates the high-speed Taxiway Bravo exit connecting to the non-standard 5-way intersection. In order to provide crossfield access to replace Taxiways Juliet, Mike and Papa, two crossfield taxiways are proposed. The new crossing taxiways, additionally remove the acute angle taxiways on Taxiways Mike and Juliet, further improving safety and airfield performance. This alternative's combination of construction and pavement removal nets a reduction of overall pavement assets. This option, shown in Figure 4-1, has the lowest construction cost, the least amount of impact on current airport operations, and reduces the amount of pavement to be maintained in the future. While there are several positive aspects of Alternative #1 to be considered, the airport wanted to investigate the potential benefits of extending Taxiway Charlie to Taxiway Delta to provide additional access to the general aviation area from 4L-22R.

Figure 4-1
Taxiway Alternative #1

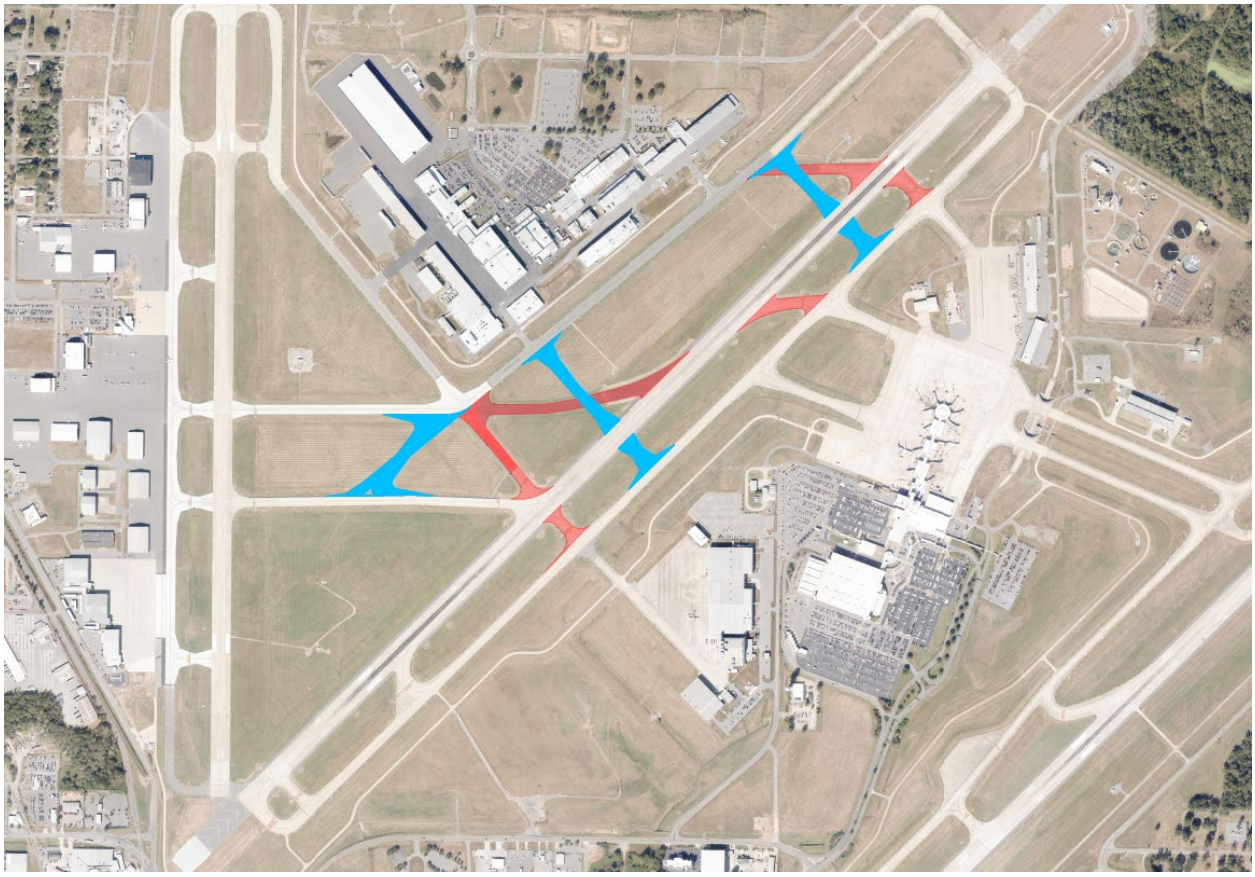


Source: LeighFisher team, August 2017.

4.3.1.2 Alternative #2 – Taxiway Charlie Extension

The second airfield alternative layout builds on the concepts proposed in Alternative #1 by eliminating both the portion of Taxiway Papa between 4L-22R and Taxiway Charlie. This alternative also considered additional taxiway access to the general aviation side of the airfield by extending Taxiway Charlie to Taxiway Delta as shown in Figure 4-2. The aim of Alternative #2 is to eliminate the confusing intersection at Taxiway Papa and Taxiway Delta at 4L-22R. However, it was discovered that eliminating the extension of Papa to 4L-22R created additional confusing intersections at the intersections of Taxiway Charlie and Bravo as well as the intersection of Taxiways Charlie and Delta. The amount of construction and demolition in this alternative is relatively equal. The total estimated cost for the implementation of Alternative #2 is almost double the cost of Alternative #1. Alternative #2 does provide more flexible egress/ingress to and from the general aviation side of the airfield; however, it creates a confusing intersection at Taxiways Bravo, Charlie and Papa and more than one taxiway acute turn. The solution presented by Alternative #2 was not considered ideal, and therefore additional alternatives were developed for evaluation.

Figure 4-2
Taxiway Alternative #2

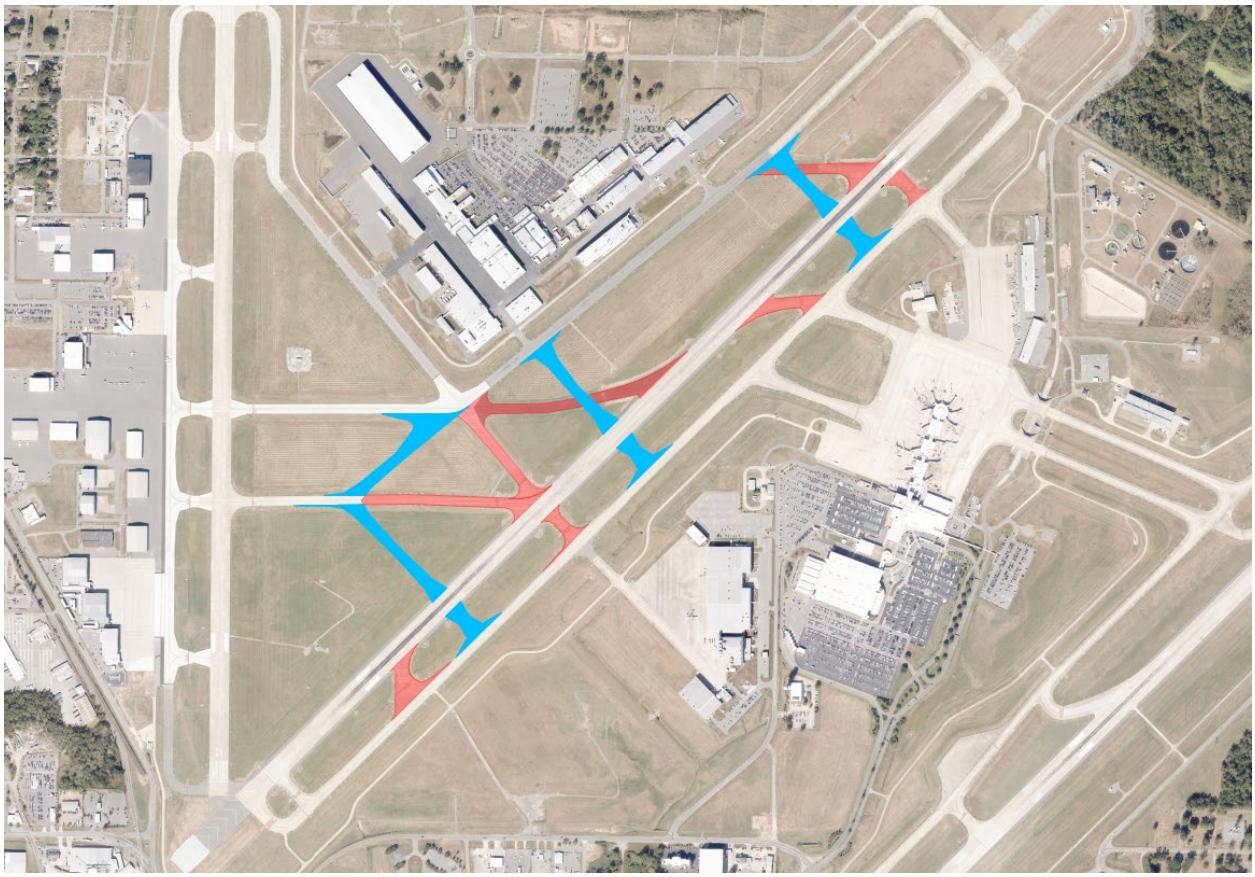


Source: LeighFisher team, August 2017.

4.3.1.3 Alternative #3 – Eliminate Acute Angled Exit Taxiways

The main focus of the development of Alternative #3 was to eliminate all acute angled taxiway intersections at Runway 4L-22R. The taxiways were arranged to provide perpendicular entrances and exits at all access points to Runway 4L-22R. While all acute angled exit taxiways were removed at Runway 4L-22R, there is still an acute angle at the intersection of Taxiways Charlie and Bravo in this alternative. This amount of new pavement construction and pavement removal for this option is approximately equal, but the cost is more than double the cost of Alternative #1. While this option did provide for perpendicular intersections to Runway 4L-22R which improves safety recommended by the FAA, the overall layout, as shown in Figure 4-3, didn't provide significant improvement in the flow or taxi times across the airfield and therefore not deemed worth the cost and was therefore removed from consideration.

Figure 4-3
Taxiway Alternative #3

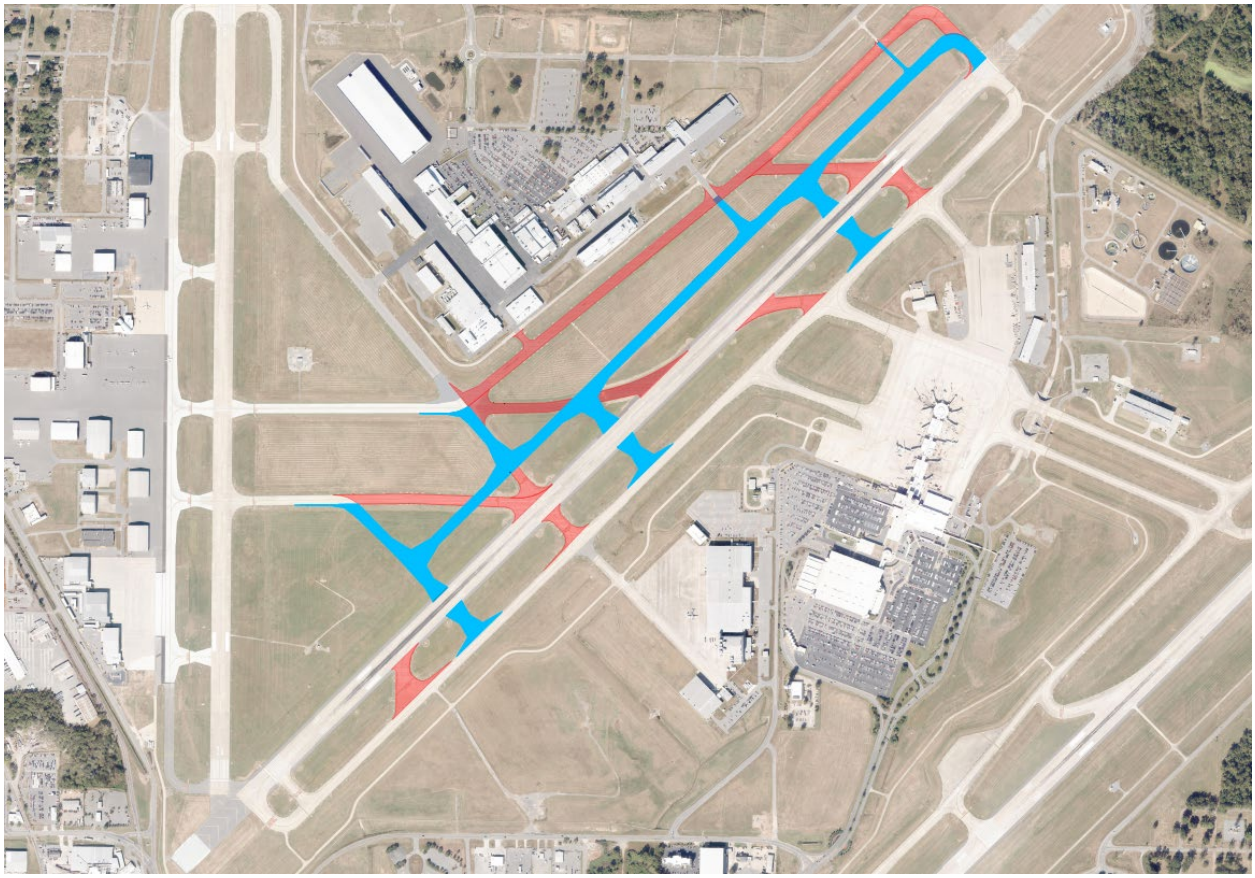


Source: LeighFisher team, August 2017.

4.3.1.4 Alternative #4 – Maximize Standardization of Taxiways

With the aim of creating the most standard layout of taxiway alignments possible, Alternative #4 was developed. Alternative #4, as shown in Figure 4-4, creates the most standard alignments, runway separation, and the most operationally efficient taxiway system by realigning Taxiway Charlie to a standard location parallel to Runway 4L-22R. This realignment not only created safer, perpendicular entrance and exit taxiways for Runway 4L-22R, it also eliminates the 5-way intersection at Taxiways Charlie and Bravo, eliminates the acute angle taxiway Delta intersection to 4L-22R and creates the most operationally efficient taxiway system. An added positive of Alternative #4 is that it opens up over 40 acres of airport property for development that was previously unusable because of its location between the Runway 4L-22R and Taxiway Charlie. Alternative #4 has the highest development cost because of the relocation of Taxiway Charlie, but it also produces the largest reduction in square yardage of pavement asset for future maintenance. Because of the significant improvement to airfield operations, the increase in developable area, and the reduction of future pavement maintenance area, Alternative #4, or a variation thereof was the preferred development alternative.

Figure 4-4
Taxiway Alternative #4



Source: LeighFisher team, August 2017.

4.3.2 Hot Spot Alternatives

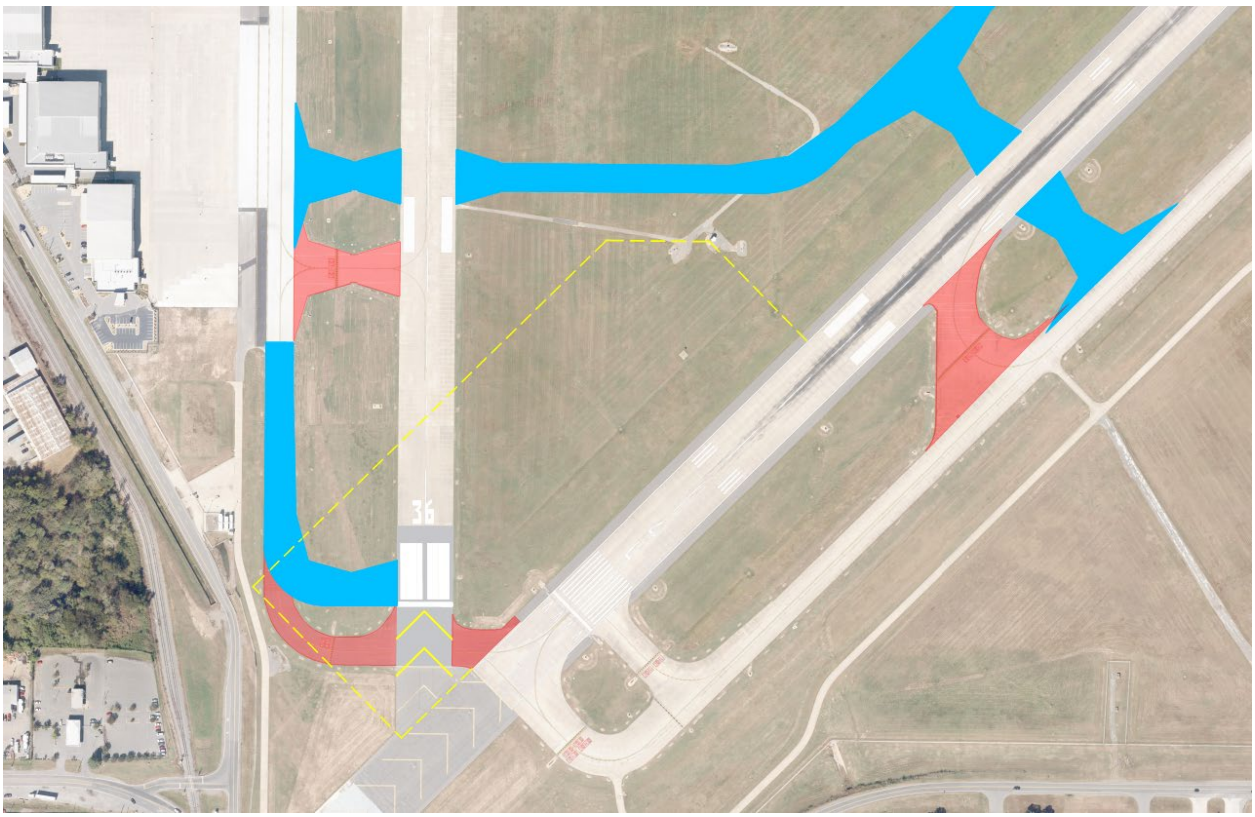
As the initial airfield alternatives were developed further into a preferred airfield layout, additional considerations for the south end of Taxiway Alpha were developed. In addition to the Hot Spot designation, there is a non-standard safety area at the end of Runway 36 and a wingtip clearance constraint at the south end of Taxiway Alpha caused by the location of Bond Street. In some cases, an end-around taxiway could resolve the conflict between two runway ends, however the area at the south end of Runway 36 will not accommodate an end around taxiway to access Runway 4L from Taxiway Alpha so other alternatives were considered for that area.

During in depth discussions between the FAA, the airport staff, air traffic control and the stakeholders, a white paper was produced to study the history of the hot spot, its potential future effect on airfield operations, and mitigation options and their effects. The following discussion contains highlights of the findings of the while paper. The complete white paper is located in the Master Plan Appendices.

4.3.2.1 Hot Spot Alternative #1 – Disconnect Runways and Eliminate Hot Spot

The first alternative, as shown in Figure 4-5, involved relocating the Runway 36 threshold north 64 feet to allow for standard safety area dimensions. The relocated threshold will subsequently shorten Taxiway Alpha, removing the current 79 foot wingtip clearance restriction. This shift eliminates the required realignment of Bond Avenue and additional property acquisition. Access to the east side of the airfield from the general aviation area will now be provided via Taxiway Lima to the new Taxiway Charlie alignment shown in Taxiway Alternative #4.

Figure 4-5
Hot Spot Alternative #1



4.3.2.2 Hot Spot Alternative #2 – Hot Spot Remains and Pavement Reconstruct in Place

The second alternative, as shown in Figure 4-6, considered explored the possibility of leaving access to the Runway 4L end from the GA area to accommodate pilot preference and then addressing the wing tip clearance restriction by relocating and realigning Bond Street. While this option offers the least disruption to current airfield operations, it does not mitigate the runway incursion risk between Runways 36 and 4L. It also required additional property acquisition as well as coordination with and funding from the City of Little Rock for the realignment of Bond Street to eliminate the 79 foot wingtip clearance restriction. Each are a major roadblock to the further consideration of this option. Additionally, the low probability of FAA approval for the Runway 36 to 4L taxiway connector (Hot Spot) led to the abandonment of this option from further consideration.

Figure 4-6
Hot Spot Alternative #2

Source: LeighFisher team, August 2017.

In order to show the comparative analysis of the two alternatives in the RW 36, 4L area, Table 4-1 highlights the consequences of each alternative as affects the RSA, wingtip clearance, hot spot, runway length, perimeter road functionality, and aircraft taxi patterns.

Table 4-1
Hot Spot Alternative Comparison

Conditions	Hot Spot Alternative 1	Hot Spot Alternative 2
Non-standard RSA	Shifts Runway 36 threshold north 64 ft. to make RSA 1,000 ft.	Relocate perimeter fence outside of RSA
Wingtip Clearance (under 79 ft.)	Move TW Alpha north, eliminates restriction	Bond St., perimeter road, and fence relocated to eliminate restriction
Hot Spot designation	Physically separates runways, eliminates hotspot	Taxiways reconstructed in place, hotspot remains
R/W 36 length	Shortened to 6,060 ft.	Remains at 6,124 ft.
Perimeter road operational restriction	No restriction	Perimeter road traffic requires ATC clearance or LOA
GA Taxi pattern to Runway 4L	Increases taxi length	Direct access from Alpha remains

During consultation with the stakeholders regarding the hot spot alternatives, concerns were raised that increases in taxi times to the FBOs would negatively impact their operations if alternative 1 was implemented. In order to further study this perception, an analysis of taxi times was performed and the results of the analysis are explained below in Tables 4-2 and 4-3.

Table 4-2
TAC-Air FBO Taxi Distances

Taxiway Configuration	TAC Air to Runway 4L (ft)	TAC Air to Runway 36 (ft)	TAC Air to Runway 22R (ft)
Existing	**4,600**	4,100	8,500
Ultimate	**6,450**	4,100	8,850

Table 4-3
Lynx FBO Taxi Distances

Taxiway Configuration	Lynx to Runway 4L (ft)	Lynx to Runway 36 (ft)	Lynx to Runway 22R (ft)
Existing	3,700	**4,200**	5,675
Ultimate	3,700	**5,775**	5,675

The results of the taxi time analysis indicated implementing Hot Spot Alternative #1 would result in minor increases in taxi times, and were still significantly less than the taxi routes used by the FBOs to 22R.

4.3.2.3 Selecting a Preferred Hot Spot Alternative

The first alternative considered provided the best overall conformance to FAA guidance at the south end of Taxiway A. While the alternative requires the relocation of the Runway 36 threshold to the north, Runway 18-36 will still provide over 6,000 feet of runway pavement after the relocation and will therefore accommodate the general aviation fleet, as discussed in the Requirements Chapter. The access from the east side of the airfield to the general aviation area via Taxiway Lima/Charlie requires the relocation of Taxiway Lima to the north to provide adequate clearance of the Runway 4L Glideslope Critical Area for 4L.

4.3.3 Additional Elements of the Overall Preferred Airfield Development

4.3.3.1 North Connector Taxilane

The continued expansion of the airport's largest tenant, Dassault Falcon Jet, and acquisition of additional property north of the Dassault lease by the airport that can be developed into additional aeronautical use area produces the need for additional access to the airfield from these areas. Construction of an access taxilane to the area was considered, as shown in Figure 4-7, near the north end of the airfield on the east side of Runway 18.

Figure 4-7
North Connector Taxilane

Source: LeighFisher team, August 2017.

4.3.3.2 Runway 18 Blast pad

Runway 18-36 is currently classified as a C-II runway and receives significant jet aircraft traffic. The future critical aircraft for Runway 18-36 will be a D-III aircraft. Blast pads are not required for D-III areas, but are recommended for runways with jet aircraft operations, therefore a 200-foot by 200-foot area for future development of a blast pad at the north end of Runway 18 should be reserved.

4.3.3.3 Terminal Ramp Expansion

The current airport capital improvement plans contains a Terminal Ramp Expansion located between Taxiways H and J on the western edge of the existing ramp as shown in Figure 4-8. The expansion is required to provide parking space for additional RON aircraft, and to allow for new hardstand parking locations that will be required during future concourse construction. The project includes an evaluation of high mast ramp lights, taxiway/ramp edge lights, taxiway centerline lights, guidance signs and electrical duct bank infrastructure.

The development of the ramp expansion will accommodate the recent increase in the number of RON aircraft for all the airlines at LIT, and the additional demand from the addition of a new Maintenance Facility at LIT for E-175 aircraft operated by Envoy. The additional RON parking will also allow the Airport to improve the utilization of their common use gates and passenger boarding bridges.

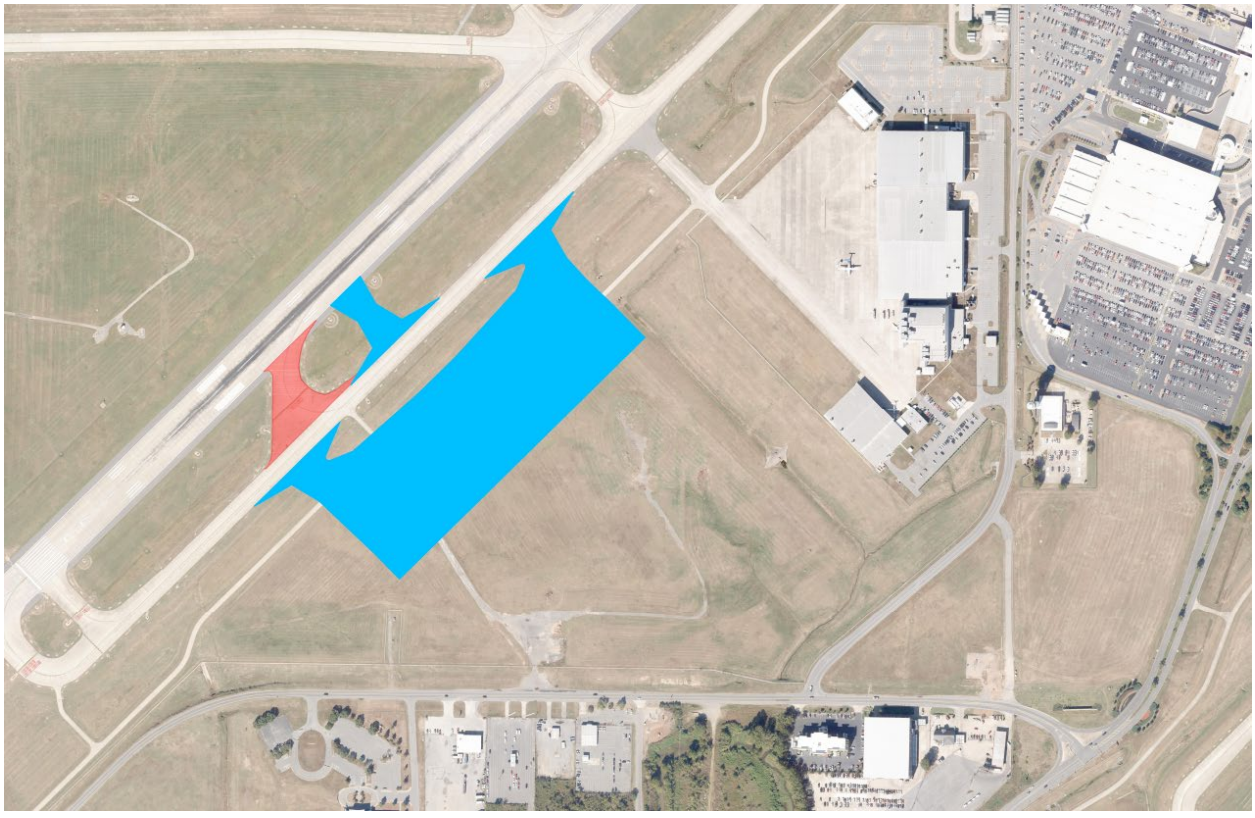
Figure 4-8
Terminal Ramp Expansion

Source: LeighFisher team, August 2017.

4.3.3.4 Multi-Use Ramp

In addition to the terminal ramp expansion, a multi-use ramp is desired by LIT to accommodate diversion traffic in excess of the usual RON parking. LIT is a diversion airport for FedEx Memphis operations and a diversion airport for Envoy DFW operations. The highest demand for diversions in recent history has been 13 diversions accommodated on a single day, and E-175 diversions from Envoy have grown steadily over the last 5 years. With the continued increase in shipping and growth of the maintenance facility, additional occurrences are possible and demand for diversion accommodations may increase. The proximity to 4L-22R, the primary runway, makes it a desirable location to store larger aircraft. In order to avoid developing the ramp exclusively for diversions, de-icing that is currently performed at the gate could be performed remotely on the multi-use ramp. The ramp could also accommodate military helicopter traffic, maintenance of grounded aircraft, and could be used as a common area ramp for future aeronautical use on the west side of the airfield. The ramp area shown in Figure 4-9 below could be built in phases according to available funding and exhibited demand.

Figure 4-9
Multi-Use Ramp

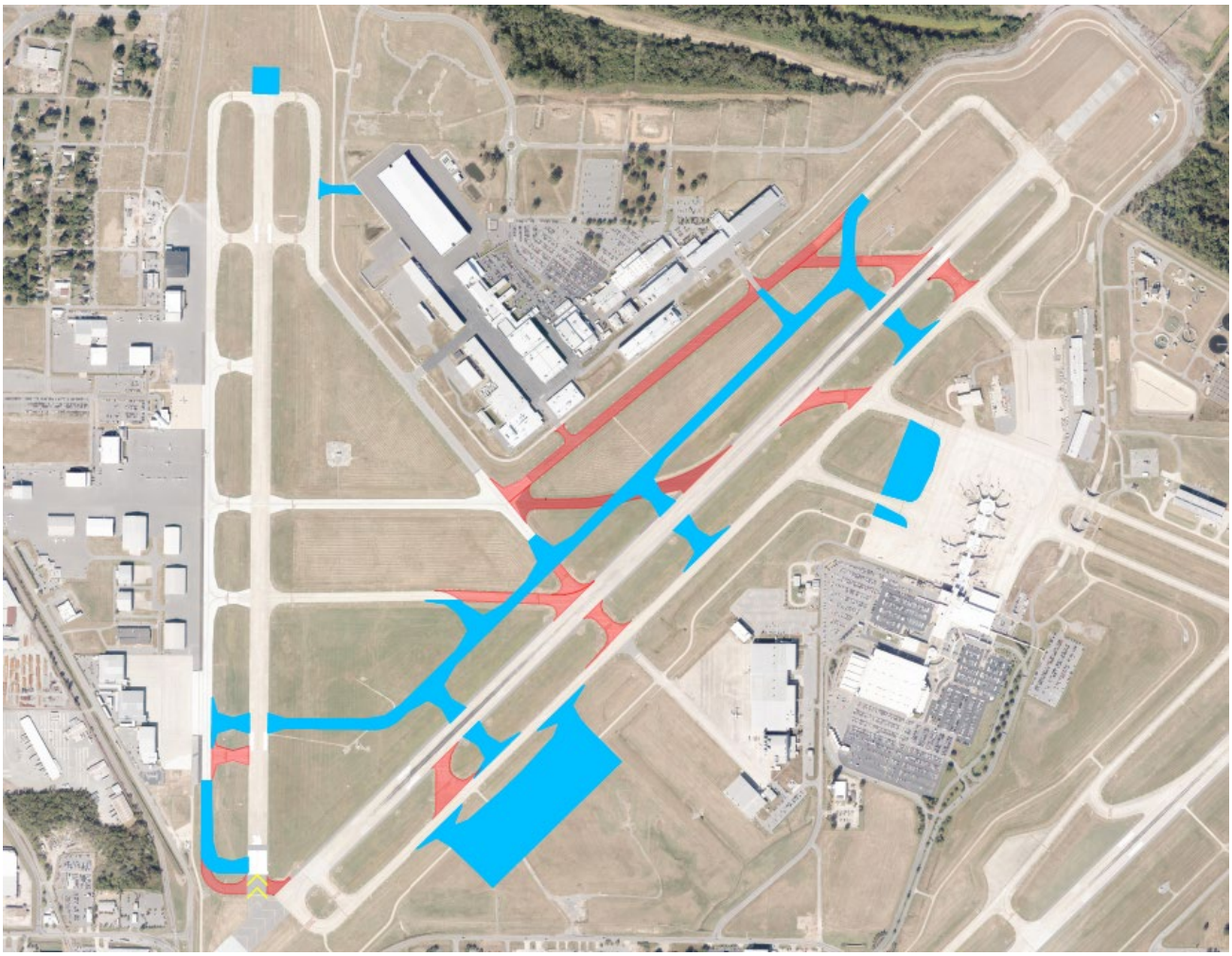


Source: LeighFisher team, August 2017.

4.3.4 Preferred Airfield Alternative

Incorporating the results of the alternatives analysis for the overall airfield, the hot spot area and the various special use areas yields an overall preferred airfield alternative. Additionally, the realignment of Taxiway Charlie at the north end was updated to avoid the localizer critical area for Runway 22R. Figure 4-10 shows the combined preferred airfield layout alternative that incorporates all aspects of the previous discussion.

Figure 4-10
Preferred Airfield Alternative



Source: LeighFisher team, August 2017.

4.4 PASSENGER TERMINAL ALTERNATIVES

An extensive Terminal Redevelopment Program (TRP) is underway at the Bill and Hillary Clinton National Airport. The history of the program and Terminal requirements shown in the Requirements chapter of this Master Plan describe the current state of the TRP. This Master Plan leveraged recently completed Terminal planning work and therefore does not develop new concepts for the size or configuration of Terminal elements. Instead, this Master Plan focuses on justification, sequencing, and trigger points for major elements, as described in the Requirements Chapter.

This Chapter explores two potential TRP phasing options and confirms previous conclusions that the TRP should proceed with construction of an Arrivals Hall prior to Concourse Reconstruction. This Chapter also explores enabling projects which could be separated from major TRP elements, to create manageable investments which can be spread throughout the planning horizon.

4.4.1 Summary of Terminal Redevelopment Program Requirements

This section summarizes key findings from the requirements chapter of this Master Plan.

The Terminal currently features 12 aircraft contact gates, which is adequate to meet forecast aviation demand for the planning period. As the TRP advances to the renovation and expansion of the concourse, additional aircraft parking gates could provide flexibility and cost savings during some construction phases.

Within the Terminal facility, hold room seating is generally adequate, with the exception of the 6-gate rotunda at the north end of the concourse. Currently, airlines rarely use all six gates simultaneously to unload and load aircraft. If this occurs in the future, then the hold rooms in that space would likely be undersized.

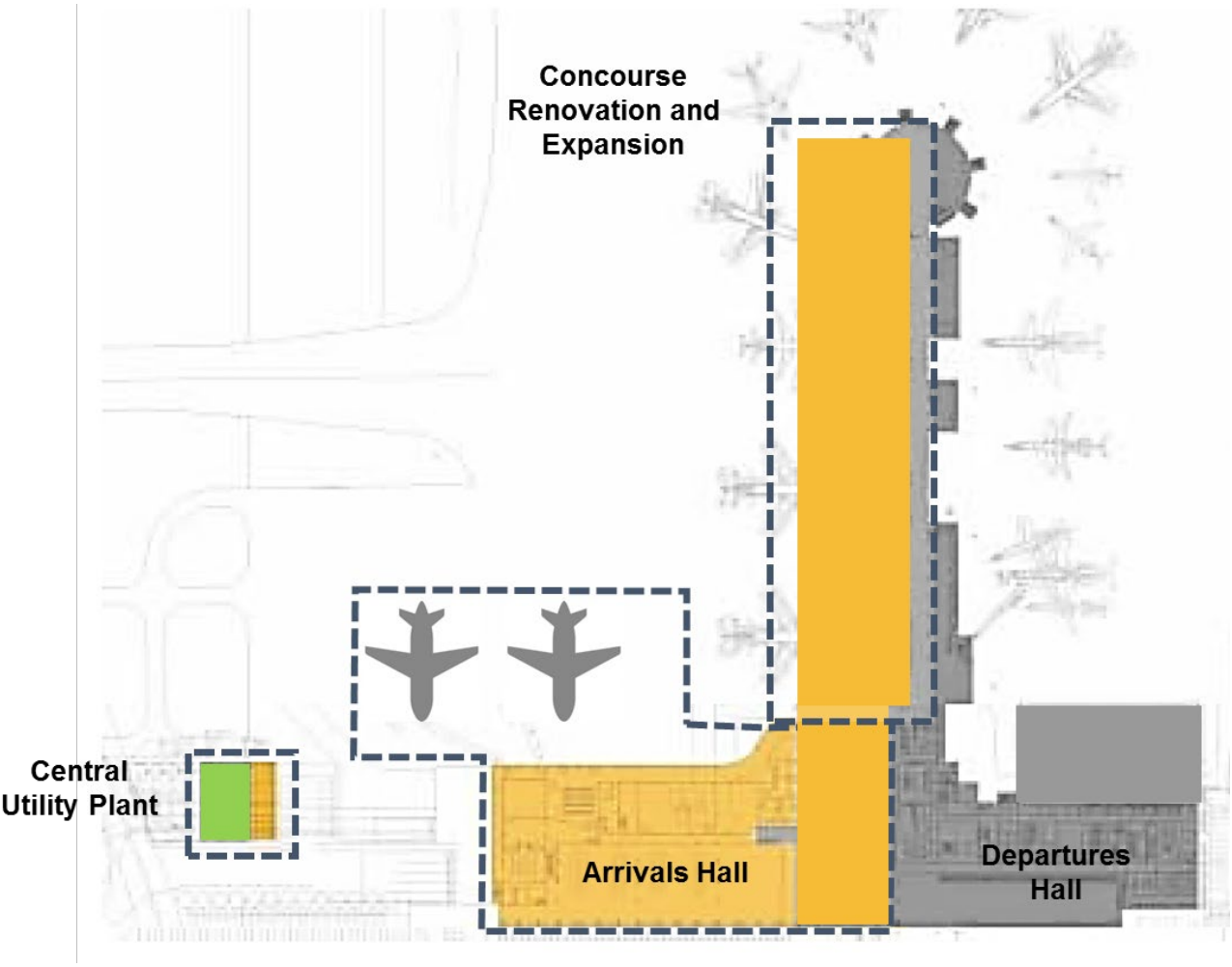
Bag claim facilities are also adequate to meet current demand. Opportunity to replace aging equipment and reconfigure the space for improved wayfinding may exist.

4.4.2 Terminal Redevelopment Program Major Projects

The Terminal Redevelopment Program (TRP) is a continuation of the previous Vision 2020 plan. This section reviews the major elements of the project, as documented in the 2014 Basis of Design document prepared by Architectural Alliiance.

The TRP is comprised of two major components which are 1) a new Arrivals Hall and 2) a renovation and expansion of the concourse. In order to do either of these projects, a new central utility plant is required. These program elements are shown in Figure 4-11, and described in this section.

Figure 4-11
Terminal Redevelopment Program Major Projects



Source: 2014 Basis of Design, prepared by Architectural Alliiance.

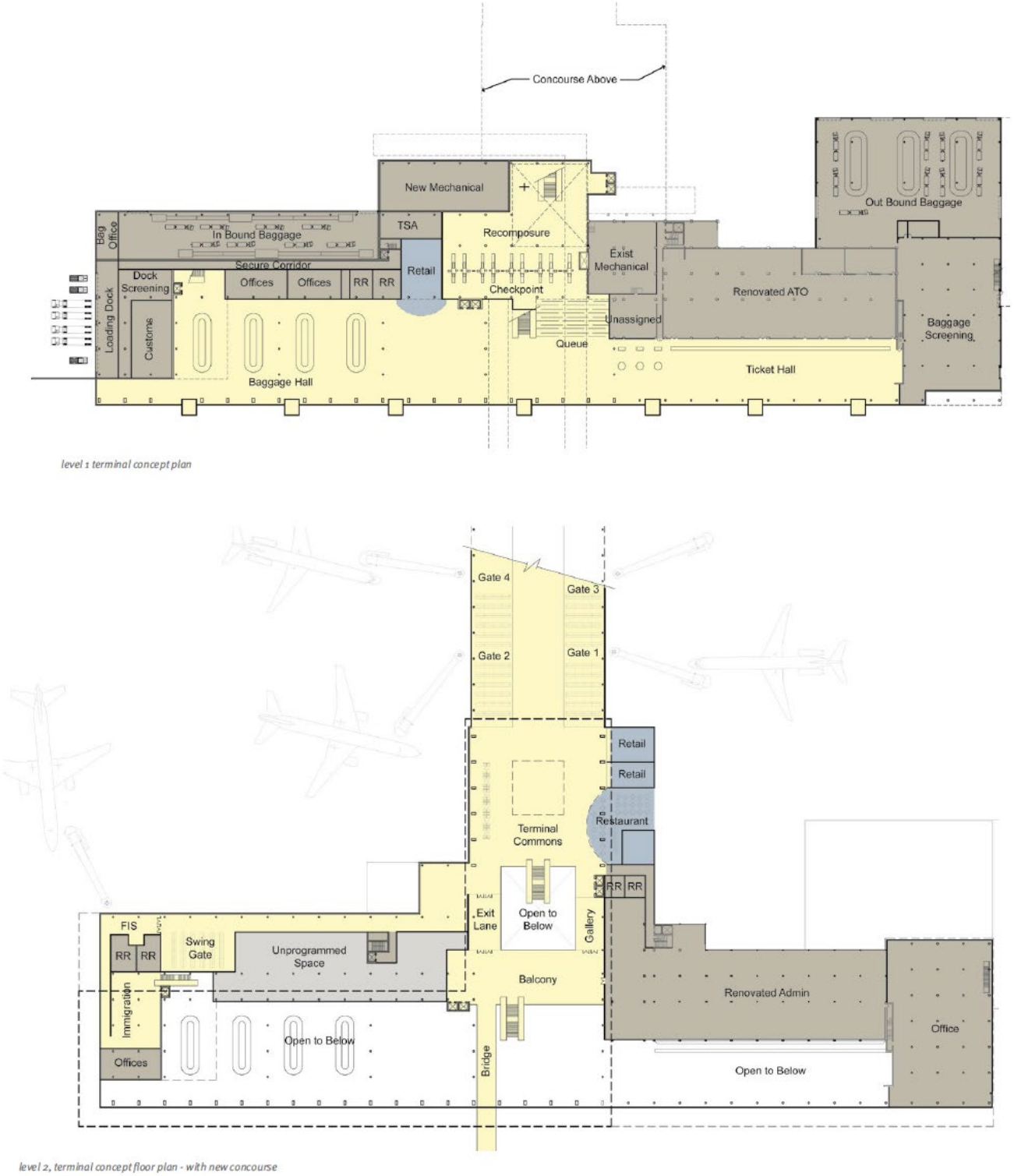
4.4.2.1 Central Utility Plant

A new central utility plant will contain new heating, cooling, electrical, and mechanical equipment to support the increased Terminal building footprint. The facility will also be the hub for the distribution of hot water, gas for heating and tenant use, fire protection systems, energy management system, etc. The plant will connect to the terminal complex through direct buried and concrete encased utilities. The location for the site is shown on Figure 4-11.

4.4.2.2 Arrivals Hall Construction

A new Arrivals Hall is proposed on the footprint of the existing west short term parking lot, as shown on Figure 4-12. The building features space for a consolidated security screening checkpoint on the ground level, up to five bag claim devices, new inbound baggage processing, a new loading dock, and space reserved for a Federal Inspection Service (FIS) facility to screen passengers on incoming international flights, all shown on Figure 4-12. Opportunity also exists to include two new aircraft gates on the northwest side of the proposed facility.

Figure 4-12
Arrivals Hall Project

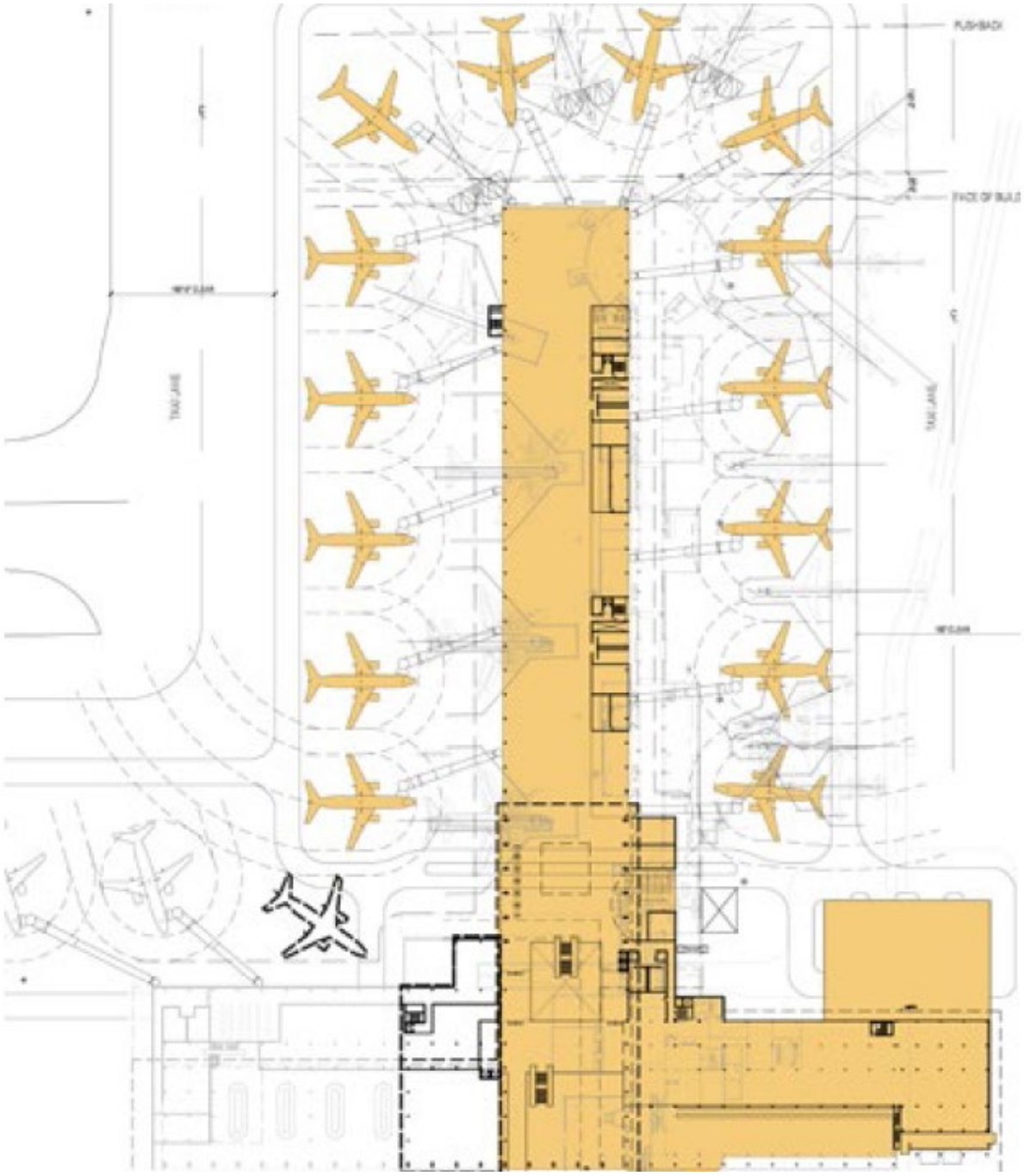


Source: 2014 Basis of Design, prepared by Architectural Alliiance.

4.4.2.3 Concourse Renovation / Expansion

The concourse renovation and expansion project will replace the existing aging concourse with a new and wider concourse as shown on Figure 4-13. In the ultimate configuration, the new concourse could support up to 17 aircraft gates, including the FIS-compatible gates added by the Arrivals Hall project.

Figure 4-13
Terminal Concourse Renovation and Expansion Project



Source: 2014 Basis of Design, prepared by Architectural Alliiance.

4.4.3 Selecting the Next Construction Phase

This Master Plan seeks to determine trigger points for the next logical phase of construction. However, the requirements analysis did not identify any capacity needs which would drive the next phase of the TRP. Therefore, justification for considering Terminal expansion includes:

- Improving customer level of service
- Enhancing hold room space, particularly at the rotunda
- Replacing aging utility and bag claim equipment
- Creating a landside footprint for enhanced public parking and roadways

Table 4-4 show the considerations used by the Master Plan team and Airport staff to confirm which phase of the TRP should be scheduled next.

Table 4-4
Terminal Phasing Considerations
Bill and Hillary Clinton National Airport

Phasing Consideration	Arrivals Hall next	Concourse Renovation and Expansion next
Hold room capacity	Improves capacity in near-term providing flexibility during concourse expansion	Improves capacity after lengthy multi-phase construction period
Bag claim space and equipment	Enhances bag claim passenger experience in near-term	Delays bag claim enhancements until after later Arrivals Halls project
Recent concourse renovations	Leverages recent investment in extending useful life of the concourse	Does not extract maximum benefit from useful life of existing Concourse
Curbside roadway configuration	Allows curbside roadway to be straightened in near-term	Delays curbside roadway reconfiguration until after later Arrivals Halls project
Close-in Public Parking	Allows for expansion of premium close-in surface parking in near-term	Delays premium close-in surface parking expansion until after later Arrivals Halls project
Federal Inspection Services (FIS) facility	Creates space which could quickly be built out to accommodate international flight arrivals	Space to build FIS and accommodate international flights not created until after Arrival Hall
Flexibility of phasing the Concourse Renovation	Two new Arrivals Hall gates mean 10 of 14 must be operational during Concourse construction	10 of the existing 12 gates must remain operational throughout Concourse construction

Source: Master Plan Team and Airport staff, September 2017.

Based on the considerations shown in Table 4-4, the Master Plan team and Airport staff confirm that the Arrivals Hall is the next logical major phase of construction.

4.5 GROUND TRANSPORTATION ALTERNATIVES

This section summarizes alternatives developed in support of the TRP, to accommodate ground access and parking facilities.

4.5.1 Summary of Ground Transportation Requirements

Landside facilities are well-positioned to accommodate the projected activity growth resulting from the aviation forecast.

The existing curbside configuration is adequately sized for demand and the proposed curbside facility coincident with the Arrivals Hall project provides additional space to accommodate long-term growth.

The Terminal roadway system has adequate capacity to accommodate existing and future demand, with the only opportunity identified for improvement located at the intersection of the Terminal exit roadway and Airport Road.

Public Parking facilities are adequately sized for the near-term, but require expansion to an ultimate build-out of approximately 4,040 spaces by 2036 to accommodate the forecast 1.31 MAP demand level. In addition to the long-term expansion from approximately 3,000 to 4,040 public parking spaces, public parking must be maintained throughout the anticipated construction of the Arrivals Hall element of the TRP.

4.5.2 Landside Alternatives

Three alternatives were developed by the Master Plan team and Airport staff to accommodate the projected public parking demand. The alternatives focus on:

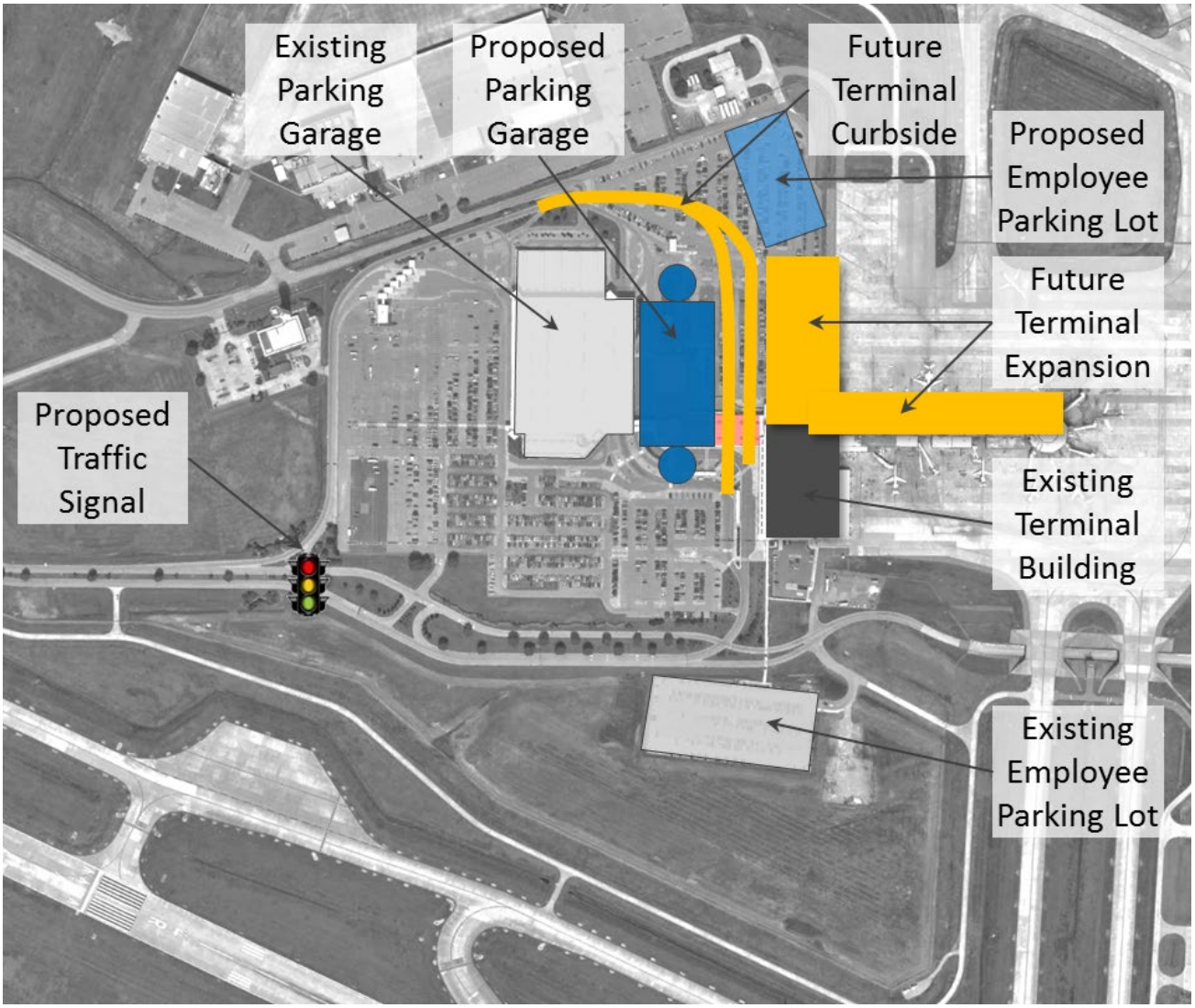
- Providing adequate public parking to accommodate long-term growth
- Balancing capital investment with potential parking revenue generation
- Developing roadways which support the TRP Arrivals Hall and Vision 2020 plan
- Maintaining continuous exemplary level of customer service throughout construction periods

4.5.2.1 Alternative #1 – New close-in garage

Landside alternative #1, shown on Figure 4-14, is to construct a new close-in garage between the existing parking deck and the proposed Arrivals Hall, on the site of the existing bag claim. The garage would provide approximately 1,200 public parking spaces in a 5- or 6-level structure. Consideration could be given to relocating rental cars from the existing parking deck to the ground floor of the proposed garage.

This alternative is an ultimate long-term phase of a near-term alternative to construct surface parking on the site, to accommodate public parking demand when the Arrivals Hall is opened.

Figure 4-14
Landside Alternative #1 – New close-in garage



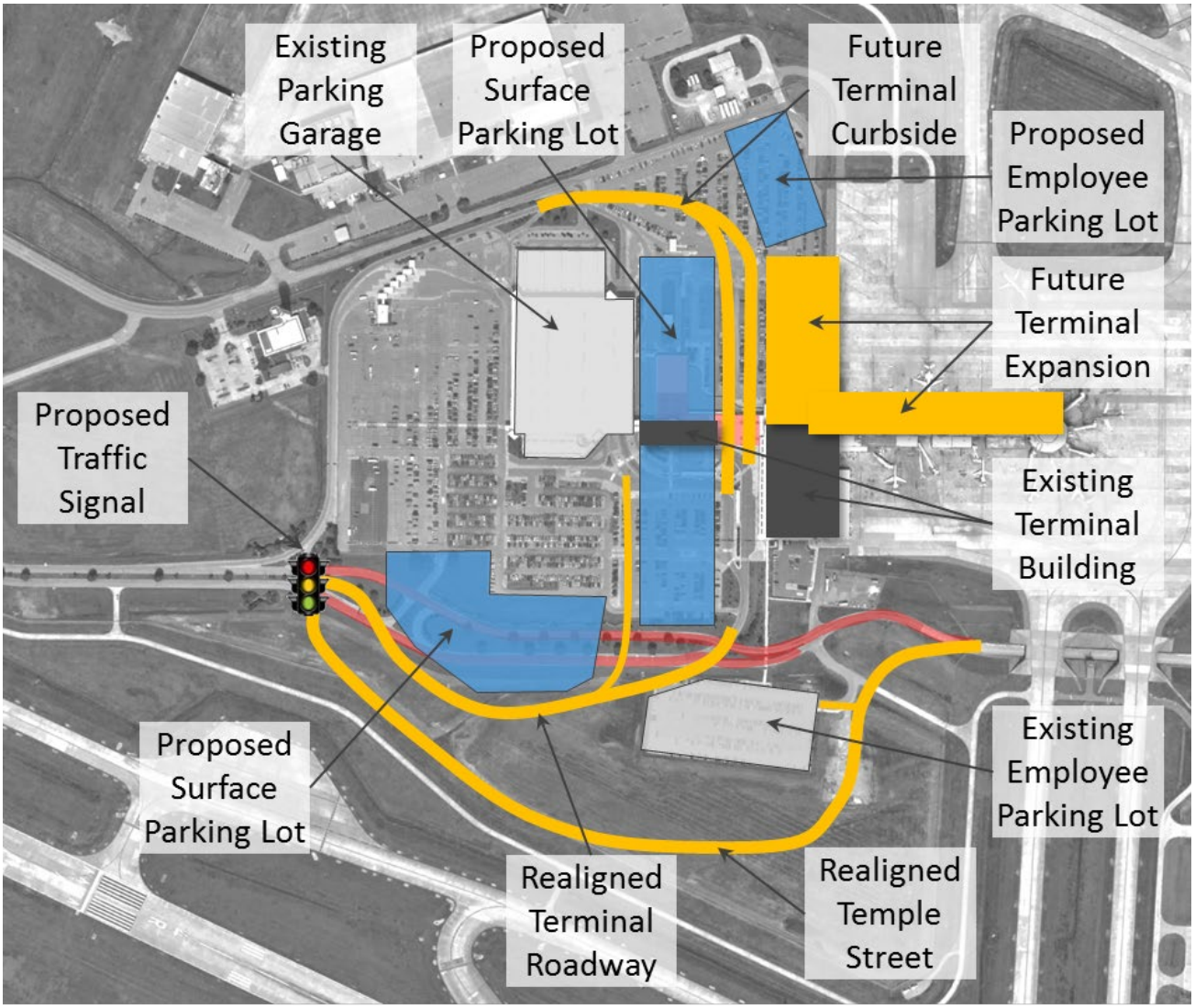
Source: LeighFisher team, August 2017.

Alternative #1 has the advantage of providing the maximum amount of parking as close to the Terminal building as possible. The existing parking deck can be connected, or nearly connected to the future Arrivals Hall by a covered walkway facility inside the proposed garage. The primary disadvantage of this alternatives is the cost of the new garage, which is likely to be considerably higher than surface parking alternatives. The revenue generating potential of the close-in parking garage is likely higher than a surface lot on the same site, since covered parking usually justifies a premium parking rate. No shuttle bus service would be required between the proposed close-in garage and the Terminal building, since the facility is within comfortable walking distance of check-in and future bag claim facilities.

4.5.2.2 Alternative #2 – Maximize surface parking

Landside alternative #2, shown on Figure 4-15, is to maximize opportunities for surface parking by reconstructing portions of the Airport roadway network to create a larger footprint for surface parking within the Terminal area. The existing long-term surface parking lot could be expanded by approximately 600 spaces. A proposed parking lot on the site of the existing East Short-term lot and existing bag claim facility would provide approximately 900 public parking spaces. While the cost of constructing surface parking rather than garage parking is appealing, much of that benefit would be offset by the cost of relocating existing roadways. Additionally, this option results in public parking further away than existing parking, which implies a need for costly enhancements to the existing shuttle bus service. With perceived lower customer service than a close-in garage, combined with the cost considerations, this alternative was not selected for further refinement.

Figure 4-15
Landside Alternative #2 – Maximize surface parking

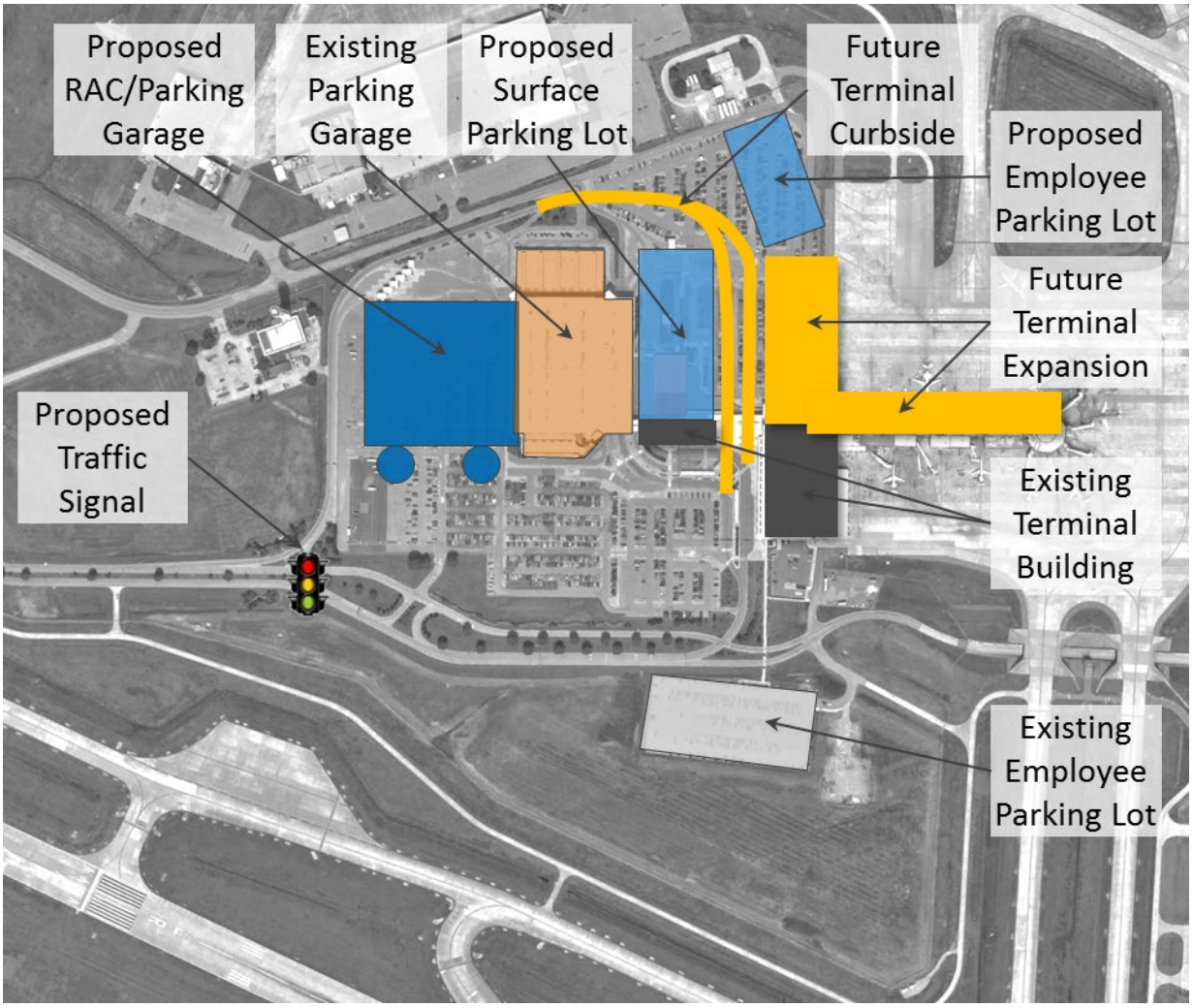


Source: LeighFisher team, August 2017.

4.5.2.3 Alternative #3 – New remote parking garage

Landside alternative #3, shown on Figure 4-16, is to construct a new parking garage south of the existing parking deck. The proposed garage would provide approximately 1,200 parking spaces in either 3- or 4-level structure. Consideration could be given to relocating rental cars from the existing parking deck to the ground floor of the proposed garage. This alternative has the advantage that the garage could be constructed with minimal disruption to existing parking operations. However, the distance from the proposed garage to the future Terminal likely exceeds the threshold for comfortable passenger walking distance. Therefore, to maintain customer service standards, costly enhancements to the existing shuttle bus operations would be required. The combined cost of garage construction and shuttle bus operations, along with lower revenue potential compared to a close-in garage, this alternative was not selected for further refinement.

Figure 4-16
Landside Alternative #3 – New remote parking garage



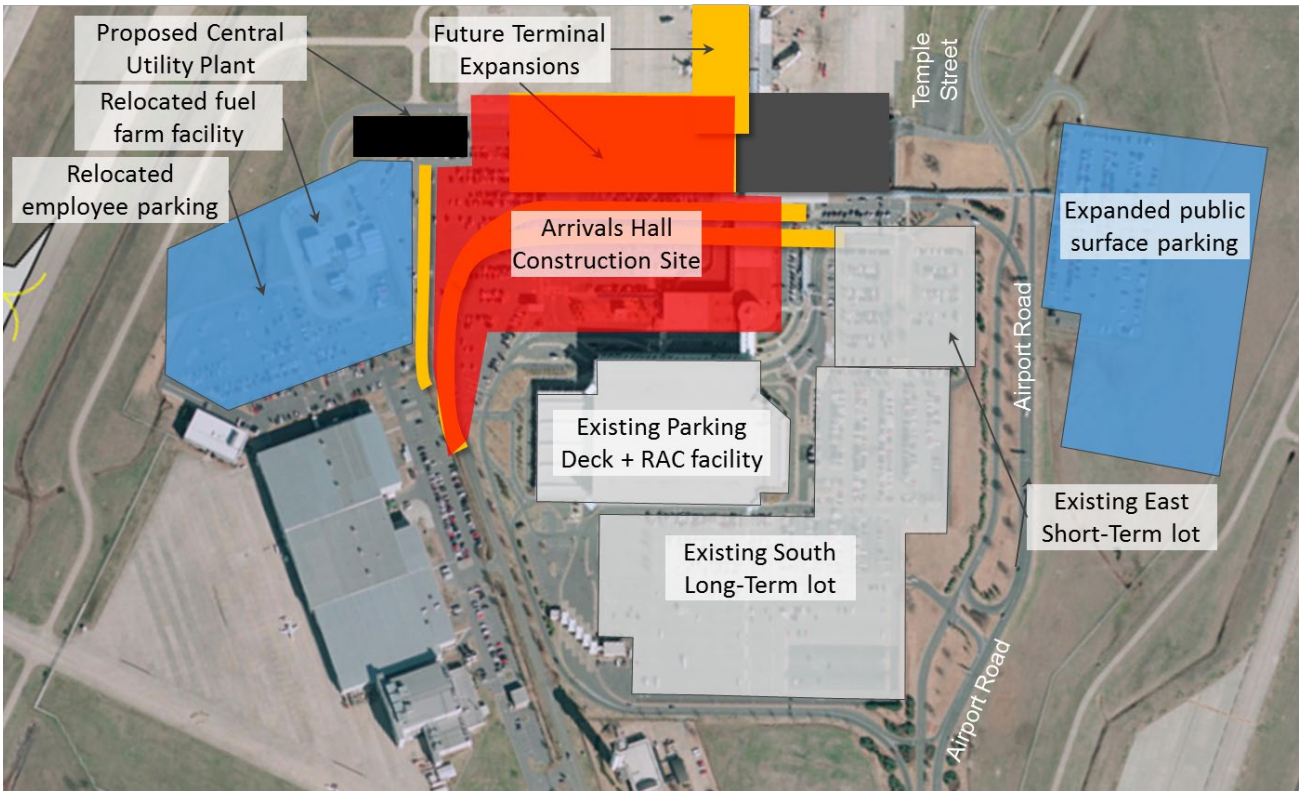
Source: LeighFisher team, August 2017.

4.5.3 Refinement of Recommended Landside Alternative

As discussed in the previous section, Alternative #1 was selected as the optimal long-term landside configuration. In this section, the alternative is further refined with additional consideration given to construction phasing, both during the TRP Arrivals Hall project and subsequently during construction of the proposed garage.

When the Arrivals Hall is constructed, the East Short-term lot and Peanut lot will likely both be closed to vacate space for proposed Terminal and roadway facilities. While a portion of the Peanut lot could be maintained, required relocation of revenue control equipment would likely mean that the lot would be used as contractor parking or construction lay-down area adjacent to the Terminal Arrivals Hall site. Therefore approximately 900 public parking spaces would be required during construction. The existing employee lot, west of Airport Road could be expanded to accommodate this public parking demand. The facility is located close enough to the Terminal complex to allow pedestrians to walk under and existing canopy structure. Employee parking could be provided with the same capacity as existing on the west side of the Terminal complex on the site of the existing building 100 parking lot and fuel farm, which could be relocated. Figure 4-17 depicts the configuration of landside parking proposed during the Arrivals Hall construction. Note that the capacity provided is approximately 3,000 spaces as shown, which matches the existing public parking supply. However, the surface parking lot east of Airport road is not constrained, and could provide approximate 300-500 additional spaces if demand warrants during this construction period.

Figure 4-17
Public Parking during Arrivals Hall construction



Source: LeighFisher team, December 2017.

The Arrivals Hall project includes demolition of the existing bag claim facility, which creates a footprint allocated for public parking. One question is whether public parking demand justifies construction of a garage coincident with the opening of the Arrivals Hall, or if surface parking is more appropriate to defer the cost of parking garage investment. From a facility capacity standpoint, adding 1,200 close-in parking spaces at the conclusion of the Arrivals Hall project is likely not required. So demand analysis should be validated closer to the time of construction to determine whether a garage is warranted or if a surface lot should be constructed for an interim 10 to 15 year period of use. Figure 4-18 shows the potential landside configuration at the conclusion of the Arrivals Hall project, if surface parking is constructed, and Figure 4-19 shows the ultimate long-term configuration if a garage with RAC facilities is constructed.

Figure 4-18
Landside configuration following opening of Arrivals Hall – Surface Parking

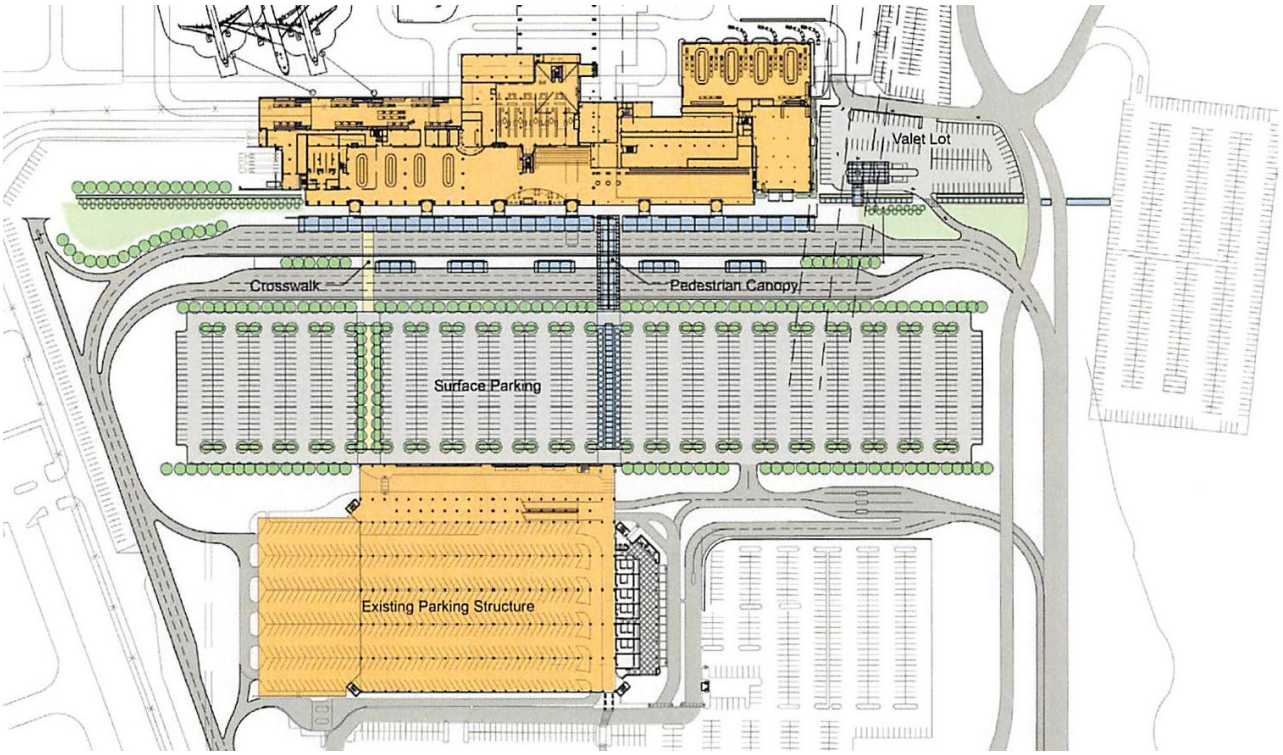
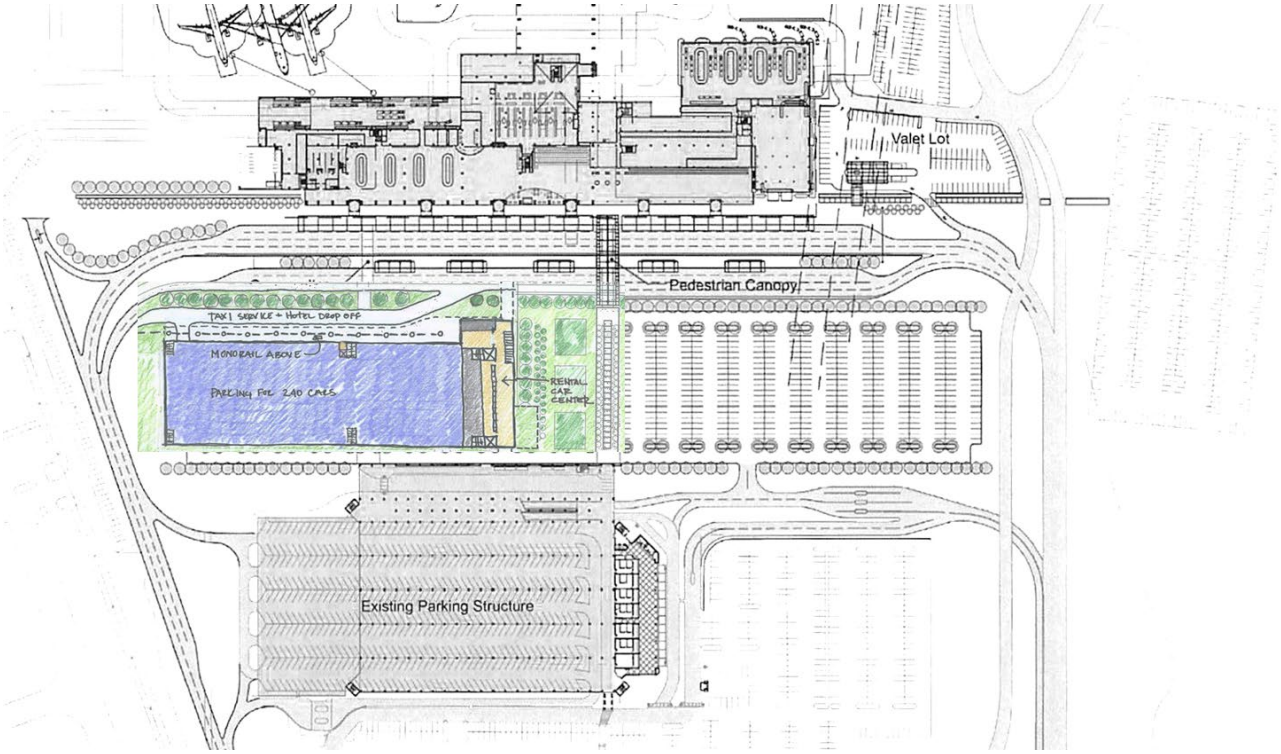


Figure 4-19
Ultimate preferred landside configuration

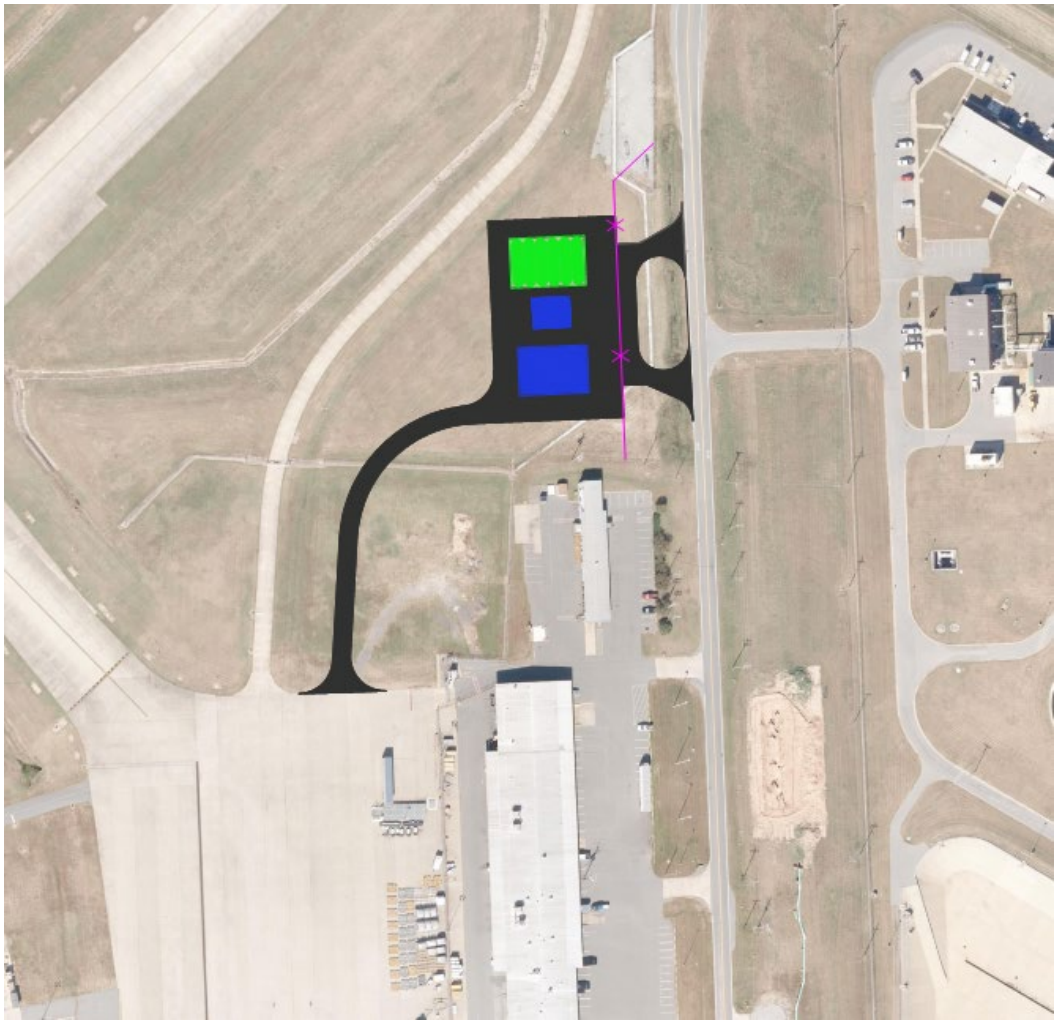


4.6 OTHER AIRPORT FACILITIES ALTERNATIVES

4.6.1 Fuel Farm Relocation

One of the enabling projects in support of the Terminal Redevelopment Program is the potential relocation of the existing fuel farm from the current location at the west side of the terminal area. One potential site identified for the relocated fuel farm facility is on Temple Street, north of the taxiway bridges. The site could be configured as shown in Table 4-20, which provides the benefit of being able to deliver fuel to the Airport from the outside of the AOA fence.

Figure 4-20
Proposed Fuel Farm Location



Source: LeighFisher team, December 2017.

4.6.2 General Aviation Conceptual Alternatives

Existing general aviation facilities are adequately sized to accommodate forecast demand. However, the Airport has identified a need for a cohesive GA development plan, in the event of increased GA demand in the future. Figure 4-21 shows three possible development areas located on the west side, and a potential configuration for each. While none of the supporting taxiway geometry is recommended at this time, the areas will be indicated on the Airport Layout Plan as reserved for future aviation development.

Figure 4-21
General Aviation Conceptual Alternatives

Source: LeighFisher team, December 2017.

4.6.3 Previous Master Plan Concepts Carried Forward

The previous Master Plan included several alternatives from the previous Master Plan which were not based on facility requirements, but which were deemed important enough to reserve space for on the Airport Layout Plan. Similarly, this Master Plan and ALP will carry forward some alternatives from the previous Master Plan including:

- Construction of a parallel taxiway system on the southeast side of Runway 4R-22L
- Retention of precision instrument approach capabilities associated with Runways 4L, 22R, 4R, and 22L (including lower minimums for Runways 4L, 4R, and 22L).
- Upgrade Runway 18-36 ARC from C-II to D-III
- Addition of precision instrument approach capabilities for Runway 18
- Re-alignment of East Roosevelt Road between Bond Street and Bankhead Drive

Chapter 5

5.1 ENVIRONMENTAL OVERVIEW

Using information gathered and documented in the Inventory chapter, this chapter presents an environmental screening review of the recommended alternatives presented in the previous chapter. This overview seeks to identify environmental obstacles or other reasons why a recommended alternative should not be included in the Recommended Development Plan, presented in the next chapter. The following narrative summarizes the potential impacts to environmental resources associated with the recommended development plan in a non-quantified fashion and identifies the likely environmental processing necessary for the airport improvements.

5.1.1 Environmental Project Assumptions

The following future conditions discussion assumes that all projects included in the Master Plan project list will be implemented as presented in previous chapters. The primary airfield proposed changes include the Taxiway C relocation and extension, the Taxiway L relocation and extension, Taxiway A south reconstruction, the removal of Taxiways D, G, M, and P intersections with Runway 04L/22R, a new entrance taxiway from Taxiway P to the Dassault Falcon Jet facilities, the Dassault Falcon Jet terminal ramp expansion from Taxiway P, and the terminal apron expansion to Taxiway F. The primary landside changes include the terminal central utility plan, arrivals hall construction, departures hall renovation, expansion and rehabilitation of the surface parking lot east of Airport Road, the rehabilitation of the Building 100 lot for employee parking, construction of new parking garages, roadway improvements, and the relocation of the fuel farm. An analysis of the potential environmental impacts resulting from implementing these improvements allows for the identification of any significant concerns at an early stage, as well as providing identification of the level of documentation required to receive environmental clearance for each project.

5.1.2 Environmental Review of Proposed Airport Development

There are several environmental resources that should be evaluated for potential impact prior to the implementation of any future airport development projects. Many of the environmental resource categories were initially reviewed and existing conditions presented in the Inventory chapter of this Master Plan. The following text follows the outline of environmental resources contained in the FAA's Order 1050.1F Desk Reference. Noise and Noise Compatible Land Use are discussed in the following section 5.2.

5.1.2.1 Air Quality

According to the U.S. Environmental Protection Agency (EPA), Pulaski County is currently designated as an attainment area for all federal health-based air quality standards known as the National Ambient Air Quality Standards (NAAQS). Being within in an attainment area is defined as a locality where air pollution levels do not exceed the NAAQS., so general conformity rules would not apply to LIT. However, there are several major construction projects that include taxiway pavement (both new paving, reconstruction, and removal), terminal building redevelopment and expansion, and parking garages, parking lot, and roadway improvement during the planning period. Short-term air quality impacts associated with construction projects may be expected from heavy equipment pollutant emissions, fugitive dust resulting from earth movement for cut and fill, any open burnings that may occur, and the operation of concrete batch plants. Contractors will be required to comply with all local, state, and Federal air quality regulations, especially the procedures contained in the FAA's Advisory Circular (AC) 150/5370-10G, *Standards for Specifying Construction of Airports*, which is the FAA's guidance to airport sponsors concerning protection of the environment during construction projects.

5.1.2.2 Biological Resources

As presented in the Inventory chapter, the USFWS indicates there are ten threatened or endangered species listed as known to occur within Pulaski County. Research does not show that habitat for any endangered species exists on LIT, nor are any endangered plant species known to grow on airport property. Prior to commencing with any major construction project at LIT, coordination with the USFWS and the Arkansas Game and Fish Commission may be necessary to confirm that the action would be likely to jeopardize the continued existence of a Federally-listed species or would result in the destruction or adverse modification of federally-designated critical habitat. Construction Best Management Practices (BMPs) should be followed to mitigate temporary construction impacts, which might include, but not limited to: straw bales, silt fences, and other sediment controls to prevent runoff into adjacent waterways, timely re-vegetation of disturbed work areas, and adherence to state guidelines to reduce threats to fauna.

5.1.2.3 Climate

Increasing concentrations of greenhouse gases (GHGs) in the atmosphere affect global climate. Climate change is a global phenomenon that can have local impacts. Research has shown there is a direct correlation between fuel combustion and GHG emissions. The EPA indicates that commercial aviation contributed approximately 6.6 percent of total CO_2 emission in 2013. CO_2 is the most important GHG because it is a long-lived gas that remains in the atmosphere for up to 100 years and it is the only GHG produced from aircraft combustion. Potential impacts to the climate are based on the change in CO_2 emissions of a particular project. If no increases in CO_2 emissions will result from a project compared to the no action alternative, then it can be assumed that no effect on climate change will occur. If a project results in increased CO_2 emissions, then effects to climate change can be assumed. However, the FAA has not established a significance threshold for aviation GHG emissions, but reducing GHG emissions contributes towards the U.S. goal of reducing aviation's impact on climate.

5.1.2.4 Coastal Resources

Little Rock is located in central Arkansas and is not subject to the Coastal Zone Management Act. Therefore, there are no projects that would impact coastal resources.

5.1.2.5 Department of Transportation Act, Section 4(f) Properties

Section 4(f) of the Department of Transportation Act (recodified at 49 USC, Subtitle I, Section 303) provides that no projects requiring federal assistance for implementation will involve more than a minimal physical use of a publicly owned park, recreation area, wildlife or waterfowl refuge, or land of a historic site that is of national, state, or local significance. Additionally, no such projects will involve a constructive use of the Section 4(f) properties based on an FAA determination that the project would substantially impair the resource. Substantial impairment occurs when activities, features, or attributes of the resource that contribute to is significance or enjoyment are substantially diminished.

Within the vicinity of Bill and Hillary Clinton National Airport there are ten local parks as provided in Table 5-1. It is not anticipated that any future airport development projects proposed by this Master Plan will impact or involve a constructive use of the parks. Any proposed park or recreation improvements near LIT should be coordinated with Airport staff and the FAA, and should be developed in a manner that is compatible with the Airport.

Table 5-1
Section 4(f) Properties
Airport Master Plan
Bill and Hillary Clinton National Airport

Park	Distance and Direction from LIT
East End Park	¼ mile northwest
Cheatham Park	½ mile west-northwest
Sherman Park	1-¼ mile northwest
Hanger Hill Park	¾ mile west
Granite Heights Park	1 mile southwest
Granite Mountain Park	1 mile south
North Shore Park	1 mile north-northeast
Rose City Park	1 mile north
School Street Park	1 mile north
Conley Park	1-¼ mile north

Source: Cities of Little Rock and North Little Rock Parks and Recreation Departments.

5.1.2.6 Farmlands

As identified in the Inventory chapter, a review of the soil survey prepared by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) indicated two soil complexes were prominent within airport property, which consisted of the Keo-Urban land complex and the Rill-Urban land complex. Other soil resource types present include the Bruno fine sandy loam, the Perry clay, and the Perry Urban soil complexes. The Bruno fin sandy loam soils are classified as farmlands of statewide importance and the Perry clay soils are classified as prime farmland if drained and either protected from flooding or not frequently flooded during the growing season. As specified in the Farmland Protection Policy Act (FPPA), any airport development project that would convert designated important farmland to a non-agricultural use, which is funded under the AIP or subject to FAA approval, is subject to FPPA coordination. Prior to future airport development within prime farmland areas, coordination with the USDA Natural Resources Conservation Service should occur to determine whether the Farmland Conversion Impact Rating Form (Form AD-1006) will need to be completed to assess the impact to prime farmlands. It should be noted that FPPA only applies to prime farmland areas that are in active agricultural use or not yet developed, and does apply to existing airport developed areas.

5.1.2.7 Hazardous Materials, Pollution Prevention, and Solid Waste

Hazardous materials, pollution prevention, and solid waste as a resource requiring environmental analysis includes such items as solid waste potentially generated by projects, potential for wastes to impact the environment, potential hazardous materials used during construction and operation of construction projects, the potential to encounter unknown hazardous materials during construction, and the potential to interfere with ongoing remediation of existing contaminated sites. LIT's solid waste and recycling plan is presented in the Master Plan Appendices, and provides recommendations to minimize solid waste generation, maximize the diversion of solid waste destined for landfills, increase reuse and recycling efforts, and increase revenue from recycling efforts. Therefore, this section will focus on hazardous waste and pollution prevention.

There will be no known hazardous substances or wastes generated from the anticipated development projects contained in this Master Plan. However, some construction activities can generate hazardous wastes and some construction materials constitute hazardous substances, such as fuel, oil, lubricants, paints, solvents, concrete-curing compounds fertilizers, herbicides, and pesticides. Plans and specifications for all projects will incorporate the provisions contained in FAA AC 150/5370-10G to ensure minimal impact during construction activities. Compliance with standards contained in Executive Order 12088, *Federal Compliance with Pollution Control Standards*, will be followed and the best available techniques and methods will be employed to prevent, control, and abate environmental pollution.

A Phase I Environmental Due Diligence Audit (EDDA) must be prepared in accordance with FAA Order 1050.19, *EDDA in the Conduct of Real Property Transactions*, prior to any real property acquisition. A review of the EPA's Superfund Enterprise Management System (SEMS) did not indicate the presence of any sites on or near LIT that are listed or under consideration for listing on the National Priorities List (NPL). A search of the Resource Conservation and Recovery Act Information System (RCRIS) database, which contains information and data on hazardous waste handler permits and activities, lists approximately 23 facilities permitted as handlers or generators of hazardous waste on or near LIT and is presented in Table 5-2.

Table 5-2
Hazardous Waste Handlers
Airport Master Plan
Bill and Hillary Clinton National Airport

Facility Name	Facility Classification
American Eagle Airlines	Conditionally Exempt Small Quantity Generator
Environmental Energy Inc.	Transporter
Central Flying Service Inc.	Conditionally Exempt Small Quantity Generator
Timex Corporation	Corrective Action
3M Little Rock College Station	Conditionally Exempt Small Quantity Generator
XPO Logistics Freight, Inc. – LLR	Conditionally Exempt Small Quantity Generator
Novus International, Inc.	Small Quantity Generator
Petroclean Solutions, LLC	Used Oil Program
UPS Ground Freight, Inc.	Small Quantity Generator
United Parcel Service	Conditionally Exempt Small Quantity Generator
US Army Reserve Center – Finkbeiner	Conditionally Exempt Small Quantity Generator
Cheyenne Industries Inc.	Conditionally Exempt Small Quantity Generator
Environmental Energy Inc.	Used Oil Program
Delta Airlines Little Rock	Conditionally Exempt Small Quantity Generator
United Parcel Service	Large Quantity Generator
Dassault Falcon Jet Corp	Large Quantity Generator
Progress Rail Services – ABS Arkansas	Small Quantity Generator
Transportation Security Administration – LIT	Small Quantity Generator
Global Manufacturing Inc.	Conditionally Exempt Small Quantity Generator
Standardaero	Conditionally Exempt Small Quantity Generator
Fedex Freight LIT	Small Quantity Generator
Weyerhaeuser Co Dba Northwest Hardwood	Conditionally Exempt Small Quantity Generator
Centerpoint Energy Little Rock	Conditionally Exempt Small Quantity Generator

Source: U.S. Environmental Protection Agency, RCRAInfo Overview.

The nine-acre former Timex site located west of the general aviation facilities and south of Crisp Drive was previously identified as contaminated with trichloroethylene (TCE) in the surface soil and groundwater. An Amendment to Consent Administrative Order (CAO) established between the Timex Corporation and the Arkansas Department of Environmental Quality (ADEQ) implemented remedial actions for the clean-up of the site. Excavation and off-site disposal of unsaturated soils, and the backfill with imported clean fill has been accomplished. In situ chemical oxidation via injection of an oxidant into the shallow groundwater has been performed. The shallow and deep groundwater aquifers at the site continue to be monitored for the effectiveness of the remedial actions. City of Little Rock ordinances have been established that restrict the development of impacted parcels to industrial uses and restricts any development of groundwater on the impacted parcels. LIT plans to allow future aviation development (i.e., hangars and/or aprons) on the site, but will incorporate the City of Little Rock ordinance restrictions in future deeds that prevent the usage of groundwater in the area.

5.1.2.8 Historical, Architectural, Archaeological, and Cultural Resources

An online query of the National Park Service's National Register of Historic Places (NRHP) revealed there are 12 listed properties near Bill and Hillary Clinton National Airport, as provided in Table 5-3. It is not expected that any of the NRHP-listed properties will be impacted by future proposed airport development. Given that some of the buildings and facilities at the airport are over 50 years old, there may be a few that are potentially eligible for listing on the NRHP. Prior to renovation or removal of any airport building, FAA consultation with the Arkansas Historical Preservation Program should be conducted to confirm the structures are not eligible for listing on the NRHP.

Table 5-3
Historical, Architectural, Archaeological, and Cultural Resources
Airport Master Plan
Bill and Hillary Clinton National Airport

Resource Name	Distance and Direction from LIT
Climber Motor Car Factory, Unit A	¼ mile west
Little Rock National Cemetery	1 mile west
Oakland-Fraternal Cemetery	1 mile west
Hanger Hill District	1 mile west
Bechle Apartment Building	1 mile west
William Woodruff House	1 mile west
Minnesota Monument	1 mile west
Reichardt House	1 mile west
Choctaw Route Station	1- ¼ mile northwest
Carl Bailey Company Building	1 mile north
East End Methodist Episcopal Church	1 mile north
Harris House	1 mile east

Source: U.S. Department of Interior National Park Service, National Register of Historic Places.

The Native American Consultation Database (NACD), maintained by the National Park Service, indicates that the Quapaw Tribe of Indians and the Osage Nation of Indians have historical ties and interests within Pulaski County. Before implementing any airport projects that require earth movement, FAA consultation with the Arkansas Historical Preservation Program and the Tribal Historic Preservation Office (THPO) for each Native

American tribe should be conducted that considers the effect on potentially buried archeological, tribal, and cultural resources. Projects implemented on property undisturbed by previous earth movement activities are more likely to affect buried cultural resources than projects located on previously disturbed land. Such projects potentially include Taxiways C, G, L, and M relocations, the new aircraft entrance from Taxiway P to the Dassault Falcon Jet facilities, the terminal ramp expansion, the fuel farm relocation, and the expansion of the surface parking lot east of Airport Road.

5.1.2.9 Natural Resources and Energy Supply

Natural resources and energy supply involve the consumption of natural resources and use of energy supplies that may result from construction, operation, and/or maintenance of proposed projects. The determination of significance for projects typically involves, but is not limited to the demands exceeding supplies. It is not anticipated that the demands for asphalt, concrete, steel, water, electric, natural gas, fuel, other construction materials, or other utilities will be exceeded by any identified project.

5.1.2.10 Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

- **Socioeconomics.** Socioeconomics is a broad term used to describe aspects of a project that are either social or economic in nature. The analysis of significance evaluates how elements of the human environment such as population, employment, housing, and public services might be affected. The existing socioeconomic conditions of Little Rock and the surrounding area were presented in the Forecasts of Aviation Activity chapter. It is not anticipated that any projects contained in this Master Plan will have the potential to induce substantial economic growth, disrupt or divide established communities, cause extensive relocations or residents or commercial establishments causing severe economic hardship, disrupt local traffic patterns or reduce levels of service for roadways, or substantially change the tax base. Any property acquisition that relocates residential structures and residences will conform to requirements contained in the Uniform Relocation Assistance and Real Property Acquisition Policies Act.

- **Environmental Justice.** Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income. Fair treatment means that no people group should bear a disproportionate share of negative environmental consequences resulting from industrial, governmental, and commercial operations or polices. According to the U.S. Census Bureau, the approximate percentage of minority population surrounding LIT, based on Census Block Group analysis, is 70.6. Higher concentrations of minority population exist in areas south and west of the airport than north and east. The estimated low-income population in Pulaski County is 17.2 percent. The FAA has not established a significance threshold for environmental justice, but has identified factors to consider when evaluating the context and intensity of potential impacts leading to a disproportionately high and adverse effect on an environmental justice population. These factors include a significant impact in other environmental categories or impacts on the physical or natural environment that is unique and significant to the environmental justice population. It is not anticipated that any proposed projects contained in this Master Plan will have a disproportionately high and adverse impact on the minority or low-income population. As stated above, any property acquisition resulting in the relocation of residential structures and residences will conform to requirements contained in the Uniform Relocation Assistance and Real Property Acquisition Policies Act.

- **Children's Environmental Health and Safety Risks.** Projects that could create health and safety risks that might disproportionately affect children are to be identified and assessed during the

NEPA process. Environmental and safety risks include those that are attributable to products or substances that children are likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products that they might use or be exposed to. According to the U.S. Census Bureau analysis of the Census Block Groups surrounding the airport, approximately 24.9 percent are children. Like the impacts to environmental justice population, the FAA has not established a significance threshold relating to children's health and safety risks, but any project having the potential to lead to a disproportionately high health or safety risk to children must be evaluated in context and intensity of the potential impacts, especially in light of significant impacts to other environmental categories. It is not anticipated that any proposed airport development projects will have a disproportionately high and adverse impact on children's health and safety risks.

5.1.2.11 Visual Effects

Visual effects typically are concerned with the extent to which airport projects would either: produce light emissions that create annoyance or interfere with activities; or contrast with, or detract from, the visual resources or visual character of the existing environment. Visual effects are difficult to define and assess as they involve subjectivity.

The existing terminal building, parking facilities, air cargo facilities, aviation/aerospace facilities, runway and taxiway lights, approach lights, and roadway lights currently produce a sizable amount of light emissions. Existing residential neighborhoods to the west and east are mostly shielded by airport and non-airport buildings or vegetation. Neighborhoods to the south tend to be shielded by vegetation or by the light sources of Interstate 440. It is not anticipated that any projects identified in this Master Plan will have any adverse light effects or annoyances to surrounding residents. Shielding and/or baffles or angular adjustments can be implemented to reduce light emission impacts.

The Airport has been in its existing location for 100 years and establishes the visual character for much of the area. No projects are anticipated that require acquisition of sizable portions of surrounding properties that would be converted from non-aviation to aviation uses. As such, no identified projects presented in this Master Plan are expected to contrast with or detract from the visual character of the airport area.

5.1.2.12 Water Resources

Water resources are defined as surface waters or groundwater considered of vital importance to society. This resource includes wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers.

- **Wetlands**. Wetlands, are areas inundated by surface or groundwater with a frequency sufficient to support vegetation or aquatic life requiring saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands and other Waters of the U.S. are classified as "jurisdictional" or "non-jurisdictional", with jurisdictional wetlands and designated Waters of the U.S. under the authority of and are regulated by the U.S. Army Corps of Engineers (USACE). Section 404 of the Clean Water Act gives the USACE the authority to regulate disposal of dredge or fill materials into Waters of the U.S., including streams and freshwater wetlands above the Ordinary High Water (OHW) line of streams that are adjacent to Waters of the U.S.
  As presented in the Inventory chapter, National Wetland Inventory (NWI) maps from the U.S. Fish and Wildlife Service (USFWS) indicate wetlands are present on airport property. However, some of the locations shown as wetlands are where active airfield pavement or airport facilities already exists, indicating the maps may be outdated. Most of the NWI-identified wetlands on airport property are located adjacent to the Arkansas River or Fourche Creek, although some are

indicated south and east of the terminal building area, southeast of Taxiway F, and between Taxiway C and Runway 04L/22R. Projects having the most potential to affect NWI-identified wetlands include the Taxiway C relocation and the expansion of the public parking lot east of Airport Road. Prior to completing any projects on the Airport, coordination should be completed with the USACE to identify and grade any wetlands that might exist within the project areas.

- **Floodplains**. According to information obtained from the Federal Emergency Management Association (FEMA) published Flood Insurance Rate Maps (FIRM), LIT borders Zone AE and Zone X floodplains. However, it is not anticipated that any proposed Airport development will be located within any floodplains or regulatory floodways.

- **Surface Waters.** Surface water components are not single, isolated ecosystems, but rather function as components of an integrated natural system. Disruption to any component of the system can result in consequences to the proper function of the entire system. The Airport is located within two major watersheds, the Fourche Creek and the Arkansas River. About one-third of the Airport's land area is located within the Arkansas River watershed, while the remainder lies within the Fourche Creek watershed.
  LIT has on record a Storm Water Pollution Prevention Plan (SWPPP), updated in December 2016, as required by the National Pollutant Discharge Elimination System (NPDES) program administered under the Arkansas Water and Air Pollution Control Act. The SWPPP identifies existing potential sources of pollutants (e.g., aircraft fuels, oils, coolants, lubricants, and deicing chemicals), the selection and implementation of appropriate management practices and controls to prevent pollution, documentation of permit eligibility related to Total Maximum Daily Loads (TMDL), and the establishment of a program for the periodic evaluation of the effectiveness of the SWPPP in achieving its stated purposes.
  The SWPPP indicates that LIT maintains large areas of grassed swales and ditches throughout the property that act to filter sediments, oils, and greases prior to discharging through outfalls. There are two storm water detention basins located in the south portion of the Airport, and two detention basins located within the Dassault Falcon Jet facilities in the northwest portion of the Airport that serve as storm water pollution prevention structures. Storm water is not currently treated prior to its discharge. The SWPPP further indicated that current potential sources of storm water pollution at LIT can be appropriately addressed through good housekeeping, various storage and handling procedures, and area-specific BMPs deemed most effective for eliminating or reducing pollutant loadings in the storm water discharges at each facility. As the Airport is expanded with new facilities and development, it is anticipated that the SWPPP will be updated and/or modified as needed, and that additional NPDES Individual Permits will be issued.
  A review of the EPA's Permit Compliance System (PCS)/Integrated Compliance Information System (ICIS) database, there are six existing facilities located on or near the Airport permitted to discharge wastewater into streams. The facilities are listed in Table 5-4.
  Projects are considered to exceed significance thresholds if Federal, state, local, or tribal groundwater quality standards are surpassed, or if a contamination of an aquifer used for public water supply is impacted such that the public health may be adversely affected. Future projects identified in this Master Plan having the potential to impact surface water resources and likely requiring construction NPDES permits include all the taxiway pavement construction or removal projects, the terminal apron expansion, the fuel farm relocation, the parking lot expansion, and

the parking garage construction. However, it is not anticipated that any projects will exceed FAA's significance thresholds for surface water impacts.

Table 5-4
Permitted Wastewater Discharge Facilities
Airport Master Plan
Bill and Hillary Clinton National Airport

Facility Name	Type of Permit	Receiving Water Body
Adams Field Wastewater Treatment Plant	General	Arkansas River
Carco Rentals-Little Rock	General	Fourche Creek, Arkansas River
GS Roofing - Certainteed Corp	General	Fourche Creek, Arkansas River
Little Rock National Airport	General	Fourche Creek, Arkansas River
Truman Arnold Companies	General	Ditch, Fourche Creek, Arkansas River
United Parcel Service	General	Arkansas River

Source: U.S. Environmental Protection Agency, Permit Compliance System and Integrated Compliance Information System.

- **Groundwater.** Groundwater is subsurface water that occupies the space between sand, clay, and rock formations. The term aquifer is used to describe the geologic layers that store or transmit groundwater. According to the US Geological Survey (USGS), a coastal plain aquifer system in semi-consolidated sand known as the Mississippi embayment aquifer underlies Little Rock and most of the state south and west of the Arkansas River. The Mississippi River Valley alluvial aquifer underlines most of the state east of little Rock, north and east of the Arkansas River. However, according to the USEPA, there is not an EPA-designated sole or principal source of drinking water aquifer located near LIT.
  Any projects increasing the amount of impervious surfaces, excavation, or construction of structures have the potential to affect groundwater. Construction activities could impact groundwater through petroleum or chemical spills and erosion and sedimentation when the ground is bared from earthmoving operations. Like surface water resources, projects are considered to exceed significance thresholds if Federal, state, local, or tribal groundwater quality standards are surpassed, or if a contamination of an aquifer used for public water supply is impacted such that the public health may be adversely affected. Although it is not anticipated that any projects presented in this Master Plan will exceed significance thresholds for groundwater impacts, identified projects with the most potential to adversely affect groundwater includes the Taxiway C relocation and extension, the expanding of the terminal apron, the expansion of the parking lot east of Airport Road, and the construction of the Arrivals Hall.

- **Wild and Scenic Rivers.** Wild and scenic rivers are those rivers believed to possess one or more outstandingly remarkable natural or cultural values judged to be at least regionally significant, as defined by the Wild and Scenic Rivers Act. According to the Nationwide Rivers Inventory, there are no rivers near LIT determined to be wild and scenic by the National Park Service.

5.1.3 Potential Environmental Processing

On a project-specific basis, the proposed improvements specified in this Master Plan that are anticipated to receive Federal funding or require a change to the Airport Layout Plan (ALP) requires environmental processing and clearance prior to implementation. The environmental processing required to receive the clearance differs with the complexity of the project, the controversial nature of the project, and the anticipated level of environmental impacts. This documentation ranges from a Categorical Exclusion for simple projects with little to no impacts to Environmental Impact Statements for complex and/or controversial projects with potentially significant impacts. This section of the LIT Master Plan attempts to discover the potentially significant environmental resource impacts and determine the level of environmental processing and permitting required to implement the proposed projects.

The identified projects associated with this Master Plan and the natural resource categories having the most potential for impact are summarized in Table 5-5, which also presents the environmental processing anticipated for each project. As outlined in the previous sections, because most of proposed airport projects occur on lands previously disturbed by past airport development, it does not appear there are significant environmental effects that cannot be addressed or mitigated below significant thresholds.

Table 5-5
Summary of Potential Environmental Impacts of Proposed Development Projects
Airport Master Plan
Bill and Hillary Clinton National Airport

	Potential Impacts to Environmental Resources					
Development Project	**Air Quality**	**Biological Resources**	**Hazardous Materials, Pollution Prevention, and Solid Waste**	**Historical, Architectural, Archaeological, and Cultural Resources**	**Water Resources**	**Potential Environmental Processing**
Fuel Farm Relocation	In Attainment Construction BMPs	No Impact Anticipated Coordination with USFWS	No Impact Anticipated Construction BMPs Coordination with ADEQ	No Impact Anticipated Coordination with Arkansas Historic Preservation Program	Construction NPDES permit. Construction BMPs Coordination with USACE	Cat Ex Anticipated Potential EA
Central Utility Plant	In Attainment Construction BMPs	No Impact Anticipated	No Impact Anticipated Construction BMPs	No Impact Anticipated Coordination with Arkansas Historic Preservation Program	No Impact Anticipated Construction BMPs	Cat Ex Anticipated
Arrivals Hall	In Attainment Construction BMPs	No Impact Anticipated	No Impact Anticipated Construction BMPs	No Impact Anticipated Coordination with Arkansas Historic Preservation Program	No Impact Anticipated Construction BMPs	Cat Ex Anticipated
Departures Hall Renovation	In Attainment Construction BMPs	No Impact Anticipated	No Impact Anticipated	No Impact Anticipated	No Impact Anticipated	Cat Ex Anticipated
Taxiway C Relocation and Extension	In Attainment Construction BMPs	No Impact Anticipated Coordination with USFWS	No Impact Anticipated Construction BMPs	No Impact Anticipated Coordination with Arkansas Historic Preservation Program	Potential wetlands Construction NPDES permit. Construction BMPs Coordination with USACE	Cat Ex Anticipated Potential EA
Taxiway A South Reconstruction	In Attainment Construction BMPs	No Impact Anticipated Coordination with USFWS	No Impact Anticipated Construction BMPs	No Impact Anticipated Coordination with Arkansas Historic Preservation Program	Construction NPDES permit. Construction BMPs Coordination with USACE	Cat Ex Anticipated Potential EA
Taxiway D and P Removal	In Attainment Construction BMPs	No Impact Anticipated Coordination with USFWS	No Impact Anticipated Construction BMPs	No Impact Anticipated Coordination with Arkansas Historic Preservation Program	Potential wetlands Construction NPDES permit. Construction BMPs Coordination with USACE	Cat Ex Anticipated
Taxiways G, L, and M Replacement	In Attainment Construction BMPs	No Impact Anticipated Coordination with USFWS	No Impact Anticipated Construction BMPs	No Impact Anticipated Coordination with Arkansas Historic Preservation Program	Construction NPDES permit. Construction BMPs Coordination with USACE	Cat Ex Anticipated Potential EA
New Taxiway Entrance to Dassault Falcon Jet from Taxiway P	In Attainment Construction BMPs	No Impact Anticipated Coordination with USFWS	No Impact Anticipated Construction BMPs	No Impact Anticipated	Construction NPDES permit, Construction BMPs Coordination with USACE	Cat Ex Anticipated
Expansion of Dassault Falcon Jet Ramp to Taxiway P	In Attainment Construction BMPs	No Impact Anticipated Coordination with USFWS	No Impact Anticipated Construction BMPs	No Impact Anticipated	Construction NPDES permit. Construction BMPs Coordination with USACE	Cat Ex Anticipated
Rehabilitate Building 100 Lot for Employee Parking	In Attainment Construction BMPs	No Impact Anticipated	No Impact Anticipated Construction BMPs	No Impact Anticipated	Potential wetlands Construction NPDES permit. Construction BMPs Coordination with USACE	Cat Ex Anticipated
Expand and Rehabilitate Surface Parking Lot East of Airport Road	In Attainment Construction BMPs	No Impact Anticipated	No Impact Anticipated Construction BMPs	No Impact Anticipated Coordination with Arkansas Historic Preservation Program	Potential wetlands Construction NPDES permit. Construction BMPs Coordination with USACE	Cat Ex Anticipated Potential EA
Construct Parking Garage on Site of Existing East Short-Term Lot	In Attainment Construction BMPs	No Impact Anticipated	No Impact Anticipated Construction BMPs	No Impact Anticipated	Construction NPDES permit. Construction BMPs Coordination with USACE	Cat Ex Anticipated Potential EA
Construct Parking Garage Adjacent to Future Terminal	In Attainment Construction BMPs	No Impact Anticipated	No Impact Anticipated Construction BMPs	No Impact Anticipated	Construction NPDES permit. Construction BMPs Coordination with USACE	Cat Ex Anticipated Potential EA

5.2 LAND USE PLANNING

In consideration of the existing local land use zoning and comprehensive planning capabilities, environs land use planning recommendations are formulated with a focus on land use compatibility concerns. The environs land use plan recommendations are principally based on aircraft-generated noise and the potential impact to noise sensitive land uses such as residences, schools, and hospitals. However, the recommendations will also include a review of the highest and best uses of airport lands that may be suitable for revenue-generating purposes, and which are not needed to support the core aviation functions of the Airport.

5.2.1 Noise

Noise is generally defined as unwanted sound and, as such, the determination of acceptable levels is subjective. The day-night sound level (DNL) methodology is used to determine both the noise levels resulting from existing conditions and the potential noise levels that could be expected to occur in the future. DNL is a 24-hour, time-weighted energy average noise level based on the "A" weighted decibel ("A" weighted refers to the sound scale pertaining to the human ear). It is a measure of the overall noise experienced during an entire day. Time-weighted refers to the fact that noise occurring between the hours of 10:00 p.m. and 7:00 a.m. is penalized by ten decibels [dB(A)] in an attempt to account for people being more sensitive to noise during nighttime hours and the expected decrease in background noise levels. Very simply, a DNL noise level for a specified area over a given time is approximately equal to the average dB(A) level that has the same sound level as the intermittent noise events. Thus, a DNL 65 level describes an area as having a constant noise level of 65 dB(A), which is the approximate average of single noise vents even though the area would experience noise events much higher than 65 dB(A) and periods of quiet.

DNL noise levels are depicted as noise contours, which are interpolations of noise levels based on the center of grid cells. Grid cells are squares composed of specific size that are entirely characterized by a noise level. Thus, noise contours connect the points of comparable noise levels, appear similar to topographical contours, and form concentric "footprints" about a noise source. These footprints drawn around an airport are used to predict community response to the noise from aircraft using the Airport.

The main advantage of DNL is that it provides a common measure for a variety of differing noise environments. The same DNL level can describe both an area with very few high-level noise events and an area with many low-level events. DNL is thus constructed because it has been found that the total noise energy in an area predicts community response.

5.2.1.1 Computer Modeling

The DNL noise contours were generated using the Aviation Environmental Design Tool (AEDT), which has been specifically developed by the FAA to model aircraft performance for fuel burn, emission, and noise. The program is provided with standard aircraft noise and performance data that can be tailored to the characteristics of individual airports. The AEDT program requires the input of the physical and operational characteristics of the Airport. Physical characteristics include runway coordinates, airport elevation, and temperature. Operational characteristics include aircraft mix, flight tracks, and approach profiles. Optional data that is contained within the model include departure profiles, approach parameters, and aircraft noise curves. These options were incorporated to model both the existing and future noise environments at LIT. It should be noted that several assumptions were made to estimate the specific types of aircraft expected to use LIT in the future, as older aircraft are retired from the fleet and newer aircraft are added.

5.2.1.2 Noise Analysis

Using the existing and future aircraft operations presented in the Forecasts chapter, existing (2016) noise contours and future (2036) noise contours have been generated. Illustrations and descriptions of the potential impacts to the surrounding land uses for each set of noise contours follow. Aircraft operations were sufficient to generate the 60, 65, 70, 75, and 80 DNL noise contours, but to determine land use compatibility for this study, the analysis uses the 65 DNL noise contour and higher. Table 5-6 presents a Land Use Compatibility Matrix that indicates land uses that are generally considered compatible within certain DNL noise contours. It identifies land uses as being compatible, incompatible, or compatible if sound attenuated. The matrix, which was developed by the FAA, can act as a guide to the City of Little Rock and surrounding jurisdictions for land use planning and control. The area outside the 65 DNL noise contour is an area within which most land uses are compatible, but is an area where single event noise complaints are often received. The area between the 65 and 70 DNL noise contours is an area of significant noise exposure where many types of land uses are normally unacceptable and where land use compatibility controls are recommended. Finally, the area inside the 75 DNL noise contour identifies land uses that are subjected to a significant level of noise and the sensitivity of various uses to noise is increased.

It should be noted that DNL noise contours do not delineate areas that are either free from excessive noise or areas that will be subjected to excessive noise. In other words, it cannot be expected that a person living on one side of a DNL noise contour will have a markedly different reaction than a person living nearby, but on the other side. What can be expected is that the general aggregate community response to noise within the DNL 65 noise contour, for example, will be less than the public response from the DNL 75 noise contour.

Table 5-6
Land Use Compatibility Matrix
Airport Master Plan
Bill and Hillary Clinton National Airport

	Yearly Day-Night Noise Level (DNL) in Decibels					
Land Use	**Below 65**	**65-70**	**70-75**	**75-80**	**80-85**	**Over 85**
RESIDENTIAL						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
PUBLIC USE						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
COMMERCIAL USE						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail-building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade-general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	Y(2)	30	N	N
MANUFACTURING AND PRODUCTION						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing resource production and extraction	Y	Y	Y	Y	Y	Y
RECREATIONAL						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf course, riding stables and water recreation	Y	Y	25	30	N	N

Numbers in parentheses refer to NOTES.

The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

TABLE KEY

SLUCM	Standard Land Use Coding Manual
Y (Yes)	Land Use and related structures compatible without restrictions
N (No)	Land Use and related structures are not compatible and should be prohibited.
NLR	Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into design and construction of the structure.
25, 30 or 35	Land Use and related structures generally compatible; measures to achieve NLR of 25, 30 or 35 dB must be incorporated into design and construction of structure.

NOTES

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB to 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often states a 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(2) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(3) Measure to achieve NLR of 30 dB must be incorporated in the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(4) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(5) Land use compatible provide that special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25.

(7) Residential buildings require an NLR of 30.

(8) Residential building not permitted.

Source: Federal Aviation Regulations (FAR) Part 150 Guidelines.

5.2.1.3 Existing (2016) Noise Impacts

The existing noise contours and the anticipated effect on the surrounding land uses are presented in Figure 5-1. As can be seen, the existing 65 DNL noise contour encompasses roughly 1,190 acres and extends beyond airport property to the south, west, and northeast, encompassing mostly undeveloped properties or existing industrial or commercial land uses. The future land use designations contained within the existing 65 DNL noise contour beyond the airport boundary include industrial, mining, commercial/office, and parks/open space. The existing 70 DNL noise contour, encompassing approximately 604 acres, extends slightly beyond airport property to the south, west, and northeast into undeveloped properties. The future land use designation of land contained within the existing 70 DNL noise contour outside of airport property is parks/open space. The existing 75 and 80 DNL noise contours encompass approximately 326 and 137 acres, respectively, and do not extend beyond the LIT boundary.

5.2.1.4 Future (2036) Noise Impacts

The future noise contours and the anticipated effect on the surrounding land uses are presented in Figure 5-2. In comparison, the future 2036 noise contours are very similar in shape and size to the existing 2016 noise contours, which is reflective of typical operating conditions at LIT and no changes to the physical layout of the airfield. The future 65 DNL noise contour encompasses roughly 1,210 acres and extends beyond airport property to the south, west, and northeast, encompassing mostly undeveloped properties or existing industrial or commercial land uses. The future land use designations contained within the future 65 DNL noise contour beyond the airport boundary include industrial, mining, commercial/office, and parks/open space. The future 70 DNL noise contour, encompassing approximately 595 acres, extends slightly beyond airport property to the south, west, and northeast into undeveloped properties. The future land use designation of land contained within the future 70 DNL noise contour outside of airport property is parks/open space. The future 75 and 80 DNL noise contours encompass approximately 310 and 140 acres, respectively, and do not extend beyond the LIT boundary.

Nationally, the aircraft fleet, particularly the jet fleet, is becoming quieter. Most the business jet aircraft that produce the greatest noise levels will, by age, be removed from service during the timeframe of this study. Additionally, the National Business Aviation Association (NBAA) passed a voluntary resolution to eliminate the operation of all Stage 1 business jets in 2005, and all newly manufactured business jets comply with Stage 3 noise reduction criteria. For propeller driven aircraft, propeller upgrades are available for some of the general aviation fleet to reduce noise, and some general aviation aircraft manufacturers are opting to utilize de-rated engines in their aircraft, which allow engine operation at lower revolutions per minute (RPMs) to achieve improved noise reduction levels.

As can be seen from the existing and future noise contours generated for this Master Plan, the projected increase in aircraft operations at LIT throughout the 20-year planning period does not result in a substantial noise impact to surrounding land uses.

Figure 5-1
Existing Noise Contours with Future Land Use

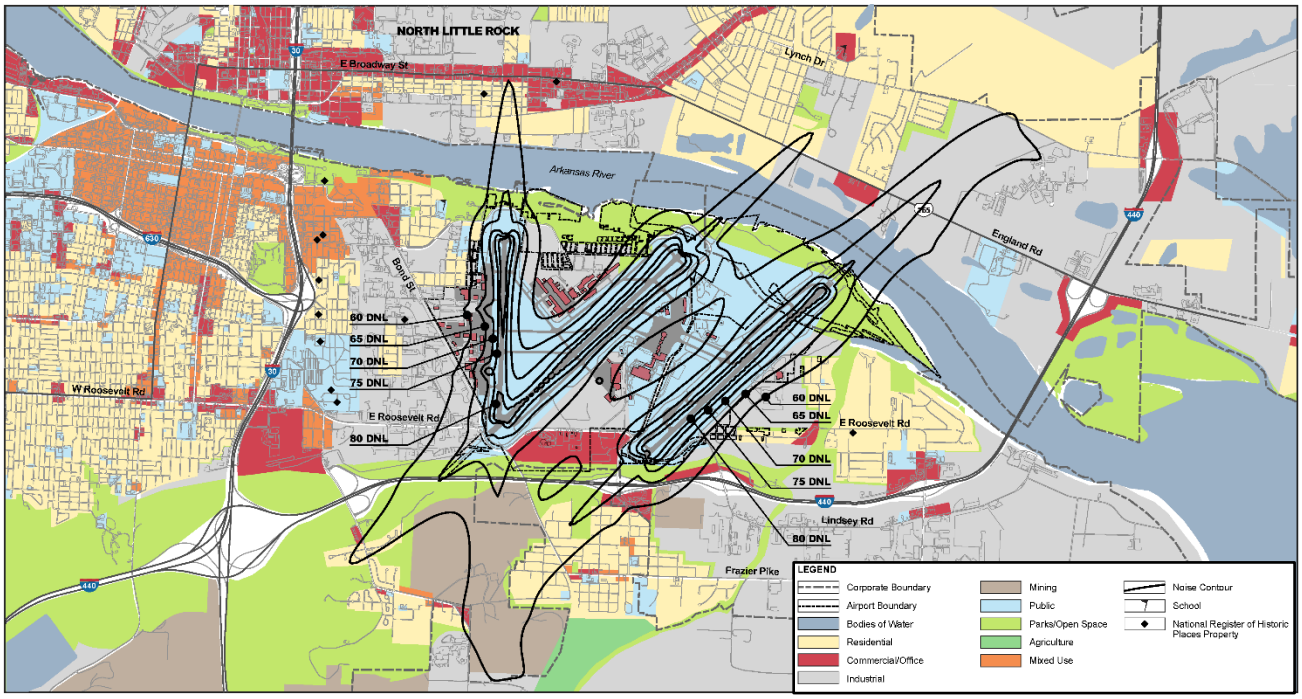
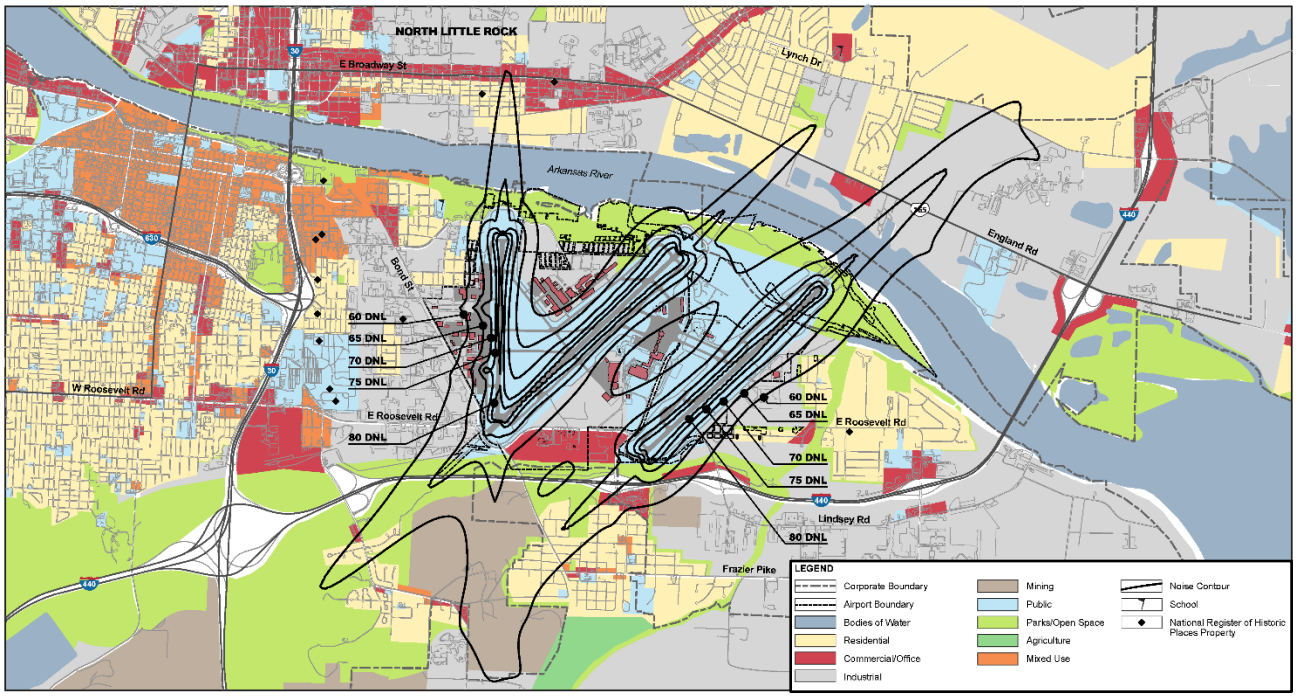


Figure 5-2
Future Noise Contours with Future Land Use



5.2.2 Other Land Use Planning Considerations

Other land use planning issues regarding the Airport include environs land use planning, height hazard zoning, land acquisition considerations, jurisdictional considerations, and the on-Airport land use plan (including highest and best use considerations).

5.2.2.1 Environs Land Use Planning

For the most part, environs land use planning around airports is driven by the noise analysis detailed in the Section 8.2. As can be noted in both existing and future conditions, regarding aircraft noise, there are no significant land use incompatibilities identified; therefore, it is recommended that the City of Little Rock continue to plan for and guide future development in the vicinity of the Airport in a manner that recognizes land use compatibility concerns.

5.2.2.2 Height Hazard Zoning

It is critical that the Airport be protected from objects in the vicinity of the Airport (i.e., trees and structures) that might become hazards to air navigation. The City of Little Rock has achieved this protection by adopting Article III – Adams Field Height Zoning Ordinance (known as "Adams Field Height Zoning Ordinance") as part of its Code of Ordinances.

5.2.2.3 Land Acquisition Considerations

Over the past several years, the Airport has made a practice of purchasing all parcels that come up for sale in the area that is east of Runway 4R/22L and west of Fourche Creek; in the area north of the Dassault Falcon Jet facilities, south of the Arkansas River levee; in the area west of Runway 18/36 and east of Apperson Street; and in the area south of Interstate 440, in the vicinity of the Runway 4R Runway Protection Zone (RPZ). This practice is expected to continue in the future

5.2.2.4 Jurisdictional Considerations

In the process of reviewing environs land use recommendations for this Master Plan Update, it was discovered that the area known as Gates Island (the northern portion of the Airport adjacent to the Arkansas River), is not incorporated as part of the City of Little Rock, as illustrated in Figure 5-3. The Airport and the City are working together to rectify this anomaly.

5.2.3 Future Land Use Plan

The following section describes the development and selection of the preferred future On-Airport land use plan. It integrates the preferred near- and long-term development alternatives, potential development beyond 2037, and surrounding future land uses, to achieve long-term compatibility between all three. The land use plan provides a flexible roadmap for future development to assist the Airport in most effectively utilizing On-Airport land to maintain compatible operations and meet future requirements.

5.2.3.1 Development of the Land Use Plan

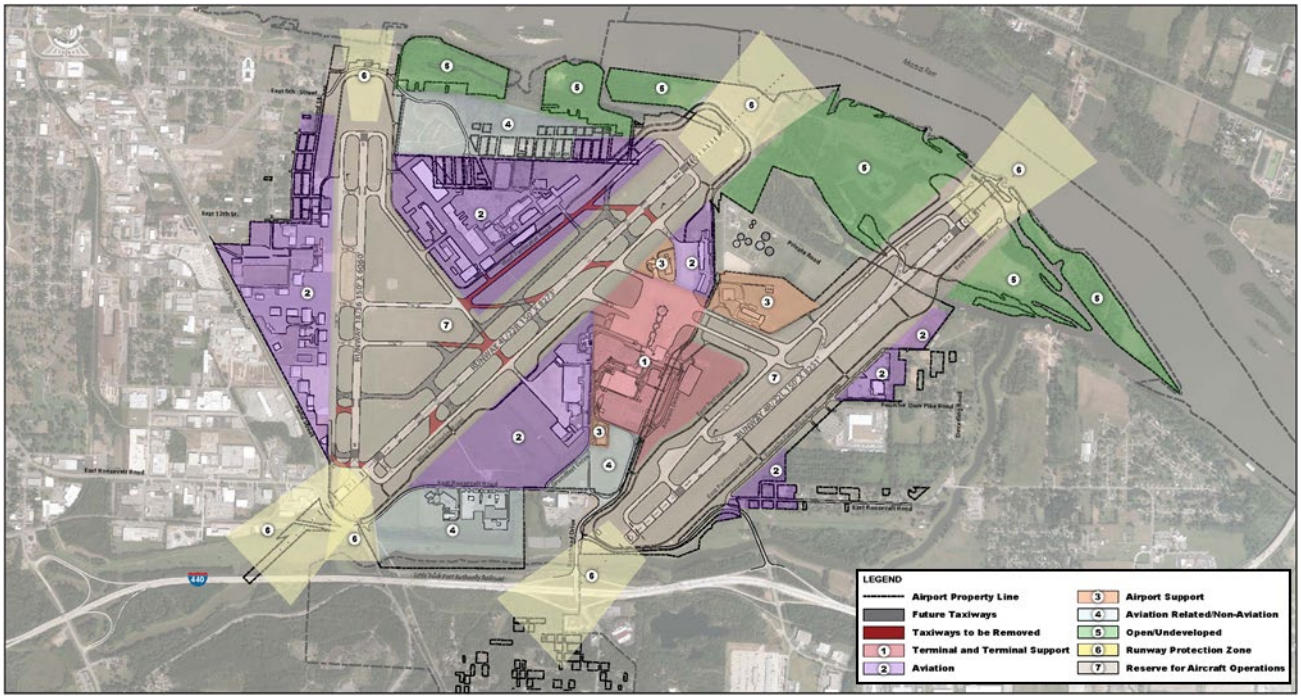
In consideration of projected facility needs, the On-Airport Land Use Plan, shown on Figure 5-4, considers the highest and best use of each land parcel. The priority for land use is a reserve for aircraft operations (i.e., runways, taxiways, and surrounding safety and object clearing areas). Other areas include the passenger terminal and its support facilities, aviation use areas (i.e., areas reserved for those activities and facilities that require direct taxiway access), Airport support facilities (i.e., Airport maintenance, Airport traffic control tower, etc.), aviation related/non-aviation (i.e., areas that are not likely to be needed for

aviation facilities and that could be used to generate non-aeronautical revenues), and open/undeveloped areas (i.e., on-Airport areas that will remain open such as floodplains).

5.2.3.2 Future On-Airport Land Uses

The future on-Airport land use map, shown in Figure 5-3, indicates few changes compared to the existing On-Airport Land Uses shown in Figure 1-1 of the Inventory chapter. Following completion of the proposed Taxiway C project, land currently occupied by Taxiway C can be designated from Aircraft Operations to Aviation uses. The land reserved for Aviation Related / Non-Aviation Activities has also been slightly expanded.

Figure 5-3
Future On-Airport Land Uses



5.3 SUSTAINABILITY PLANNING

5.3.1 Introduction

There are several commonly used definitions of sustainability in various industries, with the applicability of a definition depending largely on the individual industry, type of facility, environmental factors, community values, and desired outcomes. The basic premise of sustainability, as developed in 1983 by the Brundtland Commission convened by the United Nations is: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The Airports Council International – North America (ACI-NA) definition is: "a holistic approach to managing an airport so as to ensure the integrity of the Economic viability, Operational efficiency, Natural Resource Conservation and Social responsibility (EONS) of the Airport."

LIT is committed to sustainability practices in its upcoming development projects. This section will focus on the Social, Environmental, and Economic sustainability aspects of the proposed development projects identified previously, and the potential practices that can be incorporated.

5.3.2 Social Sustainability

Social sustainability involves the Airport's ability to be a visible and valued member of the community, to continue improving and enhancing the customer experience, and to increase citizen involvement. LIT personnel make use of existing public and community outreach/education opportunities, regularly meeting with various citizen's groups to update the progress of the Airport Commission, to address specific concerns, and to provide information of the value provided by the Airport. User surveys are regularly conducted providing feedback on passenger experience and suggested improvements, often resulting in implementable policies aimed at providing safe, clean, and efficient airport facilities and services, thus increasing customer satisfaction.

Two public information meetings were conducted during the preparation of this Master Plan. Potential improvement projects identified for future development that are anticipated to need continued citizen involvement/public information meetings include any expansion or renovation of the terminal building expansion and parking garage construction. Public involvement associated with airport projects could include open house meetings, available information on the airport website, and opportunities for public comment.

5.3.3 Economic Sustainability

Economic sustainability principally involves the Airport's commitment to financial responsibility, remaining debt fee to the extent practical, and ensuring the long-term financial viability of the Airport. Continually searching to increase and diversify employment opportunities on the Airport, reducing energy consumption throughout Airport facilities, and reducing the amount of solid waste entering the waste stream are policies LIT has enacted that are intended to accomplish economic sustainability.

Potential improvements that could improve the financial stability of LIT include replacing incandescent airfield lighting with LED lighting, using efficient heating and cooling systems in the terminal expansion and redevelopment, and replacing gasoline/diesel-powered fleet vehicles with electric or compressed natural gas-powered vehicles. Energy efficiency provides both environmental benefits and cost savings.

5.3.4 Environmental Sustainability

Environmental sustainability involves reducing, to the extent practical, the Airport's impact on the environment and demonstrating good environmental stewardship. For purposes of this Master Plan, the Airport is principally focused on the solid waste reduction and recycling plan discussed in the next section. However, environmental sustainability also involves construction management practices, operations and maintenance decisions, and policies enacted by the Airport Commission. Some overlap with social and economic sustainability issues are included in environmental sustainability.

Through technological improvements, policy changes, and innovative thought processes, the Airport is committed to minimizing its impact on the environment. The recent terminal renovations were designed with a high priority placed on sustainability issues, which earned LIT a rating of three out of four Green Globes from the Green Building Initiative, meeting more than 70% of the criteria for sustainability in the program.

Future improvement projects identified in this Master Plan having the potential to implement environmental sustainability practices include the recycling of airfield pavement as aggregate when Taxiways A, C, G, L, M and P are replaced or relocated, using efficient heating and cooling systems in the terminal expansion and renovation projects, and replacing gasoline/diesel-powered fleet vehicles with electric or compressed natural gas-power vehicles. Potential environmentally sustainable practices that can be employed include re-use of construction materials, improvements in energy efficiency, procurement of sustainable supplies for airport facilities, replacing incandescent lighting with LED lighting, continued and enhanced recycling efforts within the Airport facilities, and LEED or Envision certifications, among others.

LIT has had recent conversations with the Little Rock Water Reclamation Authority about using treated wastewater for irrigation on the Airport. Wastewater and sewage effluent reuse have recently been considered options at other airports around the world to decrease water usage, particularly in areas facing water shortages. Options available to airports are typically dependent on the quality of the effluent produced after treatment. Potential health risks due to pathogenic microorganisms requires careful evaluation for the reuse of treated water. Applications of treated wastewater include irrigation, toilet flushing, cleaning, and environmental enhancement. Consultation with ADEQ to determine the potential health risks and necessary permits would be required before LIT could begin using the treated water for irrigation.

5.4 RECYCLING, REUSE, AND WASTE REDUCTION PLAN

5.4.1 Introduction

The FAA Modernization and Reform Act of 2012 updated the definition of Airport planning to include waste and recycling and required that airports completing a master plan consider issues related to waste and recycling under that plan. To meet this requirement, an Airport Recycling, Reuse, and Waste Reduction Plan was developed for Bill and Hillary Clinton National Airport and is included in the Appendices. The purpose of this report is to document and assess LIT's existing waste and recycling program based on the feasibility of recycling, minimizing the generation of waste, the operation and maintenance requirements, review of waste management contracts, and the potential for cost savings or revenue generation.

Clinton National Airport has an active recycling program in the passenger terminal building, airport offices, and other areas within the facility. Opportunities exist to expand this program to other areas of and waste streams generated at the Airport to increase diversion.

Chapter 6

6.1 INTRODUCTION AND FINANCIAL OVERVIEW

This chapter describes the implementation of the Recommended Development Plan for the Airport. Future land use is described and refinements to the selected terminal alternatives are discussed. Projects that comprise the recommended development plan are presented along with the Financial Plan. The Implementation Plan begins in 2018, with Near-Term Projects identified for the period from 2018 through 2023, a majority of which are made up of the Airport Capital Improvement Plan (ACIP), continues with Long-Term Projects identified for the period from 2024 through 2036, and ends with additional projects outside the Master Plan timeframe. The Financial Plan focuses mainly on the Near- and Long-Term Projects.

6.2 EXISTING FINANCIAL CONDITIONS

The Airport operates as an enterprise fund, or self-sustaining unit, of the City of Little Rock, Arkansas under the guidance of the Little Rock Municipal Airport Commission (the Commission) that was created to manage, operate, improve, extend, and maintain the Airport, its related properties and facilities, and to adopt necessary rules and regulations. As an enterprise fund, the Airport receives no local tax money and funds its operating expenses through user fees and charges. Capital improvements are funded through internally generated funds, FAA Airport Improvement Program (AIP) entitlement and discretionary grants, Transportation Security Administration (TSA) grants, passenger facility charges (PFC)s, customer facility charges (CFCs), bond proceeds, and other funds.

The airlines serving the Airport operate under a month-to-month Airline Operating Permit, which has been established by resolution since December 2009. The landing fee rate is based on a cost center residual rate-setting methodology, ensuring full recovery of costs related to constructing, operating, and maintaining the airfield area. The terminal rental rate is based on a commercial compensatory methodology, where the Commission bears the vacancy risk for unleased terminal space. The Commission has historically provided discretionary credits in both the Airfield and Terminal cost centers, which they are under no obligation to continue, but do so to provide lower costs and a more competitive operating environment for airlines. In addition to the landing fee and terminal rentals the commission charges other fees for use of the airport facilities including ramp fees, gate fees, jet bridge fees, and remain overnight fees (RON).

The Airport received only 35% of its operating revenues from aeronautical sources in 2015, compared to 44% for the small hub group, indicating less reliance on airlines for revenues than its peers, the difference of which is made up by non-aeronautical revenues including parking, rental car, and concessions revenues. In 2015, the Airport generated revenues of $31.2 million and expenses of $21.4 million. According to the FAA filings, the cost per enplanement (CPE) at the Airport in 2015 was $9.68 as compared to a median level of $7.80 for its small hub peers. As revenue is received by the Commission, it is deposited into the Commission's Revenue Fund, which the Commission can utilize for any legal purpose and are not subject to approval by the airlines. As of January 31, 2017, the Commission held $35.1 million in its Revenue Fund, including a $12.3 million set aside in a Terminal Sinking fund account. The Commission is debt-free with considerable borrowing capacity if bonds are required to fund future capital investments.

In summary, the Airport is in a strong financial position with:

- No outstanding debt
- Passenger Facility Charge (PFC) capacity not yet allocated, starting in mid-2020
- Airline rates set by resolution, without airline purview over the capital program
- Liberal airline rates and charges
- Diversified revenue streams
- Strong liquidity

Further detail on the existing financial conditions can be found in the Inventory chapter of this Master Plan.

6.3 RECOMMENDED DEVELOPMENT PLAN

This section presents the combined set of recommended alternatives, which are referred to as the Recommended Development Plan (RDP). The RDP focuses on the 20-year planning horizon for the following reasons:

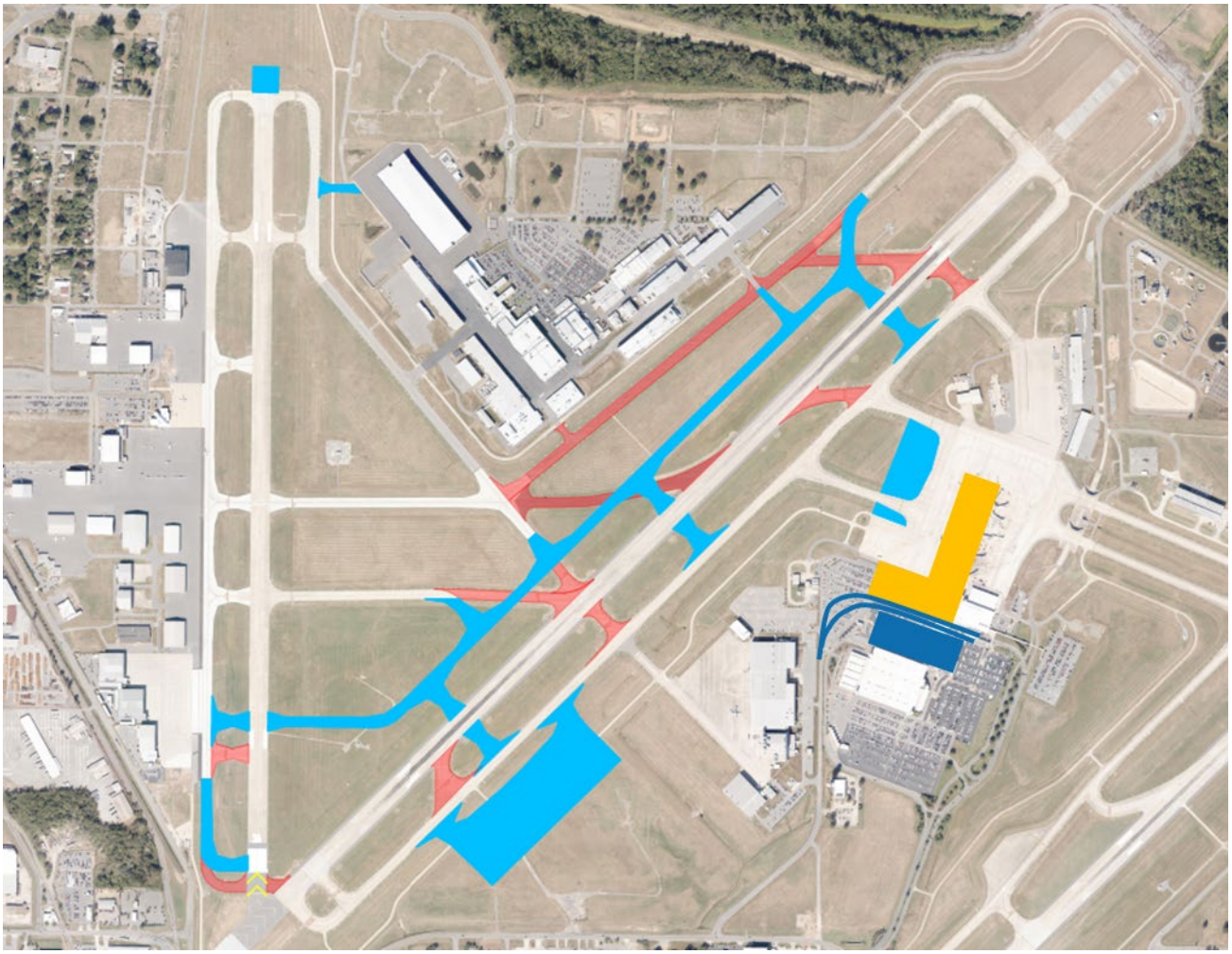
- There is a natural break in the Terminal Redevelopment Program between the Arrivals Hall and Concourse Renovation efforts, which is currently anticipated in approximately 2028 to 2031.
- Significant airfield improvements proposed in the recommended development plan are anticipated to be completed during that time.

6.3.1 Selecting the Recommended Development Plan

A variety of potential projects are described and discussed in the Alternatives chapter of this Master Plan, where a recommended alternative is identified at the end of each section. Highlights of the RDP are shown on Figure 6-1 and described in the bullet points below:

- A new full-length parallel taxiway will be constructed west of Runway 4L-22R to remove a hot spot designation, comply with new FAA guidance, and improve access to the west side of the airfield.
- A new Central Utility Plant will provide increased heating and cooling capacity for the Terminal.
- A new Arrivals Hall will increase passenger capacity and replacing the existing aging facility.
- New roadways and parking facilities will complement the Arrivals Hall project.

Figure 6-1
Recommended Development Plan



6.3.2 Cost Estimates and Phasing

Project cost estimates for the Recommended Development Plan are summarized in Table 1-1 (Near-Term Projects and Table 1-2 (Long-Term Projects). In total, the plan is estimated to cost approximately $454.6 million over the 20-year planning period.

The estimates presented in Tables 1-1 and 1-2 were originally prepared in 2017 dollars for projects not identified as part of the ACIP. The cost estimates for these projects were adjusted to include an inflationary increase of 2.0% per year through the anticipated mid-point (identified by year) of project construction for financial planning purposes. The costs presented are total project cost estimates inclusive of construction, design, planning, and administration costs.

Additional projects were considered outside the 20-year timeframe including a renovation and expansion of the terminal concourse and construction of a new short-term parking garage. However, aviation demand and an affordability analysis indicated that these alternatives be excluded from the Recommended Development Plan for this 20-year Master Plan.

Table 6-1
Near-Term Capital Projects (FY 2018-2023)

(000's)	2017 Dollars	Start Year	Escalated Cost
Terminal Redevelopment Projects			
Central Utility Plant	$ 32,000	2020	$ 34,638
Fuel Farm Relocation	4,000	2020	4,460
Subtotal Terminal Redevelopment Projects	**$ 36,000**		**$ 39,098**
Other MP Alternatives			
Airfield Alternatives			
Taxiway P Connector to Dassault Falcon Jet*	$ 1,400	2019	$ 1,400
Taxiway Charlie Relocation - Phase1 / Part A (from Twy B to Twy D)*	4,500	2020	4,500
Taxiway Charlie Relocation - Phase 1 / Part B (from Twy B to Twy D)*	9,500	2021	9,500
Taxiway Charlie Relocation - Phase 2 (Twy D to Twy G)*	13,000	2022	13,000
Taxiway Charlie/Lima Relocation - Phase 3 (Twy G to Twy A)*	7,000	2023	7,000
Taxiway Alpha South (Twy L to Rwy 36 - Completion of Phase 3)*	6,000	2023	6,000
Subtotal Airfield Alternatives	$ 41,400		$ 41,400
Landside Alternatives			
Expand + Rehab Surface Parking East of Airport Road	$ 6,300	2021	$ 6,956
Rehab Bldg 100 Lot for Employee Parking	4,000	2020	4,330
Subtotal Landside Alternatives	$ 10,300		$ 11,285
General Aviation (GA) Alternatives			
Timex Area Alternatives	$ 5,000	2022	$ 5,631
Subtotal General Aviation (GA) Alternatives	$ 5,000		$ 5,631
Subtotal Other MP Alternatives	**$ 56,700**		**$ 58,316**
Subtotal Master Plan Preferred Implementation Plan Projects	**$ 92,700**		**$ 97,414**
6-Year CIP (non-MP projects only)			
Runway 18-36 Edge Light Rehabilitation*		2018	$ 607
Runway 4L-22R Rehabilitate Runway Guard Lights*		2018	500
Emergency Generators for ARFF & West Lighting Vault (2 generators)*		2018	550
Airfield Drainage Improvement - Outfall at Airport Road*		2018	800
Airfield Drainage Improvement - Outfall at Hangar 6*		2018	1,350
Airfield Drainage Improvement - Perimeter Road at Taxiway R*		2018	400
Rehabilitate Terminal Apron & Drainage*		2019	3,580
Terminal Ramp Expansion*		2019	3,250
Taxiway Papa Rehabilitation (from Twy B to Z)*		2020	5,500
Airfield Drainage Rehabilitation (78" Pipe)*		2020	2,600
Utility Relocation*		2020	2,600
PAPIs Runway 36, 4L, 22R, 4R*		2018	900
Passenger boarding bridges*		2019	6,000
Lobby Renovation*		2019	5,000
ARFF Replacement Vehicles (3 @ $700,000)*		2022	2,100
Subtotal 6-Year CIP (non-MP projects only)			**$ 35,737**
Future LIT AIP Entitlement Projects (non-MP)		2022	**$ 4,500**
Total Near-Term Projects			**$ 137,651**

*Cost estimates for indicated ACIP projects were developed by the Airport and stated in nominal dollars with no adjustment for inflation

Table 6-2
Long-Term Capital Projects (FY 2024-2037)

(000's)	2017 Dollars	Start Year	Escalated Cost
Terminal Redevelopment Projects			
Arrivals Hall	$ 158,311	2027	$ 217,327
Terminal Improvements Contingency	10,000	2028	12,682
Subtotal Terminal Redevelopment Projects	**$ 168,311**		**$ 230,009**
Other MP Alternatives			
Airfield Alternatives			
Taxiway Charlie Relocation - Phase 4 (Twy P to TW M)	20,000	2025	23,902
Subtotal Airfield Alternatives	$ 20,000		$ 23,902
Subtotal Other MP Alternatives	**$ 20,000**		**$ 23,902**
Subtotal Master Plan Preferred Implementation Plan Projects	**$ 188,311**		**$ 253,911**
Future LIT AIP Entitlement Projects (non-MP)		2024-36	**$ 63,000**
Total Long-Term Projects			**$ 316,911**
Total CIP (including both Near- and Long-Term Projects)			**$ 454,562**

6.4 FINANCIAL PLAN

This section describes the Financial Plan prepared for the Master Plan. The Financial Plan was prepared to determine the feasibility of the Airport's Recommended Development Plan, and is inclusive of the Airport's ACIP (consisting of ongoing, committed, or planned projects occurring during the Airport's six-year budgeting period) and other identified Master Plan projects through 2037. Improvements beyond 2037 were not included in the Financial Plan because of uncertainties regarding actual implementation dates and future costs.

The financial feasibility specifically considers the effects of the capital program on the Airport's financial operations, including airline cost per enplaned passenger (CPE), debt service coverage (DSC), and cash balances. In general, the analysis presented herein indicates that funding the Recommended Development Plan, inclusive of the ACIP projects, results in key metrics within the goals set by the Airport. Although changes in key assumptions could affect this conclusion, the Airport does have the flexibility to adjust the timing of projects, and to develop alternative financing plans, which would allow a similar development plan to progress under various changed assumptions.

6.4.1 Assumptions

The Financial Plan was developed using information and assumptions that provide a reasonable basis for analysis at a master plan-appropriate level of detail. Some of the assumptions may not be realized, and unanticipated events and circumstances may occur. Therefore, actual results may vary from those projected, and such variations could be material.

The Financial Plan is not intended to be used to support the sale of bonds or to obtain any other forms of financing. More detailed cost estimates and financial analysis will be required if and when the Airport decides to pursue the sale of bonds or other forms of financing. Some projects included in the Recommended Development Plan may be postponed or eliminated if forecast aviation demand is not achieved, construction costs rise significantly, financial targets set by the Airport cannot be met, or if projected funding is not available. Similarly, projects may be undertaken earlier than indicated if demand requires earlier implementation, financial targets can be maintained, and funding is available.

The following overarching assumptions guided development of the Financial Plan:

- Underlying long-term passenger and landed weight compound annual growth rate (CAGR) of 1.4% between FY 2017 and FY 2037 using the forecasted activity for FY 2018 through FY 2037 as documented in the Forecast chapter of this Master Plan.

- The rate-making formulas under the month-to-month Airline Operating Permits established by resolution will remain in effect through the planning period and that the same allocation formulas used by the Airport to calculate terminal building rentals and landing fees in FY 2018 are appropriate for allocating revenues, operating expenses, and future debt service requirements.

- The Airport has no debt outstanding, but assumes a debt issuance within the 20 year master plan timeframe to support the Recommended Development Plan and resulting estimated debt service requirement for future bonds was allocated to the appropriate cost centers consistent with the net bond proceeds by project and current rate-making formulas.

- Although development of certain facilities can be accomplished by third-party developers leasing ground from the Airport (the "ground lease" approach), the Financial Plan assumes the Airport would develop some projects such as the fuel farm.

6.4.2 Long Term Goals and Strategies

In addition to the underlying assumptions, the Financial Plan was guided by the Airports Long Term Goals and Strategies identified by the Airport management team as follows:

1. Be an Economic Driver for the Region – provide opportunity for economic growth within the region through ongoing investment in Airport infrastructure

2. Apply Strategic Rate Discipline – maintain a balance between project requirements, including timing and cost, and resulting financial metrics, including cost per enplanement (CPE), debt service coverage (DSC), and cash balances (available for future projects)

3. Maintain Exemplary Customer Service – maintain a 95% or higher customer satisfaction score as measured through customer satisfaction survey.

4. Enhance Non-Aeronautical Revenues – grow non-aeronautical revenues in order to offset Airport costs and maintain a low-cost structure for airlines providing service at the Airport

5. Support the Terminal Redevelopment Program – provide opportunity for a future Terminal Redevelopment Program through funding of enabling projects and managing finances in manner consistent with a future terminal investment

6.4.3 Potential Funding Sources

The following potential sources of funding were considered for the Financial Plan:

- **Federal Airport Improvement Program.** Federal grants-in-aid under the Airport Improvement Program (AIP) can be used to fund most Airport improvements, particularly airfield capacity enhancement projects. There are three types of Federal AIP grants:

  - AIP entitlement grants are annual amounts calculated based on the number of enplaned passengers and a legislated per passenger formula.

  - AIP cargo entitlement grants are similar grants calculated based on the landed weight of all-cargo aircraft and a legislated per pound formula.

  - AIP discretionary grants are awarded at the discretion of the FAA based on its determination of priorities for projects at the Airport in relation to funding priorities for the national airport system.

  In FY 2017, the Authority was eligible to receive AIP passenger entitlement grants and AIP cargo entitlement grants. Apportioned funds, if unspent from previous years, can be carried over for 2 years.

- **State Grants.** State grants, administered by the Arkansas Department of Transportation (ArDOT), are provided to the Airport on an annual basis, although funding amounts vary year-by-year.
- **Passenger Facility Charge.** Revenues from a Passenger Facility Charge (PFC) are derived by the imposition of charges on passengers through the PFC Program administered by the FAA. An airport must apply to the FAA for the authority to impose a PFC and for the authority to use the

PFC Revenues collected for specific FAA-approved projects. The Airport's PFC level was raised to $4.50 in January 2002. At current enplanement levels, the Commission collects approximately $3.9 million of PFC revenue annually in FY 2017 with expectations of growth to just over $5.1 million through the forecast period.

- **Customer Facility Charge.** Revenues from a Customer Facility Charge (CFC) are derived by the imposition of charges on rental car customers and provide funding to certain eligible and approved rental car projects. The Airport currently collects a $3.50 charge per rental car transaction day.
- **Commission Funds.** Internally generated cash flows can be used to fund improvements as available. These funds are available for the Commission's discretionary use and are not subject to airline approval.
- **Bond Proceeds.** Proceeds from bonds can supplement the above sources for funding future development projects.

6.4.4 Application of Funding Sources

This section describes the application of funding sources to the Near- and Long-Term Capital projects. Since certain sources of funds, such as PFC revenues, AIP grants and CFC revenues, have restrictions on how they can be used, aligning the source of capital funds with allowable and optimal uses is essential for maximizing financial capacity. In general, specific funding sources for projects were determined considering the following:

1. Near-Term Projects (completed prior to FY 2024) were reviewed to confirm that existing funding commitments were accounted for and that these commitments did not conflict with the funding assumptions for other projects in the Recommended Development Plan.

2. Based on FAA classifications, the Airport is a small-hub airport, and therefore, the Authority must provide a 10% local match of eligible project costs. Furthermore, the Airport's small-hub status makes terminal projects ineligible for AIP discretionary grants.

3. Projected funding available from AIP, ArDOT, PFC, and CFC funding sources take into account key factors affecting future funding levels, including future FAA authorizations and forecast passenger and cargo activity at the Airport.

4. Each funding source was matched to the best use in a given year, taking into consideration future airline costs, debt coverage requirements, fund balance requirements, and future funding needs.

Table 6-3 presents the estimated funding sources for projects included in the Financial Plan. Estimated project costs total $454.6 million for the Recommended Development Plan consisting of $137.7 million in Near-Term Project costs (30%) and $316.9 million in Long-Term Project costs (70%).

The amount of funding available from the various funding sources and the application of that funding to specific projects is summarized in the following sections.

- **Federal Airport Improvement Program.** Future entitlement and discretionary AIP grants are projected to provide about $132.3 million in pay-as-you-go funding capacity for the Recommended Development Plan. Future AIP funding is based on the following assumptions:
  - Annual AIP appropriation will stay above $4.0 million and the existing grant formula will remain in effect throughout the forecast period.
  - AIP entitlement grants through 2023 will be fully committed to the ACIP projects, except for $4.5 million included as a placeholder for future Airfield improvement projects in FY 2023. AIP entitlement grants throughout the remaining forecast period include funding for Relocation of Taxiway Charlie, which is outside of the 6-year ACIP timeframe, and a continued $4.5 million placeholder for future Airfield improvement projects to be identified.
  - AIP discretionary grants of $45.1 million will be available for various airfield projects in the Recommended Development Plan. If AIP discretionary grants are not available, it will be necessary to defer such projects until funds become available or there is agreement to fund such projects from bond proceeds or other sources.
- **State Grants.** Historically, the amount of funding provided to the Airport through State Grants has been minimal. As such, for purposes of this report, no State Grant funding is assumed.
- **Passenger Facility Charge.** The Airport began collecting a PFC in 1995 at the $3.00 level, which was increased to the $4.50 level in January 2002. The Airport plans to utilize $36.2 million of PFC funds to fund portions of the Central Utility Plant, Terminal Improvements Contingency, and recommended Airfield Alternatives in the amount of $15.0 million, $11.4 million, and $9.8 million respectively.
- **Customer Facility Charge.** The Airport began collecting a CFC at a rate of $3.50 per transaction day per vehicle to be collected from the customers of all rental car companies operating at or serving the Airport. For purposes of this Financial Plan, it was assumed that CFC revenues would be used to pay for approximately 62%, or $7.0 million, of the recommended Parking Alternatives in the Recommended Development Plan on a pay-as-you-go basis.
- **Commission Funds.** Under the month-to-month Airline Operating Permits established by resolution, the Airport retains any remaining funds after paying operating expenses and debt service for its discretionary use. In addition to funding large portions of the Terminal Redevelopment Program ($130.4 million), the Airport plans to utilize these monies to fund $4.3 million in Parking Alternatives and $5.6 million in General Aviation (GA) alternatives as well as fund matching portions FAA grant funds. The Authority further plans to retain a portion of these moneys as liquidity for fluctuations in cash flow, for future use in cash funding projects, and to interim fund PFC projects until PFC funds have been collected and are available for utilization. In an effort to minimize the interest cost of bond financing, the Airport prefers to cash fund projects when possible in order to maintain a low-cost structure for the airlines serving the Little Rock area. For the purpose of this analysis, it was assumed that portions of the remaining moneys in the Commission Fund would be utilized to fund future capital projects outside 20-year time frame, but considered as part of the Master Plan Strategic Plan.

- **Bond Proceeds.** Remaining project costs not funded through AIP grants, ArDOT grants, PFC revenues, CFC revenues, and Commission Funds would be financed through the issuance of bonds. None of the Near-Term Project costs are planned to be financed with new bonds. Approximately 35% of the Long-Term Project costs, or $112 million, are to be financed with new bonds forecasted to be issued in FY 2027 to fund approximately 52% of the Arrivals Hall project.

The Airport does not currently have bonds outstanding and operates under month-to-month Airline Operating Permits established by resolution since December 2009. In order to issue bonds, the Airport would need to establish a new master bond indenture and resolution. There are no restrictions on future bond issues present through the Airline Operating Permits.

Further detail regarding available funding sources available can be found in the Financial Inventory section.

6.4.5 Consideration of Costs and Revenues

The following summarizes costs and revenues associated with implementation of the Recommended Development Plan.

6.4.5.1. Debt Service Requirements

The debt service requirement represents the scheduled annual principal and interest payments on new bonds to be issued by the Airport. Requirements for debt service are based on the following assumptions (the actual structure and sizing of a future bond issue(s) will depend on municipal market conditions at the time of issuance):

1. The annual debt service requirement on future bonds was calculated assuming:
   a. A bond term of 30 years, amortized over 28 years (assuming two years of capitalized interest)
   b. Level annual debt service for each issue during the amortization period
   c. Coupon rate of 5.5%, and
   d. A financing and issuance markup of 2.0% of the gross principal amount (includes any deposit to debt service reserve and capitalized interest funds).

2. The annual debt service requirement reflected in Table 6-4 excludes any CFC-and PFC-related debt and PFC and CFC revenues, which, if any, are assumed to be deposited annually to separate bond funds to pay interest and principal on the respective bonds. The annual debt service requirement for PFC bonds (if any) and PFC cash flow are shown in Table 6-11. Likewise, CFC bonds (if any) and CFC cash flow are evaluated separately in Table 6-12.

As a result of a projected bond issue, an annual debt service requirement is projected to begin during the planning period, which all things being equal, will result in increases to airline costs. Currently, the Airport has no bonds outstanding. The Financial Plan projects that the Airport may generate annual cash flow from operations sufficient to fund a substantial portion of the Recommended Development Plan ($166 million or 36.7%). As shown in Table 6-3, only one project is shown requiring GARBs to be issued: the Arrivals Hall.

6.4.5.2. Operation and Maintenance Costs

The costs of operations and maintenance were projected by analyzing historical trends in expenses by line item. Operations and maintenance costs were projected using the FY 2018 budget as a base taking into account management plans, facility development plans, expected increases in inflation, and other

assumptions. It was assumed that overall operations and maintenance costs will increase 3.5% per year on average over the FY 2018 budget (3.4% CAGR FY 2017-37) with higher annual growth assumed in Personnel Compensation and Benefits and Communications and Utilities areas. Allocation of expenses to cost center was assumed to be consistent with FY 2018 budget operations and maintenance costs.

6.4.5.3. Future Revenues

Future revenues must be sufficient to provide for payment of the (1) cost of operation and maintenance; (2) debt service requirement on the outstanding bonds (if any) and additional bonds; and if applicable (3) other subordinated indebtedness. The Airport received $31.3 million of revenues in 2017, and budgeted $31.6 million of revenues in FY 2018 (excluding PFCs and CFCs). By the next projected bond issuance in FY 2027, the revenues are expected to grow to $46.8 million, driven primarily by growth in enplaned passengers, reductions in airline subsidies, increases in non-airline revenues, and other planned management actions. Sources of airline and non-airline revenues and key assumptions are summarized below:

- **Non-Airline Revenues.** Non-airline revenues were projected by analyzing the trend in revenue by line item and cost center and comparing those revenues to passenger activity. In order to best match historical trends, individual revenues were projected either by using revenue per enplaned passenger or revenue per enplaned passenger adjusted for inflation (2.0%). Parking revenue was adjusted to reflect an anticipated rate increase (between 1.3% and 1.6%) every 5 years beginning in FY 2021. It also assumed that Airport management will be taking action to generate an additional $1.0 million in annual non-airline revenue beginning in FY 2019.
- **Airline Revenues.** Existing airline revenues are generated primarily through landing fees and terminal rents using month-to-month Airline Operating Permits established by resolution. It was assumed in the financial projections that the resolution and rate making formulas will continue in effect during the forecast period, although that assumption is subject to change as a result of a lease negotiation or change to the resolution. It is further assumed that the Terminal and Airfield discretionary credits could be phased out by FY 2024.

6.4.5.4. Effect on Airline Costs per Enplanement, Debt Service Coverage, and Other Financial Metrics

The Airline Cost per Enplaned Passenger presented on Table 6-7 summarizes passenger airline costs expressed on a per enplaned passenger basis (CPE). The forecasts were based on the assumption that the Airport will maintain rates by resolution as it relates to the calculation of airline rentals, fees, and charges through the forecast period and that the airlines collectively will make all payments required by such terms. Airline payments to airports (landing fees, terminal rentals, apron fees, and other payments) represent a relatively small percentage of an airline's overall cost structure. Nevertheless, airline costs per enplaned passenger are commonly used as a summary measure of "affordability" of an airport and its proposed capital improvement program.

The debt service coverage (DSC) ratio and Commission cash balances are presented on Table 6-10. The debt service coverage ratio refers to the amount of cash flow available to meet annual interest and principal payments on debt, including sinking fund payments. The DSC ratio is an indication of financial strength utilized by rating agencies to determine an issuer's credit rating resulting in higher or lower interest rates and cost of capital, which is passed on to the airline cost base when applicable. The Airport seeks to maintain a cash balance on hand at least equivalent to one year of operating expenses, another indication of financial strength utilized by rating agencies, as well as accumulate funds in order to cash fund projects and forgo additional interest costs.

For the Airport, the ultimate gauge of success is its contribution as an economic driver to the region while maintaining affordable costs for the airline community through the application of strategic rate discipline. This is done by balancing project requirements, including timing and cost, with resulting financial metrics, including cost per enplanement (CPE), debt service coverage (DSC), and Commission cash balances (available for future projects).

6.5. OUTPUTS FROM FINANCIAL MODEL

The Master Plan team has developed an extensive financial model which uses historical revenues and costs, along with future aviation forecasts and direction from Airport management to predict future revenues and costs. Key output metrics from the metrics are referenced in the previous section. This section contains tables in support of the previous section.

Table 6-3
Aviation Activity

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	> CAGR '17-'27	> CAGR '27-'37	> CAGR '17-'37
Enplaned Passengers																								
Signatory	1,017,004	1,024,422	1,016,655	1,027,885	1,045,170	1,060,334	1,075,498	1,090,662	1,105,826	1,120,990	1,138,777	1,156,564	1,174,351	1,192,138	1,209,925	1,230,746	1,251,567	1,272,388	1,293,209	1,314,030	1,335,186	*1.1%*	*1.6%*	*1.4%*
Nonsignatory	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.0%*	*0.0%*	*0.0%*
Total Enplaned Passengers	1,017,004	1,024,422	1,016,655	1,027,885	1,045,170	1,060,334	1,075,498	1,090,662	1,105,826	1,120,990	1,138,777	1,156,564	1,174,351	1,192,138	1,209,925	1,230,746	1,251,567	1,272,388	1,293,209	1,314,030	1,335,186	*1.1%*	*1.6%*	*1.4%*
Growth Rate		*0.7%*	*-0.8%*	*1.1%*	*1.7%*	*1.5%*	*1.4%*	*1.4%*	*1.4%*	*1.4%*	*1.6%*	*1.6%*	*1.5%*	*1.5%*	*1.5%*	*1.7%*	*1.7%*	*1.7%*	*1.6%*	*1.6%*	*1.6%*			
By revenue status																								
Revenue Passengers (for PFC Calculation)	996,664	1,003,934	996,322	1,007,327	1,024,267	1,039,127	1,053,988	1,068,849	1,083,709	1,098,570	1,116,001	1,133,433	1,150,864	1,168,295	1,185,727	1,206,131	1,226,536	1,246,940	1,267,345	1,287,749	1,308,482	*1.1%*	*1.6%*	*1.4%*
Non-revenue Passengers	20,340	20,488	20,333	20,558	20,903	21,207	21,510	21,813	22,117	22,420	22,776	23,131	23,487	23,843	24,199	24,615	25,031	25,448	25,864	26,281	26,704	*1.1%*	*1.6%*	*1.4%*
Total	1,017,004	1,024,422	1,016,655	1,027,885	1,045,170	1,060,334	1,075,498	1,090,662	1,105,826	1,120,990	1,138,777	1,156,564	1,174,351	1,192,138	1,209,925	1,230,746	1,251,567	1,272,388	1,293,209	1,314,030	1,335,186	*1.1%*	*1.6%*	*1.4%*
Landed Weight																								
Passenger Airlines	1,178,175	1,191,309	1,182,276	1,195,336	1,215,437	1,233,071	1,250,705	1,268,340	1,285,974	1,303,608	1,324,293	1,344,978	1,365,662	1,386,347	1,407,032	1,431,245	1,455,458	1,479,670	1,503,883	1,528,096	1,552,699	*1.2%*	*1.6%*	*1.4%*
Cargo Airlines	135,585	136,685	135,649	137,147	139,453	141,477	143,500	145,523	147,547	149,570	151,943	154,316	156,690	159,063	161,436	164,214	166,992	169,770	172,548	175,327	178,149	*1.1%*	*1.6%*	*1.4%*
Charter / Cargo - Other	6,726	6,775	6,724	6,798	6,912	7,013	7,113	7,213	7,313	7,414	7,531	7,649	7,767	7,884	8,002	8,140	8,277	8,415	8,553	8,690	8,830	*1.1%*	*1.6%*	*1.4%*
Total Landed Weight	1,320,486	1,334,769	1,324,649	1,339,281	1,361,803	1,381,560	1,401,318	1,421,076	1,440,834	1,460,592	1,483,768	1,506,943	1,530,119	1,553,294	1,576,470	1,603,599	1,630,727	1,657,856	1,684,985	1,712,113	1,739,679	*1.2%*	*1.6%*	*1.4%*
Growth Rate		*1.1%*	*-0.8%*	*1.1%*	*1.7%*	*1.5%*	*1.4%*	*1.4%*	*1.4%*	*1.4%*	*1.6%*	*1.6%*	*1.5%*	*1.5%*	*1.5%*	*1.7%*	*1.7%*	*1.7%*	*1.6%*	*1.6%*	*1.6%*			
By Signatory Status																								
Signatory (including cargo)	1,313,760	1,327,994	1,317,925	1,332,483	1,354,890	1,374,548	1,394,205	1,413,863	1,433,521	1,453,178	1,476,236	1,499,294	1,522,352	1,545,410	1,568,468	1,595,459	1,622,450	1,649,441	1,676,432	1,703,423	1,730,848	*1.2%*	*1.6%*	*1.4%*
Nonsignatory	6,726	6,775	6,724	6,798	6,912	7,013	7,113	7,213	7,313	7,414	7,531	7,649	7,767	7,884	8,002	8,140	8,277	8,415	8,553	8,690	8,830	*1.1%*	*1.6%*	*1.4%*
Total	1,320,486	1,334,769	1,324,649	1,339,281	1,361,803	1,381,560	1,401,318	1,421,076	1,440,834	1,460,592	1,483,768	1,506,943	1,530,119	1,553,294	1,576,470	1,603,599	1,630,727	1,657,856	1,684,985	1,712,113	1,739,679	*1.2%*	*1.6%*	*1.4%*
Total Aircraft Operations	101,215	101,953	101,180	102,298	104,018	105,527	107,036	108,546	110,055	111,564	113,334	115,104	116,875	118,645	120,415	122,487	124,559	126,632	128,704	130,776	132,881	*1.1%*	*1.6%*	*1.4%*
Growth Rate		*0.7%*	*-0.8%*	*1.1%*	*1.7%*	*1.5%*	*1.4%*	*1.4%*	*1.4%*	*1.4%*	*1.6%*	*1.6%*	*1.5%*	*1.5%*	*1.5%*	*1.7%*	*1.7%*	*1.7%*	*1.6%*	*1.6%*	*1.6%*			

Sources: Historical and Budget: LRMAC; Forecast: Mead and Hunt; LeighFisher analysis.

Table 6-4

Capital Development Program – By Project by Year

	Total	2018-2023	2024-2037	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Capital Development Program																							
Master Plan Projects																							
Terminal Redevelopment Plan																							
Central Utility Plant	$ 34,637,829	$ 34,637,829	$ -	$ -	$ -	$ 17,318,915	$ 17,318,915	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Fuel Farm Relocation	4,460,268	4,460,268	-	-	-	-	-	4,460,268	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arrivals Hall	217,326,792	-	217,326,792	-	-	-	-	-	-	-	-	-	108,663,396	108,663,396	-	-	-	-	-	-	-	-	-
Terminal Improvements Contingency	12,682,418	-	12,682,418	-	-	-	-	-	-	-	-	-	-	6,341,209	6,341,209	-	-	-	-	-	-	-	-
Subtotal Terminal Redevelopment Plan	$ 269,107,307	$ 39,098,097	$ 230,009,210	$ -	$ -	$ 17,318,915	$ 17,318,915	$ 4,460,268	$ -	$ -	$ -	$ -	$ 108,663,396	$ 115,004,605	$ 6,341,209	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other Master Plan Alternatives																							
Airfield Alternatives	$ 65,301,851	$ 41,400,000	$ 23,901,851	$ -	$ 1,400,000	$ 2,250,000	$ 7,000,000	$ 11,250,000	$ 19,500,000	$ -	$ 11,950,926	$ 11,950,926	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Parking Alternatives	11,285,438	11,285,438	-	-	-	2,164,864	5,642,719	3,477,855	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GA Alternatives	5,630,812	5,630,812	-	-	-	-	-	2,815,406	2,815,406	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Master Plan Alternatives	$ 82,218,101	$ 58,316,250	$ 23,901,851	$ -	$ 1,400,000	$ 4,414,864	$ 12,642,719	$ 17,543,261	$ 22,315,406	$ -	$ 11,950,926	$ 11,950,926	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Subtotal Master Plan Projects	$ 351,325,408	$ 97,414,347	$ 253,911,062	$ -	$ 1,400,000	$ 21,733,779	$ 29,961,633	$ 22,003,528	$ 22,315,406	$ -	$ 11,950,926	$ 11,950,926	$ 108,663,396	$ 115,004,605	$ 6,341,209	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Other Projects																							
6-Year CIP (not incluced in MP Projects)																							
Runway 18-36 Edge Light Rehabilitation	$ 607,000	$ 607,000	$ -	$ 607,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Runway 4L-22R Rehabilitate Runway Guard Lights	500,000	500,000	-	500,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Emergency Generators for ARFF & West Lighting Vault (2 generators)	550,000	550,000	-	550,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airfield Drainage Improvement - Outfall at Airport Road	800,000	800,000	-	800,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airfield Drainage Improvement - Outfall at Hangar 6	1,350,000	1,350,000	-	1,350,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airfield Drainage Improvement - Perimeter Road at Taxiway R	400,000	400,000	-	400,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rehabilitate Terminal Apron & Draingage	3,580,000	3,580,000	-	-	3,580,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Terminal Ramp Expansion	3,250,000	3,250,000	-	-	3,250,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Taxiway Papa Rehabilitation (from Twy B to Z)	5,500,000	5,500,000	-	-	-	5,500,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airfield Drainage Rehabilitation (78" Pipe)	2,600,000	2,600,000	-	-	-	2,600,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Utility Relocation	2,600,000	2,600,000	-	-	-	2,600,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PAPIs Runway 36, 4L, 22R, 4R	900,000	900,000	-	225,000	675,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Passenger boarding bridges	6,000,000	6,000,000	-	-	-	2,000,000	4,000,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lobby Renovation	5,000,000	5,000,000	-	-	5,000,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ARFF Replacement Vehicles (3 @ $700,000)	2,100,000	2,100,000	-	-	-	-	-	2,100,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal 6-Year CIP (not incluced in MP Projects)	$ 35,737,000	$ 35,737,000	$ -	$ 4,432,000	$ 12,505,000	$ 12,700,000	$ 4,000,000	$ 2,100,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Long Term Projects																							
Airfield Improvement Placeholders	$ 67,500,000	$ 4,500,000	$ 63,000,000	$ -	$ -	$ -	$ -	$ -	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000
Subtotal Long Term Projects	$ 67,500,000	$ 4,500,000	$ 63,000,000	$ -	$ -	$ -	$ -	$ -	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000
Subtotal Other Projects	$ 103,237,000	$ 40,237,000	$ 63,000,000	$ 4,432,000	$ 12,505,000	$ 12,700,000	$ 4,000,000	$ 2,100,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000
Total Capital Development Program	$ 454,562,408	$ 137,651,347	$ 316,911,062	$ 4,432,000	$ 13,905,000	$ 34,433,779	$ 33,961,633	$ 24,103,528	$ 26,815,406	$ 4,500,000	$ 16,450,926	$ 16,450,926	$ 113,163,396	$ 119,504,605	$ 10,841,209	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000	$ 4,500,000

Sources: LRMAC and LeighFisher analysis.

Table 6-5

Capital Development Program – By Project by Funding Source

	Total	Grants	LRMAC Pay-as-you-go	LRMAC Bonds	PFC Pay-as-you-go	CFC Pay-as-you-go
Capital Development Program						
Master Plan Projects						
Terminal Redevelopment Plan						
Central Utility Plant	$ 34,637,829	$ -	$ 19,637,829	$ -	$ 15,000,000	$ -
Fuel Farm Relocation	4,460,268	-	4,460,268	-	-	-
Arrivals Hall	217,326,792	-	105,000,000	112,326,792	-	-
Terminal Improvements Contingency	12,682,418	-	1,268,242	-	11,414,176	-
Subtotal Terminal Redevelopment Plan	$ 269,107,307	$ -	$ 130,366,339	$ 112,326,792	$ 26,414,176	$ -
Other Master Plan Alternatives						
Airfield Alternatives	$ 65,301,851	$ 55,506,574	$ -	$ -	$ 9,795,278	$ -
Parking Alternatives	11,285,438	-	4,329,729	-	-	6,955,709
Apron/RON Alternatives	-	-	-	-	-	-
GA Alternatives	5,630,812	-	5,630,812	-	-	-
Other Master Plan Alternatives	$ 82,218,101	$ 55,506,574	$ 9,960,541	$ -	$ 9,795,278	$ 6,955,709
Subtotal Master Plan Projects	$ 351,325,408	$ 55,506,574	$ 140,326,879	$ 112,326,792	$ 36,209,454	$ 6,955,709
Other Projects						
6-Year CIP						
Runway 18-36 Edge Light Rehabilitation	$ 607,000	$ 546,300	$ 60,700	$ -	$ -	$ -
Runway 4L-22R Rehabilitate Runway Guard Lights	500,000	450,000	50,000	-	-	-
Emergency Generators for ARFF & West Lighting Vault (2 generators)	550,000	495,000	55,000	-	-	-
Airfield Drainage Improvement - Outfall at Airport Road	800,000	720,000	80,000	-	-	-
Airfield Drainage Improvement - Outfall at Hangar 6	1,350,000	1,215,000	135,000	-	-	-
Airfield Drainage Improvement - Perimeter Road at Taxiway R	400,000	360,000	40,000	-	-	-
Rehabilitate Terminal Apron & Draingage	3,580,000	3,222,000	358,000	-	-	-
Terminal Ramp Expansion	3,250,000	2,925,000	325,000	-	-	-
Taxiway Papa Rehabilitation (from Twy B to Z)	5,500,000	4,950,000	550,000	-	-	-
Airfield Drainage Rehabilitation (78" Pipe)	2,600,000	-	2,600,000	-	-	-
Utility Relocation	2,600,000	-	2,600,000	-	-	-
PAPIs Runway 36, 4L, 22R, 4R	900,000	-	900,000	-	-	-
Passenger boarding bridges	6,000,000	-	6,000,000	-	-	-
Lobby Renovation	5,000,000	-	5,000,000	-	-	-
ARFF Replacement Vehicles (3 @ $700,000)	2,100,000	1,890,000	210,000	-	-	-
Subtotal 6-Year CIP	$ 35,737,000	$ 16,773,300	$ 18,963,700	$ -	$ -	$ -
Long Term Projects						
Airfield Improvement Placeholders	$ 67,500,000	$ 60,000,000	$ 7,500,000	$ -	$ -	$ -
Subtotal Long Term Projects	$ 67,500,000	$ 60,000,000	$ 7,500,000	$ -	$ -	$ -
Subtotal Other Projects	$ 103,237,000	$ 76,773,300	$ 26,463,700	$ -	$ -	$ -
Total Capital Development Program	$ 454,562,408	$ 132,279,874	$ 166,790,579	$ 112,326,792	$ 36,209,454	$ 6,955,709

Sources: LRMAC and LeighFisher analysis.

Table 6-6
Debt Service

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Gross Debt Service																				
Annual debt service by bond series																				
Series 2027 Bonds: Arrivals Hall	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516
Total annual debt service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516
Debt Service by Cost Center																				
Gross annual debt service by cost center																				
Terminal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,793,464	$ 8,793,464	$ 8,793,464	$ 8,793,464	$ 8,793,464	$ 8,793,464	$ 8,793,464	$ 8,793,464	$ 8,793,464
Airfield	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Other	-	-	-	-	-	-	-	-	-	-	-	977,052	977,052	977,052	977,052	977,052	977,052	977,052	977,052	977,052
Total annual debt service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516
PFCs applied to debt service by cost center																				
Terminal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Airfield	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total annual PFCs applied to debt service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Net annual debt service by cost center																				
Terminal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,793,464	$ 8,793,464	$ 8,793,464	$ 8,793,464	$ 8,793,464	$ 8,793,464	$ 8,793,464	$ 8,793,464	$ 8,793,464
Airfield	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
All Other	-	-	-	-	-	-	-	-	-	-	-	977,052	977,052	977,052	977,052	977,052	977,052	977,052	977,052	977,052
Total net annual debt service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516

Sources: LRMAC and LeighFisher analysis.

Table 6-7
O&M Expenses

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	> CAGR '17-'27	> CAGR '27-'37	> CAGR '17-'37
Operating expenses by line item																								
Personnel Compensation and Benefits	$ 10,572,955	$ 12,632,069	$ 13,105,771	$ 13,597,238	$ 14,107,134	$ 14,636,152	$ 15,185,007	$ 15,754,445	$ 16,345,237	$ 16,958,183	$ 17,594,115	$ 18,253,894	$ 18,938,415	$ 19,648,606	$ 20,385,429	$ 21,149,882	$ 21,943,003	$ 22,765,865	$ 23,619,585	$ 24,505,320	$ 25,424,269	*5.2%*	*3.8%*	*4.5%*
Communications and Utilities	2,006,880	2,120,004	2,183,604	2,249,112	2,316,586	2,386,083	2,457,666	2,531,396	2,607,338	2,685,558	2,766,124	2,849,108	2,934,581	3,022,619	3,113,297	3,206,696	3,302,897	3,401,984	3,504,044	3,609,165	3,717,440	*3.3%*	*3.0%*	*3.1%*
Supplies and Materials	805,270	885,230	898,508	911,986	925,666	939,551	953,644	967,949	982,468	997,205	1,012,163	1,027,346	1,042,756	1,058,397	1,074,273	1,090,387	1,106,743	1,123,344	1,140,194	1,157,297	1,174,657	*2.3%*	*1.5%*	*1.9%*
Contractual Services	6,079,833	5,788,154	5,874,976	5,963,101	6,052,547	6,143,335	6,235,485	6,329,018	6,423,953	6,520,312	6,618,117	6,717,389	6,818,149	6,920,422	7,024,228	7,129,591	7,236,535	7,345,083	7,455,259	7,567,088	7,680,595	*0.9%*	*1.5%*	*1.2%*
Insurance Claims and Settlements	383,148	422,000	428,330	434,755	441,276	447,895	454,614	461,433	468,355	475,380	482,511	489,748	497,094	504,551	512,119	519,801	527,598	535,512	543,545	551,698	559,973	*2.3%*	*1.5%*	*1.9%*
Other Expenses	873,507	1,629,447	1,653,888	1,678,697	1,703,877	1,729,435	1,755,377	1,781,708	1,808,433	1,835,560	1,863,093	1,891,039	1,919,405	1,948,196	1,977,419	2,007,080	2,037,187	2,067,744	2,098,761	2,130,242	2,162,196	*7.9%*	*1.5%*	*4.6%*
Total Operating Expenses	$ 20,721,593	$ 23,476,903	$ 24,145,078	$ 24,834,888	$ 25,547,086	$ 26,282,452	$ 27,041,793	$ 27,825,948	$ 28,635,783	$ 29,472,197	$ 30,336,123	$ 31,228,524	$ 32,150,401	$ 33,102,790	$ 34,086,765	$ 35,103,438	$ 36,153,962	$ 37,239,533	$ 38,361,388	$ 39,520,810	$ 40,719,129	*3.9%*	*3.0%*	*3.4%*
Growth Rate		*13.3%*	*2.8%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*			
Operating expenses by cost center (w/ Admin allocation)																								
Adminstration	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	*0.0%*	*0.0%*	*0.0%*
Airfield	7,012,221	8,531,697	8,774,518	9,025,200	9,284,019	9,551,257	9,827,208	10,112,176	10,406,476	10,710,436	11,024,394	11,348,700	11,683,717	12,029,823	12,387,408	12,756,875	13,138,644	13,533,149	13,940,840	14,362,184	14,797,663	*4.6%*	*3.0%*	*3.8%*
Terminal	10,261,984	11,265,466	11,586,092	11,917,099	12,258,850	12,611,717	12,976,089	13,352,368	13,740,970	14,142,327	14,556,884	14,985,105	15,427,471	15,884,478	16,356,641	16,844,495	17,348,593	17,869,507	18,407,832	18,964,185	19,539,202	*3.6%*	*3.0%*	*3.3%*
Parking	2,313,772	2,302,456	2,367,986	2,435,638	2,505,486	2,577,605	2,652,077	2,728,981	2,808,404	2,890,434	2,975,162	3,062,683	3,153,094	3,246,498	3,343,000	3,442,708	3,545,737	3,652,202	3,762,226	3,875,934	3,993,457	*2.5%*	*3.0%*	*2.8%*
Ground Transportation	109,088	337,760	347,372	357,297	367,543	378,123	389,047	400,329	411,980	424,013	436,442	449,281	462,544	476,246	490,402	505,029	520,143	535,761	551,901	568,581	585,821	*14.9%*	*3.0%*	*8.8%*
RAC	151,354	99,582	102,416	105,342	108,363	111,482	114,703	118,029	121,464	125,012	128,677	132,462	136,372	140,412	144,586	148,898	153,354	157,959	162,718	167,635	172,718	*-1.6%*	*3.0%*	*0.7%*
Commercial/Industrial	869,029	931,879	958,401	985,782	1,014,051	1,043,241	1,073,382	1,104,507	1,136,652	1,169,853	1,204,145	1,239,567	1,276,160	1,313,963	1,353,021	1,393,376	1,435,075	1,478,165	1,522,695	1,568,716	1,616,282	*3.3%*	*3.0%*	*3.2%*
General Aviation	4,145	8,063	8,293	8,530	8,774	9,027	9,288	9,557	9,835	10,122	10,419	10,726	11,042	11,369	11,707	12,056	12,417	12,790	13,175	13,574	13,985	*9.7%*	*3.0%*	*6.3%*
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.0%*	*0.0%*	*0.0%*
Total Operating Expenses	$ 20,721,593	$ 23,476,903	$ 24,145,078	$ 24,834,888	$ 25,547,086	$ 26,282,452	$ 27,041,793	$ 27,825,948	$ 28,635,783	$ 29,472,197	$ 30,336,123	$ 31,228,524	$ 32,150,401	$ 33,102,790	$ 34,086,765	$ 35,103,438	$ 36,153,962	$ 37,239,533	$ 38,361,388	$ 39,520,810	$ 40,719,129	*3.9%*	*3.0%*	*3.4%*

Sources: Historical and Budget: LRMAC; Forecast: LeighFisher analysis.

Table 6-8

O&M Expense Allocation to Cost Centers

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	> CAGR '17-'27	> CAGR '27-'37	> CAGR '17-'37
Operating expenses by cost center																								
Administration	$ 6,057,862	$ 6,007,358	$ 6,178,333	$ 6,354,844	$ 6,537,084	$ 6,725,252	$ 6,919,555	$ 7,120,207	$ 7,327,431	$ 7,541,456	$ 7,762,520	$ 7,990,871	$ 8,226,765	$ 8,470,466	$ 8,722,249	$ 8,982,399	$ 9,251,211	$ 9,528,991	$ 9,816,055	$ 10,112,732	$ 10,419,363	*2.5%*	*3.0%*	*2.7%*
Airfield	4,962,231	6,348,575	6,529,261	6,715,798	6,908,389	7,107,245	7,312,585	7,524,634	7,743,628	7,969,810	8,203,431	8,444,752	8,694,044	8,951,587	9,217,672	9,492,598	9,776,679	10,070,236	10,373,606	10,687,135	11,011,182	*5.2%*	*3.0%*	*4.1%*
Terminal	7,261,940	8,382,816	8,621,399	8,867,707	9,122,009	9,384,584	9,655,719	9,935,715	10,224,880	10,523,535	10,832,014	11,150,661	11,479,832	11,819,898	12,171,243	12,534,263	12,909,370	13,296,991	13,697,568	14,111,558	14,539,438	*4.1%*	*3.0%*	*3.5%*
Parking	1,637,351	1,713,295	1,762,057	1,812,398	1,864,373	1,918,038	1,973,453	2,030,679	2,089,779	2,150,819	2,213,867	2,278,992	2,346,269	2,415,772	2,487,581	2,561,775	2,638,440	2,717,663	2,799,534	2,884,146	2,971,597	*3.1%*	*3.0%*	*3.0%*
Ground Transportation	77,197	251,332	258,486	265,870	273,495	281,367	289,496	297,891	306,561	315,515	324,764	334,317	344,187	354,382	364,916	375,800	387,047	398,668	410,678	423,091	435,919	*15.5%*	*3.0%*	*9.0%*
RAC	107,106	74,101	76,210	78,387	80,635	82,956	85,353	87,828	90,384	93,024	95,750	98,567	101,477	104,483	107,589	110,798	114,113	117,540	121,081	124,740	128,523	*-1.1%*	*3.0%*	*0.9%*
Commercial/Industrial	614,972	693,426	713,162	733,536	754,572	776,292	798,721	821,882	845,802	870,506	896,024	922,382	949,611	977,741	1,006,805	1,036,834	1,067,862	1,099,926	1,133,062	1,167,307	1,202,702	*3.8%*	*3.0%*	*3.4%*
General Aviation	2,934	6,000	6,171	6,347	6,529	6,717	6,911	7,111	7,318	7,532	7,753	7,981	8,217	8,460	8,712	8,971	9,240	9,517	9,804	10,100	10,407	*10.2%*	*3.0%*	*6.5%*
Total Operating Expenses	$ 20,721,593	$ 23,476,903	$ 24,145,078	$ 24,834,888	$ 25,547,086	$ 26,282,452	$ 27,041,793	$ 27,825,948	$ 28,635,783	$ 29,472,197	$ 30,336,123	$ 31,228,524	$ 32,150,401	$ 33,102,790	$ 34,086,765	$ 35,103,438	$ 36,153,962	$ 37,239,533	$ 38,361,388	$ 39,520,810	$ 40,719,129	*3.9%*	*3.0%*	*3.4%*
Administration O&M allocation by cost center																								
Administration	$ (6,057,862)	$ (6,007,358)	$ (6,178,333)	$ (6,354,844)	$ (6,537,084)	$ (6,725,252)	$ (6,919,555)	$ (7,120,207)	$ (7,327,431)	$ (7,541,456)	$ (7,762,520)	$ (7,990,871)	$ (8,226,765)	$ (8,470,466)	$ (8,722,249)	$ (8,982,399)	$ (9,251,211)	$ (9,528,991)	$ (9,816,055)	$ (10,112,732)	$ (10,419,363)	*2.5%*	*3.0%*	*2.7%*
Airfield	2,049,991	2,183,123	2,245,256	2,309,402	2,375,629	2,444,011	2,514,623	2,587,541	2,662,848	2,740,626	2,820,963	2,903,948	2,989,673	3,078,236	3,169,736	3,264,277	3,361,965	3,462,913	3,567,234	3,675,049	3,786,481	*3.2%*	*3.0%*	*3.1%*
Terminal	3,000,044	2,882,649	2,964,692	3,049,392	3,136,840	3,227,133	3,320,370	3,416,654	3,516,091	3,618,791	3,724,870	3,834,445	3,947,639	4,064,580	4,185,399	4,310,232	4,439,223	4,572,516	4,710,265	4,852,626	4,999,764	*2.2%*	*3.0%*	*2.6%*
Parking	676,420	589,161	605,929	623,240	641,113	659,567	678,623	698,302	718,625	739,615	761,296	783,691	806,826	830,726	855,419	880,933	907,296	934,539	962,692	991,789	1,021,861	*1.2%*	*3.0%*	*2.1%*
Ground Transportation	31,891	86,427	88,887	91,426	94,048	96,755	99,551	102,438	105,419	108,498	111,678	114,964	118,358	121,864	125,486	129,229	133,096	137,093	141,222	145,491	149,902	*13.4%*	*3.0%*	*8.0%*
RAC	44,248	25,481	26,207	26,955	27,728	28,527	29,351	30,202	31,081	31,989	32,926	33,895	34,895	35,929	36,997	38,101	39,241	40,419	41,637	42,895	44,196	*-2.9%*	*3.0%*	*0.0%*
Commercial/Industrial	254,057	238,453	245,239	252,246	259,479	266,948	274,661	282,625	290,851	299,346	308,121	317,185	326,549	336,222	346,216	356,542	367,212	378,238	389,633	401,409	413,580	*1.9%*	*3.0%*	*2.5%*
General Aviation	1,212	2,063	2,122	2,183	2,245	2,310	2,377	2,445	2,517	2,590	2,666	2,745	2,826	2,909	2,996	3,085	3,177	3,273	3,371	3,473	3,579	*8.2%*	*3.0%*	*5.6%*
Total Operating Expenses	$ 0	$ (0)	$ (0)	$ (0)	$ (0)	$ (0)	$ 0	$ (0)	$ (0)	$ (0)	$ (0)	$ (0)	$ (0)	$ (0)	$ (0)	$ (0)	$ (0)	$ (0)	$ (0)	$ (0)	$ (0)	*0.0%*	*-4.1%*	*0.0%*
Operating expenses by cost center (w/ Admin allocation)																								
Administration	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	*0.0%*	*0.0%*	*0.0%*
Airfield	7,012,221	8,531,697	8,774,518	9,025,200	9,284,019	9,551,257	9,827,208	10,112,176	10,406,476	10,710,436	11,024,394	11,348,700	11,683,717	12,029,823	12,387,408	12,756,875	13,138,644	13,533,149	13,940,840	14,362,184	14,797,663	*4.6%*	*3.0%*	*3.8%*
Terminal	10,261,984	11,265,466	11,586,092	11,917,099	12,258,850	12,611,717	12,976,089	13,352,368	13,740,970	14,142,327	14,556,884	14,985,105	15,427,471	15,884,478	16,356,641	16,844,495	17,348,593	17,869,507	18,407,832	18,964,185	19,539,202	*3.6%*	*3.0%*	*3.3%*
Parking	2,313,772	2,302,456	2,367,986	2,435,638	2,505,486	2,577,605	2,652,077	2,728,981	2,808,404	2,890,434	2,975,162	3,062,683	3,153,094	3,246,498	3,343,000	3,442,708	3,545,737	3,652,202	3,762,226	3,875,934	3,993,457	*2.5%*	*3.0%*	*2.8%*
Ground Transportation	109,088	337,760	347,372	357,297	367,543	378,123	389,047	400,329	411,980	424,013	436,442	449,281	462,544	476,246	490,402	505,029	520,143	535,761	551,901	568,581	585,821	*14.9%*	*3.0%*	*8.8%*
RAC	151,354	99,582	102,416	105,342	108,363	111,482	114,703	118,029	121,464	125,012	128,677	132,462	136,372	140,412	144,586	148,898	153,354	157,959	162,718	167,635	172,718	*-1.6%*	*3.0%*	*0.7%*
Commercial/Industrial	869,029	931,879	958,401	985,782	1,014,051	1,043,241	1,073,382	1,104,507	1,136,652	1,169,853	1,204,145	1,239,567	1,276,160	1,313,963	1,353,021	1,393,376	1,435,075	1,478,165	1,522,695	1,568,716	1,616,282	*3.3%*	*3.0%*	*3.2%*
General Aviation	4,145	8,063	8,293	8,530	8,774	9,027	9,288	9,557	9,835	10,122	10,419	10,726	11,042	11,369	11,707	12,056	12,417	12,790	13,175	13,574	13,985	*9.7%*	*3.0%*	*6.3%*
Total Operating Expenses	$ 20,721,593	$ 23,476,903	$ 24,145,078	$ 24,834,888	$ 25,547,086	$ 26,282,452	$ 27,041,793	$ 27,825,948	$ 28,635,783	$ 29,472,197	$ 30,336,123	$ 31,228,524	$ 32,150,401	$ 33,102,790	$ 34,086,765	$ 35,103,438	$ 36,153,962	$ 37,239,533	$ 38,361,388	$ 39,520,810	$ 40,719,129	*3.9%*	*3.0%*	*3.4%*

Sources: Historical and Budget: LRMAC; Forecast: LeighFisher analysis.

Table 6-9
Revenues

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	> CAGR '17-'27	> CAGR '27-'37	> CAGR '17-'37
Revenues																								
Aeronautical revenue																								
Landing Fees	$ 5,483,278	$ 5,532,647	$ 6,107,724	$ 6,866,090	$ 7,753,364	$ 8,447,445	$ 9,020,858	$ 10,314,546	$ 10,630,017	$ 10,955,207	$ 11,288,756	$ 11,632,719	$ 11,964,797	$ 12,330,698	$ 12,708,149	$ 13,095,590	$ 13,495,410	$ 13,902,749	$ 14,328,656	$ 14,762,454	$ 15,216,108	*7.5%*	*3.0%*	*5.2%*
Terminal Fees	5,369,903	5,551,069	5,707,552	5,845,955	5,924,007	6,695,470	6,776,003	6,647,608	6,810,341	6,959,629	7,145,550	7,337,601	11,449,746	11,654,712	11,865,503	12,084,309	12,310,403	12,544,042	12,785,493	13,035,032	13,292,946	*2.9%*	*6.4%*	*4.6%*
Fuel Fees	84,326	100,211	99,451	100,550	102,241	103,724	105,207	106,691	108,174	109,657	111,397	113,137	114,877	116,617	118,357	120,394	122,431	124,468	126,504	128,541	130,611	*2.8%*	*1.6%*	*2.2%*
Other Aeronautical Revenue	650,108	594,391	606,279	618,405	630,773	643,388	656,256	669,381	682,769	696,424	710,352	724,559	739,051	753,832	768,908	784,286	799,972	815,972	832,291	848,937	865,916	*0.9%*	*2.0%*	*1.4%*
Subtotal Aeronautical Revenue	$ 11,587,615	$ 11,778,318	$ 12,521,006	$ 13,431,000	$ 14,410,384	$ 15,890,027	$ 16,558,324	$ 17,738,225	$ 18,231,300	$ 18,720,917	$ 19,256,056	$ 19,808,017	$ 24,268,471	$ 24,855,859	$ 25,460,918	$ 26,084,579	$ 26,728,216	$ 27,387,230	$ 28,072,944	$ 28,774,964	$ 29,505,580	*5.2%*	*4.4%*	*4.8%*
Non-aeronautical Revenue																								
Parking and Ground Transportation	$ 9,485,494	$ 9,770,305	$ 9,891,634	$ 10,198,730	$ 10,708,667	$ 11,078,208	$ 11,458,204	$ 11,848,923	$ 12,250,643	$ 12,863,175	$ 13,324,541	$ 13,799,153	$ 14,287,356	$ 14,789,503	$ 15,528,978	$ 16,106,788	$ 16,701,408	$ 17,313,280	$ 17,942,855	$ 18,839,998	$ 19,781,998	*3.5%*	*4.0%*	*3.7%*
Rental Cars	4,338,995	4,400,470	4,455,116	4,593,429	4,762,541	4,926,890	5,095,888	5,269,656	5,448,315	5,631,993	5,833,997	6,041,801	6,255,555	6,475,414	6,701,537	6,950,891	7,207,500	7,471,554	7,743,247	8,022,780	8,312,405	*3.0%*	*3.6%*	*3.3%*
Terminal Concessions	1,249,686	1,268,553	1,284,306	1,324,179	1,372,930	1,420,308	1,469,026	1,519,119	1,570,622	1,623,573	1,681,806	1,741,710	1,803,331	1,866,711	1,931,897	2,003,780	2,077,754	2,153,875	2,232,198	2,312,781	2,396,273	*3.0%*	*3.6%*	*3.3%*
Other Rents and Leases	3,880,311	3,659,114	3,732,296	3,806,942	3,883,081	3,960,743	4,039,958	4,120,757	4,203,172	4,287,235	4,372,980	4,460,440	4,549,648	4,640,641	4,733,454	4,828,123	4,924,686	5,023,179	5,123,643	5,226,116	5,330,638	*1.2%*	*2.0%*	*1.6%*
Other Revenues	762,397	726,695	741,229	756,053	771,175	786,598	802,330	818,377	834,744	851,439	868,468	885,837	903,554	921,625	940,057	958,859	978,036	997,597	1,017,548	1,037,899	1,058,657	*1.3%*	*2.0%*	*1.7%*
Non-aeronautical Revenue Enhancements	-	-	1,000,000	1,020,000	1,040,400	1,061,208	1,082,432	1,104,081	1,126,162	1,148,686	1,171,659	1,195,093	1,218,994	1,243,374	1,268,242	1,293,607	1,319,479	1,345,868	1,372,786	1,400,241	1,428,246	*0.0%*	*2.0%*	*0.0%*
Subtotal Non-aeronautical Revenue	$ 19,716,883	$ 19,825,137	$ 21,104,581	$ 21,699,334	$ 22,538,794	$ 23,233,955	$ 23,947,838	$ 24,680,912	$ 25,433,659	$ 26,406,101	$ 27,253,451	$ 28,124,034	$ 29,018,438	$ 29,937,268	$ 31,104,165	$ 32,142,047	$ 33,208,863	$ 34,305,353	$ 35,432,277	$ 36,839,816	$ 38,308,217	*3.3%*	*3.5%*	*3.4%*
Total Revenue	$ 31,304,498	$ 31,603,455	$ 33,625,587	$ 35,130,334	$ 36,949,178	$ 39,123,982	$ 40,506,161	$ 42,419,137	$ 43,664,959	$ 45,127,018	$ 46,509,507	$ 47,932,051	$ 53,286,909	$ 54,793,127	$ 56,565,083	$ 58,226,627	$ 59,937,079	$ 61,692,583	$ 63,505,222	$ 65,614,780	$ 67,813,797	*4.0%*	*3.8%*	*3.9%*
Growth Rate		*1.0%*	*6.4%*	*4.5%*	*5.2%*	*5.9%*	*3.5%*	*4.7%*	*2.9%*	*3.3%*	*3.1%*	*3.1%*	*11.2%*	*2.8%*	*3.2%*	*2.9%*	*2.9%*	*2.9%*	*2.9%*	*3.3%*	*3.4%*			
Airline Cost per Enplaned Passenger (CPE)																								
Revenues from Passenger Airlines																								
Landing Fees (Passenger Airlines)	$ 5,483,278	$ 5,532,647	$ 6,107,724	$ 6,866,090	$ 7,753,364	$ 8,447,445	$ 9,020,858	$ 10,314,546	$ 10,630,017	$ 10,955,207	$ 11,288,756	$ 11,632,719	$ 11,964,797	$ 12,330,698	$ 12,708,149	$ 13,095,590	$ 13,495,410	$ 13,902,749	$ 14,328,656	$ 14,762,454	$ 15,216,108	*7.5%*	*3.0%*	*5.2%*
Terminal Rental Fees	5,369,903	5,551,069	5,707,552	5,845,955	5,924,007	6,695,470	6,776,003	6,647,608	6,810,341	6,959,629	7,145,550	7,337,601	11,449,746	11,654,712	11,865,503	12,084,309	12,310,403	12,544,042	12,785,493	13,035,032	13,292,946	*2.9%*	*6.4%*	*4.6%*
Other Aeronautical Revenue	650,108	594,391	606,279	618,405	630,773	643,388	656,256	669,381	682,769	696,424	710,352	724,559	739,051	753,832	768,908	784,286	799,972	815,972	832,291	848,937	865,916	*0.9%*	*2.0%*	*1.4%*
Total Revenues from Passenger Airlines	$ 11,503,289	$ 11,678,107	$ 12,421,555	$ 13,330,450	$ 14,308,144	$ 15,786,303	$ 16,453,117	$ 17,631,535	$ 18,123,126	$ 18,611,260	$ 19,144,658	$ 19,694,880	$ 24,153,594	$ 24,739,242	$ 25,342,560	$ 25,964,185	$ 26,605,786	$ 27,262,763	$ 27,946,440	$ 28,646,423	$ 29,374,970	*5.2%*	*4.4%*	*4.8%*
Enplaned Passengers	1,017,004	1,024,422	1,016,655	1,027,885	1,045,170	1,060,334	1,075,498	1,090,662	1,105,826	1,120,990	1,138,777	1,156,564	1,174,351	1,192,138	1,209,925	1,230,746	1,251,567	1,272,388	1,293,209	1,314,030	1,335,186	*1.1%*	*1.6%*	*1.4%*
Airline Cost per Enplaned Passenger (CPE)	$ 11.31	$ 11.40	$ 12.22	$ 12.97	$ 13.69	$ 14.89	$ 15.30	$ 16.17	$ 16.39	$ 16.60	$ 16.81	$ 17.03	$ 20.57	$ 20.75	$ 20.95	$ 21.10	$ 21.26	$ 21.43	$ 21.61	$ 21.80	$ 22.00	*4.0%*	*2.7%*	*3.4%*
Inflation-adjusted CPE (2017 Baseline)	11.31	11.18	11.74	12.22	12.65	13.48	13.58	14.07	13.99	13.89	13.79	13.70	16.22	16.04	15.87	15.67	15.49	15.30	15.13	14.96	14.81	*2.0%*	*0.7%*	*1.4%*

Sources: Historical and Budget: LRMAC; Forecast: LeighFisher analysis.

Table 6-10
Airline Terminal Rentals

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Terminal Requirement																				
Terminal O&M Expenses	$ 11,265,466	$ 11,586,092	$ 11,917,099	$ 12,258,850	$ 12,611,717	$ 12,976,089	$ 13,352,368	$ 13,740,970	$ 14,142,327	$ 14,556,884	$ 14,985,105	$ 15,427,471	$ 15,884,478	$ 16,356,641	$ 16,844,495	$ 17,348,593	$ 17,869,507	$ 18,407,832	$ 18,964,185	$ 19,539,202
Security Cost Reimbursement	189,250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Terminal O&M Reserve Requirement	768,267	59,646	61,577	63,576	65,644	67,784	69,999	72,291	74,664	77,120	79,662	82,293	85,017	87,836	90,755	93,777	96,905	100,144	103,498	106,970
Terminal Debt Service	-	-	-	-	-	-	-	-	-	-	-	8,793,464	8,793,464	8,793,464	8,793,464	8,793,464	8,793,464	8,793,464	8,793,464	8,793,464
Terminal Portion of Admin Capital Costs Expensed	190,419	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Terminal Amortization	495,117	490,408	467,864	298,892	1,676,680	1,490,480	1,490,480	1,464,545	1,395,544	1,395,544	1,395,544	1,395,544	1,395,544	1,393,352	1,393,352	1,393,352	1,393,352	1,393,352	1,393,352	1,393,352
PFC Ineligible Amortized Legacy Project Costs	167,476	167,476	167,476	167,476	115,263	115,263	115,263	115,263	-	-	-	-	-	-	-	-	-	-	-	-
Terminal Requirement	$ 13,075,995	$ 12,303,621	$ 12,614,016	$ 12,788,793	$ 14,469,303	$ 14,649,616	$ 15,028,110	$ 15,393,069	$ 15,612,534	$ 16,029,548	$ 16,460,311	$ 25,698,772	$ 26,158,503	$ 26,631,294	$ 27,122,066	$ 27,629,186	$ 28,153,228	$ 28,694,793	$ 29,254,499	$ 29,832,988
Divide by: Total Usable space	278,068	278,068	278,068	278,068	278,068	278,068	278,068	278,068	278,068	278,068	278,068	278,068	278,068	278,068	278,068	278,068	278,068	278,068	278,068	278,068
Calculated Terminal Rental Rate	$ 47.02	$ 44.25	$ 45.36	$ 45.99	$ 52.04	$ 52.68	$ 54.04	$ 55.36	$ 56.15	$ 57.65	$ 59.20	$ 92.42	$ 94.07	$ 95.77	$ 97.54	$ 99.36	$ 101.25	$ 103.19	$ 105.21	$ 107.29
Multiply by: Airline Rented Space	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761
Airline Rented Space Requirement	$ 5,819,793	$ 5,476,029	$ 5,614,178	$ 5,691,967	$ 6,439,919	$ 6,520,172	$ 6,688,630	$ 6,851,064	$ 6,948,742	$ 7,134,344	$ 7,326,066	$ 11,437,870	$ 11,642,485	$ 11,852,912	$ 12,071,342	$ 12,297,048	$ 12,530,287	$ 12,771,323	$ 13,020,434	$ 13,277,905
Plus: ATO/Airline Office Construction	297,143	297,143	297,143	297,143	297,143	297,143	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Plus: Temporary Guard/Porter Services for BHS Install	8,672	8,919	9,174	9,437	9,708	9,989	10,278	10,578	10,887	11,206	11,535	11,876	12,228	12,591	12,967	13,355	13,756	14,170	14,598	15,041
Less Airport Discretionary Terminal Credit	(500,000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Less: Legacy Project Cost Transfer	(74,539)	(74,539)	(74,539)	(74,539)	(51,301)	(51,301)	(51,301)	(51,301)	-	-	-	-	-	-	-	-	-	-	-	-
Actual Airline Rented Space Requirement	$ 5,551,069	$ 5,707,552	$ 5,845,955	$ 5,924,007	$ 6,695,470	$ 6,776,003	$ 6,647,608	$ 6,810,341	$ 6,959,629	$ 7,145,550	$ 7,337,601	$ 11,449,746	$ 11,654,712	$ 11,865,503	$ 12,084,309	$ 12,310,403	$ 12,544,042	$ 12,785,493	$ 13,035,032	$ 13,292,946
Airline Rented Space	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761	123,761
Actual Average Airline Rental Rate (psf)	$ 44.85	$ 46.12	$ 47.24	$ 47.87	$ 54.10	$ 54.75	$ 53.71	$ 55.03	$ 56.23	$ 57.74	$ 59.29	$ 92.51	$ 94.17	$ 95.87	$ 97.64	$ 99.47	$ 101.36	$ 103.31	$ 105.32	$ 107.41

Sources: Budget: LRMAC; Forecast: LeighFisher analysis.

Table 6-11
Airline Landing Fees

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Airfield Requirement																				
Airfield O&M Expenses (Including Allocated Admin)	$ 8,531,697	$ 8,774,518	$ 9,025,200	$ 9,284,019	$ 9,551,257	$ 9,827,208	$ 10,112,176	$ 10,406,476	$ 10,710,436	$ 11,024,394	$ 11,348,700	$ 11,683,717	$ 12,029,823	$ 12,387,408	$ 12,756,875	$ 13,138,644	$ 13,533,149	$ 13,940,840	$ 14,362,184	$ 14,797,663
Security Cost Reimbursement	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)	(75,750)
Airfield O&M Reserve Requirement	581,833	45,172	46,634	48,148	49,714	51,335	53,012	54,748	56,545	58,405	60,330	62,323	64,386	66,521	68,732	71,020	73,389	75,842	78,382	81,012
Airfield Portion of Admin Capital Costs Expensed	144,210	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airfield Amortization	545,377	523,466	536,973	675,131	610,248	415,928	932,810	962,083	991,356	1,020,630	1,049,903	1,056,513	1,085,786	1,115,059	1,144,332	1,173,605	1,197,579	1,226,853	1,250,278	1,279,551
PFC Ineligible Amortized Legacy Project Costs	26,395	26,395	26,395	26,395	23,723	23,723	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airfield Requirement	$ 9,753,763	$ 9,293,800	$ 9,559,452	$ 9,957,942	$ 10,159,191	$ 10,242,443	$ 11,022,248	$ 11,347,558	$ 11,682,588	$ 12,027,679	$ 12,383,183	$ 12,726,803	$ 13,104,245	$ 13,493,238	$ 13,894,189	$ 14,307,519	$ 14,728,368	$ 15,167,785	$ 15,615,094	$ 16,082,475
Less: Cargo and Nonsignatory Airline Landing Fees	(564,510)	(560,230)	(566,418)	(575,943)	(584,299)	(592,655)	(601,011)	(609,367)	(617,724)	(627,525)	(637,327)	(647,128)	(656,930)	(666,731)	(678,205)	(689,678)	(701,152)	(712,625)	(724,099)	(735,757)
Less: Fuel Flowage Fees	(100,211)	(99,451)	(100,550)	(102,241)	(103,724)	(105,207)	(106,691)	(108,174)	(109,657)	(111,397)	(113,137)	(114,877)	(116,617)	(118,357)	(120,394)	(122,431)	(124,468)	(126,504)	(128,541)	(130,611)
Less: Credit for Previously Charged Debt Service Coverage	(26,395)	(26,395)	(26,395)	(26,395)	(23,723)	(23,723)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Requirement before Adjustments	$ 9,062,647	$ 8,607,724	$ 8,866,090	$ 9,253,364	$ 9,447,445	$ 9,520,858	$ 10,314,546	$ 10,630,017	$ 10,955,207	$ 11,288,756	$ 11,632,719	$ 11,964,797	$ 12,330,698	$ 12,708,149	$ 13,095,590	$ 13,495,410	$ 13,902,749	$ 14,328,656	$ 14,762,454	$ 15,216,108
Signatory Landed Weight (1,000 lbs)	1,327,994	1,317,925	1,332,483	1,354,890	1,374,548	1,394,205	1,413,863	1,433,521	1,453,178	1,476,236	1,499,294	1,522,352	1,545,410	1,568,468	1,595,459	1,622,450	1,649,441	1,676,432	1,703,423	1,730,848
Calculated Signatory Landing Fee Rate ($/1,000 lbs) before Asjustments	$ 6.82	$ 6.53	$ 6.65	$ 6.83	$ 6.87	$ 6.83	$ 7.30	$ 7.42	$ 7.54	$ 7.65	$ 7.76	$ 7.86	$ 7.98	$ 8.10	$ 8.21	$ 8.32	$ 8.43	$ 8.55	$ 8.67	$ 8.79
Less Airport Discretionary Airfield Credit	(3,530,000)	(2,500,000)	(2,000,000)	(1,500,000)	(1,000,000)	(500,000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Actual Airfield Requirement	$ 5,532,647	$ 6,107,724	$ 6,866,090	$ 7,753,364	$ 8,447,445	$ 9,020,858	$ 10,314,546	$ 10,630,017	$ 10,955,207	$ 11,288,756	$ 11,632,719	$ 11,964,797	$ 12,330,698	$ 12,708,149	$ 13,095,590	$ 13,495,410	$ 13,902,749	$ 14,328,656	$ 14,762,454	$ 15,216,108
Final Signatory Landing Fee Rate ($/1,000 lbs)	$ 4.17	$ 4.63	$ 5.15	$ 5.72	$ 6.15	$ 6.47	$ 7.30	$ 7.42	$ 7.54	$ 7.65	$ 7.76	$ 7.86	$ 7.98	$ 8.10	$ 8.21	$ 8.32	$ 8.43	$ 8.55	$ 8.67	$ 8.79
Landing Fee Revenues	$ 5,532,647	$ 6,107,724	$ 6,866,090	$ 7,753,364	$ 8,447,445	$ 9,020,858	$ 10,314,546	$ 10,630,017	$ 10,955,207	$ 11,288,756	$ 11,632,719	$ 11,964,797	$ 12,330,698	$ 12,708,149	$ 13,095,590	$ 13,495,410	$ 13,902,749	$ 14,328,656	$ 14,762,454	$ 15,216,108

Sources: Budget: LRMAC; Forecast: LeighFisher analysis.

Table 6-12
Application of Revenues

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Net Revenues																				
Revenues	$ 31,603,455	$ 33,625,587	$ 35,130,334	$ 36,949,178	$ 39,123,982	$ 40,506,161	$ 42,419,137	$ 43,664,959	$ 45,127,018	$ 46,509,507	$ 47,932,051	$ 53,286,909	$ 54,793,127	$ 56,565,083	$ 58,226,627	$ 59,937,079	$ 61,692,583	$ 63,505,222	$ 65,614,780	$ 67,813,797
PFC Revenues to Pay Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CFC Revenues to Pay Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Revenues	$ 31,603,455	$ 33,625,587	$ 35,130,334	$ 36,949,178	$ 39,123,982	$ 40,506,161	$ 42,419,137	$ 43,664,959	$ 45,127,018	$ 46,509,507	$ 47,932,051	$ 53,286,909	$ 54,793,127	$ 56,565,083	$ 58,226,627	$ 59,937,079	$ 61,692,583	$ 63,505,222	$ 65,614,780	$ 67,813,797
Less Operating and Maintenance (O&M) Expenses	(23,476,903)	(24,145,078)	(24,834,888)	(25,547,086)	(26,282,452)	(27,041,793)	(27,825,948)	(28,635,783)	(29,472,197)	(30,336,123)	(31,228,524)	(32,150,401)	(33,102,790)	(34,086,765)	(35,103,438)	(36,153,962)	(37,239,533)	(38,361,388)	(39,520,810)	(40,719,129)
Net Revenues Remaining	$ 8,126,552	$ 9,480,509	$ 10,295,445	$ 11,402,092	$ 12,841,531	$ 13,464,368	$ 14,593,189	$ 15,029,176	$ 15,654,821	$ 16,173,384	$ 16,703,526	$ 21,136,508	$ 21,690,337	$ 22,478,318	$ 23,123,189	$ 23,783,116	$ 24,453,050	$ 25,143,834	$ 26,093,970	$ 27,094,668
Add Foregone Revenue as Discretionary Revenue Sharing	4,030,000	2,500,000	2,000,000	1,500,000	1,000,000	500,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Revenues before Revenue Sharing	$ 12,156,552	$ 11,980,509	$ 12,295,445	$ 12,902,092	$ 13,841,531	$ 13,964,368	$ 14,593,189	$ 15,029,176	$ 15,654,821	$ 16,173,384	$ 16,703,526	$ 21,136,508	$ 21,690,337	$ 22,478,318	$ 23,123,189	$ 23,783,116	$ 24,453,050	$ 25,143,834	$ 26,093,970	$ 27,094,668
Commission Cash (Including Terminal Sinking Fund)																				
Commission Cash Beginning Balance	$ 36,700,000	$ 43,492,025	$ 46,447,491	$ 38,171,005	$ 33,411,269	$ 37,248,984	$ 47,208,111	$ 61,105,261	$ 75,431,979	$ 90,377,696	$ 53,335,098	$ 16,181,404	$ 26,182,806	$ 37,364,530	$ 49,326,338	$ 61,924,843	$ 75,174,813	$ 89,085,955	$ 103,678,809	$ 119,212,408
Sources																				
Terminal Sinking Fund (TSF) Transfer	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Net Revenues Remaining	12,156,552	11,980,509	12,295,445	12,902,092	13,841,531	13,964,368	14,593,189	15,029,176	15,654,821	16,173,384	16,703,526	21,136,508	21,690,337	22,478,318	23,123,189	23,783,116	24,453,050	25,143,834	26,093,970	27,094,668
CFCs Utilized to Pay O&M Expenses	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uses																				
O&M Reserve Deposit	(688,827)	(167,044)	(172,453)	(178,049)	(183,841)	(189,835)	(196,039)	(202,459)	(209,104)	(215,981)	(223,100)	(230,469)	(238,097)	(245,994)	(254,168)	(262,631)	(271,393)	(280,464)	(289,856)	(299,580)
Revenue Bond Debt Service	-	-	-	-	-	-	-	-	-	-	-	(9,770,516)	(9,770,516)	(9,770,516)	(9,770,516)	(9,770,516)	(9,770,516)	(9,770,516)	(9,770,516)	(9,770,516)
Discretionary Revenue Sharing to Airlines	(4,030,000)	(2,500,000)	(2,000,000)	(1,500,000)	(1,000,000)	(500,000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LRMAC-funded CIP Pay-as-you-go Projects	(645,700)	(6,358,000)	(18,399,478)	(15,983,779)	(8,819,974)	(3,315,406)	(500,000)	(500,000)	(500,000)	(53,000,000)	(53,634,121)	(1,134,121)	(500,000)	(500,000)	(500,000)	(500,000)	(500,000)	(500,000)	(500,000)	(500,000)
Change in Commission Cash Balance	$ 6,792,025	$ 2,955,466	$ (8,276,485)	$ (4,759,736)	$ 3,837,715	$ 9,959,127	$ 13,897,151	$ 14,326,717	$ 14,945,717	$ (37,042,597)	$ (37,153,695)	$ 10,001,402	$ 11,181,724	$ 11,961,809	$ 12,598,505	$ 13,249,970	$ 13,911,142	$ 14,592,855	$ 15,533,599	$ 16,524,573
Commission Cash Ending Balance	$ 43,492,025	$ 46,447,491	$ 38,171,005	$ 33,411,269	$ 37,248,984	$ 47,208,111	$ 61,105,261	$ 75,431,979	$ 90,377,696	$ 53,335,098	$ 16,181,404	$ 26,182,806	$ 37,364,530	$ 49,326,338	$ 61,924,843	$ 75,174,813	$ 89,085,955	$ 103,678,809	$ 119,212,408	$ 135,736,981
Debt Service Coverage (DSC) calculation																				
Revenues	$ 31,603,455	$ 33,625,587	$ 35,130,334	$ 36,949,178	$ 39,123,982	$ 40,506,161	$ 42,419,137	$ 43,664,959	$ 45,127,018	$ 46,509,507	$ 47,932,051	$ 53,286,909	$ 54,793,127	$ 56,565,083	$ 58,226,627	$ 59,937,079	$ 61,692,583	$ 63,505,222	$ 65,614,780	$ 67,813,797
Less: O&M Expenses	(23,476,903)	(24,145,078)	(24,834,888)	(25,547,086)	(26,282,452)	(27,041,793)	(27,825,948)	(28,635,783)	(29,472,197)	(30,336,123)	(31,228,524)	(32,150,401)	(33,102,790)	(34,086,765)	(35,103,438)	(36,153,962)	(37,239,533)	(38,361,388)	(39,520,810)	(40,719,129)
Add: PFC Revenues to Pay Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Add: CFC Revenues to Pay Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Revenue for DSC Calculation	$ 8,126,552	$ 9,480,509	$ 10,295,445	$ 11,402,092	$ 12,841,531	$ 13,464,368	$ 14,593,189	$ 15,029,176	$ 15,654,821	$ 16,173,384	$ 16,703,526	$ 21,136,508	$ 21,690,337	$ 22,478,318	$ 23,123,189	$ 23,783,116	$ 24,453,050	$ 25,143,834	$ 26,093,970	$ 27,094,668
Gross Debt Service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516	$ 9,770,516
Debt Service Coverage Ratio	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.16	2.22	2.30	2.37	2.43	2.50	2.57	2.67	2.77

Sources: Budget: LRMAC; Forecast: LeighFisher analysis.

Table 6-13
Passenger Facility Charge Funds

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Sources of PFC Revenues																				
Starting PFC Account balance	$ 11,500,000	$ 15,410,466	$ 19,081,284	$ 15,167,469	$ 10,607,136	$ 12,967,187	$ 14,147,623	$ 18,310,943	$ 20,739,509	$ 23,225,960	$ 27,572,947	$ 26,280,743	$ 25,056,437	$ 29,607,115	$ 34,225,692	$ 38,923,746	$ 43,701,280	$ 48,558,293	$ 53,494,784	$ 58,510,754
PFC Revenues																				
Enplaned Revenue Passengers	1,003,934	996,322	1,007,327	1,024,267	1,039,127	1,053,988	1,068,849	1,083,709	1,098,570	1,116,001	1,133,433	1,150,864	1,168,295	1,185,727	1,206,131	1,226,536	1,246,940	1,267,345	1,287,749	1,308,482
Net Passenger Facility Charge [1]	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39
Percentage of Passengers Paying a PFC	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%	88.7%
Total PFC Airline Collections	$ 3,910,466	$ 3,880,818	$ 3,923,685	$ 3,989,666	$ 4,047,551	$ 4,105,436	$ 4,163,320	$ 4,221,205	$ 4,279,090	$ 4,346,987	$ 4,414,884	$ 4,482,782	$ 4,550,679	$ 4,618,576	$ 4,698,055	$ 4,777,534	$ 4,857,012	$ 4,936,491	$ 5,015,970	$ 5,096,728
Total PFC Interest Earnings	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total PFC Revenues	$ 3,910,466	$ 3,880,818	$ 3,923,685	$ 3,989,666	$ 4,047,551	$ 4,105,436	$ 4,163,320	$ 4,221,205	$ 4,279,090	$ 4,346,987	$ 4,414,884	$ 4,482,782	$ 4,550,679	$ 4,618,576	$ 4,698,055	$ 4,777,534	$ 4,857,012	$ 4,936,491	$ 5,015,970	$ 5,096,728
Total Sources of PFCs/Available PFCs	$ 15,410,466	$ 19,291,284	$ 23,004,969	$ 19,157,136	$ 14,654,687	$ 17,072,623	$ 18,310,943	$ 22,532,148	$ 25,018,599	$ 27,572,947	$ 31,987,831	$ 30,763,525	$ 29,607,115	$ 34,225,692	$ 38,923,746	$ 43,701,280	$ 48,558,293	$ 53,494,784	$ 58,510,754	$ 63,607,482
Uses of PFC Revenues																				
Pay-as-you-go CIP	$ -	$ (210,000)	$ (7,837,500)	$ (8,550,000)	$ (1,687,500)	$ (2,925,000)	$ -	$ (1,792,639)	$ (1,792,639)	$ -	$ (5,707,088)	$ (5,707,088)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Applied to Debt Service	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Uses of PFC Revenues	$ -	$ (210,000)	$ (7,837,500)	$ (8,550,000)	$ (1,687,500)	$ (2,925,000)	$ -	$ (1,792,639)	$ (1,792,639)	$ -	$ (5,707,088)	$ (5,707,088)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Surplus/(Deficit)	$ 3,910,466	$ 3,670,818	$ (3,913,815)	$ (4,560,334)	$ 2,360,051	$ 1,180,436	$ 4,163,320	$ 2,428,566	$ 2,486,451	$ 4,346,987	$ (1,292,204)	$ (1,224,307)	$ 4,550,679	$ 4,618,576	$ 4,698,055	$ 4,777,534	$ 4,857,012	$ 4,936,491	$ 5,015,970	$ 5,096,728
Ending PFC Account Balance/Available PFCs	$ 15,410,466	$ 19,081,284	$ 15,167,469	$ 10,607,136	$ 12,967,187	$ 14,147,623	$ 18,310,943	$ 20,739,509	$ 23,225,960	$ 27,572,947	$ 26,280,743	$ 25,056,437	$ 29,607,115	$ 34,225,692	$ 38,923,746	$ 43,701,280	$ 48,558,293	$ 53,494,784	$ 58,510,754	$ 63,607,482
PFC Debt Service Paid by Cost Center																				
Terminal	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Airfield	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Debt Service Paid by Cost Center	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Sources: Budget: LRMAC; Forecast: LeighFisher analysis.

1. $4.50 collection level less $0.11 airline collection fee.

Table 6-14
Customer Facility Charge Funds

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Sources of CFC Revenues																				
Starting CFC Account balance	$ 500,000	$ 2,980,782	$ 5,442,755	$ 6,597,622	$ 5,650,793	$ 6,074,987	$ 8,679,456	$ 11,320,648	$ 13,998,561	$ 16,713,195	$ 19,470,904	$ 22,271,686	$ 25,115,542	$ 28,002,471	$ 30,932,475	$ 33,912,899	$ 36,943,744	$ 40,025,010	$ 43,156,697	$ 46,338,806
CFC Revenues																				
CFC Car Rental Collections																				
Enplaned Passengers [1]	1,024,422	1,016,655	1,027,885	1,045,170	1,060,334	1,075,498	1,090,662	1,105,826	1,120,990	1,138,777	1,156,564	1,174,351	1,192,138	1,209,925	1,230,746	1,251,567	1,272,388	1,293,209	1,314,030	1,335,186
Percentage of Passengers Renting Cars	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%	18.5%
Rental Car Transactions	189,012	187,579	189,651	192,840	195,638	198,436	201,234	204,031	206,829	210,111	213,393	216,675	219,957	223,238	227,080	230,922	234,763	238,605	242,446	246,350
Average Transaction-Days per Rental	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75
Rental Car Transaction-Days	708,795	703,421	711,191	723,150	733,642	744,134	754,626	765,118	775,610	787,917	800,223	812,530	824,837	837,144	851,550	865,956	880,362	894,768	909,174	923,812
CFC Rate ($ / Transaction-Day)	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50	$ 3.50
Total CFC Car Rental Collections	$ 2,480,782	$ 2,461,973	$ 2,489,168	$ 2,531,026	$ 2,567,748	$ 2,604,469	$ 2,641,191	$ 2,677,913	$ 2,714,635	$ 2,757,708	$ 2,800,782	$ 2,843,856	$ 2,886,930	$ 2,930,003	$ 2,980,424	$ 3,030,845	$ 3,081,266	$ 3,131,687	$ 3,182,108	$ 3,233,341
Total CFC Interest Earnings	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total CFC Revenues	$ 2,480,782	$ 2,461,973	$ 2,489,168	$ 2,531,026	$ 2,567,748	$ 2,604,469	$ 2,641,191	$ 2,677,913	$ 2,714,635	$ 2,757,708	$ 2,800,782	$ 2,843,856	$ 2,886,930	$ 2,930,003	$ 2,980,424	$ 3,030,845	$ 3,081,266	$ 3,131,687	$ 3,182,108	$ 3,233,341
Total Sources of CFCs/Available CFCs	$ 2,980,782	$ 5,442,755	$ 7,931,922	$ 9,128,648	$ 8,218,541	$ 8,679,456	$ 11,320,648	$ 13,998,561	$ 16,713,195	$ 19,470,904	$ 22,271,686	$ 25,115,542	$ 28,002,471	$ 30,932,475	$ 33,912,899	$ 36,943,744	$ 40,025,010	$ 43,156,697	$ 46,338,806	$ 49,572,147
Uses of CFC Revenues																				
Applied to Debt Service	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Pay-as-you-go CIP	-	-	(1,334,301)	(3,477,855)	(2,143,554)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Uses of CFC Revenues	$ -	$ -	$ (1,334,301)	$ (3,477,855)	$ (2,143,554)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Annual Surplus/(Deficit)	$ 2,480,782	$ 2,461,973	$ 1,154,867	$ (946,829)	$ 424,194	$ 2,604,469	$ 2,641,191	$ 2,677,913	$ 2,714,635	$ 2,757,708	$ 2,800,782	$ 2,843,856	$ 2,886,930	$ 2,930,003	$ 2,980,424	$ 3,030,845	$ 3,081,266	$ 3,131,687	$ 3,182,108	$ 3,233,341
Ending CFC Account Balance	$ 2,980,782	$ 5,442,755	$ 6,597,622	$ 5,650,793	$ 6,074,987	$ 8,679,456	$ 11,320,648	$ 13,998,561	$ 16,713,195	$ 19,470,904	$ 22,271,686	$ 25,115,542	$ 28,002,471	$ 30,932,475	$ 33,912,899	$ 36,943,744	$ 40,025,010	$ 43,156,697	$ 46,338,806	$ 49,572,147

Sources: Budget: LRMAC; Forecast: LeighFisher analysis.

1. Assumes relationship of visiting deplaned passengers (the relevant population for rental cars) with enplaned passengers is constant; therefore enplaned passengers is an appropriate surrogate.

Chapter 7

7.1 OVERVIEW AND PURPOSE OF THE STRATEGIC BUSINESS PLAN

This Chapter presents a Strategic Business Plan for the Airport. This plan is intended to provide a framework for a new document which the Airport intends to review and update annually. The purpose of the plan is to confirm long-term goals for the Commission, the Airport, and it's stakeholders. The action items documented in the plan can serve to guide staff and management decisions regarding capital investments and day-to-day operations.

An annual review and update process for this document would be most effective if it coincides with Airport budgeting cycles, updates of the 5-year Capital Improvement Plan for the FAA, and an annual Airport Commission retreat. Key strategic goals and near-term action items should incorporate guidance from the Commission, Airport leadership, customer satisfaction surveys, and other stakeholders.

The remainder of this chapter presents a draft Strategic Business Plan developed with input from appropriate stakeholders throughout the course of the Master Plan process. Two workshops were conducted with Airport leadership in December 2017 and March 2018 which form the basis of the long-term strategies and action items to execute the strategy.

7.2 AIRPORT BACKGROUND

7.2.1 About Bill and Hillary Clinton National Airport

Bill and Hillary Clinton National Airport is Arkansas's largest commercial service airport, with over two million passengers annually. Also known as Adams Field, Little Rock's airport hosts six airlines with daily departures and nonstop service to 14 destinations.

At Bill and Hillary Clinton National Airport, our main goal is to provide passengers with the best travel experience possible. Our Mission Statement is:

> To pursue all 'Opportunities in Flight' to safely and efficiently connect our customers with the world and to promote economic development for all aeronautical activities.

The Airport also strives to be a positive part of our community. To that end, our goals as stated on the Airport website include:

- To build a state-of-the-art terminal facility to meet future demand
- To develop and implement a plan that attracts all levels of corporate aviation to the airport
- To locate additional sources of funding
- To become the employer of choice in the community
- To complete current land acquisition programs within the next three years
- To promote industrial development
- To continue to improve air service
- To continue to promote and enhance disadvantaged business enterprises (DBE) participation.

7.2.2 Financial and Economic History

Throughout the 1990s, more than $170 million in capital improvements were made at the Airport to ensure that the facility would continue to serve its customers in the new century. The airport was renamed in 2012, and concourse renovation was announced in 2014 as part of the 2020 Vision Plan.

The Airport has accomplished a series of financial successes since the last Master Plan Update:

- Long-term Airport debt paid off
- Dassault Falcon Jet constructed new hangar
- TAC Air acquires Central Flying Service
- Fly Arkansas opens
- Envoy opens maintenance facility

7.3 AIRPORT LEADERSHIP AND COMMUNITY IMPACT

7.3.1 Leadership

Bill and Hillary Clinton National Airport is governed by the Little Rock Municipal Airport Commission – local business leaders who volunteer their expertise to ensure decisions are made in the best interests of the community and state.

The locally run aspects of the Airport promote a community engagement and development. That means working to maximize the benefit of the airport by driving economic development, continually pursuing new airline service and fostering competition for lower fares.

7.3.2 Our Impact

Bill and Hillary Clinton National Airport is self-supporting using no local or state tax dollars for operations or capital improvements. Clinton National is funded primarily by fees paid by airport users, including airlines, passengers and businesses that operate at the airport. The airport generates more than $1.2 billion in annual economic benefit.

During the past four years, the airport has generated more than $45 million in taxes for the state of Arkansas, city of Little Rock and Pulaski County. As a net tax generator, Clinton National Airport does not drain valuable tax dollars away from important government services. Nearly 3,000 jobs are provided on the airport's 2,100 acres.

7.4 AIRPORT MANAGEMENT'S STRATEGIC VISION FOR THE FUTURE

7.4.1 Airport Master Plan

An airport master plan is a comprehensive study that identifies long-term plans for airport development. A new master plan for Bill and Hillary Clinton National Airport is being prepared to provide the Little Rock Municipal Airport Commission and its stakeholders with a comprehensive, organized and rational plan for developing and improving airport facilities over the next 20 years.

This strategic business plan will provide the Commission with a framework to efficiently and effectively meet the demands for commercial passenger and air cargo service, as well as other aviation-related needs. Development of the master plan included input from stakeholders with an interest in the Airport's future, such as: Airport users, community groups, local businesses, government agencies and the general public. The goals of the Master Plan have been identified in Figure 7-1.

Figure 7-1
Typical Master Plan Goals

7.4.1.1 Strengths, Weaknesses, Opportunities, and Threats (SWOT)

This SWOT analysis aids development of long-term strategies which seek to embrace strengths, recognize weaknesses, maximize opportunities, and mitigate threats

In December 2016, the Master Plan team conducted a workshop with Airport Staff to discuss SWOTs, which was used to develop Master Plan goals and confirm the areas of emphasis for the strategic business plan process. The results of the SWOTs analysis were subsequently presented to the Master Plan Advisory Committee (MPAC) for concurrence on several occasions. The results of the SWOTs analysis are shown in Figure 7-2.

Figure 7-2
Master Plan SWOT Analysis

STRENGTHS

- Airport is a strong employer and economic driver for the region
- Good roadway access with nearby rail and marine port
- Airport is located close to downtown Little Rock
- Airfield is well positioned to accommodate forecast demand
- Customer service amenities are exceptional as reflected in surveys
- Plan for future Terminal program is well established
- Key facilities have capacity and room to expand
- General aviation facilities are physically grouped together
- Multiple FBOs foster competitive rates
- Aviation and aerospace is #1 export out of Arkansas (by $ value)
- Airport is debt-free and Commission has cash reserves for future projects

WEAKNESSES

- Older facilities will require rehabilitation or rebuilding
- Lack of restaurants and retail available to non-airport patrons
- Some public parking facilities have reached overnight capacity
- Some passengers find roadway signage and wayfinding confusing
- Curbside roadways are uncovered and exposed to the elements
- Historical low-growth economic conditions prevail
- Skilled work force shortage prevails in central Arkansas
- Tax code does not encourage corporate aircraft to base in Arkansas
- Competing geographic proximity (e.g., Memphis, Dallas ,etc.)
- Airport land is constrained by river, interstate, and arterial streets
- Environmental conditions restrict development in some areas
- Crime has been reported in and around the airport

OPPORTUNITIES

- Increased marketability of available facilities and vacant parcels
- Airport well positioned to become a multi-modal center
- Located on a potential Dallas to Memphis high-speed rail corridor
- Capitalize on international connections
- Vendors who support existing tenants may relocate closer to the airport
- Preserve location for station and right of way for future light rail
- Advance terminal program to expand curbside for drop off and pickup

THREATS

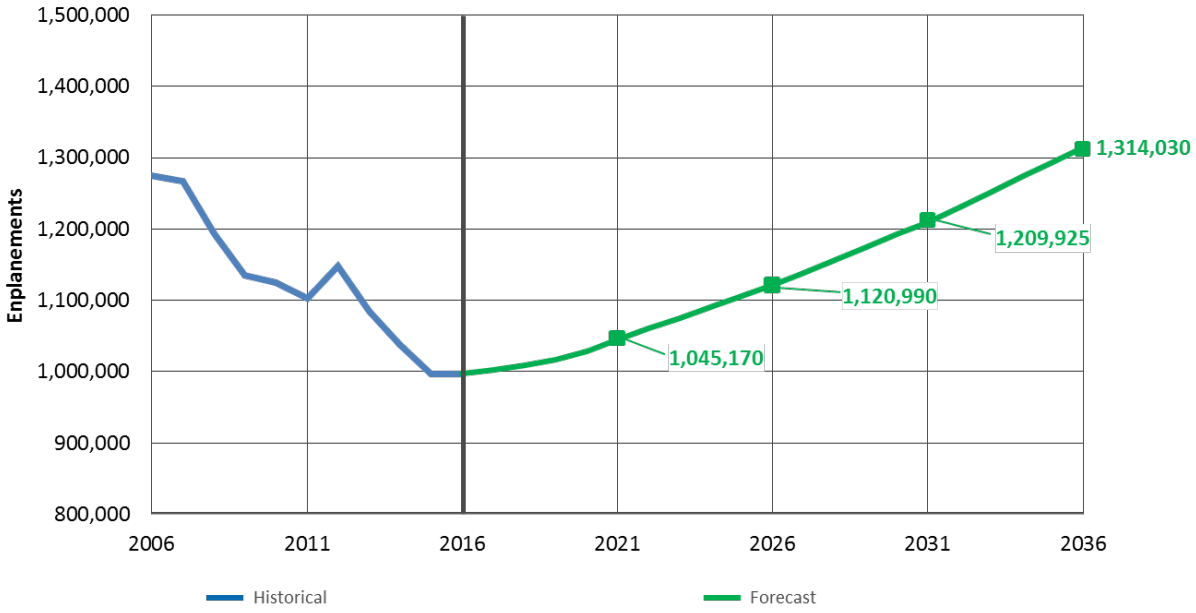
- Historical economic conditions could continued unchanged
- Nearby reliever airports could divert general aviation activity and revenue
- Current tenants could relocate away from Little Rock
- Development off-airport could divert non-aeronautical revenues
- New ground transportation entrants could divert parking revenues
- Airlines could choose to reduce service if demand declines
- Aging facilities may require increased costs before replacement

Source: LeighFisher Master Plan, 2017.

7.4.1.2 Aviation Forecast

An aviation activity forecast drives the analysis and conceptual plan for each element of the Master Plan. At the outset of the study, an economic forecast projected a 1.4% growth in enplanements long-term, as shown in Figure 7-3. Operations are also expected to grow at approximately 0.4% long-term. The forecasts have been reviewed and approved by the FAA.

Figure 7-3
Master Plan Passenger Forecast



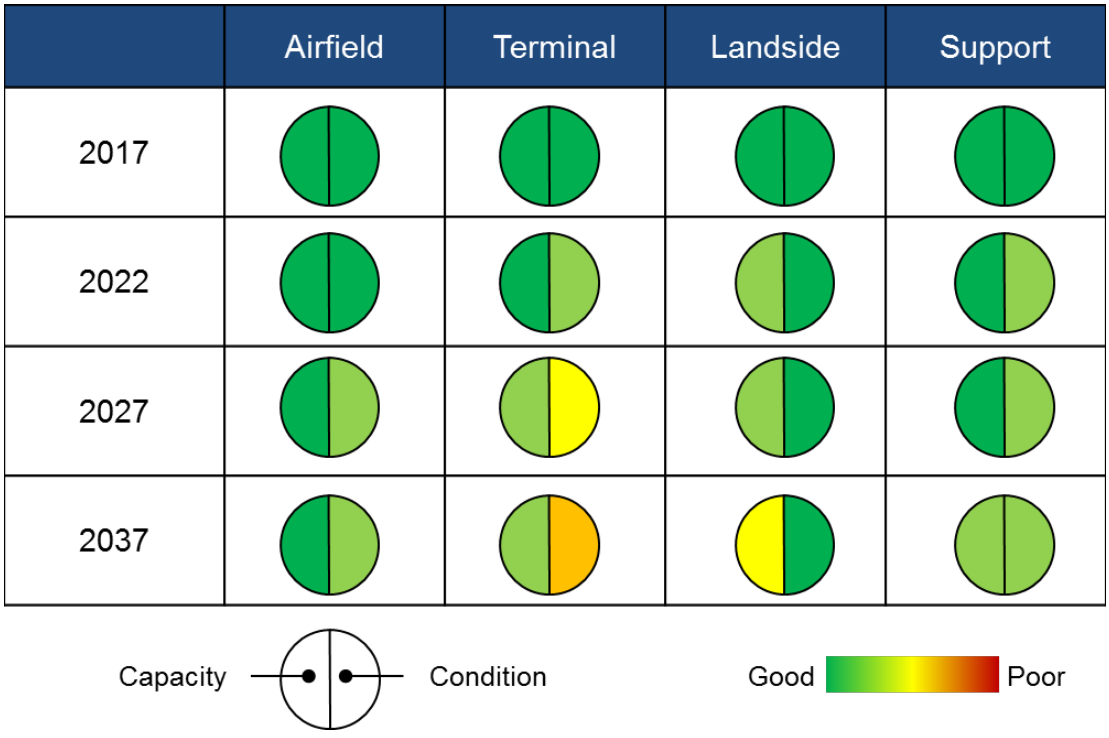
Source: LeighFisher Master Plan, 2017.

Note that the existing facilities were able to provide adequate capacity during the peak aviation activity levels experienced in 2006 of 1.2m passengers. With passenger levels forecast to reach the 2006 levels late in the planning horizon, nearly all of the Master Plan facilities have adequate existing capacity to serve demand throughout the 20 year planning period. Therefore major capacity-generating projects like new runways and new parking garage facilities are not required. However passenger levels above 1.2m enplanements will likely cause a drop in the level of passenger satisfaction in the terminal facility unless further improvements are made.

7.4.1.3 Facility Requirements

Requirements for each functional area of the airport including airfield, terminal, landside, and support facilities have been evaluated. The analysis concludes that facilities are sufficient to meet future demand, however there may be opportunities to improve facilities over time to meet customer and airline activity demands. Figure 7-4 depicts a high-level assessment of the ability of existing facilities to meet future demand, and a comparison to the need to replace aging facilities.

Figure 7-4
Summary of Facility Requirements

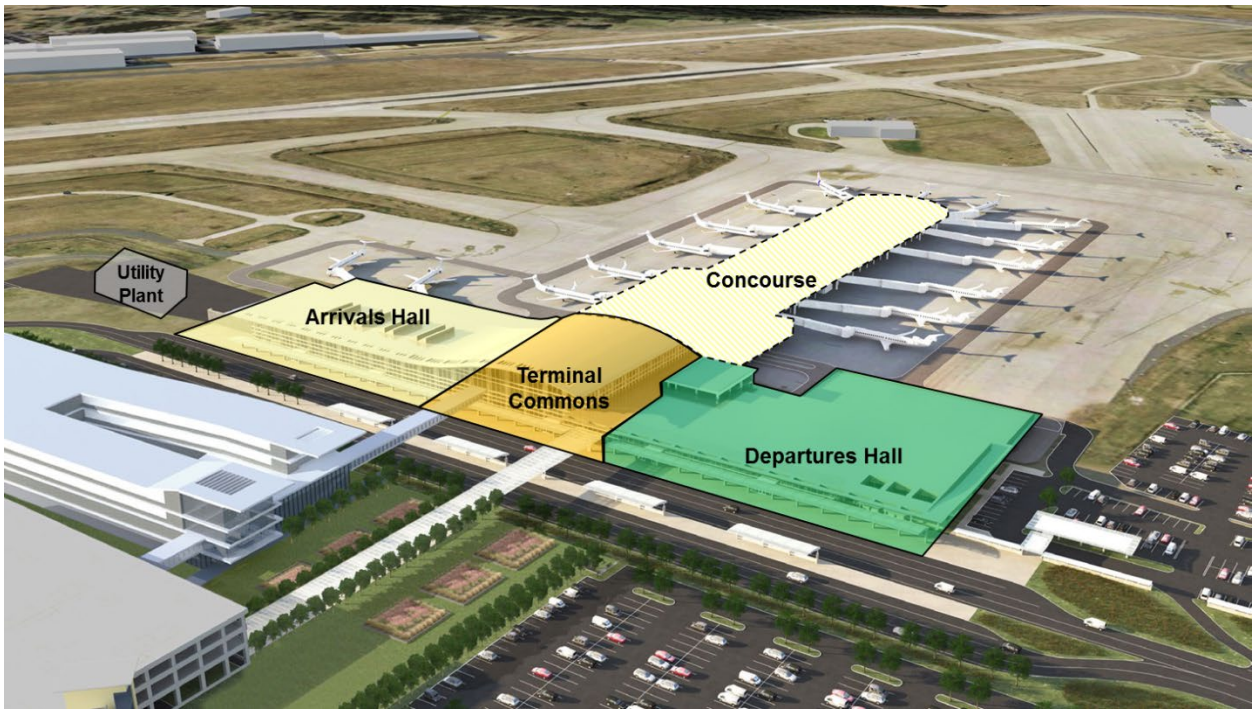


Source: LeighFisher Master Plan, 2017, based on existing facilities and activity.

7.4.1.4 Terminal Redevelopment Program Update

A well-established Terminal Redevelopment Program (TRP) was first outlined in the Vision 2020 planning study prepared by Architectural Alliiance in 2010. A rendering of the major elements of the program is illustrated in Figure 7-5. The first phase of the project, the departures hall and baggage handling system was constructed by renovating and expanding the existing departures hall, and was opened in 2012. The next phase of the TRP which will be implemented is a Central Utility Plant, which will support the Terminal Commons and Arrivals Hall. Recent improvements to the existing Concourse facility have extended their useful life such that the final phase of the TRP can be done when demand warrants and affordability permits.

Figure 7-5
Terminal Redevelopment Program Overview



Source: Architectural Alliance rendering, Vision 2020 Study.

7.4.1.5 Long-Term Goals

The Commission along with Airport leadership, staff, tenants, and stakeholders have established the following goals:

1) **Community: Be an Economic Driver for the Region –** More than the place where airlines connect passengers to other cities outside of Arkansas, the Bill and Hillary Clinton National Airport is an economic driver for the region. The jobs provided along with tax revenues collected by airlines and airport users make the Airport one of the great civic buildings in Little Rock, and the Airport functionality to remain the primary goal.

2) **Airlines: Apply Strategic Rate Discipline** – The Airport has historically derived long-term financial stability by refraining from making sudden large changes in rates, fees, and policies. By looking into the future and considering upcoming capital expenditures, the Airport and associated stakeholders can understand the scale of financing required for major capital projects. This can result in modest rate increases necessary to maintain and improve the Airport spaced out at appropriate intervals. This approach provides maximum long-term stability for airlines, tenants, and other stakeholder groups who rely on the Airport to make rate changes thoughtfully and over long periods of time.

3) **Customer Service: Maintain Exemplary Customer Service** – The Airport has earned an extraordinarily high customer satisfaction score in recent years by listening to customers and maximizing opportunities to provide amenities. Some recent examples include the fastest free wireless internet access in the world, power at every seat in the terminal, a pet relief area, nursing mothers room, and more. Shifting attention away from customer service could result in an unacceptable degradation in level of service to the Airport customers.

4) **Financial Stability: Enhance Non-Aeronautical Revenues** – Non-Aeronautical revenues including land leases, parking fees, rental car revenue contributions, ground transportation fees, and other revenues represent a significant portion of the Airports budget and moreover represent nearly all of the Airport's net revenue after costs. Increasing non-aeronautical revenues will support the TRP, but will also make the Airport a stronger economic driver for the region.

5) **Airport Facilities: Support the Terminal Redevelopment Program** – The TRP has been a long standing and continuously evolving program intended to maximize customer service with world-class airport facilities in a financially responsible way and with the support of airlines and other key stakeholders. Continuing to strategically support the TRP will ensure that limited resources are applied to the Terminal in the highest and best use.

7.5 IMPLEMENTING THE STRATEGY

This section represents a call to action for the Airport Commission, leadership, staff, tenants, and other stakeholders. The potential activities described below represent some of the numerous ways to implement the long-term strategies described in the previous section. If successfully completed, these activities will allow the Airport to build on past financial success and maintain exemplary customer service while improving the ability to complete the Terminal Redevelopment Program expeditiously.

- **Gradually Reduce Airline Credits –** Since paying off the long-term debt, the Airport has generated a surplus of revenue which has recently been shared with airline partners, effectively reducing the airline costs to operate at Little Rock. A gradual reduction in the revenue sharing program and increase in airline costs would fund master plan improvements on a pay-as-you-go basis. This avoids future debt and produces savings for all parties including the airlines.

- **Refine the Next Phase of the TRP** – While the TRP is a well-established plan, a review of the sizing program considering the latest passenger forecasts along with new and future technology could potentially result in a reduced footprint and lower cost of the Arrivals Hall phase. This could potentially allow the program to advance ahead of schedule.

- **Continue to Support the Terminal Concessions Program** – Recent and ongoing improvements to the Terminal concourse have improved the passenger experience with new restrooms, seating, power outlets, wireless internet, and other highly desirable features. Concession programs such as new or renovated restaurants provide revenue while serving customers and can be supported by all parties.

- **Conduct a Parking Study and Consider increasing rates** – Parking rates are politically sensitive and have direct customer service implications. Conducting a parking study to confirm customer demand and willingness to pay for various parking amenities such as covered parking, short- and long-term parking, and the provision of a shuttle could result in recommendations which increase net revenues while maintaining or enhancing customer service.

- **Revaluate Commercial Vehicle Management and Fee Policies** – The introduction of Transportation Network Companies (TNCs) such as Uber and Lyft has had a significant impact on Airport ground access across the industry. Many Airports are reviewing agreements with ground transportation operators and increasing fees to support a ground transportation cost recovery policy.

- **Support Non Aeronautical Airport Developments** – The Airport is well-positioned to accommodate additional on-airport commercial development, which could increase land lease revenues. Vacant or underutilized properties should be considered for uses such as:
  - Travel plaza
  - Airport hotel
  - Expansion of general aviation facilities
  - Growth of existing tenant activities e

The incremental improvements outlined are intended to advance the long-term strategies. They should strengthen the Airport's financial position and mitigate growing industry threats, such as self-driving cars. Each of the above actions can be completed independently with different groups of stakeholders and under different time frames.