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in association with

Hanson Professional Services, Inc.
Corporate Environmental Risk Management, LLC
Jacobsen|Daniels
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TECHNICAL MEMORANDUM No. 1 – INVENTORY OF EXISTING CONDITIONS

MASTER PLAN
Mobile Downtown Airport

Prepared for

Mobile Airport Authority
Mobile, Alabama

July 2020

Mobile Airport Authority

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ACRONYMS AND ABBREVIATIONS

Term	Definition
1R8	Bay Minette Municipal Airport
25R	St. Elmo Airport
4R9	Jeremiah Denton Airport
5R4	Foley Municipal Airport
AIP	Airport Improvement Program
ARFF	Aircraft Rescue and Fire Fighting
ASOS	Automated Surface Observing System
ATCT	Airport Traffic Control Tower
AVIC	Aviation Industry Corporation of China
BFM	Mobile Downtown Airport
BIX	Kessler Air Force Base
Continental	Continental Aerospace Technologies
CN	Canadian National
CQF	H. L. (Sonny) Callahan Airport
FAA	Federal Aviation Administration
FAL	Final Assembly Line
FBO	Fixed Base Operator
FIDS	Flight Information Display System
GPS	Global Positioning System
GPT	Gulfport-Biloxi International Airport
HIRL	High-Intensity Runway Edge Lighting
HTRW	Hazardous, Toxic, and Radioactive Waste
ILS	Instrument Landing System
IFR	Instrument Flight Rules
IMC	Instrument Meteorological Conditions
KBFM	Mobile Downtown Airport (FAA Identifier)
KMOB	Mobile Regional Airport (FAA Identifier)
LPV	Localizer Performance with Vertical Guidance
MAA	Mobile Airport Authority
MALSR	Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights
MIRL	Medium-Intensity Runway Edge Lights

MOA	Military Operations Area
MOB	Mobile Regional Airport
MRO	Maintenance, Repair, and Overhaul
MSA	Metropolitan/Micropolitan Statistical Area
MSL	Mean Sea Level
NFA	No Further Action
NOLF	Navy Outlying Field Barin
NPA	Pensacola Naval Air Station/Forrest Sherman Field
NPIAS	National Plan of Integrated Airport Systems
PAPI	Precision Approach Path Indicator
PCN	Pavement Classification Number
PCI	Pavement Condition Index
PNS	Pensacola International Airport
PRP	Potential Responsible Parties
PQL	Trent Lott International Airport
RVR	Runway Visual Range
The City	The City of Mobile
TNC	Transportation Network Company
TSA	Transportation Security Administration
USGS	United States Geological Survey
VASI	Visual Approach Slope Indicator
VMC	Visual Meteorological Conditions
VT MAE	VT Mobile Aerospace Engineering

1. AIRPORT LOCATION AND HISTORY

1.1 Location

The City of Mobile (the City) sits along Mobile Bay, which connects into the Gulf of Mexico in the southwestern portion of Alabama (see Figure 1.1[1]). The City is nicknamed the "Home of Mardi Gras," as it boasts the oldest Mardi Gras celebration in the nation.

The Mobile metropolitan area is one of the most heavily populated in the state, and the local citizenry is spread across a large geographic area. Downtown Mobile plays a central role in the region's economy and is easily accessed at the convergence of I-10 (which also accesses BFM) and I-65, with more densely populated areas west of downtown and east of downtown in Daphne.

Mobile is home to two airports, both owned and operated by the Mobile Airport Authority (MAA). The fist, situated along Mobile Bay, is Mobile Downtown Airport (BFM). BFM is four miles south of the City's downtown and on the site of the former Brookley Air Force Base. The airport's unique Federal Aviation Administration (FAA) identifier is KBFM, and the airport elevation is 26.2 feet above mean sea level (MSL). The entire airport property, which includes aviation and non-aeronautical uses, encompasses 1,688 acres and is home to the Mobile Aeroplex at Brookley, a mixed-use industrial area. A portion of the former Air Force Base also sits on land adjacent to BFM, between the airfield and Mobile Bay, that is not owned by the MAA.

Figure 1.1: Alabama County Map

The second is Mobile Regional Airport (MOB) (FAA identifier KMOB), which is approximately 11 miles due west of the City's downtown area. The airport elevation is 218.7 feet MSL. MOB is a publicly-owned facility, and it is presently the City's primary commercial service airport encompassing 3,073 acres.

The airports encourage economic vitality of the local and regional community through support of business travel and scheduled passenger service. Figure 1.2[2] depicts the airports' location and population density at the census tract level, based upon 2016 estimates.

1 Hanson Professional Services, 2019.
2 Hanson Professional Services, 2019.

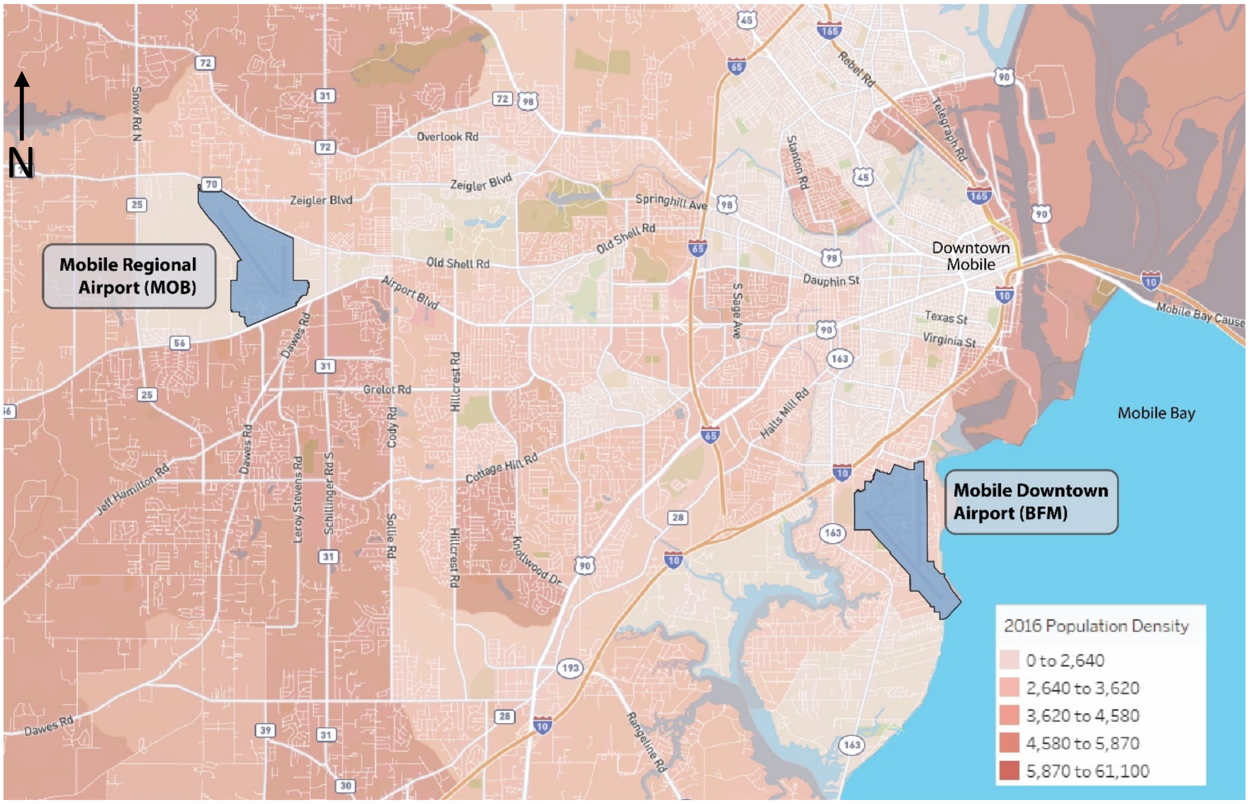

Figure 1.2: Mobile Airport Map

1.1.1 Mobile Metropolitan Statistical Area

A metropolitan/micropolitan statistical area (MSA) comprises a core population center, along with economically and socially integrated neighboring communities. Currently, delineated areas are based on 2010 Census, 2011-2015 American Community Survey, and 2016 Population Estimates Program data. The most recent MSA delineations were effective in September 2018. Each metropolitan statistical area must have at least one urbanized area of 50,000 or more inhabitants, and each micropolitan statistical area must have at least one urban cluster of at least 10,000 but less than 50,000 inhabitants.

The two components that create the Mobile MSA are depicted on Figure 1.3 (in Mobile County), and it also shows the microstatistical area of Daphne-Fairhope-Foley to the east in Baldwin County.[3] Based upon 2018 population estimates, the Mobile MSA (population 413,757) is the 130th most populous in the United States.[4] The Mobile MSA is the third most populous in Alabama, following Birmingham-Hoover (population 1,151,801) and Huntsville (population 462,693). Two nearby MSAs have comparable rankings and population estimates: Pensacola-Ferry Pass-Brent, Florida MSA ranks 108th (population 494,883) and Gulfport-Biloxi-Pascagoula, Mississippi MSA ranks 136th (population 397,261).

[3] United States Census Bureau. *Metropolitan and Micropolitan Map*. https://www.census.gov/data-tools/demo/metro-micro/thematic_maps.html.

[4] United States Census Bureau. *Metropolitan and Micropolitan Statistical Areas Population Totals and Components of Change: 2010-2019. https://www.census.gov/data/tables/time-series/demo/popest/2010s-total-metro-and-micro-statistical-areas.html*.

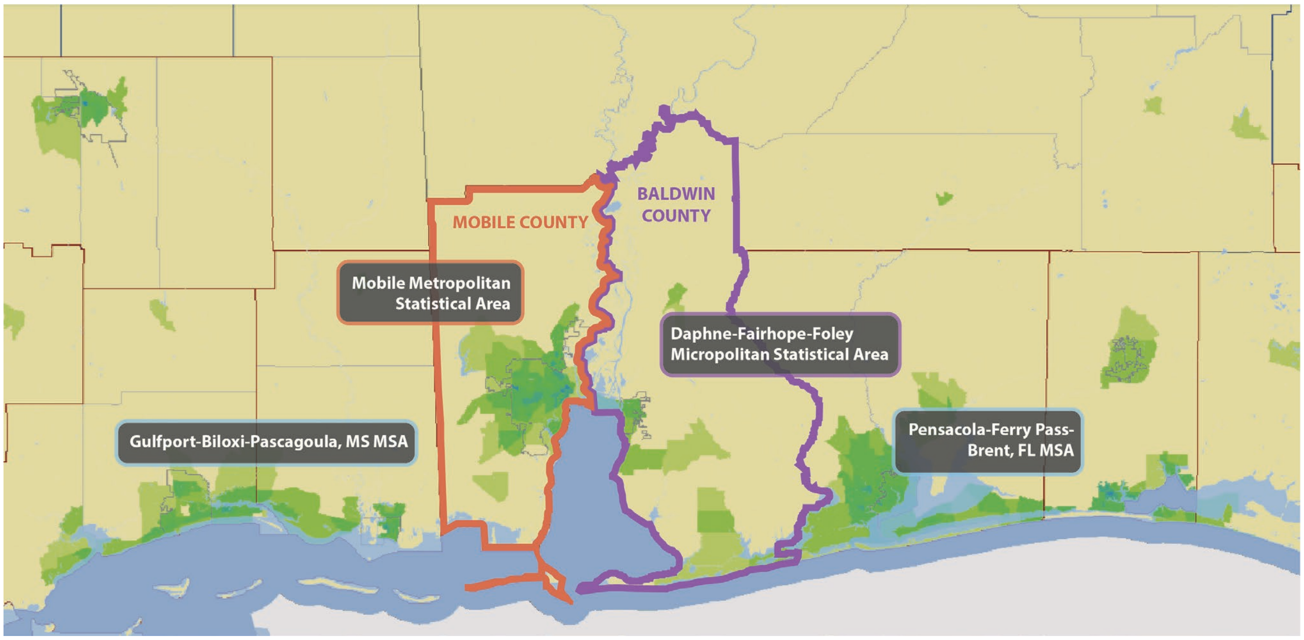

Figure 1.3: MSA Map

1.1.2 State System Plan

A statewide aviation system plan examines the needs and roles of airports from a state level. The Alabama Statewide Airport System Plan[5] classifies both BFM and MOB as national airports. In terms of the state system plan, a national airport provides the local, regional, and statewide economy with access to and from the national and global economy. This differs from lower classifications in that they do not provide access to the global economy. The singular classification above national airport is an international airport, which provides global access to passenger and air cargo markets.

Alabama is currently undertaking an update to the statewide system plan, along with an economic impact study and pavement management program. The anticipated completion date is the end of 2020.

[5] Alabama Department of Transportation, *Alabama State Airport System Plan*. https://www.dot.state.al.us/aerweb/alabamastateairportsystemplan.html

1.1.3 National Plan of Integrated Airport Systems

The FAA biennially publishes its *National Plan of Integrated Airport Systems (NPIAS) Report* detailing the nation's airport system.[6] The 2019-2023 report identified 3,328 public-use airports in the country. Each airport in the NPIAS is designated as either primary or nonprimary, with additional subcategories under each. Primary airports receive scheduled air carrier service with 10,000 or more annual enplaned passengers. Based upon 2016 data, there are 380 primary airports nationwide.

Nonprimary airports make up the bulk of the country's airports and help support general aviation. A nonprimary airport may have commercial service, but with less than 10,000 yearly enplanements. Nonprimary airports are designated as one of five subcategories: national, regional, local, basic, and unclassified.

See Figure 1.4 for the statewide NPIAS map.[7] MOB is designated a non-hub primary airport because it enplanes more than 10,000 annual passengers but accounts for less than 0.05% of all commercial passenger enplanements. BFM is designated as a regional general aviation nonprimary airport. Regional airports are one step below national airports and serve relatively large populations. Through long-distance flights and high activity levels, regional airports support their local economies. With the start of commercial service, the BFM designation is anticipated to change to a primary airport in the next NPIAS edition.

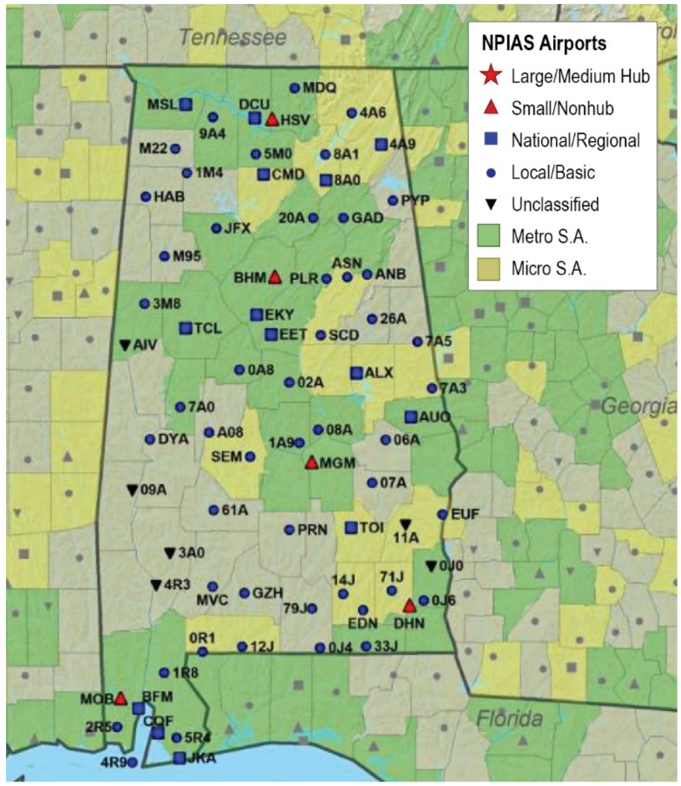

Figure 1.4: Alabama NPIAS Map

[6] Federal Aviation Administration (FAA). *National Plan of Integrated Airport Systems (NPIAS) Report.* https://www.faa.gov/airports/planning_capacity/npias/reports/.

[7] Federal Aviation Administration (FAA). *NPIAS Report, Appendix B: State Maps.* https://www.faa.gov/airports/planning_capacity/npias/reports/media/NPIAS-Report-2019-2023-Appendix-B.pdf.

1.2 History of Mobile Aviation

Aviation in Mobile has a rich history spanning more than a full century, starting with Legion Field, the first official flying field, in 1917.[8] Figure 1.5[9] lists key events in the history of aviation and airports in Mobile, highlighting the diversity and importance of flying in the region.

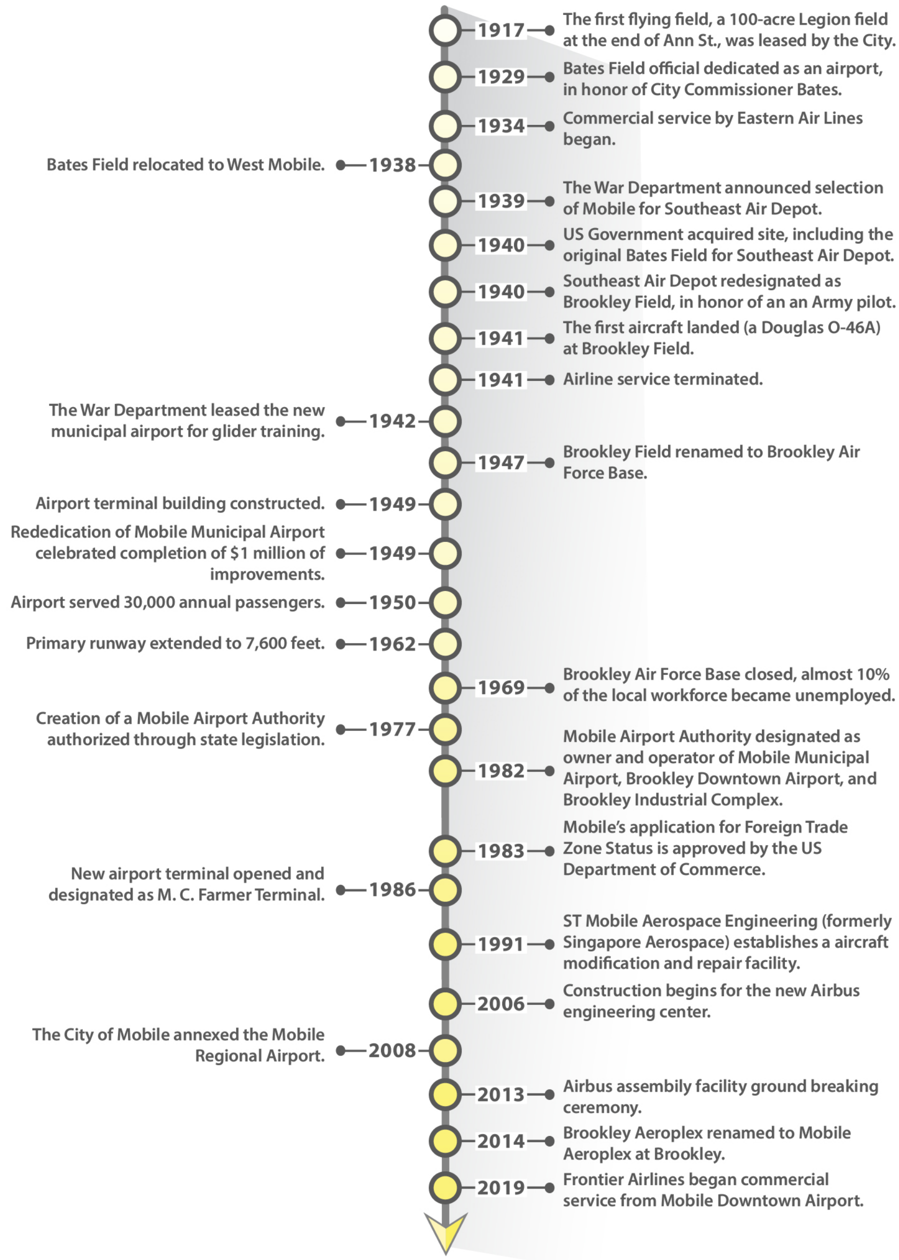

Figure 1.5: Aviation in Mobile Timeline

[8] Mobile Aviation by Billy J. Singleton (2010); Mobile Regional Airport Master Plan Update by MAA (November 2013), and Mobile Airport Authority Personnel Handbook by MAA.

[9] Hanson Professional Services, 2019.

1.3 Grant History

Table 1.1 and Table 1.2 list historic improvement projects accomplished through FAA-issued grants at BFM and MOB.[10] Data were obtained from FAA's website and only dates back to 2005. Descriptions of work are verbatim from the report output. Projects are typically funded through a combination of federal Airport Improvement Program (AIP), state, and local monies. The AIP funds in the tables represent only the federal share.

Table 1.1: BFM Grant History

Fiscal Year	Service Level	AIP Federal Funds	Work Description
2005	Reliever	$3,529,383	Install Miscellaneous NAVAIDS (navigational aids), Install Runway Vertical/Visual Guidance System–14/32, Install Runway Vertical/Visual Guidance System–18/36, Rehabilitate Runway–14/32
2006	Reliever	$23,603	Install Perimeter Fencing
2007	Reliever	$2,508,501	Acquire Equipment, Conduct Miscellaneous Study, Install Perimeter Fencing, Rehabilitate Apron
2008	General Aviation	$71,964	Update Airport Master Plan Study
2008	General Aviation	$807,744	Improve Airport Drainage, Rehabilitate Apron
2009	General Aviation	$106,585	Install Miscellaneous NAVAIDS, Rehabilitate Taxiway
2009	General Aviation	$190,604	Install Miscellaneous NAVAIDS, Rehabilitate Taxiway
2010	General Aviation	$327,224	Rehabilitate Taxiway, Remove Obstructions, Wildlife Hazard Assessments
2010	General Aviation	$1,643,865	Rehabilitate Taxiway
2011	General Aviation	$320,000	Acquire Safety Equipment and/or Fencing, Install Airfield Guidance Signs, Install Perimeter Fencing, Rehabilitate Apron
2012	General Aviation	$1,108,230	Construct Taxiway, Improve Runway Safety Area–14/32, Rehabilitate Apron, Update Airport Master Plan Study
2013	General Aviation	$15,015,736	Construct Taxiway
2014	General Aviation	$13,900,000	Construct Taxiway
2015	General Aviation	$5,825,493	Improve Airport Miscellaneous Improvements
2016	General Aviation	$455,271	Rehabilitate Apron
2017	General Aviation	$261,508	Install Taxiway Lighting, Reconstruct Taxiway, Update Miscellaneous Study
2018	General Aviation	$5,449,119	Reconstruct Taxiway
	Total	**$51,544,830**	

[10] Federal Aviation Administration (FAA). *Grant History Look Up*. https://www.faa.gov/airports/aip/grant_histories/lookup/.

Table 1.2: MOB Grant History

Fiscal Year	Service Level	AIP Federal Funds	Work Description
2005	Primary	$40,000	Install Miscellaneous NAVAIDS
2005	Primary	$4,814,271	Acquire Land for Development, Conduct Miscellaneous Study, Expand Service Road, Improve Terminal Building, Rehabilitate Access Road
2006	Primary	$115,719	Rehabilitate Access Road
2006	Primary	$1,622,400	Acquire Land for Noise Compatibility within 65–69 DNL (Day-Night Average Sound Level)
2006	Primary	$2,382,780	Acquire Land for Development, Construct Service Road, Rehabilitate Terminal Building
2007	Primary	$2,441,273	Construct Apron, Improve Airport Drainage, Rehabilitate Access Road, Rehabilitate Terminal Building
2008	Primary	$599,719	Rehabilitate Terminal Building
2008	Primary	$1,721,226	Rehabilitate Terminal Building
2008	Primary	$2,341,822	Rehabilitate Taxiway, Rehabilitate Taxiway
2009	Primary	$564,181	Acquire Aircraft Rescue and Fire Fighting Vehicle
2009	Primary	$765,541	Improve Airport Drainage, Install Airport Beacons, Rehabilitate Emergency Generator, Security Enhancements
2009	Primary	$1,192,878	Improve Terminal Building
2009	Primary	$2,113,685	Rehabilitate Access Road, Rehabilitate Aircraft Rescue and Fire Fighting Building, Rehabilitation
2010	Primary	$2,785,961	Acquire Aircraft Rescue and Fire Fighting Vehicle, Improve Airport Drainage, Rehabilitate Aircraft Rescue–Fire Fighting Building, Rehabilitate Runway–18/36, Rehabilitate Runway Lighting–18/36, Rehabilitate Taxiway, Rehabilitate Taxiway Lighting, Update Airport Master Plan Study, Wildlife Hazard Assessments
2011	Primary	$2,282,210	Acquire Aircraft Rescue and Fire Fighting Vehicle, Improve Airport Drainage, Install Guidance Signs, Rehabilitate Aircraft Rescue and Fire Fighting Building, Rehabilitate Terminal Building
2012	Primary	$2,354,053	Improve Airport Drainage, Rehabilitate Access Road, Rehabilitate Terminal Building
2013	Primary	$3,369,428	Improve Airport Drainage, Install Guidance Signs
2014	Primary	$2,361,294	Rehabilitate Access Road, Rehabilitate Terminal Building
2015	Primary	$1,992,083	Acquire Equipment, Conduct Miscellaneous Study, Extend Taxiway, Rehabilitate Apron, Rehabilitate Building, Security Enhancements
2016	Primary	$2,212,040	Acquire Land for Development, Improve Terminal Building, Rehabilitate Access Road, Rehabilitate Apron, Rehabilitate Runway–15/33, Rehabilitate Terminal Building

Fiscal Year	Service Level	AIP Federal Funds	Work Description
2017	Primary	$8,319,730	Acquire Aircraft Rescue and Fire Fighting Vehicle, Reconstruct Runway Lighting–15/33, Rehabilitate Runway–15/33
2018	Primary	$82,905	Acquire Friction Measuring Equipment
	Total	**$46,475,199**	

2. AIRPORT MANAGEMENT STRUCTURE

Figure 2.1[11] contains the organizational chart for MAA. The Board of Directors leads the organization, which is made up of five individuals, three of whom serve as officers (the chairman, vice-chairman/treasurer, and secretary). Each board member is appointed by the mayor of Mobile and confirmed by the city council for a term of four years. Based on the needs of the organization or personnel transition, some listed positions may be vacant. Multiple positions perform duties for both airports and often have dual offices (one at each airport).

[11] Mobile Airport Authority, 2020.

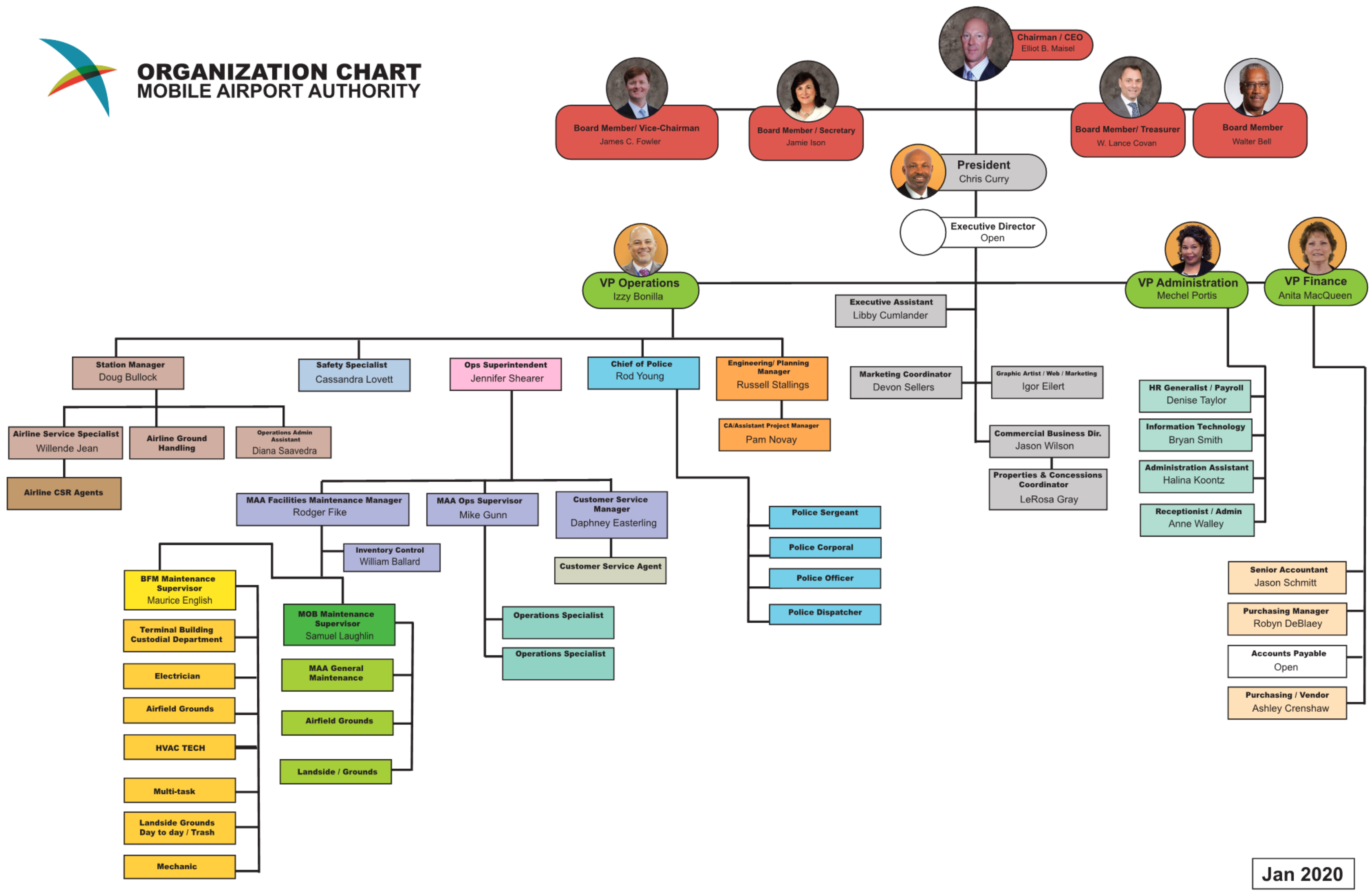

Figure 2.1: MAA Organizational Chart (January 2020)

3. AIRFIELD (BFM)

Figure 3.1[12] depicts the BFM airfield map of major airfield components.

Figure 3.1: BFM Airfield

12 Hanson Professional Services, 2019.

3.1 Runways and Taxiways

BFM has a dual, non-intersecting runway system. The primary runway, Runway 14/32, is 9,618 feet long and 150 feet wide. The runway elevation is 26.1 feet MSL, and the surface is grooved and has precision markings. The surface of the runway is mainly asphalt with a smaller portion (approximately 20%) concrete. The weight-bearing capacity is published as Pavement Classification Number (PCN) 72 /F/B/X/T (75,000 pounds single wheel; 185,000 pounds double wheel; 325,000 pounds for double tandem). Runway 14/32 has high-intensity runway edge lighting (HIRL).

Runway 18/36 comprises 55% concrete and 45% asphalt overlaid concrete. The runway is 7,800 feet long and 150 feet wide with a published weight-bearing capacity rating of PCN 34 /R/B/X/T (76,000 pounds single wheel; 150,000 pounds double wheel; and 320,000 pounds dual tandem). The runway elevation is 25.4 feet MSL and is marked with non-precision markings. Runway 18/36 has medium-intensity runway edge lights (MIRL).

Taxiway A runs parallel to the length of Runway 14/32. There are 600 feet between the parallel taxiway and runway centerlines for the northwest two-thirds of Runway 14/32, and 788 feet between the remaining one-third centerlines. An aircraft engine run-up and compass calibration pad connects to Taxiway A near the southern side.

Taxiway and runway connections are as follows:

- Taxiway K connects from Taxiway A to Runway 18/36.
- Taxiway L connects Taxiway A into the Airbus facilities.
- Taxiway H connects Taxiway A to the passenger terminal and ramp area.
- Taxiway J, which previously connected to Taxiway H, is now closed to accommodate the new entry road and roundabout to Airbus' expanded facilities.
- Taxiway B is a planned parallel to Runway 18/36.

3.2 NAVAIDs and Other Structures

All four runway ends are served by a four-light precision approach path indicator (PAPI) with a standard 3.00-degree glide path. Runway 32 is served by an instrument landing system (ILS), which includes medium-intensity approach lighting system with runway alignment indicator lights (MALSR) that extend to the southeast into Mobile Bay. MALSRs are lights that extend 2,400 feet down the centerline from the runway end to help guide the aircraft toward and align with the runway during the transition from instrument flight to the runway environment.

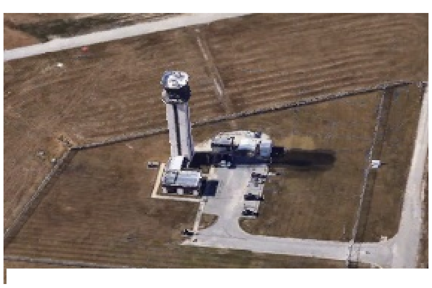

Figure 3.2: Air Traffic Control Tower

The airport traffic control tower (ATCT) (Figure 3.2) sits midfield between the two runways near the aircraft rescue and firefighting (ARFF) and Airbus facilities. The Brookley very high frequency (VHF) omnidirectional range beacon and a tactical air navigation system beacon (VORTAC) sit on the southeastern corner of BFM property near the shore of Mobile Bay. The white-green airport beacon, operating from sunset to sunrise and during instrument meteorological conditions, is on the eastern edge of BFM property near Mobile Bay and the end of Runway 32.

Real-time weather data are reported by the onsite automated weather observing system (ASOS). An ASOS provides data on wind speed and direction, temperature, dew point, visibility, sky condition, precipitation, and thunderstorm detection. Between the two runways is the wind cone and segmented circle, depicting the non-standard right traffic pattern for Runways 14 and 36.

A roughly 340-foot-long blast fence sits between the fixed-base operator (FBO) building on the apron and the turn from parallel Taxiway A to the end of Runway 14.

3.3 Port

Easy intermodal access is an advantage of BFM's location. A port northeast of BFM is under airport control and is used to receive Airbus and other large-item shipments, including aircraft components shipped via barge. Items disembarked at this dock are loaded onto roll-on/roll-off flatbed trailers and then transported to BFM's Airbus facility (see Figure 3.3[13] for the ground transportation route). It takes roughly 1 hour from the time equipment is loaded off the barge until it is clear and stowed within the Airbus final assembly facility (Figure 3.4).

Figure 3.3: Airbus Port Route

Figure 3.4: Aircraft Component Delivery to Airbus Facility

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[13] Hanson Professional Services, 2019.

4. NON-STANDARD CONDITIONS (BFM)

As part of their continuing development on the airfield, Airbus has constructed a new calibration hangar. The hangar blocks line-of-sight from the ATCT to a small portion of Runway 18/36. The area blocked is approximately 1,300 feet from the Runway 18 end and obstructs no more than half the runway width.

Fencing surrounding the US Army Reserve area encroaches into the runway object free area (ROFA) of Runway 18/36. The ROFA extends 400 feet from the runway centerline, and 220 linear feet of the fencing run parallel to the runway and is only 373 feet from the centerline.

5. AIRFIELD (MOB)

Figure 5.1[14] denotes key components of the MOB airfield.

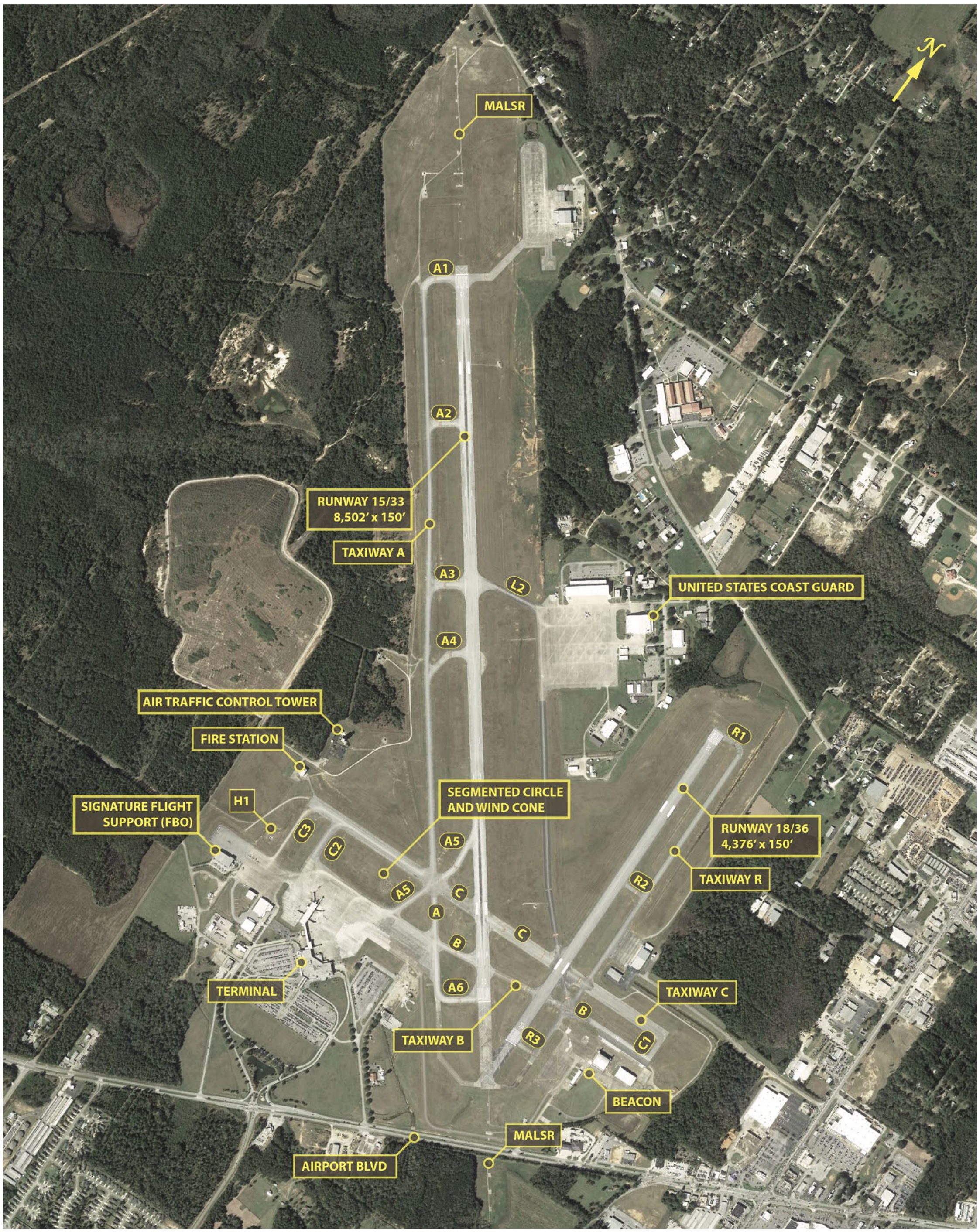

Figure 5.1: MOB Airfield

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[14] Hanson Professional Services, 2019.

5.1 Runways and Taxiways

Primary Runway 15/33 is a grooved asphalt runway measuring 8,502 feet long by 150 feet wide with precision markings in good condition. The published weight-bearing capacity is PCN 55 /F/D/W/U (75,000 pounds single wheel; 162,000 pounds double wheel; 270,000 pounds double tandem; 550,000 pounds dual double tandem). Runway 15/33 is served by HIRL. The runway elevation is 213.2 feet MSL.

Crosswind Runway 18/36 is also a grooved asphalt runway that is 4,376 feet long by 150 feet wide. The runway elevation is 216.4 feet MSL and has non-precision markings in good condition. The published runway weight-bearing capacity is PCN 14 /F/D/W/U (47,000 pounds single wheel; 60,000 pounds double wheel; and 96,000 pounds double tandem). The runway lighting is MIRLs.

Taxiway positions are as follows:

- Taxiway A runs parallel to Runway 15/33 with six connectors.
- Taxiway B runs along the outer edge of the apron area connecting to a hangar area on the east side of the runways.
- Taxiway C was formerly a runway and provides connection similar to Taxiway B, providing access from the apron areas to both runways.
- Taxiway L connects the northeastern apron area, where the Coast Guard is located, to the primary runway and the southern airfield.
- Taxiway R is parallel to Runway 18/36 and has three connectors.

Helipad H1 connects to the general aviation apron, near the FBO. Helipad usage is restricted to military use only.

5.2 NAVAIDs and Other Structures

Runways 15 and 33 are served by an ILS and with a MALSR. Each runway end is also supported by 4-box PAPI with a standard 3.00-degree glide slope. The Aircraft Rescue and Fire Fighting (ARFF IC) and the Airport Traffic Control Tower (ATCT) are located on the western side of Runway 15/33 and north of the general aviation apron area. There are no visual slope indicators (PAPI or visual approach slope indicator [VASI]) for Runway 18/36.

All runways have a standard left traffic pattern. An ASOS that provides weather information is located between the runways.

The white and green beacon operates from sunset to sunrise and during instrument meteorological conditions, and it is located near the small corporate apron area on the southeastern side of MOB property.

6. TERMINAL (BFM)

Opened in May 2019, the BFM passenger service terminal, situated north of the runways on the western side of the apron area, is a retrofitted 20,000-square-foot space with two gates in a repurposed warehouse (see Figure 6.1). Road access is via Michigan Avenue, and the general layout of facilities is shown on Figure 6.2[15]. The terminal building features high ceilings with exposed ductwork and a bright and inviting color scheme throughout.

Figure 6.1: Front of BFM Terminal

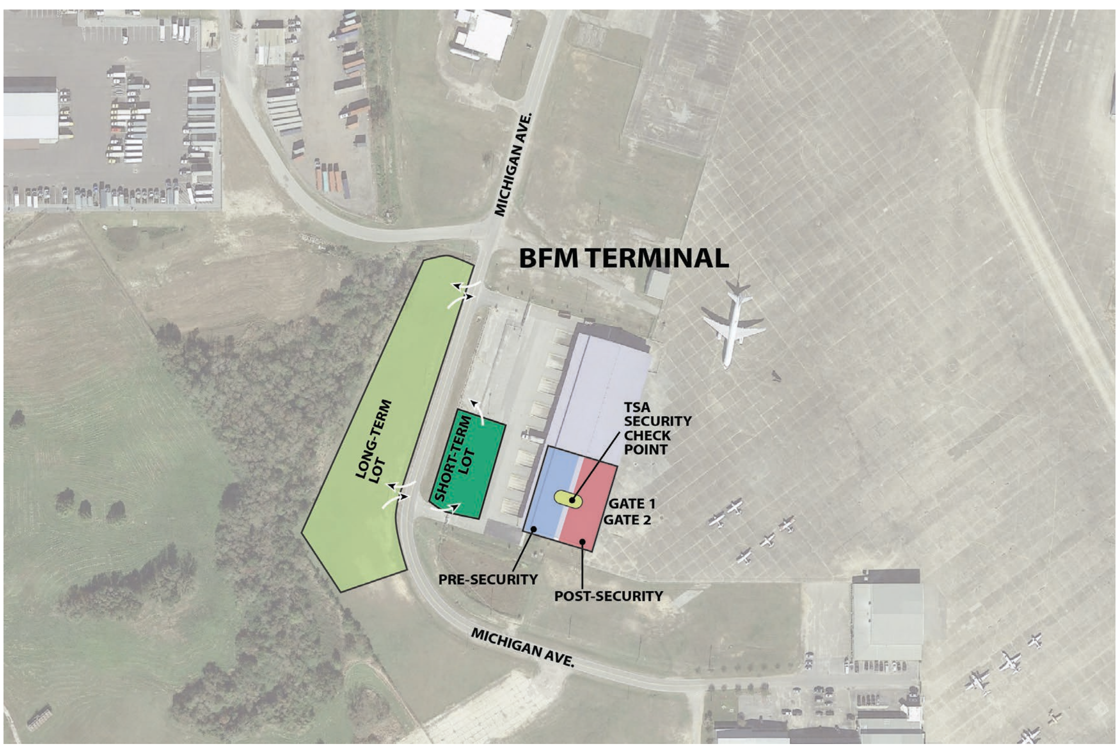

Figure 6.2: BFM Terminal Map

[15] Hanson Professional Services, 2019.

6.1 Pre-Security

The terminal building is separated into two halves (pre-security and post-security) with a center hallway housing a Transportation Security Administration (TSA) security checkpoint that serves as the connection between the two. There is airline ticketing, baggage drop-off and pick-up, vending machines, and restrooms inside of the terminal on the pre-security side. Rental car companies occupy a trio of desks in this area.

As the single passenger airline operating at BFM, Frontier maintains the only terminal ticketing counters (see Figure 6.4). Frontier staff operate at five stands for customer service and baggage tagging. Passengers queue in a stanchion-designated area.

Bags must be unloaded by hand and placed next to the single baggage claim rolling dispenser where they await passenger pickup (see Figure 6.3).

Figure 6.3: BFM Baggage Dispenser

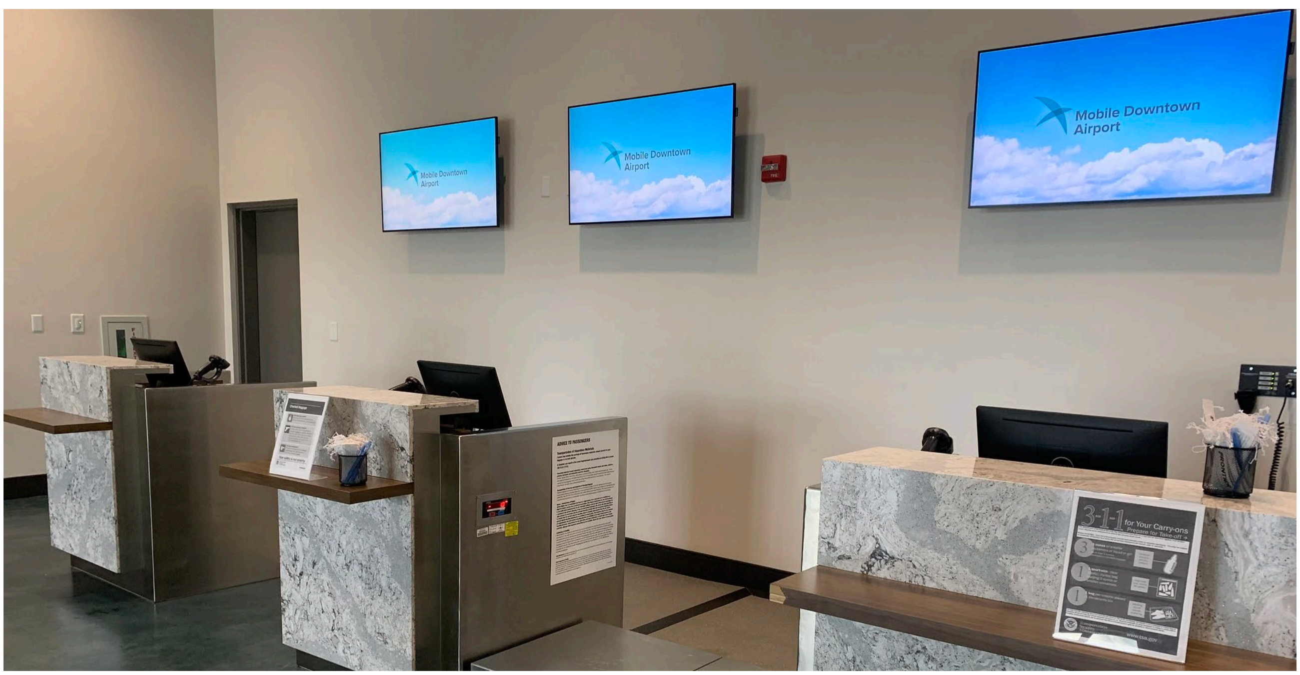

Figure 6.4: Frontier Ticketing at BFM

6.2 Post-Security

The post-security side of the terminal has multiple rows of passenger seating and additional chair and table seating along one wall (see Figure 6.5). During peak flight time, and dependent on load factor, seating can be limited, requiring some passengers to sit on the floor or stand.

Figure 6.5: BFM Post-Security Seating

There are restrooms and vending machines for passengers to access post-security. The vending machines feature a larger-than-typical selection, and foods can be heated with an available microwave (see Figure 6.6).

There are two gates: Gate 1 and Gate 2. Passengers load through a set of doors behind the Frontier desks on the ground level. Passengers travel through a short, covered walkway and onto a passenger loading ramp to access the aircraft (see Figure 6.7).

Figure 6.6: BFM Vending

Figure 6.7: BFM Passenger Loading Stairs to Joey the Opossum Frontier Flight

6.3 Terminal Parking

While there are three lanes for passenger pick-up and drop-off in front of the terminal entrance curbside, these lanes are fed by only a single lane from the access road. This single lane can become congested and back traffic beyond the entrance and onto Michigan Avenue.

Pre-pay for short- and long-term parking is available inside the terminal. A small lot immediately in front of the terminal building serves as short-term parking. A single access lane comes from Michigan Avenue straight into this lot. The first 15 minutes are free; then, the rate is $1 for the first hour and $2 for each subsequent hour, capping at $20 for 1 day.

An additional long-term parking lot is located across Michigan Avenue. The first 15 minutes are free, and the charge is $1 for the first hour. Subsequent hours are $1 each with a cap at $8 for 1 day. Rental cars are also located in this lot.

The short-term lot has 49 regular spaces and 3 handicap spaces, and the long-term lot has 121 regular spaces (13 are designated for rental cars) and 5 handicap spaces. The employee parking lot is not striped and can fit between 28 and 30 cars

7. TERMINAL (MOB)

The MOB terminal finished construction and opened in 1986. The building is divided into two levels. The main entrance comprises two sets of doors on the southern side of the lower floor. There are additional building access doors on both the eastern and western wings of the lower floor. Passengers typically enter through the main entrance, which provides access straight to the parking lots and passenger drop-off and pick-up.

The lower level is occupied by airline ticketing, car rental, customer service, and baggage claim. The upper level is mainly split between pre- and post-security passenger areas. The pre-security side contains the TSA security screening area, a child's play area, airport staff offices, TSA staff offices, a restaurant, and a concessionaire/gift store. The post-security area, after passing through TSA screening, includes another restaurant and concessionaire, a shoeshine stand, and the airline gates and passenger holding area.

7.1 Terminal Lower Level

Figure 7.1[16] depicts the general use of the lower-level areas.

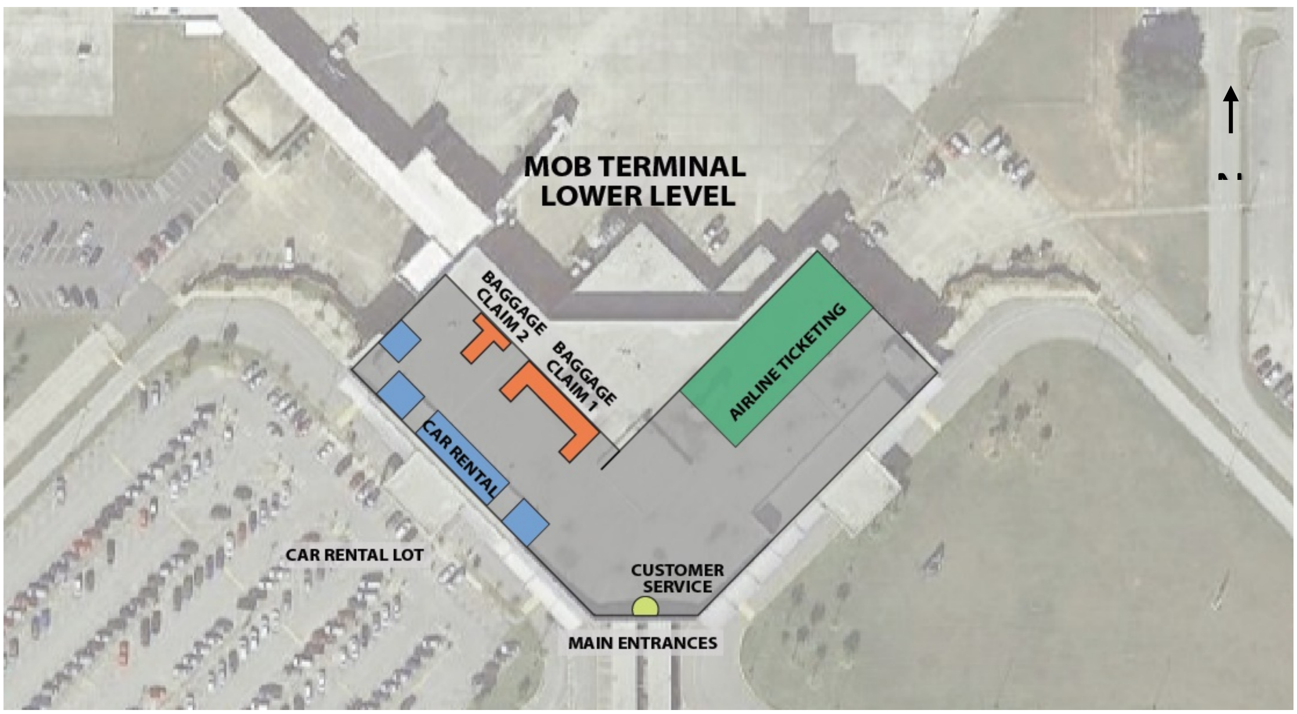

Figure 7.1: MOB Terminal Lower Level Map – Public Areas

[16] Hanson Professional Services, 2019.

7.1.1 Airline Ticketing

Airline ticketing is handled in the eastern wing of the lower terminal level. There are 12 counters total; each counter is approximately 10 feet long with room for two computers. Counter space breakdown is as follows:

- United has three computers for agents spread across two counters, as well as two self-service check-in kiosks and one baggage drop.
- Delta uses the most ticketing space and has six computers across three counters, along with six kiosks and two baggage drops.
- American Airlines uses two counters with four computers, two self-service kiosks, and one baggage drop (see Figure 7.2).

Customer queuing areas are designated for each airline with movable stanchions. ViaAir, which is currently not operating at the airport, used counter space that is still branded but could be used by another airline with new or expanded service. The ticketing area counters and passenger queuing area is roughly 3,700 square feet and does not include the offices behind the ticketing counters.

Public seating in this terminal wing is available through benches set against the wall opposite from the ticketing counters. Throughout the ticketing area, hanging sets of small digital monitors show a Flight Information Display System (FIDS) with pertinent flight arrival and departure information.

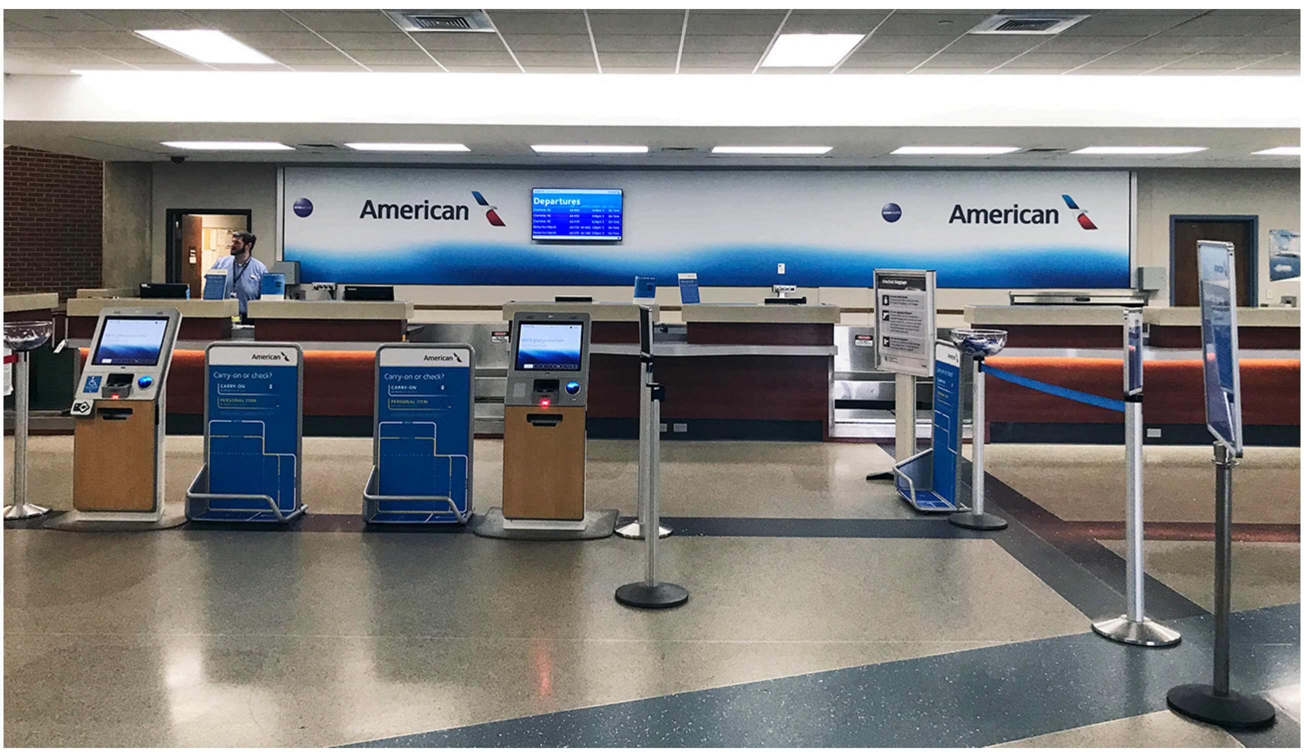

Figure 7.2: Airline Ticketing

7.1.2 Car Rental

Five car rental companies operate at MOB, each with a customer service area in the lower level of the terminal. Each rental car company has its own desk space (26 feet by 8 feet) with a plentiful standing area that abuts into the baggage claim. The customer waiting area for each company is designated with stanchions with retractable belts. The desk space area is mirrored behind a wall with a private, behind-doors area (see Figure 7.3). Each company outfits its space differently, with differing number of computers and staff. The companies and their number of public-facing customer service positions/work stations are as follows:

- Hertz: 4
- National: 3
- Enterprise: 4
- Alamo: 2
- Avis/Budget: 3
- Dollar/Thrifty: 3

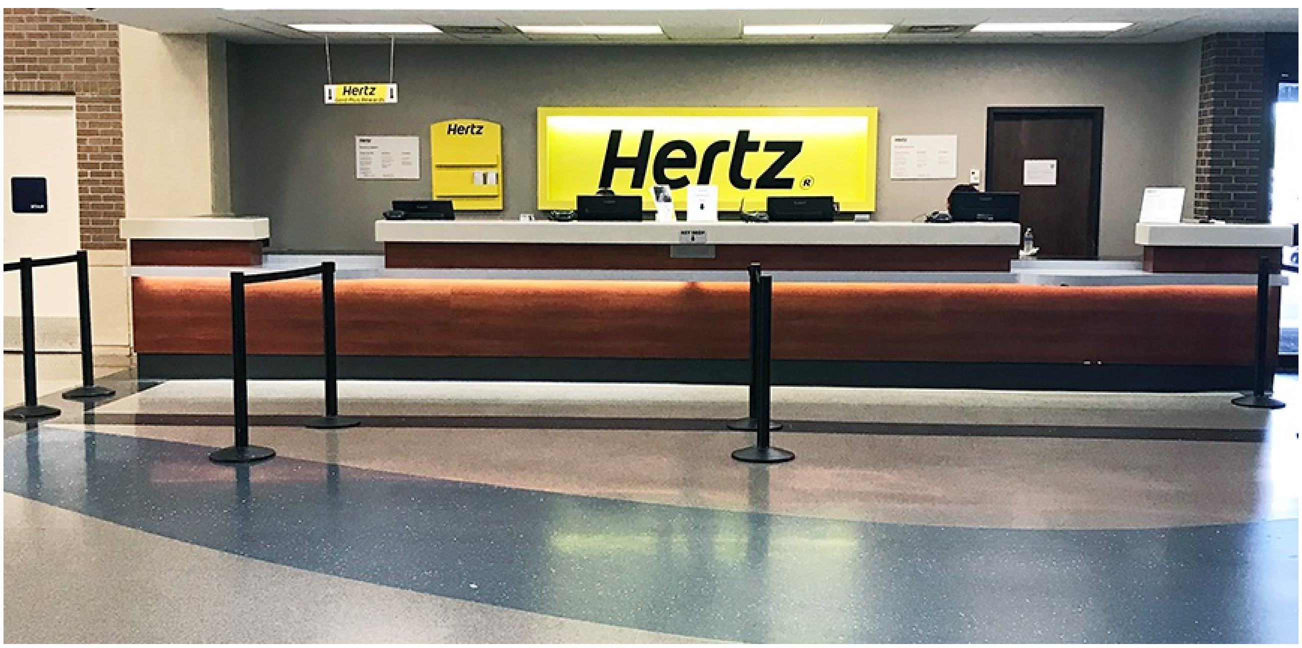

Figure 7.3: Car Rental Customer Area

7.1.3 Customer Service

The MOB customer service and information desk sits between the main set of entry doors on the lower terminal level (see Figure 7.4). Two FIDS, noting departures and arrivals, and a screen with current weather conditions are mounted on the wall behind the service desk. Water is available for free, and a selection of pamphlets with key information for traveling passengers is displayed on the counter. A landline phone is also available. The counter is staffed whenever there are passengers in the terminal, from the first flight in the morning until the final flight each evening.

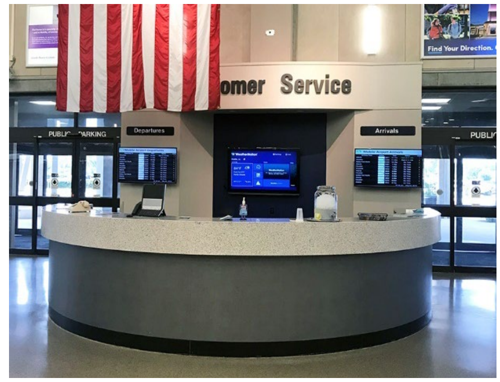

Figure 7.4: Customer Service Desk

7.1.4 Art

Figure 7.5: M. C. Farmer Bust

Artwork is spread throughout the terminal, on both levels and pre- and post-security sides. Most of the work is displayed in secure glass containers. The art covers a wide range of topics, including a large number of Mobile and Alabama-centric work. Most pieces are loaned courtesy of entities such as the Mobile Museum of Art, Bellingrath Gardens, Mobile Carnival Museum, Archaeology Museum of University of South Alabama, History Museum of Mobile, and the Historic Mobile Preservation Society Collection.

A small number of the works on display appear to be owned and presented by the airport, including a bust of M. C. Farmer (see Figure 7.5), the namesake of the MOB terminal, and a large paper airplane sculpture on the ground floor of the terminal. M. C. Farmer was instrumental in the creation of the terminal and served as the first chair of the MAA Board of Directors.

7.1.5 Baggage Claim

Passenger baggage claim is located on the western wing of the lower terminal level. There are two conveyor belts for delivering baggage (see Figure 7.6). Baggage Claim 1 has a significantly longer belt, with two protruding loops and a run in-between along the wall. Baggage Claim 2 has a single protruding loop. Luggage is loaded from the secure airside area on the other side of the brick wall. Total baggage claim area is approximately 8,100 square feet.

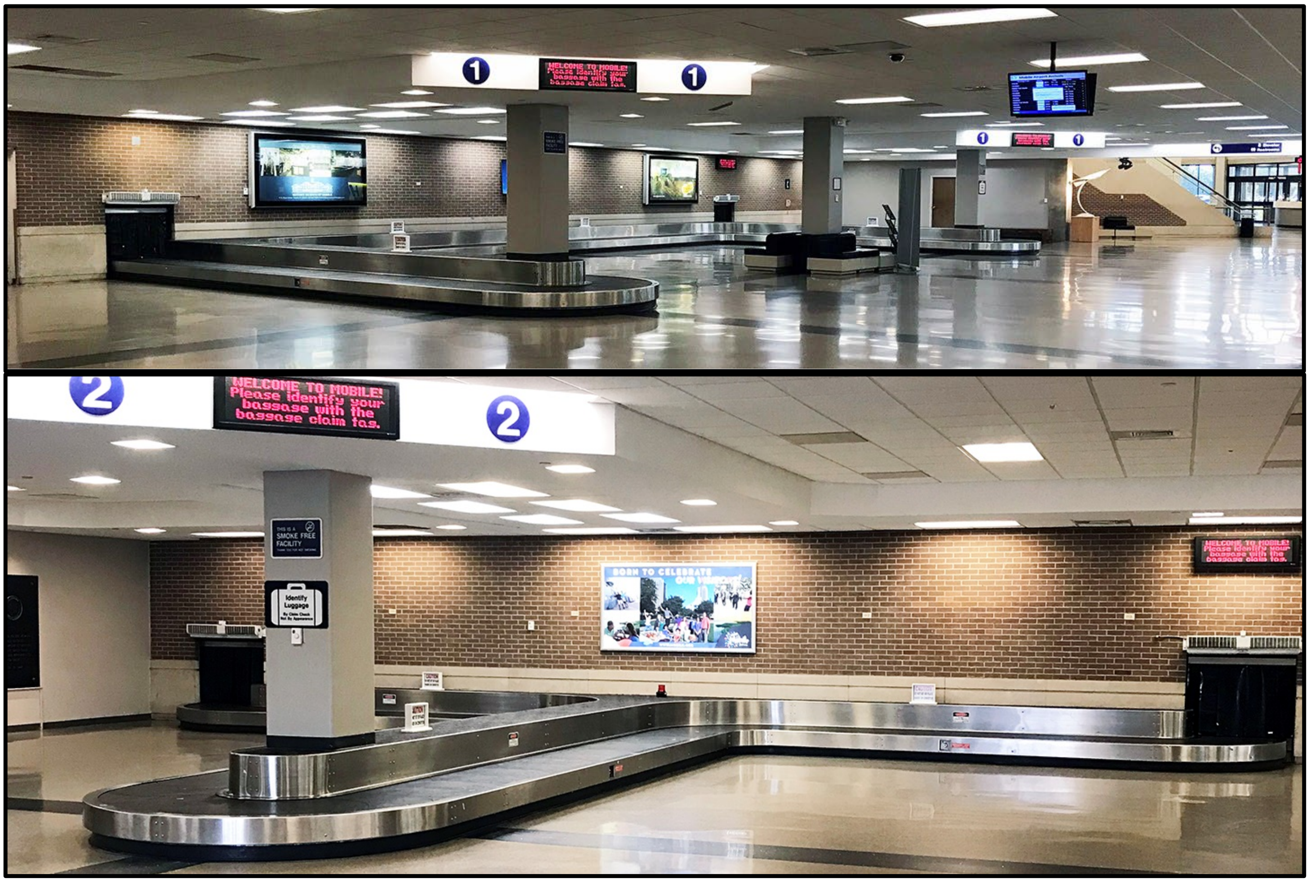

Figure 7.6: Baggage Claims

7.1.6 Restricted Areas

7.1.6.1 Mixed-Use Area

Underneath the gate and passenger waiting area on the lower level is a mixed-use area accessible only to pertinent badged staff and personnel. This area is mixture of office space, utility rooms, breakrooms, and storage with the following features:

- Terminal electrical, mechanical, and phone rooms
- MOB operations staff office
- GAT Airline Ground Support offices, breakrooms, lockers, and a training room
- Police training room
- Custodial storage
- Frontier operations office
- Ice room for airlines
- National Weather Service (weather watchers)

7.1.6.2 Mechanical Building

A separate building, located on the backside of the lower level, houses the boiler, additional mechanical room, power, telephone, and fire pump.

7.1.6.3 Luggage Handling

Baggage processing is located on the opposite side of the wall behind the airline ticketing.

7.2 Terminal Upper Level

Figure 7.7[17] shows the general areas on the upper level of the MOB terminal.

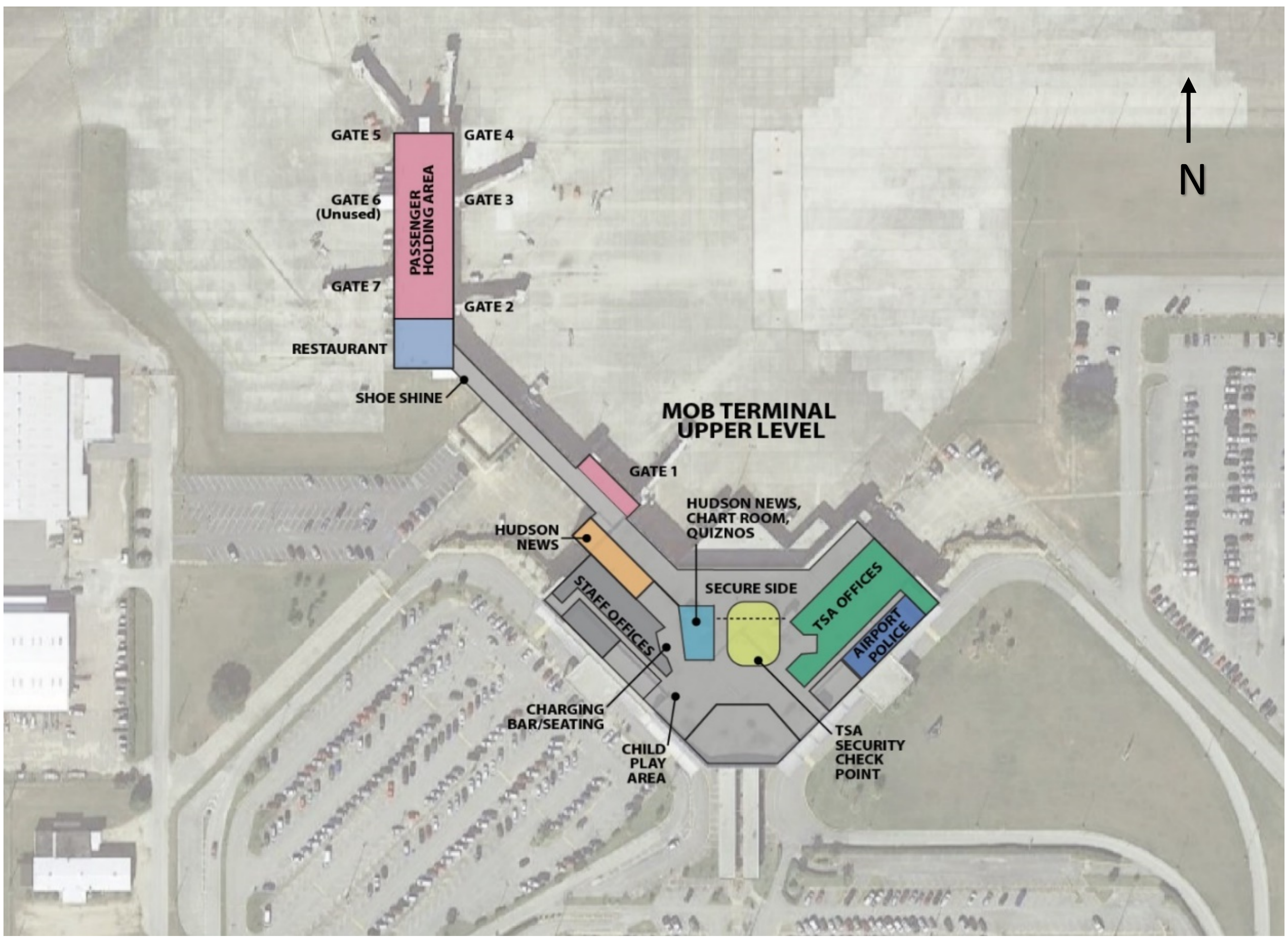

Figure 7.7: MOB Terminal Upper-Level Map

[17] Hanson Professional Services, 2019.

7.2.1 Charging Bar

The pre-security area of the upper terminal floor has a charging bar that houses five outlets and a lounge area with multiple couches (see Figure 7.8). This is a popular location with passengers before proceeding through security. There is additional seating nearby with chairs and tables for approximately 25 people.

Figure 7.8: Charging Bar

7.2.2 Child Play Area

Another popular passenger location upstairs prior to screening is a child play area, roughly 25 feet by 20 feet, with a selection of toys, seating, and a television.

7.2.3 Staff Offices

Staff offices are located upstairs. The entryway for these offices is open during typical business hours but otherwise locked.

7.2.4 Hudson News, Quiznos, and the Chart Room

Hudson News, a concessionaire, leases space on the pre- and post-security sides of the upper terminal floor. Within the Hudson News on the pre-security side is a Quiznos. The Chart Room, a small bar and dining area, is next to Hudson News and has seating for approximately six people, with additional table seating (see Figure 7.9). This area is age-restricted to those 21 years and older because alcohol is served. Hudson News and the Chart Room are connected by an employee-only room.

A set of couches in front of this area provides seating for eight people.

Figure 7.9: Chart Room

7.2.5 TSA Security Screening Checkpoint

Security screening is managed by TSA and is located on the upper level (with access via stairs, escalator, and elevator). TSA leases a large area on the eastern side of the upper terminal floor, comprising offices, a breakroom, a training room, and other support uses. The checkpoint has two screening lanes, including a lane for TSA PreCheck enrollees.

7.2.6 Executive Club

There is an executive lounge for VIP travelers located off the hallway between the TSA security checkpoint and the main passenger holding area. This is an upscale area adorned with upscale seating, a private bathroom, and other amenities.

7.2.7 Shoeshine

There is a single shoeshine stand in the hallway leading to the passenger area.

7.2.8 Hudson News, Cruise City Bar and Grill, and Carpe Diem Coffee & Tea

A mixed-use commercial area is located past Gate 1 and immediately prior to the remaining gates and passenger waiting area. A small Hudson News that sells mainly snack items is in this area. There is a register to order from the Cruise City Bar and Grill (serving fast food such as hamburgers and fries) and a small bar area for purchasing and consuming alcohol. Carpe Diem Coffee & Tea also has counter space in this area, as well as a common seating area with a large number of chairs and tables.

7.2.9 Gates and Passenger Waiting Area

There are seven gates at MOB. With the exception of Gate 6, all are used by airlines for passenger loading.

The entire waiting area is approximately 14,500 square feet. Mixed types of seating (about 345 total seats) are spread through the area to accommodate passengers at each gate (see Figure 7.10).

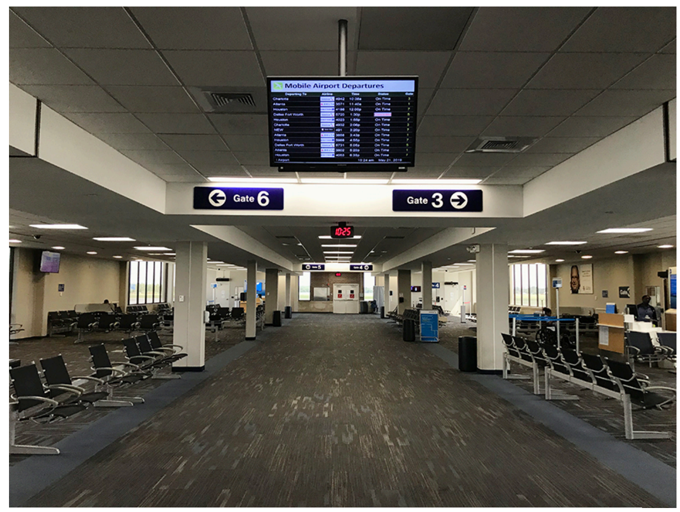

Figure 7.10: Gates and Passenger Waiting Area

A pair of FIDS screens hang in the center aisle of the waiting area. There is small area for children to play with a television and toys.

Passengers board aircraft by passing through these gate doors and walking down a jet bridge, which is a moveable enclosed connector from a terminal building to an aircraft. There are six jet bridges, each 15 or 16 years old; maintenance staff is in the process of overhauling the bridges.

7.3 Terminal Parking

Figure 7.12[18] shows a map of terminal parking available for passengers, meet-and-greet, transportation network companies (TNC), and employees.

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[18] Hanson Professional Services, 2019.

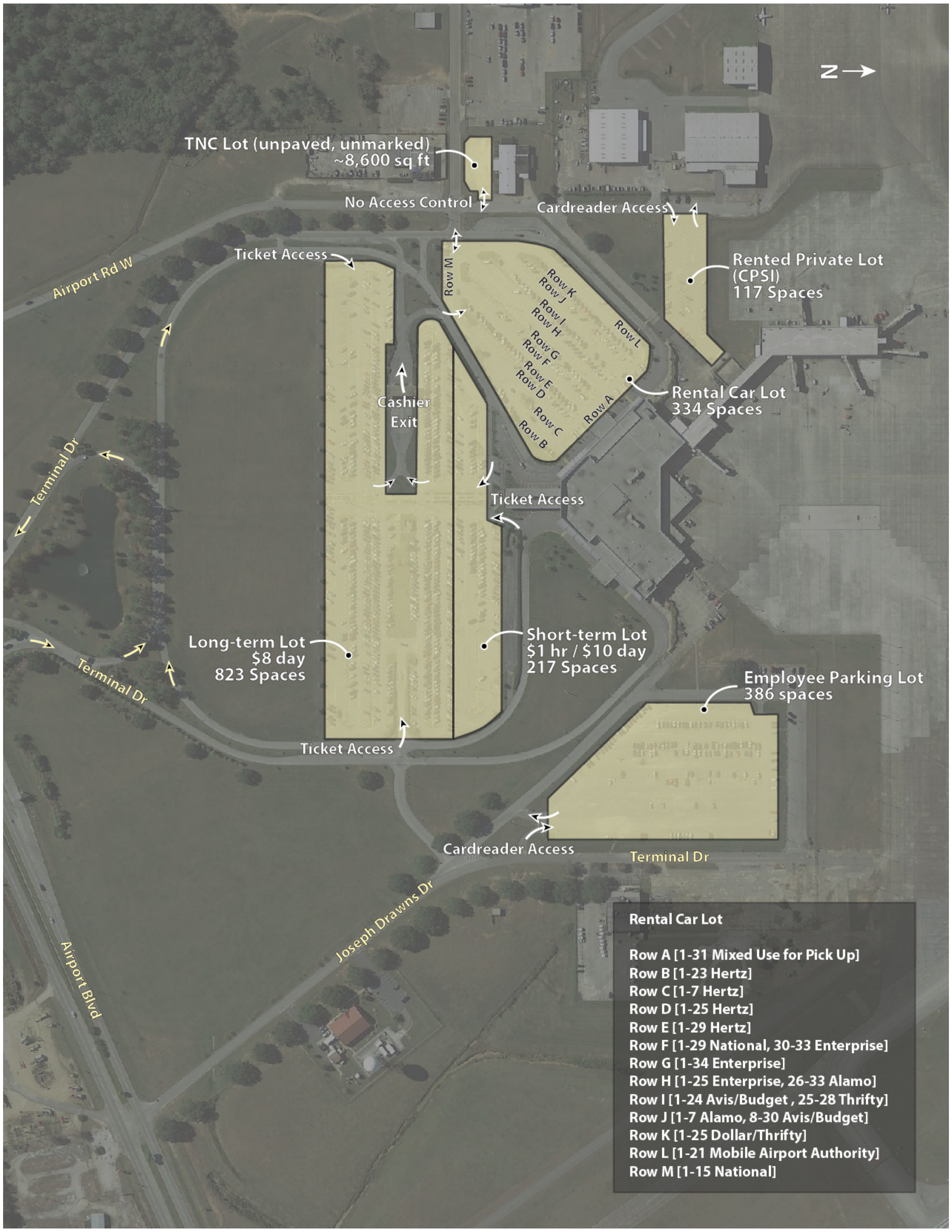


Figure 7.12: MOB Parking Map

There is a short-term passenger lot with 217 spaces that costs $1 per hour, up to $10 per day. The long-term lot is adjacent to the short-term lot, has 823 spaces, and costs slightly less (up to $8 per day). The first 15 minutes in both lots are free. Each lot has two vehicular ticket access points and share an exit through a staffed cashier booth and gate. Valet parking costs $2 per hour (up to $13 per day).

Uber and Lyft use the designated TNC lot to wait until passengers send a summons. Access to the TNC lot is uncontrolled, and the lot is unpaved (roughly 8,600 square feet in size). The drive time from the TNC lot to passenger pick-up at the terminal is only a couple minutes.

The rental car lot comprises Rows A through M. Row A is for vehicles that passengers are picking up. The remainder of the rows, with the exception of Row L for the MAA staff, are split between the rental car companies for drop-offs and upcoming reservations. In total, the lot has 334 spaces.

Parking for employees working in the terminal is in a lot directly east of the terminal. The lot is accessed and exited through a single location that uses a card reader. There are 386 parking spaces available.

There is one additional paved lot near the terminal, and access is restricted through a card reader (see Figure 7.13). The lot is rented to a private company (CPSI) for their employees who travel often.

Figure 7.13: MOB Rented Parking Lot

8. AIRPORT BUILDINGS AND FACILITIES (BFM)

The Mobile Aeroplex at Brookley, located on BFM property, is a 216-acre, mixed-use industrial complex comprising a number of existing and build-to-suit buildings with and without airside access (see Figure 8.1). Existing buildings vary in size and provide numerous leasing options ranging from a single office to large warehousing with loading dock access. The Mobile Aeroplex is located at Foreign Trade Zone #82 and the Renewal Community Zone, allowing for enhanced business operations and attractive tax incentives.

Figure 8.1: Mobile Aeroplex at Brookley Sign

Three of the largest lessees at the Mobile Aeroplex are Airbus, Continental Aerospace Technologies (Continental), and VT Mobile Aerospace Engineering. Smaller facilities have been built at the Mobile Aeroplex to support these larger entities, especially Airbus, causing a cascading and synergistic effect.

AIRBUS

Airbus is the second largest aerospace and defense company in the world. The company, headquartered in the Netherlands with locations and customers worldwide, has a robust portfolio. In 2015, Airbus opened its first U.S.-based manufacturing facility in the center of the BFM airfield. The facility now serves as the final assembly line (FAL) for the A320 and A220 aircraft families. Airbus currently occupies 82 acres of airport property and has plans for occupying additional land. A number of companies located in Mobile support Airbus in this manufacturing process. Opened in 2007, Airbus also has an engineering center in Mobile, located landside near its manufacturing plant.

CONTINENTAL AEROSPACE TECHNOLOGIES

Continental, a spinoff from Continental Motors in 1929, was acquired by the Aviation Industry Corporation of China (AVIC) in 2010. AVIC is a Fortune 500 aerospace and defense conglomerate. Beyond Mobile, Continental has locations in Fairhope, Alabama; Miami, Florida; Germany; and China. Continental manufactures a number of different aircraft engines, both JetA and AvGas. Continental completed its new global headquarters in the Mobile Aeroplex in 2020. A few older buildings will be reverting back to the MAA as part of this process.

VTMAE

Since 1991, VT Mobile Aerospace Engineering (VT MAE) has been based in Mobile providing maintenance, repair, and overhaul (MRO). VT MAE, which is part of the larger ST Engineering company, currently leases a significant footprint at the Mobile Aeroplex and is one of the largest employers in the Mobile area. The company offers aircraft maintenance and modification services for a wide range of aircraft, including: Boeing 737, 747, 757, 767, and 777; McConnell Douglas DC-10 and MD-10/11; and Airbus A300/310, A320 family, A330, and A340. Specific services include items such as wing skin replacement, winglet installation, and repair of damaged structures. VT MAE also has facilities at the Pensacola International Airport.

Other notable entities conducting business at the Mobile Aeroplex include:

- **MAAS Aviation:** This entity provides original equipment manufacturer/MRO services. An international company, the U.S. headquarters for MAAS Aviation is at BFM, where they provide the exclusive paint shops for the Airbus final assembly line. In early 2017 MAAS Aviation opened a new twin-bay MRO paint facility with space to accommodate the Airbus 320 aircraft up to the Boeing 757 aircraft.
- **FedEx:** A U.S.-based multinational delivery company, FedEx conducts two flights to and from BFM five days a week with an Airbus A300F4-600 (A300) aircraft. The A300 is the largest aircraft regularly operating at BFM.
- **Alabama Aviation Center:** Started in 2002, the Alabama Aviation Center, part of the Coastal Alabama Community College, offers programs in Airframe Technology, Power Plant Technology, and Avionics. Graduates from these programs receive training that help transition into jobs at other aviation-related companies at BFM and in Mobile. Costal Alabama Community College was formed in 2017 when Faulkner State Community College, Alabama Southern Community College, and Jefferson Davis Community College merged.
- **Safran Nacelles:** The local Safran Nacelles facility integrates turbofan power plants within the engines for the Airbus A320 aircraft. Zodiac Aerospace, part of Safran Nacelles since February 2018, specializes in aerosystems, cabins, and seats.
- **Hutchinson Aerospace & Industry:** This entity is an international company with an aerospace manufacturing Center of Excellence facility at Mobile Aeroplex.
- **Aerostar:** Aerostar is an FAA/EASA 145 Certified Repair station servicing Boeing, McDonnell Douglas, Airbus, and Bombardier aircraft. The company specializes in hydraulics, pneumatics, and electrical aircraft repairs.
- **Alabama Aviation Training Center:** This entity in the Mobile Aeroplex opened in 2014 and is 36,500 square feet. The center is operated by AIDT, a workforce development agency, and trains potential employees to work on the Airbus FAL.

8.1 Aircraft Rescue and Fire Fighting

The BFM ARFF station is centrally located in the airfield between the runways. BFM is an ARFF Index A facility (see Figure 8.2). The required ARFF Index is based on the size and frequency of aircraft using the airport.

Figure 8.2: BFM ARFF

8.2 Airport Traffic Control Tower Facilities

The ATCT at BFM is located midfield, in-between the two runways. The tower is operated Monday from 7:00 a.m. to 10:00 p.m.; Tuesday through Friday from 3:30 a.m. to 10:00 p.m.; Saturday from 4:00 a.m. to 7:00 p.m.; and Sunday from 7:00 a.m. to 7:00 p.m. (all Central Standard Time). It is part of the FAA's federal contract tower program, but it is an FAA-owned-and-equipped asset.

8.3 Fixed-Base Operator

Signature Flight Support, a large, multi-continental company, serves as the fixed base operator (FBO) at BFM.[19] Signature provides full FBO services at BFM, including fueling, showers, courtesy crew cars, flight planning resources, lavatory services, and tie-downs.

8.4 Fuel Storage Facilities

Table 8.1 lists the fuel storage facilities at BFM, owned and operated by various entities.

Table 8.1: Fuel Storage

Owner	Number Owned	Item	Size
Signature Flight Support	1	AVGas Tank	12,000 Gallons
Signature Flight Support	4	JetA Tank	12,000 Gallons
Signature Flight Support	7	JetA Tank	20,000 Gallons
Signature Flight Support	2	JetA Truck	5,000 Gallon
Signature Flight Support	1	AVGas Truck	750 Gallons
MAA	1	Gas Tank	800 Gallons
MAA	1	Diesel Tank	1,000 Gallons
MAA	1	BAX Gas Tank	300 Gallons
VT MAE	1	Diesel Tank	2,000 Gallons
VT MAE	1	Gas Tank	1,000 Gallons
VT MAE	2	Waste Oil Tank	800 Gallons
VT MAE	2	Diesel Fire Pump Tank	360 Gallons

[19] Signature Flight Support. https://www.signatureflight.com/.

9. AIRPORT BUILDINGS AND FACILITIES (MOB)

9.1 Delta Cargo

Delta Cargo has an office and small warehouse area (estimated at 2,000 square feet total) in a hangar shared with and leased from Signature FBO and provides cargo and freight shipping services (see Figure 9.1).[20] This location is open seven days per week and has two employees. A business must be registered as a TSA-approved Known Shipper (requires completion of a TSA-mandated approval process) to ship items with Delta Cargo.

Figure 9.1: Delta Cargo

9.2 Fixed-Base Operator

Signature Flight Support serves as the FBO at MOB. Provided services at MOB include fueling, showers, courtesy crew cars, flight planning resources, lavatory services, overnight hangars, and tie-downs. The main Signature building has an accompanying parking lot with 57 automobile spaces. This is a sister site to the Signature operation at BFM (see Figure 9.2).

Figure 9.2: Signature FBO Building

9.3 Aircraft Rescue and Firefighting

The MOB ARFF station is located on the western side of airport property, north of Taxiway C. MOB is an ARFF Index C facility.

9.4 Airport Maintenance

Located on Airport Road West, across from the TNC lot, is the airport maintenance shop and yard. The shop building is approximately 7,700 square feet. The lot, where vehicles and other items are stored, is about 19,000 square feet.

[20] Delta Cargo. https://www.deltacargo.com/.

9.5 Fuel Storage Facilities

At MOB there is one 15,000-gallon and three 20,000-gallon Jet A storage tanks, as well as one 12,000-gallon AvGas storage tank. The FBO has a Jet-A fuel truck (14,000-gallon capacity) and an AvGas fuel truck (3,000-gallon capacity).

9.6 Airport Traffic Control Tower Facilities

The ATCT, located on the western side of the airport, is operated seven days a week from 6:00 a.m. to 11:00 p.m. Central Standard Time.

10. MOBILE AEROPLEX AT BROOKLEY LAND USE AND TENANTS

The Mobile Aeroplex is a massive area containing a wide range of land uses and tenants. To facilitate a high-level view of the Mobile Aeroplex, the planning team reviewed the following categories:

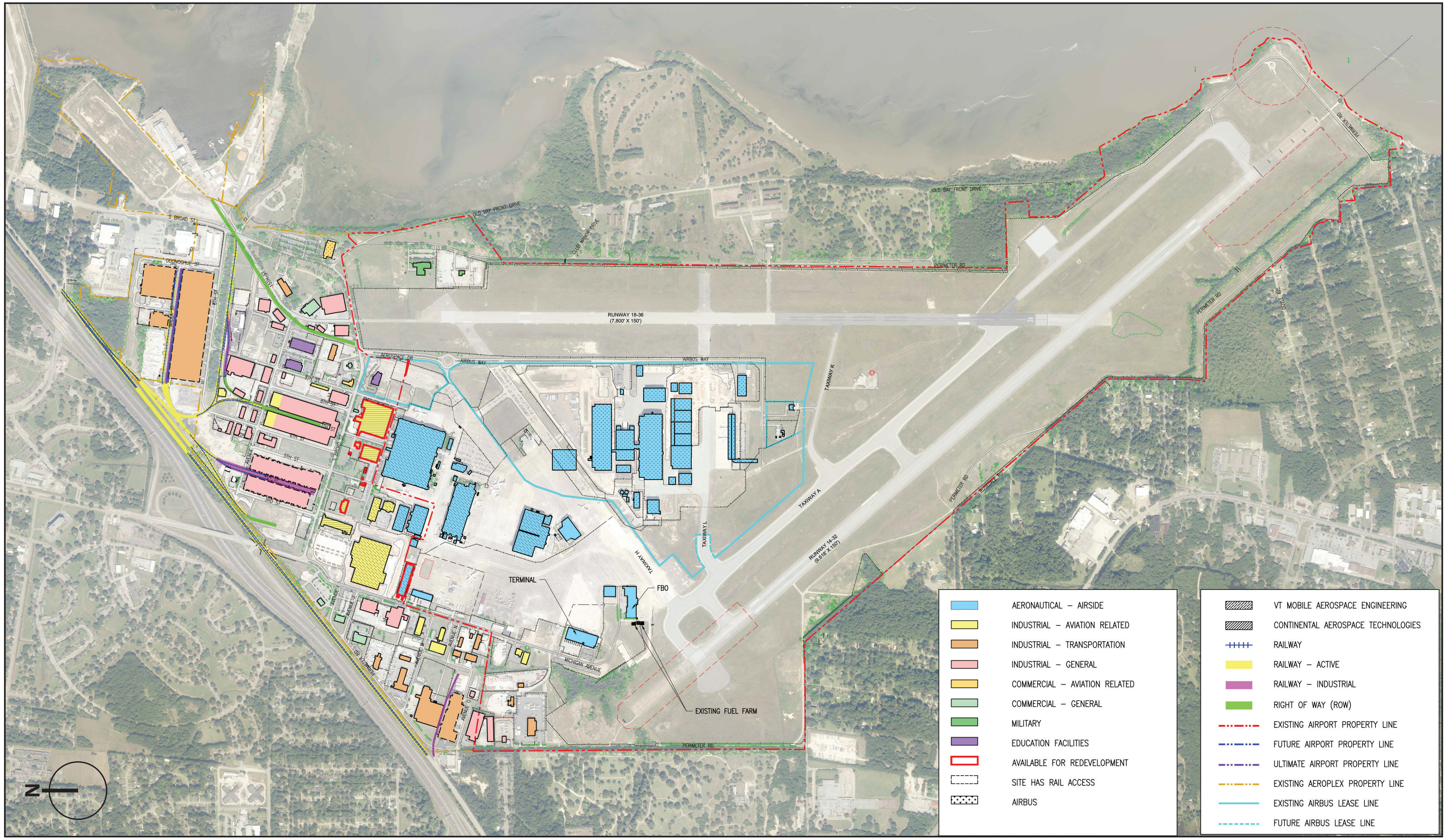
- Aeronautical (Airside)
- Industrial (Aviation Related)
- Industrial (Transportation Related)
- Industrial (General)
- Commercial (Aviation Related)
- Commercial (General)
- Educational Facility

FAA AC 150/5100-19D, *Guide for Airport Financial Reports Filed by Airport Sponsors Aeronautical*, defines aeronautical use as “any activity that involves, makes possible, is required for the safety of, or is otherwise directly related to the operation of aircraft.” Airside is the controlled area of the airport with access to the airfield pavements, and landside is open to the public. Thus, there are companies that are aviation-related (i.e., testing landing systems) but are not directly aeronautical and do not require airside access.

The intermodal nature of the Aeroplex, along with significantly sized buildings and land options, is attractive to transportation-related companies. A number of these companies are currently lessees at the Mobile Aeroplex and have been designated separately from the other industrial uses.

Commercial use typically includes office space and better public-facing access. Tenants, such as the banks and credit unions, require commercial use to operate profitably.

With these definitions in mind, it is possible to categorize the existing tenants and land available at the aeroplex. Figure 10.1 applies these categories to all existing areas and is a broad stroke meant to help paint a picture of current conditions and for future tenant analyses.



Source: Hanson Professional Services, September 2020

Figure 10.1: Aeroplex Tenants / Land Uses Mobile DowntownAirport

11. TOPOGRAPHY

Figure 11.1 shows the topographic United States Geological Survey (USGS) maps for BFM and MOB.[21] Both airfields are low elevations with minimal surrounding terrain contours. Mobile Bay, which feeds into the Gulf of Mexico, lies to the east of BFM. A mixture of flat forested and developed land encloses MOB. The airfield elevation of BFM is 26 feet MSL, nearly 200 feet below MOB's elevation of 219 feet MSL.

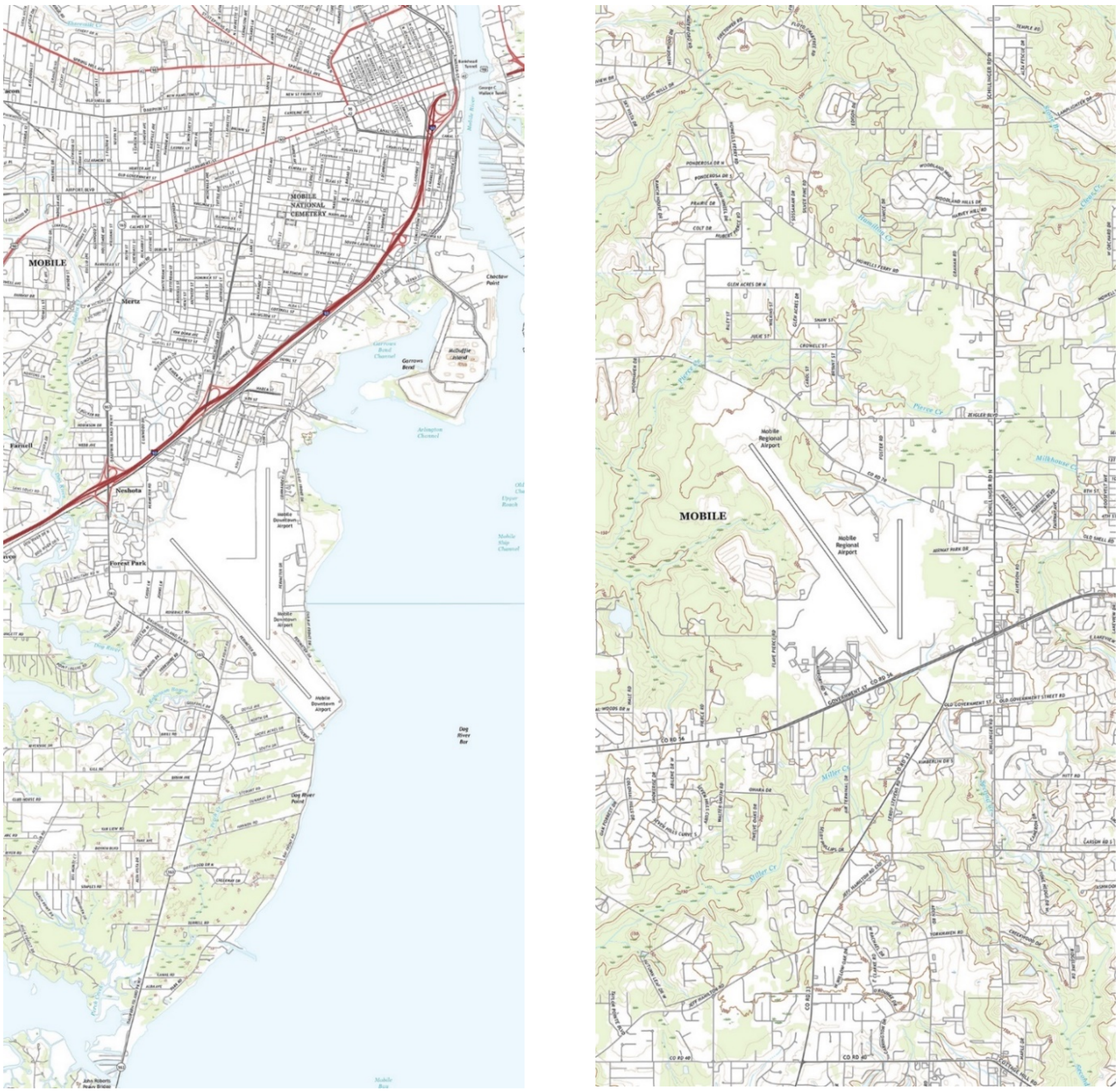


Figure 11.1: USGS Maps

[21] United States Geological Survey. *topoView*. https://ngmdb.usgs.gov/topoview/.

12. VICINITY AIRPORTS

Figure 12.1[22] shows key airports in the vicinity of BFM. The airports are color-coded by general purpose (commercial service, general aviation, military, and owned by MAA) and include airports in Alabama, Mississippi, and Florida. Brief descriptions of each airport follow.

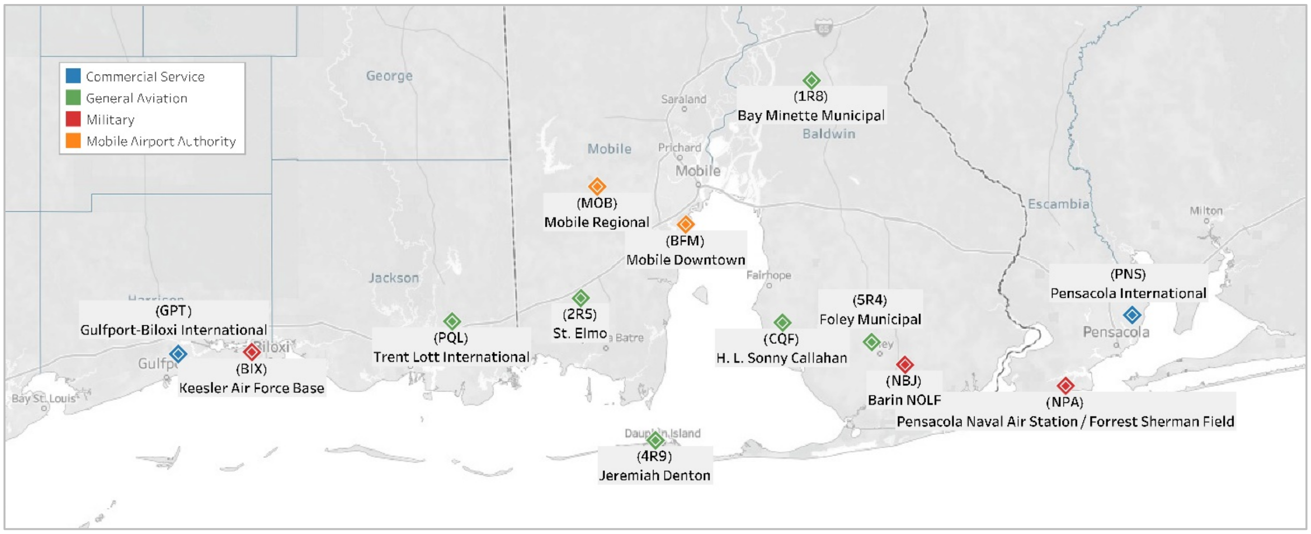


Figure 12.1: Vicinity Airports Map

12.1 Commercial Service Airports

12.1.1 Pensacola International Airport

Pensacola International Airport (PNS), a public small hub primary airport, is owned by and located in the City of Pensacola, Florida. The airport enplaned 839,248 passengers in 2017, an increase of 5.8% from 792,916 in 2016.[23] PNS has a pair of perpendicular runways. Six airlines currently serve PNS: American, Delta, Frontier, Silver, Southwest, and United.

Runway 17/35 is a grooved concrete runway measuring 7,004 feet long by 150 feet wide and with precision markings. The weight-bearing capacity is rated at PCN 74 /R/B/W/T. Both runway ends are served by 4-box PAPIs. Runway 17 has the airport's only approach lighting system with a MALSR. All four runway ends are supported by RNAV (Global Positioning System [GPS]) instrument approaches. The ILS approach to Runway 17 provides the lowest minimums for approaching aircraft (321-foot decision altitude and 1,800-foot Runway Visual Range [RVR]).

The local ATCT is in operation from 6:30 a.m. to 12:00 a.m. Central Standard Time. There are 122 based aircraft on the field: 89 single-engine, 16 multi-engine, and 17 jets. There were a reported 118,822 aircraft operations from February 2018 through January 2019.

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[22] Hanson Professional Services, 2019.
[23] Federal Aviation Administration, 2017 Enplanement Data, https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/.

The drive time from BFM to PNS is approximately 1 hour via I-10, and the two airports are 52 miles apart through the air.

12.1.2 Gulfport-Biloxi International Airport

Gulfport-Biloxi International Airport (GPT) is a public non-hub primary that served 324,611 enplaned passengers in 2017 (compared to 305,157 in 2016, a positive change of 6.4%)[24]. The airport is located in Gulfport, Mississippi and is owned by the Gulfport-Biloxi Regional Airport Authority. Thirty-four aircraft are based at GPT: 24 single-engine, 6 multi-engine, 1 jet, and 3 helicopters. Five airlines serve GPT: American, Delta, United, Allegiant, and Sun Country.

There are two non-intersecting runways at GPT. Runway 14/32 is the primary runway at 9,002 feet long and 150 feet wide. From the Runway 14 end, about 2,000 feet is concrete, then a middle section of 5,500 feet is asphalt, with the final 1,500-foot concrete section extending to the Runway 17 end. The runway is grooved. The weight-bearing capacity for Runway 14/32 is PCN 194 /F/A/W/T. Runway 18/16 is a grooved asphalt runway measuring 4,935 feet long and 150 feet wide. The weight-bearing capacity for Runway 18/36 is PCN 147 /F/B/W/T.

All runway ends are supported by 4-box PAPIs and MALSR. There is a published instrument RNAV (GPS) approach procedure to each runway end. The HI-ILS and ILS procedures to Runway 14 have the lowest minima (227-foot decision height and 2,400-foot RVR) of all GPT-published procedures. Runway 18/36 is an asphalt grooved runway that is considerably shorter than the primary at 4,935 feet long and 150 feet wide. Both runway ends are served by 4-box PAPIs.

It takes approximately 1 hour and 5 minutes to drive from BFM to GPT, and the facilities are 61 miles apart through the air.

12.2 General Aviation Airports

St. Elmo Airport (2R5), located in St. Elmo, Alabama, is a public local nonprimary general aviation airport. The airport, owned by the State of Alabama and managed by MAA, has a single runway, Runway 6/24, which is asphalt, 3,998 feet long, and 80 feet wide. The runway has non-precision markings in good condition. There are no approach lights nor visual slope indicators. There are 28 based aircraft at the airport. The only instrument approach procedure into the airport is an RNAV (GPS) for Runway 6 with localizer performance with vertical guidance (LPV) minimums as low as 475-foot ceiling and 1.25-mile visibility. 2R5 is 20 miles by ground and 15 miles by air from BFM.[25]

Jeremiah Denton Airport (4R9), situated on the north side of Dauphin Island, is a public basic nonprimary general aviation airport owned by Mobile County. The single runway, Runway 12/30, is asphalt, 3,000 feet in length, and 80 feet in width. There is a VASI providing visual slope guidance for pilots on both runway ends. There are no based aircraft. The airport is 35 miles from BFM via automobile and 25 miles direct through the air. [26]

Foley Municipal Airport (5R4) is a public local nonprimary general aviation airport in Foley, Alabama. The City of Foley is the airport owner. Runway 18/36, the only runway on the airfield, is constructed of asphalt

[24] Federal Aviation Administration, 2017 Enplanement Data, https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/.
[25] Federal Aviation Administration, Airport Data and Information Portal, https://adip.faa.gov/agis/public/#/public.
[26] Federal Aviation Administration, Airport Data and Information Portal, https://adip.faa.gov/agis/public/#/public.

and is 3,700 feet long by 74 feet wide. Both runway ends are supported by 2-light PAPIs. The runway is marked with non-precision markings. Each runway end has a RNAV (GPS) instrument approach, and the approach into Runway 18 has the lowest minima requirements (393-foot ceiling and 1-mile visibility). There are 28 based aircraft at 5R4. The airport is a 45-mile drive and 25-mile flight from BFM.[27]

H. L. (Sonny) Callahan Airport (CQF) is a public regional nonprimary general aviation airport in Fairhope, Alabama. The airport is publicly owned by the Fairhope Airport Authority. The airport has a single runway, Runway 1/19, which is an asphalt grooved runway that is 6,604 feet in length and 100 feet in width. The runway has precision markings. Both ends of the runway have 4-light PAPIs. Both ends also have an RNAV (GPS) procedure, and the procedure into Runway 1 provides the lowest minimums (287-foot ceiling with .75-mile visibility). There are 41 based aircraft at the airport. From BFM, CQF is a 27-mile drive and 15-mile flight.[28]

Bay Minette Municipal Airport (1R8) is a public basic nonprimary general aviation airport owned by and located in the City of Bay Minette, Alabama. Runway 8/26 is asphalt and the airport's only runway. The runway is 5,500 feet long and 79 feet wide. Each runway end is supported by a 2-light PAPI and RNAV (GPS) approach. The instrument approach procedure into Runway 26 provides lowest minima (880-foot ceiling and 1-mile visibility). Ten aircraft are based at 1R8. From BFM the airport is 35 miles via Alabama State Route 225 and 20 miles through the air.[29]

Trent Lott International Airport (PQL), situated in Pascagoula, Mississippi, is public regional nonprimary general aviation airport owned by Jackson County. The single runway at the airport, Runway 17/35, is grooved asphalt and 6,500 feet long by 100 feet wide. There is a 4-light PAPI on both runway ends. RNAV (GPS) instrument approach procedures serve both runway ends. Runway 17 also has an ILS procedure, providing the best minimums at 217-foot ceiling and .5-mile visibility. Twenty-nine aircraft are based at PQL. PQL to BFM is 35 miles by car and 29 miles by aircraft.[30]

12.3 Military Airports

Pensacola Naval Air Station/Forrest Sherman Field (NPA) is a private-use Navy base located in Warrington, Florida. There are more than 16,000 military and 7,400 civilian employees at this Naval Air Station.[31] The airfield has three runways: 7L/25R, 7R/25L, and 1/19. The pair of 7/25 runways are both asphalt. Primary Runway 7L/25R is 8,001 feet in length and 200 feet in width with a weight-bearing capacity of PCN 39 /R/B/W/T. Approach Lighting System with Sequenced Flashing Lights (ALSF Category 1) support Runway 7L operations. There are a large number of instrument approach procedures for NPA, including ILS, RNAV (GPS), HI-VOR, and HI-TACAN. The ILS approach for Runway 7L lists minimums of 223-foot ceiling and .5-mile visibility.[32]

Runway 7R/25L is 8,000 feet long and 200 feet wide, with a weight-bearing capacity of PCN 40 /R/B/W/T. There are 4-light PAPIs installed on the left of both runway ends. Asphalt Runway 1/19 is 7,136 feet long and 200 feet wide. No visual slope indicators nor approach lighting is installed on the runway.

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[27] Ibid.
[28] Ibid.
[29] Ibid.
[30] Federal Aviation Administration, Airport Data and Information Portal, https://adip.faa.gov/agis/public/#/public.
[31] Commander, Navy Installations Command. *Naval Air Station Pensacola*. https://www.cnic.navy.mil/regions/cnrse/installations/nas_pensacola.html.
[32] Federal Aviation Administration, Airport Data and Information Portal, https://adip.faa.gov/agis/public/#/public.

Kessler Air Force Base (BIX), located on the Gulf Coast in Biloxi, Mississippi, is privately owned by the Air Force. BIX is home to multiple components of the Air Force's Air Education and Training Command. A single runway, Runway 3/21, serves the base. Runway 3/21 is 7,631 feet long and 150 feet wide. Approach lighting (ALSF Category 1) is installed for the Runway 21 end, and a 4-box PAPI is installed on each runway end. The best instrument approach into the airport is the ILS for Runway 21 with 219-foot ceiling and 2,400-foot RVR. There are also RNAV (GPS) and TACAN procedures for both runway ends.[33]

Navy Outlying Field Barin (NOLF), in Foley in Baldwin County, Alabama, is private airfield owned and operated by the Navy. Both runways at NOLF, Runway 9/27 and Runway 15/33, are asphalt measuring 5,000 feet in length and 150 feet in width. There are no publicly available published instrument procedures for NOLF.[34]

33 Ibid.
34 Ibid.

13. PAVEMENT CONDITION

Airport pavements are routinely evaluated to determine maintenance needs. The result of these tests is a Pavement Condition Index (PCI), a score ranging from 0 to 100, which provides a general gauge of the current operational condition. A score of 100 indicates like-new pavement, while a score of 0 indicates extremely high degradation. The window for rehabilitation for asphalt is typically when the PCI is between 50 and 80.

A pavement management study that finished in February 2018 examined BFM airfield pavements.[35] The PCI score of each pavement section is shown on Figure 13.1.[36] A large portion of the runways and apron are in poor condition. The parallel Taxiway A is in good condition.

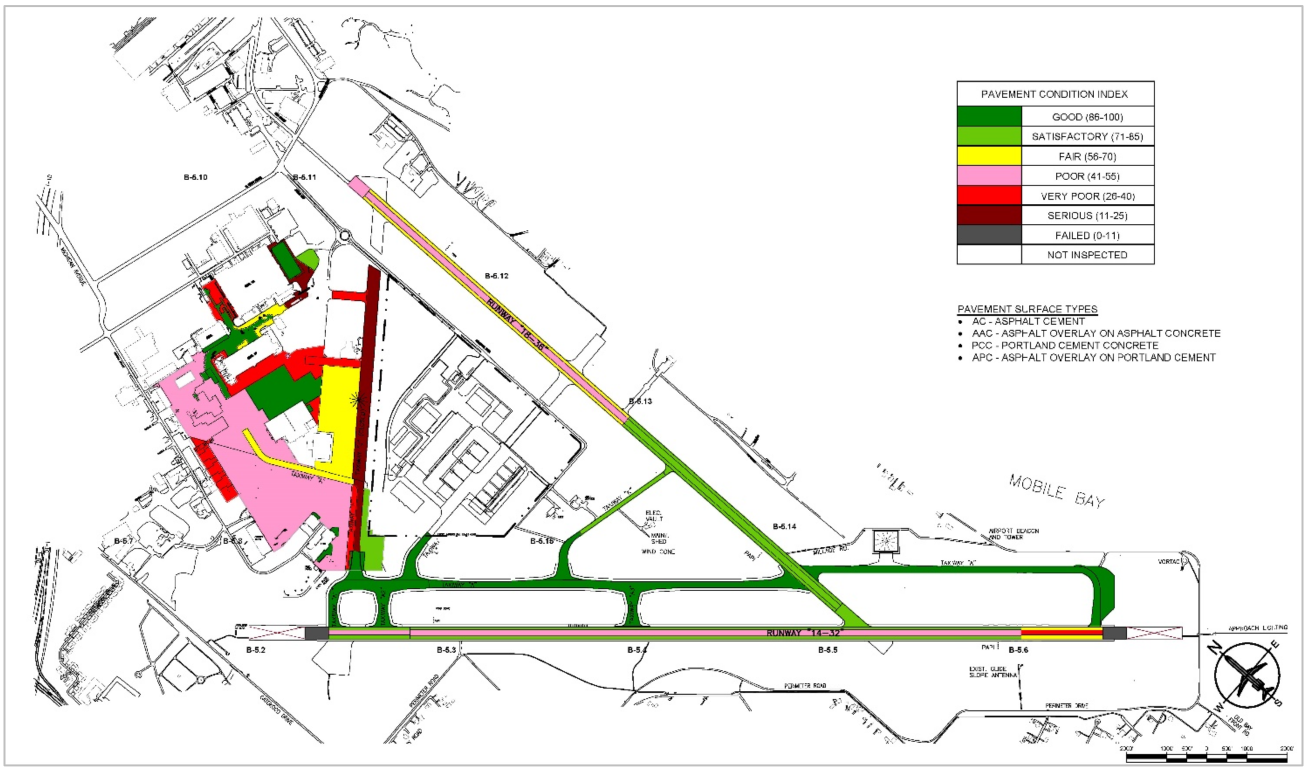

Figure 13.1: PCI at BFM

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[35] Michael Baker International (prepared for Mobile Airport Authority). *Pavement Management Study Report Mobile Downtown Airport (BFM)*. February 2018.
[36] Ibid., 2018.

14. AIRSPACE AND AIR TRAFFIC CONTROL

There are five classes of controlled airspace in the U.S.: A, B, C, D, and E. Each class has its own defined dimensions within which air traffic control services are provided to instrument flight rule (IFR) and visual flight rule flights. The FAA designates the type of airspace based on the type of air traffic control services available and the volume of traffic.

Class A airspace is from 18,000 feet MSL up to and including flight level 600. Unless otherwise authorized, all persons must operate their aircraft under IFR.

Class B airspace is generally from the surface to 10,000 feet MSL surrounding the nation's busiest airports. An aircraft must be appropriately equipped with a two-way radio and altitude reporting equipment, and an air traffic clearance is required to operate in Class B airspace. There are also restrictions on student pilot operations within Class B airspace.

Class C airspace is generally from the surface to 4,000 feet above airport elevation surrounding airports that have an operating ATCT, serviced by radar approach control, and have a certain number of IFR operations or passenger operations. Class C airspace typically has an inner area of about 5 nautical miles that extends from the surface to 4,000 feet above airport elevation. It also has an outer area extending from 5 nautical miles to 10 nautical miles that extends no lower than 1,200 feet up to 4,000 feet above airport elevation. A two-way radio and transponder with altitude reporting equipment is required for operations in Class C airspace. In addition, two-way radio communications must be established with ATCT before entering, and while in, Class C airspace. There are no pilot certification requirements for operations in Class C airspace. MOB is surrounded by Class C airspace during ATCT operating hours.

Class D airspace is generally from the surface to 2,500 feet above airport elevation surrounding airports that have an operational ATCT. An operable two-way radio is required for Class D airspace, and there are no specific pilot certification requirements. BFM is surrounded by Class D airspace during ATCT operating hours. A portion of the BFM Class D airspace overlaps with the outer ring of the MOB Class C airspace.

Generally, if the airspace is not Class A, B, C, or D and is controlled, it is **Class E** airspace. Class E airspace is established around airports with instrument procedures and for the airways below 18,000 feet MSL. There are no specific pilot certification or equipment requirements for operations in Class E airspace. When the ATCT is closed at MOB and BFM, the airports are surrounded by Class E airspace beginning at 700 feet above ground level. There is also Class E airspace at BFM to the ground to protect the ILS approach.

Uncontrolled airspace is designated **Class G**.

The national airspace system also contains other specialty airspace, such as prohibited, restricted, warning, alert, and military operations area (MOA). To the east of MOB and BFM is the alert area A-292 that is active Monday through Friday from sunrise to 1:00 a.m. and Saturday from sunrise to sunset. The alert area is in place due to a high volume of rotary and fixed wing training from the surface to 17,500 feet MSL. To the south of the alert area is restricted area R-2908 and the Pensacola South MOA. Restricted area R-2908 operates November and December from 8:00 a.m. to 4:00 p.m. Monday through Friday. The Pensacola South MOA has intermittent operations sunrise to midnight Monday through Saturday. These alert, military operation, and restricted areas are established to support military training activities. There are also additional areas, MOAs, warning areas, and the U.S. Air Defense Identification Zone farther south over the Gulf of Mexico.

Figure 14.1[37] shows the Mobile area airspace. The solid magenta line is the Class C airspace around MOB, the dashed blue line is the Class D airspace around BFM, and the gradient magenta line is the Class E airspace that is around both airports when the ATCT is closed. The dashed purple line outside the BFM Class D airspace is the Class E airspace to the surface for the instrument approach procedure. The upside-down V in blue are obstructions that are mapped. The alter area is the magenta solid line with adjacent dashes.

Figure 14.1: Mobile Area Aeronautical Chart

37 Federal Aviation Administration, Sectional Aeronautical Charts, https://www.faa.gov/air_traffic/flight_info/aeronav/productcatalog/vfrcharts/sectional/.

15. FAA SURFACES AND HAZARDS TO AIR NAVIGATION

15.1 Part 77

Title 14 of the Code of Federal Regulations (CFR) Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*[38] (typically referred to as just Part 77) defines the standards used in determining obstructions and hazards to air navigation. As defined in Part 77, obstructions are objects that penetrate the imaginary airspace surfaces surrounding an airport and can be a hazard to air navigation, unless an airspace study shows otherwise. Imaginary surfaces include the primary surface, approach surface, transitional surface, horizontal surface, and conical surface (see Figure 15.1[39]). The imaginary surfaces vary in size by the category of each runway.

The primary surface is an area around the runway that cannot exceed the runway elevation. The primary surface extends 200 feet beyond the runway's ends, and the width is determined by the lowest approach visibility minimum. Both runways at BFM have a 1,000-foot-wide primary surface.

While standards in both Part 77 and Advisory 150/5300-13A change according to the lowest visibility minimums at an airport, there is a disconnect between the two documents. For Part 77, standards are defined for minimums greater than .75 mile and as low as .75 mile, whereas standards in 150/5300-13A are defined by not lower than 1 mile and not lower than .75 mile. Thus, when an airport has an approach with minimums of exactly .75 mile, the surfaces change to the next group under Part 77 but not under 150/5300-13A, which is the case for Runway 18/36 at BFM.

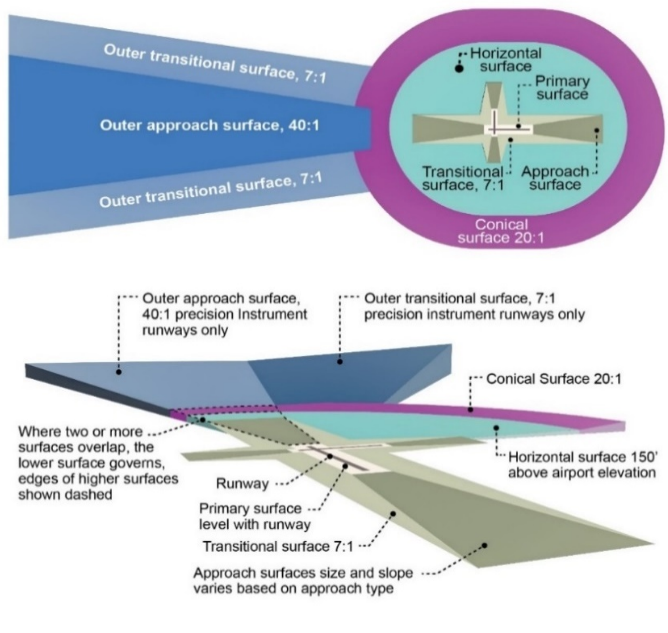

Figure 15.1: Part 77 Surfaces Example

The Part 77 approach surface is centered on the runway centerline and extends outward and upward from each end of the primary surface. The surface is trapezoidal and slopes upward. For Runway 32 with the ILS, the approach surface has an inner width of 1,000 feet and extends 10,000 feet at a slope of 50:1 (1 foot higher for every 50 feet farther from the runway), and then it extends an additional 40,000 feet at a slope of 40:1. The outer width is 16,000 feet. The approach surface for Runways 14, 18, and 36 has an inner width of 1,000 feet, outer width of 4,000 feet, and a length of 10,000 feet at a slope of 34:1.

The transitional surface extends outward and upward at right angles to the runway centerline and extended centerline from the sides of the primary surface and the approach surfaces at a 7:1 slope up until the horizontal surface. The 7:1 transitional surface should be kept clear. The horizontal surface protects for aircraft operations in the vicinity of the airport. The horizontal surface is located 150 feet above the airport

38 https://www.ecfr.gov/cgi-bin/text-idx?rgn=div5&node=14:2.0.1.2.9.
39 Hanson Professional Services, 2019.

elevation, which is the highest elevation on any runway. The radius of the horizontal surface is 10,000 feet from the runway ends for other than utility runways (runways serving large aircraft) with straight-in instrument approaches. The conical surface extends upward and outward from the end of the horizontal surface for a distance of 4,000 feet at a 20:1 slope.

15.2 FAA Advisory Circular 150/5300-13A Approach Surfaces

With the implementation of GPS-based approaches (RNAV approaches), the FAA has issued additional approach standards through its advisory circulars and orders. Threshold siting surfaces were listed in the AC 150/5300-13A, Table 3-2, Approach/Departure Standards[40] table and then updated by the FAA Engineering Brief 99 in September 2018.

Runways 18, 36, and 14 each have an approach surface (row 4 in the Engineering Brief 99 table) that begins 200 feet beyond the runway end, with an inner width of 400 feet and extending out 10,000 feet to an outer width of 3,400 feet. This surface has a slope of 20:1. Runway 32 has an approach surface (row 5) starting 200 feet after the runway end. The surface has an inner width of 800 feet, length of 10,000 feet, an outer width of 3,400 feet, and a slope of 34:1.

The ILS approach to Runway 32 and the RNAV (GPS) approaches to all four runway ends provide vertical guidance (the RNAV approaches have LNAV/VNAV and LPV lines of minima). For the approach end of a runway with instrument approaches with vertical guidance, there is an additional surface to ensure a clear glide path. This surface starts at runway end and is 10,000 feet long, with an inner width of 200 feet plus the runway width and an outer width of 1,520 feet. This surface has an associated slope of 30:1 and is the same for any visibility minimum, as it is triggered by vertical guidance.

15.3 FAA Advisory Circular 150/5300-13A Departure Surfaces

On runways that support instrument departures, the FAA has designated an instrument departure surface. On July 24, 2020, the FAA revised the departure surface with Engineering Brief 99A. The departure surface starts at the end of the runway pavement and is 12,152 feet long with an outer width of 7,512 feet. An inner width, the width of the runway, starts flat at the runway elevation and has side sections that slope up to 150

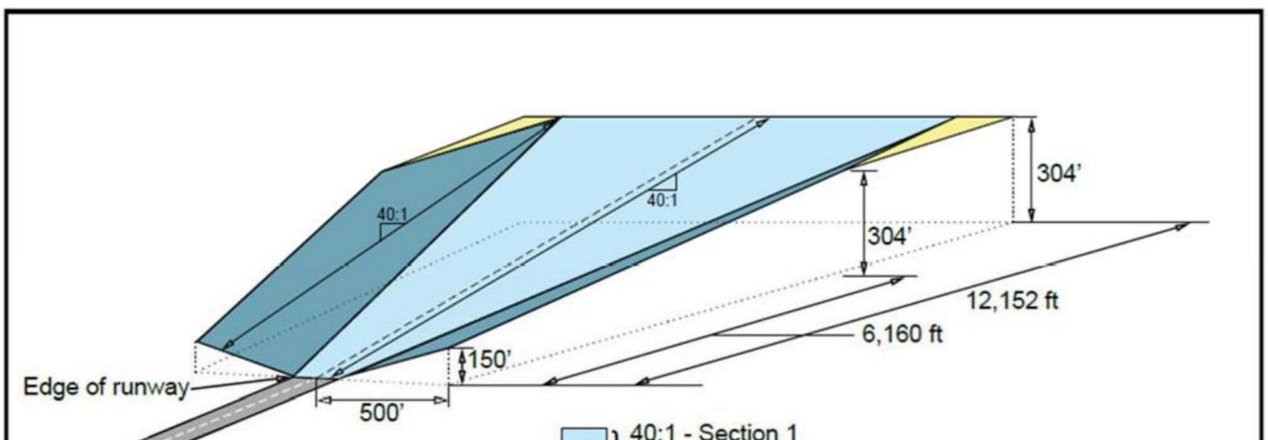

Figure 15.2: Departure Surface Perspective View

[40] FAA Advisory Circular150/5300-13A, *Airport Design*, https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5300-13A-chg1-interactive-201612.pdf.

feet above runway elevation at 500 feet from the runway centerline. The departure surface has a slope of 40:1. While it is desirable to provide a clear departure surface, the FAA can design and publish instrument departure takeoff minimums, (obstacle) departure procedures, and takeoff obstacle notes to mitigate obstacles in departure surfaces (see Figure 15.2[41]).

BFM has published departure minimums for Runway 14 of a 400-foot ceiling and 2.25-mile visibility, or standard minimums with a higher than standard climb rate (244 feet per nautical mile until 500 feet). There is a departure procedure for Runway 36 that indicates a 1-degree climb heading until 900 feet before turning right. There are takeoff obstacles notes published for Runway 18 (trees), Runway 36 (poles and trees), and Runway 32 (a sign and trees).

[41] FAA Engineering Brief 99A, https://www.faa.gov/airports/engineering/engineering_briefs/media/EB-99A-Changes-to-Airport-Design-Tables-3-2-and-3-4.pdf.

16. METEOROLOGICAL CONDITIONS

Ideally, runways are aligned so that airplanes take off and land into the wind and minimize any crosswind. Crosswinds are directional winds that blow perpendicular to the runway. Small, light aircraft are more affected by crosswinds than are larger, heavier ones. The FAA design standards recommend 95% wind coverage. This means that 95% of the time the crosswind does not exceed the demonstrated crosswind component (design capability) for the aircraft. Table 16.1 lists the crosswind components used by the FAA for planning. The Airport Reference Code is based upon aircraft size and speed and is discussed in a later chapter.

Table 16.1: Crosswind Components

Airport Reference Code	Allowable Crosswind Component
A-I and B-I	10.5 knots
A-II and B-II	13 knots
A-III, B-III, C-I through C-III, D-I through D-III	16 knots
A-IV and B-IV, C-IV through C-VI, D-IV through D-VI, E-I through E-VI	20 knots

Onsite ASOS collected and downloaded wind data directly from the Integrated Surface Database provided through the National Oceanic and Atmospheric Administration.[42] The data comprised wind direction and speed readings (every hour or more frequently) over the most recent complete 10-year span (from 2009 through 2018 in this case). Three separate weather conditions were analyzed: all weather conditions, visual meteorological conditions, and instrument meteorological conditions. All analyses used the FAA-defined wind speed categories (for example, 0 to 3 knots, 4 to 6 knots, 7 to 10 knots).

The all-weather wind rose was created from 110,519 observations. Of these total observations, 17% were classified as calm and recorded with zero wind speed. Roughly half of the time (51%), wind speeds were recorded as greater than 0 and less than 7 knots. As shown in Figure 16.1[43], the wind coverage for both runways was 98.59% for a 10.5-knot crosswind component, 99.43% for a 13-knot crosswind, 99.86% for a 16-knot crosswind, and 99.96% for a 20-knot crosswind.

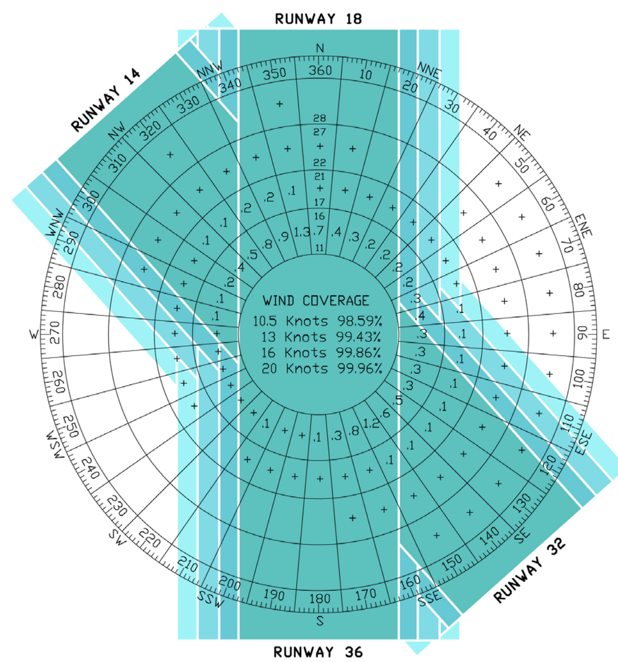

Figure 16.1: All Weather Wind Rose

42 National Oceanic and Atmospheric Administration. *Integrated Surface Database.* https://www.ncdc.noaa.gov/isd.
43 Hanson Professional Services, 2019.

The Visual Meteorological Conditions (VMC) wind rose depicts weather data VMC (generally when horizontal visibility is 1 mile or greater and clear of cloud during the day) based on 94,444 observations from 2009 through 2018 (see Figure 16.2[44]). Pilots are permitted to fly during VMC with visual flight rules. The pair of runways at BFM provide more than 98% coverage for all crosswind components during VMC.

The Instrument Meteorological Conditions (IMC) Wind Rose (see Figure 16.3[45]) depicts weather data during IMC, when horizontal visibility is less than 3 miles and/or the ceiling is less than 1,000 feet. A total of 14,543 IMC observations were contained in the wind data. To fly during IMC, pilots are required to be instrument-rated and fly aircraft with proper instrumentation. Combined Runway 18/36 and Runway 14/32 provide no less than 98% coverage for all crosswind components during IMC.

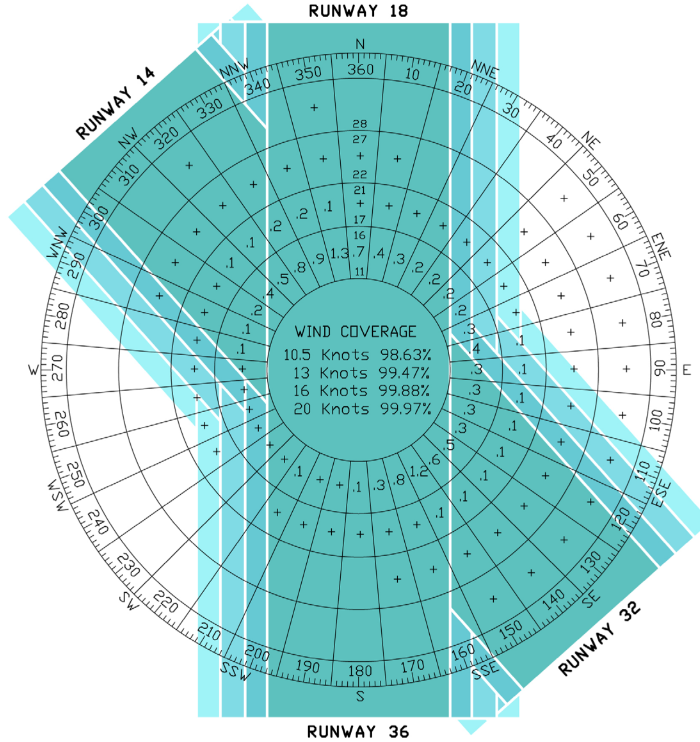

Figure 16.2: VMC Wind Rose

[44] Hanson Professional Services, 2019.
[45] Hanson Professional Services, 2019.

Table 16.2 lists wind coverage percentages for the runways individually and combined during the three weather conditions. Individually, each runway meets recommended wind coverages for all crosswind components. Together, the pair of runways provides at least 98% coverage during all weather conditions, providing coverage better than the 95% recommendation. For both runways, coverage percentages dip slightly during IMC.

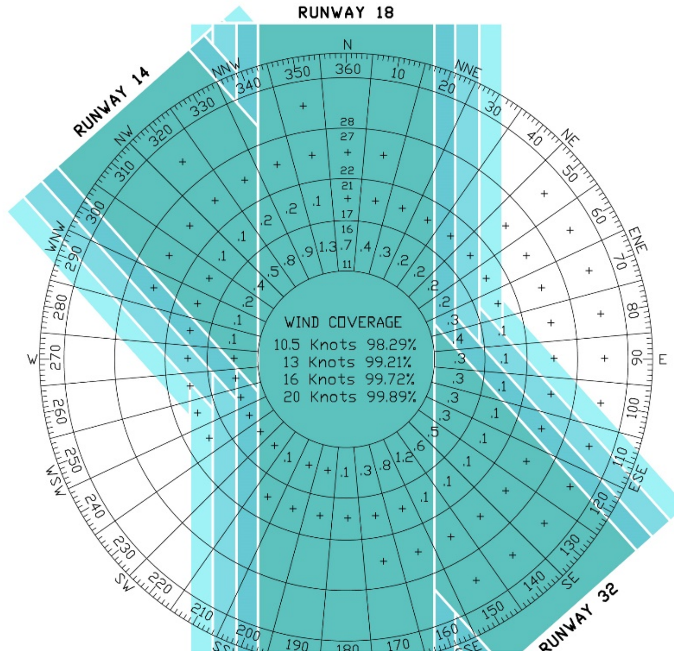

Figure 16.3: IMC Wind Rose

Table 16.2: Wind Coverages

Crosswind Component	Both Runways			Runway 14/32 Only			Runway 18/36 Only		
	All Weather (%)	***IMC (%)***	***VMC (%)***	***All Weather (%)***	***IMC (%)***	***VMC (%)***	***All Weather (%)***	***IMC (%)***	***VMC (%)***
10.5 knots	98.59	98.29	98.63	97.27	96.87	97.31	95.77	95.76	95.75
13 knots	99.43	99.21	99.47	98.76	98.42	98.81	97.82	97.51	97.87
16 knots	99.86	99.72	99.88	99.73	99.52	99.77	99.38	98.92	99.47
20 knots	99.96	99.89	99.97	99.93	99.85	99.95	99.81	99.57	99.86

A heat map is another way to visually interpret wind data. Each column represents 100% of the observations of wind in that speed category (for example, 0 to 3 knots, 4 to 6 knots) (see Figure 16.4[46]). Blue represents the least common directions for a given speed category; yellow is the most common. The heat map coloring visualizes how at lower speeds the wind comes from every direction. As wind speed picks up, the directions become less spread out and come primarily from fewer directions. Calm (zero wind) is not shown.

An understanding of the local airport's wind conditions provides insight into potential pilot behaviors, such as favoring certain runway ends, and justification for airport improvements to assist landing and taking off. The direction of the majority of strongest winds recorded were between 40 degrees and 160 degrees. In fact, as wind speeds increased, no wind recordings occurred in the window from about 170 degrees to 280 degrees. Slower winds tended to be more spread out.

Wind Direction	Wind Speed (Knots)						
	0-3	4-6	7-10	11-16	17-21	22-27	28+
0 - 10°	1.4%	2.4%	3.4%	3.0%	0.8%	0.4%	0.0%
10 - 20°	1.4%	2.4%	3.3%	2.7%	1.2%	0.4%	0.0%
20 - 30°	1.6%	3.1%	2.9%	1.8%	1.6%	0.4%	0.0%
30 - 40°	1.9%	3.2%	2.4%	1.3%	1.5%	0.4%	0.0%
40 - 50°	1.7%	3.1%	2.3%	1.3%	0.9%	2.0%	4.8%
50 - 60°	1.7%	2.8%	2.0%	1.6%	1.1%	2.4%	7.1%
60 - 70°	1.4%	2.6%	2.5%	2.5%	2.0%	6.4%	7.1%
70 - 80°	1.3%	2.3%	2.5%	3.6%	3.4%	3.6%	7.1%
80 - 90°	1.1%	1.9%	2.2%	2.9%	3.8%	3.6%	9.5%
90 - 100°	1.0%	1.9%	2.6%	2.7%	3.3%	7.6%	11.9%
100 - 110°	1.1%	2.3%	2.7%	2.5%	3.4%	8.4%	7.1%
110 - 120°	1.5%	2.9%	3.0%	2.9%	4.1%	10.0%	9.5%
120 - 130°	1.8%	3.2%	3.8%	3.8%	6.8%	13.5%	11.9%
130 - 140°	2.1%	4.2%	5.2%	4.6%	8.2%	6.4%	4.8%
140 - 150°	2.2%	4.3%	7.9%	10.1%	5.3%	2.8%	2.4%
150 - 160°	2.3%	5.8%	10.5%	6.3%	0.9%	1.2%	0.0%
160 - 170°	3.4%	6.6%	7.3%	2.5%	0.6%	0.4%	0.0%
170 - 180°	4.0%	3.7%	2.3%	0.6%	0.1%	0.4%	0.0%
180 - 190°	3.7%	1.9%	0.8%	0.2%	0.1%	0.4%	0.0%
190 - 200°	3.9%	1.5%	0.8%	0.2%	0.1%	0.4%	0.0%
200 - 210°	3.8%	1.5%	0.7%	0.4%	0.1%	0.4%	0.0%
210 - 220°	3.0%	1.3%	0.6%	0.2%	0.1%	0.0%	0.0%
220 - 230°	3.0%	1.2%	0.3%	0.2%	0.1%	0.4%	0.0%
230 - 240°	3.5%	1.6%	0.3%	0.1%	0.1%	0.4%	0.0%
240 - 250°	3.6%	1.9%	0.4%	0.1%	0.1%	0.4%	0.0%
250 - 260°	3.7%	1.8%	0.4%	0.2%	0.1%	0.4%	0.0%
260 - 270°	3.6%	1.7%	0.4%	0.2%	0.1%	0.4%	0.0%
270 - 280°	3.4%	1.8%	0.8%	0.4%	0.1%	0.4%	0.0%
280 - 290°	3.5%	1.5%	0.9%	0.8%	0.3%	0.8%	0.0%
290 - 300°	4.7%	2.1%	1.5%	1.8%	1.5%	2.0%	0.0%
300 - 310°	6.1%	3.6%	2.3%	3.4%	5.0%	1.6%	0.0%
310 - 320°	6.6%	3.8%	2.5%	4.4%	8.4%	5.6%	4.8%
320 - 330°	4.6%	3.4%	3.1%	6.9%	14.0%	8.8%	2.4%
330 - 340°	3.0%	3.6%	4.3%	7.6%	11.8%	6.0%	2.4%
340 - 350°	1.9%	3.9%	6.4%	10.4%	7.1%	0.8%	7.1%
350 - 360°	1.7%	2.9%	4.6%	5.6%	2.1%	0.8%	0.0%
	100%	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*

Figure 16.4: Wind Speed Heat Map (All Weather)

[46] Hanson Professional Services, 2019.

Figure 16.5[47] shows monthly precipitation (all precipitation, not only rain) for the past 5 years at BFM. Data were downloaded from the onsite ASOS. Any entries marked as erroneous or suspect were removed. Values shown are total recorded accumulation. Variation from month to month and year to year is notable. For example, in October 2016 no precipitation was recorded, while October 2017 experienced more than 12 inches total. Over the past 5 years, August (7.4 inches) was, on average, the wettest month, followed by December (6.9 inches) and April (6.9 inches).

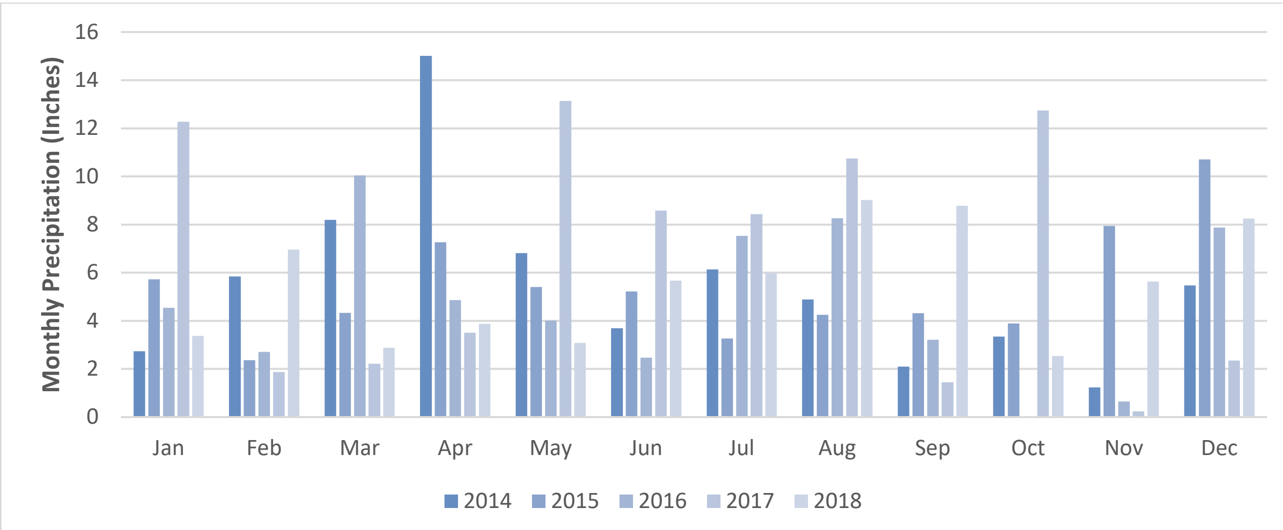

Figure 16.5: Monthly Precipitation Accumulation (5 Years)

Figure 16.6[48] shows the number of days per month with recorded precipitation. June, July, and August typically have the most days with precipitation, while October and November have the fewest.

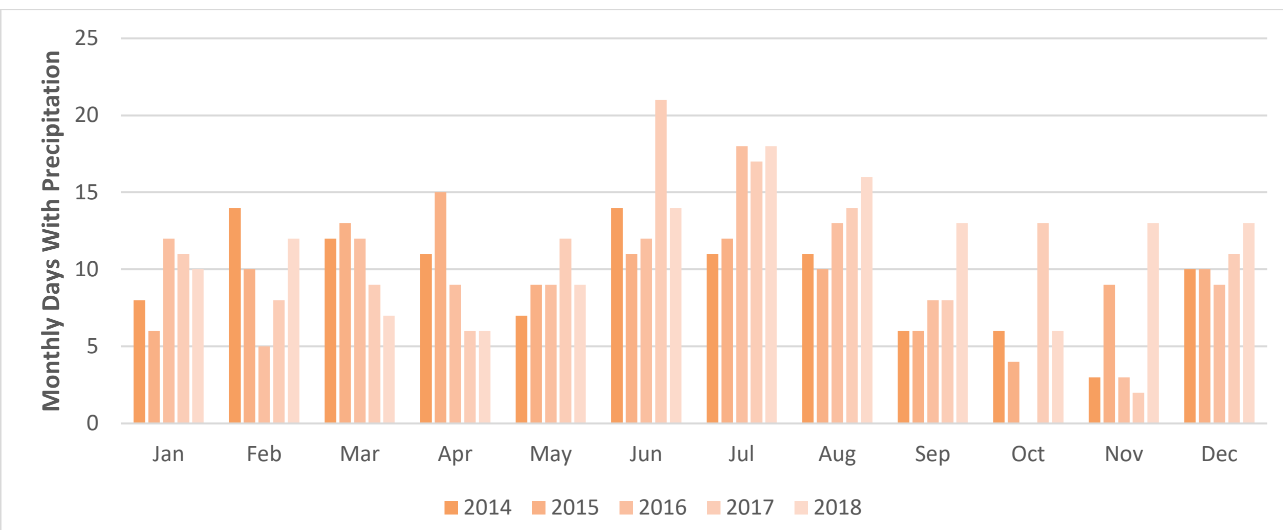

Figure 16.6: Monthly Days with Precipitation

[47] Hanson Professional Services, 2019.
[48] Hanson Professional Services, 2019.

17. VEHICULAR ACCESS

17.1 BFM Ground TransportationInterstate Access

The Mobile MSA straddles the Mobile River and Bay. From the west, I-10 travels through the Wallace Tunnel under the Mobile River. East of the Mobile River, I-10 traverses Mobile Bay on the I-10 Bayway, which is a pair of concrete viaduct bridges approximately 7.5 miles long. BFM abuts I-10 along the northwest side. The two primary access points from I-10 to BFM are at Michigan Avenue (Exit 23) and Duval/Broad Street (Exit 24). The Michigan Avenue exit provides the most direct access into BFM and the Brookley Aeroplex. From the Duval/Broad Street exit, it is less than 1 mile to the north side of BFM. BFM is also accessible from the Dauphin Island Parkway; however, it is more than 2 miles on city streets around the cemetery to reach the landside development on BFM.

17.1.2 On BFM Access

The primary access roads on BFM are Michigan Avenue, Broad Street, and Aerospace Drive to Airbus Way. All of these roads are two lanes, one each direction, with some added turn lanes. Avenue A through Avenue N run in a generally east-west direction, and 1st Street to 15th Street run in a generally north-south direction; both provide access to the leased properties. Commanders Drive and Old Bay Front Drive provide access on the east side of the airfield. All of these access roads are also two-lane roads. There is a roundabout where Aerospace Drive and Airbus Way meet. The airport access roads at BFM serve the employers at the airport, and there are peak periods at shift changes. Michigan Road also serves the passenger terminal.

17.1.3 Public Transportation

The Wave Transit System Route 9 Broad/South/BelAir Mall provides hourly service to BFM from downtown Mobile and the BelAir Mall (along I-65).[49] Inbound service toward downtown starts at 5:10 a.m., and outbound service runs 6:00 a.m. until 9:55 p.m. Monday through Friday. Service starts an hour later on Saturdays but still runs until 9:55 p.m. There is no service on Sunday. A 7-day bus pass costs $10, and a one-day pass can be purchased on the bus for $3.00.

17.1.4 Perimeter Road

At BFM there is a partial, inside-the-fence perimeter road system along the west side of Runway 14/32 and around the Runway 32 end to the compass calibration/run-up pad. Airport staff uses the perimeter for access as part of maintenance activities.

[49] The Wave Transit System. Route Maps. https://www.thewavetransit.com/182/Route-9---Broad-Southside-Bel-Air-Mall.

17.2 MOB Ground Transportation

17.2.1 Interstate Access

The closest interstate access to MOB is I-65 about 7 miles to the east via Airport Boulevard (Exit 3). The Airport Boulevard interchange on I-65 is about 3.5 miles north of I-10. When approaching MOB from the west, access is also available from I-10 via the Theodore Dawes Road (Exit 13) to Schillinger Road. It is about 9 miles via Schillinger Road from I-10.

17.2.2 Airport Boulevard

Airport Boulevard is a four-lane (two in each direction) arterial roadway with turn lanes at intersections and stop lights. As a boulevard, there is a grass median running the length from I-65 to MOB. In addition to serving MOB, Airport Boulevard also provides access to the commercial development along the roadway and neighborhoods. Theodore Dawes and Schillinger Roads are four-lane (two in each direction) arterial roadways.

17.2.3 On MOB Access

Terminal Drive serves at the primary airport entrance for passengers from Airport Boulevard. Terminal Drive provides access to the terminal front curb and recirculation to the parking lots and terminal. Airport Road W. and Joseph Drawns Drive serve other developments on the south side of the airfield. Airbus Military Drive off Schillinger Road North provides access to the east side of the airfield. Schillinger Road North to Tanner Williams Road to Mariner Drive provides access to the Coast Guard facilities at the north end of the airfield.

17.2.4 Public Transportation

The Wave Transit System Route 1 provides hourly service from downtown Mobile to the MOB, mainly along Airport Boulevard.[50] Service runs Monday through Friday from 6:00 a.m. to 6:55 p.m., and Saturday from 7:00 a.m. to 6:45 p.m. There is no service on Sunday. A 7-day bus pass costs $10, and a day pass can be purchased on the bus for $3.00.

17.2.5 Perimeter Road at MOB

At MOB there is a partial, inside-the-fence perimeter road from the ATCT to the end of Runway 15 on the eastern side. This road provides access to the NAVAIDS and localizer on the end of Runway 15. There is also a partial, inside-the-fence perimeter road on the western side of Runway 18/36.

[50] The Wave Transit System. *Route Maps*. https://www.thewavetransit.com/177/Route-1---Airport.

18. MOBILE CRUISE PORT

The Mobile Alabama Cruise Port is located in downtown Mobile on South Water Street. It is .5 miles from I-10. The cruise port is 5 miles from BFM and 13 miles via city streets from MOB. Carnival uses this terminal for mostly 5-day cruises.

19. RAIL ACCESS

BFM has rail access (see Figure 19.1 for the rail lines). The yellow lines are owned by CSX. There is also an agreement that allows the Illinois Central Railroad, a legal Subsidiary of the Canadian National (CN) Railway, to serve this area. The tracks that are part of this agreement are shown in orange. The CN gets on the CSX tracks about 1.8 miles northeast at the Lawrence Street grade crossing near the Choctaw Point Container Terminal. The blue tracks are the industrial track owned and maintained by multiple entities.

Not all of the track right-of-way shown on Figure 19.1 still contains tracks. In particular, track is no longer present along 5th Street. Also, the rail crossing at Avenue B for the 7th Street track appears to be paved over. Any future development within areas containing track right-of-way should coordinated with CSX.[51]

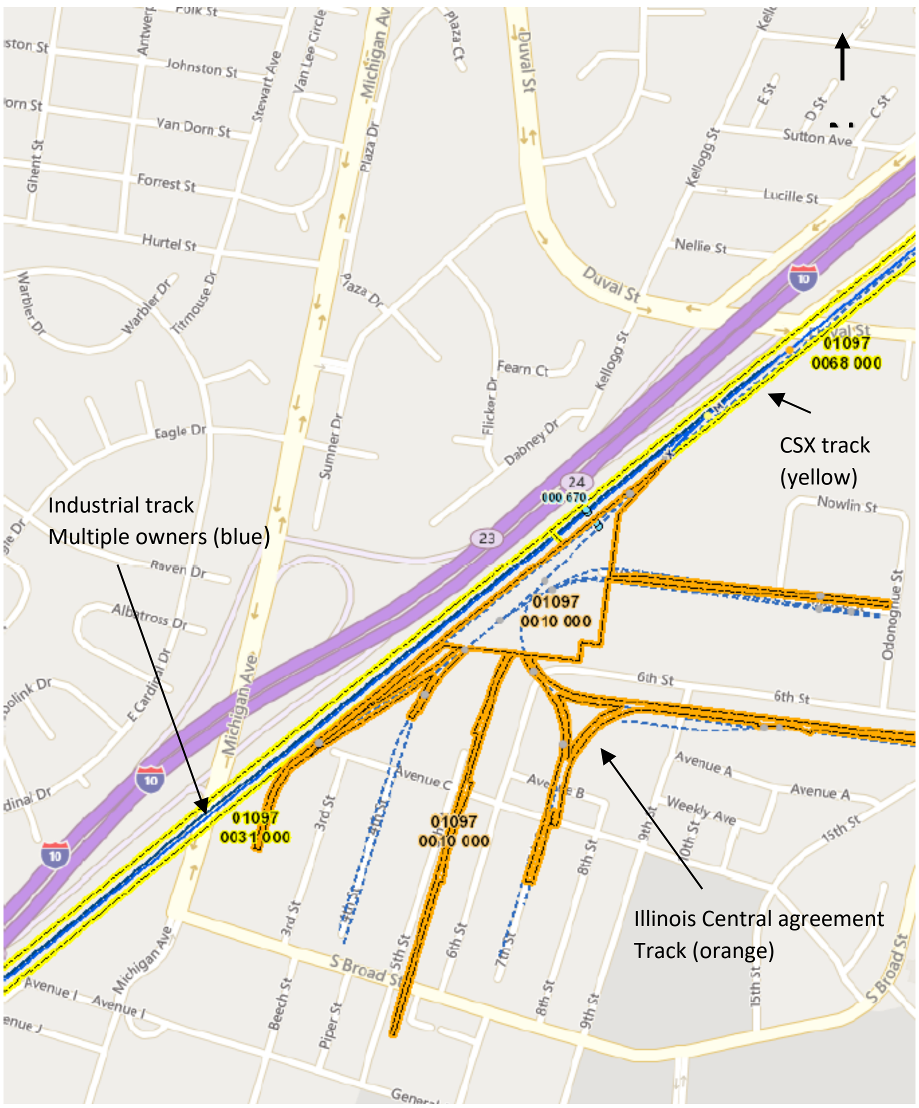

Figure 19.1: Rail Tracks at BFM

[51] CSX property lines, email correspondence with CSX, October 11, 2019.

20. UTILITIES

Available utilities at BFM and MOB include city water, sewer, trash, internet, telephone, and satellite television.

Alabama Power is the electrical provider at both BFM and MOB. At BFM, the electrical service is provided with both aboveground and underground service, as shown on Figure 20.1.[52] The underground portion of the system is in the outlined and lightly hatched area. There are two primary feeds, shown as different colors, to provide redundancy for the service at BFM. The location of the electrical service on Figure 20.1 is approximate and may change with future development projects.

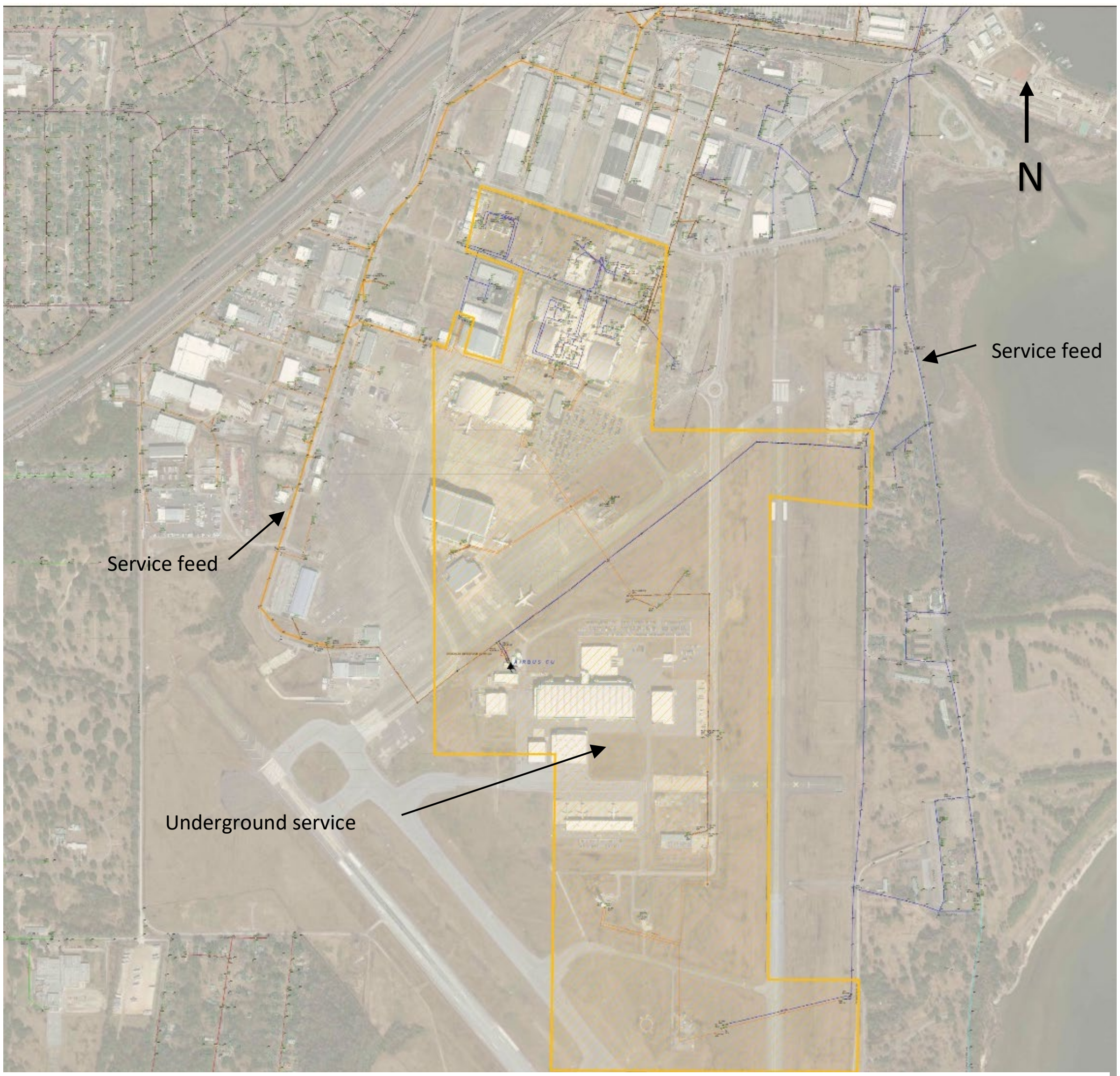

Figure 20.1: Electrical Distribution System at BFM

[52] Alabama Power distribution system exhibit, October 14, 2019.

Mobile Area Water and Sewer provides water and sewer. On Figure 20.2[53], the blue lines are water lines, the green lines are sanitary sewer lines, and the yellow-green dashed line is sanitary sewer force main. The Air Force installed the storm sewers at BFM, and they are still in place but modified as needed on a case-by-case basis. Both BFM and MOB are within Spire's natural gas service area.

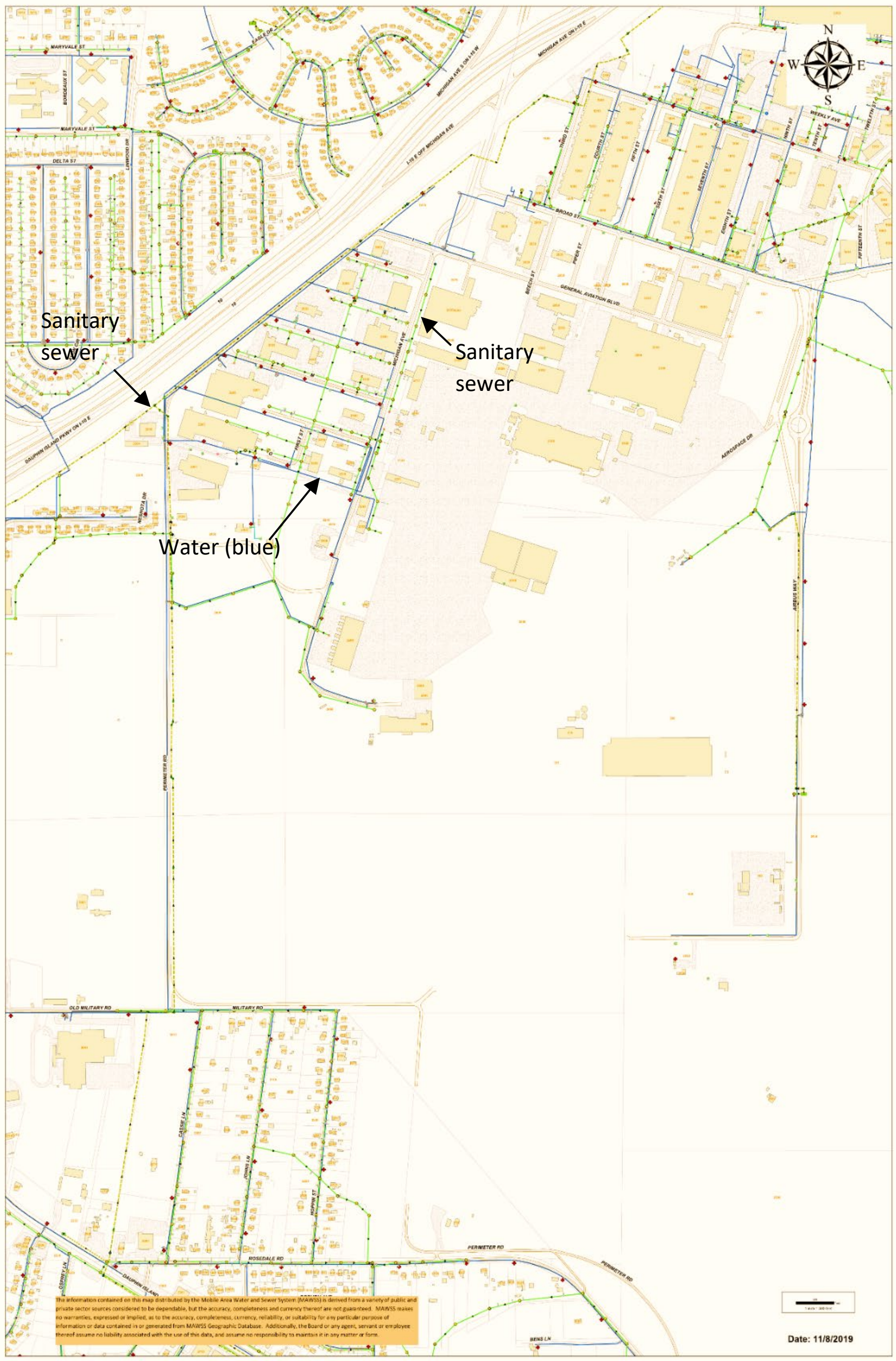

Figure 20.2: Water and Sanitary Sewer Systems at BFM

[53] Mobile Area Water and Sewer, 2019.

21. HAZARDOUS WASTE

There are several hazardous material waste sites on BFM in various stages of clean-up and monitoring, as shown on Figure 21.1.[54] At BFM, these sites can be grouped into four categories: potential responsible parties (PRP); no further action (NFA); hazardous, toxic, and radioactive waste projects (HTRW); and military munitions response program at Formerly Under Defense Sites. In general, the sites at BFM no longer pose an active threat as long as they are left undisturbed. Monitoring wells are in place on most sites and are monitored throughout the year. Results are catalogued, and results indicate that contaminant levels are continuing to decline.

Figure 21.1: Hazardous Material Sites on BFM

At BFM there are five PRP sites:

1. AOC-001 – Landfill 1, located east of Taxiway A at the south end along the shore
2. AOC-003 – Landfill 3, located north of the Runway 14 end
3. AOC-005 – Landfill 5, located between I-10, Perimeter Road, and Neshota Drive
4. AOC-007 – Hangar 17, located at the south end of 5th Street
5. AOC-010 – Industrial maintenance area, bounded by Michigan Avenue, Broad Street, 9th Street, and Hangar 17 (aligned approximately with Avenue K to the west). Within AOC-010 there are multiple underground storage tank closure locations.

[54] Site Location Map, Former Brookley Air Force Base, Mobile, AL BCM Engineers, Inc.

There are five NFA sites at BFM:

1. AOC-002 – Landfill 2, located east of Taxiway A where Perimeter Drive makes a bend from north-south to parallel Taxiway A
2. AOC-004 – Landfill 4, located at the corner of Old Bay Drive and 15th Street
3. AOC-006 – Landfill 6, located south of the Runway 36 end inside the Perimeter Road
4. AOC-008 – Former locomotive maintenance shop, located south of the railroad tracks and west of 9th Street
5. Solvent Pipeline, located on the east side of Michigan Avenue across from Avenue M

The former refuse oil burning pit (ACO-009) is an active HTRW site. It is located west of Runway 14/32, north of Rosedale Road, and west of Perimeter Road.

Along the eastern boundary of BFM and extending into Mobile Bay were several shooting ranges, including the Trap and Shoot Ranges (Central Single Skeet Range, Central Double Skeet Range, and South Skeet and Trap Ranges) and Small Arms Ranges (Central Pistol Range, Firing-in Butt, 200-yard Rifle, Submachine Gun Range, and South Pistol Range). Most of these sites are within the boundary of the land not owned by the MAA, which presently buffers the airfield from Mobile Bay. Many of these ranges were along the historical coast, which has subsequently been backfilled to increase the base land mass into Mobile Bay. The weapons impact areas (where the ammunition landed) are mostly within Mobile Bay, as shown on Figure 21.2.[55]

Figure 21.2: BFM Shooting Ranges and Impact Areas

[55] Former Brookley Air Force Base, Kemron, September 20, 2016.

22. ZONING, LAND USE, ORDINANCES, AND POLICIES

22.1 Zoning Districts (BFM)

Figure 22.1 contains the city zoning districts for BFM and the surrounding area. Currently, the majority of the area surrounding the airport, as well as the airport itself, falls under R-1 zoning. City code designates R-1 zoning as a single-family, residential district. Zoning information was acquired from the City GIS department.

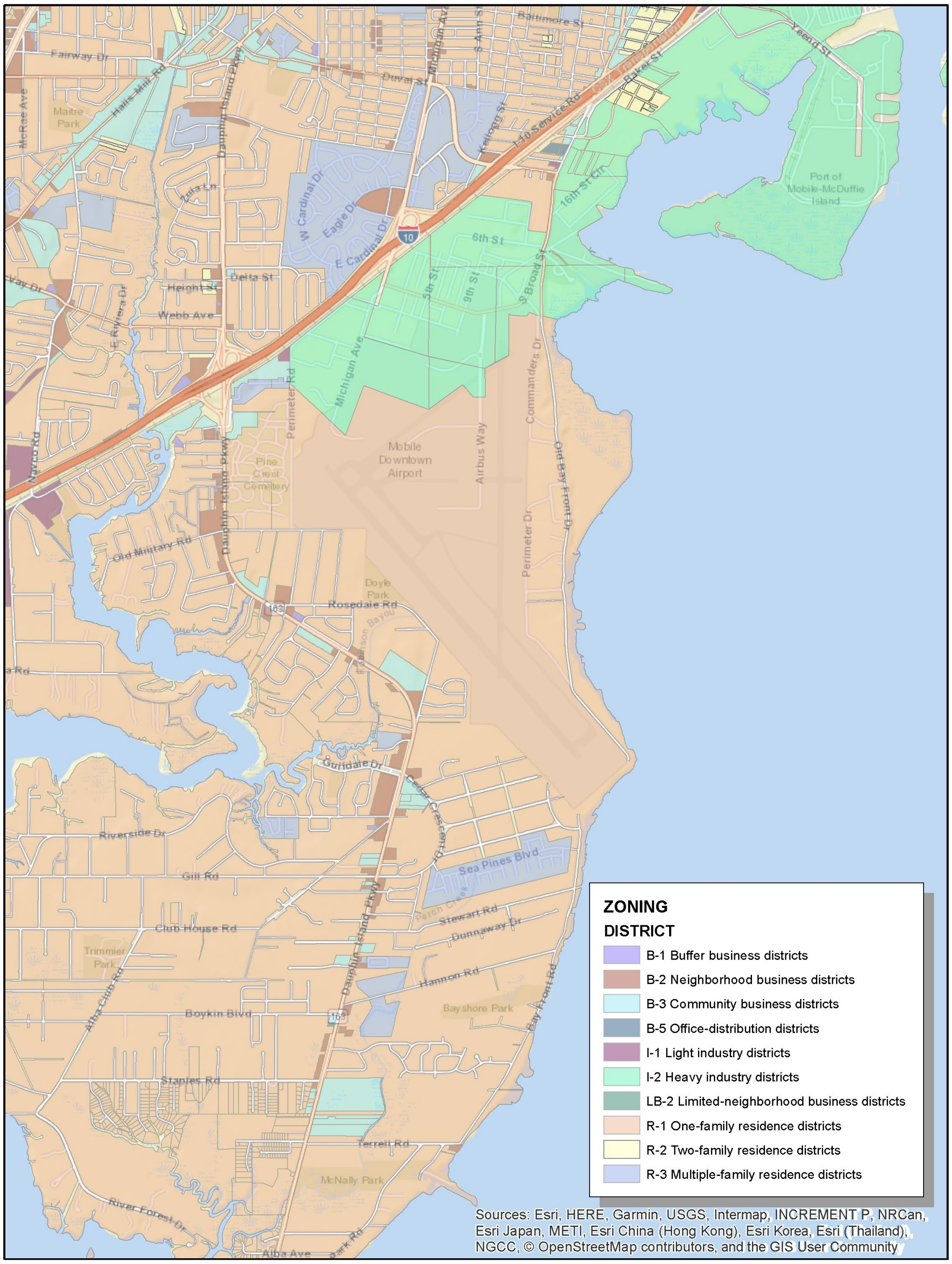

Figure 22.1: Zoning Districts (BFM)

22.2 Zoning Districts (MOB)

Figure 22.2 shows the city zoning districts around MOB. Heading east toward the city center, the adjacent areas are mainly zoned for community business districts. County land does not show zoning districts.

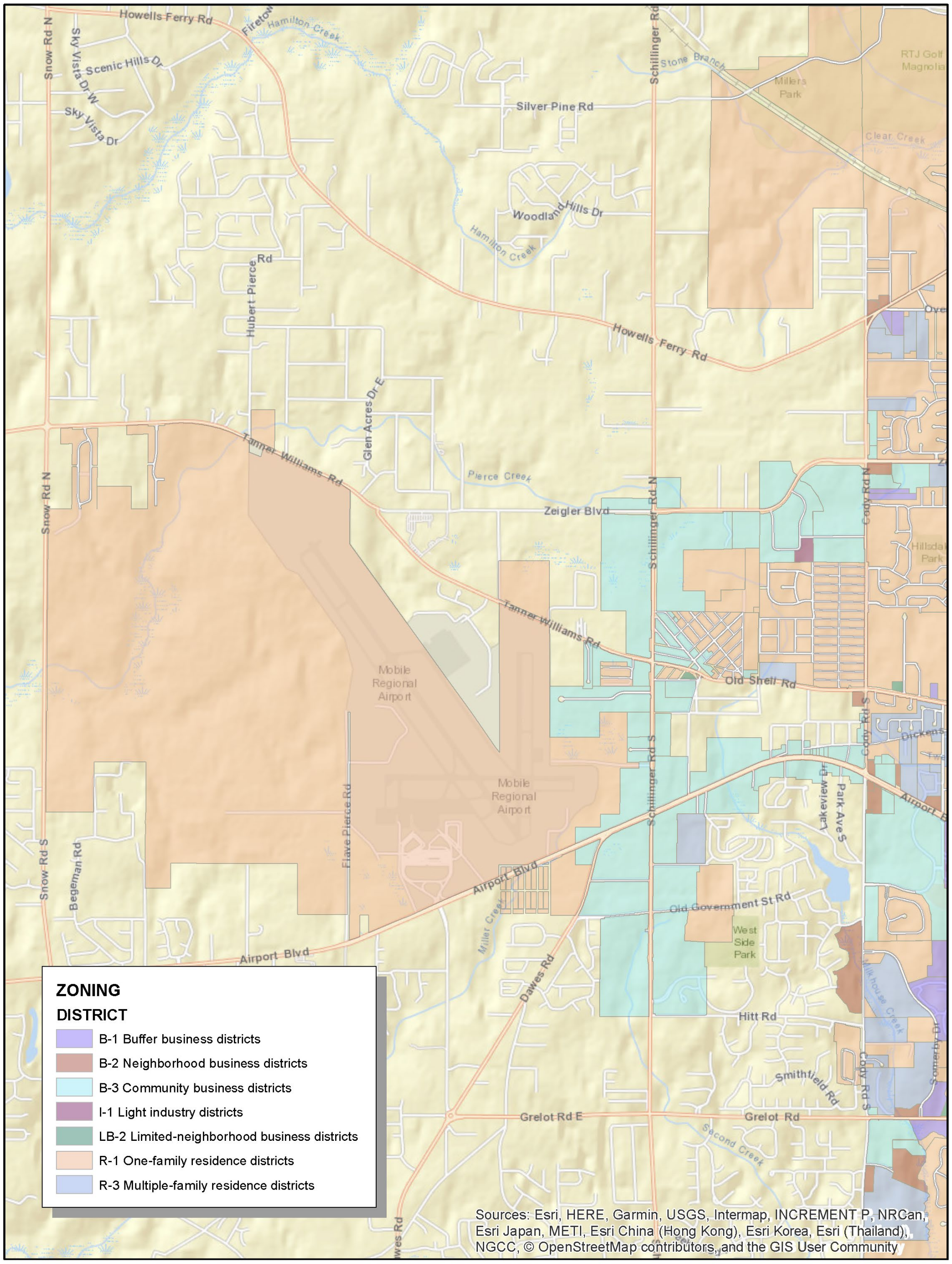

Figure 22.2: Zoning Districts (MOB)

22.3 Land Use (BFM)

Figure 22.3 presents area land use around BFM. Most land immediately surrounding the airport is low- or mixed-density residential. The airport itself and Mobile Aeroplex are heavy industrial. Land use data were obtained from the City GIS department.

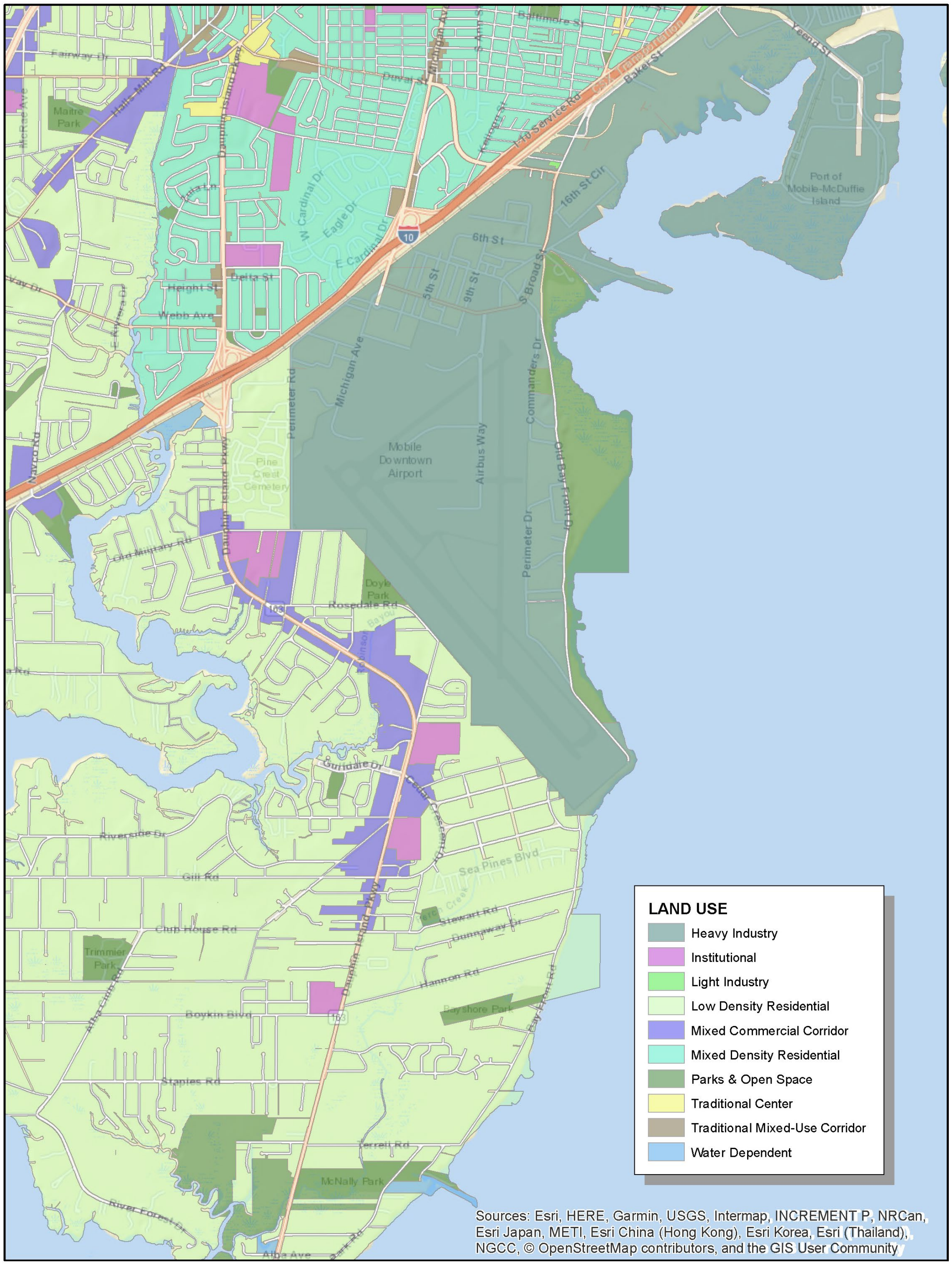

Figure 22.3: Land Use (BFM)

22.4 Land Use (MOB)

Figure 22.4 depicts land uses in the MOB area. The airport is shown as an institutional land use, with an adjacent district center area.

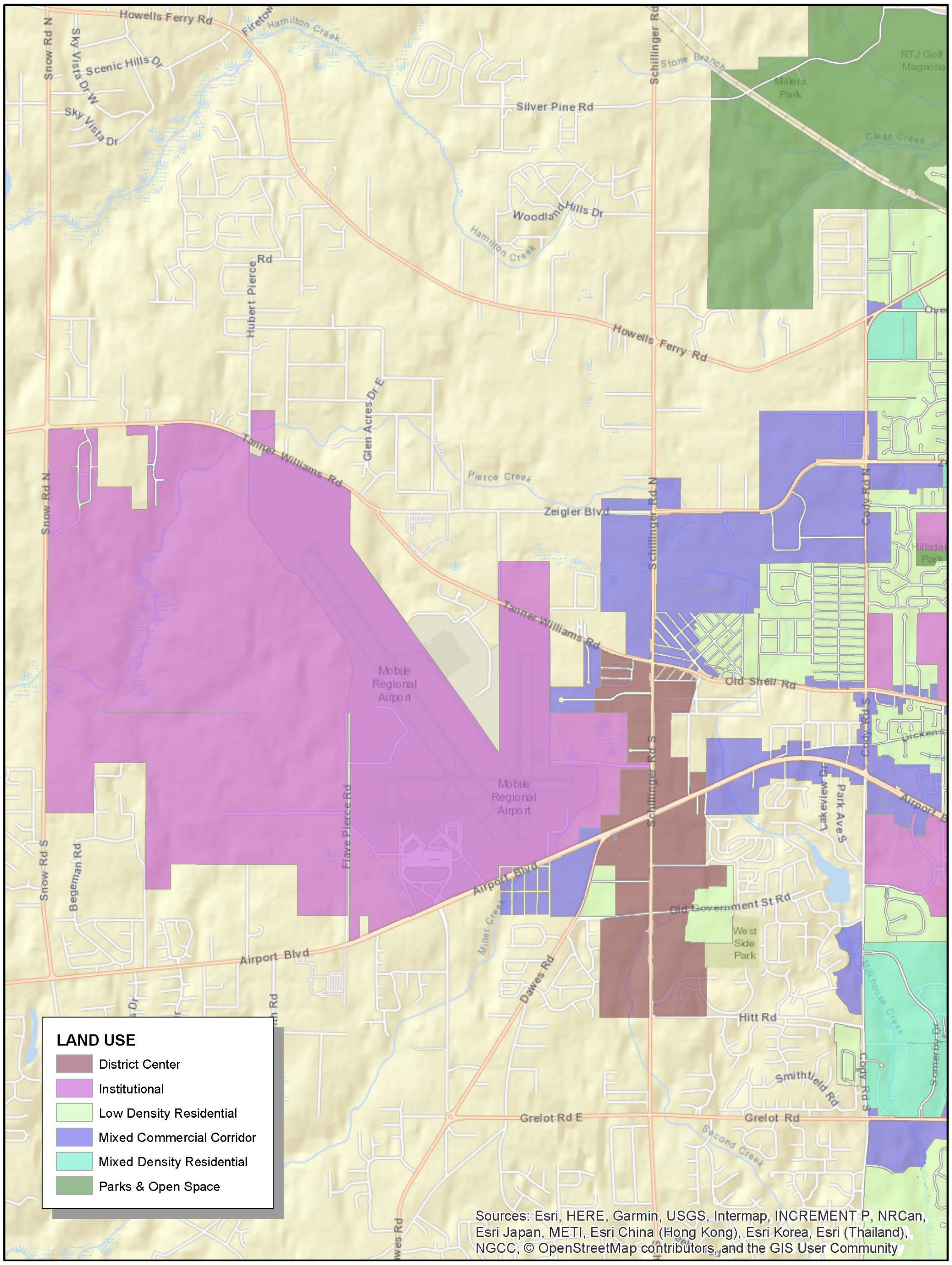

Figure 22.4: Land Use (MOB)

22.5 Ordinances

There are currently no noise abatement nor height restrictions in place for airports in the City of Mobile. Chapter 5 of the City of Mobile Code of Ordinances[56] is designated for Airports and Aviation; however, the chapter is blank. The adoption of Ordinance 05-072 transferred airport property to the airport authority and granted authority to control the airports.

Chapter 25, Section 8 of the City code outlines zoning for the airport trash landfill on Flave Pierce Road off Airport Boulevard (see Figure 22.5[57]).

Figure 22.5: MOB Landfill

Chapter 39, Section 96-1[58] contains code for noise in residential districts. Mobile Municipal Airport noise from airports is exempted in the code:

> *Noises from authorized activities.* The prohibitions of this section shall not apply to air traffic at the Mobile Municipal Airport, or any activities of a temporary duration which are permitted by law and for which a license or permit has been granted by the city including but not limited to parades, sporting events, concerts, Greater Gulf State Fair and fireworks displays.

Chapter 64, Section 12 outlines that land may be used as an airport in two Mobile districts: Industrial-1 and Industrial-2.

22.6 MAA Policies

In June 2019, the MAA adopted *Minimum Standards for Commercial Aviation Operations* and a standard *Leasing Policy*.

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[56] https://library.municode.com/al/mobile/codes/code_of_ordinances?nodeId=CICO_CH25GALILOMA.
[57] Google Earth, 2019.
[58] https://library.municode.com/al/mobile/codes/code_of_ordinances?nodeId=CICO_CH39OFMIPR_ARTIINGE_S39-6ENETFRSCDETROBMOET.

The FAA strongly encourages sponsors to adopt minimum standards for their airports, and the MAA *Minimum Standards for Commercial Aviation Operations*[59] applies to operators at both BFM and MOB. This document helps minimize the potential for federal grant obligation violations and is intended to "protect airport patrons from irresponsible, unsafe, or inadequate service for the protection of both the public and the established operator." Specific standards are outlined for FBOs, Specialized Aviation Service Operators, and commercial tenants. Also defined in the minimum standards are non-tenant operating permits, construction and site development standards, prequalification requirements, and the prohibition of Through-the-Fence activities.

The *Leasing Policy*[60] "ensures that leasing activities are consistent with Local, State, and Federal requirements." This document helps to safeguard compliance with FAA grant assurances and other governing entities. The *Leasing Policy* applies to property leasing at BFM, MOB, and Mobile Aeroplex at Brookley.

[59] https://www.mobileairportauthority.com/mra/uploads/maa-rules-&-regulations-(app.-12.11.18)(ld1).pdf.
[60] https://www.mobileairportauthority.com/mra/uploads/mobile-airport-authority-leasing-policy-2019.pdf.

Leigh|Fisher

in association with
Hanson Professional Services, Inc.
Corporate Environmental Risk Management, LLC
Jacobsen|Daniels
MPACT Public Affairs Consulting
Quantum Spatial, Inc.

TECHNICAL MEMORANDUM No. 2 – AVIATION DEMAND FORECASTS

MASTER PLAN

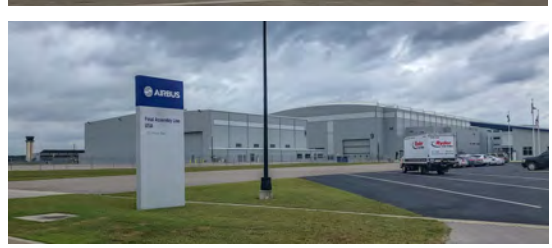
Mobile Downtown Airport

Prepared for

Mobile Airport Authority
Mobile, Alabama

July 2020

Mobile Airport Authority



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ACRONYMS AND ABBREVIATIONS

Term	Definition
A300	Airbus A300F4-600 aircraft
BFM	Mobile Downtown Airport
Catchment Area	The area extending approximately 120 miles from the Mobile Downton Airport and Mobile Regional, into southern Mississippi to the west and northwestern Florida to the east; includes the Pensacola-Ferry Pass Combined Statistical Area
CSA	Combined Statistical Area
DOT	U.S. Department of Transportation
FAA	Federal Aviation Administration
FedEx	FedEx Corporation
GDP	Gross Domestic Product
GPT	Gulfport-Biloxi International Airport
Gulfport MSA	Gulfport-Biloxi Metropolitan Statistical Area
LCCs	Low-Cost Carriers
MOB	Mobile Regional Airport
Mobile CSA:	The Mobile-Daphne-Fairhope, Alabama Combined Statistical Area, which encompasses the Alabama counties of Baldwin, Mobile, and Washington
MSA	Metropolitan Statistical Area
MSY	Louis Armstrong New Orleans Airport
Pensacola CSA	Pensacola-Ferry Pass Combined Statistical Area
PNS	Pensacola International Airport
TAF	Federal Aviation Administration Terminal Area Forecast
TSA	Transportation Security Administration
VHB	Vanasse Hangen Brustlin, a civil engineering and design consulting firm
VPS	Destin-Fort Walton Beach Airport

1. INTRODUCTION

This document provides economic forecasting for the Mobile Regional Airport (MOB) and Mobile Downtown Airport (BFM), both owned and operated by the Mobile Airport Authority (MAA). To generate economic forecasts for these airports, this document focuses on a variety of factors contributing to airport activity, including the demographic and economic profile of the surrounding region; historical airline service and traffic; and key factors that affect future airline traffic.

In light of the rapidly evolving situation related to the COVID-19 virus and its impact on global aviation, the aviation activity forecasts described herein are characterized by a high degree of uncertainty. Actual results may vary from the projections and forecasts, and the variance could be material.

2. AIRPORT SERVICE REGION

MOB and BFM are located on the United States Gulf Coast in Southern Alabama. The primary airport service region, as defined for the purpose of this report, is the Mobile-Daphne-Fairhope, Alabama Combined Statistical Area (the Mobile CSA) encompassing the Alabama counties of Baldwin, Mobile, and Washington. A broader secondary airport service region—defined as the "Catchment Area" in the Mobile Metropolitan Airport System Study completed by Vanasse Hangen Brustlin (VHB) in 2018—extends approximately 120 miles from the airports into southern Mississippi to the west and northwestern Florida to the east. The Catchment Area includes the Pensacola-Ferry Pass CSA (Pensacola CSA) and the Gulfport-Biloxi Metropolitan Statistical Area (Gulfport MSA). Figure 2.1 shows the primary and secondary airport service regions.

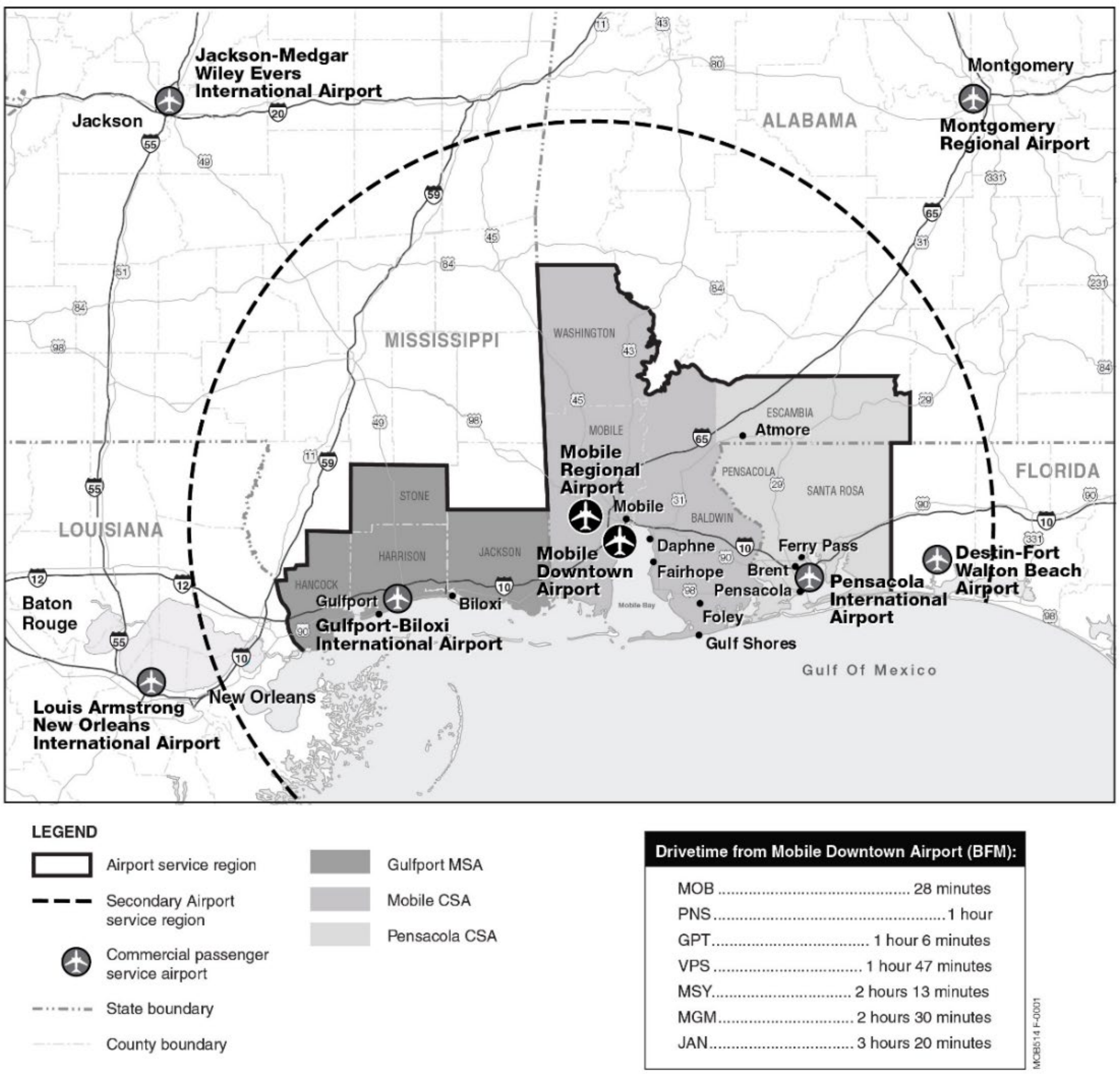


Figure 2.1: Airport Service Region: Mobile Regional and Mobile Downtown Airports

MOB and BFM are the only commercial service airports located within the primary airport service region. In July 2019, MOB had an average of 18 daily departures to four destinations, while BFM averaged less than one daily departure (five weekly departures) to two destinations. Over time, however, all commercial airline service at MOB is planned to shift to BFM, while MOB will focus on general aviation, cargo, and military activity. Other commercial service airports located within the secondary airport service region include the following:

- Pensacola International Airport (PNS): Located approximately one hour from downtown Mobile, PNS is a small-hub airport that averaged 45 daily departures to 20 destinations in July 2019.
- Gulfport-Biloxi International Airport (GPT): Located just over one hour from downtown Mobile, GPT is a non-hub airport that averaged 13 daily departures to seven destinations in July 2019.
- Fort Walton Beach Airport (VPS): Nearly two hours from downtown Mobile, VPS is a small-hub airport that averaged 36 daily departures to 37 destinations in July 2019.
- Louis Armstrong New Orleans Airport (MSY): Located more than two hours from downtown Mobile and just outside of the secondary service area, MSY is a medium-hub airport that saw an average of 161 daily departures to 49 destinations in July 2019.

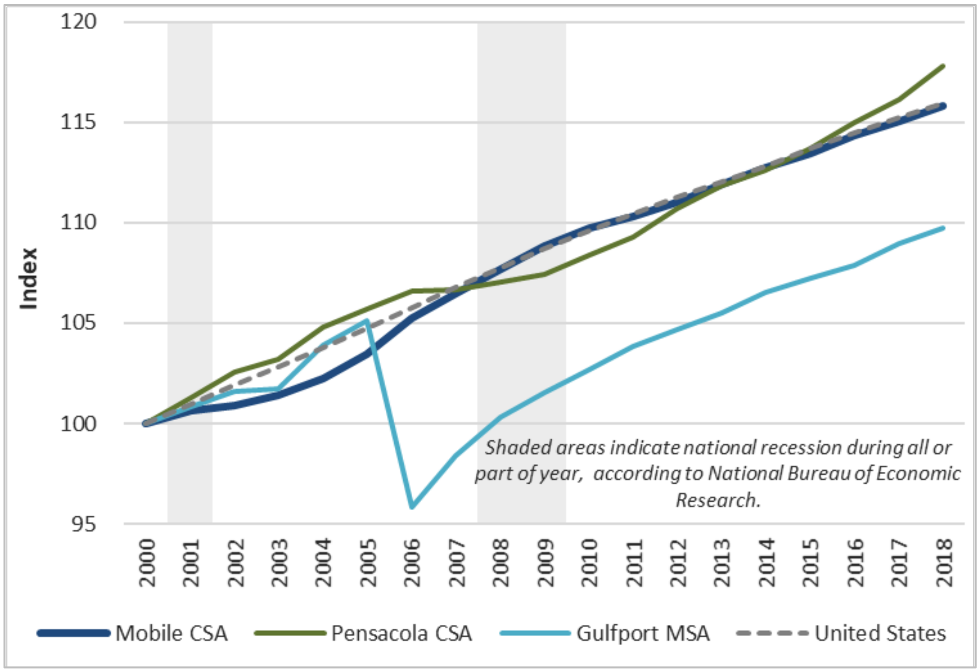
3. DEMOGRAPHIC AND ECONOMIC PROFILE

The population and economy of an airport's service region are the primary determinants of that airport's originating passenger numbers. The demographic variables with the strongest influence on airline travel demand include the region's population, employment, and per capita income. Population growth increases the number of potential travelers, while increases in employment and income raise the propensity to travel by air. Business travel and tourism also play a significant role in generating travel demand to and from the airport service region.

The Mobile CSA has a diverse economic base and is a center for aviation and aerospace, chemical, healthcare, high-tech, logistics, oil and gas, and shipbuilding industries. The Port of Mobile is a major deep-water maritime port which handled 26.8 million tons of cargo in 2018. Additionally, befitting its coastal location, the Mobile CSA is a leisure destination, containing beach vacation locales such as Gulf Shores and Dauphin Island.

3.1 Population

Population growth is a key factor influencing the demand for airline travel. Figure 3.1 shows that the population of the Mobile CSA grew an average of 0.8% annually between 2000 and 2018—an increase that was identical to the national average.



Population	2000	2007	2010	2018
United States	282,162,411	301,231,207	309,326,085	327,167,434
Mobile CSA	559,516	595,610	614,057	648,157
Pensacola CSA	451,410	481,390	489,291	531,631
Gulfport MSA	379,061	373,053	389,303	415,978
Average annual percent increase (decrease)	**2000-2007**	**2007-2010**	**2010-2017**	**2010-2018**
United States	0.9%	0.9%	0.7%	0.8%
Mobile CSA	0.9	1.0	0.7	0.8
Pensacola CSA	0.9	0.5	1.0	0.9
Gulfport MSA	(0.2)	1.4	0.8	0.5

Notes: Values represent July 1 population estimates. Gulfport-Biloxi MSA trends reflect the effect of Hurricane Katrina in 2005.

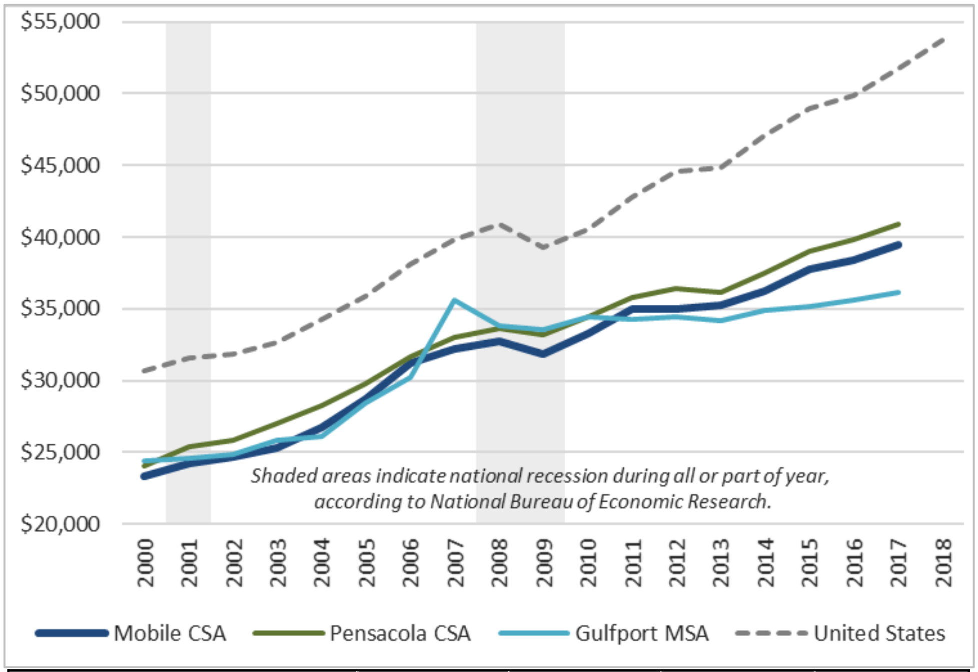
Sources: U.S. Department of Commerce Bureau of the Census. (September 2019). Retrieved from www.census.gov.

Figure 3.1: Comparative Index of Population Trends

Sources: U.S. Department of Commerce Bureau of Economic Analysis. (September 2019). Retrieved from www.bea.gov.

3.2 Per Capita Income

Figure 3.2 shows that per capita income trends in the Mobile CSA have generally mirrored nationwide trends since 2000, albeit at a lower level. In 2017 (the most recent year Mobile CSA income data was available), per capita income in the Mobile CSA was 24% lower than the national average. It is worth noting, however, that the Mobile CSA also has a lower cost of living than the national average.



Per Capita Personal Income	2000	2007	2010	2018 *(a)*
United States	30,657	39,844	40,546	53,712
Mobile CSA	23,302	32,222	33,300	39,461
Pensacola-Ferry Pass CSA	24,014	33,012	34,417	40,894
Gulfport MSA	24,414	35,600	34,423	36,175
Average annual percent increase (decrease)	**2000-2007**	**2007-2010**	**2010-2017 *(b)***	**2000-2017 *(c)***
United States	3.8%	0.6%	3.6%	3.0%
Mobile CSA	4.7	1.1	2.5	3.1
Pensacola CSA	4.7	1.4	2.5	3.2
Gulfport MSA	5.5	(1.1)	0.7	2.3

Sources: U.S. Department of Commerce Bureau of Economic Analysis. (September 2019). Retrieved from www.bea.gov.

Notes: Gulfport-Biloxi MSA trends reflect the effect of Hurricane Katrina in 2005. In September 2018, the Office of Budget and Management issued a bulletin updating MSA and CSA delineations. The per capita income shown here uses delineations as of April 2018, as a result, the Mobile CSA excludes Washington County and the Gulfport MSA excludes Stone County.

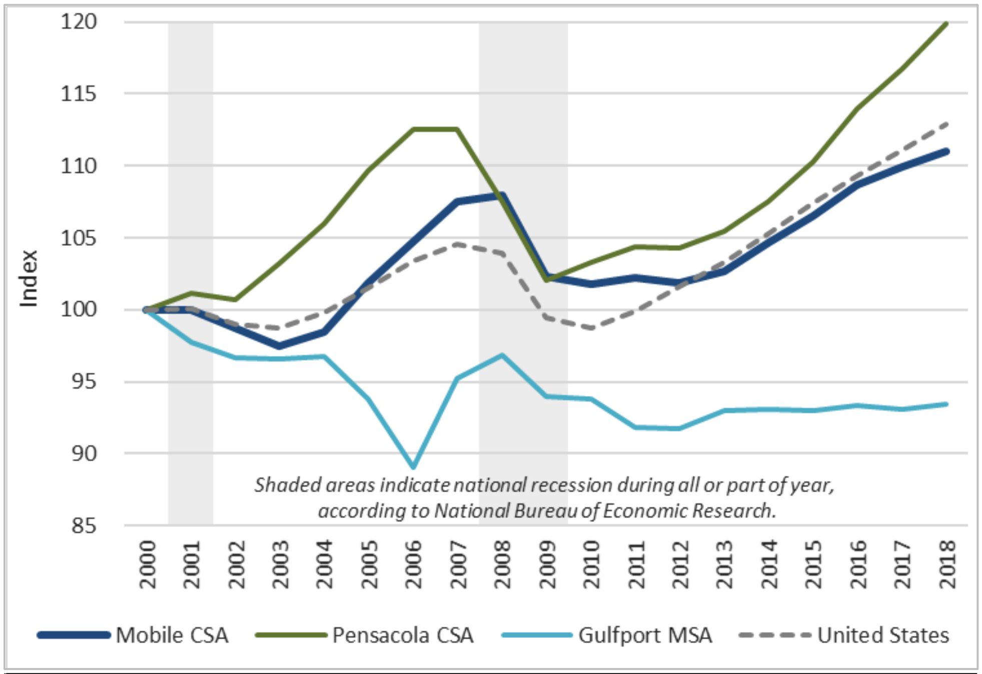
(a) Per capita personal income for MSAs and CSAs is for 2017, the most recent data available.
(b) The percentage shown for MSAs and CSAs is for 2010-2017.
(c) The percentage shown for MSAs and CSAs is for 2000-2017.

Figure 3.2: Per Capita Personal Income

3.3 Employment

Employment in the Mobile CSA increased an average of 0.6% per year between 2000 and 2018; this rate is nearly identical to the national average of 0.7% during the same time period (see Sources: U.S. Department of Commerce Bureau of Economic Analysis. (September 2019). Retrieved from www.bea.gov.

). By 2016, employment in the Mobile CSA had rebounded to exceed the peak reached before the economic recession of 2007-2009, and by 2018 was 3% above its pre-recessionary level.



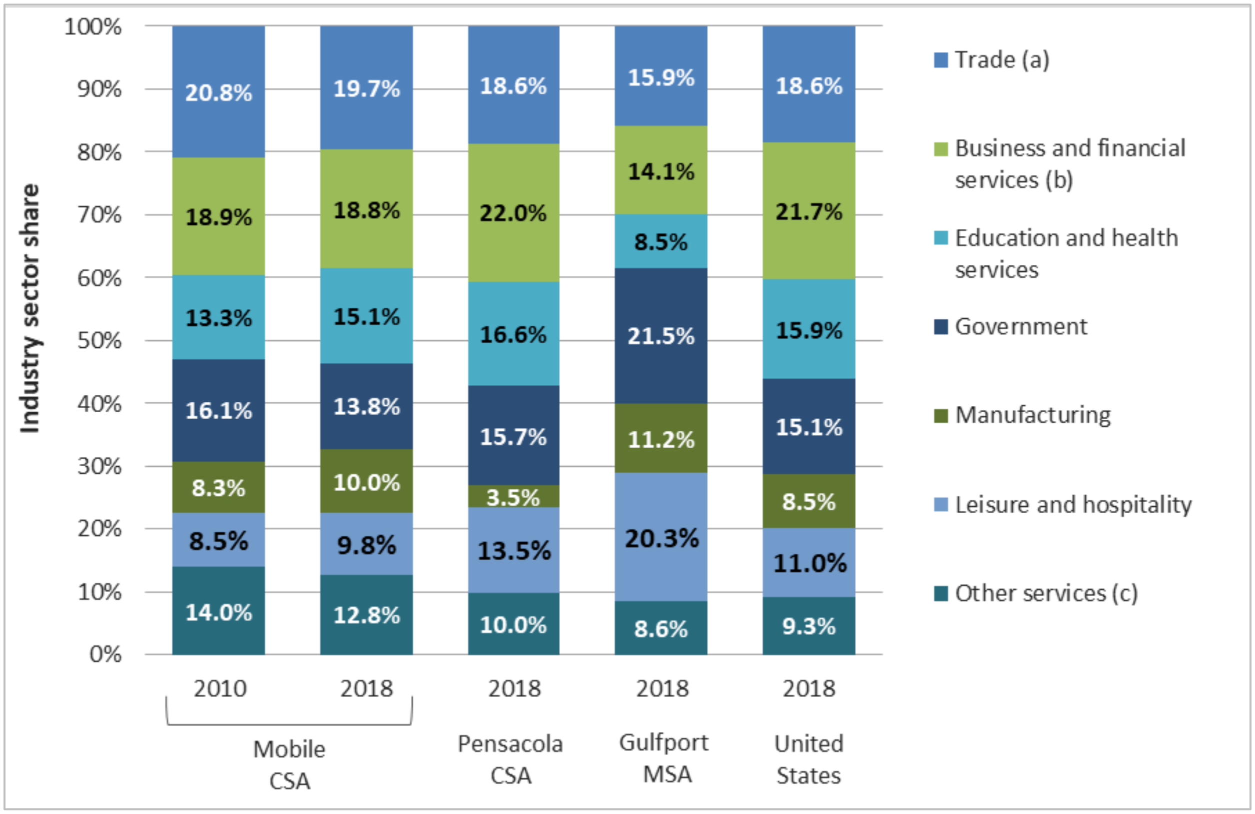
Employment	2000	2007	2010	2018
United States	132,024	137,999	130,362	149,074
Mobile CSA	236	254	241	262
Pensacola CSA	152	171	157	182
Gulfport MSA	166	158	156	155
Average annual percent increase (decrease)	**2000-2007**	**2007-2010**	**2010-2017**	**2010-2018**
United States	0.6%	(1.9%)	1.7%	0.7%
Mobile CSA	1.0	(1.8)	1.1	0.6
Pensacola CSA	1.7	(2.8)	1.9	1.0
Gulfport MSA	(0.7)	(0.5)	(0.0)	(0.4)

Sources: U.S. Department of Commerce Bureau of Economic Analysis. (September 2019). Retrieved from www.bea.gov.

Notes: Gulfport-Biloxi MSA trends reflect the effect of Hurricane Katrina in 2005.
In September 2018, the Office of Budget and Management issued a bulletin updating MSA and CSA delineations. The per capita income shown here uses delineations as of April 2018, as a result, the Mobile CSA excludes Washington County and the Gulfport MSA excludes Stone County. Additionally, the Pensacola CSA excludes Escambia, AL, due to availability of data. Excludes non-civilian military and classified government employees.

Figure 3.3: Comparative Index of Non-Agricultural Employment (2000 = 100)

Figure 3.4 shows a comparative distribution of nonagricultural employment by industry sector for the Mobile CSA in 2010 and 2018, and for the Pensacola CSA, the Gulfport MSA, and the nation in 2018. In the Mobile CSA, the trade sector accounted for the largest share of employment in 2018, with 19.7% of total employment. Business and financial services accounted for the second largest share of nonagricultural employment in 2018 with 18.8% of total employment. As the figure below illustrates, the Mobile CSA has a higher percentages of jobs in trade, manufacturing, and other services than the United States overall.



Source: U.S. Department of Labor Bureau of Labor Statistics. (September 2019). Retrieved from www.bls.gov.

Notes: In September 2018, the Office of Budget and Management issued a bulletin updating MSA and CSA delineations. The per capita income shown here uses delineations as of April 2018, as a result, the Mobile CSA excludes Washington County and the Gulfport MSA excludes Stone County. Additionally, the Pensacola CSA excludes Escambia, AL, due to availability of data.
Excludes non-civilian military and classified government employees.

(a) Includes trade, transportation, and public utilities.
(b) Includes professional and business services, financial activity, and information.
(c) Includes mining and construction and other services.

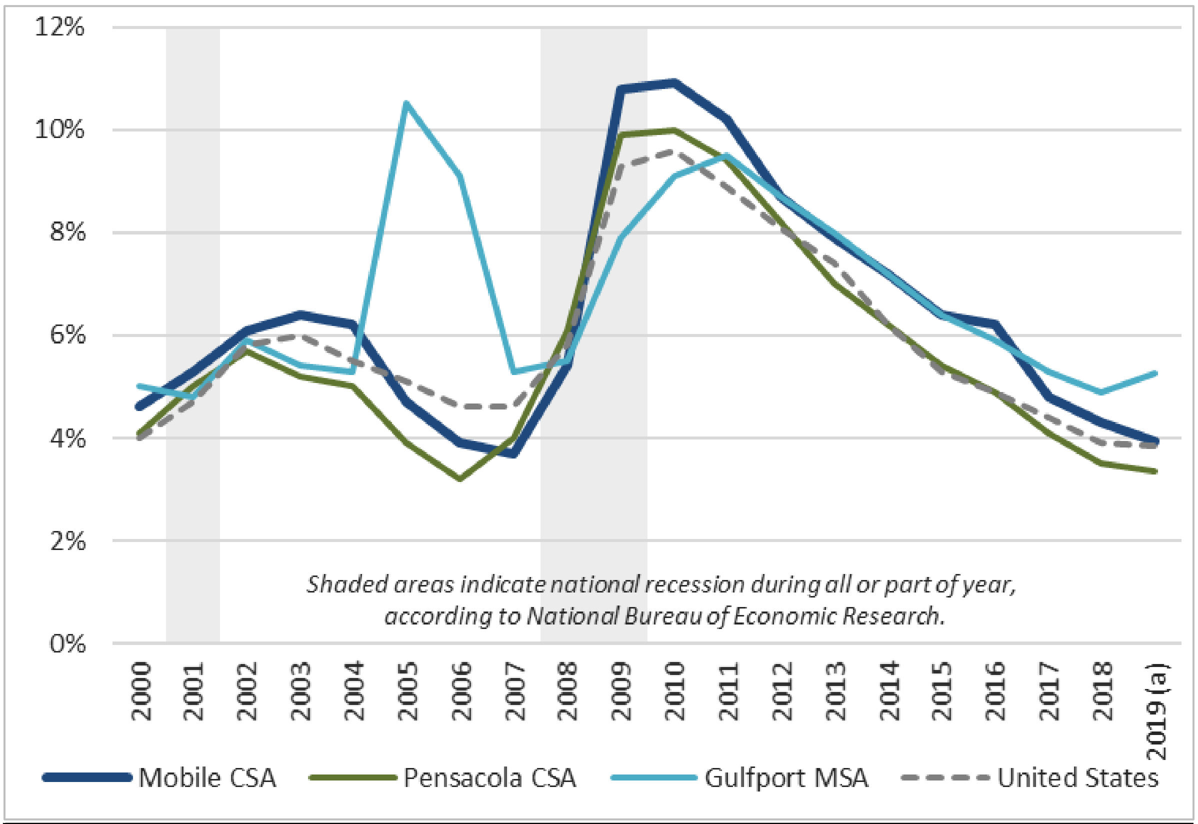
Figure 3.4: Comparative Distribution of Non-Agricultural Employment

3.4 Unemployment Rate

Unemployment in the Mobile CSA has varied from the national average by no more than 1.5 percentage points in every year since 2000 (see Sources: U.S. Department of Labor Bureau of Labor Statistics website. (September 2019). "Current Population Survey and Local Area Unemployment Statistics." Retrieved from www.bls.gov.

Notes: Values represent seasonally unadjusted unemployment rates.
Gulfport-Biloxi MSA trends reflect the effect of Hurricane Katrina in 2005.
(a) 2019 data represents average for January – July 2019.

Figure 3.5). In the first seven months of 2019, unemployment in the Mobile CSA was 3.9%, compared to 3.8% in the nation.



Unemployment rate	2000	2007	2010	2019 *(a)*
United States	4.0%	4.6%	9.6%	3.8%
Mobile CSA	4.6	3.7	10.9	3.9
Pensacola CSA	4.1	4.0	10.0	3.4
Gulfport MSA	5.0	5.3	9.1	5.3

Sources: U.S. Department of Labor Bureau of Labor Statistics website. (September 2019). "Current Population Survey and Local Area Unemployment Statistics." Retrieved from www.bls.gov.
Notes: Values represent seasonally unadjusted unemployment rates.
Gulfport-Biloxi MSA trends reflect the effect of Hurricane Katrina in 2005.
(b) 2019 data represents average for January – July 2019.

Figure 3.5: Civilian Unemployment Rate

3.5 Economic Outlook

The Congressional Budget Office forecasts real GDP growth of 2.3% in 2019, and an average of 1.7% per year thereafter.[1] Continued U.S. economic growth will depend on many factors, including: stable financial and credit markets; a stable value of the U.S. dollar versus other currencies; stable energy and other commodity prices; the ability of the federal government to reduce historically high fiscal deficits; inflation remaining within the range targeted by the Federal Reserve System; and growth in the economies of foreign trading partners.

The University of Alabama forecasts the population of the Mobile CSA to increase an average of 0.7% per year, between 2018 and 2030,[2] the same as the national growth rate forecast by the Census Bureau over the same period,[3] and in line with historical population growth in the Mobile CSA, which averaged 0.8% between 2000 and 2018.

[1] Congressional Budget Office. (2019). The Budget and Economic Outlook: 2019 to 2029, Retrieved from https://www.cbo.gov/system/files/2019-03/54918-Outlook-3.pdf.

2 Center for Business and Economic Research at The University of Alabama Culverhouse College of Business. (2019). Alabama Economic Outlook 2019.

3 U.S. Department of Commerce, Bureau of the Census. (September 2018). 2017 National Population Projections 2016-60. Retrieved from www.census.gov.

4. HISTORICAL AIRLINE SERVICE AND TRAFFIC

While the previous section described factors affecting demand for airline travel within the airport service region, this section considers how factors such as airline service and airfares affect the realization of that demand in the form of passenger traffic. Additionally, this section discusses passenger leakage and trends in aircraft operations.

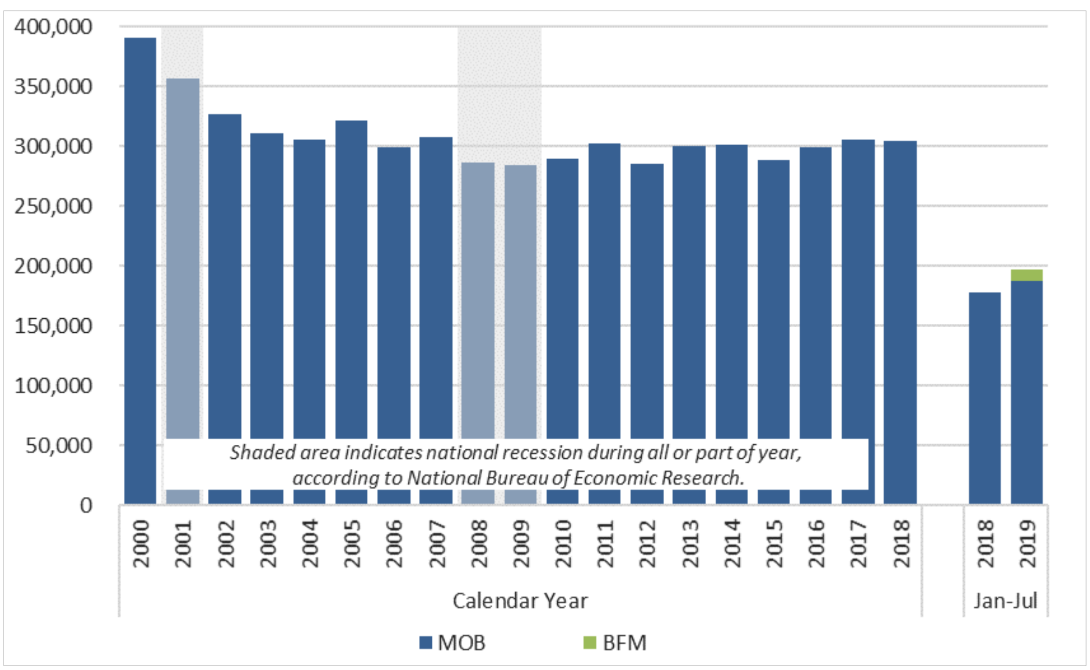
4.1 Enplaned Passenger Trends

Enplaned passenger numbers at MOB decreased following the September 2001 attacks and the 2001 and 2007-2009 economic recession. Although there has been some annual variation, enplaned passenger numbers have averaged approximately 300,000 per year since 2003.

At BFM, no historical passenger data is available prior to May 2019, as Frontier Airlines' arrival in that month marked the first commercial service at BFM since the 1980s. Via Airlines also moved its operations from MOB to BFM in May 2019 before ceasing its service shortly thereafter in June 2019.

In the first seven months of 2019, the number of enplaned passengers at MOB and BFM together increased 5.2% due to increases from Delta Air Lines and American Airlines at MOB and the new Frontier Airlines service at BFM. In 2018, more than 98% of enplaned passengers originated or terminated their flights at MOB; 51% of these passengers were visitors to the area, while the remaining 49% were Mobile-area residents. Less than 2% of enplaned passengers made flight connections at MOB in 2018.

Figure 4.1 further details historical trends in enplaned passengers at MOB and BFM from 2000 to mid-2019.



Source: Mobile Airport Authority.

Figure 4.1: Enplaned Passenger Trends

4.1.1 Airlines Serving the Airport

As Table 4.1 demonstrates, as of July 2019 a total of seven passenger airlines served the Mobile airports. This includes one major airline and five regional airlines at MOB and one major airline at BFM.

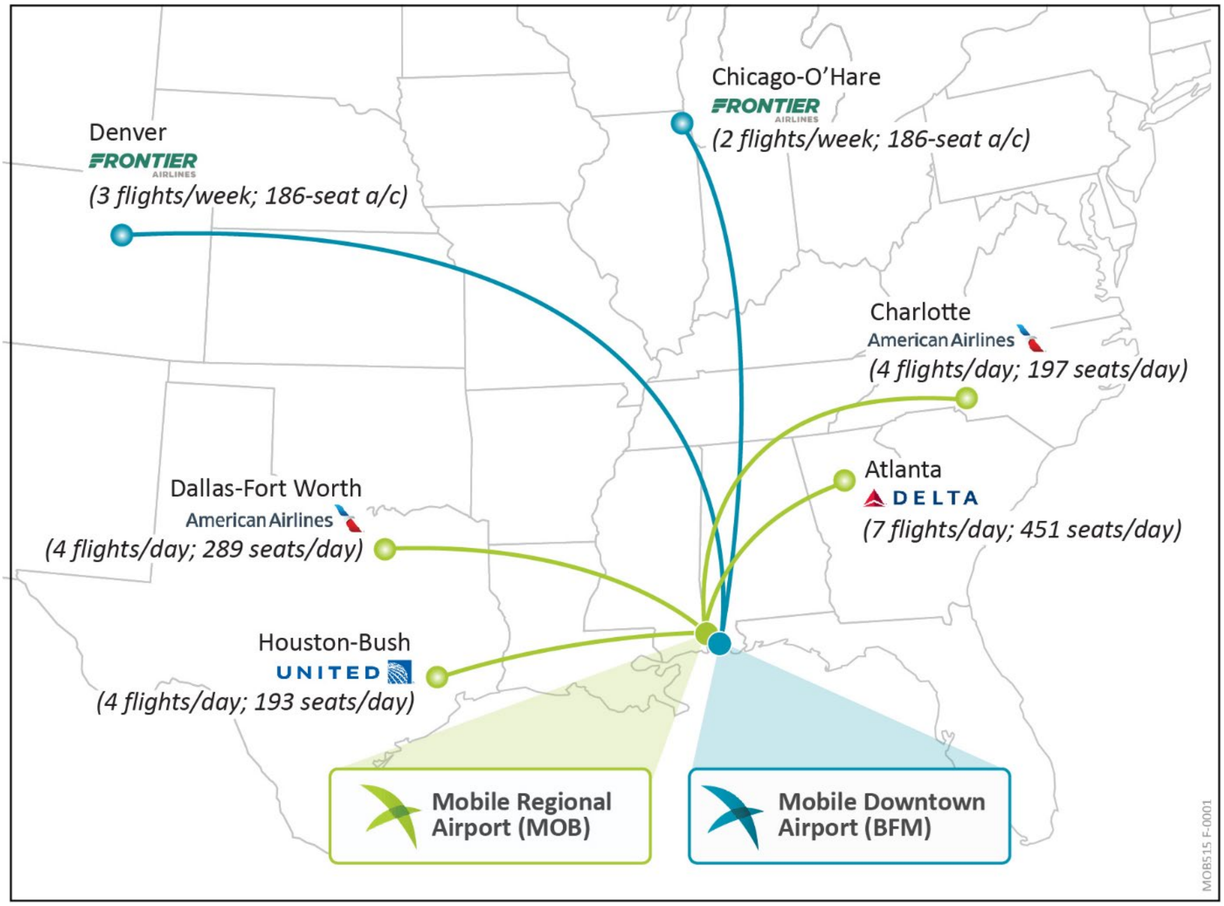
Table 4.1: Airlines Serving the Airports (as of July 2019): Mobile Regional and Mobile Downtown Airports

MOB	BFM
Major/National	
Delta Air Lines	Frontier Airlines
Regional/Commuter Airlines	
Mesa (AA, UA)	
Endeavor (DL)	
ExpressJet (UA)	
PSA (AA)	
SkyWest (DL, UA)	

Source: Mobile Airport Authority.
Note: AA = American, DL = Delta, UA = United.

4.1.2 Airline Service

Six destinations were served by scheduled nonstop flights from the Mobile airports in July 2019, including four destinations from MOB and two from BFM. Figure 4.2 below shows these flight routes and destinations.



Sources: OAG Aviation Worldwide Ltd. OAG Analyser Database, accessed August 2019.

Figure 4.2: Destinations with Scheduled Nonstop Roundtrip Passenger Service (as of July 2019)
Mobile Regional and Mobile Downtown Airports

4.1.3 Passenger Traffic by Airline

In 2018, Delta Air Lines enplaned 43.3% of all passengers at MOB—less than its 2010 share total of 56.4%. American Airlines accounted for the second largest share at MOB in 2018 with 34.7%, followed by United Airlines with 21.5%. Via Airlines, which served MOB from May 2018 to April 2019, enplaned less than .5% of passengers that year.

At BFM, Frontier Airlines began service in May 2019 and enplaned 9,400 passengers that year. BFM's 2019 enplaned passenger counts were unavailable for Via Airlines, which served BFM from May to June 2019 and ceased service in the Mobile area in June 2019.

In the first seven months of 2019, Delta enplaned 41.8% of total enplaned passengers at the two Mobile airports together, followed by American Airlines (35.2%), United Airlines (18.0%), and Frontier Airlines (4.8%).

Table 4.2 shows a breakdown of enplaned passengers by airline at each of the Mobile airports.

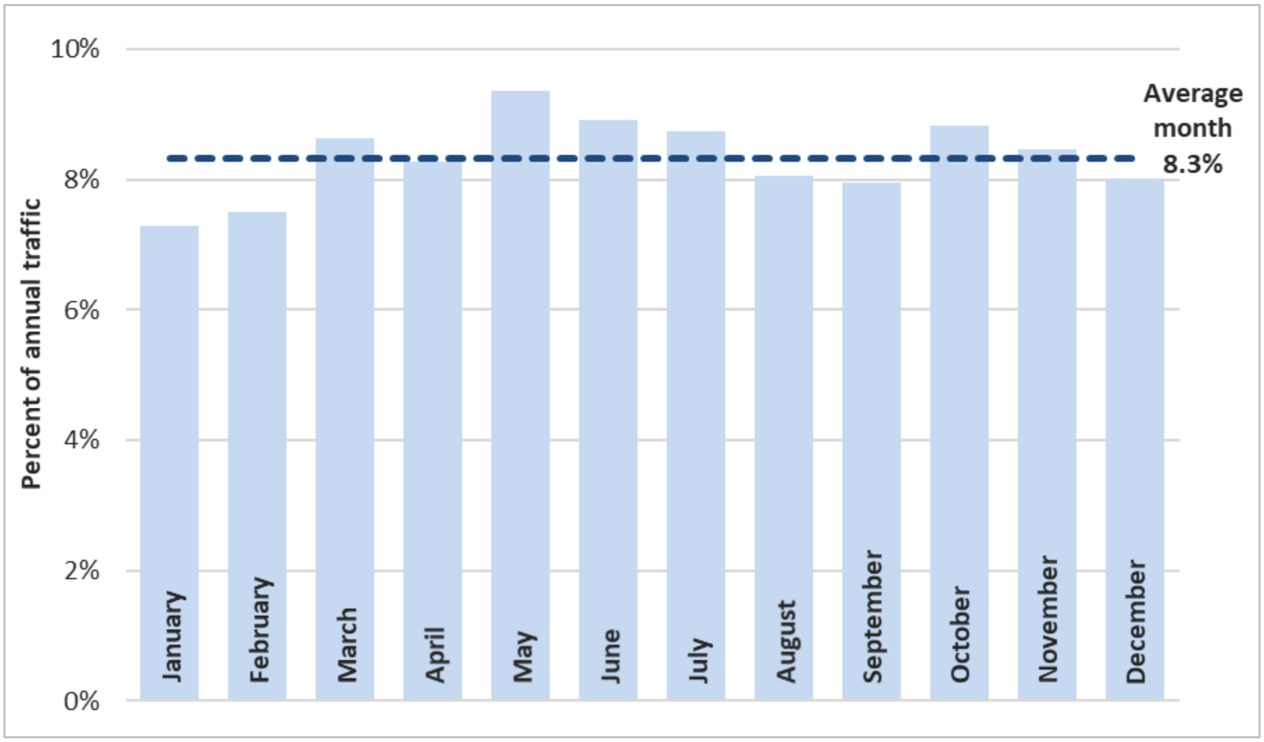
Table 4.2: Airline Shares of Total Enplaned Passengers

	Calendar years			YTD (January - July)		2019 YTD share of 2-airport
Airline	2010	2015	2018	2018	2019	total
MOB						
Delta	163,110	130,562	131,698	76,629	82,286	41.8%
American	68,918	84,881	105,487	61,390	69,187	35.2
United	57,127	72,804	65,302	39,575	35,432	18.0
Via Air	--	--	1,384	497	408	0.2
MOB Total	289,155	288,247	303,871	178,091	187,313	95.2%
BFM						
Frontier	--	--	--	--	9,400	4.8%
Via Air	--	--	--	--	n.a.	n.a.
BFM Total	--	--	--	--	9,400	4.8%
Mobile airports total	289,155	288,247	303,871	178,091	196,713	100.0%
	Share of total					
MOB						
Delta	56.4%	45.3%	43.3%	43.0%	43.9%	
American	23.8	29.4	34.7	34.5	36.9	
United	19.8	25.3	21.5	22.2	18.9	
Via Air	--	--	0.5	0.3	0.2	
MOB Total	100.0%	100.0%	100.0%	100.0%	100.0%	

Source: Mobile Airport Authority, 2019.
Notes: Columns may not add to totals shown because of rounding.
Passengers reported by regional affiliates are grouped with their respective code-sharing partners.
Enplaned passenger counts for Via Air at BFM were unavailable.

4.1.4 Passenger Seasonality

As shown in Figure 4.3, passenger traffic at MOB is relatively stable throughout the year and tends to fluctuate only slightly above and below the monthly average. Historically, May has been the peak month for enplaned passengers at MOB, accounting for an average of 9.4% of annual enplaned passengers.



Source: Mobile Airport Authority.

Figure 4.3: Monthly Variation of Enplaned Passengers (2014 through 2018)
Mobile Regional Airport

4.1.5 Leakage and Competing Airports

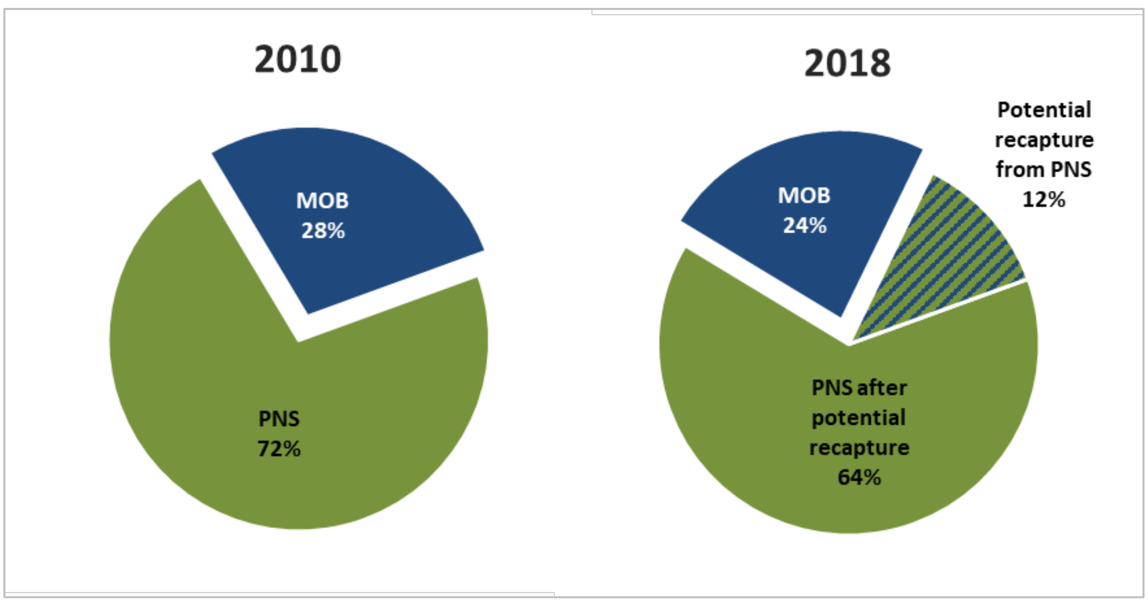
The term *leakage* refers to when passengers opt to use an airport more distant from their ultimate origin or destination to take advantage of greater breadth of air service, lower airfares, more convenient ground access, or other factors. In the Mobile area, local airports experience leakage as passengers traveling to or from the primary and secondary airport service regions have their choice of airports. In addition to MOB and BFM, several airports are within a roughly two-hour drive from downtown Mobile, including Pensacola International Airport (PNS) in Pensacola, Florida; Fort Walton Beach Airport (VPS) in Fort Walton Beach, Florida; Gulfport-Biloxi International Airport (GPT) in Gulfport, Mississippi; and Louis Armstrong New Orleans Airport (MSY) in New Orleans, Louisiana.

According to an analysis of Airlines Reporting Corporation data by VHB contained within the Mobile Metropolitan Airport System Study completed in 2018, PNS accounts for the greatest amount of leakage from the primary airport service region.[4] Recent analysis suggests that 16% of tickets purchased for travel via PNS were by Alabama travelers—the highest percentage from any state other than Florida.[5]

The planned shift of commercial service 15 miles east from MOB to BFM—which is closer to Baldwin county within the primary airport service region and closer to competing PNS—can reasonably be assumed to lead to some degree of recapture of current passenger leakage to PNS. Such recapture would lead to a higher volume of passengers at BFM, in turn supporting a broader air service offering (i.e., additional flight frequencies and destinations). It is assumed in this report that a relocation of commercial passenger service from MOB to BFM would not recapture traffic from any airports other than PNS.

Figure 4.4 illustrates the share that MOB accounts for of the combined Mobile-Pensacola airport region, which is the leakage recapture region comprised of MOB, BFM, and PNS). In 2018, 24% of passengers enplaned at MOB (down from 28% in 2010), while the remaining 77% enplaned at PNS.

Once BFM absorbs all commercial service and passengers currently flying though MOB, it could recapture 16% of PNS's enplaned passengers, which amounted to 12% of the leakage recapture region total in 2018. If this were to happen, BFM could potentially grow to accommodate more than one-third of passenger traffic in this broader region.



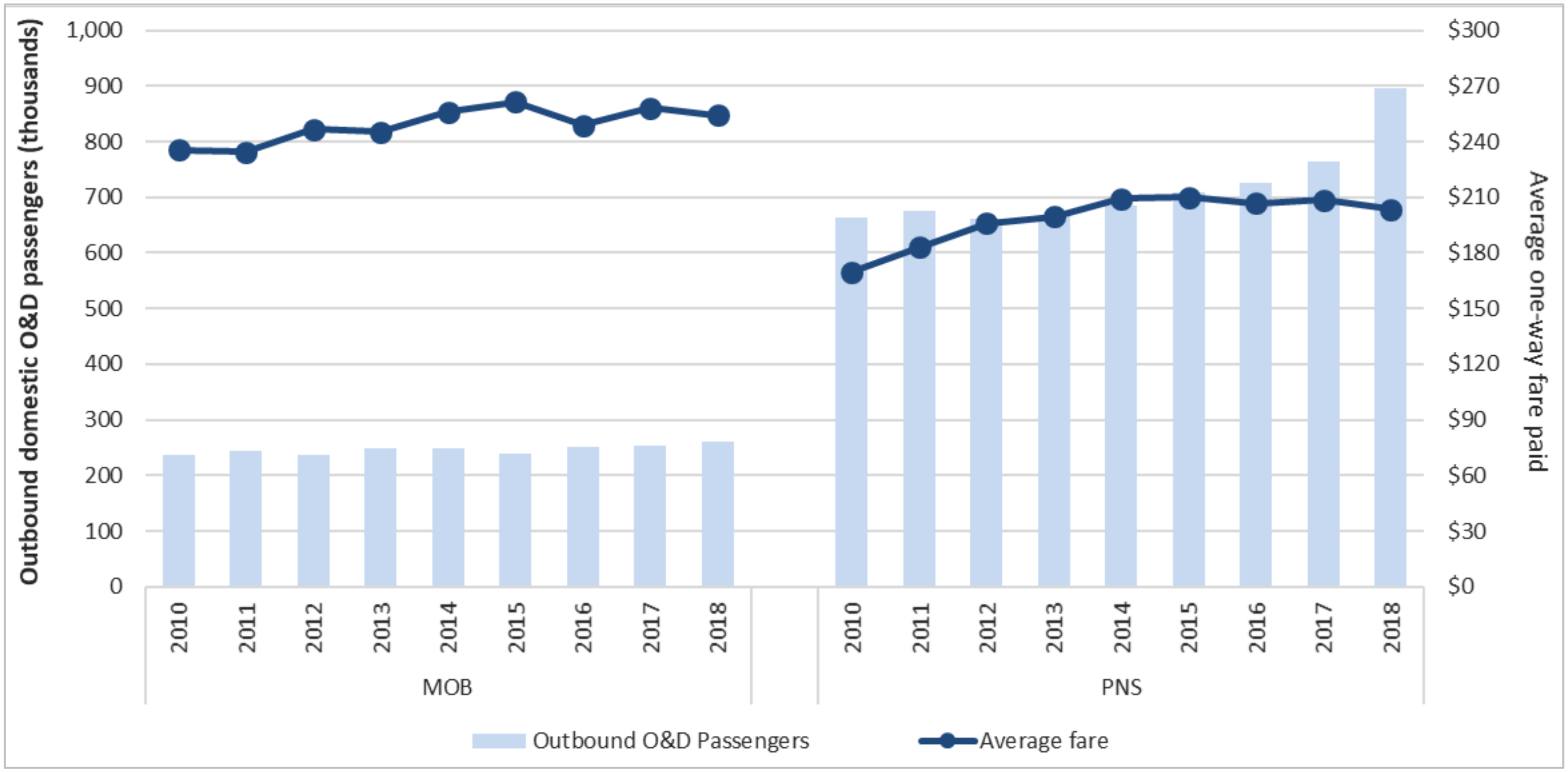
Sources: Mobile Airport Authority; Pensacola International Airport records.
Note: There were no passengers reported for BFM in 2010 or 2018; scheduled service at BFM began in May 2019.

Figure 4.4: Share of Enplaned Passengers Mobile Regional and Pensacola International Airports

4Vanasse Hangen Brustlin, Mobile Metropolitan Airport Systems Study (May 31, 2018).
5 Sharp, J. (May 21, 2019). "Business or pleasure? Mobile Downtown airport seeks its niche in state, along Gulf Coast." AL.com. Retrieved from: https://www.al.com/business/2019/05/business-or-pleasure-mobile-downtown-airport-seeks-its-niche-in-state-along-gulf-coast.html.

Figure 4.5 shows that, from 2010 to 2018, average domestic airfares were substantially higher at MOB than at PNS. Over the eight-year period, the distance traveled by domestic originating passengers at MOB has averaged only 4% longer than at PNS, meaning that differences in average airfares at the two airports do not result simply from passengers traveling different distances. The greater degree of airline competition, including a higher concentration of low-cost carriers (LCCs) at PNS help explain this airfare difference. In July 2019, 88% (32,400) of scheduled departing seats on LCCs in the Mobile-Pensacola airport region departed from PNS, which has service by Frontier Airlines and Southwest Airlines, while the remaining 12% (4,300) departed from BFM, which has service by Frontier Airlines; MOB is not currently served by any LCC.

As shown in Table 4.3, MOB and PNS's combined top 15 domestic passenger markets accounted for 49.6% of domestic originating passengers at MOB and PNS combined during 2018. Houston is the top domestic market for MOB, accounting for 7.1% of MOB's domestic originating passengers, while Washington D.C., MOB's fifth-largest market, is the top domestic market for both PNS (6.1% of total) and the broader Mobile-Pensacola airport region (5.7%). The Mobile airports together have nonstop service to six markets as of July 2019. These markets each rank among the largest domestic-originating markets, and three are the largest markets from MOB: Houston, TX; Atlanta, GA; and Dallas/Fort Worth, TX. Nonstop service was provided from PNS to 13 of the largest 15 domestic originating markets in July 2019. Five of the largest domestic originating markets have service by more than one airline from PNS, while none of the markets have service from MOB or BFM by more than one airline.



Source: U.S. Department of Transportation. *Air Passenger Origin-Destination Survey*, reconciled to Schedule T100, 2019.
Notes: There were no passengers reported for BFM in 2010-2018; scheduled service at BFM began in May 2019.
Average one-way fares are net of all taxes, fees, and PFCs, and exclude ancillary fees charged by the airlines.

Figure 4.5: Domestic Originating Enplaned Passengers and Average Fare Paid
Mobile Regional and Pensacola International Airports

Table 4.3: Domestic Originating Patterns and Airline Service (July 2019 and calendar year 2018)
Mobile Regional, Mobile Downtown, and Pensacola International Airports

		Air miles from	Percent of domestic originating passengers in CY 2018			Average daily scheduled nonstop departures in July 2019					Number of airlines				
						Mobile Airports					Mobile Airports				
Rank	Market	MOB	MOB	PNS	Total	MOB	BFM	Total	PNS	Total	MOB	BFM	Total	PNS	Total
1	Washington D.C. *(a)*	742	4.3%	6.1%	5.7%	-	-	-	2.1	2.1	--	--	--	1	1
2	Dallas/Fort Worth *(b)*	464	5.5	5.0	5.1	3.7	-	3.7	7.0	14.4	1	--	1	2	2
3	Chicago *(c)*	671	3.9	4.9	4.7	-	0.3	0.3	2.8	3.4	--	1	1	4	4
4	Houston *(d)*	371	7.1	3.6	4.4	3.7	-	3.7	5.3	12.7	1	--	1	2	2
5	Denver	974	1.9	4.3	3.8	-	0.5	0.5	0.9	1.8	--	1	1	3	3
6	New York *(e)*	919	4.6	3.5	3.8	-	-	-	1.0	1.0	--	--	--	1	1
7	Atlanta	262	5.8	3.0	3.6	6.9	-	6.9	8.6	22.5	1	--	1	1	1
8	Nashville	335	0.7	4.2	3.4	-	-	-	2.1	2.1	--	--	--	1	1
9	Los Angeles *(f)*	1,524	3.4	2.5	2.7	-	-	-	-	-	--	--	--	--	--
10	Charlotte	457	3.4	1.9	2.2	3.8	-	3.8	4.9	12.5	1	--	1	1	1
11	Miami	513	0.7	2.6	2.2	-	-	-	3.0	3.0	--	--	--	1	1
12	Orlando	387	1.1	2.4	2.1	-	-	-	1.7	1.7	--	--	--	1	1
13	Philadelphia	841	1.6	2.2	2.1	-	-	-	2.4	2.4	--	--	--	2	2
14	Kansas	606	1.3	2.1	1.9	-	-	-	0.3	0.3	--	--	--	1	1
15	San Diego	1,482	1.9	1.9	1.9	-	-	-	-	-	--	--	--	--	--
	Cities listed		47.2%	50.3%	49.6%	18.1	0.7	18.9	42.2	79.9	3	1	4	6	6
	Other cities		52.8	49.7	50.4	-	-	-	3.1	3.1	--	--	--	2	2
	All cities		100.0%	100.0%	100.0%	18.1	0.7	18.9	45.3	83.1	3	1	4	6	6

Note: There were no originating passengers reported for BFM in 2010 or 2018; scheduled service at BFM began in May 2019.

(a) Market includes Dulles, Reagan, and Baltimore airports.
(b) Market includes Dallas/Fort Worth Airport and Love Field.
(c) Market includes O'Hare and Midway airports.
(d) Market includes Hobby and Bush airports.
(e) Market includes LaGuardia, Newark, and Kennedy airports.
(f) Market includes Los Angeles, Burbank, Long Beach, Ontario, and Orange County airports.

Sources: U.S. Department of Transportation *Air Passenger Origin-Destination Survey*, reconciled to Schedule T100, 2019.
OAG Aviation Worldwide Ltd. OAG Analyser Database, accessed August 2019.

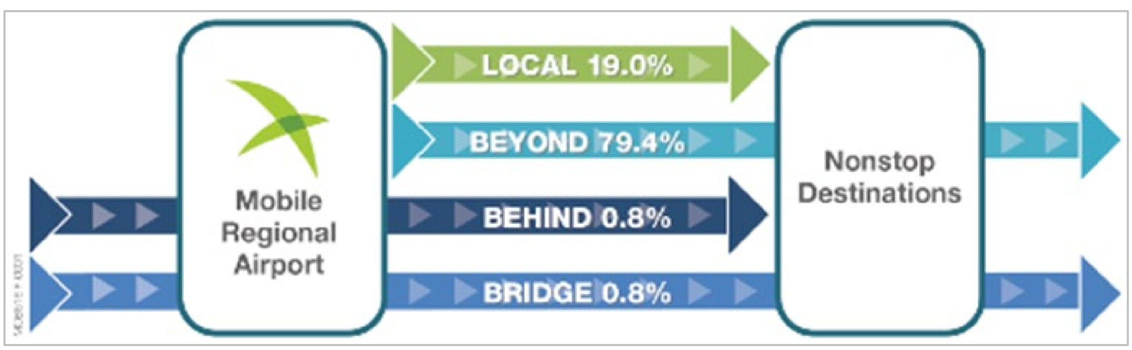
4.1.6 Passenger Itineraries by Nonstop Destination

In July 2019, MOB had scheduled nonstop service to four destinations: Hartsfield-Jackson Atlanta International Airport in (ATL) in Atlanta, Georgia; Charlotte Douglas International Airport (CLT) in Charlotte, North Carolina; Dallas/Fort Worth International Airport (DFW) in the Dallas-Fort Worth Metroplex of Texas; and George Bush Intercontinental Airport (IAH) in Houston, Texas. BFM had scheduled nonstop service to two destinations: Denver International Airport (DEN) in Denver, Colorado and O'Hare International Airport (ORD) in Chicago, Illinois.

Passengers departing from either Mobile airport on nonstop flights can be grouped into four categories:

1. Local Passengers: Passengers who originate trips at MOB and end them at ATL, making no connections during their trip (e.g., MOB-ATL)
2. Beyond Passengers: Passengers who originate trips at MOB and connect through ATL to other airports (e.g., MOB-ATL-JFK)
3. Behind Passengers: Passengers who originate trips at airports other than MOB and connect through MOB to ATL (e.g., DFW-MOB-ATL)
4. Bridge Passengers: Passengers who originate trips at airports other than MOB, make a connection through MOB to ATL, and then make an additional connection through ATL to other airports (e.g., DFW-MOB-ATL-JFK)

As seen in Figure 4.6, Beyond Passengers accounted for most passengers boarding nonstop flights at MOB (79%) in 2018, followed by Local Passengers (19%). By comparison, local traffic accounted for 28% of passengers at PNS in 2018. Behind and Bridge Passengers (i.e., passengers connecting through MOB) each accounted for 1%.



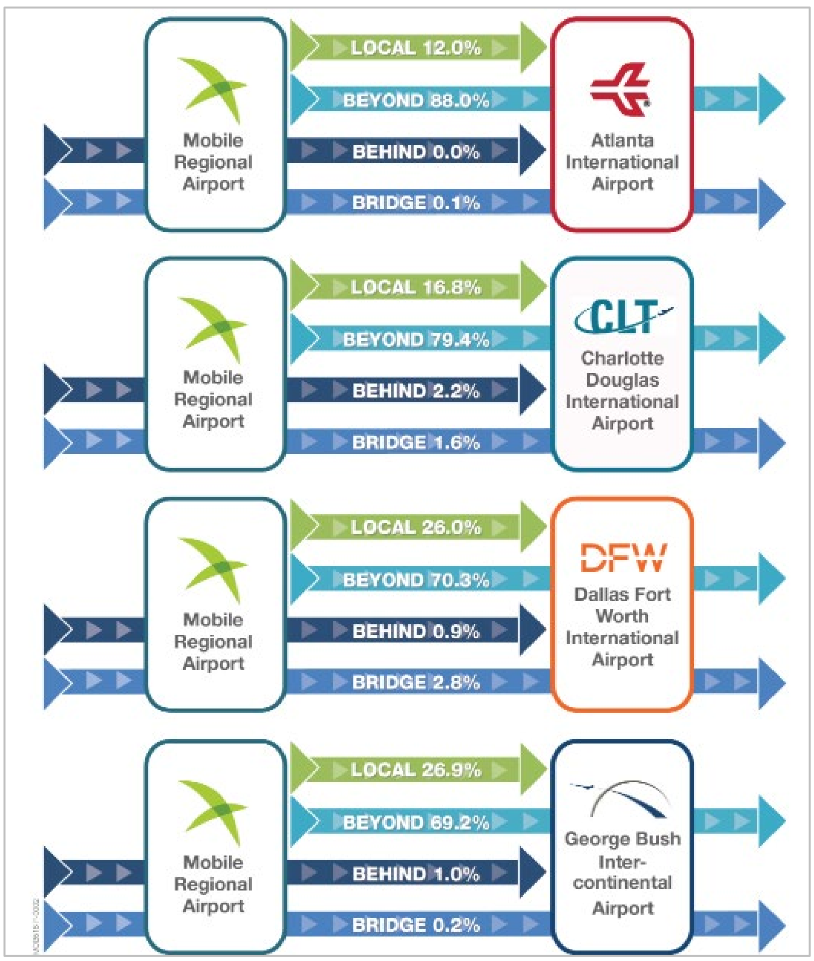
Source: U.S. Department of Transportation, *Air Passenger Origin-Destination Survey*, reconciled to Schedule T100.

Figure 4.6: Mobile Regional Airport Passenger Itineraries (2018)

Destinations without nonstop service from MOB are only reachable using Beyond flights. The three largest markets for Beyond Passengers at MOB—New York City; Washington, D.C.; and Los Angeles—each accounted for 4 to 5% of MOB's Beyond Passengers and were among the airport's largest domestic originating markets, as shown earlier in Table 4.3. While New York City and Washington, D.C. both have nonstop service from PNS, Los Angeles does not. Due to the standard delay in reporting this type of passenger data to the U.S. Department of Transportation (DOT), there is not yet any historical data available for BFM.

In general, as airports gain service to more nonstop destinations, shares of Local Passengers increase and shares of Beyond Passengers decrease, given the passenger preference for minimizing en route connections, all other factors being equal.

Figure 4.7shows the proportions of passengers by itinerary type for the four nonstop destinations from MOB, which varied by destination. In 2018, ATL had the lowest share of local passengers (12.0%), while IAH had the highest (26.9%).



Source: U.S. Department of Transportation. Air Passenger Origin-Destination Survey, reconciled to Schedule T100.

Figure 4.7: Mobile Regional Airport Passenger Itineraries by Nonstop Destination (2018)

4.2 Aircraft Operations

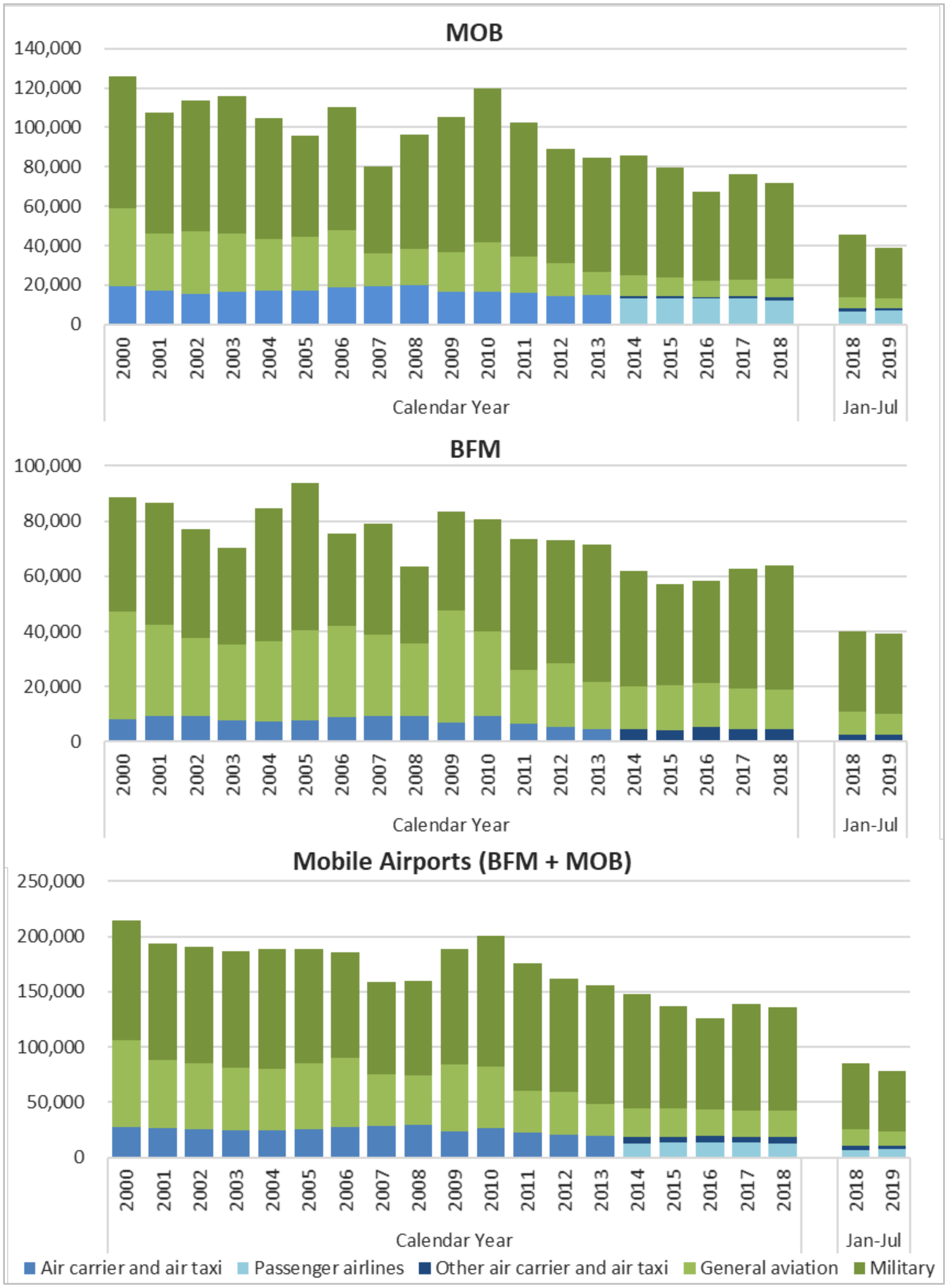
The number of total flight operations at MOB decreased an average of 3.1% per year, between 2000 and 2018, due mostly to decreases in general aviation and military flights (similar to the nationwide trend), although air carrier operations decreased over this period as well. The earliest available passenger data is from 2014. Since that year, the number of passenger airline operations have decreased an average of 1.8% per year. In the first seven months of 2019, total flight operations at MOB decreased 13.8% year-over-year, due primarily to a decrease in military flights; during the same period, passenger airline operations increased 3.8%.

Similarly, total flight operations at BFM decreased an average of 1.8% per year, between 2000 and 2015, due primarily to a decrease in general aviation flights. Since 2015, decreases in general aviation flights were more than offset by increases in military flights, resulting in average annual growth of 3.9%. Between 2000 and 2018, air carrier and air taxi operations decreased 3.2%, per year. In the first seven months of 2019, the number of general aviation flights continued to decrease, leading to a 2% year-over-year decrease in the total number of flight operations overall at BFM. Air carrier and air taxi flights increased 4.1% in the first seven months of 2019, due in part to the initiation of scheduled passenger service at BFM by Frontier Airlines.

Overall, the number of total flight operations at the Mobile airports decreased 2.5% per year between 2000 and 2018, due primarily to decreases in the number of general aviation flights; however, military, air carrier, and air taxi flights all decreased over the same period as well. In the first seven months of 2019, the number of flight operations at the Mobile airports decreased 8.3%; during the same period, passenger airline operations increased 4.7%. In 2018, MOB accounted for 52.8% of all flight operations at the two airports while BFM accounted for the remaining 47.2%.

In 2018, military operations accounted for the largest share of total flights operations at the Mobile airports with 69% of total operations (67.5% of operations at MOB and 70.6% at BFM). The next largest shares were general aviation flights with 17.4% (12.9% at MOB and 22.4% at BFM); passenger airline operations with 8.9% (16.9% at MOB and 0.0% at BFM); and other air carrier and air taxi operations with 4.7% (2.6% at MOB and 7.0% at BFM).

Figure 4.8 shows historical flight operations at the Mobile airports.



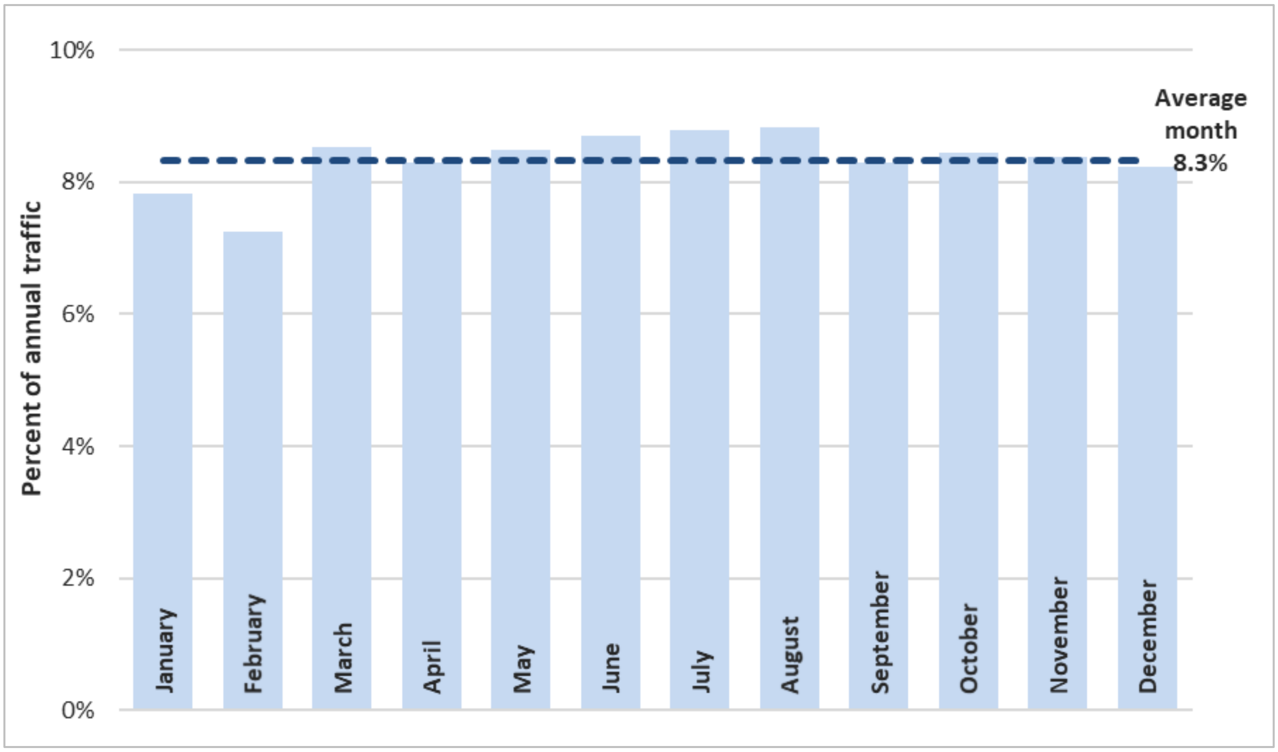
Sources: 2000-2012: FAA Air Traffic Activity Data System; 2012-2019: Mobile Airport Authority.

Notes: Air carrier and air taxi includes passenger airline operations as well as air carrier and air taxi operations prior to 2014. Beginning in 2014, passenger airline operations are shown separately. Includes arrivals and departures. Operation counts for Via Air at BFM were not available.

Figure 4.8: Trends in Aircraft Operations Mobile Regional and Mobile Downtown Airports

4.2.1 Seasonality

As shown on Figure 4.9, passenger airline operations at MOB are relatively stable throughout the year and tend to follow a similar pattern of seasonality as enplaned passengers. Between 2014 and 2018, the peak month for passenger airline operations at MOB varied from year to year, with the months of July and August each seeing 8.8% of annual traffic and accounting for the highest average share of annual passenger airline operations over the period.

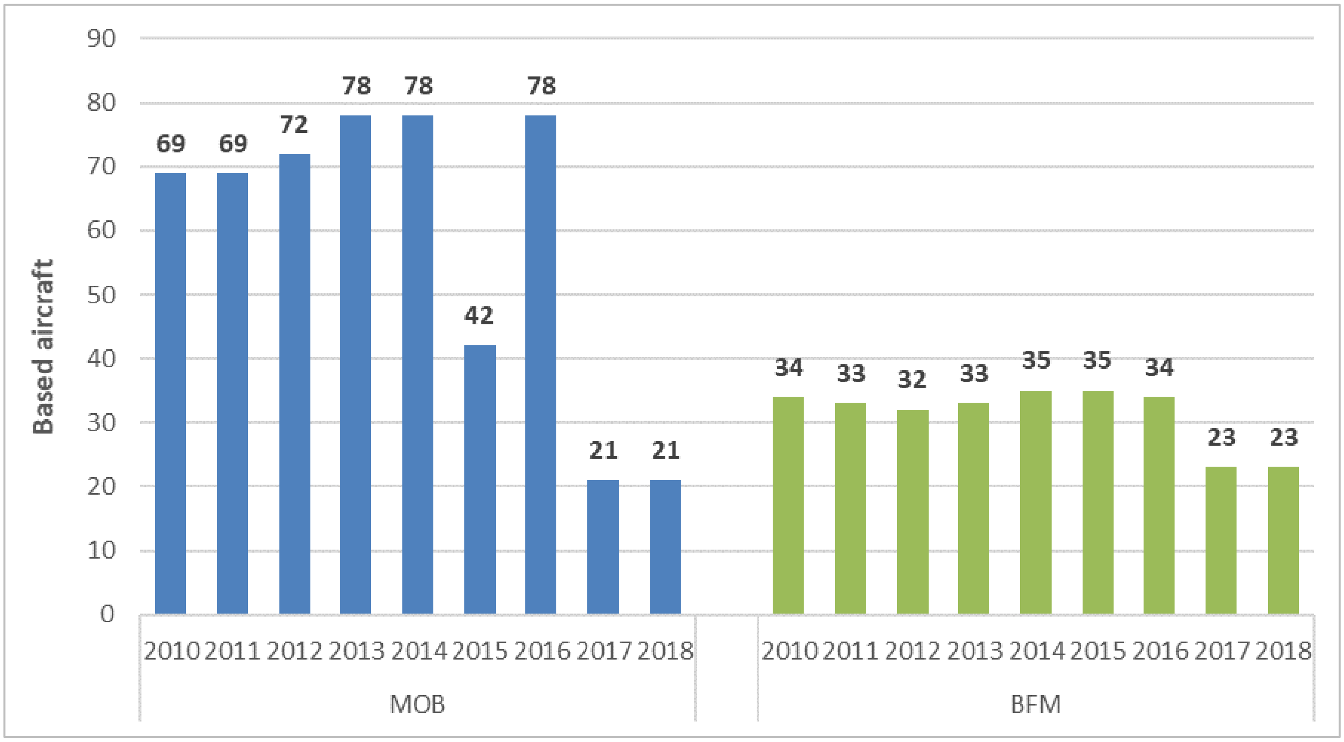


Source: Mobile Airport Authority

Figure 4.9: Monthly Variation of Passenger Airline Operations (2014 through 2018) – Mobile Regional Airport

4.2.2 Based Aircraft

The term *based aircraft* refers to operational aircraft based at a particular facility for the majority of the year. Between 2010 and 2016, based aircraft at MOB varied between 69 and 78 aircraft (apart from a decrease to 42 in 2015). In 2017 and 2018, based aircraft at MOB decreased to 21. Based aircraft at BFM followed a similar trend, averaging 32 to 35 aircraft between 2010 and 2016, before decreasing to 23 aircraft in 2017 and 2018. Figure 4.10 shows numbers for historical based aircraft at the two Mobile airports.



Source: Mobile Airport Authority.

Figure 4.10: Historical Based Aircraft - Mobile Regional and Mobile Downtown Airports

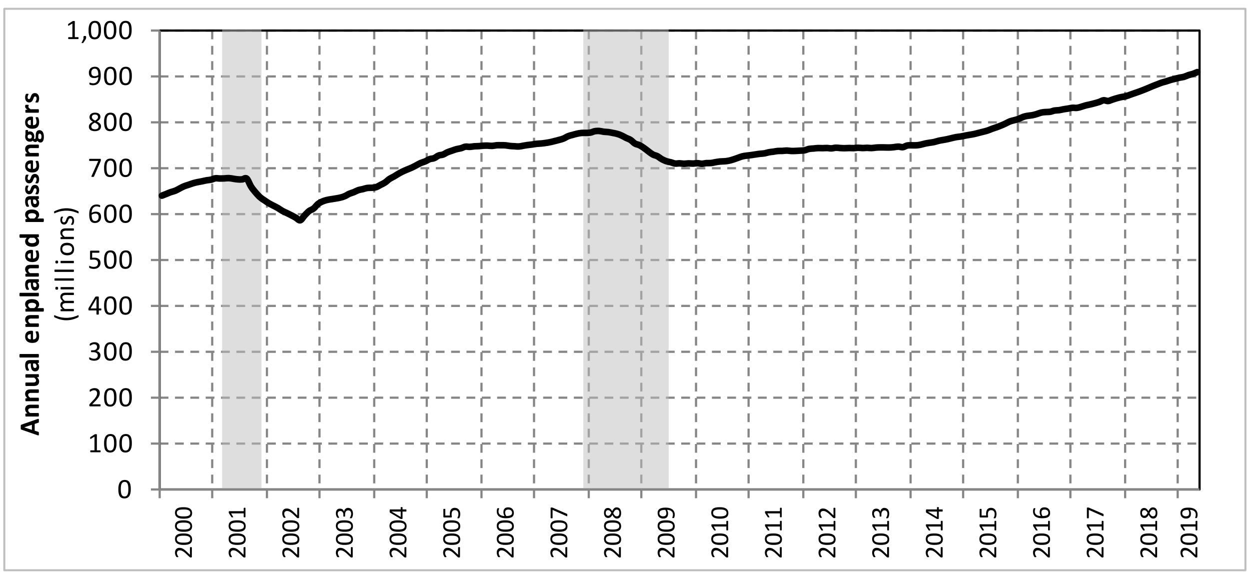
5. KEY FACTORS AFFECTING FUTURE AIRLINE TRAFFIC

In addition to the demographics and economy of the Mobile CSA, key factors that will affect future airline traffic at the Mobile airports include:

- Economic, political, and security conditions
- Financial health of the airline industry
- Airline service and routes
- Airline competition and airfares
- Availability and price of aviation fuel
- Aviation safety and security concerns
- Capacity of the national air traffic control system
- Capacity of the Mobile airports

5.1 Economic, Political, and Security Considerations

Historically, airline passenger traffic nationwide has correlated closely with the state of the U.S. economy and levels of real disposable income. As illustrated on Figure *5.1*, recessions in the U.S. economy in 2001 and 2007-2009, as well as the resulting high unemployment rates and reduced discretionary income, led to reduced airline travel. Future increases in domestic passenger traffic at the Mobile airports will depend, in part, on national economic growth.



Notes: Data shown are for 12-month moving averages of enplaned passengers on scheduled and non-scheduled flights to domestic and international destinations. Shaded areas indicate months of economic recession.

Sources: U.S. Department of Transportation Bureau of Transportation Statistics. (n.d.). T100 Market and segment. Retrieved from www.rita.dot.gov.
National Bureau of Economic Research. (n.d.). US Business Cycle Expansions and Contractions. Retrieved from www.nber.org.

Figure 5.1*: Historical Enplaned Passengers on U.S. Airlines*

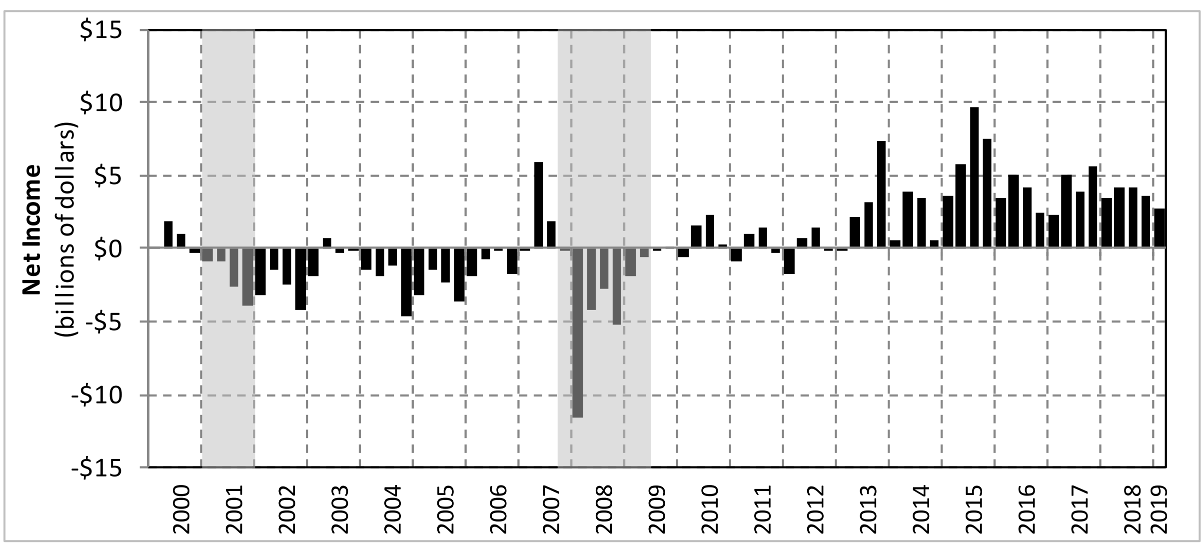
The globalization of business and the increased importance of international trade and tourism influence passenger traffic at major U.S. airports. Of particular influence are international economics, trade balances, currency exchange rates, government policies, and geopolitical relationships.

Concerns and travel restrictions related to hostilities from other countries, terrorist attacks, public health risks, and other perceived security threats also affect travel demand to and from particular international destinations. Beginning in March 2017, President Donald Trump's administration issued various orders seeking to restrict travel to the United States from certain areas, mainly targeting countries in the Middle East and Africa. Following lower court challenges, in June 2018 the U.S. Supreme Court upheld the administration's most recent travel restrictions on travelers from Iran, Syria, Yemen, Libya, Somalia, and North Korea, and government officials from Venezuela. As the restrictions are implemented, increased scrutiny by U.S. Customs and Border Protection may prevent or discourage some airline travel.

Sustaining current passenger traffic nationally and locally, as well as achieving forecast increases at the Mobile airports will partly depend on global economic growth, a stable and secure travel environment, and government policies that do not unreasonably restrict or deter travel.

5.2 Financial Health of the Airline Industry

The financial health of the airline industry has significant impacts on travel to and from the Mobile airports. In particular, the number of passengers at the Mobile airports depends partly on the profitability of the U.S. airline industry and the ability of the industry and individual airlines to make the necessary investments to provide service. This section discusses key factors affecting the financial health of the airline industry over the last two decades, including a discussion of historical net income for airlines in the U.S. (see Figure 5.2).



Source: U.S. Department of Transportation Bureau of Transportation Statistics. (n.d.). Net Income, F41 Schedule P12, www.transtats.bts.gov, accessed August 2019.

Notes: Includes scheduled service on U.S. carriers only.
Shaded areas indicate quarters of economic recession.
Data for the fourth quarter of 2005 and the first quarter of 2006 were adjusted to account for United bankruptcy claims which were settled for less than had been originally reported.

Figure 5.2: Net Income for Airlines in the U.S.

As a result of the 2001 economic recession, the disruption of the airline industry that followed the September 2001 attacks, increased fuel and other operating costs, and price competition, the airline industry experienced financial losses in 2001 through 2006. To mitigate those losses, all of the major airlines reduced their route networks and flight schedules and reached agreements with their employees, lessors, vendors, and creditors to cut costs. Between 2002 and 2005, Delta Air Lines, Northwest Airlines, United Airlines, and US Airways all filed for bankruptcy protection and restructured their operations.

In 2007, the U.S. passenger airline industry was profitable, but in 2008, as oil and aviation fuel prices increased to unprecedented levels and the U.S. economy contracted, the industry experienced a profitability crisis. In 2008 and 2009, the U.S. passenger airline industry recorded net losses of approximately $26 billion. The industry responded by grounding less fuel-efficient aircraft, eliminating unprofitable routes and hubs, reducing seat capacity, increasing airfares, and implementing other cost-saving actions. Between 2007 and 2009, the U.S. passenger airlines collectively reduced domestic available seat-mile capacity by approximately 10%.

Despite high fuel prices, U.S. passenger airlines recorded a net income of approximately $18 billion from 2010 to 2013, achieving these gains by controlling capacity and nonfuel expenses, increasing airfares, achieving high load factors, and increasing ancillary revenues. Between 2009 and 2013, the airlines collectively increased domestic seat-mile capacity by an average of 1% per year. Some airlines continued to struggle despite these cost-saving measures; American Airlines, for example, filed for bankruptcy protection in 2011.

In 2014, the U.S. passenger airline industry reported a net income of $9 billion, assisted by reduced fuel prices. In 2015, the industry achieved a record net income of $26 billion as fuel prices decreased further, demand remained strong, and capacity control allowed average fares and ancillary charges to remain high. Strong industry profitability continued from 2016 through 2018. Sustained industry profitability will depend on economic growth to support airline travel demand, continued capacity control to enable increased airfares, and stable fuel prices and labor costs.

Recent agreements between the major airlines and their unionized employees have resulted in increased labor costs. According to data from Airlines for America, a trade organization representing the industry, U.S. airlines increased wages and benefits per full-time employee by 28% between 2013 and 2018.[6] The increased costs are due in part to a shortage of qualified airline pilots resulting from retirements, changed Federal Aviation Administration (FAA) qualification standards, and duty and rest rules. The pilot shortage has required the airlines to increase salaries and improve benefits to attract and retain qualified pilots.

Consolidation of the U.S. airline industry has resulted from numerous mergers and acquisitions, including: the acquisition of Trans World Airlines by American Airlines in 2001; the merger of US Airways and America West Airlines in 2005; the merger of Delta Air Lines and Northwest Airlines in 2009; the merger of United Airlines and Continental Airlines in 2010; the acquisition of AirTran Airways by Southwest Airlines in 2011; the merger of American Airlines and US Airways in 2013; and the acquisition of Virgin America by Alaska Airlines in 2016.

[6] Airlines for America, Airlines for America Passenger Airline Cost Index, March 2019.

Such consolidation has resulted in four airlines (American Airlines, Delta Air Lines, Southwest Airlines, and United Airlines) and their regional affiliates now accounting for approximately 86% of domestic seat-mile capacity. The consolidation has contributed to recent airline industry profitability. However, any resumption of financial losses could cause one or more U.S. airlines to liquidate or seek bankruptcy protection. The liquidation of any of the large network airlines could drastically affect airline service at certain connecting hub airports and change airline travel patterns nationwide.

5.3 Airline Service and Routes

The number of originating passengers at the Mobile airports depends primarily on the intrinsic attractiveness of the region as a business and leisure destination, the propensity of its residents to travel, and the airfares and services provided at the airports compared to competing airports. Although passenger demand at an airport depends primarily on the population and economy of the region served, airline service and enplaned passenger numbers also depend on the route networks of the airlines serving that airport.

The large network airlines have developed hub-and-spoke systems that allow them to offer high-frequency service to many destinations. Because most connecting passengers have a choice of airlines and intermediate airports, connecting traffic at an airport depends primarily on the route networks and flight schedules of the airlines serving that airport and competing hub airports. Since 2003, as the U.S. airline industry has consolidated, airline service has been reduced at many former connecting hub airports, including those serving the following areas:

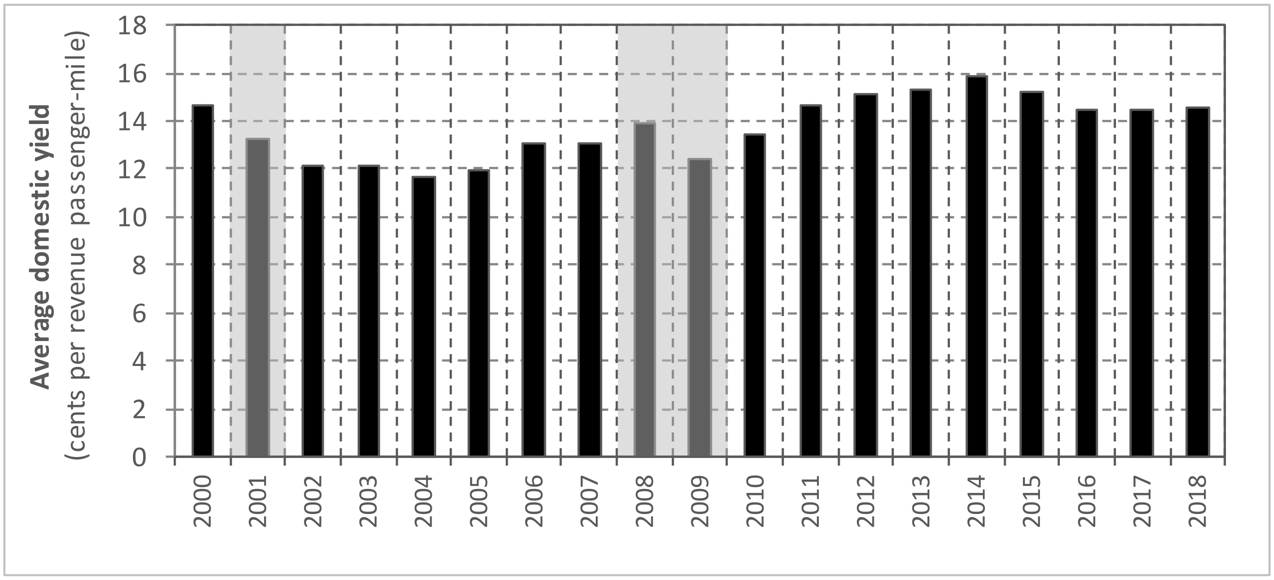
- St. Louis, Missouri (American Airlines, 2003-2005)
- The Dallas-Fort Worth Metroplex in Texas (Delta Air Lines, 2005)
- Pittsburgh, Pennsylvania (US Airways, 2006-2008)
- Las Vegas, Nevada (US Airways, 2007-2010)
- Cincinnati, Ohio (Delta Air Lines, 2009-2012)
- Cleveland, Ohio (United Airlines, 2014)
- Memphis, Tennessee (Delta Air Lines, 2011-2013).

However, because the Mobile airports operate as gateways to the Mobile CSA and Southern Alabama—serving almost exclusively originating passengers—these airports are not dependent on connecting passengers.

5.4 Airline Competition and Airfares

Future passenger numbers, both nationwide and at the Mobile airports, depend partly on the cost of airfare. Airline fares have an important effect on passenger demand, particularly for price-sensitive discretionary travel and short trips for which automobile and other surface travel modes are potential alternatives. Airfares are influenced by airline capacity and yield management; passenger demand; airline market presence; labor, fuel, and other airline operating costs; taxes, fees, and other charges assessed by governmental and airport agencies; and competitive factors. In addition, the price elasticity of demand for airline travel increases in weak economic conditions when the disposable income of potential airline travelers is reduced.

Figure 5.3 shows the historical average domestic yield (airfare per passenger-mile) for U.S. airlines. Overcapacity in the industry, the ability of consumers to compare airfares and book flights easily via the Internet, and the 2001 recession combined to reduce the average yield between 2000 and 2004. The average yield then increased between 2004 and 2008 before again decreasing during the 2007-2009 recession. The average yield then increased between 2009 and 2014 as airline travel demand strengthened, airlines collectively reduced available seat capacity, and airlines maintained airfare increases. Between 2014 and 2016, the average yield decreased, but since 2016 has been fairly stable.



Source: U.S. Department of Transportation. (n.d.). Air Passenger Origin-Destination Survey, reconciled to Schedule T100, 2019.

Notes: Average yields shown are net of taxes, fees, and passenger facility charges and exclude fees charged by the airlines for optional services.

Shaded areas indicate economic recession during all or part of year.

Figure 5.3: Historical Domestic Yield for Airlines in the U.S.

Beginning in 2006, charges were introduced by most airlines for optional services such as checked baggage, preferred seating, in-flight meals, and entertainment, thereby increasing the effective price of airline travel more than yield figures indicate.

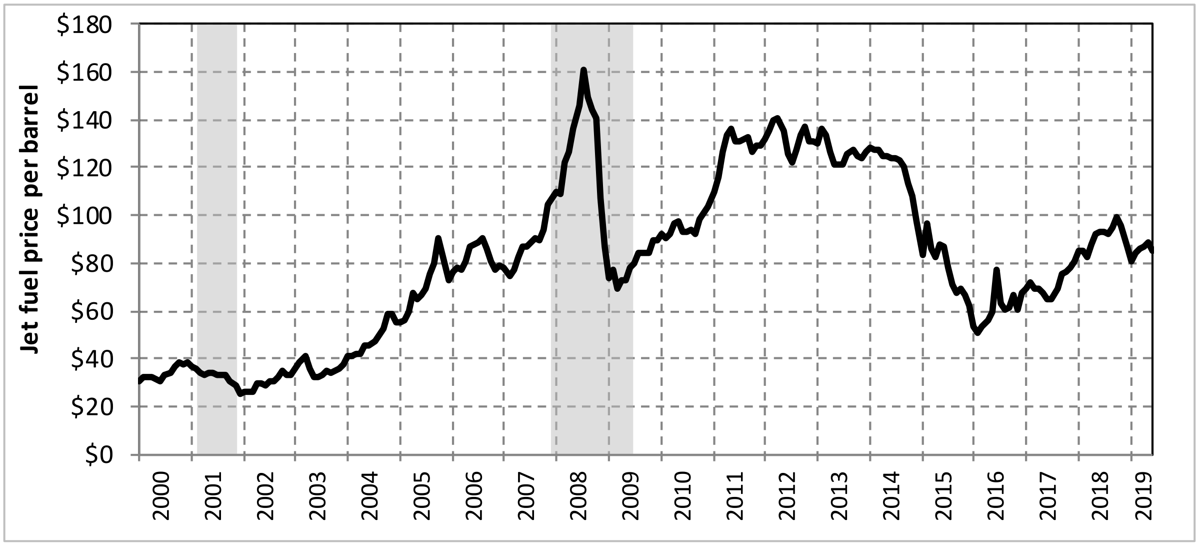
5.5 Availability and Price of Aviation Fuel

The price of aviation fuel is a critical and unpredictable factor affecting airline operating economics. While higher fuel prices tend to drive down airline profitability, lower fuel prices positively affect airline profitability and have far-reaching implications for the global economy. As such, global aviation fuel prices can affect local airports like those in Mobile.

Between 2011 and 2014, aviation fuel prices were relatively stable, partly because of increased oil supply from U.S. domestic production made possible by the hydraulic fracturing of oil-bearing shale deposits and other advances in extraction technologies. As of mid-2014, average fuel prices were approximately three times those at the end of 2003 and accounted for between 30% and 40% of expenses for most airlines.

Beginning in mid-2014, an imbalance between worldwide demand and supply resulted in a precipitous decline in the price of oil and aviation fuel through the end of 2015. Fuel prices have since increased, but the average price of aviation fuel at the end of 2018 was still approximately 30% below the price at mid-2014.

Figure 5.4 shows the historical fluctuation in aviation fuel prices caused by the many factors influencing the global demand for and supply of oil.



Source: U.S. Department of Transportation Bureau of Transportation Statistics. (n.d.). Airline Fuel Cost and Consumption, F41 Schedule P12A. Retrieved from www.transtats.gov.

Notes: Data shown are monthly averages and were converted from gallons to barrels.
Shaded areas indicate months of economic recession.

Figure 5.4: Historical Monthly Jet Fuel Prices for Airlines in the U.S.

Airline industry analysts hold differing views on how oil and aviation fuel prices may change in the near term. However, absent unforeseen disruptions, prices are expected to remain stable. There is widespread agreement that fuel prices are likely to increase over the long term as global energy demand grows in the face of finite oil supplies that are becoming more expensive to extract. Some economists predict that the development of renewable sources of energy, pressures to combat global climate change, the widespread use of electric cars, and other trends will eventually result in a decline in the demand for oil and associated downward pressure on fuel prices.

Aviation fuel prices will continue to affect airfares, passenger numbers, airline profitability, and the ability of airlines to provide service. Airline operating economics will also be affected as regulatory costs are imposed on the airline industry as part of efforts to reduce aircraft emissions contributing to climate change. These effects on the broader industry will undoubtedly impact passengers' travel habits in the Mobile area.

5.6 Aviation Safety and Security Concerns

Concerns about the safety of airline travel and the effectiveness of security precautions influence passenger travel behavior and airline travel demand. Anxieties about the safety of flying as well as the inconveniences and delays associated with security screening procedures lead some passengers to avoid airline travel and opt for surface modes of transportation for short trips.

Safety concerns in the aftermath of the September 2001 attacks were largely responsible for the steep decline in airline travel nationwide in 2002. Since 2001, government agencies, airlines, and airport operators have upgraded security measures to guard against changing threats and to maintain confidence in the safety of airline travel. These measures include strengthened aircraft cockpit doors, changed flight crew procedures, increased presence of armed federal air marshals, federalization of airport security functions under the Transportation Security Administration (TSA), more effective dissemination of information about threats, more intensive screening of passengers and baggage, and deployment of new screening technologies. Additionally, the TSA has introduced TSA PreCheck™ service to expedite the screening of passengers who have submitted to background checks.

Anxieties about safety were stirred anew following the fatal crashes of B-737 MAX aircraft that are suspected to have been caused by the malfunction of the aircraft's automated flight control system. Due to safety concerns, all B-737 MAX aircraft were grounded in March 2019 by the FAA and other aviation authorities worldwide. Affected North American airlines include Air Canada, American Airlines, Southwest Airlines, United Airlines, and WestJet Airlines; Delta Air Lines does not operate B-737 MAX aircraft. At the time of the grounding, B-737 MAX aircraft accounted for approximately 1.5% of U.S. airline seat capacity, none of which included seat capacity at the Mobile airports.

The grounding may last several more months while the flight control system software is updated and approved by the FAA and international regulators and pilot training is completed. Deliveries of new MAX aircraft have been halted until the aircraft is cleared to fly. The delay in aircraft deliveries is negatively affecting airline fleet renewal and expansion plans, particularly those of Southwest.

Historically, airline travel demand has recovered after temporary decreases stemming from terrorist attacks and threats, hijackings, aircraft crashes, and other aviation safety concerns. Provided that precautions by government agencies, airlines, and airport operators serve to maintain confidence in the safety of commercial aviation without imposing unacceptable inconveniences for airline travelers, future demand for airline travel will depend primarily on economic factors rather than safety or security concerns.

5.7 Capacity of the National Air Traffic Control System

Demands on the national air traffic control system have, in the past, caused delays and operational restrictions affecting airline schedules and passenger traffic. The FAA is gradually implementing its Next Generation Air Transportation System air traffic management programs to modernize and automate the guidance and communications equipment of the air traffic control system as well as enhance the use of airspace and runways through improved air navigation aids and procedures. Since 2007, airline traffic delays have decreased because of reduced numbers of aircraft operations, which were down approximately 15% between 2007 and 2018. However, as airline travel increases in the future, flight delays and restrictions can be expected.

5.8 Capacity of the Mobile Airports

In addition to any future constraints that may be imposed by the capacity of the national air traffic control and national airport systems, future growth in airline traffic at the Mobile airports will depend on the capacity of the airports themselves. The forecasts are conditioned on the assumption that, during the forecast period, neither available airfield and terminal capacity, nor demand management initiatives will constrain traffic growth at the Mobile airports.

6. PASSENGER FORECASTS

This report section describes the rationale underlying the long-term forecasts of passengers at the Mobile airports. The assumptions and methodology employed to develop the Base Passenger Forecast are laid out and followed by descriptions of high and low forecast scenarios. This section also documents forecasts of flight operations, based aircraft, fleet mix, peak period passengers and operations, and comparisons with the FAA Terminal Area Forecast (TAF).

6.1 Forecast Assumptions

In developing the forecasts, it was assumed that, over the long term, airline traffic at the Mobile airports will increase as a function of growth in the economy of the airport service region and continued airline service. It was also assumed that airline service will not be constrained by the availability of aviation fuel, the capacity of the air traffic control system or the airports, charges for the use of aviation facilities, or government policies or actions that restrict growth.

The traffic forecasts for the Mobile airports were developed on the basis of the following assumptions:

1. The U.S. economy will experience sustained growth in GDP averaging 2% to 2.5% per year, a range generally consistent with that projected by the Congressional Budget Office, as described in Section 3.6: Economic Outlook.
2. The economy of the airport service region will grow at approximately the same rate as the U.S. economy as a whole.
3. Demand for passenger travel to and from the airport service region will remain strong based on the strength of the local economy, population growth, and the region's relative attractiveness as a business and tourism destination.
4. The Mobile airports will continue to serve almost exclusively domestic-originating passengers.
5. Over time, airlines will add service to meet travel demand at the airports and competition among airlines will create competitive airfares for flights.
6. All remaining commercial passenger service at MOB will shift to BFM in 2024. This shift will spark the recapture of some passenger leakage to PNS, stimulating traffic growth at BFM for a three-year period following the shift.
7. A generally stable international political environment and safety and security precautions will lead to airline traveler confidence in aviation without imposing unreasonable inconveniences.
8. There will be no major disruption of airline service or airline travel behavior as a result of international hostilities, terrorist acts or threats, or government policies restricting or deterring travel.

6.2 Forecast Approach

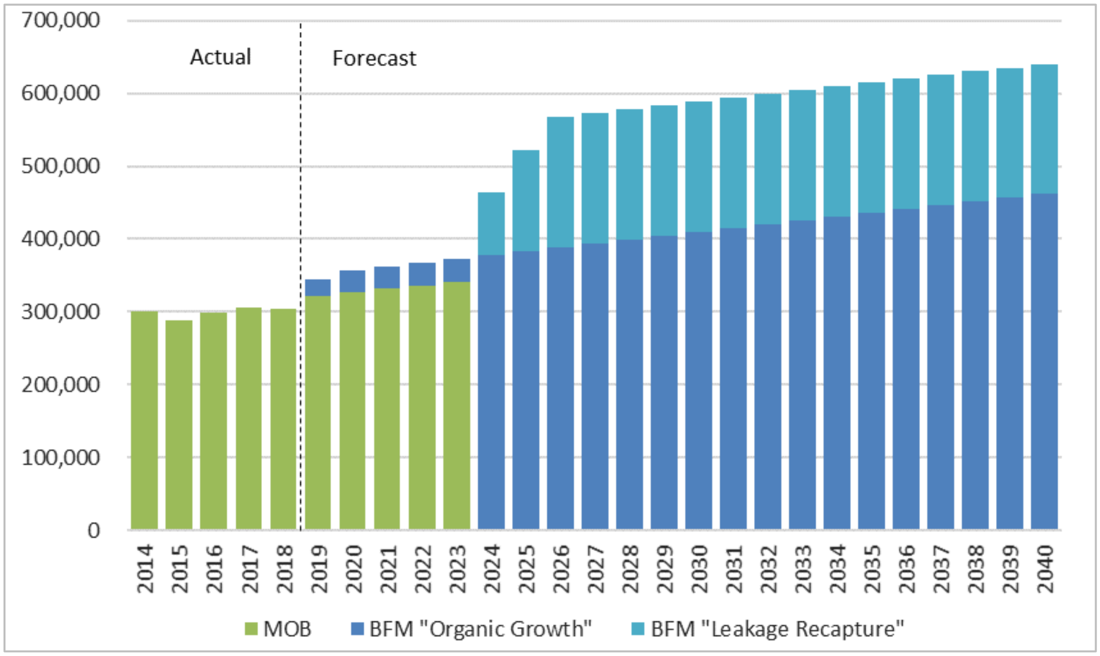
Passenger traffic at a given airport generally grows in concert with growth in demographic and socioeconomic variables, which, in turn, drive the demand for air travel. In particular, population, employment, and income trends correlate highly with passenger growth. In the case of the Mobile airports, however, the planned shift of commercial passenger service from MOB to BFM during the forecast period represents a complicating factor. Thus, the forecasts that follow were developed employing a two-pronged approach.

1. **Organic Growth.** Until the relocation of commercial passenger service occurs, traffic at both MOB and BFM is forecast to increase because of the aforementioned demographic and socioeconomic variables. Additionally, because the economy of the airport service region is expected to expand at approximately the same rate as the U.S. economy overall, traffic growth at the Mobile airports is expected to approximate national rates of traffic growth.
2. **Leakage Recapture.** Improvements in accessibility tend to position an airport more attractively against its competitors. As the planned shift of commercial passenger service from MOB to BFM improves traveler accessibility to and from downtown Mobile and points eastward in Baldwin County, BFM is expected to recapture some share of passengers bound to and from the airport service region but currently travelling via PNS. (See Section 4.1.5: Leakage and Competing Airports.) Recent analysis suggests that Alabama travelers purchased 16% of tickets for travel via PNS. As such, the forecasts that follow assume BFM will recapture 16% of future passenger traffic at PNS (as forecast in the FAA TAF). Given the time required for passenger behavior to adjust to such changes, leakage recapture is assumed to occur over a three-year period, after which organic growth again becomes the sole driver of growth at BFM.

It is worth noting that, for the purpose of these forecasts, all commercial passenger service has been assumed to shift from MOB to BFM at once, in 2024. If service shifts in a more staggered fashion, the interim pace of recapture would be expected to differ, but the ultimate market size post-shift would not.

6.3 Base Passenger Forecast

Figure 6.1:shows the passenger forecasts for the Mobile airports. The shift of passenger service from MOB to BFM is visible, as are the subcomponents of organic growth and leakage recapture. In 2040, enplaned passengers at BFM are forecast to total approximately 640,000. In the absence of any shift of air service and the resulting leakage recapture, the Mobile airports together would have been forecast to instead accommodate approximately 460,000 enplaned passengers.



*Note: This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

Sources: Historical—Mobile Airport Authority.
Forecast—LeighFisher, October 2019.

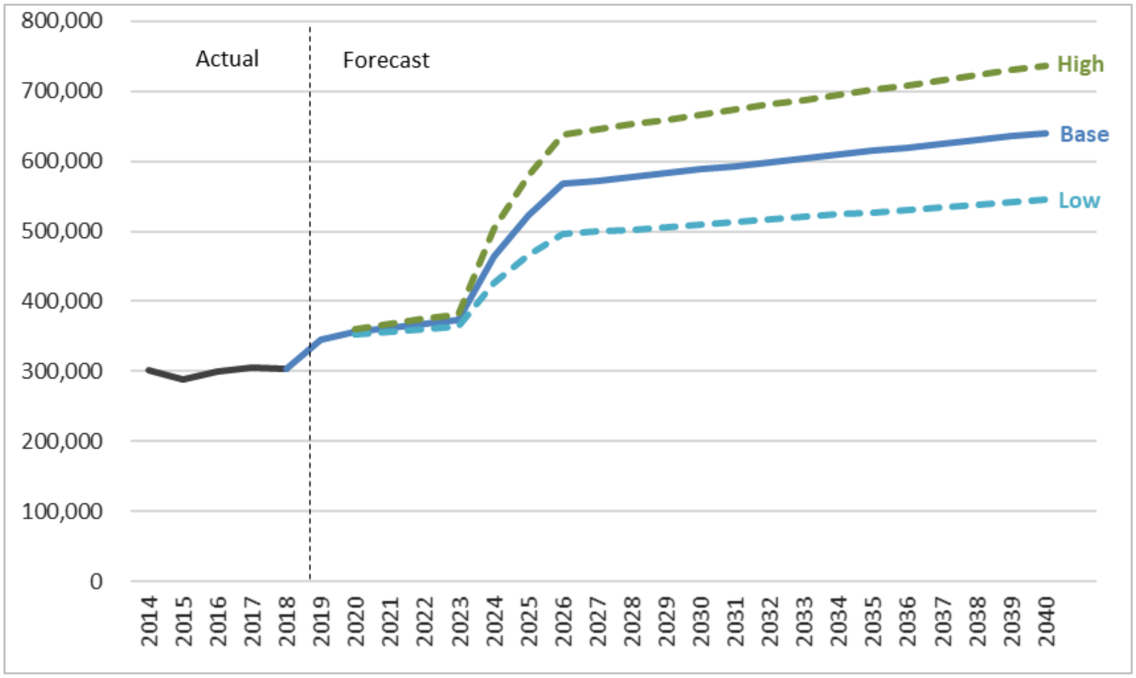
Figure 6.1: Enplaned Passenger Forecast (Base Forecast) – Mobile Regional Airports*

6.4 Range of Passenger Forecasts

Given the inherent uncertainty in airline traffic forecasting, various factors could cause passenger levels at the Mobile airports to be higher or lower than those presented in the Base Passenger Forecast. For this reason, "High" and "Low" forecast scenarios are included to bracket the Base Passenger Forecast, representing a range of variation in passenger levels that could occur through 2040. Specific factors that could cause the High and Low forecast scenarios to materialize include the following:

- The High forecast scenario could include one or more of the following events: more robust economic growth than is generally anticipated; substantial capacity additions by one or more of the airlines serving the airports; or recapture of leakage volumes in excess of those envisioned in the Base Forecast.
- The Low forecast scenario, by contrast, could reflect one or more of the following events: weaker economic growth than is generally anticipated; capacity restraint by the airlines serving the Mobile airports, with associated elevation of airfares and dampening of travel demand; or recapture of lesser leakage volumes than those envisioned in the Base Forecast, perhaps due to an aggressive competitive response by airlines at PNS.

Figure 6.2 shows the High and Low forecast scenarios relative to the Base passenger forecast. In 2040, the High and Low forecast scenarios vary approximately 15% above and below the Base passenger forecast volume.



Sources: Historical—Mobile Airport Authority.
Forecast—LeighFisher, October 2019.

*Note: This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

Figure 6.2: Enplaned Passenger Forecast (Base, High, and Low Scenarios)*
Mobile Regional and Mobile Downtown Airports

6.5 Forecasts of Flight Operations and Based Aircraft

Forecasts of flight operations (i.e., the sum of aircraft landings and takeoffs) at the Mobile airports were developed according to the category of operator (passenger airlines, other air carrier and air taxi, general aviation, and military). Passenger flight operations were derived from the passenger forecasts. Departing seats were calculated from the enplaned passenger forecasts by projecting future enplaned passenger load factors. Passenger flight operations were calculated, in turn, from the projections of departing seats by applying estimates of average seats per flight. Enplaned passenger load factors and average seats per flight were both projected to increase modestly at the Mobile airports throughout the forecast period.

Figure 6.3 shows the Base forecast passenger flight operations forecast and Figure 6.4 shows the High and Low scenarios of passenger flight operations.

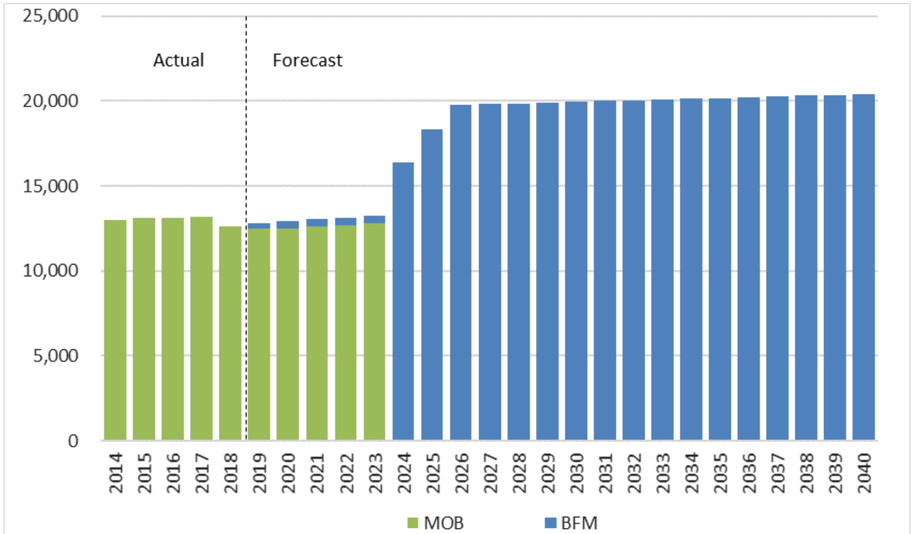


Figure 6.3: Passenger Airline Operations Forecast (Base Forecast) Mobile Regional and Mobile Downtown Airports*

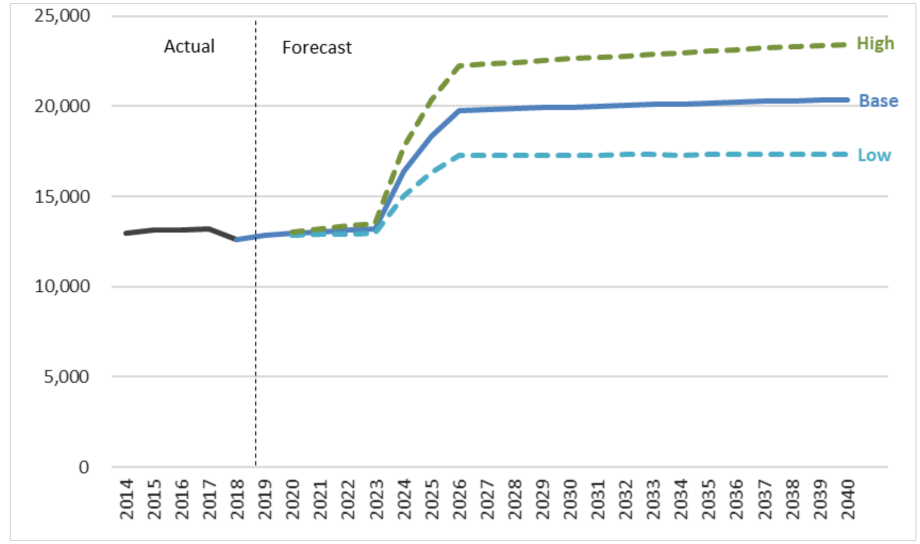
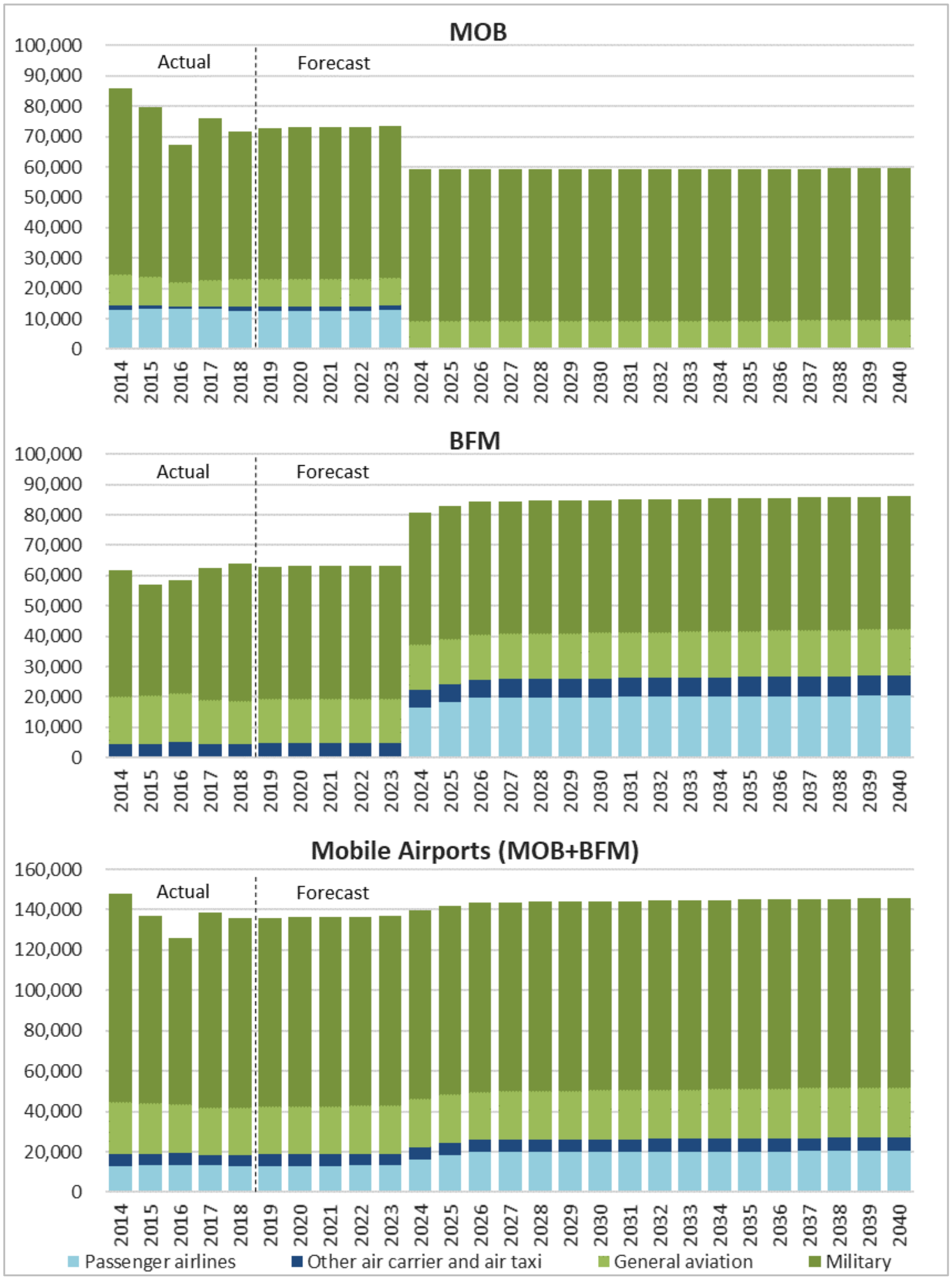


Figure 6.4: Passenger Airline Operations Forecast (Base, High, and Low Scenarios) – Mobile Regional and Mobile Downtown Airports*

Sources: Historical—Mobile Airport Authority.
Forecast—LeighFisher, October 2019.

*Note: These forecasts were prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecasts, and the variance could be material.

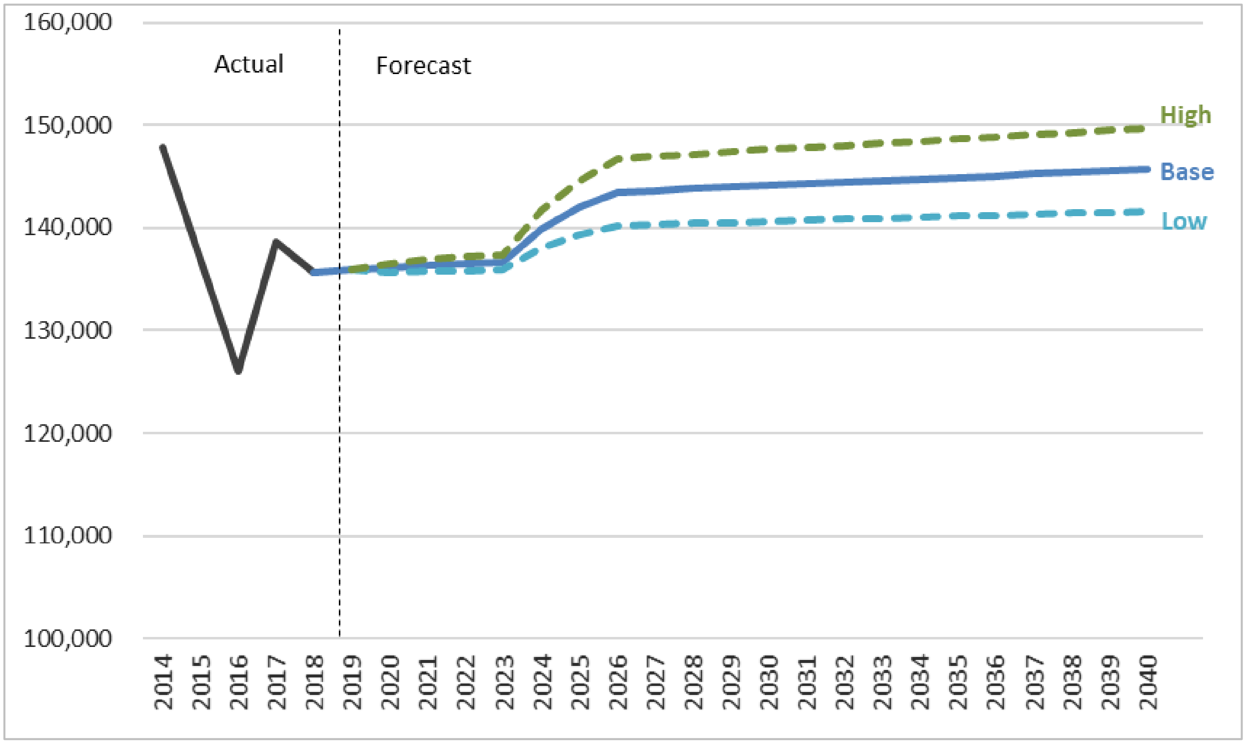
Figure 6.5 shows the Base flight operations forecasts for the Mobile airports, including general aviation and military components. No shift of general aviation or military activity between the two airports has been forecast.



Sources: Historical—Mobile Airport Authority.
*Note: This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

Figure 6.5: Aircraft Operations Forecast (Base Forecast)

Figure 6.6 shows the High and Low scenarios for flight operations.

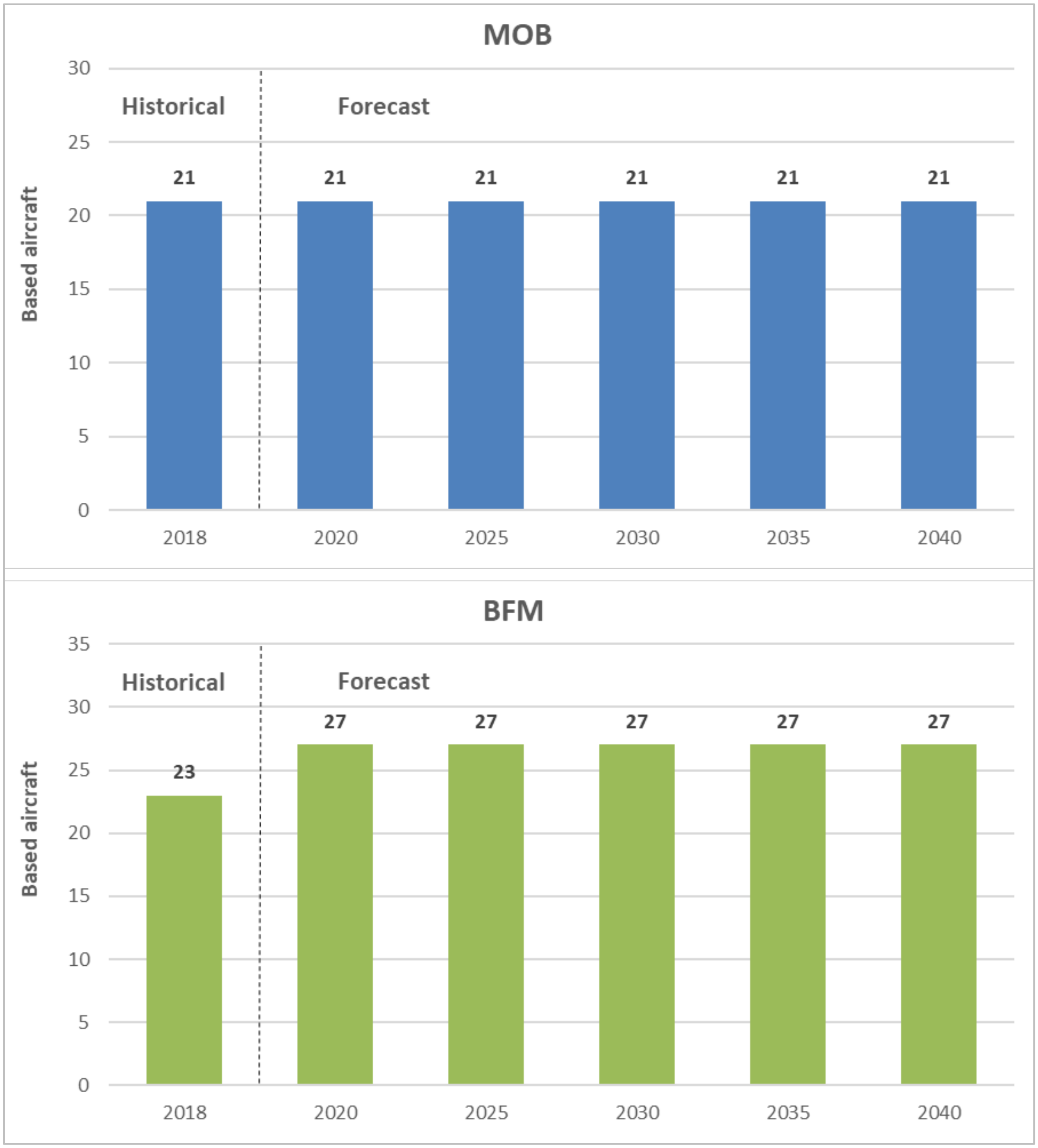


Sources: Historical—Mobile Airport Authority.
Forecast—LeighFisher, October 2019.

*Note: This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

Figure 6.6: Aircraft Operations Forecast (Base, High, and Low Scenarios)*
Mobile Regional and Mobile Downtown Airports

Figure 6.7 below illustrates based aircraft forecasts for MOB and BFM, which were adopted from the FAA TAF issued February 2019. Based aircraft for MOB are forecast at 21 through 2040. Based aircraft at BFM are forecast to increase from 23 to 27 and then remain constant through the forecast period.



Source: FAA TAF, issued February 2019.
*Note: This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

Figure 6.7: Based Aircraft Forecast (Base Forecast)*
Mobile Regional and Mobile Downtown Airports

6.6 Comparison to FAA Terminal Area Forecasts

A summary of the master plan Base forecasts for the Mobile airports and comparisons to the FAA's TAFs are presented in Table 6.1 and Table 6.2, respectively. The format of the two tables is based on FAA-provided templates for presenting airport planning forecasts for FAA review. FAA approval is being sought for the Base forecasts. As required, the results are presented for the base year of 2018 and forecast horizon years, which are equal to the base year, plus 5, 10, and 15 years (i.e., 2023, 2028, and 2033). A direct comparison of the forecasts to the TAF required the conversion of the forecasts' aviation activity categorization of enplaned passengers and flight operations into the following FAA categories:

- Categories for enplaned passengers: Air carrier and commuter
- Categories for flight operations: Air carrier and commuter/air taxi[7]

There is one minor difference between the time periods used in the master plan forecasts and those reflected in the TAF: The master plan forecasts were prepared on a calendar year basis, while the TAF was prepared on the basis of federal fiscal years ending September 30.

Table 6.2 presents a side-by-side comparison of the master plan forecasts and the TAF released in February 2019. Because the FAA TAFs do not assume the shift of commercial air service from MOB to BFM during the forecast period, the Base forecast for MOB trails the TAF while the Base forecast for BFM exceeds the TAF. The two Mobile airports, considered together, approximate the combined FAA TAFs for the two airports to a somewhat greater degree, yet still exceed the combined TAFs substantially. The key reason for the difference is the assumption of recapture of passenger leakage following the shift of commercial passenger service from MOB to BFM, as described earlier. Additionally, the most recent TAF for BFM does not reflect service by Frontier Airlines, which was announced and began after the TAF was developed.

7 The commuter/air taxi category relies upon FAA's definition per its 2016 TAF Summary Report that: "Commuter operations include takeoffs and landings by aircraft with 60 or fewer seats that transport regional passengers on scheduled commercial flights. Air taxi operations include takeoffs and landings by aircraft with 60 or fewer seats conducted on non-scheduled or for-hire flights."

Table 6.1: Forecast Summaries by FAA Categories (Base Forecast)*
Mobile Regional and Mobile Downtown Airports

	Base Year	Forecast					Average Annual Growth Rate				
	2018	2020	2025	2030	2035	2040	2018-2020	2020-2025	2025-2030	2030-2035	2035-2040
Mobile Regional Airport											
Passenger Enplanements	**303,871**	**326,750**	**--**	**--**	**--**	**--**	**3.7%**	**(100.0%)**	**--**	**--**	**--**
Air Carrier	41,697	41,800	--	--	--	--	0.1	(100.0)	--	--	--
Commuter	262,174	284,950	--	--	--	--	4.3	(100.0)	--	--	--
Aircraft Operations	**71,612**	**73,040**	**59,160**	**59,280**	**59,420**	**59,550**	**1.0%**	**(4.1%)**	**0.0%**	**0.0%**	**0.0%**
Commercial Operations	13,986	14,000	--	--	--	--	0.1	(100.0)	--	--	--
Air Carrier	4,250	4,860	--	--	--	--	6.9	(100.0)	--	--	--
Commuter/Air Taxi	9,736	9,140	--	--	--	--	(3.1)	(100.0)	--	--	--
General Aviation	9,253	9,070	9,190	9,310	9,450	9,580	(1.0)	0.3	0.3	0.3	0.3
Military	48,373	49,970	49,970	49,970	49,970	49,970	1.6	--	--	--	--
Based Aircraft	**21**	**21**	**21**	**21**	**21**	**21**	**--**	**--**	**--**	**--**	**--**
Mobile Downtown Airport											
Passenger Enplanements	**--**	**30,000**	**523,000**	**588,250**	**614,500**	**640,750**	**--**	**77.1%**	**2.4%**	**0.9%**	**0.8%**
Air Carrier	--	30,000	105,300	118,400	123,700	129,000	--	28.5	2.4	0.9	0.8
Commuter	--	--	417,700	469,850	490,800	511,750	--	--	2.4	0.9	0.8
Aircraft Operations	**64,094**	**63,075**	**82,830**	**84,860**	**85,490**	**86,110**	**(0.8%)**	**5.6%**	**0.5%**	**0.1%**	**0.1%**
Commercial Operations	4,468	4,785	24,360	26,180	26,600	27,000	3.5	38.5	1.5	0.3	0.3
Air Carrier	1,783	2,255	10,020	11,810	13,070	14,340	12.5	34.8	3.3	2.0	1.9
Commuter/Air Taxi	2,685	2,530	14,340	14,370	13,530	12,660	(2.9)	41.5	0.0	(1.2)	(1.3)
General Aviation	14,359	14,620	14,800	15,010	15,220	15,440	0.9	0.2	0.3	0.3	0.3
Military	45,267	43,670	43,670	43,670	43,670	43,670	(1.8)	--	--	--	--
Based Aircraft	**23**	**27**	**27**	**27**	**27**	**27**	**8.3%**	**--**	**--**	**--**	**--**
Mobile Airports Total (MOB + BFM)											
Passenger Enplanements	**303,871**	**356,750**	**523,000**	**588,250**	**614,500**	**640,750**	**8.4%**	**8.0%**	**2.4%**	**0.9%**	**0.8%**
Air Carrier	41,697	71,800	105,300	118,400	123,700	129,000	31.2	8.0	2.4	0.9	0.8
Commuter	262,174	284,950	417,700	469,850	490,800	511,750	4.3	7.9	2.4	0.9	0.8
Aircraft Operations	**135,706**	**136,115**	**141,990**	**144,140**	**144,910**	**145,660**	**0.2%**	**0.8%**	**0.3%**	**0.1%**	**0.1%**
Commercial Operations	18,454	18,785	24,360	26,180	26,600	27,000	0.9	5.3	1.5	0.3	0.3
Air Carrier	6,033	7,115	10,020	11,810	13,070	14,340	8.6	7.1	3.3	2.0	1.9
Commuter/Air Taxi	12,421	11,670	14,340	14,370	13,530	12,660	(3.1)	4.2	0.0	(1.2)	(1.3)
General Aviation	23,612	23,690	23,990	24,320	24,670	25,020	0.2	0.3	0.3	0.3	0.3
Military	93,640	93,640	93,640	93,640	93,640	93,640	--	--	--	--	--
Based Aircraft	**44**	**48**	**48**	**48**	**48**	**48**	**4.4%**	**--**	**--**	**--**	**--**

Sources: Base Year 2018—Mobile Airport Authority.
Forecast—LeighFisher, October 2019.

*Note: This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

Table 6.2: Forecast Summaries by FAA Categories (Base Forecast vs. TAF)*
Mobile Regional and Mobile Downtown Airports

	Year (a)	Planning forecasts	FAA 2018 TAF	Planning forecasts vs. 2018 TAF (percent variance)
Mobile Regional Airport				
Passenger enplanements				
Base yr.	2018	303,871	295,670	2.8%
Base yr. + 5yrs.	2023	341,000	306,802	11.1
Base yr. + 10yrs.	2028	--	324,745	(100.0)
Base yr. + 15yrs.	2033	--	344,339	(100.0)
Commercial operations *(b)*				
Base yr.	2018	13,986	13,927	0.4%
Base yr. + 5yrs.	2023	14,300	7,369	94.1
Base yr. + 10yrs.	2028	--	7,321	(100.0)
Base yr. + 15yrs.	2033	--	7,758	(100.0)
Total operations *(c)*				
Base yr.	2018	71,612	75,658	(5.3%)
Base yr. + 5yrs.	2023	73,410	69,529	5.6
Base yr. + 10yrs.	2028	59,230	69,546	(14.8)
Base yr. + 15yrs.	2033	59,360	70,048	(15.3)
Mobile Downtown Airport				
Passenger enplanements				
Base yr.	2018	--	1,047	(100.0%)
Base yr. + 5yrs.	2023	31,500	1,047	2908.6
Base yr. + 10yrs.	2028	577,750	1,047	55081.5
Base yr. + 15yrs.	2033	604,000	1,047	57588.6
Commercial operations *(b)*				
Base yr.	2018	4,468	4,431	0.8%
Base yr. + 5yrs.	2023	4,869	4,431	9.9
Base yr. + 10yrs.	2028	26,000	4,431	486.8
Base yr. + 15yrs.	2033	26,440	4,431	496.7
Total operations *(c)*				
Base yr.	2018	64,094	64,117	(0.0%)
Base yr. + 5yrs.	2023	63,269	64,031	(1.2)
Base yr. + 10yrs.	2028	84,590	64,318	31.5
Base yr. + 15yrs.	2033	85,250	64,619	31.9

*Note: This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

Table 6.2 (Continued): Forecast Summaries by FAA Categories (Base Forecast vs. TAF)
Mobile Regional and Mobile Downtown Airports

	Year (a)	Planning forecasts	FAA 2018 TAF	Planning forecasts vs. 2018 TAF (percent variance)
Mobile Airports Total (MOB + BFM)				
Passenger enplanements				
Base yr.	2018	303,871	296,717	2.4%
Base yr. + 5yrs.	2023	372,500	307,849	21.0
Base yr. + 10yrs.	2028	577,750	325,792	77.3
Base yr. + 15yrs.	2033	604,000	345,386	74.9
Commercial operations *(b)*				
Base yr.	2018	18,454	18,358	0.5%
Base yr. + 5yrs.	2023	19,169	11,800	62.5
Base yr. + 10yrs.	2028	26,000	11,752	121.2
Base yr. + 15yrs.	2033	26,440	12,189	116.9
Total operations *(c)*				
Base yr.	2018	135,706	139,775	(2.9%)
Base yr. + 5yrs.	2023	136,679	133,560	2.3
Base yr. + 10yrs.	2028	143,820	133,864	7.4
Base yr. + 15yrs.	2033	144,610	134,667	7.4

Sources: Base Year 2018—Mobile Airport Authority.
Forecast—LeighFisher, October 2019.
FAA Terminal Area Forecast (TAF), issued February 2019.

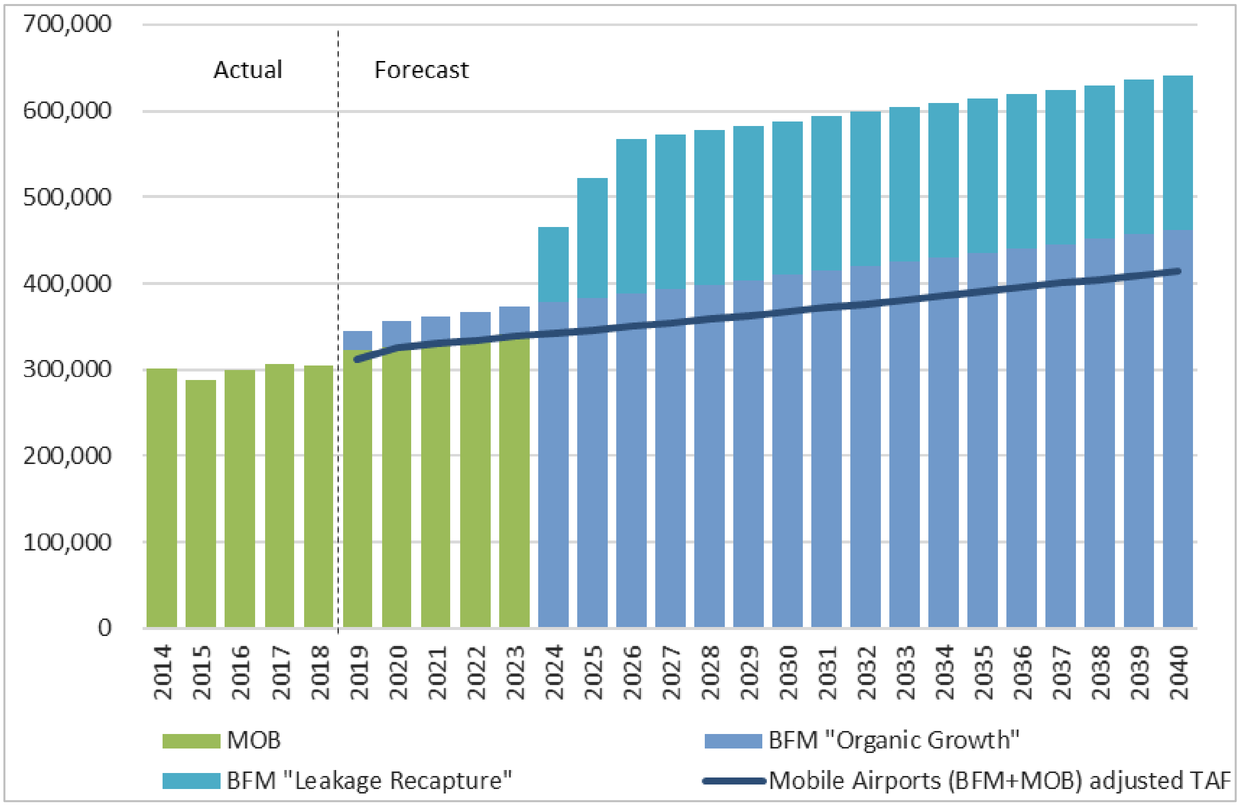
*Notes: This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

(a) The Mobile Airports planning forecasts were prepared on a calendar year basis and the FAA 2018 TAF was prepared on a U.S. government fiscal year bases (October through September).

(b) Commercial operations include operations by passenger airlines, all-cargo airlines, and air taxi operators.

(c) Total operations include commercial operations and operations by general aviation and military aircraft.

Figure 6.8 depicts the passenger forecasts for the Mobile airports, including the subcomponents driven by organic growth and leakage recapture. Factoring out leakage recapture, the organically driven forecasts for the Mobile airports exceed the combined MOB and BFM TAFs (when adjusted to account for Frontier Airlines service at BFM) by 10 to 12% throughout the forecast period. *This much closer degree of alignment is generally considered to be sufficiently consistent with the TAF to be acceptable for planning purposes.*



Sources: Historical—Mobile Airport Authority.
Forecast—LeighFisher, October 2019.
FAA Terminal Area Forecast (TAF), issued February 2019.

Notes: *This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.
FAA TAF has been adjusted to include an estimate for Frontier Airlines at BFM.

Figure 6.8: Enplaned Passenger Forecast (Base Forecast with Adjusted TAF)*
Mobile Regional and Mobile Downtown Airports

6.7 Passenger Aircraft Fleet Mix Forecast

The types of aircraft operating at an airport, referred to as the aircraft fleet mix, are an important consideration in planning terminal and airfield improvements. The passenger aircraft fleet mix forecast in this report was derived from the Base forecast of passenger flight operations. This was achieved by forecasting future shares of operations according to aircraft category and type. In developing the fleet mix forecast, the following assumptions were made:

- Through 2019, changes in passenger airline fleet mix will occur generally as indicated by advance-published airline schedules from the data provider, *Official Airline Guide*.
- Beyond 2019, changes in passenger airline fleet mix reflect changes in equipment types indicated in airline fleet renewal plans as reported in publicly available sources such as airline financial 10-K filings (financial reports filed annually by publicly traded companies). Such fleet renewal plans reflect airline-specific replacement of aging aircraft types with newer equipment, the timing of equipment retirements and deliveries, and expected new aircraft.
- Over the forecast period, narrow-body and large regional jet aircraft will account for relatively larger shares of flight operations, while small regional jets will account for a decreasing share of flights. Such a shift is in line with broader anticipated industrywide trends.

Table 6.3 shows the passenger airline fleet mix forecast for the Mobile airports. Airplane Design Group III (e.g., Boeing 737 and Airbus A320) is designated the critical aircraft. The Mobile airports together currently accommodate passenger service in excess of 500 operations per year by Airplane Design Group III aircraft, and such service is forecast to increase through 2040. Service by aircraft larger than Airplane Design Group III is not envisioned to occur during the forecast period.

Table 6.3: Passenger Airline Operations Fleet Mix Forecast (Base Forecast)*
Mobile Regional and Mobile Downtown Airports

	Mobile Regional Airport						Mobile Downtown Airport						Mobile Airports Total (MOB+BFM)					
	Actual	Forecast					Actual	Forecast					Actual	Forecast				
	2018	2020	2025	2030	2035	2040	2018	2020	2025	2030	2035	2040	2018	2020	2025	2030	2035	2040
Total passenger airline operations	**12,624**	**12,520**	**--**	**--**	**--**	**--**	**--**	**425**	**18,340**	**19,960**	**20,180**	**20,380**	**12,624**	**12,945**	**18,340**	**19,960**	**20,180**	**20,380**
Narrowbody jet	**748**	**690**	**--**	**--**	**--**	**--**	**--**	**425**	**1,600**	**1,840**	**1,960**	**2,080**	**748**	**1,115**	**1,600**	**1,840**	**1,960**	**2,080**
Airbus A220	48	60	--	--	--	--	--	--	90	100	100	100	48	60	90	100	100	100
Airbus A319	--	--	--	--	--	--	--	425	150	--	--	--	--	425	150	--	--	--
Airbus A320	--	200	--	--	--	--	--	--	420	460	460	470	--	200	420	460	460	470
Airbus 320neo	--	--	--	--	--	--	--	--	460	660	670	670	--	--	460	660	670	670
Boeing (douglas) MD-88	576	200	--	--	--	--	--	--	--	--	--	--	576	200	--	--	--	--
Boeing 717-200	4	--	--	--	--	--	--	--	--	--	--	--	4	--	--	--	--	--
Boeing 737-800	120	230	--	--	--	--	--	--	480	620	730	840	120	230	480	620	730	840
Regional Jet	**11,876**	**11,830**	**--**	**--**	**--**	**--**	**--**	**--**	**16,740**	**18,120**	**18,220**	**18,300**	**11,876**	**11,830**	**16,740**	**18,120**	**18,220**	**18,300**
Large regional jet	**3,132**	**3,380**	**--**	**--**	**--**	**--**	**--**	**--**	**5,670**	**7,070**	**8,060**	**9,060**	**3,132**	**3,380**	**5,670**	**7,070**	**8,060**	**9,060**
Canadair Regional Jet 700	1,266	60	--	--	--	--	--	--	360	690	1,000	1,320	1,266	60	360	690	1,000	1,320
Canadair Regional Jet 900	1,866	2,360	--	--	--	--	--	--	3,690	4,320	4,670	5,020	1,866	2,360	3,690	4,320	4,670	5,020
Embraer 175	--	960	--	--	--	--	--	--	1,620	2,060	2,390	2,720	--	960	1,620	2,060	2,390	2,720
Small regional jet (<60 seats)	**8,744**	**8,450**	**--**	**--**	**--**	**--**	**--**	**--**	**11,070**	**11,050**	**10,160**	**9,240**	**8,744**	**8,450**	**11,070**	**11,050**	**10,160**	**9,240**
Canadair Regional Jet 200	5,274	4,000	--	--	--	--	--	--	5,210	5,170	4,720	4,260	5,274	4,000	5,210	5,170	4,720	4,260
Embraer ERJ 140	--	130	--	--	--	--	--	--	--	--	--	--	--	130	--	--	--	--
Embraer ERJ 145	3,470	4,320	--	--	--	--	--	--	5,860	5,880	5,440	4,980	3,470	4,320	5,860	5,880	5,440	4,980
Aircraft Design Group																		
I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
II	10,010	8,510	--	--	--	--	--	--	11,430	11,740	11,160	10,560	10,010	8,510	11,430	11,740	11,160	10,560
III	2,614	4,010	--	--	--	--	--	425	6,910	8,220	9,020	9,820	2,614	4,435	6,910	8,220	9,020	9,820
IV	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
V	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

*Note: This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

Table 6.3 (Continued) Passenger Airline Operations Fleet Mix Forecast (Base Forecast)*
Mobile Regional and Mobile Downtown Airports

	Share of total																	
	Mobile Regional Airport						Mobile Downtown Airport						Mobile Airports Total (MOB+BFM)					
	Actual	Forecast					Actual	Forecast					Actual	Forecast				
	2018	2020	2025	2030	2035	2040	2018	2020	2025	2030	2035	2040	2018	2020	2025	2030	2035	2040
Total passenger airline operations	**100.0%**	**100.0%**	**--**	**--**	**--**	**--**	**--**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Narrowbody jet	**5.9%**	**5.5%**	**--**	**--**	**--**	**--**	**--**	**100.0%**	**8.7%**	**9.2%**	**9.7%**	**10.2%**	**5.9%**	**8.6%**	**8.7%**	**9.2%**	**9.7%**	**10.2%**
Airbus A220	0.4	0.5	--	--	--	--	--	--	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5
Airbus A319	--	--	--	--	--	--	--	100.0	0.8	--	--	--	--	3.3	0.8	--	--	--
Airbus A320	--	1.6	--	--	--	--	--	--	2.3	2.3	2.3	2.3	--	1.5	2.3	2.3	2.3	2.3
Airbus 320neo	--	--	--	--	--	--	--	--	2.5	3.3	3.3	3.3	--	--	2.5	3.3	3.3	3.3
Boeing (douglas) MD-88	4.6	1.6	--	--	--	--	--	--	--	--	--	--	4.6	1.5	--	--	--	--
Boeing 717-200	0.0	--	--	--	--	--	--	--	--	--	--	--	0.0	--	--	--	--	--
Boeing 737-800	1.0	1.8	--	--	--	--	--	--	2.6	3.1	3.6	4.1	1.0	1.8	2.6	3.1	3.6	4.1
Regional Jet	**94.1%**	**94.5%**	**--**	**--**	**--**	**--**	**--**	**--**	**91.3%**	**90.8%**	**90.3%**	**89.8%**	**94.1%**	**91.4%**	**91.3%**	**90.8%**	**90.3%**	**89.8%**
Large regional jet	**24.8%**	**27.0%**	**--**	**--**	**--**	**--**	**--**	**--**	**30.9%**	**35.4%**	**39.9%**	**44.5%**	**24.8%**	**26.1%**	**30.9%**	**35.4%**	**39.9%**	**44.5%**
Canadair Regional Jet 700	10.0	0.5	--	--	--	--	--	--	2.0	3.5	5.0	6.5	10.0	0.5	2.0	3.5	5.0	6.5
Canadair Regional Jet 900	14.8	18.8	--	--	--	--	--	--	20.1	21.6	23.1	24.6	14.8	18.2	20.1	21.6	23.1	24.6
Embraer 175	--	7.7	--	--	--	--	--	--	8.8	10.3	11.8	13.3	--	7.4	8.8	10.3	11.8	13.3
Small regional jet (<60 seats)	**69.3%**	**67.5%**	**--**	**--**	**--**	**--**	**--**	**--**	**60.4%**	**55.4%**	**50.3%**	**45.3%**	**69.3%**	**65.3%**	**60.4%**	**55.4%**	**50.3%**	**45.3%**
Canadair Regional Jet 200	41.8	31.9	--	--	--	--	--	--	28.4	25.9	23.4	20.9	41.8	30.9	28.4	25.9	23.4	20.9
Embraer ERJ 140	--	1.0	--	--	--	--	--	--	--	--	--	--	--	1.0	--	--	--	--
Embraer ERJ 145	27.5	34.5	--	--	--	--	--	--	32.0	29.5	27.0	24.4	27.5	33.4	32.0	29.5	27.0	24.4
Aircraft Design Group																		
I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
II	79.3	68.0	--	--	--	--	--	--	62.3	58.8	55.3	51.8	79.3	65.7	62.3	58.8	55.3	51.8
III	20.7	32.0	--	--	--	--	--	100.0	37.7	41.2	44.7	48.2	20.7	34.3	37.7	41.2	44.7	48.2
IV	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
V	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Sources: Historical—Mobile Airport Authority.
Forecast—LeighFisher, October 2019.

*Note: This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

6.8 Non-Passenger Aircraft Fleet Mix Forecast

In addition to commercial operations, BFM also accommodates regular cargo flights by FedEx Corporation (FedEx). FedEx operates the Airbus A300F4-600 (A300) aircraft at BFM, which is an Airplane Design Group IV plane. This makes the A300 the current and future critical aircraft for the Airport.

The general aviation aircraft operating at BFM and MOB range from single engine piston aircraft to corporate aircraft as large as the Boeing Business Jet. A similar mix of aircraft is anticipated to continue to use both Mobile airports in the future.

Finally, MOB is home to a U.S. Coast Guard and an Alabama Army National Guard base, both of which accommodate military aircraft operations. BFM, on the other hand, has a U.S. Army Reserve base that does not operate any aircraft. Nonetheless, BFM does accommodate training flights for regional military bases. Additionally, a wide variety of military aircraft—including both helicopters and fixed-wing aircraft—use BFM. Common military aircraft models using BFM include, but are not limited to: T-6A Texan II, Bell TH-57 Sea Ranger, MH-60 Sea Hawk, T-45 Goshawk, T-1 Jayhawk, and C130.

6.9 Passenger and Flight Operation Peaking Forecasts

For airport planners, the peak level of activity rather than the average level is the critical design factor in planning for new or expanded facilities. Therefore, forecasts of peak period activity for both passengers and flight operations are presented below.

For both passengers and operations, a five-year timeseries of monthly activity was developed. In each year, the peak month was determined and the percentage of annual activity that occurred in that month was calculated. After the determination that the most recent year of actual activity was representative of historical averages, the most recent peak month factor was applied to all future years. Average daily peak activity was calculated by dividing the peak monthly flows by 31 (days in the month).

For the resulting average day of the peak month, a similar process using the data provider *Official Airline Guide's* scheduled flight data allowed for the calculation of peak hour passenger and passenger flight operation activity.

Table 6.4, Table 6.5, and Table 6.6 show the Base, Low, and High forecasts, respectively, of peak period enplaned passengers for the Mobile airports. Table 6.7, Table 6.8, and Table 6.9 show the Base, Low, and High forecasts, respectively, of peak period passenger flight operations for the Mobile airports.

Table 6.4: Enplaned Passenger Peaking Forecast (Base Forecast)*
Mobile Regional and Mobile Downtown Airports

	Actual	Forecast				
	2018	2020	2025	2030	2035	2040
MOB						
Total Enplaned Passengers	303,871	326,750	--	--	--	--
Peak Month	28,192	30,315	--	--	--	--
% of Total	9.3%	9.3%	--	--	--	--
Average Day	909	978	--	--	--	--
Peak Hour	171	204	--	--	--	--
# Days in Month *(a)*	31	31	--	--	--	--
BFM						
Total Enplaned Passengers	--	30,000	523,000	588,250	614,500	640,750
Peak Month	--	2,783	48,522	54,576	57,011	59,446
% of Total	--	9.3%	9.3%	9.3%	9.3%	9.3%
Average Day	--	174	1,565	1,761	1,839	1,918
Peak Hour	--	101	327	368	384	401
# Days in Month *(a)*	--	16	31	31	31	31
Mobile Airports Total						
Total Enplaned Passengers	303,871	356,750	523,000	588,250	614,500	640,750
Peak Month	28,192	33,098	48,522	54,576	57,011	59,446
% of Total	9.3%	9.3%	9.3%	9.3%	9.3%	9.3%
Average Day	909	1,068	1,565	1,761	1,839	1,918
Peak Hour	171	223	327	368	384	401
# Days in Month *(a)*	31	31	31	31	31	31

Sources: Historical—Mobile Airport Authority; OAG Aviation Worldwide Ltd., OAG Analyser Database, accessed August 2019.
Forecast—LeighFisher, October 2019.

Notes: *This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

(a) Represents number of days in month with scheduled service.

Table 6.5: Enplaned Passenger Peaking Forecast (Low Scenario)*
Mobile Regional and Mobile Downtown Airports

	Actual	Forecast				
	2018	2020	2025	2030	2035	2040
MOB						
Total Enplaned Passengers	303,871	325,500	--	--	--	--
Peak Month	28,192	30,199	--	--	--	--
% of Total	9.3%	9.3%	--	--	--	--
Average Day	909	974	--	--	--	--
Peak Hour	171	204	--	--	--	--
# Days in Month *(a)*	31	31	--	--	--	--
BFM						
Total Enplaned Passengers	--	27,500	465,750	509,750	527,250	544,750
Peak Month	--	2,551	43,211	47,293	48,916	50,540
% of Total	--	9.3%	9.3%	9.3%	9.3%	9.3%
Average Day	--	159	1,394	1,526	1,578	1,630
Peak Hour	--	93	291	319	330	341
# Days in Month *(a)*	--	16	31	31	31	31
Mobile Airports Total						
Total Enplaned Passengers	303,871	353,000	465,750	509,750	527,250	544,750
Peak Month	28,192	32,750	43,211	47,293	48,916	50,540
% of Total	9.3%	9.3%	9.3%	9.3%	9.3%	9.3%
Average Day	909	1,056	1,394	1,526	1,578	1,630
Peak Hour	171	221	291	319	330	341
# Days in Month *(a)*	31	31	31	31	31	31

Sources: Historical—Mobile Airport Authority; OAG Aviation Worldwide Ltd. OAG Analyser Database, accessed August 2019.
Forecast—LeighFisher, October 2019.

Notes: *This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

(a) Represents number of days in month with scheduled service.

Table 6.6: Enplaned Passenger Peaking Forecast (High Scenario)*
Mobile Regional and Mobile Downtown Airports

	Actual	Forecast				
	2018	2020	2025	2030	2035	2040
MOB						
Total Enplaned Passengers	303,871	328,000	--	--	--	--
Peak Month	28,192	30,431	--	--	--	--
% of Total	9.3%	9.3%	--	--	--	--
Average Day	909	982	--	--	--	--
Peak Hour	171	205	--	--	--	--
# Days in Month *(a)*	31	31	--	--	--	--
BFM						
Total Enplaned Passengers	--	32,500	580,250	666,750	701,750	736,750
Peak Month	--	3,015	53,833	61,859	65,106	68,353
% of Total	--	9.3%	9.3%	9.3%	9.3%	9.3%
Average Day	--	188	1,737	1,995	2,100	2,205
Peak Hour	--	110	363	417	439	461
# Days in Month *(a)*	--	16	31	31	31	31
Mobile Airports Total						
Total Enplaned Passengers	303,871	360,500	580,250	666,750	701,750	736,750
Peak Month	28,192	33,446	53,833	61,859	65,106	68,353
% of Total	9.3%	9.3%	9.3%	9.3%	9.3%	9.3%
Average Day	909	1,079	1,737	1,995	2,100	2,205
Peak Hour	171	225	363	417	439	461
# Days in Month *(a)*	31	31	31	31	31	31

Sources: Historical—Mobile Airport Authority; OAG Aviation Worldwide Ltd. OAG Analyser Database, accessed August 2019.
Forecast—LeighFisher, October 2019.

Notes: *This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

(a) Represents number of days in month with scheduled service.

Table 6.7: Passenger Airline Operations Peaking Forecast (Base Forecast)*
Mobile Regional and Mobile Downtown Airports

	Actual	Forecast				
	2018	2020	2025	2030	2035	2040
MOB						
Passenger airline operations	12,624	12,520	--	--	--	--
Peak Month	1,292	1,281	--	--	--	--
% of Total	10.2%	10.2%	--	--	--	--
Average Day	42	41	--	--	--	--
Peak Hour	7	6	--	--	--	--
# Days in Month *(a)*	31	31	--	--	--	--
BFM						
Passenger airline operations	--	425	18,340	19,960	20,180	20,380
Peak Month	--	43	1,877	2,043	2,065	2,086
% of Total	--	10.2%	10.2%	10.2%	10.2%	10.2%
Average Day	--	3	61	66	67	67
Peak Hour	--	1	9	10	10	10
# Days in Month *(a)*	--	16	31	31	31	31
Mobile Airports Total						
Passenger airline operations	12,624	12,945	18,340	19,960	20,180	20,380
Peak Month	1,292	1,325	1,877	2,043	2,065	2,086
% of Total	10.2%	10.2%	10.2%	10.2%	10.2%	10.2%
Average Day	42	43	61	66	67	67
Peak Hour	7	7	9	10	10	10
# Days in Month *(a)*	31	31	31	31	31	31

Sources: Historical—Mobile Airport Authority; OAG Aviation Worldwide Ltd. OAG Analyser Database, accessed August 2019.
Forecast—LeighFisher, October 2019.

Notes: *This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

(a) Represents number of days in month with scheduled service.

Table 6.8: Passenger Airline Operations Peaking Forecast (Low Scenario)*
Mobile Regional and Mobile Downtown Airports

	Actual	Forecast				
	2018	2020	2025	2030	2035	2040
MOB						
Passenger airline operations	12,624	12,480	--	--	--	--
Peak Month	1,292	1,277	--	--	--	--
% of Total	10.2%	10.2%	--	--	--	--
Average Day	42	41	--	--	--	--
Peak Hour	7	6	--	--	--	--
# Days in Month *(a)*	31	31	--	--	--	--
BFM						
Passenger airline operations	--	390	16,340	17,300	17,320	17,340
Peak Month	--	40	1,672	1,771	1,773	1,775
% of Total	--	10.2%	10.2%	10.2%	10.2%	10.2%
Average Day	--	2	54	57	57	57
Peak Hour	--	1	8	9	9	9
# Days in Month *(a)*	--	16	31	31	31	31
Mobile Airports Total						
Passenger airline operations	12,624	12,870	16,340	17,300	17,320	17,340
Peak Month	1,292	1,317	1,672	1,771	1,773	1,775
% of Total	10.2%	10.2%	10.2%	10.2%	10.2%	10.2%
Average Day	42	42	54	57	57	57
Peak Hour	7	7	8	9	9	9
# Days in Month *(a)*	31	31	31	31	31	31

Sources: Historical—Mobile Airport Authority; OAG Aviation Worldwide Ltd. OAG Analyser Database, accessed August 2019.
Forecast—LeighFisher, October 2019.

Notes: *This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

(a) Represents number of days in month with scheduled service.

Table 6.9: Passenger Airline Operations Peaking Forecast (High Scenario)*
Mobile Regional and Mobile Downtown Airports

	Actual	Forecast				
	2018	2020	2025	2030	2035	2040
MOB						
Passenger airline operations	12,624	12,560	--	--	--	--
Peak Month	1,292	1,285	--	--	--	--
% of Total	10.2%	10.2%	--	--	--	--
Average Day	42	41	--	--	--	--
Peak Hour	7	6	--	--	--	--
# Days in Month *(a)*	31	31	--	--	--	--
BFM						
Passenger airline operations	--	461	20,340	22,640	23,040	23,440
Peak Month	--	47	2,082	2,317	2,358	2,399
% of Total	--	10.2%	10.2%	10.2%	10.2%	10.2%
Average Day	--	3	67	75	76	77
Peak Hour	--	2	10	12	12	12
# Days in Month *(a)*	--	16	31	31	31	31
Mobile Airports Total						
Passenger airline operations	12,624	13,021	20,340	22,640	23,040	23,440
Peak Month	1,292	1,333	2,082	2,317	2,358	2,399
% of Total	10.2%	10.2%	10.2%	10.2%	10.2%	10.2%
Average Day	42	43	67	75	76	77
Peak Hour	7	7	10	12	12	12
# Days in Month *(a)*	31	31	31	31	31	31

Sources: Historical—Mobile Airport Authority; OAG Aviation Worldwide Ltd. OAG Analyser Database, accessed August 2019.
Forecast—LeighFisher, October 2019.

Notes: *This forecast was prepared on the basis of the information and assumptions given in the text. The achievement of any forecast is dependent upon the occurrence of future events which cannot be assured. Therefore, the actual results may vary from the forecast, and the variance could be material.

(a) Represents number of days in month with scheduled service.

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MPACT Public Affairs Consulting

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TECHNICAL MEMORANDUM No. 3 – FACILITY REQUIREMENTS

MASTER PLAN
Mobile Downtown Airport

Prepared for

Mobile Airport Authority
Mobile, Alabama

July 2020

Mobile Airport Authority

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ACRONYMS AND ABBREVIATIONS

Term	Definition
A300	Airbus A300F4-600
AAC	Aircraft Approach Category
ACN	Aircraft Classification Number
ACRP	Airport Cooperative Research Program
Terminal Spreadsheet Model	Airport Cooperative Research Program's *Spreadsheet Models for Terminal Planning & Design*
ACSL	FAR Part 139 Airport Certification Status List
ADG	Airplane Design Group
ADPM	Average Day of the Peak Month
AOCC	Airport Operations Control Center
ARC	Airport Reference Code
ARFF	Aircraft Rescue and Firefighting
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASV	Annual Service Volume
ATC	Air Traffic Control
ATCT	Air Traffic Control Tower
AvGas	Aviation Gasoline
BFM	Mobile Downtown Airport
CBIS	Checked Baggage Inspection System
CFH	Cubic Feet per Hour
CMG	Cockpit and Main Gear
DOT	U.S. Department of Transportation
EDS	Explosives Detection System
ETD	Explosives Trace Detector
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FBO	Fixed Base Operator
FedEx	FedEx Corporation
FIS	Federal Inspection Services
GA	General Aviation
GSE	Ground Support Equipment

Term	Definition
IATA	International Air Transport Association
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
LOS	Level of Service
MAA	Mobile Airport Authority
MAWSS	Mobile Area Water and Sewer System
MGW	Width of the Main Landing Gear
MIRL	Medium-Intensity Runway Edge Lights
MOB	Mobile Regional Airport
MSL	Mean Sea Level
MTOW	Maximum Takeoff Weight
NAVAID	Navigational Aid?
OSR	On-Screen Resolution
PAL	Planning Activity Levels
PCI	Pavement Condition Index
PCN	Pavement Classification Number
RDC	Runway Design Code
RNAV	Area Navigation
RPZ	Runway Protection Zone
RVR	Runway Visibility Range
Airfield Capacity Spreadsheet Model	Airfield Capacity Spreadsheet Model, an Excel-based tool developed by the Airport Cooperative Research Program
TDG	Taxiway Design Group
TFMSC	Traffic Flow Management System Counts
The Airport	Mobile Downtown Airport
TNC	Transportation Network Company
VMC	Visual Meteorological Conditions
VT MAE	VT Mobile Aerospace Engineering

1. INTRODUCTION AND SUMMARY

This document summarizes the requirements for facilities and land areas to accommodate future aviation demand through 2040 at the Mobile Downtown Airport (BFM or the Airport), as presented in the *Aviation Demand Forecasts* chapter. Facility requirements were developed for the airfield, passenger terminal complex, ground transportation and parking, air cargo, general aviation, airline support facilities, airport support facilities, and utilities. This facility requirements report is organized as follows:

1. Introduction and Summary
2. Airfield Capacity and Aircraft Delay Requirements
3. Passenger Terminal Complex Requirements
4. Ground Transportation and Parking Requirements
5. Air Cargo Facility Requirements
6. General Aviation and Fixed Base Operator Requirements
7. Airport and Airline Support Requirements

1.1 History and Background

The City of Mobile sits along Mobile Bay in the southwestern portion of Alabama. Mobile is home to two airports, both owned and operated by the Mobile Airport Authority (MAA). BFM is located four miles south of the city's downtown and is partially located on a portion of the former Brookley Air Force Base. The MAA also owns the adjacent Brookley Aeroplex, a mixed-use industrial area. Lastly, another portion of the former Air Force Base, owned by the University of Southern Alabama Foundation, sits on land adjacent to BFM, between the airfield and Mobile Bay.

Mobile Regional Airport (MOB) is located approximately 11 miles due west of the city's downtown area and currently serves as the primary commercial service airport.

Although MOB is currently the primary commercial service airport in the region, the MAA plans to shift all commercial passenger traffic to the Mobile Downtown Airport by 2025. It has been determined that the existing operation at MOB creates a competitive disadvantage based on location and related access issues, which have contributed to passenger leakage to other regional facilities. To accommodate the increased passenger traffic, a number of changes will be implemented, including the building of a new terminal as well as necessary improvements to BFM's airfield, ground transportation and parking areas, and cargo facilities.

1.2 Planning Activity Levels

Recognizing the uncertainties associated with long-range aviation demand forecasting, four planning activity levels (PALs) were identified to represent the future levels of activity at which key airport improvements will be necessary. Because activity levels could occur at different periods from those anticipated when the forecasts were prepared, the use of PALs allows for facilities planning that is realistically tied to milestone activity levels as they occur, rather than arbitrary years. PAL 1, PAL 2, PAL 3, and PAL 4 correspond to the base case aviation demand forecasts for 2025, 2030, 2035, and 2040, respectively. The aviation demand associated with each PAL is summarized in Table 1.1.

Table 1.1: Aviation Demand Forecasts

	Baseline (2018)	PAL 1 (2025)	PAL 2 (2030)	PAL 3 (2035)	PAL 4 (2040)
Enplaned Passengers					
MOB (a)	303,871	-	-	-	-
BFM	-	523,000	588,250	614,500	640,750
Aircraft Operations					
Commercial					
MOB	13,986	-	-	-	-
BFM	4,468	24,360	26,180	26,600	27,000
General Aviation					
MOB	9,253	9,190	9,310	9,450	9,580
BFM	14,359	14,800	15,010	15,220	15,440
Military					
MOB	48,373	49,970	49,970	49,970	49,970
BFM	45,267	43,670	43,670	43,670	43,670
Total Aircraft Operations					
MOB	71,612	59,160	59,280	59,420	59,550
BFM	64,094	82,830	84,860	85,490	86,110

Sources: Historical—Mobile Airport Authority; OAG Aviation Worldwide Ltd., OAG Analyser database, accessed August 2019.
Forecast—LeighFisher, October 2019.
(a) Enplanements/operations are shown for both BFM and MOB to capture the total Mobile market demand

1.3 Summary of Requirements

The Airport facility requirements for the four planning activity levels defined above are summarized in Table 1.2.

Table 1.2 Facility Requirements Summary

Functional Element	Estimated total requirements				Period-over-period requirement			
	2025	2030	2035	2040	2025 (Opening Day)	2030	2035	2040
BASIS FOR REQUIREMENTS (DEMAND FORECASTS)								
Total annual passengers	1,046,000	1,176,500	1,229,000	1,281,500	n/a	n/a	n/a	n/a
Aircraft operations	82,830	84,860	85,490	86,110	n/a	n/a	n/a	n/a
AIRFIELD								
Number of Runways	1 primary plus 1 crosswind	1 primary plus 1 crosswind	1 primary plus 1 crosswind	1 primary plus 1 crosswind	n/a	n/a	n/a	n/a
Critical Aircraft	A-300	A-300	A-300	A-300				
Runway Length (feet)								
Runway 14/32	9,618	9,618	9,618	9,618	n/a	n/a	n/a	n/a
Runway 18/36	7,800	7,800	7,800	7,800	n/a	n/a	n/a	n/a
Instrument Approach Capability	CAT II/III	CAT II/III	CAT II/III	CAT II/III	n/a	n/a	n/a	n/a
PASSENGER TERMINAL COMPLEX								
Aircraft gates and parking								
Total gates	8	8	8	8	n/a	0	0	0
Remote/RON parking	2	2	2	2	n/a	0	0	0
Holdrooms (area in square feet)								
Total holdroom area	7,119	7,447	7,447	7,447	n/a	328	0	0
Airline Check-in							0	
Number of processors					n/a	0	0	0
Agent counters	5	6	6	6	n/a	1	0	0
Kiosks	3	3	4	4	n/a	0	1	0
Bag Drops	2	2	2	2	n/a	0	0	0
Total	10	11	12	12	n/a	1	1	0
Lobby queue area (square feet)	5,644	5,644	5,644	5,644	n/a	0	0	0
Passenger Security Screening							0	0
Number of screening lanes	3	4	4	4	n/a	1	0	0
Security queue area (square feet)	3,739	4,985	4,985	4,985	n/a	1,246	0	0
Baggage Security Screening							0	0
Number of primary EDS machines	2	2	2	2	n/a	0	0	0
Number of OSR Stations	1	1	1	1	n/a	0	0	0
Number of ETD Units	1	1	1	1	n/a	0	0	0
Total area (square feet)	1,740	1,740	1,740	1,740	n/a	0	0	0
Outbound Baggage Make Up							0	0
Total make up area (square feet)	5,900	5,900	5,900	5,900	n/a	0	0	0
Inbound Baggage Handling							0	0
Total offload frontage (linear feet)	60	60	60	60	n/a	0	0	0
Baggage Claim					n/a	0	0	0
Total presentation frontage (linear feet)	200	200	200	200		0	0	0
Total area for claiming baggage (square feet)	12,000	12,000	12,000	12,000		0	0	0
Concessions						0	0	0
Total area (square feet)	10,000	10,000	10,000	10,000	n/a	0	0	0

Functional Element	Estimated total requirements				Period-over-period requirement			
	2025	2030	2035	2040	2025 (Opening Day)	2030	2035	2040
GROUND TRANSPORTATION AND PARKING								
Public, employee, and commercial parking								
Low Scenario (spaces)	2,400	2,600	2,600	2,600	n/a	200	0	0
High Scenario (spaces)	3,000	3,400	3,400	3,500	n/a	400	0	100
Rental car facilities- Low (square feet)						10,000	4,000	5,000
Low Scenario (square feet)	84,000	94,000	98,000	103,000	n/a	19,000	8,000	8,000
High Scenario (square feet)	157,000	176,000	184,000	192,000	n/a	0	0	0
Roadways (number of lanes)								
Broad St E of Michigan Ave eastbound- Link ID 6	2	2	2	2	n/a	0	0	0
Broad St E of Michigan Ave westbound- Link ID 6	1	2	2	2	n/a	1	0	0
I-10 westbound on ramp- Link ID 10	1	2	2	2	n/a	1	0	0
I-10 eastbound on ramp- Link ID 11	3	3	3	3	n/a	0	0	0
I-10 eastbound exit right turn lane- Link ID 12	3	3	3	3	n/a	0	0	0
Curbside								
Loading & unloading (linear feet)	625	675	675	725	n/a	50	0	50
Roadway (lanes)	2	2	2	2	n/a	0	0	0
Commercial vehicle facilities								
Parking stalls	49	55	58	30	n/a	6	3	-28
Square feet	18,000	20,000	21,000	22,000	n/a	2,000	1,000	1,000
AIR CARGO							0	0
Belly cargo total area (square feet)	2,696	2,785	2,841	2,895	n/a	89	56	54
GENERAL AVIATION							0	0
Parcel area (acres)	3	3	3	3	n/a	0	0	0
Apron area (acres)	7	7	7	7	n/a	0	0	0
Total area (acres)	10	10	10	10	n/a	0	0	0
AIRPORT AND AIRLINE SUPPORT								
Aircraft Rescue and Firefighting (ARFF) Facilities								
Building size (square feet)	9,000	9,000	9,000	9,000	n/a	0	0	0
Number of vehicles	2	2	2	2	n/a	0	0	0
Air Traffic Control Tower (acres)	3	3	3	3	n/a	0	0	0
Airport Administration Facilities (square feet)	22,906	24,240	25,574	26,908	n/a	1,334	1,334	1,334
Fuel Storage								
Quantity (gallons)	116,000	117,600	117,900	118,300	n/a	1,600	300	400
MRO Facilities (acres)	55	56	57	58	n/a	1	1	1
Ground Support Equipment (GSE)					n/a	0	0	0
Total staging and storage area (square feet)	27,700	28,116	28,200	28,285				
Airport Maintenance Facility (square feet)	26,700	26,700	26,700	26,700	n/a	0	0	0
Maintenance building (square feet)	8,131	8,172	8,180	8,188	n/a	41	8	8
Maintenance yard (square feet)	20,064	20,164	20,184	20,204	n/a	100	20	20
Utilities								
Terminal peak hour water usage (gal/hr)	24,062	24,428	24,590	24,758	n/a	366	162	168
Terminal electrical transformer (kVA)	1,500	1,500	1,500	1,500	n/a	0	0	0
ConRAC electrical transformer (amps)	200-400	200-400	200-400	200-400	n/a	0	0	0
Natural gas consumption rate (cubic ft/hour)	25,000	25,000	25,000	25,000	n/a	0	0	0

2. AIRFIELD CAPACITY AND AIRCRAFT DELAY

The capacity of the existing airfield and airspace system was assessed to determine when additional airfield capacity improvements will be required to meet aviation demand forecast through the planning period (2040). Specifically, the airfield requirements analysis will:

- Recommend the appropriate critical design aircraft based on forecast demand and the Airport's anticipated role from now through 2040.
- Analyze airfield/airspace demand-capacity for existing conditions versus the forecasts of future aircraft operations levels using the Airport Cooperative Research Program (ACRP) Airfield Capacity Spreadsheet Model.
- Determine the required runway length for the existing and future fleet mix.

These analyses are detailed in the following sections.

2.1 Background

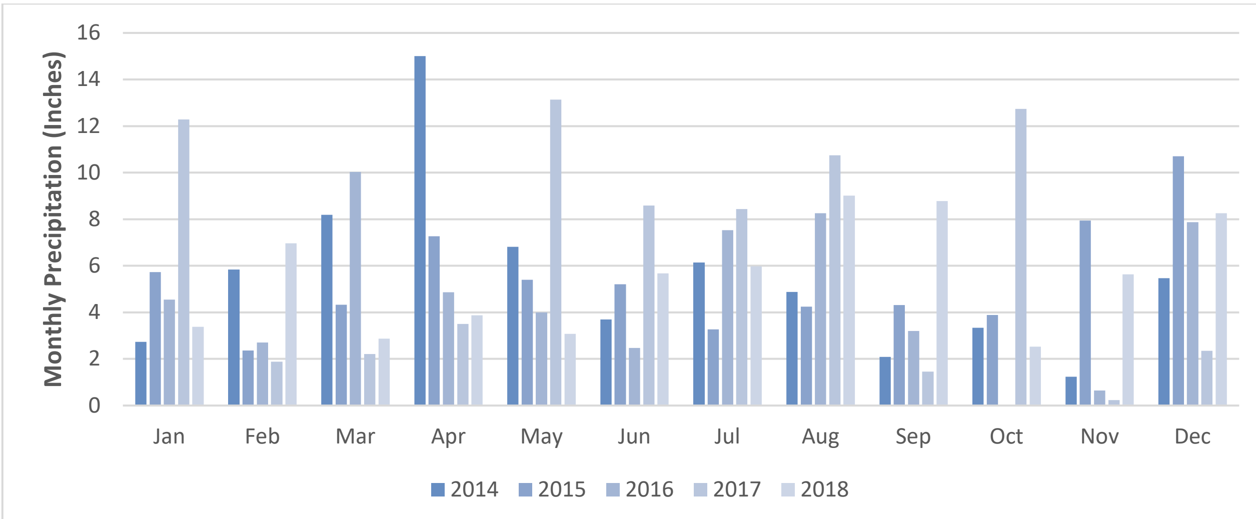
2.1.1 Wind Coverages and Meteorological Conditions

Airfields and runways are typically designed to allow aircraft to take off and land into the wind. By contrast, crosswinds are directional winds that blow perpendicular to the runway. FAA design standards recommend a wind coverage for which 95% of the time the crosswind does not exceed the demonstrated design capability for the aircraft. Wind conditions at BFM were analyzed according to three separate weather conditions: all weather conditions, visual meteorological conditions (VMC), and instrument meteorological conditions (IMC). VMC refers to good weather conditions, generally defined as when horizontal visibility is 1 mile or greater and clear of cloud during the day. IMC refers to poor weather conditions, i.e., when horizontal visibility is less than 3 miles and/or the ceiling is less than 1,000 feet. Table 2.1 summarizes the wind coverage for both runways according to all-weather conditions, VMC, and IMC.

Table 2.1: Wind Coverages

Crosswind Component	Both Runways			Runway 14/32 Only			Runway 18/36 Only		
	All Weather (%)	*IMC (%)*	*VMC (%)*	*All Weather (%)*	*IMC (%)*	*VMC (%)*	*All Weather (%)*	*IMC (%)*	*VMC (%)*
10.5 knots	98.59	98.29	98.63	97.27	96.87	97.31	95.77	95.76	95.75
13 knots	99.43	99.21	99.47	98.76	98.42	98.81	97.82	97.51	97.87
16 knots	99.86	99.72	99.88	99.73	99.52	99.77	99.38	98.92	99.47
20 knots	99.96	99.89	99.97	99.93	99.85	99.95	99.81	99.57	99.86
Source: Hanson Professional Services, 2019									

Figure 2.2 shows monthly precipitation for the past five years at BFM. Values shown are total recorded accumulation. Variation from month to month and year to year is notable. For example, in October 2016, no precipitation was recorded, while October 2017 experienced more than 12 inches total. Over the past five years, August (7.4 inches) was, on average, the wettest month, followed by December (6.9 inches) and April (6.9 inches).



Source: Hanson Professional Services, 2019

Figure 2.1: Monthly Precipitation Accumulation

2.1.2 Existing Airfield Layout

Mobile Downtown Airport has a dual non-intersecting runway system. The primary runway, Runway 14/32, is 9,618 feet long and 150 feet wide. Its grooved surface has precision markings as well as high-intensity runway edge lighting. The runway will undergo rehabilitation and repair, as a result of an $8 million grant from the Federal Aviation Administration (FAA).

Runway 18/36 is classified as an additional runway and is not eligible for FAA funding due to sufficient wind coverage provided by Runway 14/32. Runway 18/36 is 7,800 feet long and 150 feet wide. It has non-precision markings and medium-intensity runway edge lights (MIRL).

BFM also contains four existing taxiways:

1. Taxiway A runs parallel to the length of Runway 14/32.
2. Taxiway K connects from Taxiway A to Runway 18/36.
3. Taxiway L connects Taxiway A into the Airbus facilities.
4. Taxiway H provides connection from Taxiway A to the passenger terminal and ramp.

Taxiway J, which previously connected to Taxiway H, is now closed to accommodate the new entry road and roundabout to Airbus' expanded facilities. The existing airfield layout at BFM is illustrated in Figure 2.1.

Source: Hanson Professional Services, 2019

Figure 2.2: Existing Airfield Layout

2.2 Critical Design Aircraft Recommendation

A key component guiding airport design and planning is the designation of a Critical Design Aircraft. As defined in FAA Advisory Circular 150/5000-17, *Critical Aircraft and Regular Use Determination*, the Critical Design Aircraft is the most demanding aircraft type that makes regular use of the airport (minimum of 500 annual aircraft operations). The Critical Design Aircraft sets dimensional requirements of the airport, including, for example, taxiway and runway separations, and Runway Protection Zone (RPZ) dimensions. Determining the Critical Design Aircraft includes documentation of the specific aircraft types making use of the airport over the most recent 12-month period of activity.

Upon review of the 2019 Traffic Flow Management System Counts (TFMSC) data at BFM, the future fleet mix, and the flight tracking website FlightAware, it was determined that the Critical Design Aircraft for BFM should be the Airbus A300F4-600 (A300), a long-range wide-body aircraft. This aircraft type is operated by FedEx Corporation (FedEx) and sees more than 1,000 annual operations at BFM. Because of this, BFM will need to be designed to support this aircraft type's use. If a facility at the airport is not anticipated to be used by the A300, it can be designed for a different critical design aircraft.

Related to the determination of a Critical Design Aircraft is the designation of an Airport Reference Code (ARC), Runway Design Code (RDC), and Taxiway Design Group (TDG). As defined in FAA AC 150/5300-13A, *Airport Design*, the ARC is a coding system developed by the FAA that establishes airport design criteria in relation to the aircraft types that will service the airport. An airport's ARC is specifically determined by the design aircraft. The RDC is analogous to the ARC and establishes the design standards for an airport's runways.

The ARC consists of two components relating to the Critical Design Aircraft. The first component, depicted by a letter, represents the aircraft approach category (AAC), or the design aircraft's maximum approach speed. The second component of the ARC, depicted by a Roman numeral, is the airplane design group (ADG), which represents physical characteristics of the design aircraft, specifically wingspan and tail height. AAC and ADG classifications are depicted in Table 2.2.

Using the Airbus A300 as the design aircraft, the ARC for BFM is C-IV. Similarly, the RDC for Runway 14/32 is also C-IV. On the other hand, the existing RDC for Runway 18/36 is B-II. However, the existing length of Runway 18/36 is longer than required to serve B-II aircraft. In coordination with the Air Traffic Control Tower, the aircraft using Runway 18/36 are not limited to B-II.

The TDG relates to the undercarriage dimensions of an aircraft and drives requirements for taxiway and taxilane width, as well as fillet standards. The TDG of an aircraft, depicted by a number between 1 and 7, is based on the aircraft's distance between the cockpit and main gear (CMG) and the width of the main landing gear (MGW). The TDG for the A300 is TDG-5 and requires a taxiway width of 75 feet.

Since it is classified as an additional runway, Runway 18/36 is not eligible for FAA grant funding, and thus, all rehabilitation and preservation activities for Runway 18/36 are anticipated to be a local cost for the MAA. As shown in the *Alternatives* chapter, several alternatives have been considered for the future development of Runway 18/36.

Table 2.2: FAA Aircraft Approach Category and Aircraft Design Group

Aircraft Approach Category (AAC)		**Airplane Design Group (ADG)**	
A	Approach speed less than 91 knots	I	Wingspan less than 49 feet or tail height less than 20 feet
B	Approach speed of 91 knots but less than 121 knots	II	Wingspan of 49 feet but less than 79 feet or tail he3ight of 20 feet but less than 30 feet
C	Approach speed of 121 knots but less than 141 knots	III	Wingspan of 79 feet but less than 118 feet or tail height of 30 feet but less than 45 feet
D	Approach speed of 141 knots but less than 166 knots	IV	Wingspan of 118 feet but less than 171 feet or tail height of 45 feet but less than 60 feet
E	Approach speed of 166 knots or more	V	Wingspan of 171 feet but less than 214 feet or tail height of 60 feet but less than 66 feet
		VI	Wingspan of 214 feet but less than 262 feet or tail height of 66 feet but less than 80 feet

Source: FAA AC 150/5300-13A, *Airport Design*, September 2012, https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5300-13A-chg1-interactive-201612.pdf.

2.3 Demand-Capacity Analysis

The methodology used to determine the capability of the airfield to accommodate 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 operations that can be accommodated under conditions of continuous demand during a one-hour period.
- Annual Service Volume (ASV): The 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).

Calculating hourly capacities at BFM involved using the methodology in FAA Advisory Circular 150/5060-5: *Airport Capacity and Delay*[1] and ACRP Report 79: *Evaluating Airfield Capacity.*[2] ACRP Report 79 developed an Excel-based tool called the "Airfield Capacity Spreadsheet Model," which was utilized in this study to calculate the Airport's hourly capacity and ASV estimates.

The Airfield Capacity Spreadsheet Model uses input parameters to determine the minimum allowable time between aircraft using the runways at an airport. The time intervals are computed for different combinations of aircraft types and different types of operations (arrivals and departures), considering air traffic control (ATC) rules, weather conditions, runway occupancy times, runway use configurations, aircraft operating characteristics, and wake turbulence effects. The time intervals computed by the model are then averaged and used to estimate hourly airfield capacity and ASV.

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[1] FAA Advisory Circular 150/5060-5: Airport Capacity and Delay, September 1983, https://www.faa.gov/documentLibrary/media/Advisory_Circular/150_5060_5.pdf.

[2] ACRP Report 79: Evaluating Airfield Capacity, December 2016, http://www.trb.org/Publications/Blurbs/168260.aspx.

2.3.1 Model Inputs and Key Assumptions

The major assumptions and inputs used in the Airfield Capacity Spreadsheet Model include future fleet mix, weather conditions, runway use percentages, runway occupancy times, approach speeds, and aircraft separation standards. These are summarized in the following sections.

2.3.1.1 Aircraft Fleet Mix

Runway capacity is affected by the different types of aircraft using the runways. The Airfield Capacity Spreadsheet Model can model up to seven different classes of aircraft. The categorization used in the model, FAA RECAT Phase II, was introduced in FAA Order 7110.659C *Wake Turbulence Recategorization*[3] and is based on an aircraft's wingspan and ability to withstand a wake encounter from another aircraft. The proportion of aircraft types in each class constitutes the fleet mix. These aircraft classes, however, do not match the aircraft classifications defined in FAA AC 150/5060-5*, Airport Capacity and Delay*. For this capacity analysis, the aircraft classes are defined as described in Table 2.3.

Table 2.3: FAA RECAT Phase II Aircraft Classes

Aircraft Class	Description
A	MTOW of 300,000 pounds or more and wingspan greater than 245 feet
B	MTOW of 300,000 pounds or more and wingspan greater than 175 feet and less than or equal to 245 feet
C	MTOW of 300,000 pounds or more and wingspan greater than 125 feet and less than or equal to 175 feet
D	MTOW less than 300,000 pounds and wingspan greater than 125 feet and less than or equal to 175 feet; or MTOW greater than 41,000 pounds with wingspan greater than 90 feet and less than or equal to 125 feet
E	MTOW greater than 41,000 pounds with wingspan greater than 65 feet and less than or equal to 90 feet
F	MTOW of less than 41,000 pounds and a wingspan less than or equal to 125 feet; MTOW less than 15,500 pounds regardless of wingspan; or a powered sailplan
G	Heavy aircraft not included in Category B or C
Source: FAA Order 7110.659C, Wake Turbulence Recategorization	

The numbers and proportions used in this analysis reflect the future fleet mix distribution from the *Aviation Demand Forecasts* chapter. The forecast, however, contains fleet mix projections only for passenger airline aircraft; therefore, cargo, general aviation, and military operations were assigned a category based on their typical operating characteristics, as follows:

- Cargo: assumed as Class C
- General Aviation: assumed as Class D
- Military: assumed as Class D

[3] FAA Order 7110.659C *Wake Turbulence Recategorization,* February 2016, https://www.faa.gov/documentLibrary/media/Order/JO_7110_659C.pdf.

Baseline (both BFM and MOB) and forecast (PAL 1-PAL 4) fleet mix data are shown in Table 2.4.

Table 2.4: Aircraft Fleet Mix by RECAT Phase II Category

Aircraft Class	Fleet Mix Distribution				
	Baseline (2018)	PAL 1 (2025)	PAL 2 (2030)	PAL 3 (2035)	PAL 4 (2040)
C	7.5%	7.3%	7.3%	7.5%	7.7%
D	77.3%	74.4%	73.8%	74.0%	74.2%
E	15.2%	18.3%	18.9%	18.5%	18.1%
Source: LeighFisher, 2020					

Another key input for the Airfield Capacity Spreadsheet Model is the Mix Index. The Mix Index is based on the aircraft class categories from the original FAA Capacity Model. It is the percent of previously classified "Category C" aircraft plus three times the percent of previously classified "Category D" aircraft, expressed as C+3D. The aircraft class mix and Mix Index are shown in Table 2.5. The FAA-established Mix Index range of 51-180 is expected throughout the planning period.

Table 2.5: Aircraft Class Mix and Mix Index

Aircraft Class	Baseline (2018)	PAL 1 (2025)	PAL 2 (2030)	PAL 3 (2035)	PAL 4 (2040)
C	92.5%	92.7%	92.7%	92.5%	92.3%
D	7.5%	7.3%	7.3%	7.5%	7.7%
Mix Index (C+3D)	**115**	**115**	**115**	**115**	**115**
Source: LeighFisher, 2020					

2.3.1.2 Weather Conditions

Weather conditions, namely cloud ceiling and visibility, determine the ATC procedures that can be used at BFM, in turn affecting runway capacity. Cloud ceiling and visibility levels at BFM were estimated by analyzing counts from the FAA's wind rose generator between 2009 and 2018. Weather conditions were defined as follows:

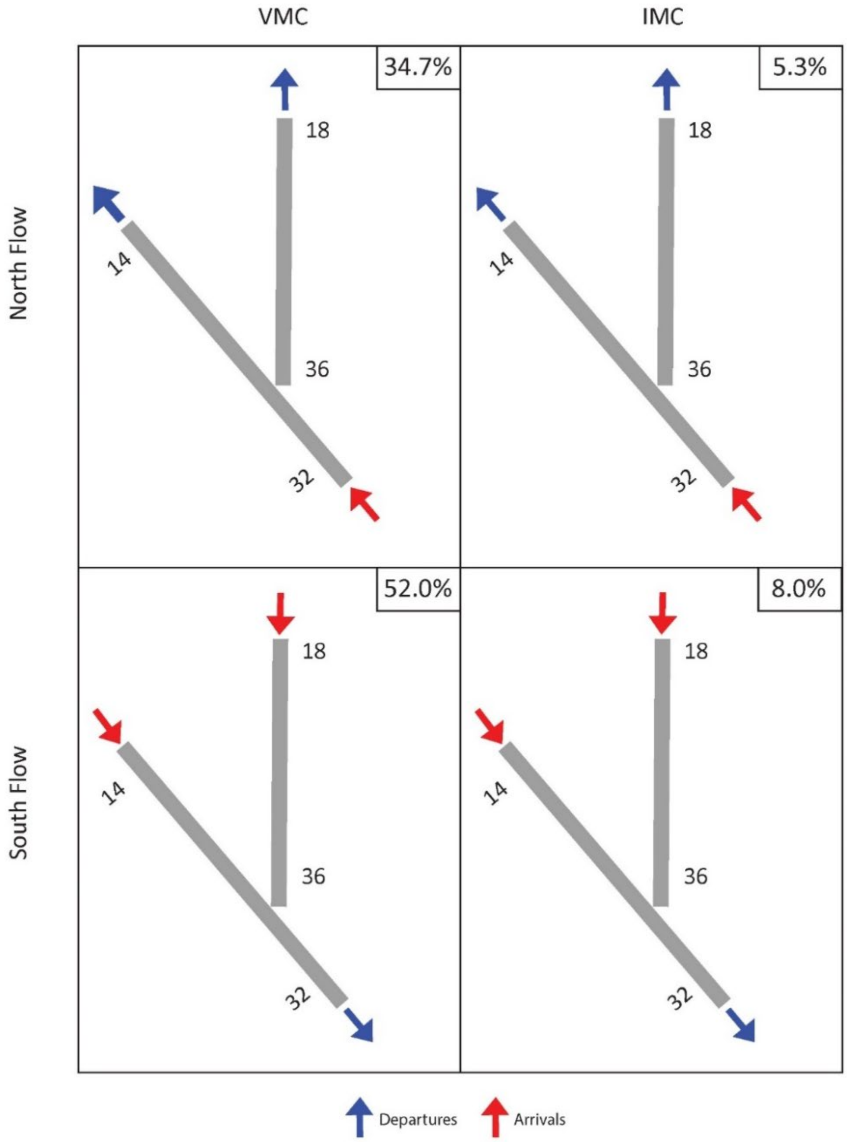
- Visual meteorological conditions (VMC): horizontal visibility of three miles or greater and cloud ceiling at least 1,000 feet above ground level
- Instrument meteorological conditions (IMC): horizontal visibility of less than three miles and/or cloud ceiling less than 1,000 feet above ground level

Due to its the location on the Mobile Bay, BFM experiences fog conditions, especially during winter months. Weather observations at BFM were analyzed to estimate the percentage of the time that these conditions occur. The Airport operates under VMC conditions 86.7% of the time and under IMC conditions 13.3% of the time.

2.3.1.3 Runway-Use Configurations

Runway use refers to the typical way in which an airfield is operated under a certain weather condition, and includes which runways are in use and for which type of operations. Runway use configurations were reviewed and confirmed with ATC staff at BFM. The typical runway operating configurations and percent occurrences used in the model are shown in Figure 2.3.

Under both VMC and IMC, north flow includes dependent operation of arrivals and departures on Runway 32 and departures on Runway 36. South flow consists of dependent operation of arrivals and departures on Runway 14 and arrivals on Runway 18.



Source: LeighFisher, 2020

Figure 2.3: Runway Operating Configurations

2.3.1.4 Runway Occupancy Times and Final Approach Speeds

Runway occupancy time refers to how long an aircraft occupies a runway. For departures, runway occupancy time refers to the time a departing aircraft takes from the moment it occupies an active runway until it clears the departure end. For arrivals, runway occupancy time refers to the time an arriving aircraft takes between crossing the runway threshold and clearing the runway. *Final approach speed* refers to aircraft speed from the outer marker to the threshold, and is a function of an aircraft's size, weight, and engine power.

Standard assumptions for departure and arrival runway occupancy times and final approach speeds, which have been developed by the FAA, MITRE Corporation, and LeighFisher in many previous studies, were used, as summarized in Table 2.6.

Table 2.6: Arrival Runway Occupancy Times and Final Approach Speeds

Aircraft Category	Arrival Runway Occupancy Time (seconds)	Average Final Approach Speed (knots)
A	55	150
B	51	140
C	46	135
D	45	130
E	42	120
F	40	100
G	32	90

Source: ACRP Airfield Capacity Spreadsheet Model

2.3.1.5 Assumed Minimum Standards for Aircraft Separation

Another critical input to the Airfield Capacity Spreadsheet Model is the minimum separation required between successive operations, expressed as distance and/or time. The assumed minimum separations required between two consecutive arriving aircraft and between two consecutive departing aircraft follow the standards set forth in FAA Report EM-78-8A *Parameters of Future ATC Systems Relating to Airport Capacity/Delay.*[4]

There are different separation requirements for VMC and IMC conditions. The assumed minimum separation requirements between successive visual approaches were based on extensive data collected at a number of busy U.S. airports by the MITRE Corporation for the FAA, as reported in FAA Report EM-78-8A. The FAA has specified these separation values as industry-standard inputs for airfield and airspace capacity and simulation models.

2.3.2 Hourly Capacity Estimates

The hourly capacity is the maximum number of operations that can be accommodated at BFM in one hour. To calculate the hourly capacity, the Airfield Capacity Spreadsheet Model uses the inputs and assumptions summarized in the preceding sections, specifically the following: aircraft fleet mix; weather conditions; runway use percentage and flow configuration; runway occupancy times and final approach speeds; and minimum arrival-arrival and departure-departure aircraft separations. The calculated hourly capacities for different runway configurations are then weighted by their percentage of utilization to calculate the weighted hourly capacity. Hourly capacities for the baseline and PAL 4 activity levels are shown in Table 2.7.

[4] FAA Report EM-78-8A Parameters of Future ATC Systems Relating to Airport Capacity/Delay, April 1978, http://www.tc.faa.gov/its/worldpac/techrpt/em78-8.pdf.

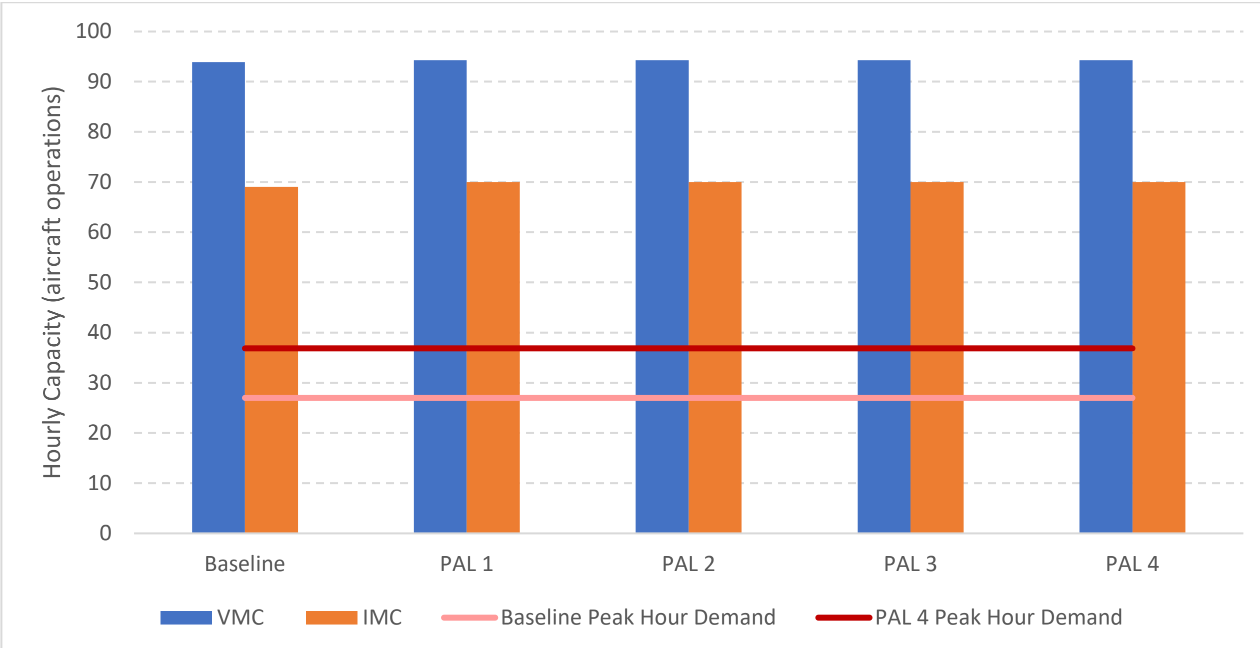
Table 2.7: Hourly Runway Capacity

	Hourly capacity (C)	Weather condition occurrence (P)	Percent of maximum capacity	Weighting factor (W)	P*C*W	P*W
Baseline (2018)						
VMC	93.9	86.7%	100%	1	81.4	86.7%
IMC	69	13.3%	73.5%	15	137.7	199.5%
Baseline weighted hourly capacity (Cw) = 76.5						
PAL 4 (2040)						
VMC	94.3	86.7%	100%	1	81.8	86.7%
IMC	70	13.3%	74.2%	15	139.7	199.5%
PAL 4 weighted hourly capacity (Cw) = 77.4						
Source: LeighFisher, 2020						

The resulting hourly capacities and weighted hourly capacities remain relatively consistent throughout the planning period. The hourly capacities for each planning activity level, compared against peak hour demand, are shown in Figure 2.4.

Because peak hour forecasts for cargo, military, and general aviation (GA) flights were not available, the planning team calculated overall peak hour demand at BFM using actual 2018 hourly traffic count data for all aircraft operations (i.e., cargo, military, and GA) obtained from the Air Traffic Control Tower (ATCT). To accomplish this, the planning team first identified the peak month and divided the hourly traffic counts by 30 to determine the peak hour in an average day of the peak month (ADPM). However, there were no passenger airline operations at BFM in 2018, so the actual peak hour was not inclusive of passenger airline operations. To address the data gap, the planning team reconciled actual 2018 hourly passenger airline operations at MOB (from the OAG Analyser database) with the BFM peak hour to find a representative ADPM and peak hour. Finally, assuming peak hour traffic would increase in direct proportion to the forecast growth in annual aircraft operations, the planning team calculated forecast ADPM and peak hour demand for the planning period.

Estimated hourly capacity for all weather conditions is well above the peak hour demand throughout the planning period, suggesting that delays will be minimal, and additional runway capacity is not needed.



Source: LeighFisher, 2020

Figure 2.4: Hourly Runway Capacity vs Peak Hour Demand

2.3.3 Estimates of Annual Service Volume

LeighFisher prepared a range of estimates of annual service volume for the Airport, as defined in FAA AC 150/5060-5 *Airport Capacity and Delay*.[5] In that circular, ASV is defined as the point at which further increases in demand will result in disproportionate increases in average aircraft delay. As such, ASV is not a hard-upper limit on annual aircraft operations and is not tied to any particular aircraft delay level. Aircraft operations levels can be as much as 15% to 20% higher than ASV before aircraft delays become excessive, depending on aircraft mix, operational complexity, and peaking patterns.

Annual service volume is calculated using a formula in FAA AC 150/5060-5:

ASV = C_w x D x H

Where:

- **C_w:** the weighted average hourly capacity of the airfield
- **D (Daily Ratio):** the ratio of annual demand to average daily demand in the peak month
- **H (Hourly Ratio):** the ratio of average daily demand to average peak hour demand in the peak month

[5] FAA Advisory Circular 150/5060-5: Airport Capacity and Delay, September 1983, https://www.faa.gov/documentLibrary/media/Advisory_Circular/150_5060_5.pdf.

The formula essentially extrapolates the various hourly runway capacities for specific runway uses and weather conditions to an annual capacity using the percent occurrence of those runway uses and weather conditions as well as weighting factors prescribed in the advisory circular. Moreover, in FAA AC 150/5060-5, ASV is the basis for estimating average annual aircraft delay using a ratio of total annual operations to ASV.

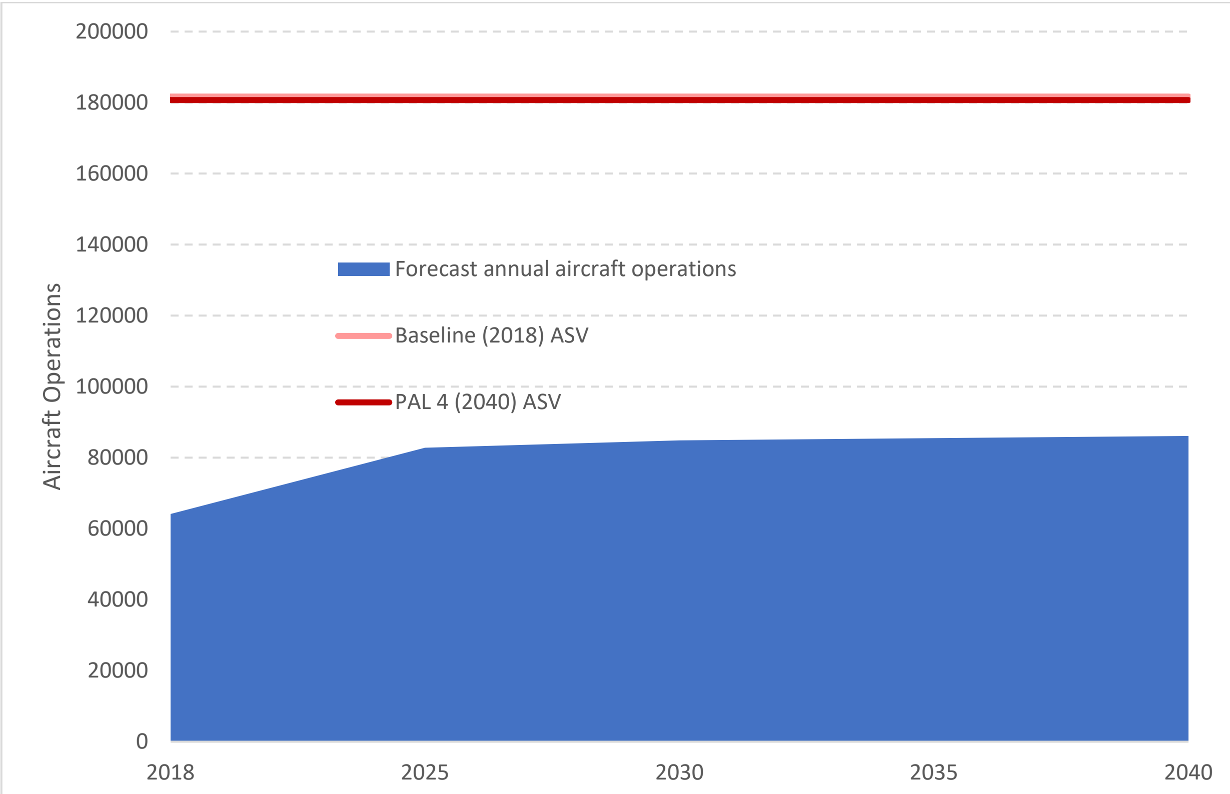
C_w was calculated using the Airfield Capacity Spreadsheet Model, as shown in the previous section. The remaining ASV parameters ("D" and "H") were based on the annual, ADPM, and peak hour levels of aircraft operations, calculated according to the methodology explained in the previous section.

Applying these parameters with the calculated weighted hourly capacity estimates yielded an estimate of ASV for each planning activity level, as shown in Table 2.8, rounded to the nearest 1,000.

Table 2.8: Annual Service Volume

Year	Cw	D	H	ASV
Baseline (2018)	76.5	223.3	10.6	181,700
PAL 1 (2025)	77.4	219.8	10.6	180,700
PAL 2 (2030)	77.4	219.8	10.6	180,700
PAL 3 (2035)	77.4	219.8	10.6	180,700
PAL 4 (2040)	77.4	219.8	10.6	180,700
Source: LeighFisher, 2020				

The forecast annual aircraft operations for each planning activity level is displayed in comparison to the estimated ASV for Baseline (2018) and PAL 4 (2040) in Figure 2.5. As shown in the figure, ASV exceeds demand by a wide margin, further confirming that additional runway capacity is not needed within the planning period.



Source: LeighFisher, 2020

Figure 2.5: Annual Service Volume vs Demand

2.4 Runway Length Assessment

This section summarizes the evaluation of runway length requirements for BFM. The takeoff length requirements associated with a variety of aircraft types in the future fleet mix and 2019 TFMSC counts were evaluated using the process identified in FAA Advisory Circular 150/55325-4B *Runway Length Requirements for Airport Design*, specifically determining runway length requirements for long-haul routes at maximum takeoff weight (MTOW). The takeoff runway length requirements at MTOW for each aircraft were estimated using requirement charts provided in aircraft-specific planning manuals, pilot operating handbooks, and airport planning publications. Furthermore, where possible, charts for optimal takeoff configuration were used to estimate requirements. The following assumptions were incorporated into the runway length estimates:

- Field elevation at sea level, which approximates the Airport elevation of 0 feet Mean Sea Level (MSL)
- Ambient temperature of 91°F, the standard mean daily maximum temperature
- For aircraft with a large assortment of engines and build outs, use of that with the highest MTOW
- No obstacles that might limit payload
- Zero wind
- Dry runway conditions

Runway length requirements for selected aircraft at MTOW as well as some of the larger aircraft at 70% load are shown in Figure 2.6.

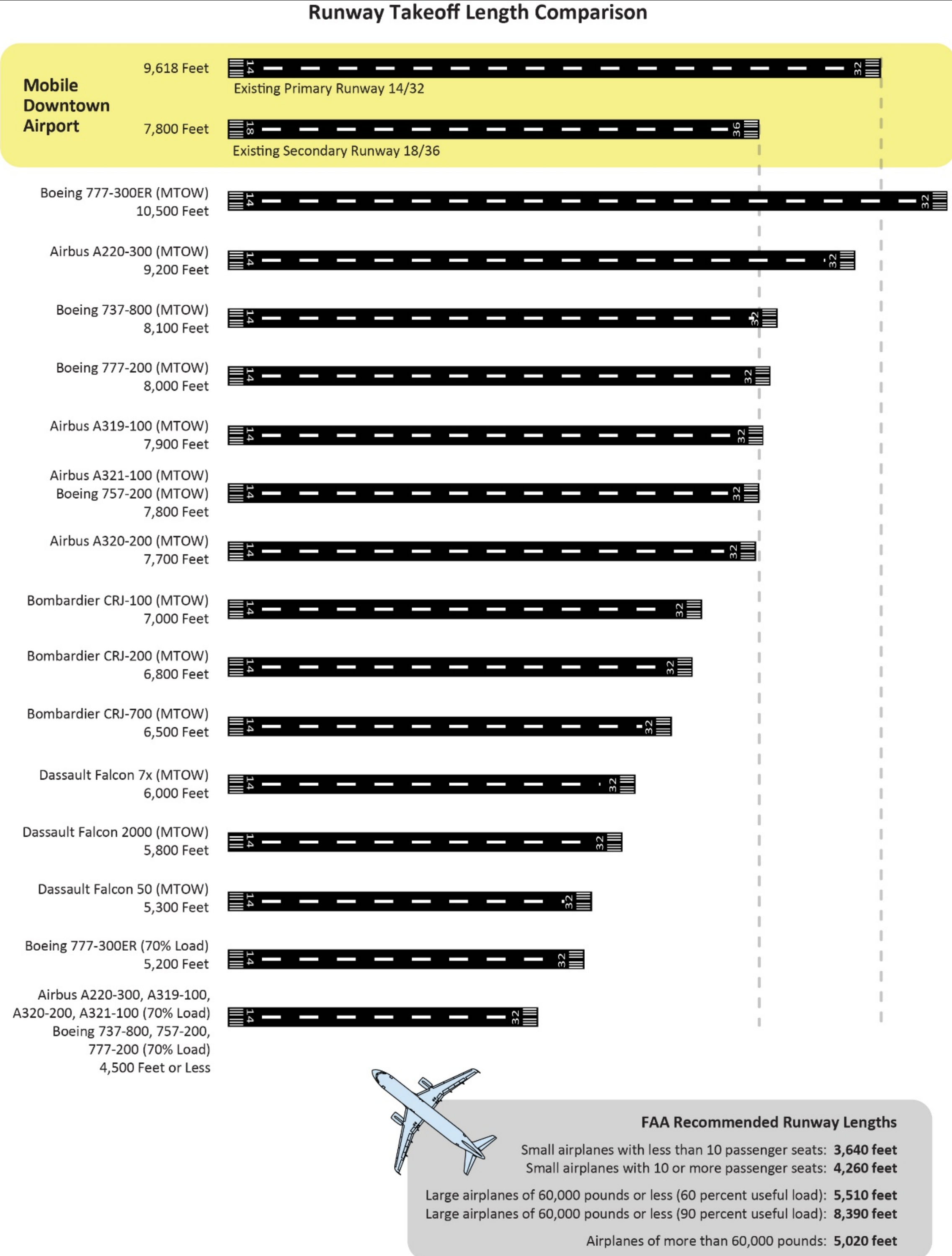


Figure 2.6: Runway Length Requirements

Source: Hanson Professional Services, 2020

As presented in Figure 2.6 above, the current runway length of approximately 9,600 feet is able to meet the requirements for the vast majority of aircraft types at MTOW that will serve BFM throughout the planning period. The only aircraft identified in the analysis whose MTOW requirement will not be accommodated is the Boeing 777-300ER (10,500 feet), but it can be accommodated at a reduced takeoff weight. At this point, it is not recommended to extend the length of Runway 14/32.

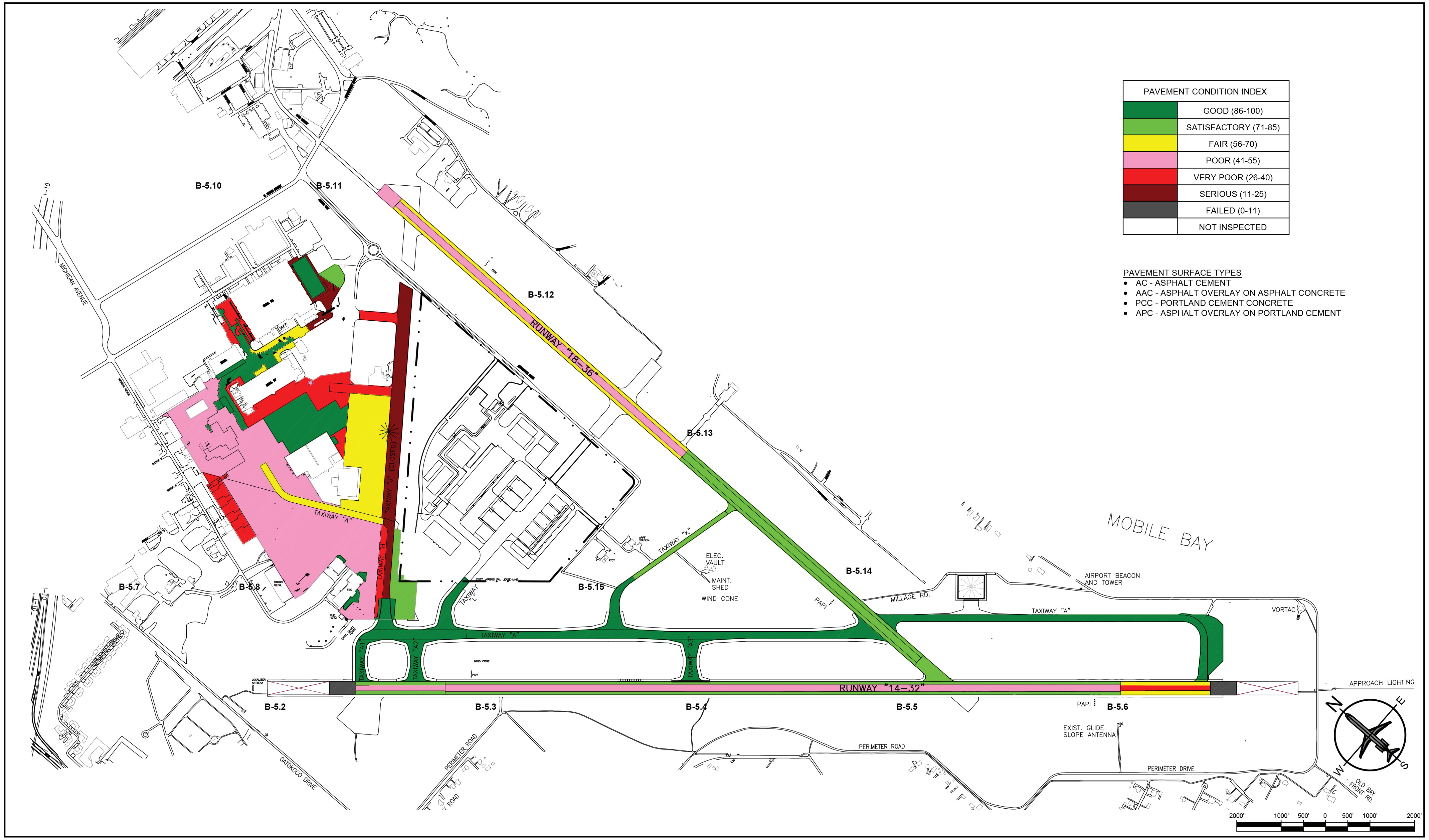
2.5 Runway Strength Assessment

This section presents an assessment of runway strength at BFM. A runway's composition is an important factor determining its strength. At BFM, runway 14/32 is grooved and has precision markings. It is primarily composed of (80%) asphalt with a smaller portion (20%) being composed of concrete. The weight-bearing capacity is published as Pavement Classification Number (PCN) 72 /F/B/X/T (75,000 pounds single wheel; 185,000 pounds double wheel; 325,000 pounds for double tandem). Runway 18/36 is 55% concrete and 45% asphalt overlaid concrete with a published weight-bearing capacity rating of PCN 34 /R/B/X/T (76,000 pounds single wheel; 150,000 pounds double wheel; and 320,000 pounds dual tandem).

The latest pavement condition survey was completed in February 2018. The Pavement Condition Index (PCI) score for each pavement section is shown in Figure 2.7. A score of 100 indicates like-new pavement, while a score of 0 indicates extremely high degradation. The window for rehabilitation for asphalt is typically when the PCI is between 50 and 80.

Both Runway 14/32 and Runway 18/36 have several sections in poor condition, and both will need to be rehabilitated. Runway 14/32 was recently awarded an $8 million FAA grant for pavement rehabilitation that will include asphalt and concrete rehabilitation, runway lighting repairs, grooving, and new pavement markings. Neither strengthening of the runway pavement nor navigational aid (NAVAID) replacement is anticipated as part of the rehabilitation project. Since Runway 18/36 is classified as an additional runway, it is not eligible for FAA grants. As such, any rehabilitation or repair of the runway will be a local cost.

The pavement strength at the Airport must satisfy the requirements of the critical design aircraft, the Airbus A300F4-600. The PCN has a corresponding Aircraft Classification Number (ACN) that must be equal to or less than the PCN in order to operate without restriction on the airport pavement. Numerically, the ACN is two times the derived single wheel load, expressed in thousands of kilograms. As published in the *Airplane Characteristics for Airport Planning* manual for the A300F4-600, (assuming a gross aircraft weight of 275,575 pounds and low subgrade strength) the ACN for flexible pavement is 35, which is under the established PCN of Runway 14/32. The future rehabilitation project should preserve this PCN to allow for operation of the critical design aircraft.



Source: Michael Baker International, February 2018

Figure 2.7: Pavement Condition Index
Mobile Downtown Airport

2.6 Instrument Approach Procedures

In addition to runway length and pavement strength, the availability of instrument approach procedures is critical to the utility of an airport. All of the runway ends at BFM have published straight-in instrument approaches. The best approaches to Runways 14, 18, and 36 are Area Navigation (RNAV) GPS-based approaches with vertical guidance that have visibilities of 7/8 to 3/4 miles and 250 to 285-foot ceilings. There are also Very High Omni Range (VOR) approaches on Runways 14, 18 and 32, using the Brookley VOR on BFM, but their minimums are higher and there is no vertical descent guidance.

Runway 32 is served by a Category I Instrument Landing System (ILS). This approach provides visibility minimums of a 1/2 mile and 200-foot ceiling. In comparison, MOB has ILS approaches on both ends of the primary runway. On one end is a Category II ILS with minimums of 1,200 runway visibility range (RVR) and a 109-foot ceiling.

With the occurrence of fog at BFM, improving the approaches to the primary runway is recommended. Improvements should include the installation of a Category II/III ILS; improvements to both the equipment for the approach and measuring visibility along the runway; improved approach lighting systems; and protection of the existing approach from encroachment of natural and manmade obstacles.

2.7 Taxiway Analysis

Runway 14/32 has a full-length parallel taxiway (Taxiway A), which connects to the passenger terminal apron (by Taxiway H), the Airbus facilities (by Taxiway L), and Runway 18/36 (by Taxiway K). Currently there is no other entrance to Runway 18/36 other than Taxiway A or Taxiway K. In order to increase the capacity of Runway 18/36 and provide operational flexibility, there should be a full-length parallel taxiway that runs alongside Runway 18/36 with multiple runway exits. Figure 2.1 shows the existing airfield and taxiway layout.

As shown in Figure 2.7, Taxiways A, K, and L are all in either good or satisfactory condition (PCI over 71), and the portion of Taxiway A leading onto the passenger terminal apron is in fair condition (PCI 56-70). Figure 2.7 shows Taxiway H in poor condition. However, as mentioned in Section 2.5, the pavement condition survey was completed in February 2018. Since then, Taxiway H has been rehabilitated and is now in good condition.

Runways and taxiways are the movement areas of the airfield and are controlled by the ATCT. On the other hand, non-movement areas are the other areas of an airfield, including aprons, that are not under the jurisdiction of the ATCT. Nonetheless, ATCT clearance is required for all vehicles and aircraft entering the movement area. All planned taxiways at the Airport as well as any surrounding non-movement areas must be within the line of sight of the ATCT.

Taxiways should be designed according to the requirements of the TDG of the critical design aircraft that will use the facility. The A300 is a TDG 5.

Lastly, per guidance in FAA AC 150/5300-13A, all taxiway intersections at BFM should be constructed according to the “three-node” design principle, which stipulates that at a taxiway intersection a pilot should be presented with no more than three choices: ideally, left, right, or straight ahead. This is to simplify intersections and thus reduce the possibility of pilot error.

2.8 Summary and Conclusions

The results of the airfield requirements analysis indicate that there will be sufficient runway capacity to accommodate forecast demand through PAL 4, suggesting that no additional runways are needed. Furthermore, the runway length assessment showed that the runways will be able to accommodate both the existing and future fleet mix at the Airport. Runway 18/36 could be shortened to ease the burden of future maintenance and rehabilitation costs and will be further studied in the *Alternatives* chapter. Runway 14/32 will undergo repair and rehabilitation, and it is suggested that Runway 18/36 also be rehabilitated at a later date. In addition to runway pavement improvements, taxiway improvements are recommended, including the construction of a full-length taxiway parallel to Runway 18/36.

3. PASSENGER TERMINAL COMPLEX

A new Passenger Terminal Complex will be built at Mobile Downtown Airport to accommodate the transfer of commercial traffic from Mobile Regional Airport. Facility requirements have been identified for the key functional elements of the Passenger Terminal Complex, as listed below.

- Aircraft Gates and Parking
- Airline Check-in
- Passenger Security Screening
- Holdrooms
- Checked Baggage Security Screening
- Baggage Claim
- Outbound Baggage Make Up
- Inbound Baggage Handling
- Concessions

All passenger terminal requirements other than concessions and baggage claim were determined by analyzing peak hour traffic, as detailed in the Master Plan forecasts. The peak hour forecasts represent scheduled airline activity occurring on an average day during the peak month of August. The development of the planning schedules is discussed in the "Passenger and Flight Operation Peaking Forecasts" section of the *Aviation Demand Forecasts* chapter. Schedules analyzed as part of the requirements analysis included an actual base year (2018) schedule and schedules for forecast years 2025 (PAL 1), 2030 (PAL 2), 2035 (PAL 3), and 2040 (PAL 4). Results of the terminal requirements analyses are summarized in Table 3.1, and a detailed discussion of each functional element is provided in the sections that follow.

In developing passenger terminal requirements, the planning team used spreadsheet-based models and other analysis tools, as appropriate. Aircraft gates and parking, airline check-in and passenger security screening requirements were among the functional areas assessed using the Airport Cooperative Research Program's *Spreadsheet Models for Terminal Planning & Design* (Terminal Spreadsheet Model). The remaining elements were assessed using other industry-standard planning formulas and methods.

Data sources for key assumptions used throughout these analyses are noted below:

- Airline-specific load factors were based on actual monthly averages for August 2018 obtained from the U.S. Department of Transportation (DOT) T100 database.
- Airline-specific percentages of passengers originating or terminating at the Airport were based on actual third quarter 2018 averages obtained from the U.S. DOT OD1B database.
- Aircraft-specific number of seats were based on seating charts of the respective aircraft published by the airlines that will provide commercial service at BFM (i.e., American Airlines, United Airlines, Delta Air Lines, and Frontier Airlines).

The following sections summarize the requirements for each functional area of the new passenger terminal complex.

Table 3.1 Passenger Terminal Complex Requirements

Functional Element	Estimated total requirements 2025	2030	2035	2040	Period-over-period requirement 2025 (Opening Day)	2030	2035	2040
BASIS FOR REQUIREMENTS (DEMAND FORECASTS)								
Total annual passengers	1,046,000	1,176,500	1,229,000	1,281,500	n/a	n/a	n/a	n/a
Aircraft operations	82,830	84,860	85,490	86,110	n/a	n/a	n/a	n/a
Aircraft gates and parking								
Total gates	8	8	8	8	n/a	0	0	0
Remote/RON parking	2	2	2	2	n/a	0	0	0
Holdrooms (area in square feet)								
Total holdroom area	7,119	7,447	7,447	7,447	n/a	328	0	0
Airline Check-in							0	
Number of processors					n/a	0	0	0
Agent counters	5	6	6	6	n/a	1	0	0
Kiosks	3	3	4	4	n/a	0	1	0
Bag Drops	2	2	2	2	n/a	0	0	0
Total	10	11	12	12	n/a	1	1	0
Lobby queue area (square feet)	5,644	5,644	5,644	5,644	n/a	0	0	0
Passenger Security Screening							0	0
Number of screening lanes	3	4	4	4	n/a	1	0	0
Security queue area (square feet)	3,739	4,985	4,985	4,985	n/a	1,246	0	0
Baggage Security Screening							0	0
Number of primary EDS machines	2	2	2	2	n/a	0	0	0
Number of OSR Stations	1	1	1	1	n/a	0	0	0
Number of ETD Units	1	1	1	1	n/a	0	0	0
Total area (square feet)	1,740	1,740	1,740	1,740	n/a	0	0	0
Outbound Baggage Make Up							0	0
Total make up area (square feet)	5,900	5,900	5,900	5,900	n/a	0	0	0
Inbound Baggage Handling							0	0
Total offload frontage (linear feet)	60	60	60	60	n/a	0	0	0
Baggage Claim					n/a	0	0	0
Total presentation frontage (linear feet)	200	200	200	200		0	0	0
Total area for claiming baggage (square feet)	12,000	12,000	12,000	12,000		0	0	0
Concessions						0	0	0
Total area (square feet)	10,000	10,000	10,000	10,000	n/a	0	0	0

3.1 Aircraft Gates and Parking

The requirements analysis for this functional element focuses on identifying the number of gates and remote aircraft parking positions required to accommodate the forecasted passenger activity for each planning activity level. Both gates and remote parking positions are used by airlines for loading and unloading passengers. For the purposes of this analysis, only aircraft contact gates or designated ground loading gates were considered for passenger operations. There was no provision for busing or other remote boarding operations.

It is assumed that legacy carriers (including American Airlines, United Airlines, and Delta Air Lines) will operate at the Airport and will require passenger boarding bridges. However, specific airline gate allocations were not considered for the purposes of this assessment.

The existing terminal apron at BFM has three aircraft parking positions, each of which occur on passenger loading ramps. On the other hand, MOB has seven gates; all but one of these gates are used by airlines for passenger loading. Further, all gates at MOB have jet bridges for passenger loading.

The gate requirements analysis was performed using the Terminal Spreadsheet Model. The Terminal Spreadsheet Model uses a two-pronged approach to identify the number of gates needed at each planning activity level. The first calculates the forecast number of enplaned passengers per gate by increasing the baseline number of enplanements per gate at the average growth rate of total enplanements. The model then calculates the total number of required gates by dividing enplanements by enplanements per gate.

The second methodology calculates the forecast number of annual departures per gate by increasing the baseline number of annual departures per gate and daily departures per gate at the average growth rate of enplanements. The model then calculates gate requirements by dividing forecast annual departures by annual departures per gate. Key assumptions used in this methodology include:

- 3.2 historical daily departures per gate (annual departures per gate/350 operational days)
- Future daily departures per gate will increase to 3.5 in PAL 1, 3.8 in PAL 2, 4.1 in PAL 3, and 4.4 in PAL 4.

The Terminal Spreadsheet Model takes the average of the two approaches to determine the required number of gates. A summary of the gate requirements analysis is shown in Table 3.2.

Table 3.2: Gate Requirements

	Annual Enplaned Passengers	Annual Enplanements per Gate	Annual Departures per Gate	Average
PAL 1 (2025)	523,000	8	7	**8**
PAL 2 (2030)	588,250	9	7	**8**
PAL 3 (2035)	614,500	9	7	**8**
PAL 4 (2040)	640,750	9	7	**8**
Source: LeighFisher, 2020				

The gate requirements analysis found that the Airport will need to provide eight gates for each of the four planning activity levels.

In addition to using the Terminal Spreadsheet Model, the planning team analyzed the number of gates at airports with a similar size and profile to BFM. This analysis also shows the number of gates at airports that BFM could grow to in the future, such as Pensacola and Savannah/Hilton Head. As shown in Table 3.3, none of the airports studied in this analysis had fewer than seven gates.

Table 3.3: Airport Gate Benchmarking

Airport	Total Enplaned Passengers (2018)	Total Number of Gates
Savannah/Hilton Head International Airport	1,345,760	15
Pensacola International Airport	972,006	12
Colorado Springs Airport	837,475	12
Wichita Dwight D Eisenhower National Airport	812,197	12
Eglin AFB Destin Fort Walton Beach Airport	682,932	8
Bozeman Yellowstone International Airport	669,959	7
Sarasota/Bradenton International Airport	663,500	13
Harrisburg International Airport	625,377	12
Asheville Regional Airport	572,784	7
Columbia Metropolitan Airport	566,284	8
Sources: Enplanements- Bureau of Transportation Statistics T-100 Domestic Market Gate Counts- Airport websites and terminal maps		

3.2 Airline Check-In

Airline check-in facilities provide for the processing of passengers and baggage via lobby and self-service check-in. This section of the requirements analysis focuses on identifying the required number of check-in processors (including ticket counters and electric kiosks where ticketing or baggage check-in is accomplished) and square footage needed for queuing in the ticket lobby. It is important to note that at airports similar in size to BFM and MOB, airlines do not typically staff curbside operations due to a lack of demand. Thus, the requirements analysis for this functional element does not consider curbside check-in processors. Requirements were calculated using the Terminal Spreadsheet Model.

The Terminal Spreadsheet Model was set up to discover the number of check-in processors that would be needed to meet an assumed level-of-service (LOS) standard for queuing wait time and the maximum queue that would result from such a facility. The maximum passenger queues were then converted to square footage requirements based on International Air Transport Association (IATA) LOS standards.

The existing check-in area at MOB is located on the eastern wing of the lower level of the terminal. There are 12 check-in counters, 10 self-service kiosks, and 4 baggage drops. The ticketing area counters and passenger queuing area is approximately 3,700 square feet. At BFM, the existing terminal has five stands for passenger check-in.

As shown in Table 3.1, the total number of processors required for the new terminal will be less than the existing terminal at MOB. From PAL 1 to PAL 4, the number of required check-in counters at BFM ranges between five and six, compared to the 12 provided at MOB. BFM will require between three and four self-service kiosks from PAL 1 to PAL 4, and two baggage drops for each planning activity level. Key assumptions for this analysis include:

- 2% connecting traffic.
- The percent of passengers in the peak 30-minute period of the peak hour is 60%.
- 50% of passengers will use the check-in counters, 30% will use self-service kiosks, and the remaining 20% will use remote check-in; it is anticipated that over the planning horizon, there will be a transition to increased remote check-in and decreased check-in counter use, which could potentially reduce the demand for physical check-in facilities at the Airport.
- Average transaction and desired maximum wait times will be as follows:

Type of processor	Average processing time (min per passenger)	Desired maximum wait time (min per passenger)
Agent counter	2	15
Self-service kiosk	1	2

- There will be two kiosks served for each staffed Bag Drop.
- The IATA “Optimum” LOS space standard for the queue area (19.3 square feet/pax) will be achieved.

3.3 Passenger Security Screening

Passenger security screening requirements involve determining the number of checkpoint lanes and area square footage needed for both document check and primary queuing. These requirements were developed using the aforementioned Terminal Spreadsheet Model. Similar to the check-in requirements, the model solved for an assumed LOS standard (maximum queue wait time) and determined the maximum queues that would result if the indicated number of lanes were provided. The maximum number of passenger queues was then converted to square footage requirements based on IATA LOS space standards.

The existing terminal at MOB has one security screening checkpoint with three screening lanes. In total, the security screening area at MOB is 5,575 square feet. Our analysis shows that the security screening area will require three screening lanes and a total of 3,379 square feet in PAL 1 of queueing area, while PALs 2, 3, and 4 will require four screening lanes and 4,985 square feet.

Key assumptions include:

- The percent of passengers in the peak 30-minute period of the peak hour will be 60%.
- The percent of additional traffic (i.e., non-passenger, employees, crew) is 10%.
- The security lane throughput rate is 150 passengers per hour per lane.
- Maximum target queue wait time is 20 minutes.
- Existing conditions at BFM:
    - Depth of security queue: 30 feet
    - Length of checkpoint area: 73 feet
    - Width of scanning lane module (2 lanes): 22 feet
    - Reconciliation area depth: 10 feet
- The IATA "Optimum" LOS space standard for the queue area (10.8 square feet/pax) will be achieved.

3.4 Holdrooms

Holdrooms are areas adjacent to the gates in terminals where passengers wait and queue before boarding flights. The areas are generally unobstructed to allow for some efficiencies of shared space between adjacent gates, and also include passenger boarding processing counters, boarding pass readers, and other associated functions.

The requirements analysis for this functional element focuses on identifying the total holdroom area required for each gate based on the gate's largest allowable aircraft. These requirements were based on the gate requirements results discussed in Section 3.1 as well as the future fleet mix, as presented in the "Passenger Aircraft Fleet Mix Forecast" section of the *Aviation Demand Forecast* chapter. Each gate's largest allowable aircraft was used as a basis for determining the required holdroom area using the following formula:

$$\textbf{Holdroom area required} = S * LF * [(P_{seat} * A_{seat}) + (P_{stand} * A_{stand})] * P_{max}$$

Whereby the values and descriptions of the variables are as follows:

Variable	Value	Description
S	Varies	Number of seats on the largest aircraft using the gate
LF	85%	Load factor
P_{seat}	80%	Percent of holdroom occupants seated
A_{seat}	18 SF	Area required per seated occupant
P_{stand}	20%	Percent of holdroom occupants standing
A_{stand}	13 SF	Area required per standing occupant
P_{max}	90%	Percent of flight's passenger load accumulated in the holdroom 10 minutes prior to boarding

An example calculation of a holdroom requirement for a B737-800 is shown below:

> 162 seats * 85% load factor * [(70% seated * 18 ft^2 area/seated occupant) * (30% standing * 12 ft^2 per standing occupant)] * 90% passengers in holdroom = **2,045 ft^2**

The specific aircraft types that will be used at each gate is based on the terminal apron design and layout. The specific apron design and layout is at this point unknown. As such, it is not possible to calculate the precise holdroom area required for each gate. However, as shown in Table 3.4, the planning team estimated the average number of seats for each aircraft type included in the future fleet mix forecast. The planning team then calculated the total number of gates required for each aircraft group (i.e., small regional jets, large regional jets, and narrowbodies) across the planning horizon. The largest holdroom area for each aircraft group was applied to the number of gates required for each aircraft group.

For example, in PAL 1 the future fleet mix at BFM is 8.7% narrowbodies, 30.9% large regional jets, and 60.4% small regional jets. When these percent shares are applied to the gate requirements, there will be four small RJ gates, two large RJ gates, and one narrowbody gate. The largest possible holdroom areas are 631 square feet (ERJ-145), 959 square feet (ERJ-175), and 2,045 square feet (B737-800) for small RJ's, large RJ's, and narrowbodies, respectively. Thus, the holdroom area requirement for PAL 1 is 7,119 square feet.

Table 3.4: Holdroom Areas Required by Aircraft Type

Aircraft Type	Typical Seats	Holdroom area (ft^2)
Narrowbodies		
B737-800	162	**2,045**
A320	157	**1,982**
A319	132	**1,660**
A220	109	**1,376**
Large Regional Jets		
CRJ-900	76	**959**
ERJ-175	76	**959**
CRJ-700	67	**850**
Small Regional Jets		
CRJ-200	50	**631**
ERJ-145	50	**631**

Source: LeighFisher, 2020

The holdroom area requirements stay relatively consistent for each planning activity level, which is to be expected, considering the total gate requirements and fleet mix do not change much over the planning horizon. For PAL 1, small regional jets (CRJ-200, ERJ-145, etc.) require five gates; large regional jets (CRJ-700, CRJ-900, ERJ-175, etc.) require two gates; and narrowbodies (A220, B737-800, etc.) require just one gate. Through PALs 2, 3, and 4, these requirements change slightly, as small regional jets need four gates, large regional jets need three, and narrowbodies need one. Required holdroom areas, by aircraft type, can be found in Table 3.4, while results of the holdroom analysis are summarized in Table 3.1.

3.5 Checked Baggage Security Screening

This section focuses on identifying the required number of explosives detection system (EDS) machines, On-Screen Resolution (OSR) stations, and explosives trace detector (ETD) units that will be needed to accommodate the forecasted peak-hour flow of originating baggage. It also estimates the required area for each of these machines. MOB has a checked baggage inspection system (CBIS) consisting of four EDS machines, three OSR stations, and one ETD unit.

The ACRP Gate Model was used to determine each of these requirements. The analysis finds that BFM will need three EDS machines, one OSR station, and one ETD unit for each planning activity level, which will require 1,740 square feet of space.

Key assumptions used in this analysis include:

- The percent of passengers checking bags is 90%.
- The average number of bags per passenger is nine.
- The percent of total bags that are over-sized or odd-sized and too large for EDS is 3%.
- The rate of scanned bags requiring level two screenings (alarm rate) is 25%.
- The rate of resolved OSR bag reviews (clear rate) is 80%.
- Processing rates and area requirements are as follows:

Facility	Processing rate (bags/hour)	Required area per unit (ft^2)
Level 1 EDS	150	800
Level 2 OSR	120	40
Level 3 ETD	24	100

3.6 Baggage Claim

The requirements analysis for this functional element focused on identifying the linear footage of claim device presentation frontage and the total area required for passengers claiming bags. Requirements were determined considering the existing facilities at MOB and using the experience of the planning team.

The existing baggage claim devices at MOB are direct feed devices located on the west side of the lower level of the terminal. There are two devices: one is T-shaped and the other is U-shaped. The devices, which together add up to approximately 280 linear feet of presentation frontage, are common-use, but airlines typically operate from a preferred device. The total area for baggage claim at MOB is approximately 12,000 square feet. On the other hand, the existing baggage claim facilities at BFM consist of a singular baggage claim rolling dispenser.

The new terminal at BFM will require two flat-plate baggage claim devices, each of which will have 100 linear feet of presentation frontage. The total area required for the baggage claim facilities will remain the same as the existing terminal at MOB: 12,000 square feet. The two claim devices and the baggage claim hall area will meet the needs of the Airport through PAL 4.

3.7 Outbound Baggage Make Up

The outbound baggage makeup system is the portion of the conveyor belt used to load baggage carts for departing aircraft. Generally, these areas are secured and not seen by the general public but are an important element in the operation of an airport. The requirements analysis for this functional element estimates the total area needed for staging baggage make up carts at aircraft. It uses the Airport's future fleet mix and the necessary number of staged carts/containers per aircraft as the primary inputs. Outbound baggage makeup at the new passenger terminal complex will be located under the terminal building. Results of the requirements analysis are shown in Table 3.1. Since the fleet mix doesn't drastically change over the planning horizon, the space requirement remains the same for each planning activity level.

Key assumptions include:

- Based on peak hour demand, there is assumed to be one departure per gate (within a two to four-hour staging period).
- Staged carts/containers per aircraft include the following:
    - One for regional jets.
    - Three for narrowbody jets.
- The area required per cart/container is 600 square feet.
- Additional allowance for baggage train circulation is 10%.

3.8 Inbound Baggage Handling

Similar to the outbound baggage makeup area, *inbound baggage handling system* refers to the portion of the conveyor belt used to load baggage carts from arriving aircraft. This section focuses on determining the linear footage of belt required to offload inbound baggage by airline baggage handlers. These requirements were established using a planning ratio of 0.30 feet of offload frontage for every foot of baggage claim carousel presentation frontage. The required baggage claim presentation frontage at BFM is 200 feet. By applying the planning ratio, the requirement for this functional element will be 60 feet and will remain the same through PAL 4.

3.9 Concessions

The concessions facilities at the existing temporary terminal at BFM consist of several vending machines, and an available microwave. MOB, on the other hand, houses a Hudson News and two restaurants. Their combined facilities total approximately 9,200 square feet. The new terminal building will need at least as much space to be allocated for a new centralized concession facility. Thus, LeighFisher recommends allocating 10,000 square feet of space for concessions at the new terminal, with flexibility for growth over the planning horizon as passenger traffic concurrently increases.

3.10 Federal Inspection Services Facility

Federal Inspection Services (FIS) facilities provide a number of passenger and baggage processing functions for arriving international flights. Although the introduction of international traffic at the Airport is not anticipated to occur within the planning period, consideration should be given to the potential long-term construction of an FIS facility at BFM. An FIS facility could be built as an addition to the new passenger terminal complex in the form of another concourse and sterile corridor. Further requirements and design analysis will be needed in the future should the Airport wish to accommodate arriving international flights.

4. GROUND TRANSPORTATION AND PARKING

This chapter summarizes the requirements for on-Airport ground transportation and parking facilities. Specifically, this chapter estimates facility requirements for public and employee parking, rental cars, roadways, curbsides, and commercial vehicle facilities. Ground transportation and parking requirements are generally based on 1) the level of activity that needs to be accommodated; 2) the level-of-service (LOS) goal for that activity; and 3) the functional requirements for each travel mode. These are driven by the peak period activity (typically peak hour or peak day) and the projected need for each type of facility to accommodate demand.

4.1 Vehicle Activity Levels

Data used for the facility requirements analysis was collected from three primary sources:

- Forecasted passenger activity levels through 2040 as detailed in the *Aviation Demand Forecasts* chapter (adjusted to account for arriving passengers)
- 2019 traffic counts conducted by the City of Mobile's Department of Traffic Engineering
- March 2020 traffic counts conducted by the Master Plan team for roadways on the Airport, Aeroplex, and other primary access roadways

These data sources were used to analyze the current vehicle activity level at the Airport and to inform future planning decisions concerning ground transportation and parking. Specific traffic count locations for the March 2020 analysis are shown in Figure 4.1.

4.1.1 Existing Roadway Network

The existing roadway network provides access between the major terminal area facilities, the Brookley Aeroplex, and Interstate 10. Key features of the roadway system include:

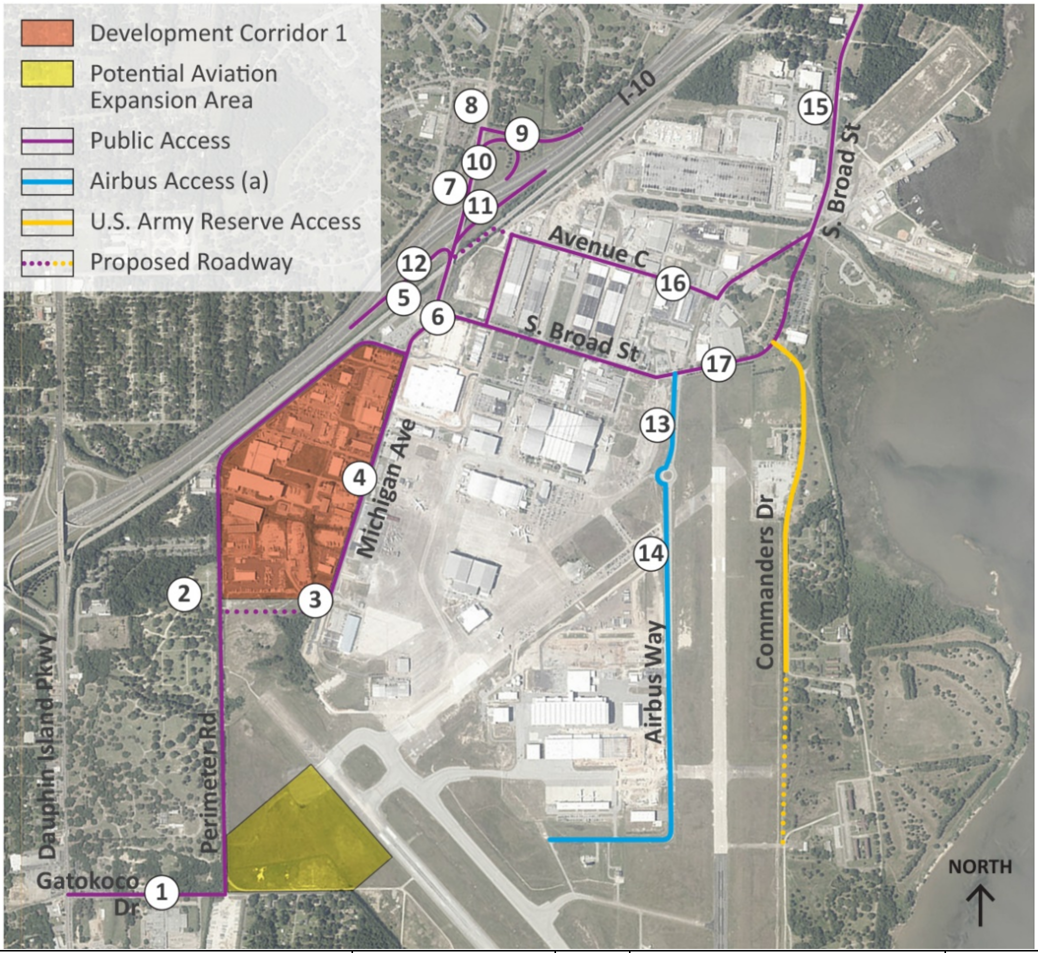
- All roads are single-lane and bidirectional, except for Michigan Avenue, which is a two-lane arterial north of Avenue I.
- Gatotkoco Drive, which runs east-west along the western edge of the Brookley Aeroplex, is intersected by an abandoned rail crossing that runs between Avenue O and Avenue M.
- The intersection of Broad Street and Michigan Avenue is controlled by a stop sign and includes turn lanes.
- Michigan Avenue includes a bridge that runs over railroad tracks parallel to Interstate 10.

The existing roadway network is shown in Figure 4.1. These roadways serve the primary traffic-generating facilities at the Airport, as described in the following section.

4.1.2 On-Airport Traffic Generators

Key traffic-generating facilities at the Airport and Aeroplex are identified in Figure 4.2. These include:

- Airbus U.S. Manufacturing Facility, accessed by Airbus Road via Aerospace Drive.
- VT Mobile Aerospace (VT MAE) Maintenance, Repair and Overhaul facility, accessed by Aerospace Drive.
- The U.S. Army Reserve facility; accessed by Commanders Drive.

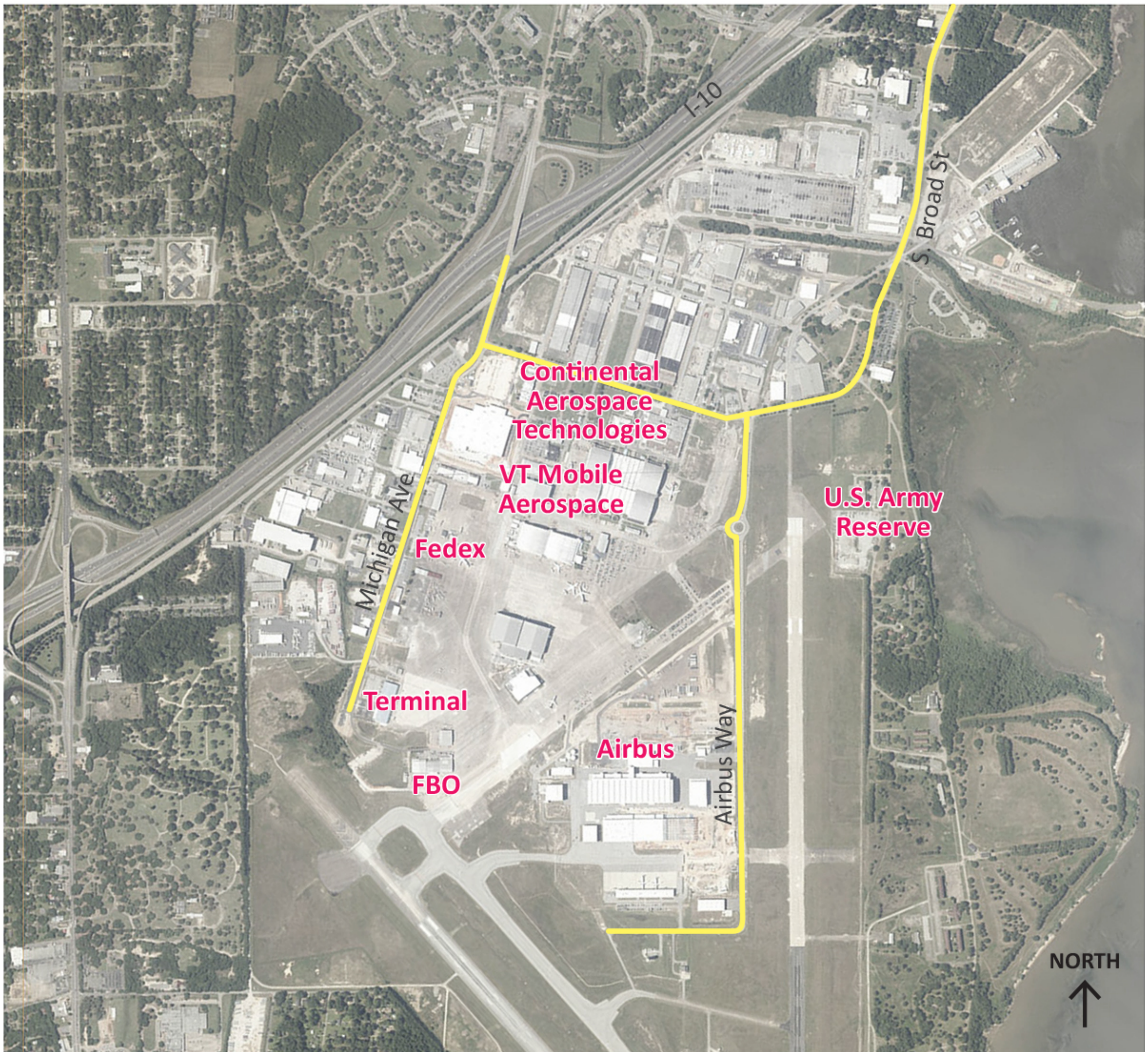


#	Description	Direction	#	Description	Direction
1	Gatokoco Dr (W of Perimeter)	Both	10	I-10 W bound on-ramp	From Airport
2	Perimeter Rd (S of Ave O)	Both	11	I-10 E bound on-ramp	From Airport
3	Michigan Ave (N of Terminal)	Both	12	I-10 E bound exit right turn	Towards Airport
4	Michigan Ave (S of Ave M)	Both		lane	
5	Michigan Ave (N of Broad St)	Both	13	Aerospace Dr (S of Broad St)	Both
6	Broad St (E of Michigan Ave)	Both	14	Airbus Way	Both
7	Michigan Ave (N of I-10)	Both	15	Board St (S of Beach)	Both
8	Michigan Ave (S of Eagle Dr)	Both	16	Avenue C (W of 15th St)	Both
9	I-10 W bound exit	Towards Airport	17	S. Broad St (E of 15th St)	Both

(a) Some roadways are primarily for Airbus use, but open to the public

Source: Jacobsen|Daniels, March 2020.

Figure 4.1: Traffic Count Locations and Roadway Network



Source: Jacobsen|Daniels, January 2020.

Figure 4.2: Key Traffic Generators

- FedEx ship center; accessed by Michigan Ave.
- The temporary passenger terminal; accessed by Michigan Ave.
- Continental Aerospace Technologies

4.1.3 Peak Hour Demand Summary

The peak hour overall traffic volume at the Airport was 3:15 p.m.-4:15 p.m., where a total of 6,343 vehicles were recorded across the Study Area. As shown in Figure 4.3 below, there are distinct morning and evening peaks, driven by a high volume of morning traffic arriving to the Airport and an even higher volume of evening traffic departing the Airport. Activity primarily occurs during the work week, with little activity on weekends, indicating that the majority of existing traffic at Mobile Downtown Airport and the Brookley Aeroplex is driven by employees.

Source: Jacobsen|Daniels analysis, April 2020; The Traffic Group, March 2020.

Figure 4.3: Rolling-Hour Profile for Trips to and from BFM

Peak hour traffic volumes for each separate roadway link are shown in Table 4.1. Each roadway link's peak hour occurs at a different time (with the exception of links 11 and 12, which are adjacent to one another). Links 11, 12, and 13 have the highest peak hour traffic volume with peak hour vehicles numbering 1,354; 1,354; and 1,217 respectively. On the other hand, links 16, 3, and 9 accommodate the lowest peak hour traffic volume with 77, 214 and 229 peak hour vehicles, respectively.

Table 4.1: Peak Hour Traffic Volume by Roadway Link

Link ID	Date	Start	End	Peak Hour Traffic Volume
1	3/11/2020	6:30 AM	7:30 AM	361
2	3/16/2020	11:00 AM	12:00 PM	342
3	3/13/2020	11:15 AM	12:15 PM	214
4	3/13/2020	11:00 AM	12:00 PM	297
5	3/12/2020	3:15 PM	4:15 PM	1190
6	3/14/2020	5:30 AM	6:30 AM	1032
7	3/12/2020	3:45 PM	4:45 PM	1186
8	3/15/2020	4:00 PM	5:00 PM	722
9	3/13/2020	6:30 AM	7:30 AM	229
10	3/14/2020	3:45 PM	4:45 PM	636
11	3/14/2020	5:30 AM	6:30 AM	1354
12	3/14/2020	5:30 AM	6:30 AM	1354
13	3/12/2020	5:30 AM	6:30 AM	1217
14	3/15/2020	2:15 PM	3:15 PM	306
15	3/12/2020	3:15 PM	4:15 PM	760
16	3/17/2020	11:00 AM	12:00 PM	77
17	3/12/2020	3:30 PM	4:30 PM	583

Source: LeighFisher, Jacobsen|Daniels, The Traffic Group, 2020

4.2 Public, Employee, and Commercial Parking

This section summarizes the projected public, employee, and commercial parking demands as well as associated facility requirements throughout the planning period.

4.2.1 Existing Parking Facilities

The total combined current parking facilities at MOB and BFM provided the basis of the estimates of future parking requirements at BFM. The existing parking facilities are summarized in Table 4.2. Due to the impending transfer of all commercial service from MOB to BFM, it was assumed that the total number of existing parking stalls and acreage at MOB would be needed to accommodate future demand at BFM.

Table 4.2: Existing Parking Facilities

	Acres	Parking Stalls
MOB		
Short-term	2.4	217
Long-term	6.7	823
Employee	3.6	386
Total	**12.7**	**1,426**
BFM		
Short-term	0.5	52
Long-term	0.8	126
Employee	0.3	30
Total	**1.6**	**208**
Combined (MOB+BFM)		
Short-term	2.9	269
Long-term	7.5	949
Employee	3.9	416
Total	**14.3**	**1,634**
Source: LeighFisher & Hanson Professional Services, 2020		

4.2.2 Parking Requirements Methodology and Assumptions

The methodology used to estimate future parking requirements at the Airport is as follows:

1. Measure baseline surface parking acreage at both MOB and BFM.
2. Use industry-standard average stalls-per-acre ratio to identify the total number of existing parking stalls at both airports:
    - 120 stalls per acre for surface parking
    - 110 stalls per acre for garage parking
3. Forecast baseline surface parking acreage and stalls in line with forecast growth in passenger enplanements and some decline in parking mode share due to Transportation Network Companies (TNCs).
4. Estimate total required area for parking in terms of the surface area and the required footprint using surface parking or garage structure parking.

The parking requirements forecast is based on the comparison of existing facilities relative to existing passenger activity to future passenger activity and expected mode shift away from parking towards TNCs. The *Aviation Demand Forecasts* chapter includes “low” and “high” scenarios, which account for variation in economic growth, leakage recapture, and capacity additions or restraints by airlines, among other factors. Parking requirements were generated for these two scenarios. Other assumptions used in the development of future parking requirements include:

- The existing parking supply represents the required space relative to existing passenger numbers, as no parking occupancy analysis was undertaken to determine whether there is currently suppressed demand or capacity surplus to requirements.
- In future years, parking duration patterns (customer length of stay) and seasonal variations will remain unchanged.
- In future years, there will be a 12% decline in parking demand in terms of passenger mode share due to the shift in passenger preference from parking towards TNCs (e.g., Uber or Lyft) or other emerging mobility trends over the planning period.

4.2.3 Parking Requirements

The forecast for total surface parking space requirements is shown in Table 4.3, in terms of both total footprint and total number of parking stalls. It is unknown whether future parking facilities at BFM will be surface parking or garage parking, which affects the total footprint of the facility for the same number of parking stalls. As such, future requirements were estimated for surface parking, two-level, and three-level garage parking facilities.

For self-parking facilities, surface parking efficiency is dependent upon the shape of the parcel. Surface parking areas would ideally be designed in 60-foot modules (2-foot to 18-foot deep stalls with a 24-foot drive aisle). Stall width is typically around 9 feet. Designs range from 110-120 stalls per acre, which includes drive aisles, set-back, and Americans with Disabilities Act allowance.

Efficient garage designs are typically in the 285-foot by 325-foot per car range. Column placement on a 60-foot grid is critical to achieving optimal efficiencies in garage design. Assuming an optimal grid, estimates on the lower end for garage structures are 110 spaces per floor per acre.

Table 4.3: Surface and Garage Parking Requirements

	Baseline (2018)	PAL 1 (2025)	PAL 2 (2030)	PAL 3 (2035)	PAL 4 (2040)
Low Scenario					
Parking Stalls	1,634	2,400	2,600	2,600	2,600
Surface Parking Footprint (acres)	14	20	22	22	22
Two-Level Garage Footprint (acres)	7	11	12	12	12
Three-Level Garage Footprint (acres)	5	7	8	8	8
High Scenario					
Parking Stalls	1,634	3,000	3,400	3,400	3,500
Surface Parking Footprint (acres)	14	25	28	29	29
Two-Level Garage Footprint (acres)	7	14	15	16	16
Three-Level Garage Footprint (acres)	5	9	10	10	11
Source: LeighFisher, 2020					

4.3 Rental Car Facilities

Rental car facilities are typically comprised of three distinct areas:

1. **Customer Service Area**: Area containing rental customer counters, lobby and circulation space, and back-office space for the individual companies; located adjacent to ready/return parking spaces
2. **Ready/Return Parking Spaces**: Parking spaces for customers renting or returning cars; located adjacent to the customer service area
3. **Quick Turnaround (QTA) Facilities**: Area where vehicles are made ready for customers, housing fueling, washing, and storage

Five rental car companies operate at MOB, each with a customer service desk in the lower level of the terminal. The rental car lot at MOB is approximately 3.8 acres with a total of 334 parking stalls.

At BFM there are an additional 13 parking spaces designated as ready/return stalls for the rental car companies, located in the long-term parking lot. For the purposes of this requirements analysis, it is assumed that the rental car companies will transfer all of their service to BFM in conjunction with the transfer of commercial passenger traffic.

The future space requirements were based on a benchmarking of the size of rental car facilities at seven other airports relative to annual passengers. This analysis identified a range of required space between 0.08 and 0.15 square feet per annual passenger which was applied to the PAL 4 forecast annual passengers at BFM. It is assumed that all rental car functions will be co-located on one level. The resulting space requirement is 103,000 square feet, or 2.4 acres in the low scenario and 192,000 square feet, or 4.4 acres in the high scenario. By comparison, the existing RAC space at MOB is 3.8 acres. This is equivalent to 0.27 square feet per annual passenger based on 2018 MOB passengers, which likely represents capacity surplus to requirements.

Table 4.4 presents the rental car facility requirements for BFM.

Table 4.4: Rental Car Facility Requirements

		Low Scenario		High Scenario	
	PAL 4 Annual Passengers	Square feet per passenger	Area (ft^2)	Square feet per passenger	Area (ft^2)
Space Requirements	1,281,500	0.08	103,000	0.15	192,000
Source: LeighFisher, 2020					

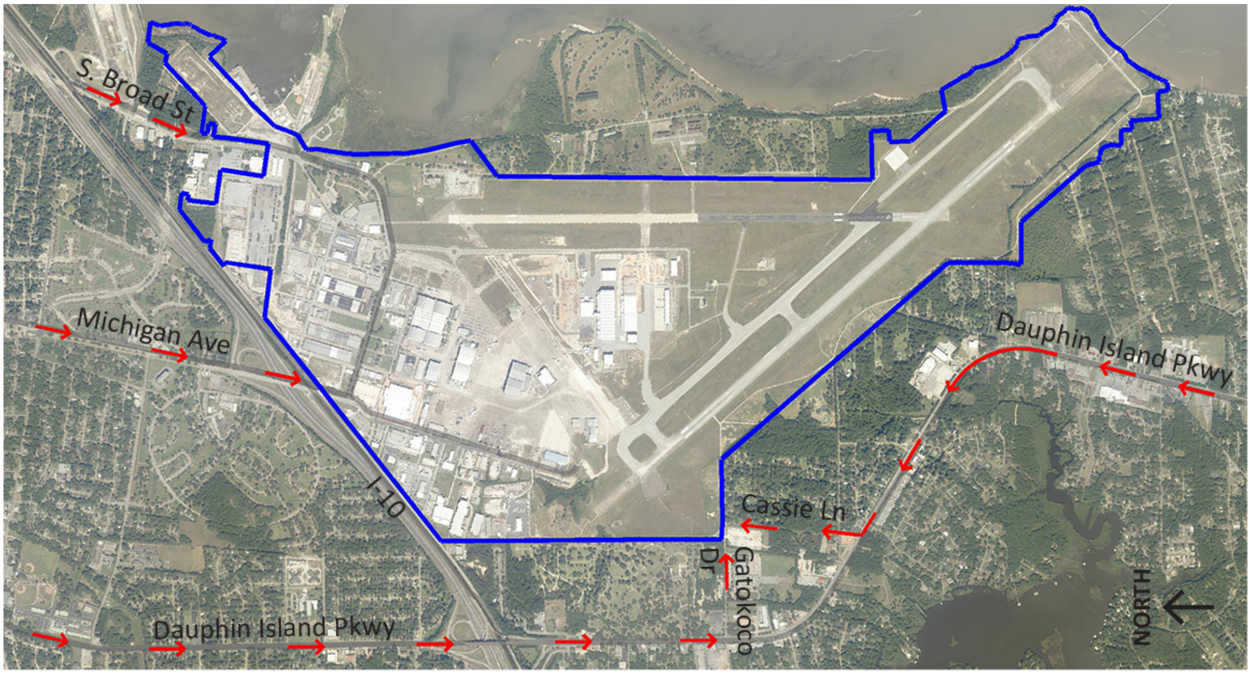
4.4 Roadways

The following sections describe the estimated future needs for key BFM roadways and intersections controlling access to the Airport. Curbside roadways, whose operations are different from those on typical free-flow roadways, are discussed separately in Section 4.5.

4.4.1 Access Roadways

Interstate 10 abuts BFM along the northwest side and connects the Airport to the City of Mobile as well as other regional epicenters, such as Pensacola, Florida; the Gulfport-Biloxi area in Mississippi; and New Orleans, Louisiana. The two primary access points from I-10 to BFM are at Michigan Avenue (Exit 23) and Duval/Broad Street (Exit 24). The Michigan Avenue exit provides the most direct access into BFM and the Brookley Aeroplex, while the Duval/Broad Street exit is less than one mile to the north side of the Airport. Dauphin Island Parkway also provides indirect access to BFM.

Figure 4.4 below shows the existing major access roadways.



Source: LeighFisher, June 2020.

Figure 4.4: Airport Access Roadways

4.4.2 On-Airport Roadways

The existing primary access roads at BFM are Michigan Avenue, Broad Street, and Aerospace Drive to Airbus Way. Avenue A through Avenue M run throughout the Airport property in an east-west direction, while 1st Street through 15th street run north-south; these roads provide access to the leased properties. Perimeter Road runs along the perimeter of the Airport, parallel to the west side of Runway 14/32 and around the Runway 32 end to the compass calibration/run-up pad. However, not all of Perimeter Road is open to the public. On-Airport roadways are anticipated to be reconfigured to accommodate traffic to the new terminal if needed.

4.4.3 Roadway Requirements

Airport roadway requirements are based on an analysis of current and projected peak hour traffic volumes for key individual roadway links at BFM, as shown in Figure 4.1. For each roadway link, a peak hour traffic volume was identified based on traffic counts conducted from March 11, 2020 through March 19, 2020. Because each link's peak hour reflects the busiest consecutive 60 minutes observed for that link, roadway link peak hours were not necessarily simultaneous.

For each roadway link, the projected peak hour volume was compared to the assumed hourly link capacity to determine whether an acceptable level of service is and will continue to be provided. Hourly link capacity was identified using the Airport Cooperative Research Program (ACRP) Report 40 *Airport Curbside and Terminal Area Roadway Operations,* which provides hourly roadway capacities based on the assumed roadway free-flow speed, as summarized in Table 4.5.

Table 4.5: Assumed Roadway Capacities

Roadway free flow speed (mph)	Hourly capacity (vehicles per hour)
25	1,250
30	1,450
35	1,600
40	1,750
45	1,900
50	2,000
Source: ACRP Report 40, Table 4-1	

Projected traffic volumes of each roadway link for future PALs were calculated assuming that the peak hour roadway traffic would increase at the same growth rate as activity driving the demand for an individual roadway, as follows:

- For roadways predominantly serving airline passengers (i.e., Michigan Avenue, the I-10 exits, and Perimeter Road), peak hour traffic is assumed to increase in direct proportion to the forecast growth in peak hour origin-destination passengers (arrivals and departures) for the planning period.
- For roadways predominantly serving non-passenger-related uses, such as cargo facilities and other commercial activities (i.e., Broad Street, Airbus Way, and Aerospace Drive), the peak hour traffic is assumed to increase in direct proportion to the forecast growth in annual aircraft operations for the planning period, as an indication of the increase in employment for the major traffic generators at the Airport.

Since peak hour traffic counts were conducted in March 2020, the 2020 forecasts for peak hour passengers and annual aircraft operations were used instead of the existing 2018 figures.

The roadway link identifiers shown on Figure 4.1 correspond to those used in Table 4.6. For each link, roadway volumes were compared with the existing capacity to calculate a volume/capacity ratio indicative of a corresponding level of service (LOS), as defined in ACRP Report 40. The facility requirements analysis reflects a desire to achieve LOS "C" during the peak hour. LOS C represents conditions in which traffic flows smoothly during peak periods, but vehicles are traveling closely together and individual motorists find it more difficult to change lanes without another motorists' cooperation in providing a gap. This LOS threshold (and corresponding volume/capacity ratio) reflects a more stringent standard than may be used for typical transportation planning studies. For LOS C, the volume/capacity ratio is approximately 0.6, varying from 0.59 for 25 miles-per-hour roads to 0.65 for 50 miles-per-hour roads.

Table 4.6 Key Roadway Volumes and Levels of Service

							Existing (2020)			PAL 1 (2025)			PAL 2 (2030)			PAL 3 (2035)			PAL 4 (2040)		
Link ID (a)	Description	Assumed free flow speed (mph) (b)	Per-lane capacity	Number of lanes	Total capacity	Growth factor source	Peak Hour Volume	Volume/capacity ratio	Level of service	Peak Hour Volume	Volume/capacity ratio	Level of service	Peak Hour Volume	Volume/capacity ratio	Level of service	Peak Hour Volume	Volume/capacity ratio	Level of service	Peak Hour Volume	Volume/capacity ratio	Level of service
	Gatotkoco Dr (W of Perimeter) eastbound	30	1450	1	1450	Peak hour enpl.	202	0.14	C	296	0.20	C	333	0.23	C	348	0.24	C	363	0.25	C
1	Gatotkoco Dr (W of Perimeter) westbound	30	1450	1	1450	Peak hour enpl.	185	0.13	C	271	0.19	C	305	0.21	C	319	0.22	C	333	0.23	C
	Perimeter (S of Ave O) northbound	40	1750	1	1750	Peak hour enpl.	172	0.10	C	252	0.14	C	284	0.16	C	296	0.17	C	309	0.18	C
2	Perimeter (S of Ave O) southbound	40	1750	1	1750	Peak hour enpl.	209	0.12	C	306	0.18	C	345	0.20	C	360	0.21	C	376	0.21	C
3	Michigan Ave (N of Terminal)	35	1600	2	3200	Peak hour enpl.	214	0.07	C	314	0.10	C	353	0.11	C	369	0.12	C	385	0.12	C
	Michigan Ave (S of Ave M) northbound	35	1600	1	1600	Peak hour enpl.	157	0.10	C	230	0.14	C	259	0.16	C	270	0.17	C	282	0.18	C
4	Michigan Ave (S of Ave M) southbound	35	1600	1	1600	Peak hour enpl.	164	0.10	C	240	0.15	C	271	0.17	C	282	0.18	C	295	0.18	C
	Michigan Ave (N of Broad St) northbound	35	1600	2	3200	Peak hour enpl.	902	0.28	C	1323	0.41	C	1489	0.47	C	1553	0.49	C	1622	0.51	C
5	Michigan Ave (N of Broad St) southbound	35	1600	2	3200	Peak hour enpl.	951	0.30	C	1395	0.44	C	1569	0.49	C	1638	0.51	C	1710	0.53	C
	Broad St (E of Michigan Ave) eastbound	35	1600	1	1600	Annual ops.	947	0.59	C	1244	0.78	D	1274	0.80	D	1284	0.80	E	1293	0.81	E
6	Broad St (E of Michigan Ave) westbound	35	1600	1	1600	Annual ops.	735	0.46	C	965	0.60	C	989	0.62	D	996	0.62	D	1003	0.63	D
	Michigan Ave (N of I-10) northbound	35	1600	2	3200	Peak hour enpl.	991	0.31	C	1453	0.45	C	1635	0.51	C	1706	0.53	C	1782	0.56	C
7	Michigan Ave (N of I-10) southbound	35	1600	2	3200	Peak hour enpl.	274	0.09	C	402	0.13	C	452	0.14	C	472	0.15	C	493	0.15	C
	Michigan Ave (S of Eagle Dr) northbound	35	1600	2	3200	Peak hour enpl.	371	0.12	C	544	0.17	C	612	0.19	C	639	0.20	C	667	0.21	C
8	Michigan Ave (S of Eagle Dr) southbound	35	1600	2	3200	Peak hour enpl.	356	0.11	C	522	0.16	C	587	0.18	C	613	0.19	C	640	0.20	C
9	I-10 (westbound exit)	35	1600	1	1600	Peak hour enpl.	229	0.14	C	336	0.21	C	378	0.24	C	394	0.25	C	412	0.26	C
10	I-10 (westbound on ramp)	35	1600	1	1600	Peak hour enpl.	636	0.40	C	933	0.58	C	1050	0.66	D	1095	0.68	D	1144	0.71	D
11	I-10 (eastbound on ramp)	35	1600	1	1600	Peak hour enpl.	1354	0.85	E	1985	1.24	F	2234	1.40	F	2332	1.46	F	2435	1.52	F
12	I-10 (eastbound exit right turn lane)	35	1600	1	1600	Peak hour enpl.	1354	0.85	E	1985	1.24	F	2234	1.40	F	2332	1.46	F	2435	1.52	F
	Aerospace Dr (S of Broad St) northbound	35	1600	2	3200	Annual ops.	683	0.21	C	897	0.28	C	919	0.29	C	926	0.29	C	932	0.29	C
13	Aerospace Dr (S of Broad St) southbound	35	1600	2	3200	Annual ops.	1146	0.36	C	1505	0.47	C	1542	0.48	C	1553	0.49	C	1565	0.49	C
	Airbus Way northbound	35	1600	2	3200	Annual ops.	207	0.06	C	272	0.08	C	278	0.09	C	281	0.09	C	283	0.09	C
14	Airbus Way southbound	35	1600	2	3200	Annual ops.	217	0.07	C	285	0.09	C	292	0.09	C	294	0.09	C	296	0.09	C
	Broad St (S of Beach St) northbound	35	1600	1	1600	Annual ops.	626	0.39	C	822	0.51	C	842	0.53	C	848	0.53	C	855	0.53	C
15	Broad St (S of Beach St) southbound	35	1600	1	1600	Annual ops.	521	0.33	C	684	0.43	C	701	0.44	C	706	0.44	C	711	0.44	C
	Avenue C (W of 15th St) eastbound	35	1600	1	1600	Annual ops.	43	0.03	C	56	0.04	C	58	0.04	C	58	0.04	C	59	0.04	C
16	Avenue C (W of 15th St) westbound	35	1600	1	1600	Annual ops.	37	0.02	C	49	0.03	C	50	0.03	C	50	0.03	C	51	0.03	C
	S Broad St (E of 15th St) eastbound	35	1600	1	1600	Annual ops.	487	0.30	C	640	0.40	C	655	0.41	C	660	0.41	C	665	0.42	C
17	S Broad St (E of 15th St) westbound	35	1600	1	1600	Annual ops.	400	0.25	C	525	0.33	C	538	0.34	C	542	0.34	C	546	0.34	C

(a) See Figure 4.1
(b) Assumed free flow speed for roadway capacities taken from posted speed limits on Google Street View. Links 9, 10, 11, 12, and 16 were unmarked and assumed as 35 mph
(c) Peak hour enpl. = forecast growth in peak hour enplaned passengers; Annual ops. = forecast growth in annual aircraft operations

As shown in Table 4.6, five roadway links operate, or are forecast to operate, at a LOS below the LOS C goal. The number of lanes required to achieve LOS C for each of these links is as follows:

- Link 6 (Broad Street east of Michigan Ave eastbound): This link is expected to operate at LOS D by PAL 1 and LOS E by PAL 3. To achieve LOS C through the planning period, one additional lane is required.
- Link 6 (Broad Street east of Michigan Ave westbound): This link is expected to operate at LOS D by PAL 2. To achieve LOS C through the planning period one additional lane is required
- Link 10 (I-10 westbound on ramp): This link is expected to operate at LOS D by PAL 2. To achieve LOS C through the planning period, one additional lane is required.
- Link 11 (I-10 eastbound on ramp): This link currently operates at LOS E during the peak hour and is expected to operate at LOS F by PAL 1. It will achieve LOS C through the planning period with two additional lanes.
- Link 12 (I-10 eastbound exit right-turn lane): This link currently operates at LOS D during the peak hour and is expected to operate at LOS E by PAL 1 and LOS F by PAL 2. It will achieve LOS C through the planning period with two additional lanes.

It is important to note that links 9, 10, 11, and 12 do not have marked speed limits, and may have a higher hourly capacity than indicated in Table 4.6. Furthermore, these links are either on ramps or exits for I-10 and are not governed by the same capacity restrictions as on-airport roadways.

4.5 Curbside

Terminal curbside roadways provide space for private and commercial vehicles to drop off and pick up passengers at the terminal complex.

At MOB, Terminal Drive provides access to the terminal curbfront and recirculation to the parking lots and terminal. The curbside is single-level with arrivals and departures completely separated. The arrivals curbside is located on the western-most end of the terminal building and the departure curbside is on the eastern-most end of the terminal building. Both the arrivals and departures curbside facilities have two through lanes and one curbside lane.

For the purposes of the requirements analysis, it was assumed that the terminal curbside at BFM will be single-level, with arrivals and departures sharing the terminal curbfront.

The objective of the curbside facility requirements is to identify the forecast number of loading and unloading vehicles to be accommodated during the peak hour at the terminal and the required curbside frontage in terms of linear feet. Key data used in the development of curbside requirements include:

- Peak hour passenger forecasts
- 2018 OAG Aviation Worldwide schedule data
- Passenger mode shares
- Average dwell times of vehicles stopping at the curb to pick up or drop off passengers
- Typical length of curb occupied by a stopped vehicle, by mode

Curbside facility requirements were calculated based on peak hour vehicle volumes and assumed dwell times to determine the average number of vehicles simultaneously picking up or dropping off passengers during the peak hour. A Poisson distribution is then used to determine the 95th percentile number of vehicles simultaneously picking up or dropping off, which was multiplied by the average vehicle length to estimate the required length of linear curb.

4.5.1 Curbside Requirements Assumptions

Table 4.7 summarizes the assumed dwell times and vehicle lengths associated with each mode. Dwell times are based on the standard dwell time values from the Quick Analysis Tool for Airport Roadways (QATAR), a modeling tool originally developed by LeighFisher and included in ACRP Report 40. The vehicle lengths are those typically used in the industry and represent the distance between the front of a vehicle and the front of the vehicle immediately in front or behind, including the space required for maneuvering as the vehicle exits or enters the traffic stream. The future curbside requirements assume that these values remain unchanged through the planning period.

Table 4.7: Dwell Times and Vehicle Lengths

Vehicle Type	Curbside Dwell Time (minutes)		Vehicle Length (ft)
	Arrivals	Departures	
Private car	1.6	2.4	25
Taxi	1.9	1.9	25
TNC	1.9	1.9	25
Rental Car/Parking Shuttle	2.7	3.5	50
Source: LeighFisher, 2020			

Table 4.8 shows the assumed existing and future passenger mode shares. Data for mode share calculations was unavailable, so the assumptions shown in Table 4.8 are based on observed behavior at other airports and industry trends. The curbside analysis assumes that private vehicle pick-up and drop-off, taxis, TNCs, and shuttles require curbside access whereas rental car and terminal-parking passengers do not.

The forecasted peak hour passenger numbers were for departing passengers only, so it was necessary to estimate the volume of arriving passengers in the same hour in order to estimate the total curbside requirements. The planning team analyzed 2018 OAG schedule data to determine the number of departing and arriving seats during the peak hour of a sample week of the peak month. The ratio of peak hour arriving and departing seats as a percentage of the peak hour departing seats was calculated to be 1.31, which was applied to the forecast peak hour enplanements to estimate the total of arriving and departing passengers in the peak hour.

Table 4.8: Vehicle Mode Share

Vehicle Type	Mode Share (Existing)	Mode Share (Future)
Private car pick-up/drop-off	25%	23%
Taxi	5%	3%
TNC	10%	20%
Shuttle	5%	5%
On-Airport Parking	40%	36%
Rental Car	15%	13%
Total	**100%**	**100%**
Source: LeighFisher, 2020		

Finally, the forecast peak hour arriving and departing passengers were multiplied by the percent share of origin-destination trips (98%) to more accurately represent peak hour curbside usage. Table 4.9 presents peak hour volumes.

Table 4.9: Peak Hour Volumes

	Peak Hour Departures	Peak Hour Passengers (Arrivals + Departures)
Baseline (2018)	168	220
PAL 1 (2025)	320	420
PAL 2 (2030)	361	473
PAL 3 (2035)	376	493
PAL 4 (2040)	393	515
Source: LeighFisher, 2020		

4.5.2 Curbside Requirements

Table 4.10 summarizes the curbside requirements for BFM through PAL 4 by vehicle mode. Requirements are provided in linear feet. Requirements could be achieved using a single curbside roadway or using an inner and outer curbside roadway separated by an island, meaning the required length of the terminal frontage would be reduced by up to 50%.

The recommended curbside capacity was estimated such that, even though vehicles do not arrive at the curbside at a uniform rate during the peak hour, 95% of the time in the peak hour a vehicle would be able to find a curbside space to load and unload passengers. This method means that the recommended curbside capacity would involve minimal double-parking, which is necessary to avoid congestion if the roadway is only two lanes wide, including the curbside lane. If the roadway is wider with additional passing lanes, some double-parking in the peak hour may be acceptable and a shorter curb length would be sufficient.

Table 4.10: Terminal Curbside Requirements

	Length (linear feet)				
Arrivals + Departures	**Baseline (2018)**	**PAL 1 (2025)**	**PAL 2 (2030)**	**PAL 3 (2035)**	**PAL 4 (2040)**
Private car	100	150	150	175	175
Taxi	25	25	50	50	50
TNC	50	125	125	125	150
Parking/RAC Shuttle	50	50	50	50	50
Total	**225**	**350**	**375**	**400**	**425**
Source: LeighFisher, 2020					

4.6 Commercial Vehicle Facilities

The landside facilities at the Airport will accommodate private vehicles, taxis, TNCs, and shuttle buses. Taxis and TNCs will pick up and drop off passengers at the terminal curbside. However, to control the flow of commercial vehicles and to reduce the congestion of the passenger terminal curbside facilities, commercial vehicles picking up passengers will be required to wait in the hold lot before being dispatched to the terminal curbside.

At MOB, Uber and Lyft use the designated TNC lot to wait until passengers send a summons. The roughly 8,600-square-foot lot is located southwest of the terminal building and immediately west of the rental car lot, across Terminal Drive and Airport Road. Once arriving passengers request a ride, TNCs must drive approximately two minutes to the terminal curbfront. Access to the TNC lot is uncontrolled, and its surface is unpaved and unmarked.

The commercial vehicle hold lot at BFM should be located away from the curbside to accommodate taxis, TNCs, and other vehicles that are not actively loading or unloading passengers. The hold lot should provide parking spaces for up to 60 vehicles, based on an estimate of 88 TNC and taxi pick-ups in the passenger arrivals peak hour for PAL 4. Furthermore, using a planning assumption of 120 parking stalls per acre (see Section 4.2: Public, Employee, and Commercial Parking), approximately 22,000 square feet should be reserved for TNC and taxi use at the Airport's parking facilities.

The commercial vehicle hold lot should be co-located in the Airport parking facilities to provide maximum flexibility for future expansion.

5. AIR CARGO

Cargo operations are categorized as either all-cargo carriers using dedicated cargo-only aircraft, or as belly cargo using excess capacity on passenger aircraft. Existing cargo operations at BFM are predominantly driven by the air freight integrator FedEx. Existing belly cargo activity at BFM is minimal because of its small-scale passenger airline activities. However, belly cargo activity is expected to grow when commercial service is relocated from MOB to BFM.

At MOB, Delta Cargo has an office and small warehouse area that is approximately 2,000 square feet. It is located in a hangar shared with and leased from the Signature Flight Support fixed base operator (FBO) and provides cargo and freight shipping services. The location of the Delta cargo facility has access to both the airfield and the surface road (Airport Road). There is no other belly cargo activity by passenger airlines at MOB.

Air cargo facility requirements are typically identified based on cargo tonnage forecasts. Cargo tonnage forecasts for BFM, however, are not available. As such, the planning team estimated the area to be reserved for future belly cargo by applying the average annual growth rate of the air carriers at BFM to the current office and warehouse area at MOB, as shown in Table 5.1.

Table 5.1: Belly Cargo Facility Requirements

	Base Year	PAL 1	PAL 2	PAL 3	PAL 4
Average Annual Growth Rate (%)	-	34.8	3.3	2.0	1.9
Area (ft^2)	2,000	2,696	2,785	2,841	2,895

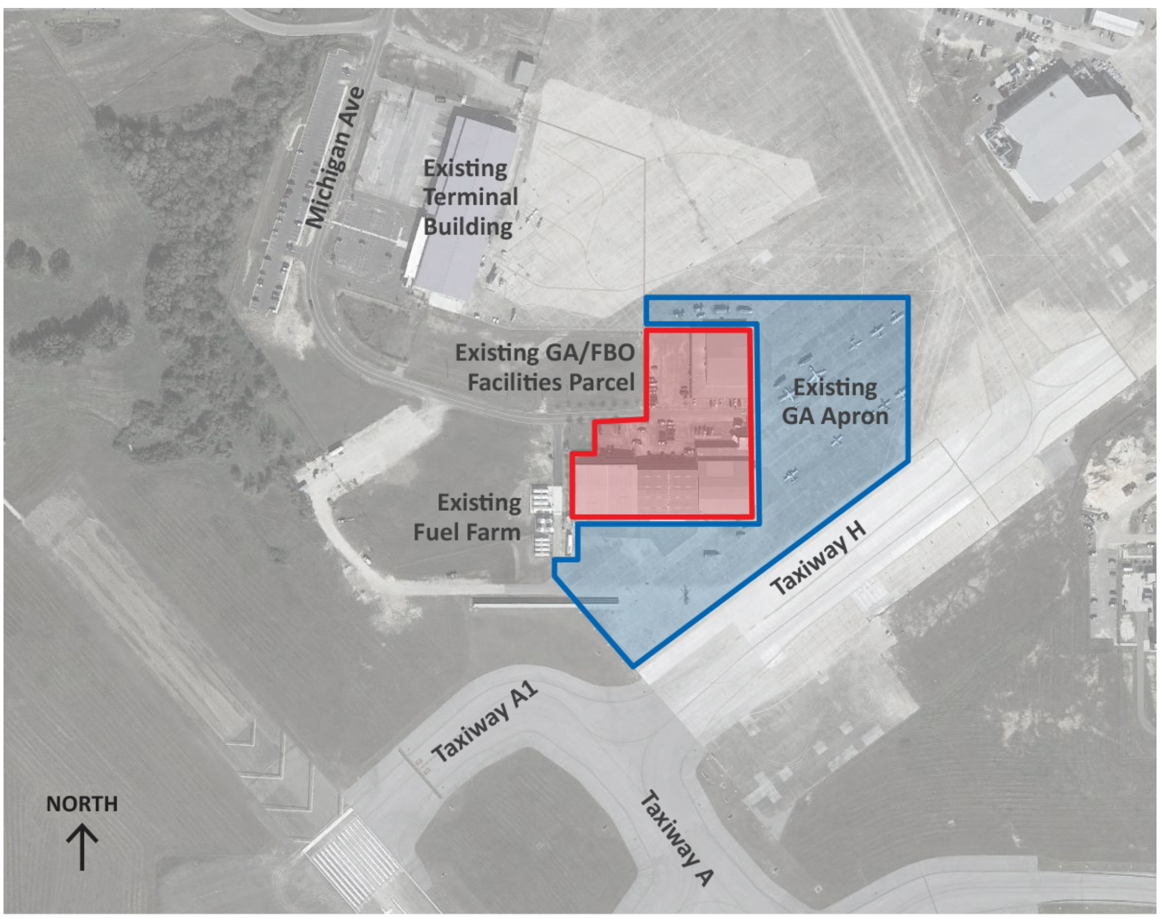
Sources: Base Year – LeighFisher, January 2020.
Forecast – LeighFisher, October 2019.
Analysis – LeighFisher, June 2020.

6. GENERAL AVIATION AND FIXED BASE OPERATOR

An airport's accommodation of general aviation (GA) activities is largely a matter of policies and priorities and should be determined through discussions with key stakeholders, such as GA service providers. GA needs are driven by the total number of GA operations as well as the aircraft type that will need to be accommodated.

At BFM the existing FBO, which is owned and operated by Signature Flight Support Corporation, is located east of the temporary terminal building on the terminal apron. While its immediate relocation is not necessary, it is likely that a new taxilane will need to be built on the terminal apron 10 to 15 years into the planning period, which will require the relocation of the FBO.

The approximate area of the existing FBO facilities parcel outlined in red in Figure 6.1 below is 14,520 square yards, and the existing GA apron outlined in blue is about 33,630 square yards. The planning team estimated the area of future GA/FBO facilities by applying the average annual growth rate to the existing areas, as shown in Table 6.1. In PAL 4, the total required area for FBO facilities will be 48,680 square yards, or approximately 10 acres.



Source: Image by Google Earth; Drawing by LeighFisher, May 2020.

Figure 6.1: Existing General Aviation / Fixed Base Operator Facilities

Table 6.1: General Aviation / Fixed Base Operator Facilities Requirements

	Base Year	PAL 1	PAL 2	PAL 3	PAL 4
Average Annual Growth Rate	-	0.2%	0.3%	0.3%	0.3%
Parcel Area (yd^2)	14,520	14,550	14,590	14,640	14,680
Apron Area (yd^2)	33,630	33,700	33,800	33,900	34,000
Total Area (yd^2)	**48,150**	**48,250**	**48,390**	**48,540**	**48,680**

Sources: Forecast – LeighFisher, October 2019.
Analysis – LeighFisher, June 2020.

7. AIRPORT AND AIRLINE SUPPORT

Airline and airport support areas refer to those areas and facilities which directly support the functionality and operations of the airport and airlines. These support areas include Aircraft Rescue and Firefighting facilities, Air Traffic Control facilities, jet-fuel storage facilities, airport administration, airline support facilities, airport maintenance facilities, and utilities. Requirements for these support areas were identified through discussions with key stakeholders, traffic forecasts at BFM, and FAA guidance.

7.1 Aircraft Rescue and Firefighting Facilities

Federal Aviation Regulations (FAR) Part 139-certified airports are required to provide ARFF services. According to FAR Part 139 Airport Certification Status List (ACSL), updated on March 26, 2020, BFM is currently certified as Class I with an ARFF Index A category.

The two longest passenger aircraft that will be operating at BFM, the Airbus A220 (127 feet) and the Boeing 737-800 (129 feet) are each over 126 feet, which indicates an ARFF Index C classification. The critical design aircraft, the Airbus A300, is over 159 feet, indicating an ARFF Index D classification. However, the total number of daily departures for these aircraft is forecast to be fewer than five over the planning horizon. Therefore, once the new terminal is built and commercial traffic transfers over from MOB, the Airport will need to satisfy the ARFF Index B requirement.

The existing ARFF facility is located in the airfield, between the two runways. With relocation of commercial operations to the Mobile Downtown Airport, a new ARFF facility is crucial for the Airport to provide aircraft safety, incident stabilization, and property conservation. In addition, the existing ARFF facility is located within the Airbus leasehold and must be relocated. FAA Advisory Circular (AC) 150/5210-15A *Aircraft Rescue and Firefighting Station Building Design* provides requirements and guidance to site and design an ARFF facility.

7.1.1 Site Selection

The location of an ARFF station must meet or exceed FAR Part 139.319 ARFF vehicle response time requirements for certification purposes. In general, at least one required aircraft rescue and firefighting vehicle must reach the midpoint of the farthest runway within three minutes from the time of the alarm. Other site selection parameters include the following:

- Immediate and straight access to the airfield network with minimum turns
- Direct access to the terminal aprons, minimizing the crossing of active runways, taxiways, or difficult terrain
- Non-interference with the Air Traffic Control Tower's line of sight
- Maximum surveillance of the airfield
- Adherence to the Building Restriction Line and FAR Part 77 surfaces
- Non-interference by ARFF vehicles or the ARFF station's communications equipment or with navigational facilities
- Ease of connection to, and integration with, the airport's security system

Future expansion of the ARFF or other facility and airfield improvements should not negatively impact ARFF vehicle response time requirements.

7.1.2 Aircraft Rescue and Firefighting Station Elements and Sizing

The number of vehicles and their characteristics drive the sizing of the ARFF facility. The ARFF indexes and their respective vehicle and extinguishing agent requirements are listed in Table 7.1.

Table 7.1: Aircraft Rescue and Firefighting Index Classifications

ARFF Index	Aircraft Length (ft)	Required # of Vehicles	Minimum Requirements of Extinguishing Agent
A	<90	1	500 lbs of sodium-based dry chemical or halon 1211 or clean agent; or 450 lbs of potassium-based dry chemical and water with a commensurate quantity of aqueous film-forming foam (AFFF) to total 100 gallons for simultaneous dry chemical and AFFF application
B	90 ≤ X < 126	1	500 lbs of sodium-based dry chemical or halon 1211 or clean agent; or clean agent and 1,500 gallons of water and the commensurate quantity of AFFF for foam production
		2	One vehicle carrying the extinguish agents as specified for Index A; and one vehicle carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons
C	126 ≤ X < 159	2	One vehicle carrying 500 lbs of sodium-based dry chemical or halon 1211 or clean agent or clean agent and 1,500 gallons of water and the commensurate quantity of AFFF for foam production; and one vehicle carrying water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by both vehicles is at least 3,000 gallons
		3	One vehicle carrying the extinguish agents as specified for Index A; and two vehicles carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by both vehicles is at least 3,000 gallons
D	159 ≤ X < 200	3	One vehicle carrying the extinguishing agents as specified for Index A; and two vehicles carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by all three vehicles is at least 4,000 gallons
E	≥ 200	3	One vehicle carrying the extinguishing agents as specified for Index A; and two vehicles carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by all three vehicles is at least 6,000 gallons
Source: FAR Part 139.317, updated 3/22/2013			

An ARFF Index B facility requires one or two ARFF vehicles. The new ARFF facility should include a three-bay space plus overhead doors on both sides as well as interior space, offices, training, berthing, and fitness rooms totaling approximately 9,000 square feet.

7.2 Air Traffic Control Facilities

The existing ATCT at BFM is located within the Airbus leasehold and must be relocated. FAA Order 6480.4B, *Airport Traffic Control Tower Siting Process* establishes requirements for determining site location, tower height, and cab orientation of a proposed new ATCT.

7.2.1 Size of ATC Facilities

The new ATCT at BFM must be at least the same size as the existing ATCT at MOB because it has to control a similar amount of air traffic volume when commercial activity is transferred over to BFM. The current ATC facilities at MOB total approximately three acres, which includes a base building with a tower, 50 parking spaces, and other FAA facilities. Therefore, reserving at least three acres of land for the new ATC facilities at BFM is recommended.

7.2.2 Siting Criteria

The proposed new ATCT site must meet the requirements that are outlined in the aforementioned FAA Order 6480.4B, including the following criteria.

- **Visibility Performance**: The FAA's Airport Traffic Control Tower Visibility Analysis Tool must be used to analyze each potential site for unobstructed view, object discrimination, and line-of-sight angle of incidence requirements.
- **Impacts to Instrument Approach Procedures**: The proposed site must be sited so that it does not adversely impact any existing or planned terminal instrument procedures. Also, the site must meet standards such as Title 14 Code of Federal Regulations (CFR) Part 77 Objects Affecting Navigable Airspace and *FAA Advisory Circular 150/5300-13A* Airport Design Standards.
- **Impacts to Communications, Navigation, and Surveillance Equipment**: The performance of existing or planned facilities and/or equipment for communications, navigation, and surveillance should not be affected by the new ATCT.
- **Siting Safety Risk Management Process/Comparative Safety Assessment (CSA)**: The Air Traffic Organization Safety Management System requires that safety assessments be conducted for potential sites. The Safety Risk Management process verifies documentation of safety-related changes, identification of hazards, assessment and analysis of risks, and risk mitigation strategies.
- **Operational Requirements**: Operational conditions must be considered for potential sites, such as ATCT orientation, weather, look-down angle, look across line of sight, cab mullion/column orientation, look-up angle, line of sight during and after the construction of a new ATCT, and site access.
- **Economic Considerations**: Economic impact is also a key factor when evaluating ATCT sites. Cost estimates should be developed based on the height and size of the ATCT, connection to cabling and utilities, site access, security, and potential risk mitigation.

A detailed siting analysis for the new ATC facilities at BFM is included in the *Alternatives* chapter.

7.3 Airport Administration

Airport administration staff and functions are currently located on both the first and second floors of the MOB terminal building. Sixty-two airport staff—including administrative staff, maintenance personnel, custodians, operational staff, police, and Airport Operations Control Center (AOCC) personnel—occupy approximately 13,000 square feet of space. When commercial traffic transfers to BFM, it is assumed that most of the airport staff will be relocated to a new airport administration office space at BFM.

The future airport administration facility requirements were calculated by applying the projected growth rate of passenger enplanements to the current number of administrative, custodial, operational, and police personnel, and applying the projected growth rate of commercial aircraft operations to the current number of AOCC and maintenance staff. As shown in Table 7.2, 26,908 square feet of airport administration space will be required by PAL 4. Specific space allocations of the required space should be refined during the design phase.

Table 7.2: Airport Administration Requirements

	Base Year (2018)	PAL 1 (2025)	PAL 2 (2030)	PAL 3 (2035)	PAL 4 (2040)
Number of Personnel	62	96	102	108	114
Area (ft^2)	13,000	22,906	24,240	25,574	26,908

Sources: Base Year – Mobile Airport Authority, June 2020.
Forecast – LeighFisher, October 2019.
Analysis – LeighFisher, June 2020.

7.4 Fuel Storage Facilities

The requirements analysis for this functional area seeks to identify the number and volume of storage tanks and land areas to be reserved for fuel facilities through the planning period. Existing fuel tanks at MOB and BFM are shown in Table 7.3. Key assumptions are as follows:

- At BFM, 108,000 gallons are earmarked for Airbus and defueling and a total of 80,000 gallons are available for commercial aviation purposes.
- MOB currently maintains 10-day fuel reserves; BFM will require five-day fuel reserves.
- A fuel supplier can provide Jet-A fuel and aviation gasoline (AvGas) to meet future demand without making major facility modifications; typical fuel delivery was made one to two times a day with 8,000 gallons per delivery.
- MOB currently has a 14,000-gallon capacity Jet-A fuel truck and a 3,000-gallon capacity AvGas fuel truck. At BFM, there are two 5,000-gallon Jet-A fuel trucks and a 750-gallon AvGas fuel truck. MAA will need to invest in larger fuel trucks for Jet-A and AvGas at BFM to meet future demand.

Table 7.3: Inventories of Existing Fuel Storage

		MOB		BFM	
	Tank Size (gallons)	Quantity	Gross Capacity (gallons)	Quantity	Gross Capacity (gallons)
Jet-A (a)	12,000	-	0	4	48,000
Jet-A	15,000	1	15,000	-	-
Jet-A (b)	20,000	3	60,000	7	140,000
AvGas	12,000	1	12,000	1	12,000

(a) Four tanks at BFM are dedicated to Airbus.
(b) Three tanks at BFM are dedicated to de-fuel.
Source: Mobile Regional Airport Master Plan Update, November 2013.

A basic measure of fuel demand is the average amount of fuel required for all departing aircraft during a particular day. This measure of demand is referred to as uplift and is measured in gallons. Average Day Peak Month (ADPM) fuel uplift is typically calculated as follows:

ADPM Daily Fuel Uplift = ADPM Departures X Average Fuel Uplift per Departure X % of Departures which are Refueled at BFM

Fuel demand is calculated for each type of operation (i.e., passenger airline, cargo, and general aviation) separately, and the sum of uplift by type of operation equals the total daily uplift of the airport.

Data for the average amount of fuel dispensed per departure was unavailable. Thus, the planning team estimated fuel facility requirements by applying the projected average annual growth rate of commercial aircraft operations at BFM to the current fuel storage capacity at MOB, as shown in Table 7.4. This estimating method is less accurate than the aforementioned methodology, so further analysis is strongly recommended.

Fuel storage requirements through PAL 4 are shown in Table 7.5. It was assumed the current capacity of Jet-A at BFM, excluding capacities dedicated to Airbus and defueling (approximately 80,000 gallons), will be used for commercial aircraft operations. As a result 31,100 gallons of Jet-A fuel storage and 200 gallons of AvGas storage will need to be added by the end of the planning period.

Table 7.4: Aviation Activity Forecast

	Average Annual Growth Rate (%)				
	Base Year	**PAL 1**	**PAL 2**	**PAL 3**	**PAL 4**
Commercial Aircraft Operations (a)	3.5	38.5	1.5	0.3	0.3
General Aviation	0.9	0.2	0.3	0.3	0.3
Source: LeighFisher, October 2019.					

Table 7.5: Fuel Storage Requirements

	2020 Capacity at MOB	Estimated Fuel Storage Required at BFM (gallons)			
	(gallons)	**PAL 1**	**PAL 2**	**PAL 3**	**PAL 4**
Jet-A	75,000	103,900	105,500	105,800	106,100
AvGas	12,000	12,100	12,100	12,100	12,200
Sources: Capacity at MOB – Mobile Regional Airport Master Plan Update, November 2013. Analysis – LeighFisher, May 2020.					

7.5 Airline Support Facilities

7.5.1 Airline Maintenance Facilities

VT Mobile Aerospace Engineering (VT MAE) provides maintenance, repair, and overhaul services at BFM. VT MAE offers aircraft maintenance and modification services for a wide range of aircraft, including Boeing 737, 747, 757, 767, and 777; McConnell Douglas DC-10 and MD-10/11; and the Airbus A300/310, A320 family, A330, and A340. VT MAE occupies eight buildings on Airport property and leases approximately 39 acres of total space.

Table 7.6: Airline Maintenance Facility Requirements

	Base Year	**PAL 1**	**PAL 2**	**PAL 3**	**PAL 4**
Average Annual Growth Rate (%)	-	38.5	1.5	0.3	0.3
Area (acre)	39	55	56	57	58
Sources: Base Year – Mobile Airport Authority, June 2020. Forecast – LeighFisher, October 2019. Analysis – LeighFisher, June 2020.					

As shown in Table 7.6, the estimated airline maintenance facility requirements were prepared by applying the projected average annual growth rate of commercial aircraft operations at BFM to the current VT MAE space. However, the size of airline maintenance facilities is not typically driven by passenger traffic, but rather by elements such as hubbing characteristics, fleet size, maintenance schedules, and climate. Therefore, it is recommended that the MAA coordinate with the airlines and other key stakeholders on specific business decisions and arrangements before implementing the plan. Future locations of additional airline maintenance hangars are addressed in the *Alternatives* chapter.

7.5.2 Ground Support Equipment

Ground support equipment (GSE) are critical components of airports, helping to provide a wide range of support services to both commercial and GA aircraft. Examples of GSE include baggage tugs, cargo loaders, passenger stairs, and ground power units. Ground support equipment for passenger airlines should be stored as close to the passenger terminal apron as possible.

At MOB, GAT Airline Ground Support handles the operations and equipment for Delta Air Lines and United Airlines, while American Airlines handles their own GSE. The GSE staging and storage areas for the airlines are located on the terminal apron immediately surrounding the parked aircraft, unless the aircraft is in the workshop for scheduled maintenance or repair. According to the MAA, the GSE staging and storage areas at MOB measure between roughly 10,000 and 20,000 square feet. At BFM, all GSE is stored on the terminal apron or inside the former flight training building.

The required area for GSE storage and staging, not to mention the specific vehicles needed, is highly variable and dependent upon numerous factors, including apron size, lease agreements, management structures, and business arrangements of the airlines related to aircraft servicing. Thus, the best methodology for determining GSE requirements is to coordinate with stakeholders to understand their individual needs, and to understand whether the existing arrangements and facilities are sufficient. For the purposes of the Master Plan, the planning team estimated the land to be reserved for the GSE staging and storage area by applying the projected average annual growth rate of commercial aircraft operations at BFM to the aforementioned current GSE area at MOB, as shown in Table 7.7.

Table 7.7: GSE Staging and Storage Area Requirements

	Base Year	PAL 1	PAL 2	PAL 3	PAL 4
Average Annual Growth Rate (%)	-	38.5	1.5	0.3	0.3
Area (ft^2)	20,000	27,700	28,116	28,200	28,285

Sources: Base Year – Mobile Airport Authority, June 2020.
Forecast – LeighFisher, October 2019.
Analysis – LeighFisher, June 2020.

7.6 Airport Maintenance Facilities

Airport maintenance facilities refer to the areas associated with the servicing and upkeep of key equipment and physical infrastructure at the airport.

At MOB, the maintenance building is approximately 7,700 square feet. The maintenance yard, where vehicles and other equipment are stored, is about 19,000 square feet. In order to estimate the land to be reserved for future airport maintenance facilities, the projected annual growth rate of aircraft operations at BFM was applied to the existing area at MOB. The result is shown in Table 7.8.

Table 7.8: Airport Maintenance Facilities Requirements

	Base Year	PAL 1	PAL 2	PAL 3	PAL 4
Average Annual Growth Rate (%)	-	5.6	0.5	0.1	0.1
Maintenance Building (ft^2)	7,700	8,131	8,172	8,180	8,188
Maintenance Yard (ft^2)	19,000	20,064	20,164	20,184	20,204

Sources: Base Year – LeighFisher, January 2020.
Forecast – LeighFisher, October 2019.
Analysis – LeighFisher, June 2020.

7.7 Wash Rack

With extensive maintenance activity at BFM, a wash rack is an important asset. A wash allows aircraft to be washed, and also captures runoff for appropriate treatment. To allow for development at BFM, the MAA needed to relocate their existing aircraft wash rack and placed the temporary wash rack between the interim terminal building and the FedEx facility. A long-term permanent location is needed for the wash rack. The permanent wash rack should be sized to accommodate all aircraft operating or maintained at BFM.

7.8 Utilities

BFM is served by all major utilities. Access to the utilities and any improvements required to serve the passenger terminal complex will be part of the alternatives analysis. To identify potential utility improvements, the existing utility availability was reviewed along with the proposed terminal facilities and utility usage at Mobile Regional Airport.

7.8.1 Water and Sewer

7.8.1.1 Mobile Downtown Airport New Terminal

The proposed new terminal for the Mobile Downtown Airport will be located north and slightly west of the existing terminal building. The new terminal is planned for approximately 130,000 square feet. In addition to the new terminal, an additional 13,000 square feet of administrative space and approximately 5,000 square feet of additional maintenance space will be needed. The location of the new terminal is adjacent to existing water and sewer lines that service the airport.

7.8.1.2 Proposed Water and Sewer Demands

Water demands for the new terminal were broken down by the various services provided and the number of passengers utilizing the airport, which in turn is based on the planning activity levels and projections of employees at the BFM terminal. Peak hour projections were used to calculate a maximum flow.

The domestic water usage projections were based on passengers using an average of three gallons per capita at the airport. Airport employees were projected for an average use of 12 gallons per shift per capita. Non-domestic water usage in the airport tied to the restaurant spaces was calculated separately. The water demand for the restaurant space was projected at 521 gallons per 1,000 square feet per day per shift.

The water usage per passenger is treated as an absolute number not subject to a peaking factor since the passenger forecast is based on peak hour arrival/departure. The water usage for airport employees and concessions have a peaking factor tied to them since they tend to have concentrated spikes during mealtimes and shift changes. A peaking factor of 4.0 was used for each. This peak level represents a point in time when there is high usage so that adequate capacity can be provided. Table 7.9 summarizes water demands by use for the design period. The peak water demands for the proposed terminal start at 378 gallons per minute when the terminal opens and increase to 413 gallons per minute for the 2040 timeframe.

Table 7.9: Projected Passenger Terminal Water Usage

	Baseline (2018)	PAL 1 (2025)	PAL 2 (2030)	PAL 3 (2035)	PAL 4 (2040)
Domestic Passengers					
Peak hour passengers (enplaning and deplaning)*	342	654	736	768	802
Peak hour water usage for passengers (gallons)	**1,026**	**1,962**	**2,208**	**2,304**	**2,406**
Airport Employees					
Airline and Ground Handling Employees**	38	56	63	66	69
Concessionaire Employees (per shift)	7	10	11	11	11
Rental Car Employees	32	47	53	55	57
Weather Observer	1	1	1	1	1
Airport Authority	62	96	102	108	114
Total Airport Employees per shift	**140**	**210**	**230**	**241**	**252**
Water usage per shift (12 gallons)	1,680	2,520	2,760	2,892	3,024
Peak hour usage, 4.0 peaking factor (gallons)	**840**	**1,260**	**1,380**	**1,446**	**1,512**
Concessions					
Concessions (square feet)	10,000	10,000	10,000	10,000	10,000
Water use per 1,000 ft^2 per shift	521	521	521	521	521
Water use per shift	5,210	5,210	5,210	5,210	5,210
Peak hour water usage, 4.0 peaking factor (gallons)	**20,840**	**20,840**	**20,840**	**20,840**	**20,840**
Total Terminal Peak Hour Water Usage (gal/hr)	**22,706**	**24,062**	**24,428**	**24,590**	**24,758**
Total Terminal Peak Hour Water Usage (gal/min)	**378**	**401**	**407**	**410**	**413**

*Peak hour enplanements doubled to account for enplanements and deplanements

**Includes overlapping shifts

7.8.1.3 Existing Utilities

Mobile Area Water and Sewer System (MAWSS) provides the water and sewer service at BFM. The existing water main to the west of the proposed terminal has a 12-inch diameter. Depending on pressure, the existing main can provide up to 6.7 million gallons per day of water under a peak flow condition. The existing sewer lines to the west of the proposed terminal are 12 inches in diameter. At a minimum slope, these lines can convey 1.07 million gallons per day, or 743 gallons per minute. The existing infrastructure serving the airport can accommodate the present and future water demands of the proposed terminal. When planning the terminal utility service, the potential to have dual water feeds to the terminal should be investigated. Service from two lines would lessen the potential for a disruption to water services.

7.8.1.4 Utility Relocation

Some existing water and sewer utilities within the footprint of the proposed terminal building will need to be isolated and removed. Additionally, because the existing 8-inch diameter water main appears to be looped through the site, coordination with MAWSS must occur to determine whether the line should be routed around the new terminal to maintain capacity to the airport site or isolated and removed.

Finally, there are existing gravity sewers to the north and south of the proposed terminal that can be removed to the next manhole. Since these sewers are both dead-end sewers that do not convey flow through the site, there does not appear to be a need to reroute them.

7.8.2 Electrical

Alabama Power is the electrical service provider at BFM via two service feeds. In the central portion of the airfield, the electrical service is underground and new service would need to be established to the terminal building. The service should be provided from both services feeds to have redundancy; this will lessen loss of service to the terminal. Generator back-up for essential services in the terminal should also be provided.

Based upon the size of the terminal and parking garage, it is estimated that the size of the transformer to service these facilities could be as large as 1,500 kilo-volt-amps for a 1600A 480Y/277 V, 3-Phase 4-Wire Service. This would allow service to be provided to the terminal, parking garage, surface parking lot, and apron lighting. This is anticipated to be underground service and would include main distribution equipment. The recommended transformer size should be within the capacity of the existing system. The size of the electrical service installed will be driven by the design of the building and its energy efficiency.

A separate rental car facility would be anticipated to have its own new service. This service would be smaller, estimated at approximately 200-400 amps at 208Y/120V, 3-Phase 4-Wire.

It is anticipated that the electrical utility provider would provide the medium-voltage cabling and connections and the pad-mounted transformer and meter specifications. The electrical contractor would provide a conduit to the demarcation point for the utility to route the primary cabling between their system and the new pad-mounted transformer, secondary conduits, cabling, and connections into the new main distribution equipment, the transformer pad, and a current transformer cabinet, with all items meeting the specification of the utility.

7.8.3 Natural Gas

Natural gas service at BFM is provided by Spire. There is an existing 4-inch gas line along Michigan Avenue and two 6-inch gas lines along Broad Street and Avenue I.

The existing natural gas pressure in the area of the new terminal is approximately 35 pounds per square inch. For calculations, it was assumed that a minimum of 5 pounds per square inch would be available at the new terminal; 5 pounds per square inch is greater than that required by typical HVAC equipment as well as those of most gas-fired generators.

Natural gas in the new terminal was anticipated to be consumed via domestic hot water, concessions equipment, and building heating loads. Domestic hot water consumption rates were taken from the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Handbook titled *HVAC Applications*, and applied to the anticipated number of occupants based on the forecast passengers and employees. An estimate of the gas-fired cooking equipment was made, and average consumption values were taken from the ASHRAE Handbook titled *Fundamentals*. To provide high-level estimates of heating demand for the terminal building, the proposed terminal area was multiplied by 1.0 cubic foot per minute per square foot (CFM/square feet) of terminal area. This value was translated into a proposed natural gas consumption rate. These demands were totaled to produce an estimated maximum natural gas consumption rate of 25,000 cubic feet per hour (CFH).

As stated previously, the existing service pressure is approximately 35 pounds per square inch and the minimum pressure at the proposed terminal was considered to be 5 pounds per square inch. A 4-inch schedule 40 steel pipe would be capable of carrying 93,000 CFH. This capacity indicates that the proposed terminal should be capable of utilizing the existing natural gas utilities for new building hot water, concessions, and building heating demands.

If additional capacity is needed, one of the two existing 6-inch service lines slightly farther from the proposed terminal location could be tapped. Depending on the routing, a 6-inch schedule 40 steel pipe would be capable of carrying over 270,000 CFH at a runout distance of 3,000 linear feet.

Any new maintenance shop service could be routed individually from one of the existing 4-inch or 6-inch lines or branched from the new terminal service line. It is anticipated that the separate rental car facility would have an individual service line, if required by building equipment.

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TECHNICAL MEMORANDUM No. 4 – ALTERNATIVES

MASTER PLAN
Mobile Downtown Airport

Prepared for

Mobile Airport Authority
Mobile, Alabama

July 2020

Mobile Airport Authority

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ACRONYMS AND ABBREVIATIONS

Term	Definition
AGL	Above Ground Level
ALP	Airport Layout Plan
ALSF-2	Approach Lighting System with Sequence Flashing Lights
ARC	Airport Reference Code
ARFF	Aircraft Rescue and Fire Fighting
ATCT	Airport Traffic Control Tower
ATCTVAT	Airport Traffic Control Tower Visibility Analysis Tool
BFM	Mobile Downtown Airport
CAT	Category
ConRAC	Consolidated Rental Car Facility
Continental	Continental Aerospace Technologies
FAA	Federal Aviation Administration
FBO	Fixed Base Operator
GA	General Aviation
ILS	Instrument Landing System
MAA	Mobile Airport Authority
MALSR	Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights
MOB	Mobile Regional Airport
MRO	Maintenance, Repair, and Overhaul
OFZ	Obstacle Free Zone
PAL	Planning Activity Level
RSA	Runway Safety Area
ROFA	Runway Object Free Area
RPZ	Runway Protection Zone
RVR	Runway Visual Range
TDG	Taxiway Design Group
TFMSC	Traffic Flow Management System Counts
TOFA	Taxiway Object Free Area
VT MAE	VT Mobile Aerospace Engineering

1. INTRODUCTION AND SUMMARY

This chapter of the Master Plan summarizes the alternative concepts considered for satisfying facility requirements (presented in Chapter 3) at Mobile Downtown Airport (BFM or the Airport) through 2040. Previous chapters outlined the existing airport structures and pavements, current and future aviation users, and airport needs. This chapter outlining alternatives combines that background information to create future projects to address current needs and accommodate future use.

The planning team developed alternative concepts for the airfield, passenger terminal complex, ground transportation and parking, general aviation, and other airport support areas. Chapter 5: Development Plan summarizes potential cost estimates for the recommended long-term development options.

1.1 Background

The Mobile Regional Airport (MOB), owned and operated by the Mobile Airport Authority (MAA), is currently the primary commercial service airport in the Mobile region. However, due to its location and related access issues, MOB is at a competitive disadvantage with other airports in the Gulf Coast. In order to curb the leakage to competitor airports, the MAA seeks to relocate all commercial passenger traffic from MOB to BFM.

To accommodate the increased passenger traffic, a new terminal will be built at BFM, along with necessary improvements to the Airport's airfield, ground transportation and parking, general aviation facilities, and more, as detailed in this technical memorandum.

1.2 Planning Activity Levels

Recognizing the uncertainties associated with long-range aviation demand forecasting, four planning activity levels (PALs) were identified to represent future levels of activity at which key Airport improvements will be necessary:

- PAL 1: Corresponds to the 50th percentile aviation demand forecast for 2025.
- PAL 2: Corresponds to the 50th percentile aviation demand forecast for 2030.
- PAL 3: Corresponds to the 50th percentile aviation demand forecast for 2035.
- PAL 4 correspond to the 50th percentile aviation demand forecast for 2040.

Because, for any number of reasons, activity levels could occur at different periods from those anticipated when the forecasts were prepared, the use of PALs allows for facilities planning that is realistically tied to milestone activity levels as they occur, rather than arbitrary years. Table 1.1 summarizes the aviation demand associated with each PAL.

Table 1.1: Aviation Demand Forecasts

	Baseline (2018)	PAL 1 (2025)	PAL 2 (2030)	PAL 3 (2035)	PAL 4 (2040)
Enplaned Passengers					
MOB[(a)]	303,871	-	-	-	-
BFM	-	523,000	588,250	614,500	640,750
Aircraft Operations					
Commercial					
MOB	13,986	-	-	-	-
BFM	4,468	24,360	26,180	26,600	27,000
General Aviation					
MOB	9,253	9,190	9,310	9,450	9,580
BFM	14,359	14,800	15,010	15,220	15,440
Military					
MOB	48,373	49,970	49,970	49,970	49,970
BFM	45,267	43,670	43,670	43,670	43,670
Total Aircraft Operations					
MOB	71,612	59,160	59,280	59,420	59,550
BFM	64,094	82,830	84,860	85,490	86,110

Sources:
Historical – Mobile Airport Authority; OAG Aviation Worldwide Ltd., OAG Analyser database, accessed August 2019.
Forecast – LeighFisher, October 2019.
Notes:
(a) Enplanements/operations are shown for both BFM and MOB to capture the total Mobile market demand.

1.3 Summary of Requirements

Chapter 3 summarizes the findings of the facility requirements analysis for BFM. The construction of a brand-new passenger terminal complex and the introduction of increased commercial traffic at BFM necessitates accompanying improvements to the airfield, parking facilities, roadway system, and airport support buildings, among other items. The planning team calculated requirements to accommodate the forecast demand within the planning horizon.

The most significant findings reported in Chapter 3 were that:

- Additional runway capacity is not needed
- The new passenger terminal complex will require eight aircraft parking gates and approximately 130,000 square feet of total area
- Terminal area and airport access roadways will need to be realigned to accommodate the reconfigured traffic flow to the new terminal.

Refer to Appendix A for the detailed requirements, which in part form the basis for the alternatives presented in this report (also referenced in Chapter 3, Table 1.2).

2. AIRFIELD

2.1 Background

Chapter 3 assessed the capacity of the existing airfield system to determine if and when additional airfield capacity improvements will be required to meet aviation demand forecast through PAL 4 (2040). The primary conclusions from that assessment were as follows:

- Delay levels will remain low even with the forecast increase in commercial traffic. Thus, there is no immediate need for significant capacity enhancements at the Airport.
- Certain sections of pavement on Runway 14/32 and Runway 18/36 are in poor condition and will need to be rehabilitated.
- Due to the occurrence of fog at the Airport in the winter months, the approaches to Runway 14/32 should be improved, including the installation of a Category (CAT) II/III Instrument Landing System (ILS).
- In order to increase the capacity of Runway 18/36 and to provide operational flexibility, there should be a full-length parallel taxiway that runs alongside Runway 18/36 with multiple runway exits.

The planning team developed several alternatives in order to address the airfield needs identified in the requirements analysis. The results of the assessment of these issues are described in the following sections.

2.2 Runway Configuration and Extensions

BFM has a dual non-intersecting runway system. Runway 14/32 is the primary runway and Runway 18/36 is classified as an additional runway.

Upon review of the 2019 annual Traffic Flow Management System Counts (TFMSC)[1] data at BFM, the planning team identified the Airbus A300F4-600 (A300) as the Airport's critical aircraft. The Airbus A300 is an Airport Reference Code (ARC) C-IV aircraft. For the runway safety area (RSA), runway object free area (ROFA), and runway protection zone (RPZ), the size for ARC C-III, the critical aircraft on the current ALP, and ARC C-IV are the same. The biggest difference is in the taxiway safety area and taxiway object free area (TOFA).

Since there are more than 1,000 annual A300 operations at BFM, the primary runway needs to be able to accommodate this aircraft. However, an additional runway is not required to be able to serve all aircraft operating at an airport. For example, MOB is designed with different critical aircraft for each runway, with the 8,502-foot primary runway designed to serve up to ARC D-III aircraft and the secondary 4,376-foot runway designed to ARC B-II aircraft.

In reviewing the 2019 TFMSC data, after the Airbus aircraft that are being manufactured at BFM, a range of business jets and military aircraft are the next most active classes of aircraft. The business jets operating at BFM range from ARC B-II to C-II. The most common military aircraft operations at BFM range up to C-III. With the goal to transition the passenger service to BFM in the future, there would also be an increase in ARC C-II regional jets and C-III main line aircraft at BFM.

[1] FAA Traffic Flow Management System Counts, 2019, https://aspm.faa.gov/tfms/sys/main.asp.

2.2.1 Runway 14/32

Runway 14/32 is of sufficient length for the aircraft operating at BFM and also meets C-IV RSA, ROFA, and RPZ requirements. The runway pavement is being rehabilitated in 2020 and will not need any additional physical improvements once the rehabilitation project is completed.

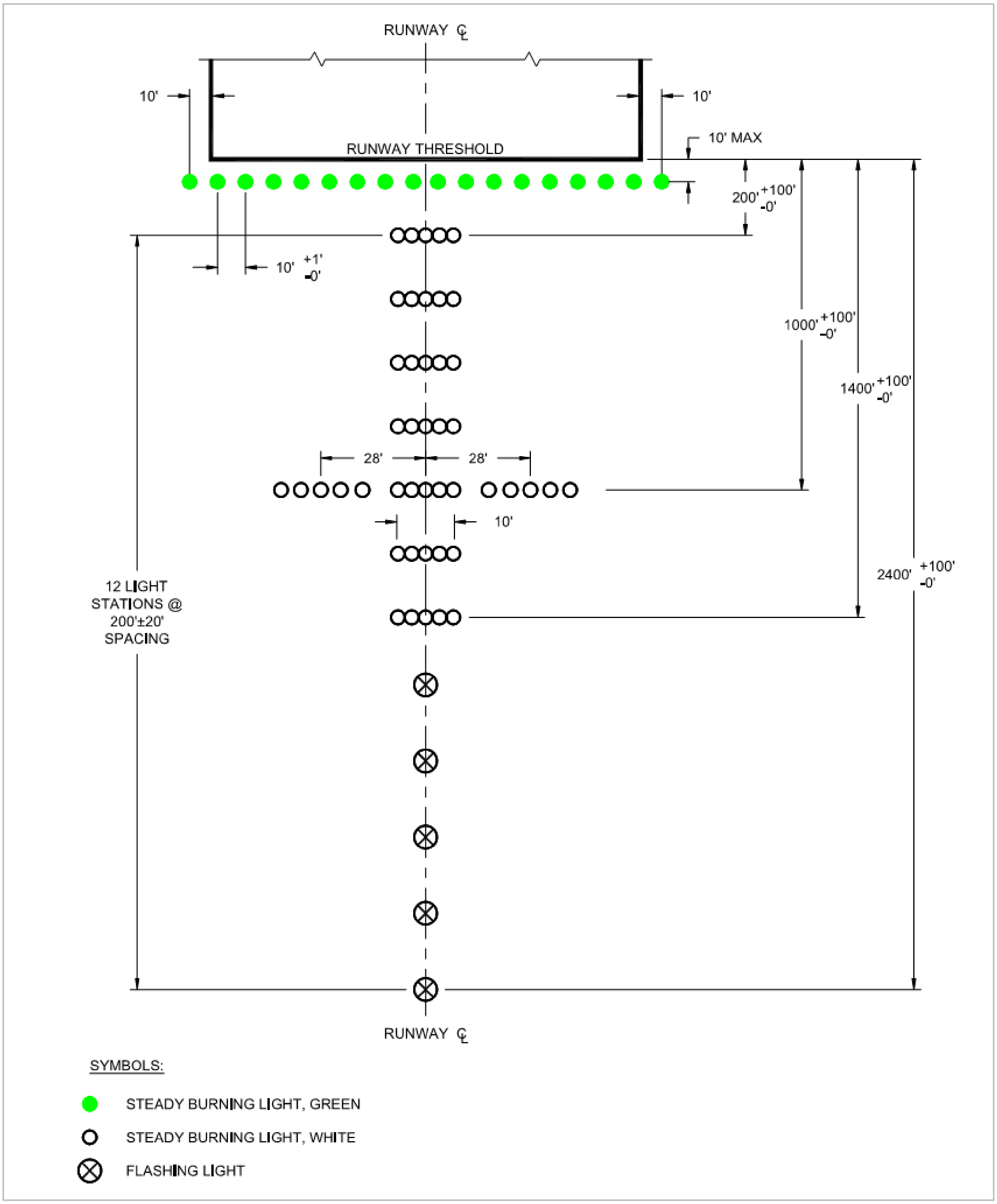
Due to its location on Mobile Bay, BFM frequently experiences fog conditions, especially during winter months. Weather data indicates that BFM experiences instrument meteorological conditions 13.3% of the time. Thus, to improve the accessibility of BFM in poor visibility conditions, an improved instrument approach is needed.

Runway 32 supports the only precision instrument approach at BFM, a CAT I ILS with minimums of a 200-foot ceiling and ½-mile visibility. To increase the availability of BFM, a CAT II/III ILS is recommended. A CAT II ILS can provide minimums as low as a 100-foot ceiling and a runway visual range (RVR) of 1,200 feet. A CAT III can provide minimums as low as 600 RVR with suitably equipped aircraft and appropriately qualified crews.

The CAT II/III ILS needs to be on the primary runway. In addition to upgrading the localizer and glideslope to a CAT II/III system (the equipment that provides the horizontal and vertical guidance to the landing pilot), a more extensive approach lighting system is needed. An RVR system for each third of the runway is required to support a CAT II/III ILS.

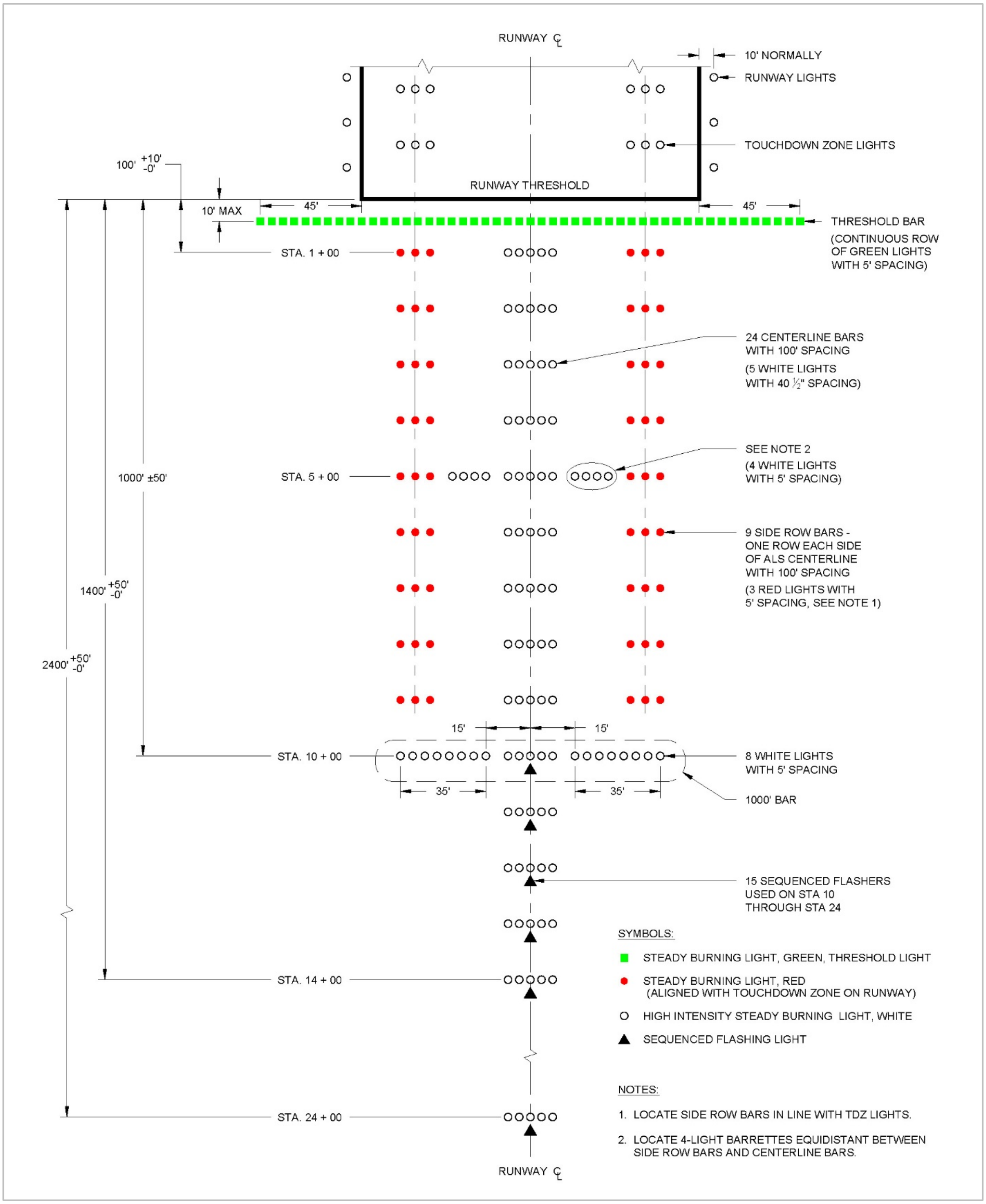
A medium intensity approach lighting system with runway alignment indicator lights (MALSR) currently serves Runway 32. This system is 2,400 feet long and extends into Mobile Bay. Runway 14 does not have an existing approach lighting system.

An approach lighting system with sequence flashing lights (ALSF-2) is required for a CAT II/III ILS. An ALSF-2 is also 2,400 feet long but has additional light bars. Figure 2.1 and Figure 2.2 show the MALSR and ALSF-2 approach lighting systems, respectively.



Source: FAA Order 6850.2B

Figure 2.1: MALSR Approach Lighting System



Source: FAA Order 6850.2B

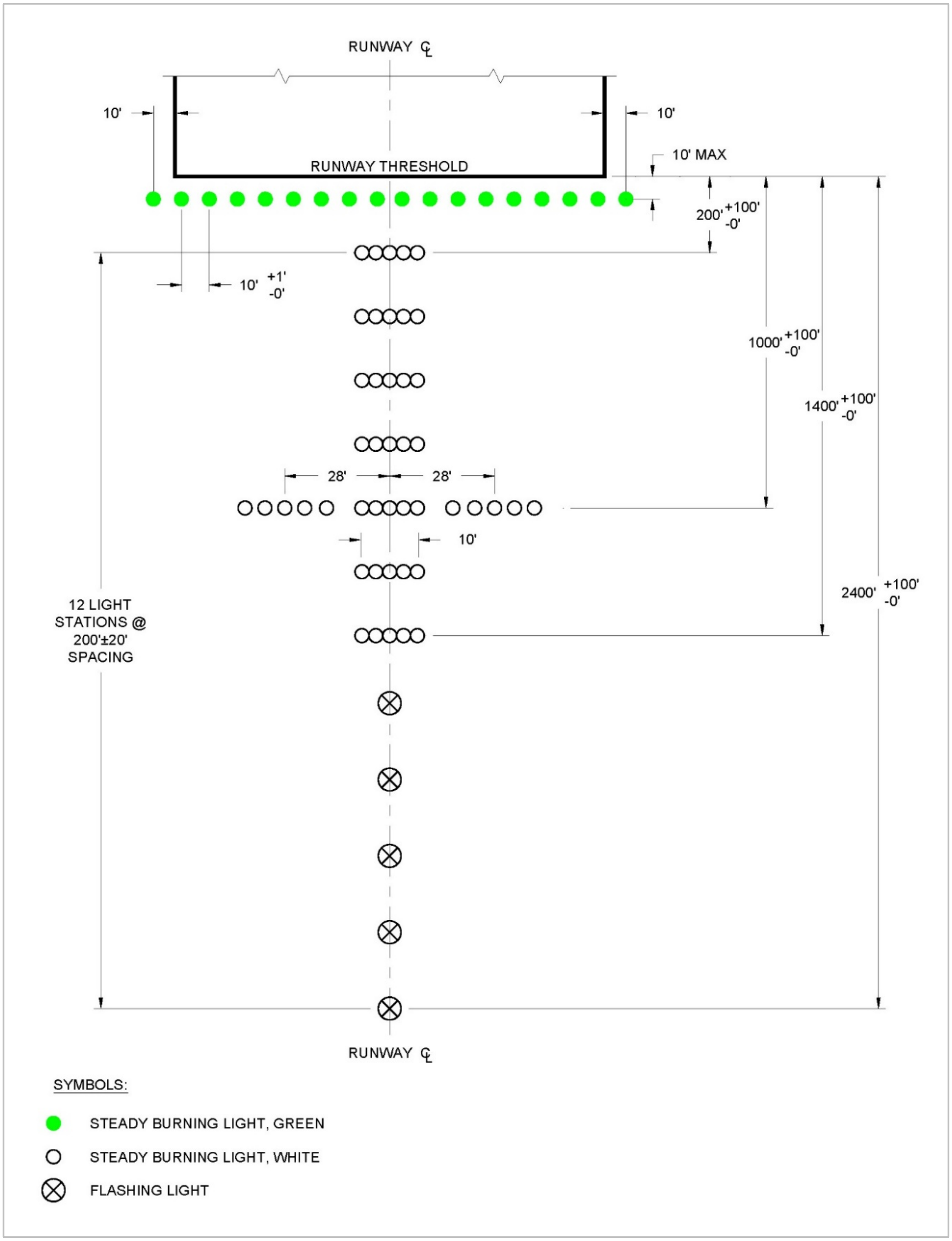
Figure 2.2: ALFS-2 Approach Lighting System

An inner approach obstacle free zone (OFZ) serves to protect an approach lighting system from obstacles. The lighting system OFZ must be the same width as the runway OFZ (400 feet for Runway 14/32) and must extend 200 feet from the runway end to 200 feet beyond the last light unit. The lighting system also requires an inner transitional OFZ that extends from the sides of the OFZ and inner approach OFZ to the Part 77 horizontal surface at 150 feet above airport elevation.

The planning team reviewed both ends of Runway 14/32 for the potential to support a CAT II/III ILS. There is a cemetery located approximately 1,600 feet beyond Runway 14, which limits the length of a potential approach lighting system. Therefore, only Runway 32 can accommodate a CAT II/III ILS. It is recommended that the Runway 32 ILS be upgraded to a CAT II/III ILS with the appropriate supporting equipment, including an RVR sensor to serve each third of the runway (touch down, midpoint, and rollout).

While Runway 14 cannot support a CAT II/III ILS, the runway can accommodate a 1,400-foot-long MALSF, as shown in Figure 2.3.

The installation of a MALSF on Runway 14 could both reduce visibility minimums down to ¾ mile, as well as aid pilots in visual identification of the Runway 14/32 environment. Figure 2.4 shows the proposed navigational aid improvements on Runway 14/32.



Source: FAA Order 6850.2

Figure 2.3: MALSF Approach Lighting System

Source: Hanson, 2020

Figure 2.4: Runway 14/32 Preferred Alternative

2.2.2 Runway 18/36

Runway 18/36 is classified as an additional runway. This classification is significant because the Federal Aviation Administration (FAA) can only fund a single runway at an airport, unless there is a specific determination that one or more crosswind or secondary runways are justified. A crosswind runway is justified if the wind coverage on the primary runway is less than 95%. Runway 14/32 provides more than 95% wind coverage for all sizes of aircraft operating at BFM. A secondary runway that is not a crosswind runway is eligible if the primary runway is operating at 60% or more of its annual capacity or if the FAA Headquarters Airport Planning and Environmental Division makes a determination that a runway is required for operation of the airfield. However, BFM's Runway 14/32 is not operating at 60% of capacity. With the mix of traffic operating at BFM, including various military training operations, the MAA may wish to provide data to the FAA supporting the need for two runways and requesting that Runway 18/36 be classified as a secondary runway. Until that occurs, all rehabilitation and preservation activities on Runway 18/36 will be a local cost.

The planning team has developed a range of alternatives for the future operation of Runway 18/36. These include keeping Runway 18/36 the same size as current FAA standards, reducing its size, and closing it to repurpose the surrounding land and infrastructure.

On the previous BFM Airport Layout Plan (ALP), Runway 18/36 was shown as 7,800 feet by 150 feet serving ARC B-II aircraft with 1-mile visibility. Runway 18/36 is currently served by instrument approaches with less than 1-mile visibility (not lower than ¾-mile visibility). The existing length of Runway 18/36 is longer than required to serve ARC B-II aircraft, and aircraft larger than B-II use the runway. Since rehabilitation and preservation of Runway 18/36 is likely to be a local cost, there would be a financial benefit to reducing the size of the runway.

Alternatives range from keeping the runway the existing length and applying ARC C-III standards, which encompass the Airbus aircraft assembled at BFM, to reducing the runway length with the associated ARC for that length of runway, ARC C-II or B-II. Reducing the footprint of Runway 18/36 may also result in a benefit of increasing potential development areas. However, there is also a benefit to having two runways at an airport. If one of the runways needs to be closed, either for maintenance or due to an incident, aircraft are still able to arrive and depart. With the Airbus assembly facilities at BFM, test flights of the new assembled aircraft are required. Keeping two runways open for Airbus test flights increases reliability for their operations.

2.2.2.1 Alternative Concept 1 – Runway 18/36 ARC C-III on Existing Runway

Alternative Concept 1 keeps Runway 18/36 its current size and applies C-III design standards (see Figure 2.5). ARC C-III design standards are appropriate, as C-III aircraft can operate on 7,800 feet of runway. The BFM critical design aircraft of C-IV was not used, since this is a secondary runway and the C-IV aircraft are assumed to operate on the primary runway in normal conditions.

When applying the C-III standards to Runway 18/36, there are several items that do not meet FAA standards that would need to be addressed.

A portion of the perimeter fence by the Army Reserve Center is within the ROFA. Improvements would need to be made to remove this fence from the ROFA.

Additionally, Aerospace Drive and multiple buildings fall within the RPZ and approach surface (not lower than ¾-mile visibility). Per FAA guidelines, existing developments can remain within the RPZ, but if changes are made to the runway, buildings and roads within the RPZ should be minimized.

Consideration was also given to minimizing the objects in the RPZ and approach objects by raising the approach minimums to not lower than 1-mile visibility. Raising the visibility reduces the size of the RPZ and approach surface, specifically the inner width that is set by Part 77 primary surface. The visibility on both ends of the runway would need to be increased to decrease the width of the Part 77 primary and approach surfaces.

The previous ALP included parallel taxiways on both sides of the runway. During the review of the runway alternatives, it was identified that a parallel taxiway on the east side of Runway 18/36 would be preferable. This is depicted on the alternative exhibits and discussed in more detail in Section 2.3.5.

2.2.2.2 Alternative Concept 2 – Runway 18/36 ARC C-III at 6,215 feet

Alternative Concepts 2, 3, and 4 seek to shorten the length of Runway 18/36 to eliminate the ROFA penetration by the perimeter fence (see Figure 2.6). The maximum length that can be retained on Runway 18/36 and eliminate the ROFA extending over the perimeter fence by the Army Reserve facility is 6,215 feet. At this length ARC C-III aircraft could still use the runway, so ARC C-III design standards have been applied.

Using this runway length, Aerospace Drive, a portion of the Army Reserve Center, and a small portion of Airbus leased land still fall within the RPZ and approach surface (not lower than ¾-mile visibility). If the visibility minimums on the approach to Runway 18 are raised to 1 mile, the RPZ size would be reduced, it would keep most of Aerospace Drive outside of the RPZ, and it would eliminate the Army Reserve facility from the RPZ.

2.2.2.3 Alternative Concept 3 – Runway 18/36 ARC C-II at 6,000 feet

Since the preservation of Runway 18/36 as an additional runway is likely to be a local cost, additional alternative concepts were considered to further reduce the size of the runway and thus the areas that would need to be maintained (see Figure 2.7).

In Alternative Concept 3, Runway 18/36 is shorted to 6,000 feet with ARC C-II standards. This alternative would reduce future costs for Runway 18/36 while still keeping it available for corporate jet and similar sized aircraft. At 6,000 feet, the runway could still be used by C-II regional jet aircraft and in emergency situations by C-III aircraft.

As a runway designed to serve ARC C-II, it is only required to be 100 feet wide. When narrowing the runway from its existing width of 150 feet, it is recommended that at least the C-II standard 10-foot shoulders be maintained on each side.

In Alternative Concept 3, considering the existing approach visibility minimums of not lower than ¾ mile, the perimeter fence would no longer be located within the ROFA. However, Aerospace Drive, the Army Reserve facility, and a small portion of Airbus leased property would still fall within the RPZ. If the visibility minimums are raised to 1 mile, the non-airfield land uses within the RPZ would be reduced.

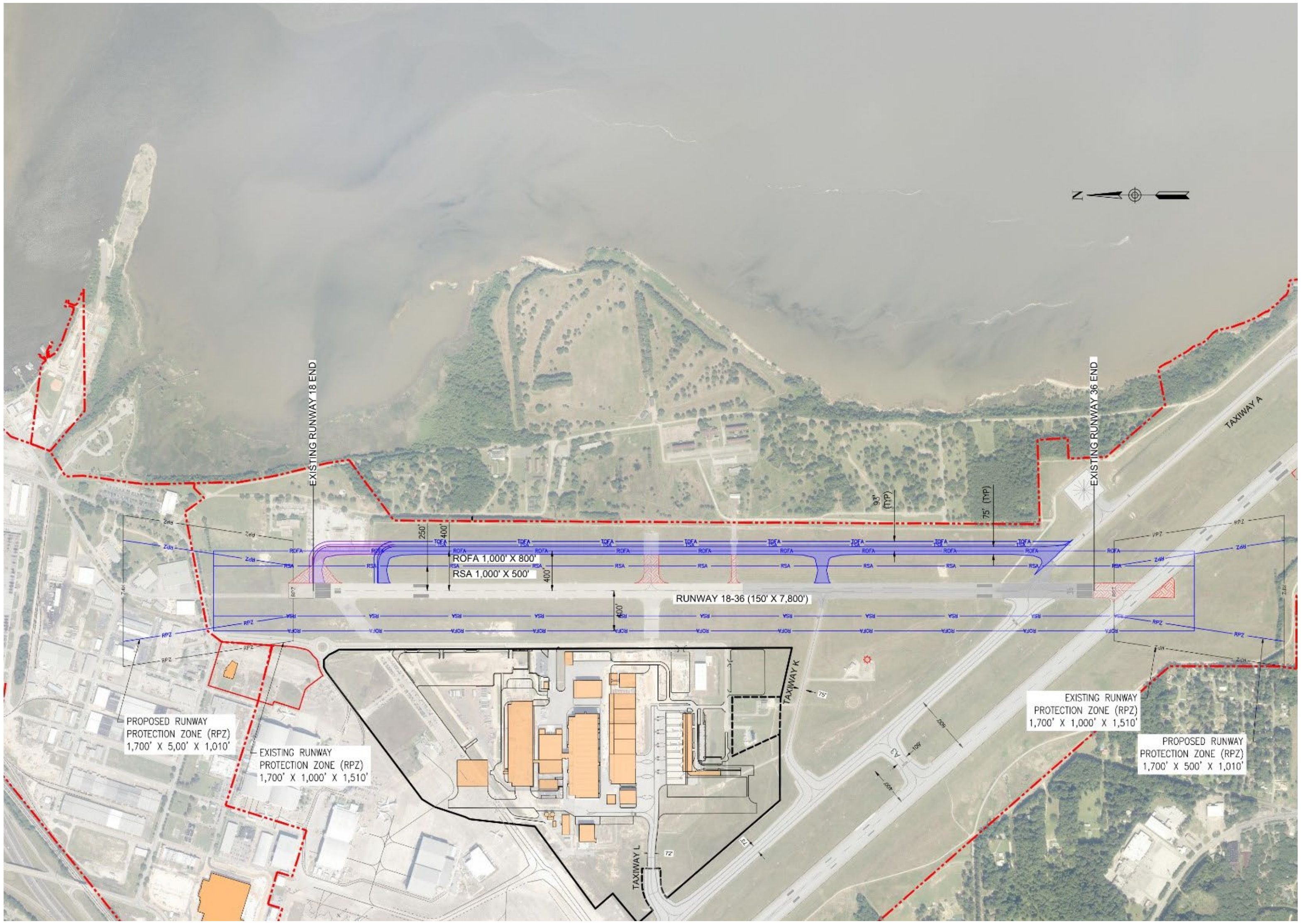
2.2.2.4 Alternative Concept 4 – Runway 18/36 ARC B-II at 5,000 feet

MOB has only one runway able to serve commercial traffic. The second runway is 4,376 feet serving ARC B-II aircraft. Thus, with the transfer of commercial service to BFM, it would still be feasible to further reduce the length of Runway 18/36 (see Figure 2.8). Reducing the design standards of Runway 18/36 to ARC B-II would require an associated reduction in length to approximately 5,000 feet. A runway length of 5,000 feet would be able to accommodate small jet aircraft such as Cessna Citations.

Changing the ARC from C-II to B-II would also reduce the requirements of the RSA and ROFA. Furthermore, if the length of Runway 18/36 was reduced to 5,000 feet, there would also be an opportunity to move the Runway 36 end so that it aligns with Taxiway A to reduce back taxiing on the runway. The RPZ size is still driven by the approach minimums, so increasing the minimums to 1-mile visibility would likely be needed to avoid development within the RPZ.

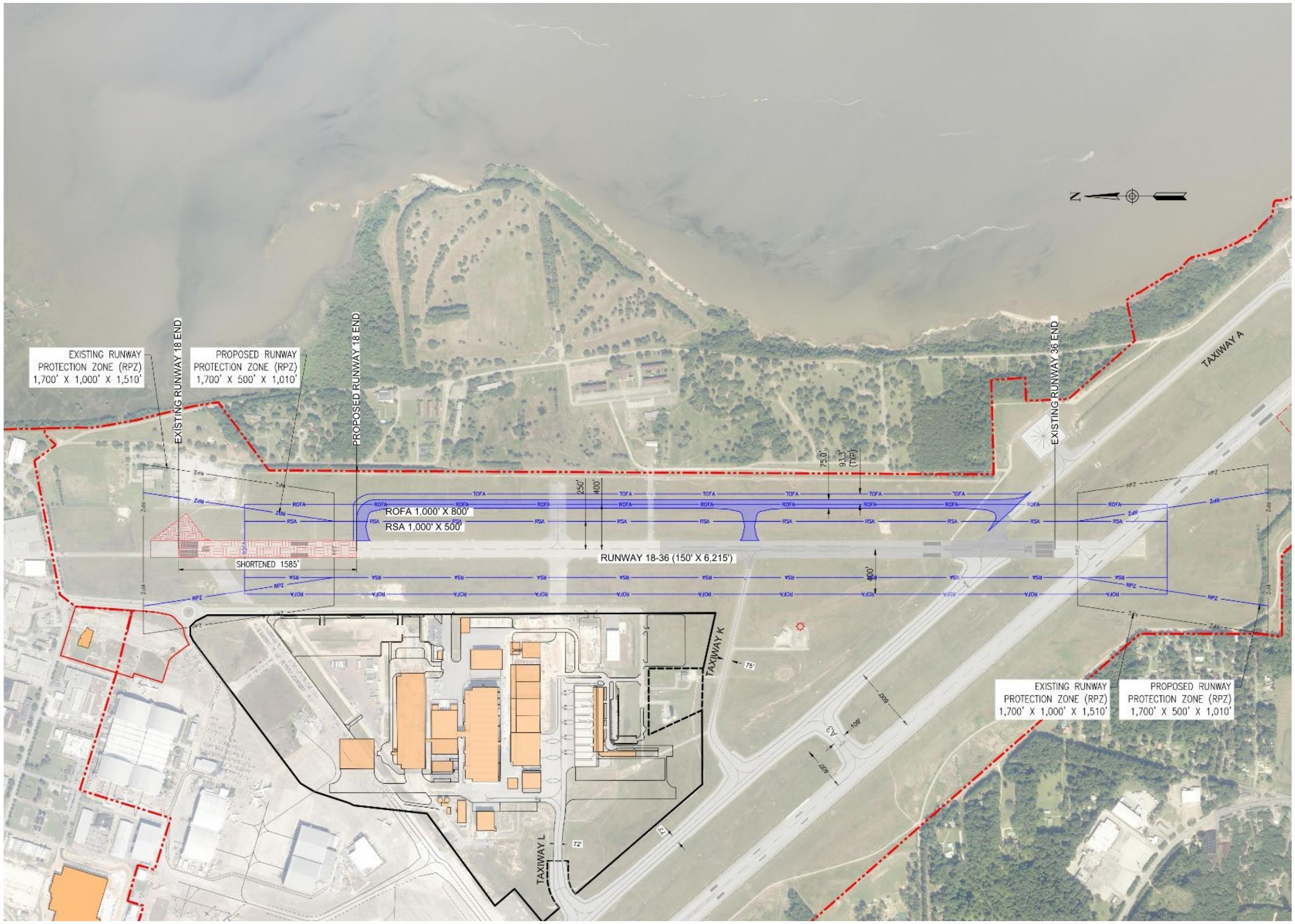
2.2.2.5 Identification of Preferred Runway 18/36 Alternative

After reviewing the alternatives, the preferred alternative for Runway 18/36 is Alternative Concept 1, which would maintain the existing runway length and existing approaches. Improvements to address the perimeter fence in the ROFA will need to be included in future development plans.



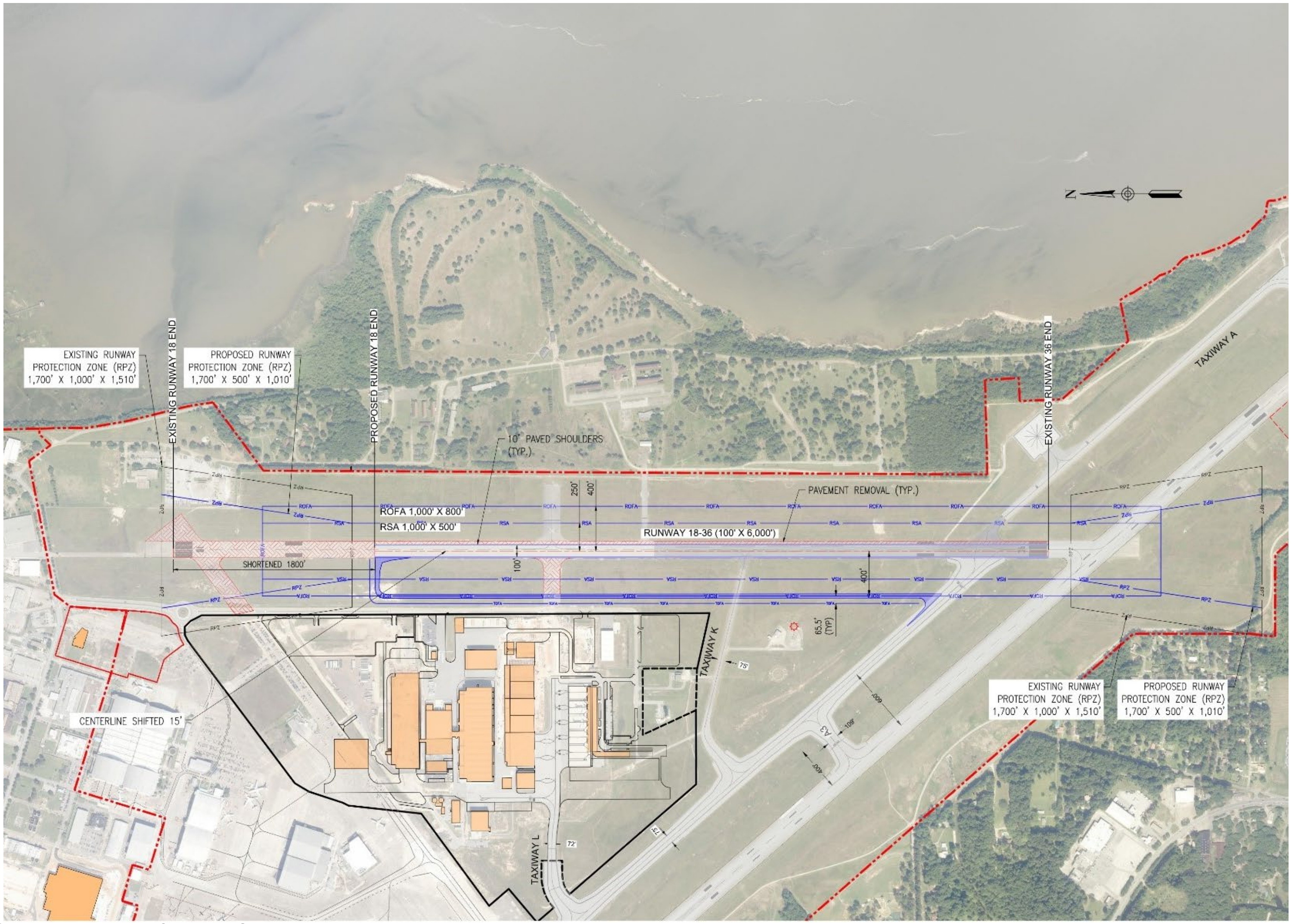
Source: Hanson Professional Services, 2020

Figure 2.5: Alternative Concept 1 – Runway 18/36 ARC C-III on Existing Runway



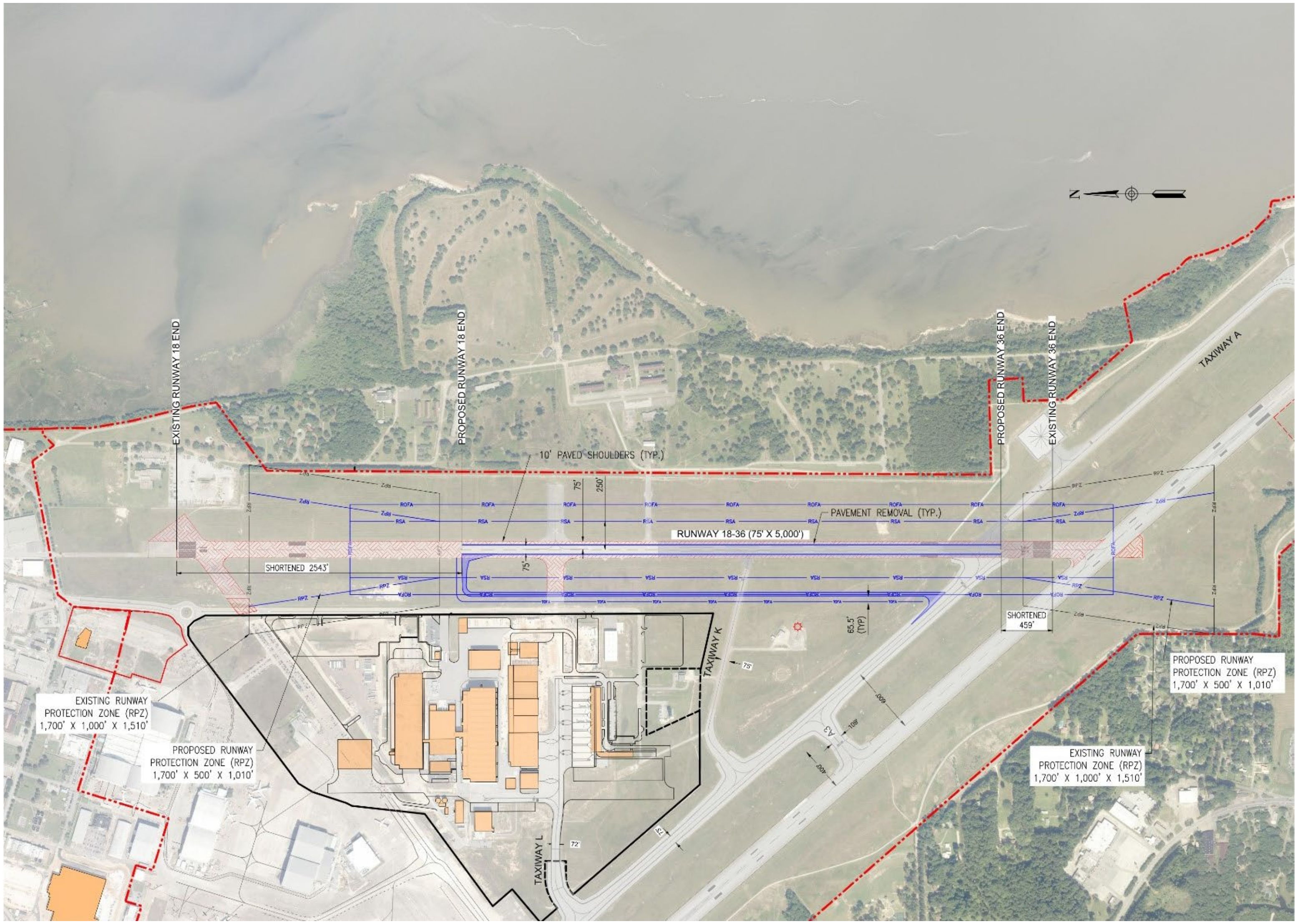
Source: Hanson Professional Services, 2020

Figure 2.6: Alternative Concept 2 – Runway 18/36 ARC C-III at 6,215 feet



Source: Hanson Professional Services, 2020

Figure 2.7: Alternative Concept 3 - Runway 18/36 ARC C-II at 6,000 feet



Source: Hanson Professional Services, 2020

Figure 2.8: Alternative 4 - Runway 18/36 ARC B-II at 5,000 feet

2.3 Taxiway System Configuration

After the runway system, the taxiway system is the next critical element for maximizing the utility of the airfield. At BFM, Runway 14/32 is served by a full-length parallel taxiway, Taxiway A. Taxiway H serves the terminal area and aeronautical businesses with airside access on the north end of the airfield. Taxiway L provides access into the Airbus facility and Taxiway K provides access from Taxiway A to Runway 18/36.

2.3.1 Taxiway A

With instrument approach minimums less than ¾ mile, Runway 14/32 is required to have a full-length parallel taxiway. Taxiway A serves as the parallel taxiway for Runway 14/32 and also provides access to near the end of Runway 36. The northern portion of Taxiway A between Runway 18/36 and the Runway 14 end was constructed in 2015 and 2016. It has a separation of 600 feet from the runway centerline to the taxiway centerline, meeting ARC C-IV standards. Furthermore, it is 75 feet wide with shoulders, meeting Taxiway Design Group (TDG) Group 5 and 6 standards. The Airbus A300, the critical aircraft for BFM, is a TDG 5 aircraft.

The southern portion of Taxiway A from Runway 18/36 to the end of Runway 32 is also 75 feet wide, but without shoulders. It has a runway centerline to taxiway centerline separation of 788 feet. The larger runway to taxiway separation was in place from the use of the Airport as a military base. A larger than standard runway to taxiway separation is acceptable, especially for an existing facility. When the other portion of Taxiway A was constructed, the fillets around Runway 18/36 were improved to allow for a smooth taxi from one section of Taxiway A to the other. Finally, the pavement on the southern portion is in good condition, and it provides access to the compass calibration/run-up pad. Thus, no change in separation is recommended.

It is recommended to add shoulders and current FAA design fillets to the portion of Taxiway A without shoulders.

2.3.2 Taxiway H

Taxiway H serves the terminal area and provides access to the fixed base operator (FBO), interim terminal building, FedEx, and VT Mobile Aerospace Engineering (VT MAE) hangars. The majority of Taxiway H is marked across the apron area. It is marked as 75 feet wide, meeting the TDG standards of the critical aircraft for BFM. With the transfer of commercial service to BFM, consideration should be given to an option to provide a dual parallel taxiway system to serve the new passenger terminal complex.

2.3.3 Taxiway L

The portion of Taxiway L adjacent to Taxiway A was improved as part of a project to meet current FAA design standards. No additional improvements are recommended. The remaining portion of Taxiway L is located within the Airbus lease hold and is thus the responsibility of Airbus.

2.3.4 Taxiway K

Taxiway K provides cross-field access from Taxiway A to Runway 18/36 and is commonly used by small aircraft landing on Runway 18 to turn off and taxi to the terminal area. Taxiway K is 50 feet wide, meeting TDG 3 and 4 standards. The critical aircraft for Runway 18/36, the A320 and B737, are TDG 3 aircraft and can be accommodated on Taxiway K. The portion of Taxiway K that connects to Taxiway A was reconstructed to meet current FAA taxiway design standards; however, the remaining sections of the taxiway have not been upgraded.

Furthermore, to provide landside access to the new Airport Traffic Control Tower (ATCT) and Aircraft Rescue and Fire Fighting (ARFF) facilities, the existing Taxiway K should be converted to a landside access road and a replacement Taxiway K should be constructed south of the maintenance facility and electrical vault. The new Taxiway K should retain the same design standards as the existing taxiway.

Lastly, although the pavement on the reconstructed section of Taxiway K is classified as being in good condition, the remaining areas are only satisfactory. When the balance of Taxiway K needs to be rehabilitated, consideration should be given to upgrading it to current FAA taxiway design standards.

2.3.5 Parallel Taxiway for Runway 18/36

With visibility minimums on the instrument approaches to Runway 18/36 of ¾ mile or greater, a full-length parallel taxiway is not required. However, without a full-length parallel taxiway, Runway 18 is primarily used only for arrivals and Runway 36 is primarily used only for departures. This usage minimizes back taxiing on the runway, which in turn severely limits runway capacity. Thus, the construction of a full-length parallel taxiway is recommended in order to increase the utility of Runway 18/36.

To meet ARC C-III design standards, the runway centerline to parallel taxiway centerline separation must be 400 feet. Airbus Way was located to allow for this separation on the west side with a C-III TOFA. While a westside parallel taxiway would serve Runway 18/36, there would not be sufficient space for development between the parallel taxiway and Airbus Way. If a parallel taxiway is not developed on the west side of Runway 18/36, a small strip of undeveloped land between the ROFA and Airbus Way could be used for a function such as auto parking.

There is space within the existing airport property to develop a parallel taxiway on the east side of Runway 18/36; however, the taxiway would need to stop short of the Army Reserve facility and would require approximately 700 feet of back taxiing to reach the end of Runway 18. While the Army Reserve facility is located on Airport property, future plans could include its relocation, at which time an eastside parallel taxiway could be extended the full length.

An eastside parallel taxiway for Runway 18/36 would require aircraft to cross Runway 18/36 to access the terminal area from the taxiway. However, unoccupied former base land owned by the University of Southern Alabama Foundation (USA Foundation) is east of Runway 18/36. If the MAA is able to acquire a portion of this land, it could be used for aeronautical purposes, and a parallel taxiway on the east side of Runway 18/36 would provide access.

The recommended parallel taxiway for Runway 18/36 is on the east side, as this location could also provide access to potential future aeronautical land.

3. PASSENGER TERMINAL COMPLEX

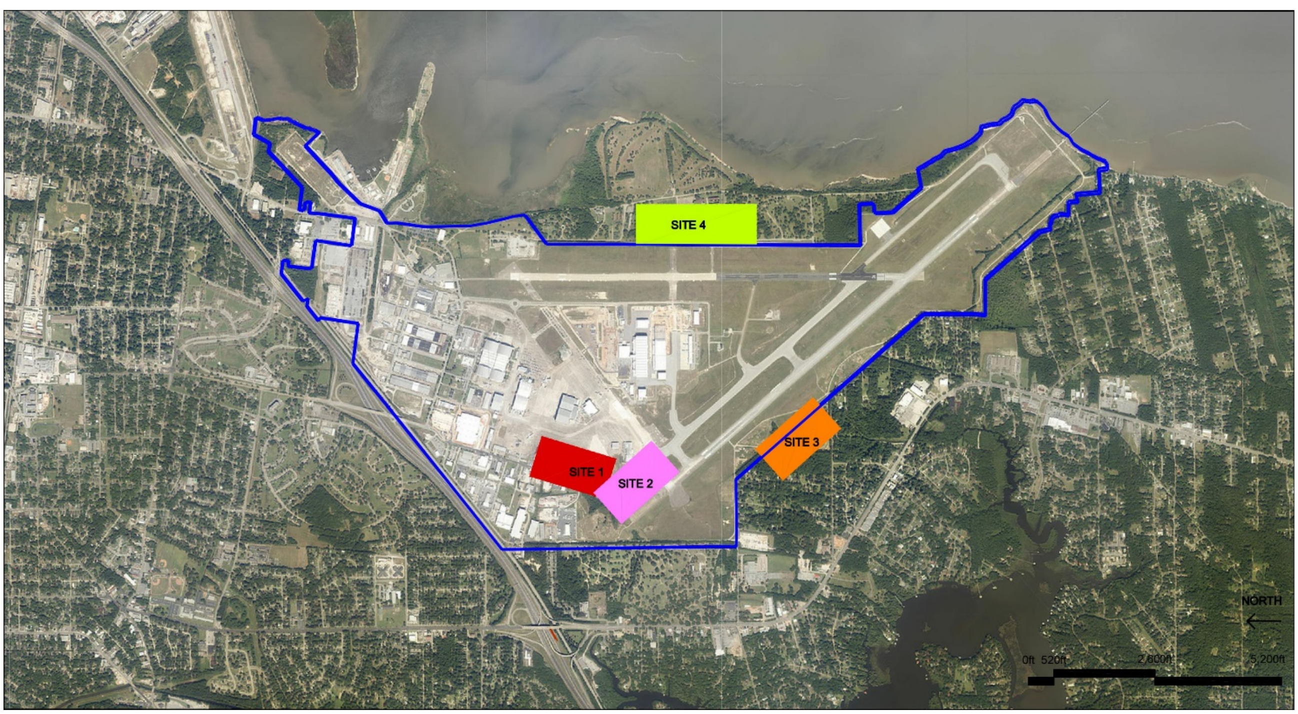
3.1 Background

The construction of a new passenger terminal complex at BFM is the most important and impactful project associated with the transfer of commercial service from MOB. The passenger terminal complex is the central component of a commercial service airport, and it is the primary facility with which passengers interact in their travel experience. The location of the terminal building directly drives the development of many other areas on the Airport, such as the passenger terminal apron, taxiway configuration, terminal area roadways, curbside, and parking. In other words, the passenger terminal is the main component of the Airport, and deciding its location and layout allows for the determination of other key pieces of the overall development.

The construction of a new passenger terminal at an airport is often a greenfield project: entirely new and not built on any existing structures or used land. However, the new passenger terminal at BFM will be built within the existing airport property on land that is in use for both aeronautical purposes and by existing commercial tenants. This presented a unique set of challenges in determining the location of the future passenger terminal complex. Thus, the first step in the alternatives analysis was to decide the general location for the future terminal, as detailed in the sections that follow.

3.1.1 Development Corridor Study

The first step in deciding the location of the future passenger terminal complex was the identification of potential sites for development. As depicted in Figure 3.1, the planning team highlighted four potential sites and prepared high-level terminal concepts for each location. These concepts were accompanied by an analysis of the pros and cons of each site, including impact to existing tenants, accessibility, and potential costs.

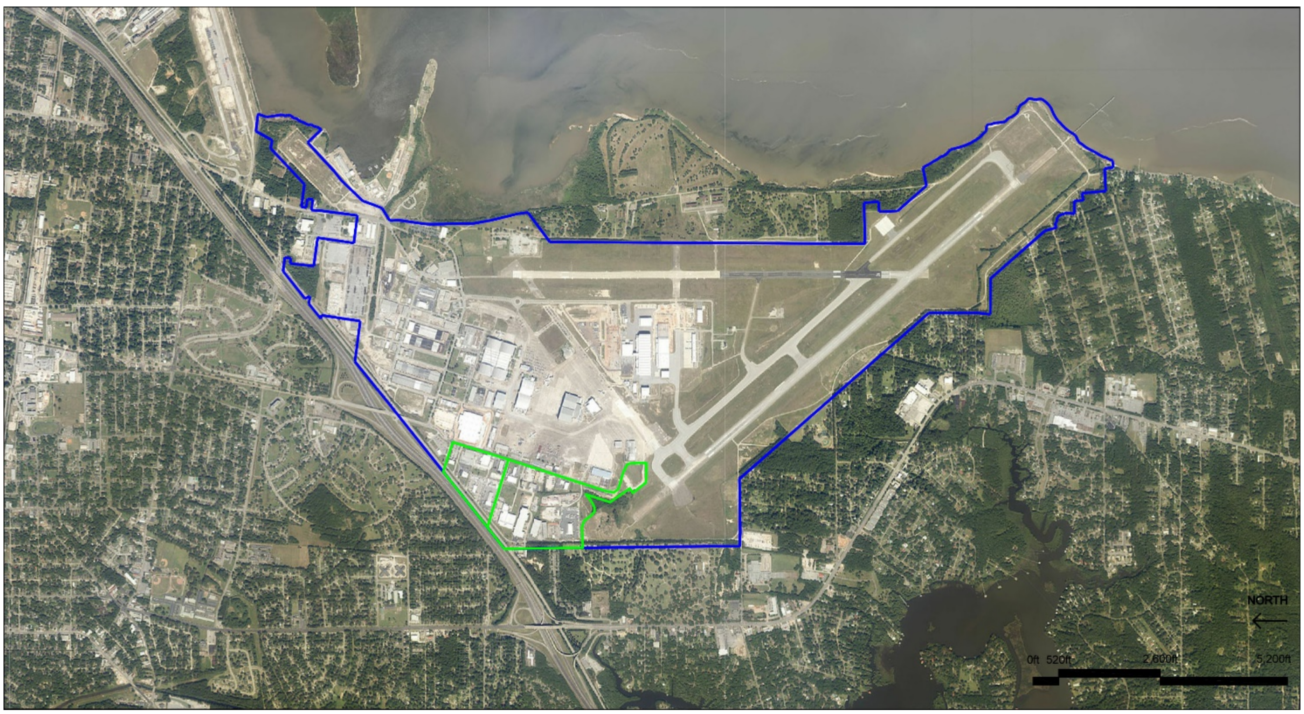


Source: LeighFisher, 2020

Figure 3.1: Potential Terminal Development Locations

Following this initial analysis, in November 2019, the planning team and the MAA identified two locations for the development of the future terminal complex. The team analyzed these areas, termed “Development Corridor 1” and “Development Corridor 2,” to identify which one would be the optimal location for future development. Specifically, each corridor was evaluated according to its size, impact to existing tenants, land use, parcel value, and estimated land acquisition and tenant relocation costs.

The planning team and the MAA decided on Development Corridor 1 as the preferred location. It is approximately 94 acres, 15% of which is occupied by existing buildings. There are 14 buildings within the corridor, occupied by 17 tenants, comprising 7 different industries. Every tenant leases property from the Airport, and their total combined annual lease value is approximately $1.2 million. Figure 3.2 shows the size and location of Development Corridor 1.

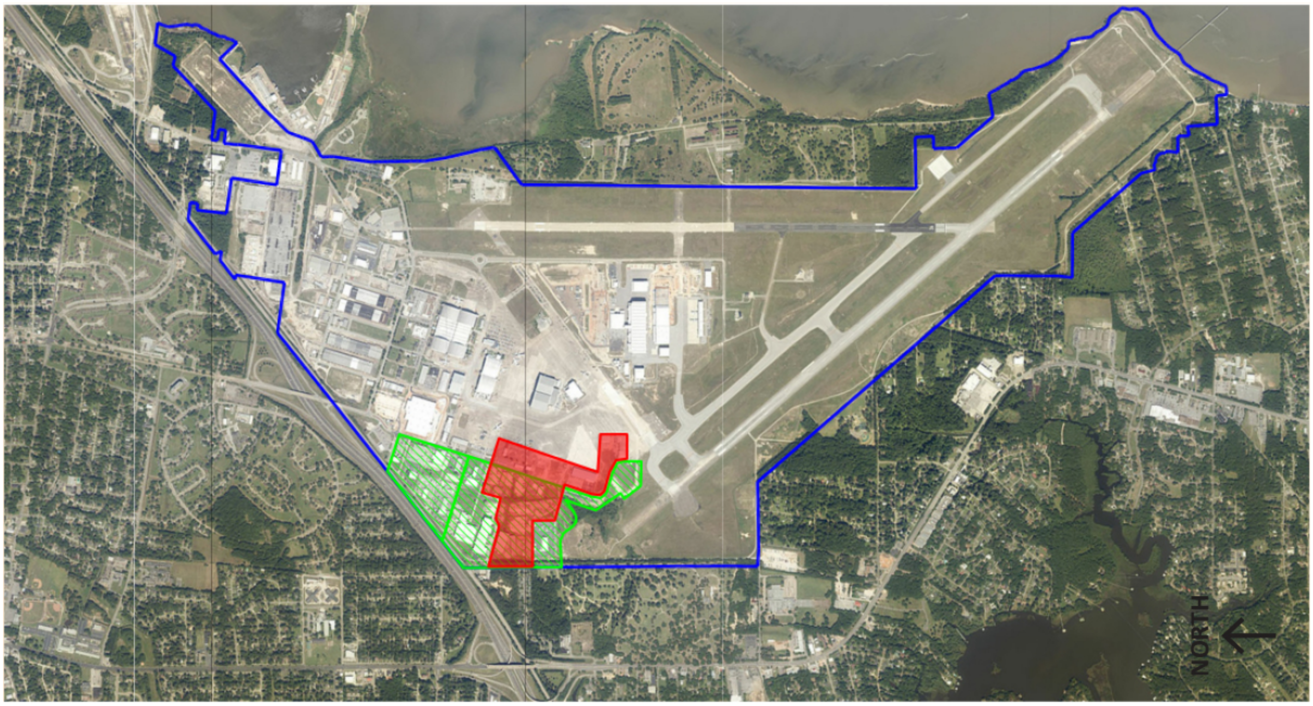


Source: LeighFisher, 2020

Figure 3.2: Development Corridor 1

3.2 Alternatives

After determining its general future location, the planning team developed a set of detailed alternatives of the potential site, size, and layout of the future passenger terminal complex. To start, further refinement of Development Corridor 1 generated a more detailed terminal study area, as shown in Figure 3.3.



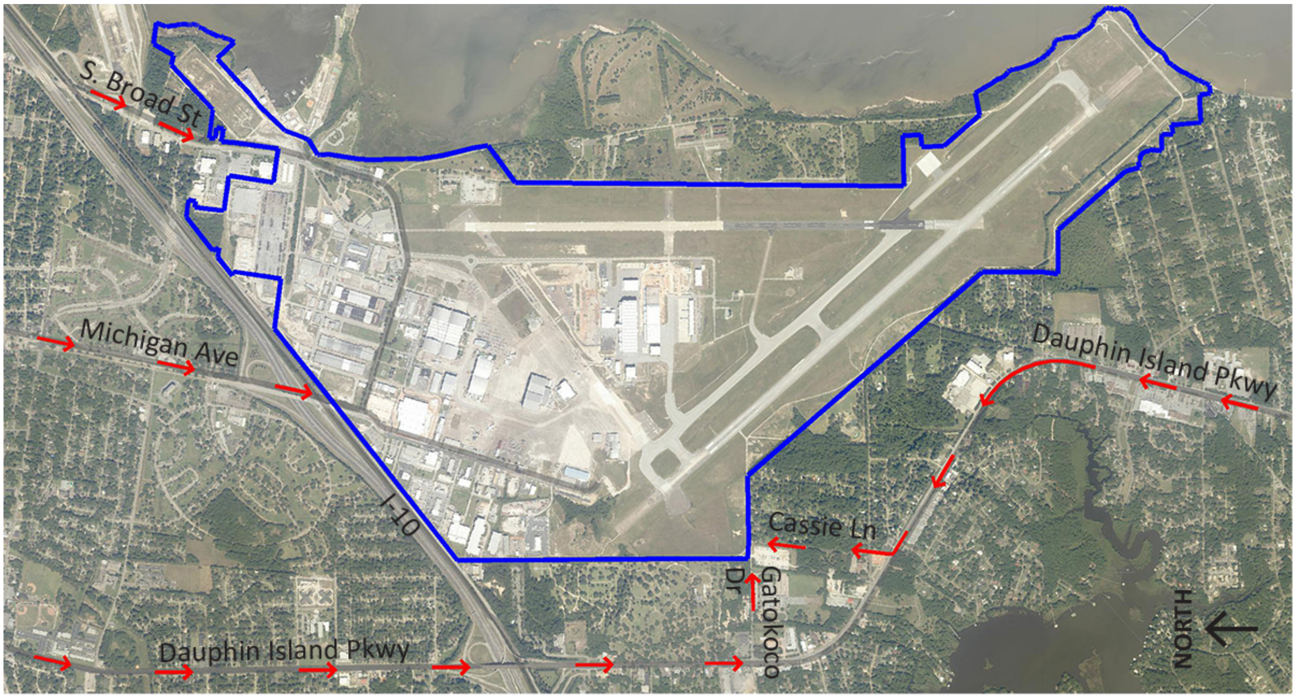
Source: LeighFisher, 2020

Figure 3.3: Terminal Study Area

The alternative terminal concepts are based on conclusions described in Section 1 of this report and in Chapter 3. Additional guiding assumptions for the development of alternative concepts include the following:

- The interim terminal building can be used as a transitional facility.
- The timetable for new terminal development and legacy airline relocation to BFM will require adoption of a schedule accommodating required planning, design, environmental, and construction activities.
- Additional parking facilities will be required adjacent to the new terminal complex.
- Terminal roadway system will require reconfiguration and circulation revision.
- Airport access roadway circulation will be reconfigured, as shown in Figure 3.4.

The planning team identified and assessed five alternative concepts for developing terminal facilities, each capable of accommodating passenger demand through PAL 4. The five long-range terminal development concepts are described in the following sections.



Source: LeighFisher, 2020

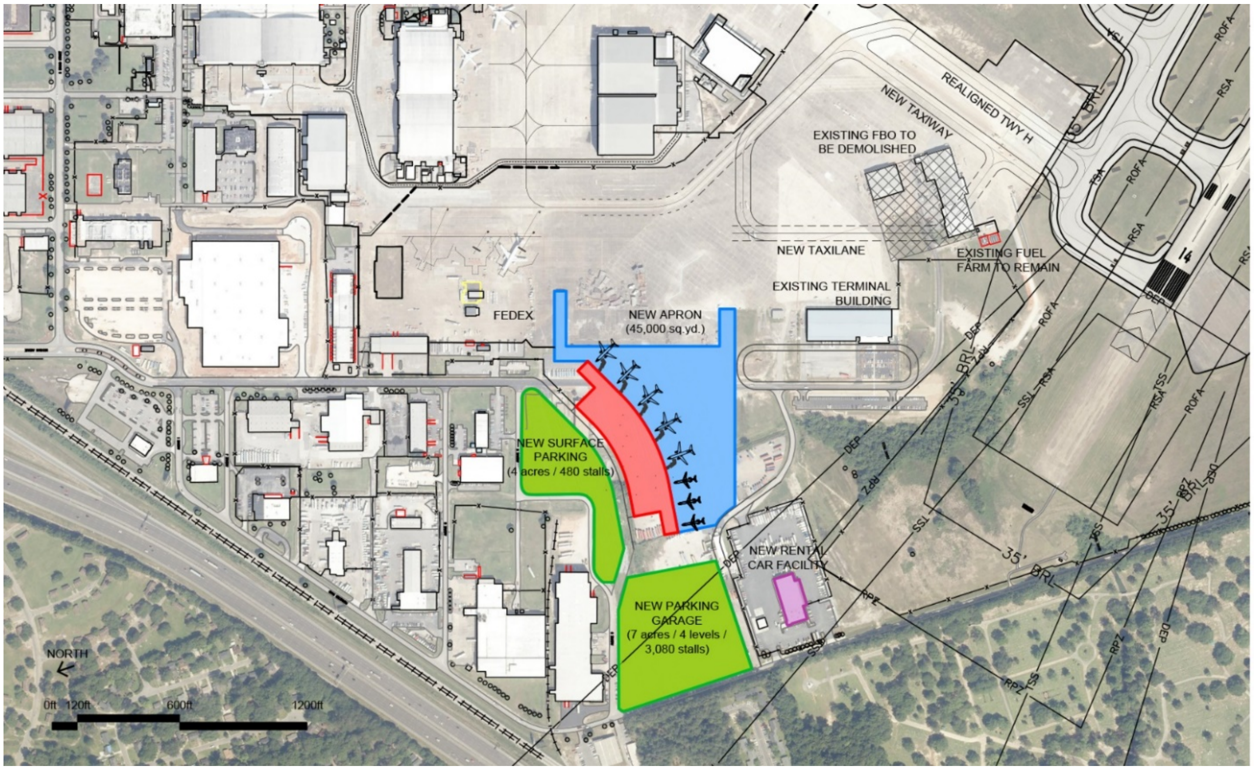
Figure 3.4: Future Airport Access Roadways

3.2.1 Alternative Concept 1

Alternative Concept 1, illustrated on Figure 3.5, was the initial concept developed for the future passenger terminal complex. It features a new two-level passenger terminal building in an east-west configuration, located west of Michigan Avenue and adjacent to the existing terminal apron. Key features of this concept include the following:

- Demolition of 18 total buildings and relocation of the following tenants: Signature Flight Support FBO, ASF Intermodal, Petro Clean, McAleer Tunstall, FedEx Ship Center, Bay Lines, Verizon, Shoreline Transportation, Aero Star, Gulf Intermodal
- Construction of 45,500 square yards of new apron
- Realignment of Taxiway H and extension of a new taxiway to the passenger terminal apron
- New terminal roadway access with ingress on Avenue O via Perimeter Road and egress on Avenue M
- Terminal orientation providing moderate future expandability of gates to the east past the planning period
- Construction of a four-level parking garage west of the terminal and additional surface parking directly across from the terminal that would provide convenient, close-in parking
- Conversion of the Penske building and lot to a rental car facility

Section 4 further details the specific landside implications associated with this concept, such as parking and roadway realignment.



Source: LeighFisher, 2020

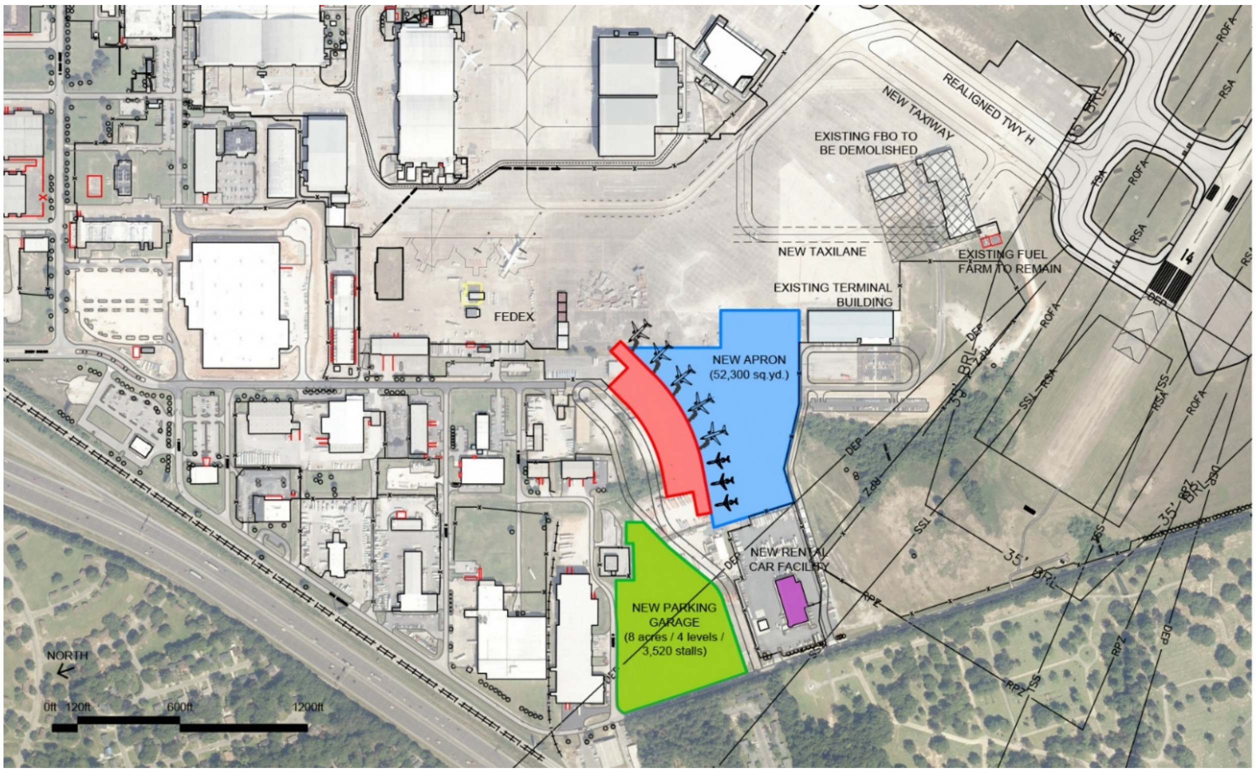
Figure 3.5: Terminal Concept 1

3.2.2 Alternative Concept 2

Alternative Concept 2, illustrated in Figure 3.6, is a slight variation to the layout presented in Concept 1, shifting the terminal building south to preserve several of the existing tenants and buildings. Key features of this concept include the following:

- Demolition of 11 total buildings and relocation of the following tenants: Signature Flight Support FBO, ASF Intermodal, Petro Clean, FedEx Ship Center, Bay Lines, Shoreline Transportation, Aero Star
- Construction of 52,300 square yards of new apron
- Realignment of Taxiway H and extension of a new taxiway to the passenger terminal apron
- New terminal roadway access with ingress and egress on new terminal access loop road north of the existing Penske property
- Terminal orientation providing moderate future expandability of gates to the east past the planning period
- Construction of a four-level parking garage west of the terminal, requiring a shuttle to the terminal curb front
- Conversion of the Penske building and lot to a rental car facility

Section 4 details the specific landside implications associated with this concept, such as parking and roadway realignment.



Source: LeighFisher, 2020

Figure 3.6: Terminal Concept 2

3.2.3 Alternative Concept 3

Alternative Concept 3, illustrated in Figure 3.7, is situated to reduce the total amount of new apron construction and to minimize relocation of existing tenants. Key features of this concept include the following:

- Demolition of nine total buildings and relocation of the following tenants: Signature Flight Support FBO, FedEx Ship Center, Bay Lines, Shoreline Transportation, Aero Star
- Construction of 35,500 square yards of new apron
- Realignment of Taxiway H and extension of a new taxiway to the passenger terminal apron
- New terminal roadway access with ingress and egress on new terminal access loop road north of the existing Penske property
- Terminal orientation providing good future expandability of gates to both the east and west past the planning period
- Construction of a five-level parking garage in front of the terminal building, connected by a crosswalk, and two additional surface parking lots west of the terminal
- Conversion of the Penske building and lot to a rental car facility

Section 4 details the specific landside implications associated with this concept, such as parking and roadway realignment.

Source: LeighFisher, 2020

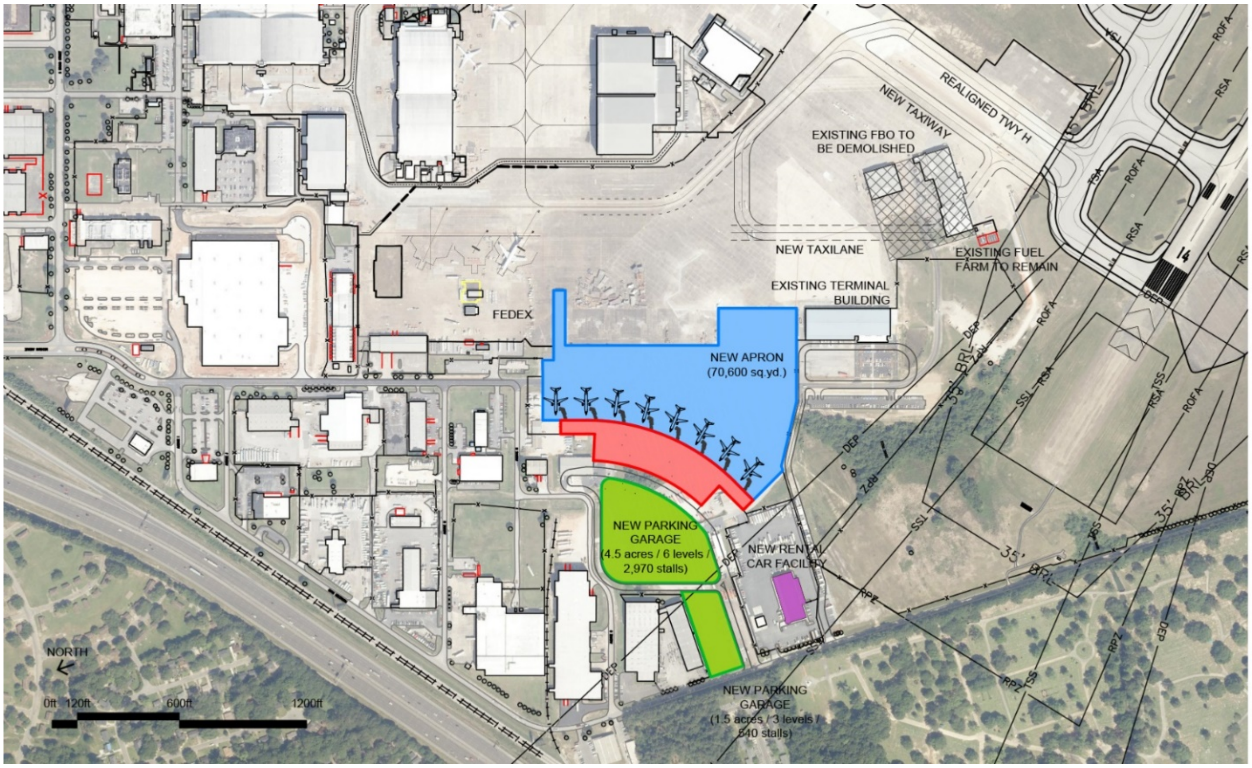
Figure 3.7: Terminal Concept 3

3.2.4 Alternative Concept 4

Alternative Concept 4, illustrated in Figure 3.8, is rotated to a north-south configuration and shifted completely south of Michigan Avenue to avoid encroachment on the existing apron. Key features of this concept include the following:

- Demolition of 14 total buildings and relocation of the following tenants: Signature Flight Support FBO, ASF Intermodal, Petro Clean, FedEx Ship Center, Bay Lines, Shoreline Transportation, Aero Star
- Construction of 70,600 square yards of new apron
- Realignment of Taxiway H and extension of a new taxiway to the passenger terminal apron
- New terminal roadway access with ingress and egress on new terminal access loop road north of the existing Penske property
- Terminal orientation that inhibits future expandability of gates
- Construction of a six-level parking garage in front of the terminal building, connected by a crosswalk, and an additional smaller three-level parking garage on Perimeter Road, requiring shuttle connection
- Conversion of the Penske building and lot to a rental car facility

Section 3 details the specific landside implications associated with this concept, such as parking and roadway realignment.



Source: LeighFisher, 2020

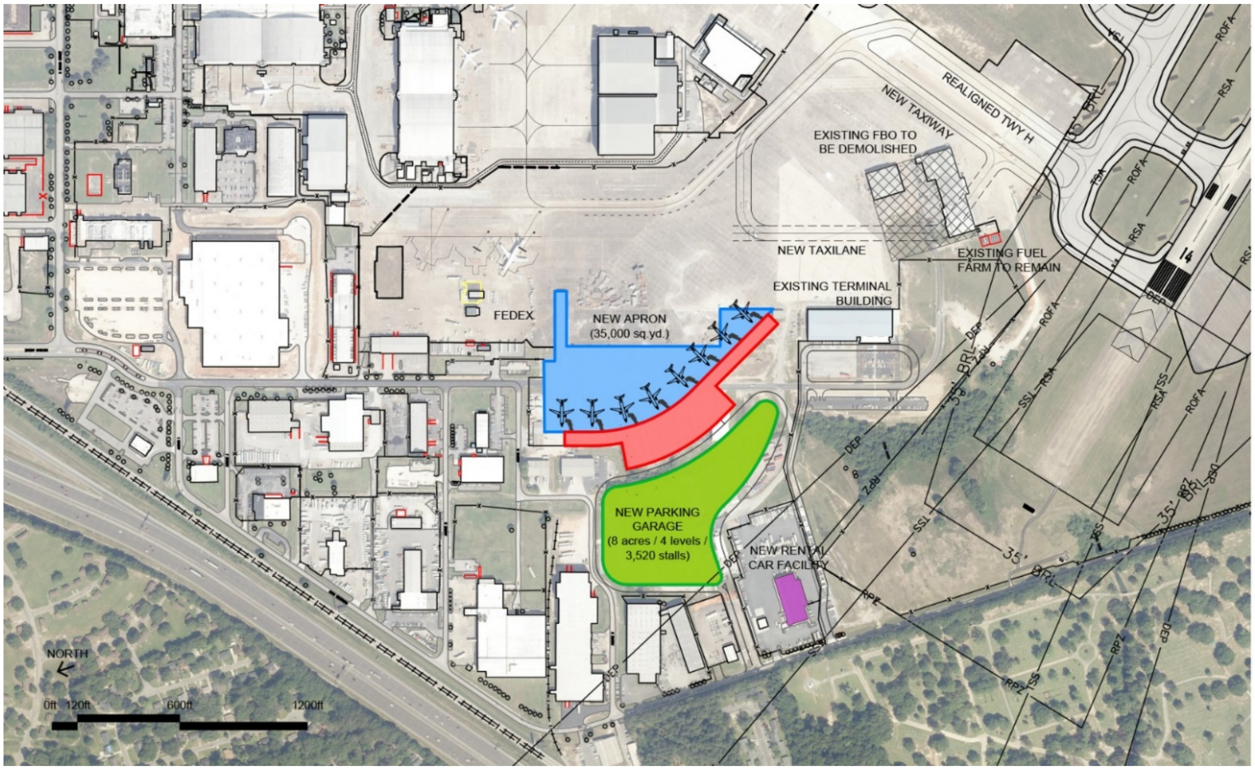
Figure 3.8: Terminal Concept 4

3.2.5 Alternative Concept 5

Alternative Concept 5, illustrated in Figure 3.9, is the most unique option in the set of alternatives. The terminal building is the same size as the other alternative concepts; however, the building's shape is configured in such a way as to reduce the need for new apron construction. It partly utilizes the existing apron, but it is largely situated south of Michigan Avenue. In addition to these changes, key features of this concept include the following:

- Demolition of 14 total buildings and relocation of the following tenants: Signature Flight Support FBO, ASF Intermodal, Petro Clean, FedEx Ship Center, Bay Lines, Shoreline Transportation, Aero Star
- Construction of 35,000 square yards of new apron
- Realignment of Taxiway H and extension of a new taxiway to the passenger terminal apron
- New terminal roadway access with ingress and egress on a new terminal access loop road north of the existing Penske property
- Terminal orientation that inhibits future expandability of gates
- Construction of a four-level parking garage in front of the terminal building, connected by a crosswalk
- Conversion of the Penske building and lot to a rental car facility

The specific landside implications associated with this concept, such as parking and roadway realignment are further detailed in Section 4.



Source: LeighFisher, 2020

Figure 3.9: Terminal Concept 5

3.3 Identification of a Preferred Concept

As shown above, each of the five alternative concepts had certain similar cost and development schedule implications. These included the following:

- The terminal building will be 130,000 square feet with eight aircraft parking gates.
- The Signature Flight Support FBO will be demolished and relocated in order to accommodate a new taxilane off Taxiway H and/or a new taxiway parallel to Taxiway H.
- Perimeter Road will be improved to accommodate traffic from Dauphin Island Parkway.
- The two Aerostar properties will be demolished on Michigan Avenue.

Furthermore, the planning team qualitatively assessed the five alternative terminal development concepts relative to potential cost and feasibility. Specifically, the team evaluated each concept based on the following:

- **Impact to existing tenants:** The number of tenants that would need to be relocated for the new terminal development.
- **Need for airside modification:** Total required area for construction of a new passenger terminal apron and taxilanes.
- **Environmental impact:** Impact to surrounding wetlands and drainage.
- **Relative ease of phasing and delivery:** Overall assessment of site availability and acquisition needs, airfield modification, and environmental impact.
- **Expandability:** Ability to add gates and other terminal facilities beyond the planning period.

The evaluation criteria for each concept was scored numerically on a scale of 0 to 2, with 0 representing a relatively poor performance and 2 representing a relatively strong performance in the respective categories. Table 3.1 shows the evaluation matrix of each alternative concept.

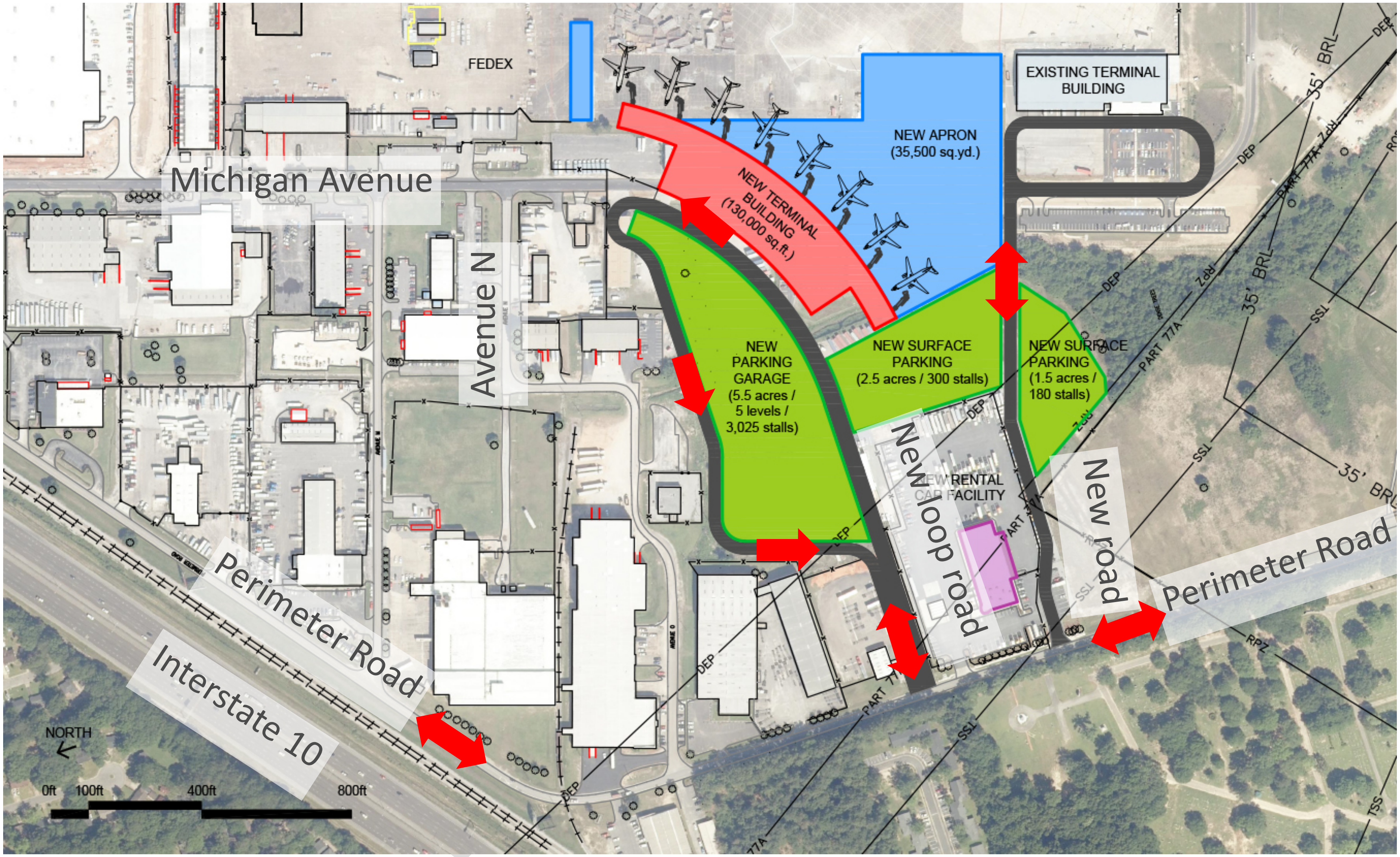
Table 3.1: Alternative Concepts Evaluation Matrix

	Concept 1	Concept 2	Concept 3	Concept 4	Concept 5
Impact on Existing Tenants	0	2	2	1	1
Airside Modification	1	1	2	0	2
Environmental Impact	1	1	1	1	1
Phasing and Delivery	0	1	1	0	1
Expandability	1	1	2	0	0
Score	**3**	**6**	**8**	**2**	**5**
Relative Ranking	**4th**	**2nd**	**1st**	**5th**	**3rd**

Source: LeighFisher, 2020

As shown in Table 3.1, Alternative Concept 2 and Alternative Concept 3 performed the best relative to the other alternatives included in this analysis. Alternative Concept 3, in particular, had the least impact on existing tenants, in that only nine total buildings would need to be demolished to make way for the new terminal complex. Furthermore, Alternative Concept 3 requires only 35,500 square yards of airside modification for new apron and taxilane modifications. It also has the highest potential for future expandability of gates to both the east and west. Finally, as discussed in Chapter 7: Environmental Overview, Alternative Concept 3 had the least environmental impact of the five alternatives studied.

Taking these myriad factors into account, the assessment conducted for this analysis concluded that Alternative Concept 3 is the preferred terminal development concept. Figure 3.10 shows a more detailed layout of Alternative Concept 3.



Source: LeighFisher, 2020

Figure 3.10: Preferred Terminal Concept

3.4 Impact of COVID-19 on Future Terminal

Due to the global pandemic and associated economic impact caused by the COVID-19 virus, there is a possibility that there will be decreased federal funding available for capital projects at airports in the near-term. Specific to BFM, uncertainty about future FAA funding might impact the MAA's ability to construct the preferred alternative concept for the future passenger terminal complex by PAL 1. Nonetheless, it remains a priority for the MAA to transfer commercial traffic from MOB to BFM as soon as possible. If FAA and other funding is not available as early as PAL 1, the MAA may find it necessary to consider lower cost alternatives to accommodate the new carriers at BFM. As such, the planning team prepared and analyzed several alternatives that seek to utilize and expand the existing temporary terminal building into a transitional facility.

It is important to note that the temporary use of the interim terminal does not reflect the preferred alternative for the future passenger terminal. Rather, it enables BFM to accommodate future passenger traffic in the near-term with a less costly option that still allows commercial traffic to transfer from MOB to BFM by PAL 1.

3.4.1 Existing Terminal Facility

As described in Chapter 1: Inventory, the existing temporary terminal at BFM, opened in May 2019, is a retrofitted 22,800-square-foot facility that is housed inside a larger building. The terminal has two ground-loaded gates with a total of three aircraft parking positions. The existing facility is very minimalistic and is likely not suitable to accommodate the legacy carriers the MAA hopes to attract for a long-term solution.

On the pre-security side of the terminal, there is airline ticketing, baggage drop-off and pick-up, vending machines, and restrooms, in addition to rental car service desks. On the post-security side, there is an area with vending machines, a holdroom with multiple rows of passenger seating, and additional chair and table seating along a wall.

3.4.2 Alternatives to Expand Temporary Terminal

In order to identify a lower-cost alternative concept for the future passenger terminal complex at BFM, the planning team developed and evaluated alternative concepts that seek to repurpose and expand the existing temporary terminal building as a transitional facility. While the existing facility has only the most basic amenities, the interim terminal could eventually become a terminal building suitable for legacy carriers for the short-term. This approach provides maximum flexibility to the MAA and requires minimum additional investment and resources.

The transitional facility would allow the new terminal construction to utilize the existing passenger terminal apron, access roadways, surface parking, and other services. The planning team recommends expansion of the existing terminal in up to three phases. When broken down into distinct phases, the MAA will be able to respond more adeptly and dynamically to changing economic conditions, as needed. The recommended steps of phasing for a transitional facility are summarized below.

3.4.2.1 Phase 1

The existing temporary terminal facility at BFM occupies approximately half of a 50,000-square-foot building. In Phase 1 of the terminal expansion, the entire 50,000-square-foot building could be converted to exclusively passenger terminal use. Conversion of the existing property would require minimum additional investment and could add up to five gates.

3.4.2.2 Phase 2

In order to further expand the passenger terminal complex in Phase 2, adding a two-level, 40,000-square-foot addition to the north of the existing building could be a possibility. This addition facilitates two new aircraft parking gates with passenger boarding bridges. Through Phase 2, the total terminal building would be 90,000 square feet with up to seven aircraft parking gates. The passenger loading bridges could then be transferred to the new terminal, once the new terminal opens.

3.4.2.3 Phase 3

In Phase 3 of the interim terminal complex expansion, construction of another two-level, 45,000-square-foot addition to the north would allow for the addition of two aircraft parking gates with boarding bridges. This phase of the expansion would bring the passenger terminal complex to 135,000 square feet with up to eight aircraft parking gates. As in Phase 2, the passenger loading bridges could be transferred to the new terminal.

3.4.2.4 Summary

The foregoing outlines how the interim terminal could function and grow as a transitional facility prior to the opening of the new terminal. Beyond Phase 1, the MAA will need to address the financial implications of further expansion relative to traffic recovery in both the national and Mobile markets. Phase 1 maximizes the existing building footprint at the ground level with minimal costs. Phases 2 and 3 will require more investment as the interim terminal is expanded both vertically and horizontally to the north.

4. GROUND TRANSPORTATION AND PARKING

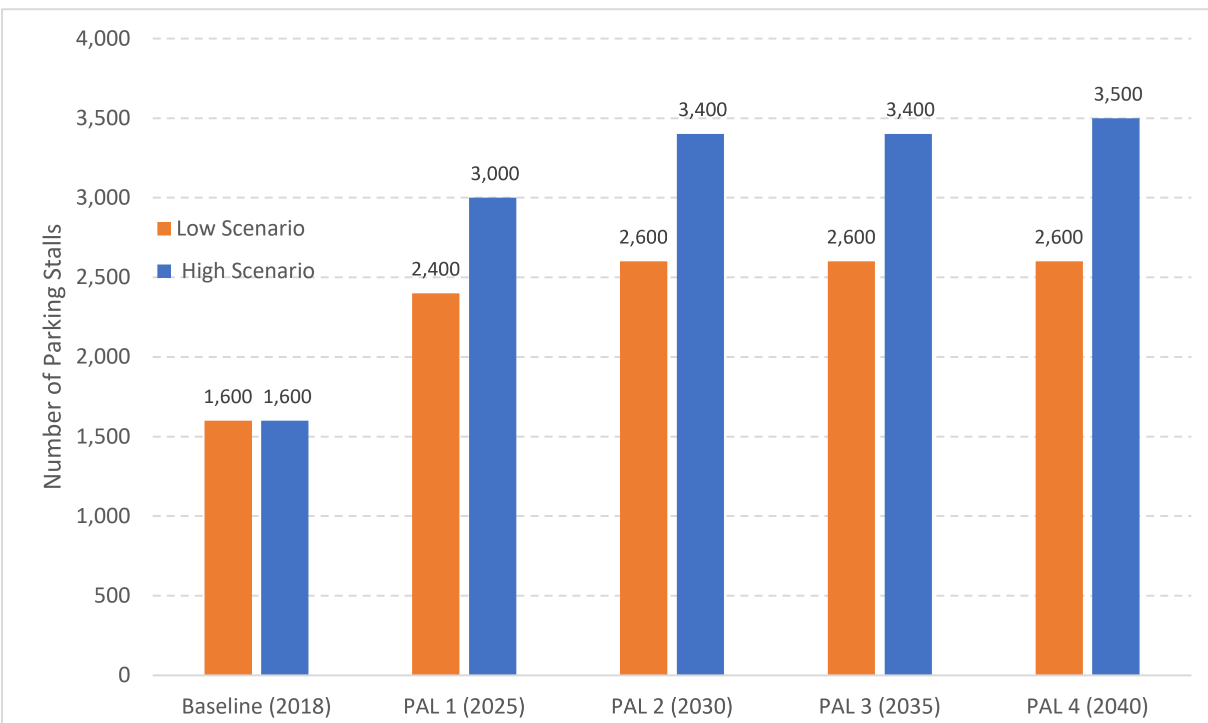
This section describes the alternatives the planning team considered for meeting the Airport's ground transportation and parking requirements through PAL 4 (2040) and identifies key conclusions and recommended alternatives. The five major ground transportation and parking elements considered in the alternatives analysis were as follows:

- Parking
- Rental car facilities
- Passenger terminal curbside roadways
- Terminal area roadways
- Access roadways

The sections that follow describe specific alternatives for each of these functional areas.

4.1 Parking

The alternatives identified for this analysis were based on the parking requirements generated in Chapter 3. Figure 4.1 details the total number of required parking spaces for each PAL, for both the high and low planning scenarios. Under the high scenario, approximately 3,500 parking stalls will be required through PAL 4. Under the low scenario, approximately 2,600 stalls will be required.



Source: LeighFisher, 2020

Figure 4.1: Parking Requirements

In conjunction with the development of passenger terminal alternatives, the planning team concurrently identified and evaluated locations for future parking at the Airport. The primary assumptions used in the analysis were that:

- All airport parking (public, employee, commercial) will be co-located.
- Industry-standard stalls per acre ratios (110 stalls per acre for garage parking and 120 stalls per acre for surface parking) will be used to estimate required acreage.
- Preferred location of parking facilities is within walking distance of the passenger terminal complex.
- Structured parking (i.e., garages) are preferred in order to preserve space and limit impact to existing tenants.
- The alternatives are based on consideration of the most demanding facility requirements (i.e., the high scenario) to ensure that sufficient land will be available for public parking.

The alternatives for parking facilities are illustrated in each of the terminal alternative concepts, as shown on Figures 3.5 through Figure 3.9 in Section 3. Each alternative location has strengths and weaknesses, but the general layout of each concept stays relatively consistent throughout. The alternative concepts developed for future parking facilities at the Airport are summarized as follows:

- **Alternative Concept 1:** 4-level, 7-acre parking garage west of the terminal and an additional 4 acres of surface parking directly across from the terminal
- **Alternative Concept 2:** 4-level, 8-acre parking garage west of the terminal, requiring a shuttle to the terminal curbfront
- **Alternative Concept 3:** 5-level, 5.5-acre parking garage in front of the terminal building, connected by a crosswalk, and two additional surface parking lots west of the terminal of 2.5 acres and 1.5 acres
- **Alternative Concept 4:** 6-level, 4.5-acre parking garage in front of the terminal building, connected by a crosswalk, and an additional smaller 3-level, 1.5-acre parking garage on Perimeter Road, requiring shuttle connection
- **Alternative Concept 5:** 4-level, 8-acre parking garage in front of the terminal building, connected by a crosswalk

The preferred concept for the future passenger terminal complex is Alternative Concept 3. As such, parking at the Airport will be a 5.5 acre, 5-level parking garage with 3,025 stalls situated directly across from the terminal building and connected by a crosswalk. Furthermore, there will be two additional surface parking lots located adjacent to the terminal building, comprising 4 acres and 480 stalls.

4.2 Rental Car Facilities

The requirements analysis for rental car facilities determined that the total space requirement for rental cars through PAL 4 will be 2.4 acres in the low scenario and 4.4 acres in the high scenario. For the purposes of the requirements analysis, it was assumed that the customer service areas, ready/return parking spaces, and quick turnaround facilities would be co-located. Additionally, to ensure that sufficient land will be available for the rental car facilities, the alternatives are based on consideration of the most demanding facility requirements (i.e., the high scenario).

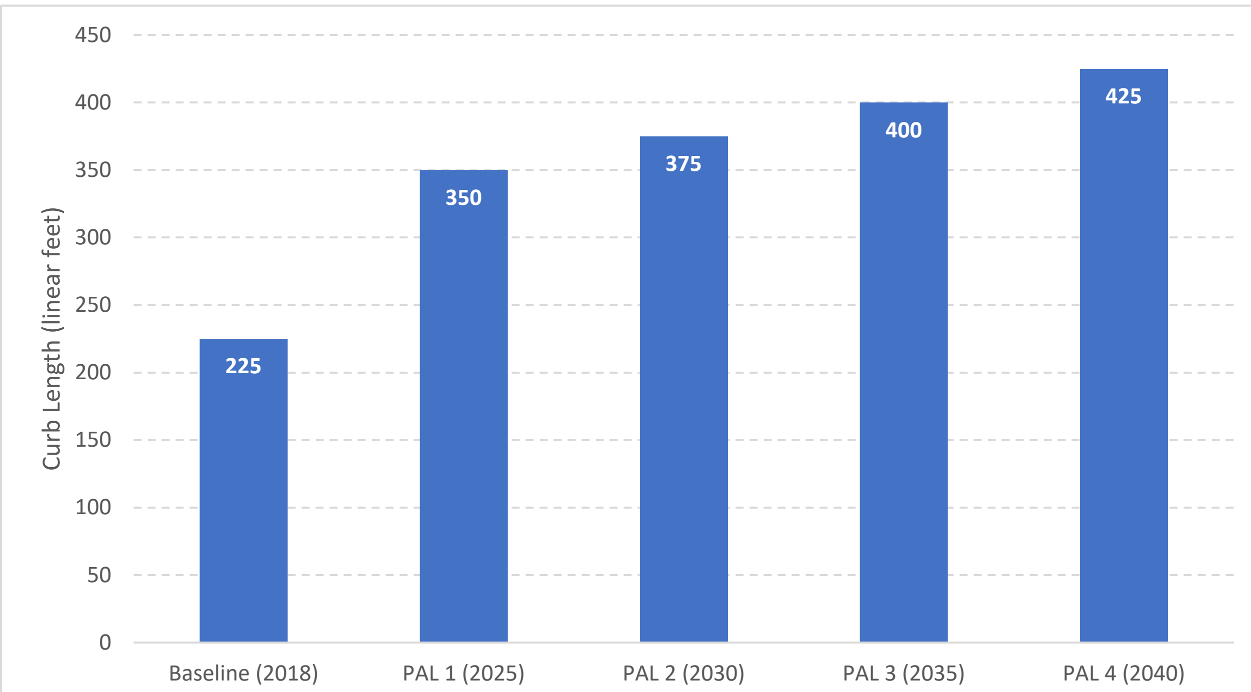
In each of the passenger terminal alternative concepts, which are illustrated in Figures 3.5 through 3.9 in Section 3, it is recommended that the new consolidated rental car facility (ConRAC) at BFM be located at the facility currently owned and operated by Penske Truck Rental. This facility should be retrofitted to accommodate future rental car operations. The ConRAC will require a shuttle connection to the new passenger terminal complex.

4.3 Passenger Terminal Curbside Roadways

As shown in Chapter 3, Table 4.10, the terminal curbside roadways will require 425 linear feet of offload frontage, or the equivalent of 16 vehicle loading positions, in PAL 4. The requirements analysis for curbside facilities at BFM assumed the following:

- The curbside will be single-level with arrivals and departures co-located.
- The ratio of peak hour arriving and departing seats as a percentage of the peak hour departing seats was calculated to be 1.31.
- The recommended curbside capacity would involve minimal double-parking, which is necessary to avoid congestion if the roadway is only two lanes wide including the curbside lane.

Figure 4.2 shows the combined arrivals and departures curbside capacity and requirements, by PAL.



Source: LeighFisher, 2020

Figure 4.2:Curbside Roadway Requirements

The planning team identified three alternatives for satisfying the requirements for arrivals and departures curbside roadways and loading areas. Alternative Concepts 2 and 3 assume that some double-parking in the peak hour is acceptable, and thus the required length of the terminal frontage could be reduced by up to 50%. The specific concepts are detailed as follows:

- **Alternative Concept 1:** One curbside lane for arriving and departing passengers and one thru lane for passing vehicles; assumes that double-parking in the peak hour is prohibited (see Figure 4.3)
- **Alternative Concept 2**: One curbside lane for arriving and departing passengers and two thru lanes for passing vehicles; assumes that some double-parking in the peak hour is acceptable (Figure 4.4)
- **Alternative Concept 3**: Two curbside lanes (an inner and outer curbside separated by an island) and two thru lanes for passing vehicles (Figure 4.5)

While Alternative Concepts 2 and 3 may require less terminal curb frontage than Alternative 1, they are likely to be more costly. Furthermore, these concepts would be more impactful to the proposed terminal roadway reconfiguration and existing tenants. As such, Alternative Concept 1 is the preferred alternative because its costs are lower and it would be less impactful to the existing tenants and roadway system.

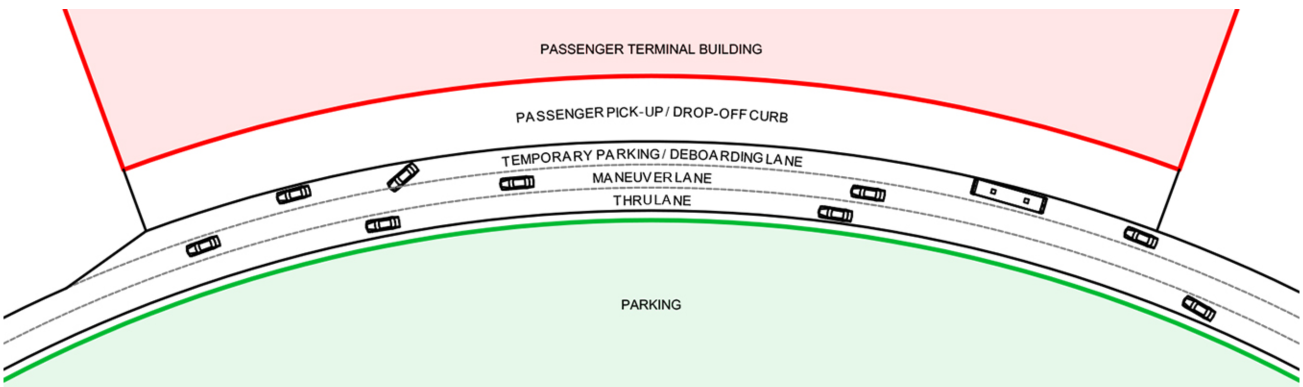


Figure 4.3: Curbside Roadway Alternative Concept 1

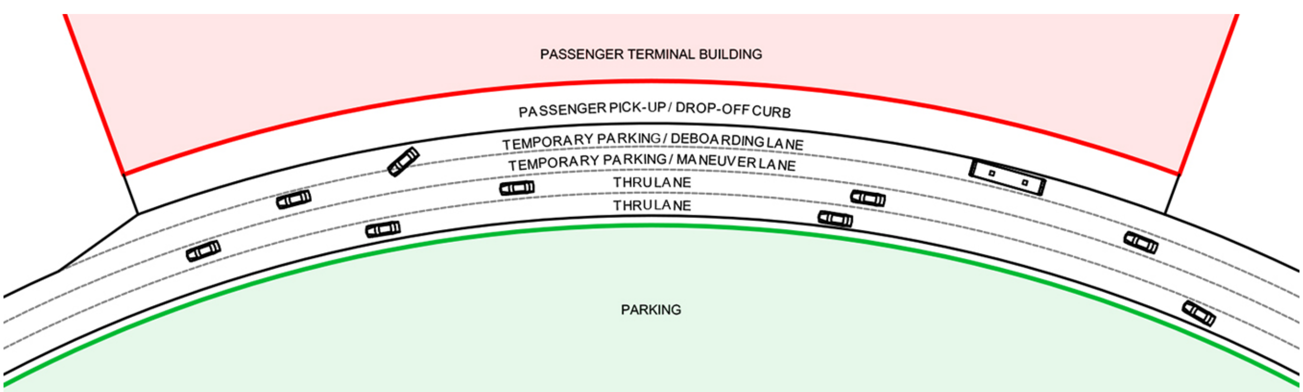
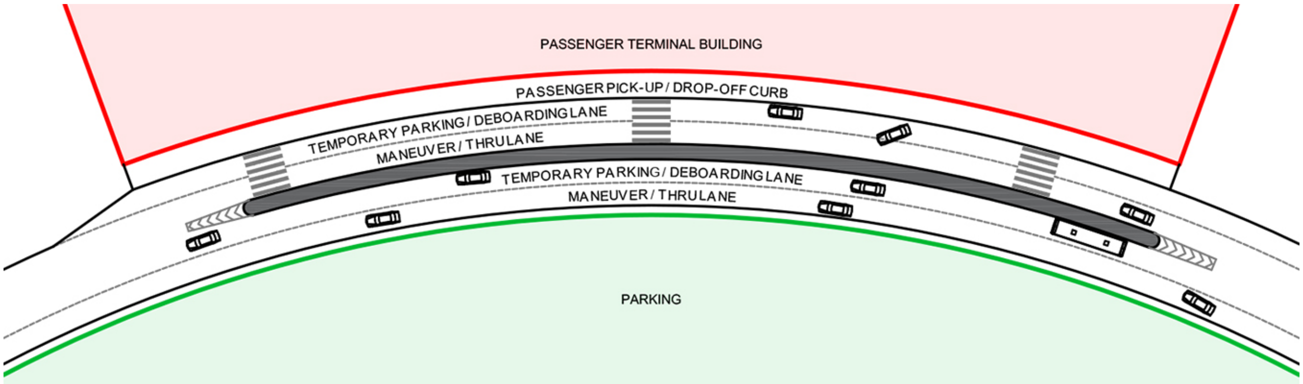


Figure 4.4: Curbside Roadway Alternative Concept 2



Source: LeighFisher, 2020.

Figure 4.5: Curbside Roadway Alternative Concept 3

4.4 Terminal Area Roadways

In order to provide access to the new passenger terminal complex at the Airport, improvements will need to be made to terminal area roadway lanes and intersections. The planning team developed several alternatives for terminal access roadways in conjunction with the passenger terminal concepts.

Each of the alternative concepts assumes that there would be some level of roadway improvement or realignment to accommodate the forecast increase in traffic to the passenger terminal complex. As shown in Figure 3.5 through Figure 3.9, terminal roadway ingress and egress patterns remain relatively consistent for each alternative. The terminal roadway configurations for each concept are summarized as follows:

- **Alternative Concept 1:** Ingress on Avenue O via Perimeter Road; egress on Avenue M
- **Alternative Concept 2:** Ingress and egress on new terminal access loop road north of the current Penske property
- **Alternative Concept 3:** Ingress and egress on new terminal access loop road north of the current Penske property bordering the new surface parking lot
- **Alternative Concept 4:** Ingress and egress on new terminal access loop road north of the current Penske property bordering the new garage parking lot
- **Alternative Concept 5:** Ingress and egress on new terminal access loop road north of the current Penske property bordering the new garage parking lot

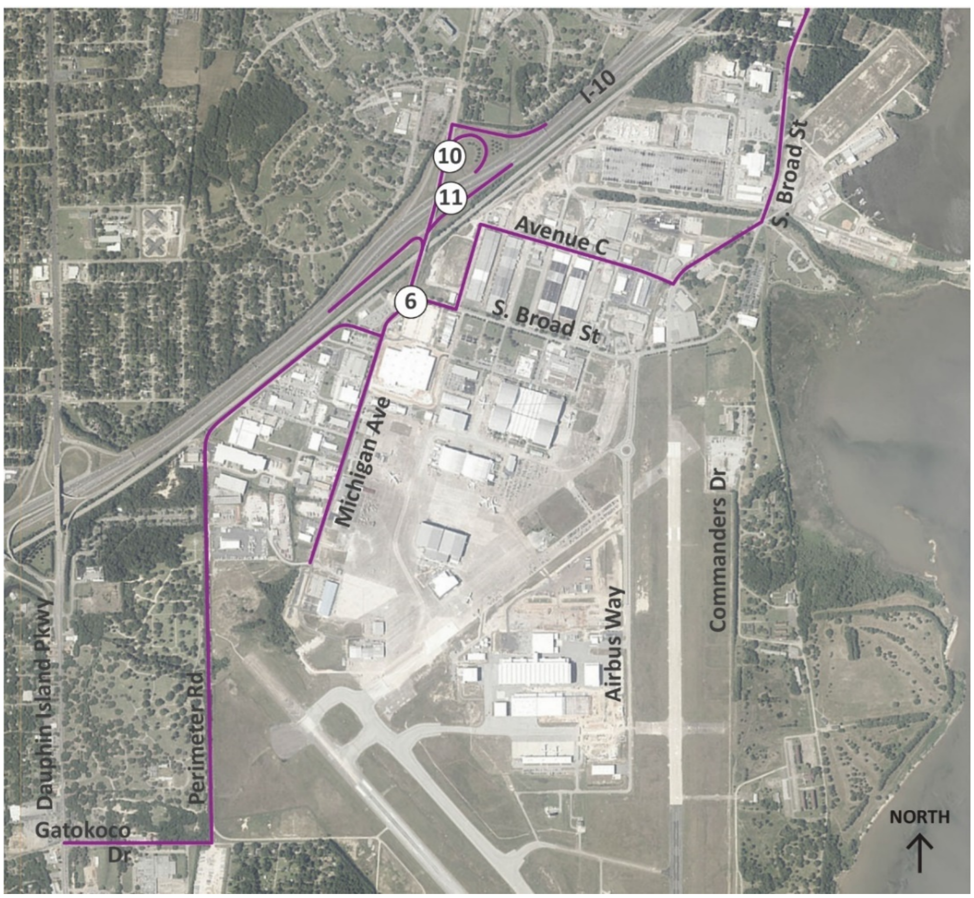
The preferred concept for the future passenger terminal complex is Alternative Concept 3. As such, to provide access to the terminal curbfront, a new terminal loop road connecting to Perimeter Road and bordering the parking garage will be constructed. On the new roadway alignment, incoming traffic will travel eastbound to the terminal building and loop westbound around the parking garage back to Perimeter Road.

4.5 On-Airport Access Roadways

Access roadway improvements will be required in PALs 1 and 2, as described below and indicated in Chapter 3, Table 4.6 (the intersection numbers referred to in the descriptions are identified on Figure 4.6).

- PAL 1: Additional capacity will be required on Broad Street east of Michigan Avenue (link 6) and the I-10 eastbound on ramp (link 11). The alternatives for increasing capacity will be identified during design; however, the most likely solution is the addition of another lane in both directions on Broad Street and an additional two lanes on the eastbound I-10 on ramp.
- PAL 2: Additional capacity will be required on the I-10 westbound on ramp (link 10) in the form of an additional lane.

As discussed in Section 6, Broad Street between Michigan Avenue and 9th Street will be closed in the future to accommodate future aeronautical development. Specifically, its closure would enable airside access to be provided to this entire area. Nonetheless, a new primary access road would need to be developed in its place. This new roadway realignment could be located in the vicinity of 15th Street to Avenue C to 3rd Street and would require two lanes in each direction.



Source: LeighFisher, 2020

Figure 4.6: Access Roadway Links

In addition to the roadway improvements mentioned above, as indicated in Figure 3.10, a new access roadway will be built to the existing temporary terminal building off of Perimeter Road. This alignment will run east between the surface parking lots to a loop road in front of the temporary terminal building.

5. GENERAL AVIATION/FIXED BASE OPERATOR FACILITIES

5.1 Background

The existing FBO at BFM, owned and operated by Signature Flight Support Corporation, is located east of the temporary terminal building on the terminal apron. While its immediate relocation is not necessary, it is likely that a new taxilane will need to be built on the terminal apron 10-15 years into the planning period. This taxilane would greatly improve circulation and access to the new terminal building for aircraft taxiing from Taxiway H. As such, in order to allow for the continued development and growth of the future passenger terminal complex, the planning team identified and evaluated several alternative FBO locations, as described in the following sections.

5.2 Alternatives

The alternative concepts developed for the future FBO at BFM were based on the requirements analysis for this functional area. The planning team estimated future FBO facility requirements by applying the average annual forecast growth rate of general aviation (GA) operations at BFM to the footprint of the existing FBO building and apron. This analysis showed that the FBO will require approximately 10 acres of total area.

Using the requirements analysis as a basis, the planning team identified two locations for the site of the future FBO, as illustrated in Figure 5.1 and as detailed in the following sections.

Source: LeighFisher, 2020

Figure 5.1: Potential FBO Sites

5.2.1 Alternative Concept 1 – West of Runway 14/32

Alternative Concept 1 is a triangular area of land that is located west of Runway 14/32 near the Runway 14 threshold, as shown in Figure 5.1. The developable size of the site, which is just within the Airport property boundary, is approximately 32 acres.

This site has several benefits. First, it has existing access to Perimeter Road, the main arterial that will be used for airport access in the future. It is also immediately adjacent to the Runway 14 threshold. If taxiway access is developed, this site would have direct access to the Airport's primary runway. This location would also allow for separation from passenger operations and its associated Security Identification Display Area. Finally, since the area is already developed, this site would have limited environmental impacts.

However, the site is physically constrained by areas off-Airport property to the south and west. Additionally, the allowable height of buildings and hangars developed at this site are limited by airspace and transitional surface impacts.

5.2.2 Alternative Concept 2 – East of Runway 18/36

The second site identified in the alternatives analysis is located east of Runway 18/36 on land currently owned by the USA Foundation. The developable size of the site, as shown in Figure 5.1, is approximately 30 acres. The MAA has expressed interest in acquiring some of the property currently owned by the USA Foundation. If successful, this site would be an ideal location for the future FBO due to its direct access to the airfield.

The planning team identified several benefits of the site proposed in Alternative Concept 2. First, in comparison to Alternative Concept 1, this site has nearly limitless expansion potential and far fewer airspace limitations. Further, if taxiway access was developed, this site would have direct access to Runway 18/36, the secondary runway, which may be more suitable for GA operations.

However, Alternative Concept 2 has significant drawbacks. Most notably, this site would require property acquisition of land currently owned by the USA Foundation. Second, landside access to this site would need to be developed. And lastly, the land area of this site is currently undeveloped, and it would require tree clearing and other potential environmental impacts.

5.2.3 Identification of a Preferred Concept

The two alternative concepts were qualitatively evaluated to identify a preferred alternative. Alternative Concept 1 was identified as the preferred alternative because it is located on Airport property and has existing landside access via Perimeter Road.

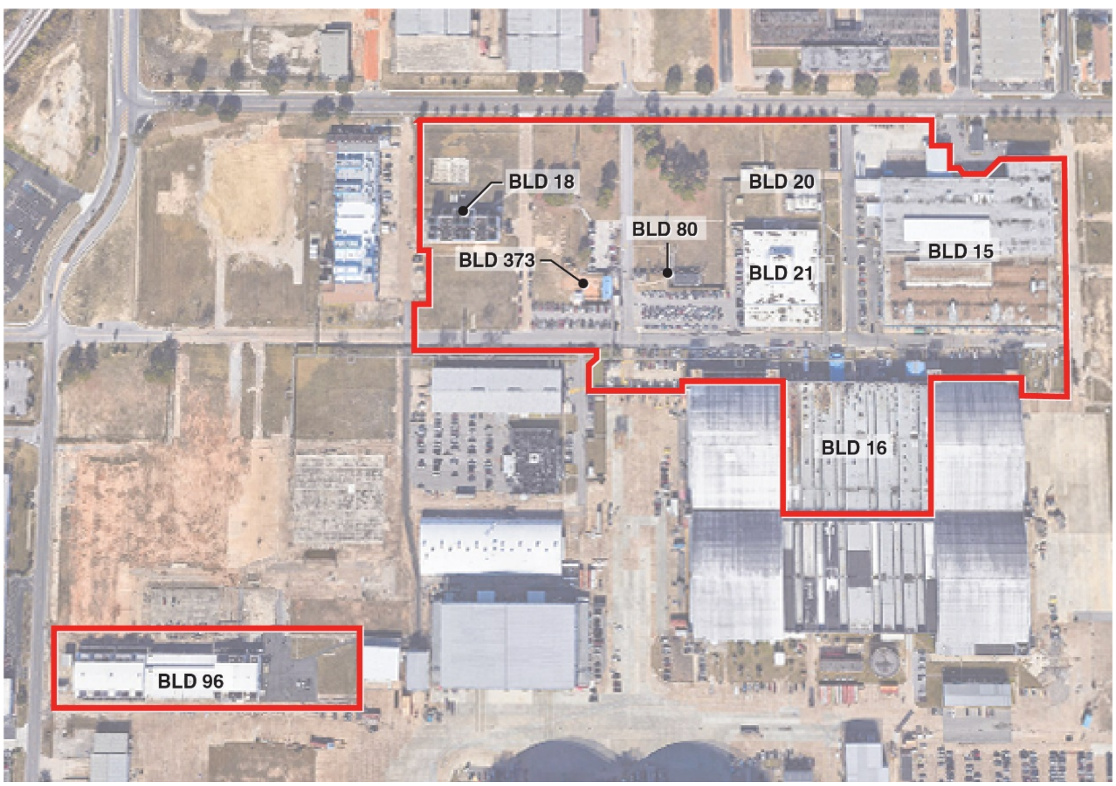
6. MAINTENANCE, REPAIR, AND OVERHAUL FACILITIES

BFM is home to ST Engineering's VT MAE, an aircraft maintenance, repair, and overhaul (MRO) company. VT MAE currently occupies 10 hangars and associated buildings on the north side of the airfield. Some of the facilities are buildings that have been repurposed from the former Air Force base, and others are newer facilities. With the Airbus expansion, there is limited space for VT MAE to expand or redevelop hangars within the current airport property line.

To provide development opportunities at BFM for VT MAE, the planning team has considered several alternatives that convert Aeroplex property to Airport property. These include repurposing the former Continental Aerospace Technologies (Continental) leasehold that will be returning to MAA over the next several years, repurposing the returned Continental leasehold and expanding beyond it, and opening a new area at BFM for MRO facilities.

6.1 Background

With the development of the new Continental facilities to consolidate their manufacturing under one roof, Continental is returning some of their leasehold to the MAA after environmental clean-up of the site. Figure 6.1 details the area of the Continental leasehold being returned to the MAA.



Source: Hanson Professional Services, 2020

Figure 6.1: Former Continental Leasehold to be Returned to MAA (red outline)

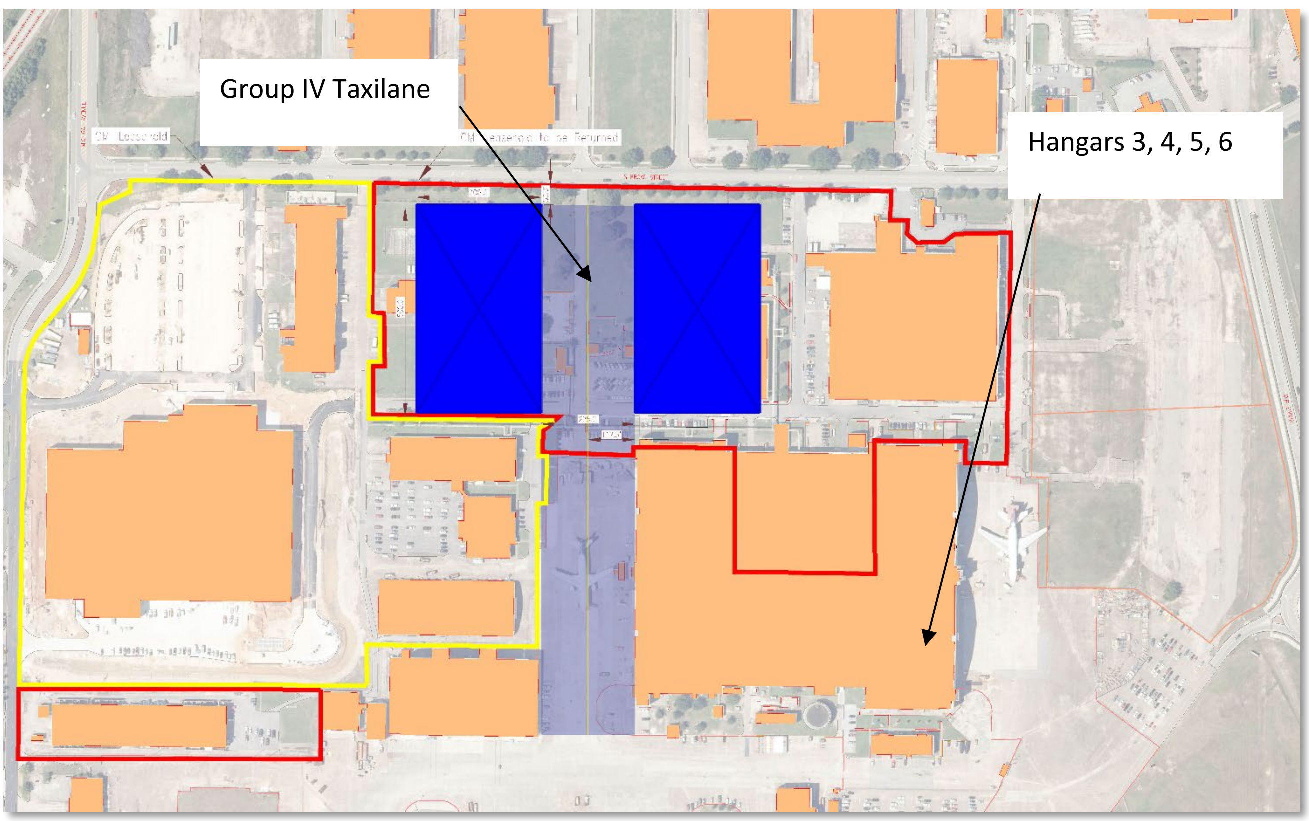
The return of these properties to the MAA, estimated to occur in Quarter 3 2021, opens the opportunity for VT MAE to expand to the north. With the closure of Avenue I, the taxilane between VT MAE's Hangar 4 and 6 and Hangar 8-1 could be extended north, opening up area for development on both sides of the taxilane.

6.2 Alternatives

The following sections detail the various alternative concepts developed for the expansion of the existing MRO facilities at BFM.

6.2.1 Alternative Concept 1 – Expand into Returned Continental Leasehold and Preserve Existing Buildings

Alternative Concept 1 would expand the existing VT MAE facilities into the returned Continental leasehold and preserve the existing buildings. This concept allows for the development of a Group IV taxilane to serve development north of Avenue I. Since Avenue I has primarily been used to support Continental and VT MAE operations, its closure should not impact the overall flow of traffic on BFM. As illustrated in Figure 6.2, the extension of the taxilane would allow for two large hangar complexes to be developed north of the existing VT MAE leasehold. In addition, there would be space for another support building or parking facilities within the area that does not currently have taxilane access.



Source: Hanson Professional Services, 2020

Figure 6.2: Expansion of VT MAE to North on Former Continental Leasehold

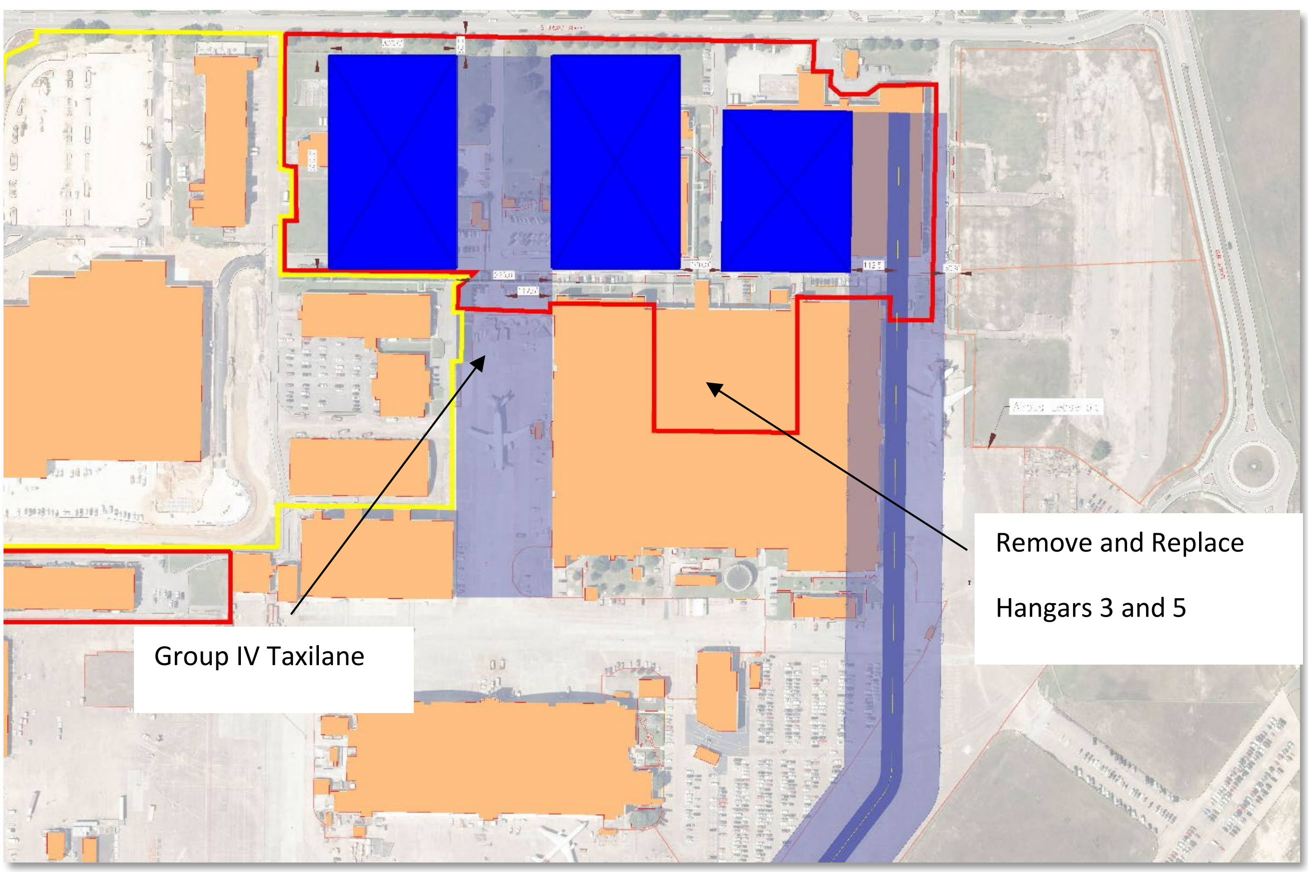
The former Continental leasehold land is currently within the Aeroplex property line. For airside access to be provided to the hangars, the MAA would need to submit a request to the FAA for its inclusion in the Airport property line. Land shown within the Airport property line is subject to FAA grant assurances, while land owned by the MAA within the Aeroplex is not. Converting land to airport property is generally easy for the

FAA to approve. Regardless, converting airport property into nonaeronautical land requires the airport sponsor to provide data demonstrating the benefit of the change to the airport.

6.2.2 Alternative Concept 2 – Repurpose Former Continental Leasehold and Redevelop VT MAE Hangars 3 and 5

Hangars 4 and 6, as well as Hangars 3 and 5, are original to the former Air Force base. The barrel roofs on these hangars are due for replacement, which will be a multi-million-dollar project. However, before investing in the old facilities, consideration should be given to removing the hangars and redeveloping the site. By expanding to the north, a replacement hangar for Hangars 3 and 5 could be constructed, which would enable the existing Hangars 3 and 5 to be removed. With the removal of Hangars 3 and 5, an additional taxilane could be extended to the north, which could open development for up to three large hangar complexes, as shown on Figure 6.3.

Alternative Concept 2 still uses the development of a taxilane between Hangars 4 and 6, and between Hangar 8-1 and the closure of Avenue I. However, the new hangars developed north of Avenue I would initially be replacements for Hangars 3 and 5. This would allow for the eventual removal of Hangars 3 and 5 to make room for an additional taxilane. Once this taxilane is developed, up to three large hangar complexes could be constructed North of Avenue I to replace the entire Hangar 3, 4, 5, and 6 complex.

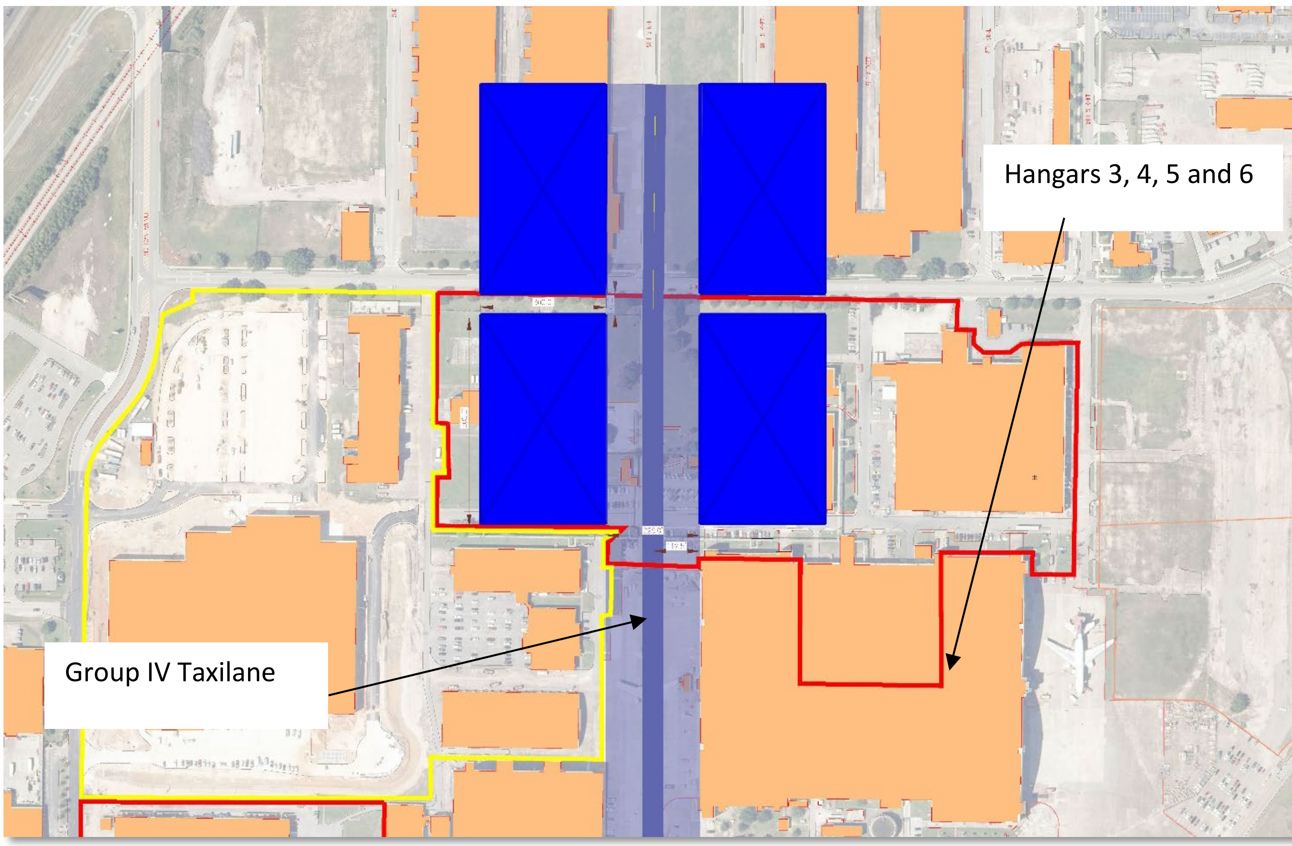


Source: Hanson Professional Services, 2020

Figure 6.3: Expansion of VTMAE North on Former Continental Leasehold with Removal of Hangars 3 and 5

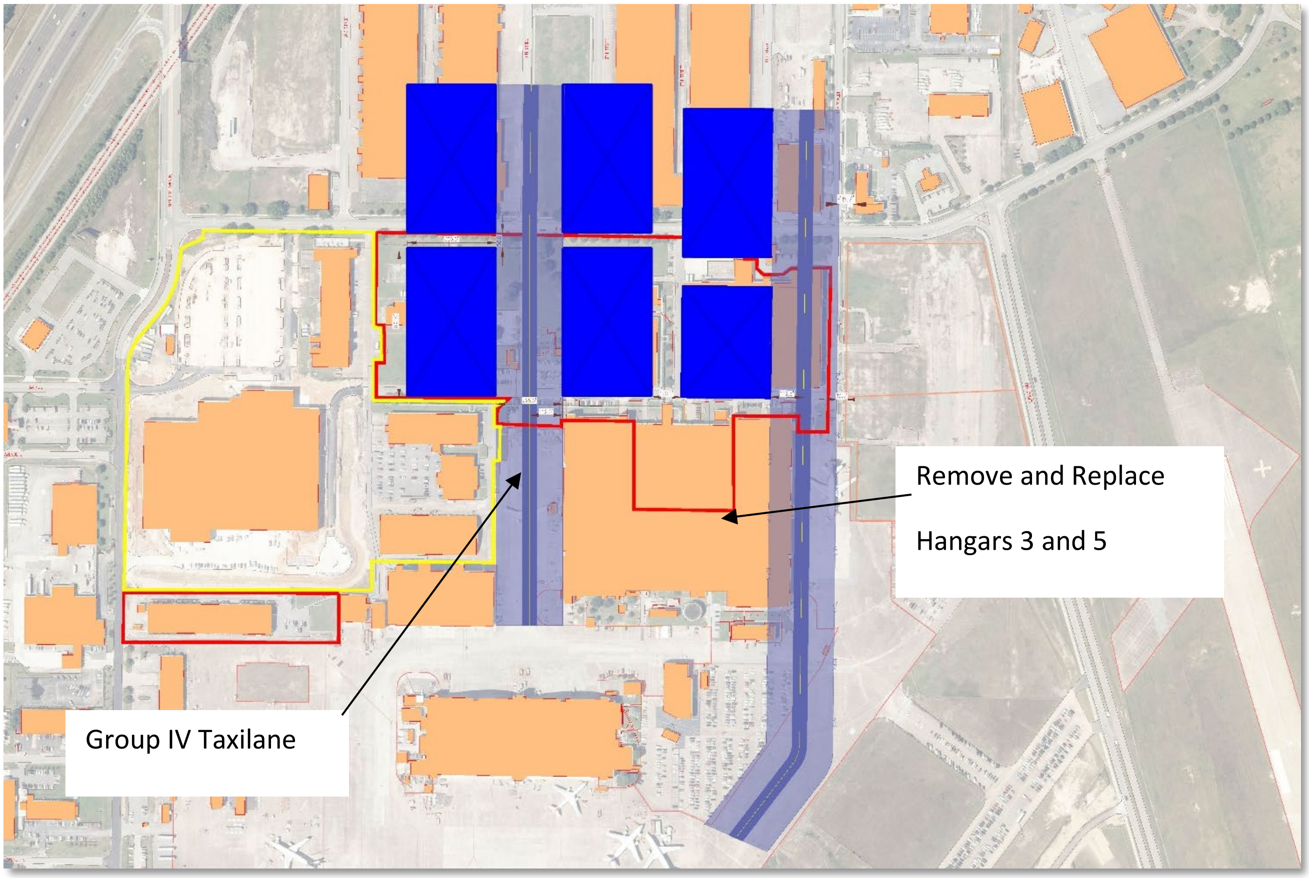
6.2.3 Alternative Concepts 3 and 4 – Repurpose Former Continental Leasehold and Expand Beyond

Alternative Concepts 3 and 4, shown in Figure 6.4 and Figure 6.5, respectively, are similar to the concepts described above; however, in these alternatives Broad Street would be closed between 9th Street and Michigan Avenue, and a new primary access road would be developed in its place. This new roadway realignment could be located in the vicinity of 15th Street to Avenue C to 3rd Street. The closure of Broad Street would enable airside access to be provided to this entire area. This alternative would need to be developed over time, as the leases for non-aviation uses between Broad Street and Avenue C expire and the businesses are able to be relocated.



Source: Hanson Professional Services, 2020

Figure 6.4: Repurpose Form Continental Leasehold and Expand Beyond While Preserving Existing Buildings



Source: Hanson Professional Services, 2020

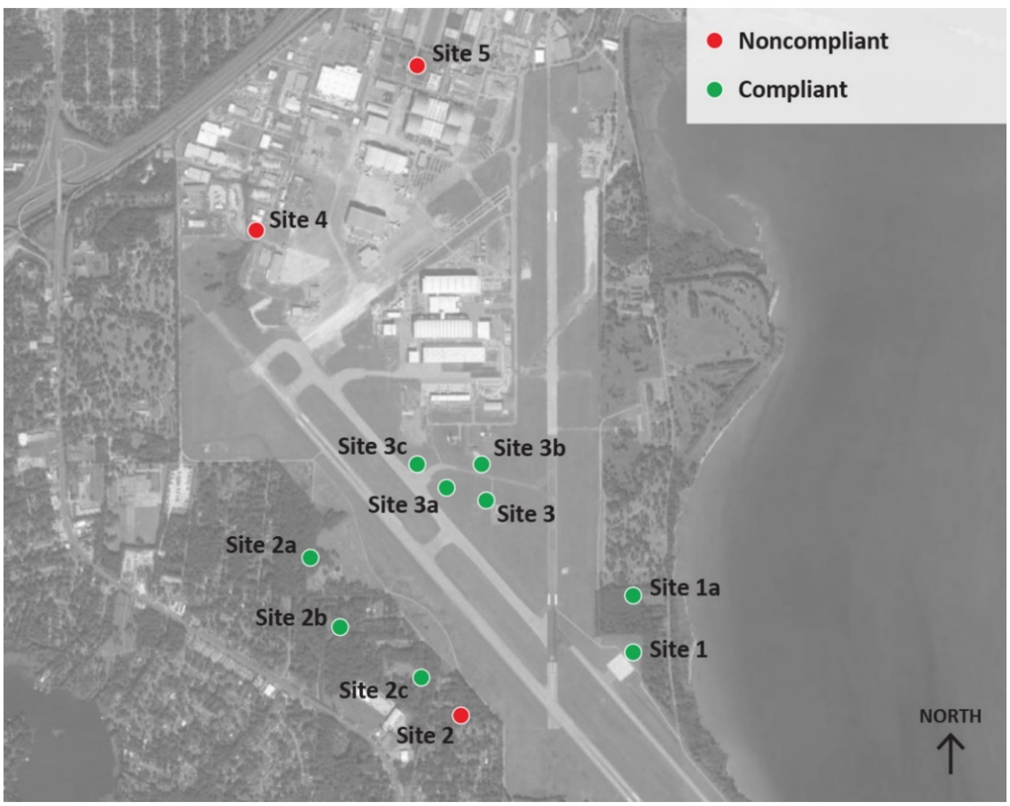
Figure 6.5: Repurpose Former Continental Leasehold and Redevelop VT MAE Hangar 3 and 5 and Expand Beyond

7. AIR TRAFFIC CONTROL TOWER

The existing ATCT is located within the Airbus leasehold and should be relocated in accordance with ongoing coordination between the MAA and Airbus. In order to relocate the ATCT, the planning team studied and evaluated the visibility performance of 12 sites to ensure that the location and height of the new ATCT can provide adequate visibility to all movement areas at the Airport. FAA Order 6480.4B, *Airport Traffic Control Tower Siting Process*[2] details the requirements and recommendations for determining site location, tower height, and cab orientation of a proposed new ATCT. Chapter 3, Section 7.1 shows the specific ATCT requirements at BFM.

7.1 Preliminary Evaluation of Visual Performance Criteria

It is crucial for air traffic controllers to have clear visibility around an airport to safely direct aircraft on the ground and through the airspace. In relocating air traffic control towers, FAA Order 6480.4B requires use of the Airport Traffic Control Tower Visibility Analysis Tool (ATCTVAT) to analyze potential sites for unobstructed view, object discrimination, and line of sight angle of incidence requirements. The planning team evaluated all 12 sites using the ATCTVAT and immediately eliminated three as non-compliant, while studying the remaining nine sites further. Figure 7.1 illustrates the locations of all potential sites and the results of the ATCTVAT analysis.



Source: LeighFisher, June 2020.

Figure 7.1: ATCTVAT Analysis Result

[2] FAA Order 6480.4B, Airport Traffic Control Tower Siting Process, August 2018, https://www.faa.gov/documentLibrary/media/Order/FAA_Order_6480.4B.pdf.

7.2 Shadow Study

View from the ATCT cab must be unobstructed to all controlled movement areas of an airport, including all runways, other landing areas, and airspace in the vicinity of the airport. View to all taxiways and ramp areas should also be unobstructed from the ATCT cab. Figure 7.2 shows the obstructed view at each site. The area in red is in the viewshed created by the existing buildings and/or planned development. The areas in yellow are still obstructed, but the viewshed can be improved to gain visibility to critical areas such as runways and taxiways. Suggested improvement strategies were to 1) lower the maximum allowable building height for future buildings, or 2) raise the ATCT cab height. For the purposes of this analysis, the planning team only considered raising ATCT cab heights because changing the maximum allowable building heights would involve further discussion and coordination with Airbus.

Sites 2a, 2b, and 3c have obstructed view to the northern half of Runway 18/36, which cannot be improved because the shadows are created mostly by the existing buildings. Therefore, these sites were eliminated.

Site 2c proceeds to further analysis despite its poor visibility to Runway 18/36 because the shadow in yellow covering the northern half of the runway can be improved by the strategies mentioned above.

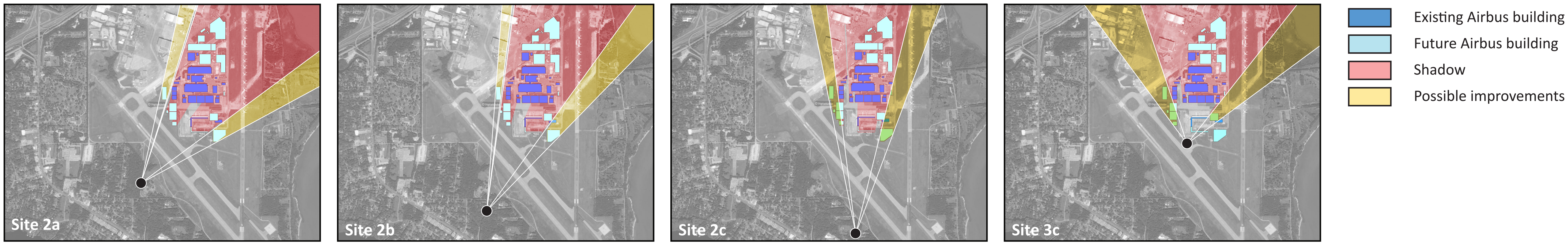
Site 1a was chosen for further analysis over Site 1, because Site 1 requires relocation of the existing aircraft engine run-up compass calibration pad.

The site characteristics of Site 3 and 3b are almost identical, but Site 3b was chosen for further analysis because it has better site access.

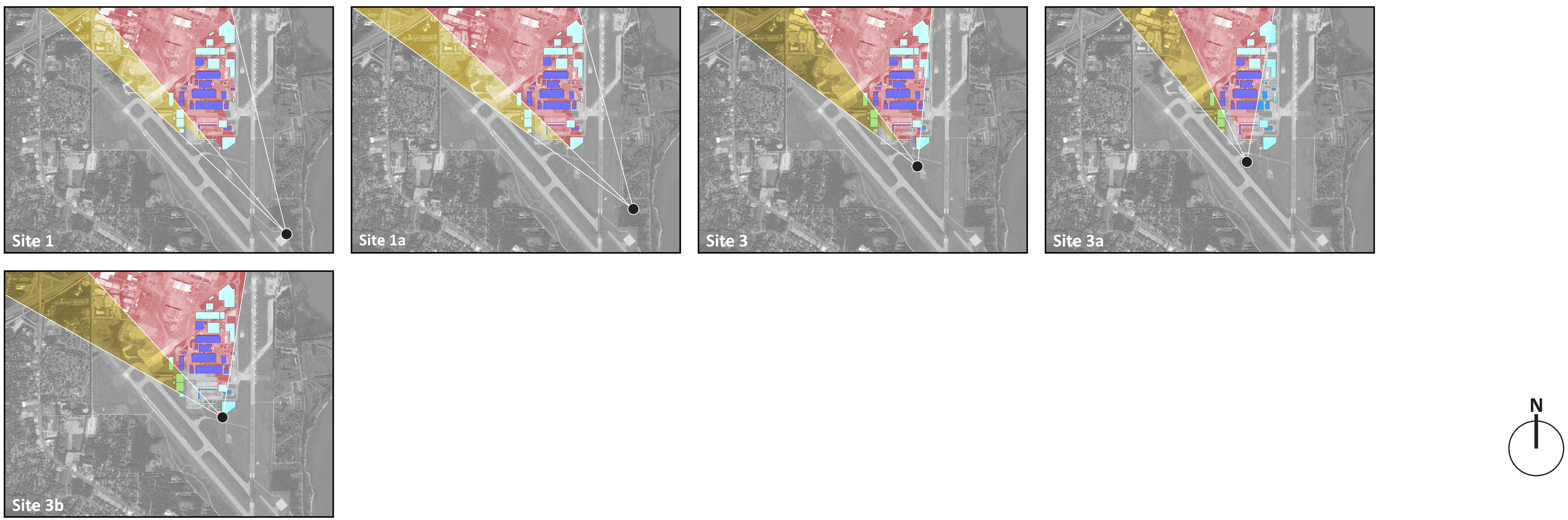
Site 3a has the minimum amount of shadowing among all nine sites, so it proceeds to further analysis.

Figure 7.3 shows the result of the shadow study.

SITES WITH POOR VISIBILITY TO RUNWAY 18-36



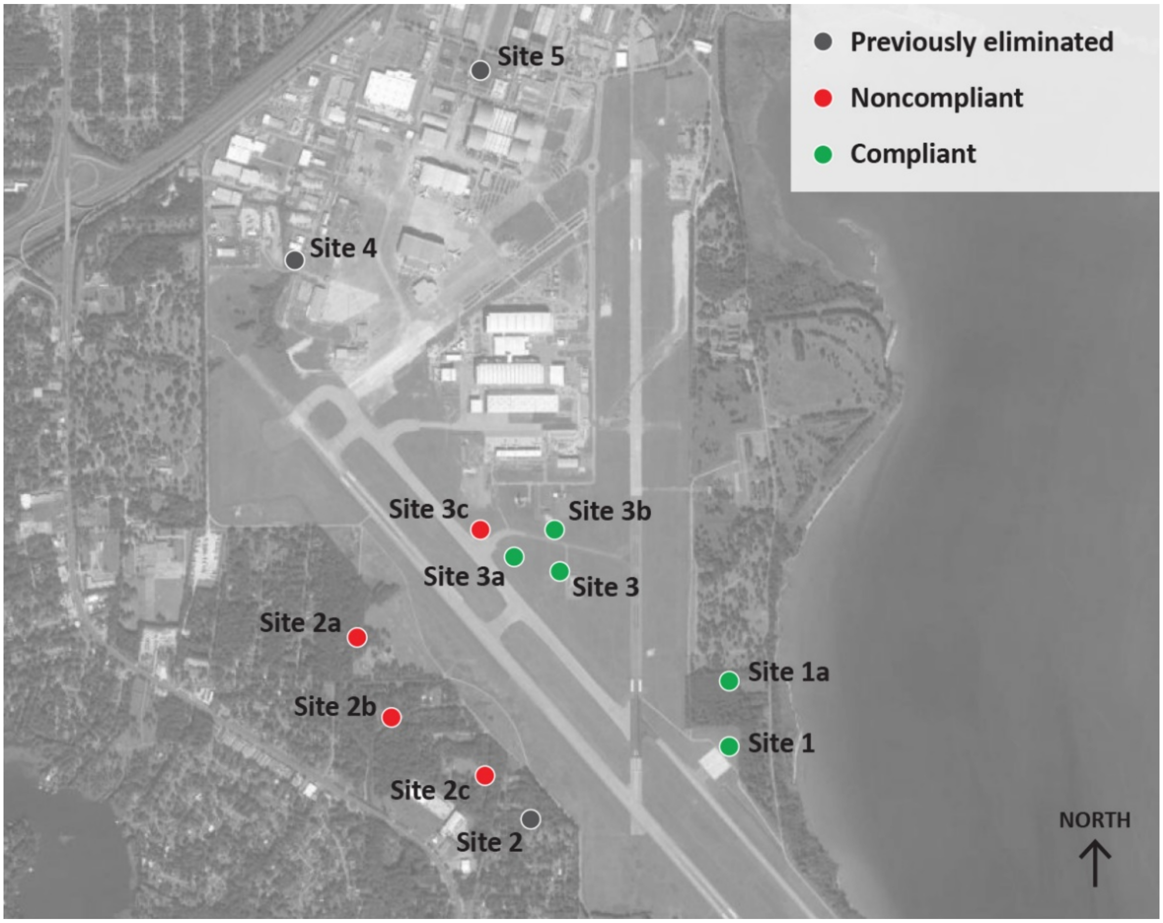
SITES WITH GOOD VISIBILITY TO BOTH RUNWAYS



Source: LeighFisher, July 2020

Figure 7.2 Shadow Study

Mobile Downtown Airport



Source: LeighFisher, June 2020.

Figure 7.3: Shadow Study Result

7.3 Line of Sight Study

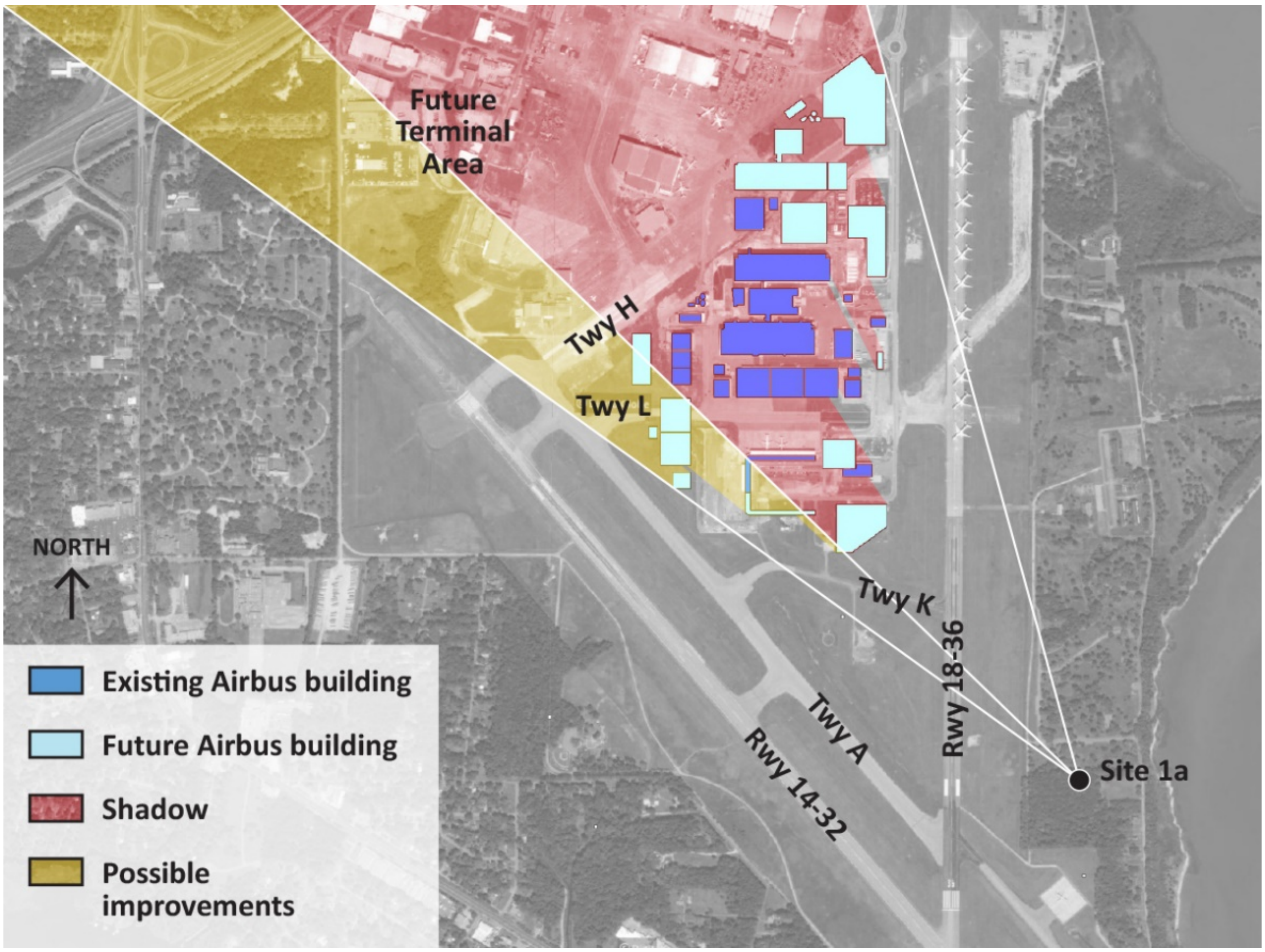
As a result of the shadow study, the planning team selected Sites 1a, 2c, 3a, and 3b as the potential future ATCT sites, and those sites were included in a line of sight analysis, conducted with a SketchUp 3D model. The planning team used the maximum building heights provided by Airbus in their expansion study (dated May 12, 2020) to model existing and future development. The maximum tower height was set at 146.8 feet above ground level (AGL), and the maximum controller eye height was at 116.8 feet AGL to avoid penetrating the horizontal surface.[3] The planning team also explored different controller eye heights to identify an elevation that could improve obstructed views at the four potential sites.

Some sites had visibility issues with Taxiway L and the future terminal apron. As such, the planning team recommends making Taxiway L a non-movement area, because it will be blocked by the future Airbus hangars. Based on discussion with the MAA, the future terminal apron will also become a non-movement area. Therefore, the line of sight study primarily focuses on visibility improvement to other movement areas at the Airport.

[3] Site ground level (elevation) was taken at the closest point on the runway centerline.

7.3.1 Site 1a

Site 1a is located off-Airport approximately 1,600 feet northeast of the Runway 36 threshold and 900 feet north of the existing aircraft engine run-up compass calibration pad. As shown in Figure 7.4, the visibility of the site has no obstruction to Runway 14/32, Runway 18/36, most of Taxiway A, and Taxiway K. On the other hand, Taxiway A near the Runway 14 threshold, Taxiway H, Taxiway L, and the future terminal apron are in the shadow.

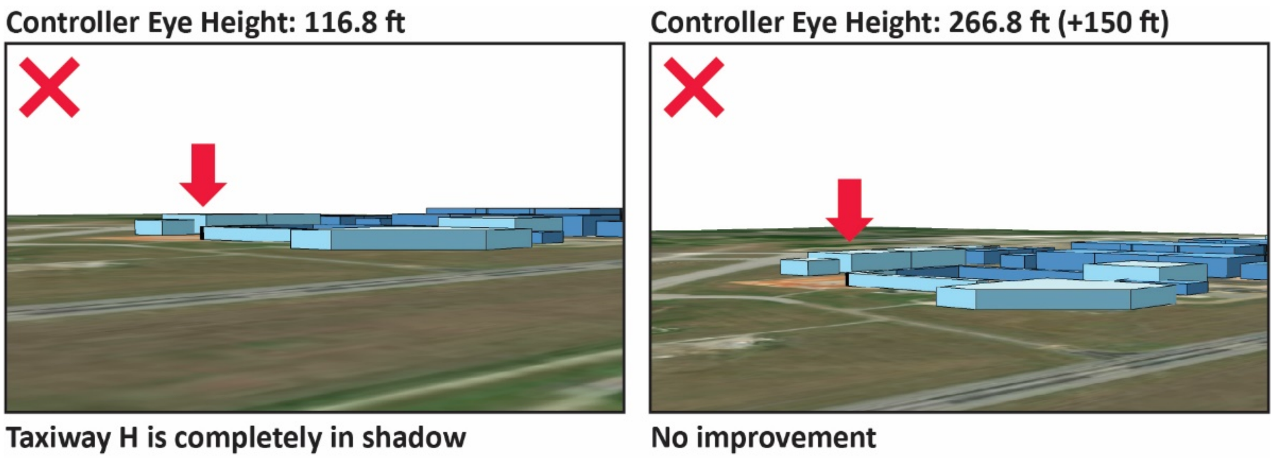


Source: LeighFisher, June 2020.

Figure 7.4: Shadow Study at Site 1a

Next, the planning team analyzed the controller eye height in the 3D model in an attempt to minimize the shadow area highlighted in yellow. As shown in Figure 7.5, even if the ATCT eye height is raised 150 feet AGL, Taxiway H is still in the shadow area.

This site cannot meet the visual performance criteria and requires land acquisition and permitting. Therefore, Site 1a is not recommended.



Source: LeighFisher, June 2020.

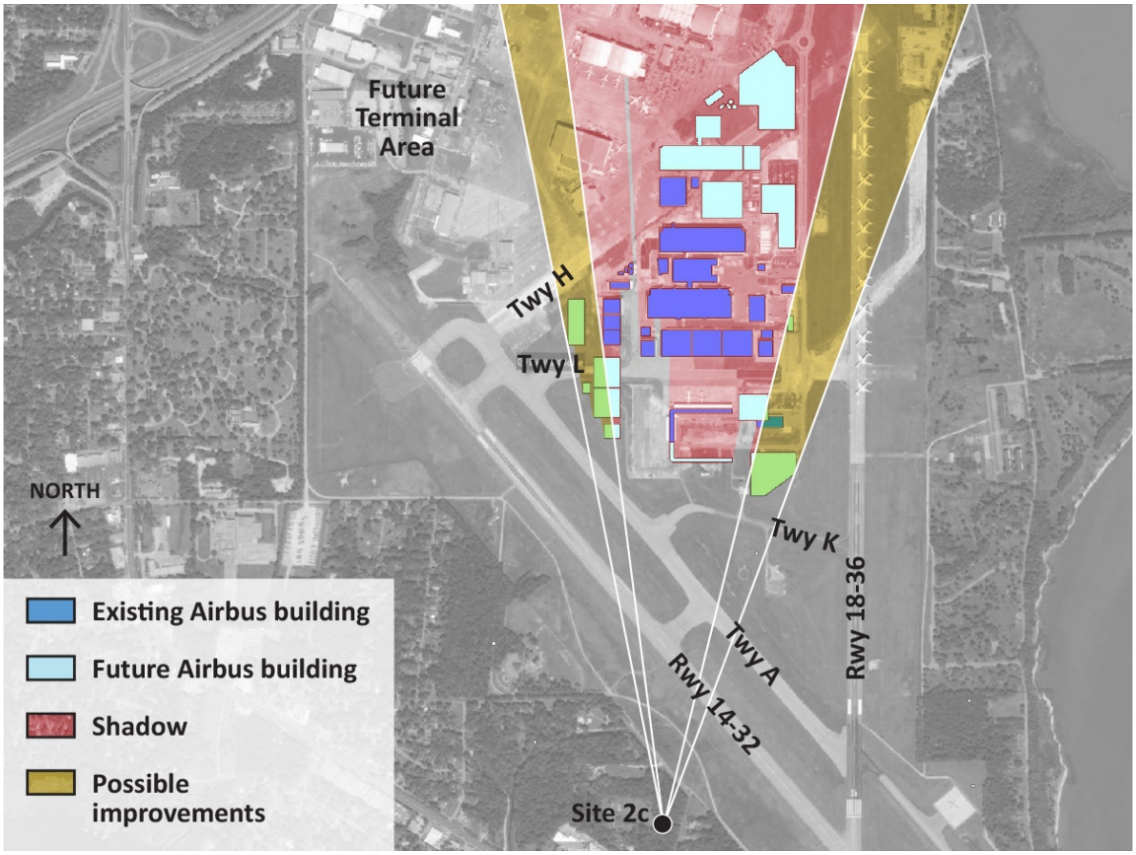
Figure 7.5: Line of Sight Study at Site 1a

7.3.2 Site 2c

Site 2c is located off-Airport approximately 1,900 feet west of the Runway 36 threshold. The shadow study for this site (see Figure 7.6) indicates that there is no visibility issue in the movement areas except in the northern half of Runway 18/36.

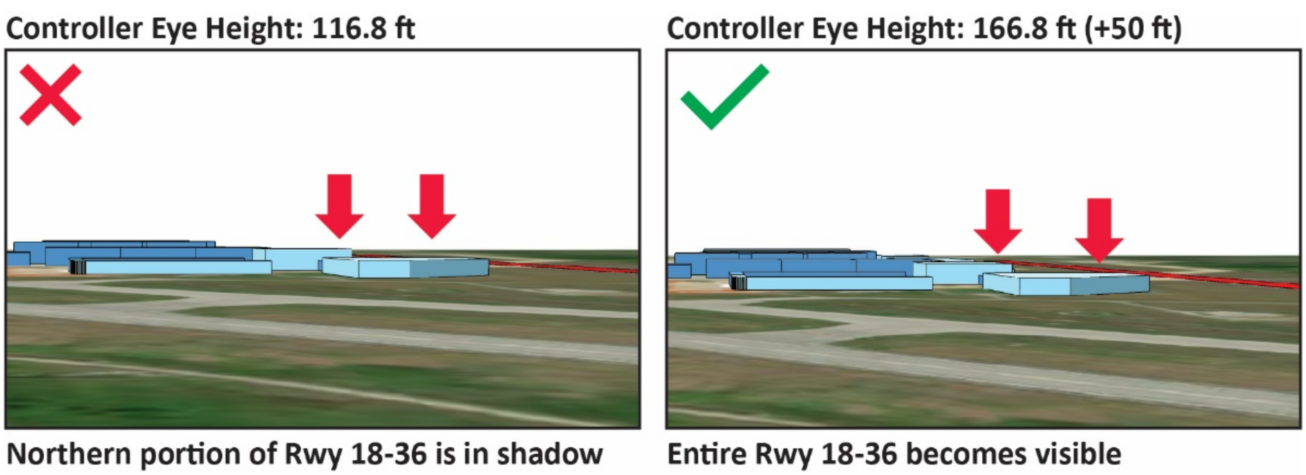
Using the 3D model, the planning team adjusted the controller eye height to improvement visibility on Runway 18/36 (see Figure 7.7). When the controller eye height was raised to 166.8 feet AGL (50 feet higher than the established maximum controller eye height), the entirety of Runway 18/36 became visible.

Site 2c and eventual site access would require land acquisition and permitting. Furthermore, because the tower height must be at least 166.8 feet AGL to have clear visibility, further discussion with the FAA is highly recommended.



Source: LeighFisher, June 2020.

Figure 7.6: Shadow Study at Site 2c



Source: LeighFisher, June 2020.

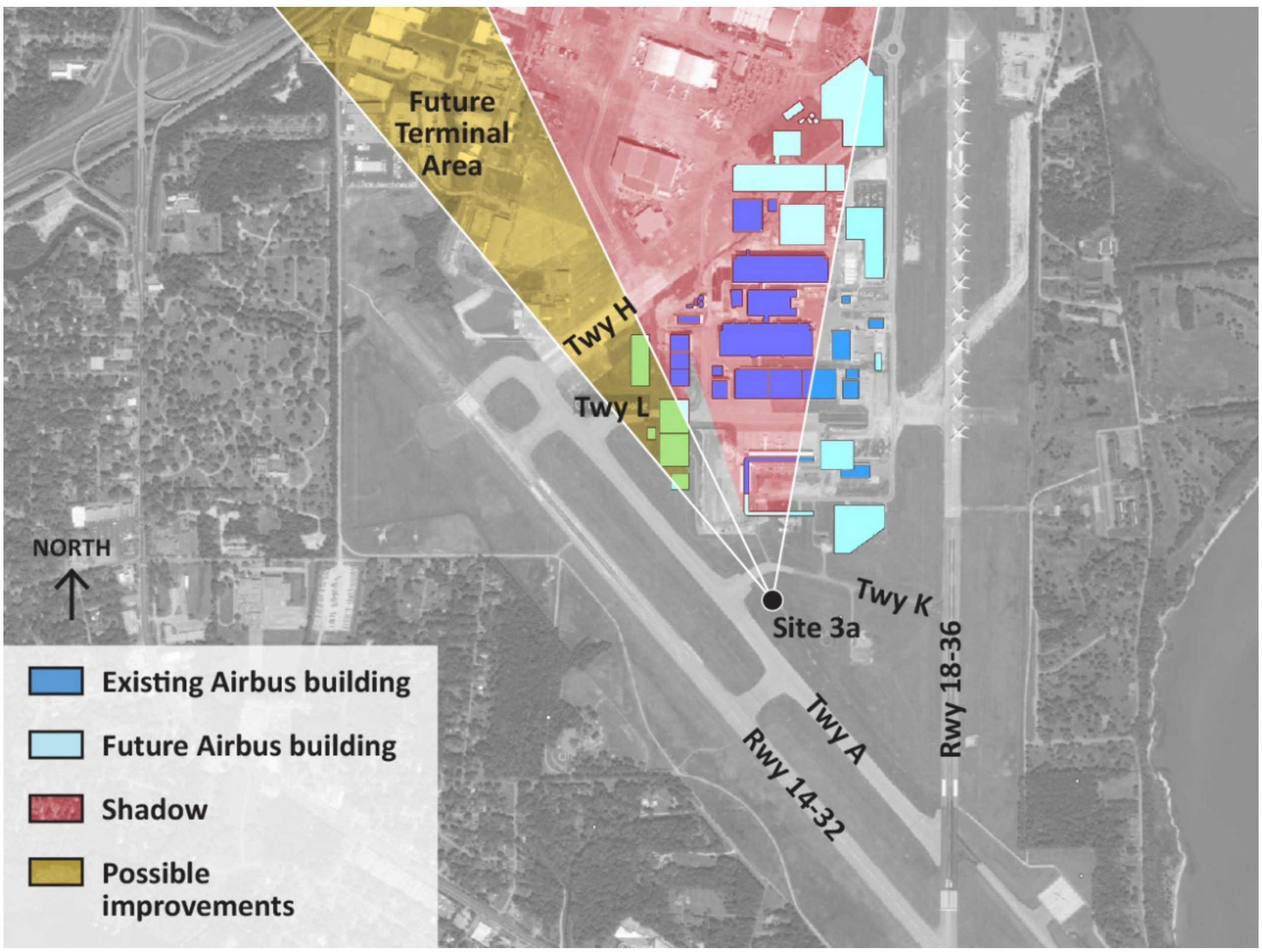
Figure 7.7: Line of Sight Study at Site 2c

7.3.3 Site 3a

Site 3a is located within the Airport property boundary near the intersection of Taxiway A and Taxiway K; however, site access would require air traffic control staff and controllers to cross Taxiway K.

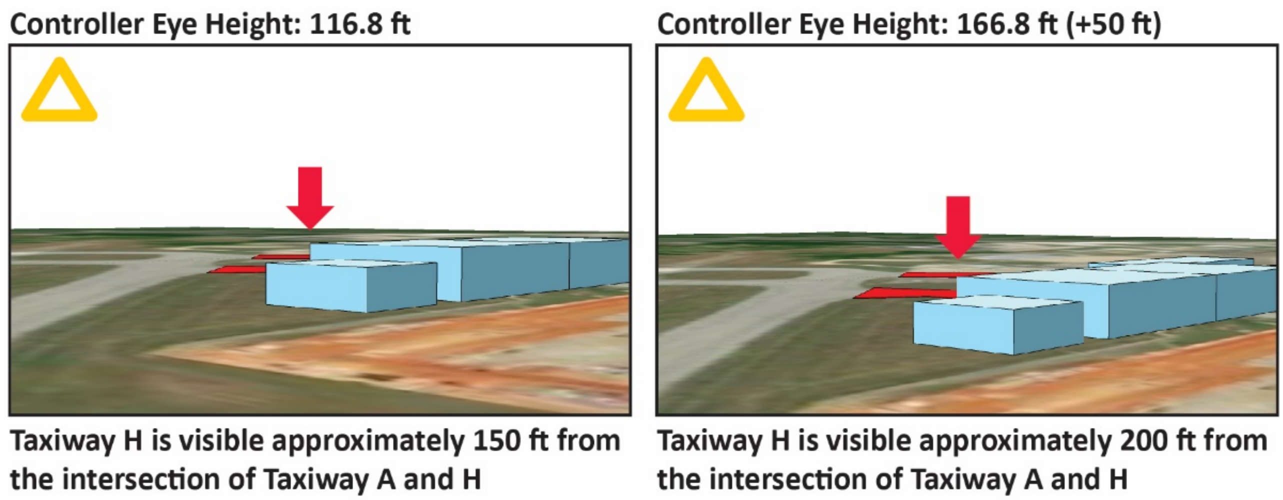
Figure 7.8 shows that a controller would have clear visibility of Runway 14/32, Runway 18/36, Taxiway A, and Taxiway K. However, most of Taxiway H, Taxiway L, and the future terminal apron would potentially be in the shadow from the ATCT cab.

The 3D model confirms that a controller has visibility of Taxiway H, approximately 150 feet from the intersection of Taxiway A and Taxiway H (see Figure 7.9). Using the 3D model, the planning team raised the eye height of the tower to 166.8 feet above-ground to see if improvements could be made to the visibility of Taxiway H. Unfortunately, the increase in height only added 50 feet of visibility to the taxiway. Therefore, raising the tower height is not financially viable.



Source: LeighFisher, June 2020.

Figure 7.8: Shadow Study at Site 3a



Source: LeighFisher, June 2020.

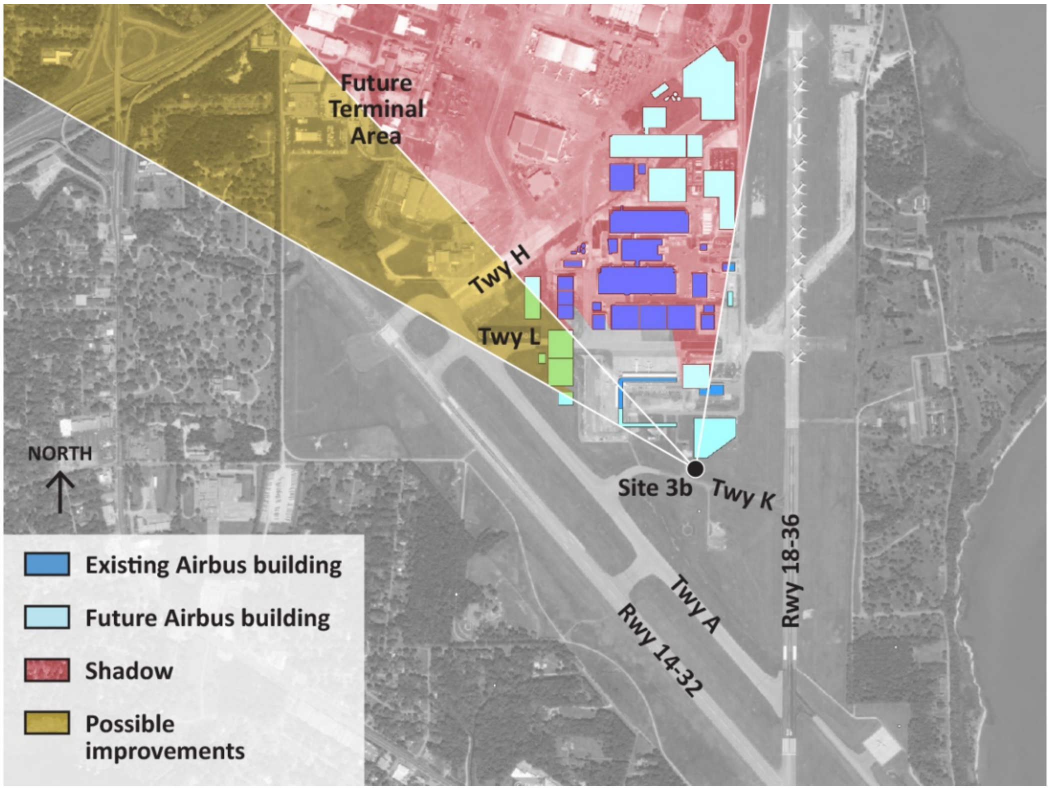
Figure 7.9: Line of Sight Study at Site 3a

7.3.4 Site 3b

Site 3b is located north of Taxiway K between the existing Airbus leasehold boundary and the TOFA.

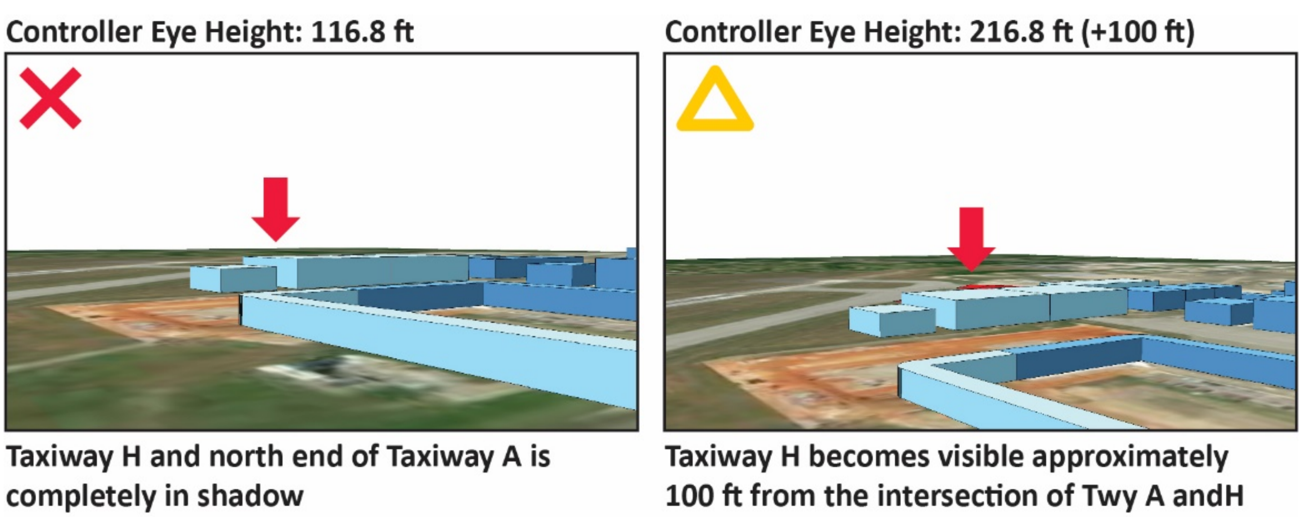
As shown in Figure 7.10, there is no visual obstruction to Runway 14/32, Runway 18/36, most of Taxiway A, and Taxiway K from this site. The northern tip of Taxiway A, Taxiway H, Taxiway L, and the future terminal apron are, however, in the shadow.

The planning team ran several eye-height tests in the 3D model to improve the visibility to Taxiway A and Taxiway H. When the eye height was raised to 216.8 feet AGL, Taxiway H became visible approximately 100 feet from the intersection of Taxiway A and H (see Figure 7.11). However, a small portion of Taxiway A was still in the shadow. As shown in Figure 7.12, in order to provide sufficient visibility to Taxiway H, the eye height would need to be raised to 266.8 feet AGL, which is not feasible. Therefore, Site 3b is not recommended.



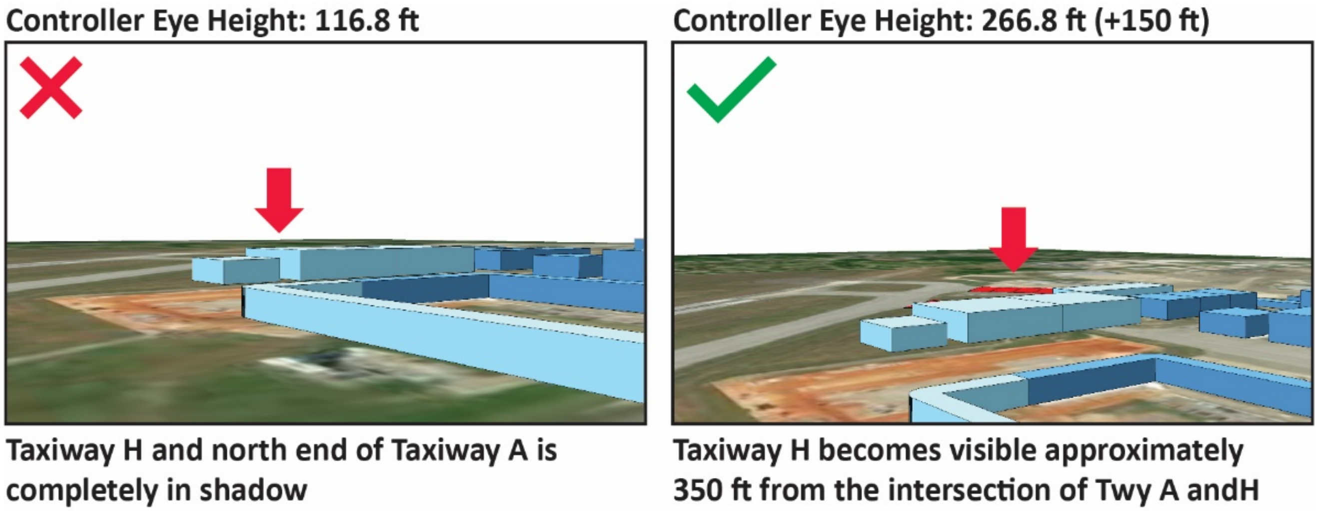
Source: LeighFisher, June 2020.

Figure 7.10: Shadow Study at Site 3b



Source: LeighFisher, June 2020.

Figure 7.11: Line of Sight Study at Site 3b



Source: LeighFisher, June 2020.

Figure 7.12: Additional Line of Sight Study at Site 3b

7.4 Identification of a Preferred Concept

Table 7.1 summarizes the site characteristics and the analysis of four potential sites.

Based on its visual performance, Site 3a was identified as the preferred alternative for the future ATCT at BFM. If a higher tower is not feasible, the planning team recommends accepting 150-foot visibility on Taxiway H and making the rest of the taxiway a non-movement area.

Site 2c is the runner-up. However, site acquisition would be required, and further study on possible environmental analysis and discussion with the FAA are strongly recommended.

Site 3a is south of existing Taxiway K. Under the current configuration, air traffic controllers and ARFF personnel must cross Taxiway K in order to access the new ARFF and ATCT facilities. Since the ATCT must have both airside and landside access, the existing Taxiway K should be converted to a landside access road and a replacement Taxiway K should be constructed south of the maintenance facility and electrical vault.

Coordination with the FAA and ATC staff at the Airport is still ongoing to determine an optimal location for the future ATCT.

Table 7.1: ATCT Site Comparison Chart

Item Description	Site 1a	Site 2c	Site 3a	Site 3b
Latitude	30°37'25.43"N	30°37'12.96"N	30°37'41.12"N	30°37'44.21"N
Longitude	88° 3'43.84"W	88° 4'19.21"W	88° 4'15.52"W	88° 4'9.18"W
On/off Airport Property	Off	Off	On	On
Controller Eye Level (AGL)	116.8'	116.8'	116.8'	116.8'
ATCT Height (incl. antennas) (AGL)	146.8'	146.8'	146.8'	146.8'
ATCT Orientation Direction	TBD	TBD	TBD	TBD
Maximum Distance to Farthest Movement Area Point	6,751'	8,135'	6,455'	6,450'
Critical Key Point	Runway 18 End	Runway 18 End	Runway 32 End	Runway 32 End
Impacts to Instrument Approach Procedures (TERPS)	FAA NASWATCH Study Required	FAA NASWATCH Study Required	FAA NASWATCH Study Required	FAA NASWATCH Study Required
Part 77 Impacts	Transitional Surface Runway 18/36 penetrated by 18.2 Obstruction Light Required	Transitional Surface Runway 18/36 penetrated by 46.8 Obstruction Light Required	Transitional Surface Runway 18/36 penetrated by 86.2 Obstruction Light Required	Transitional Surface Runway 18/36 penetrated by 34.2 Obstruction Light Required
Impacts to NAVAIDS	FAA NASWATCH Study Required	FAA NASWATCH Study Required	FAA NASWATCH Study Required	FAA NASWATCH Study Required
ATCTVAT Object Discrimination Pass/Fail (Front View, Dodge Caravan)	PASS	PASS	PASS	PASS
ATCTVAT Object Discrimination Pass/Fail (Front View, C-172)	PASS	PASS	PASS	PASS
Line of Sight Angle of Incidence at Max. Distance (0.8 deg. min.)	0.95	0.81	1.09	1.10
Shadowing	Taxiway A near Rwy 14 threshold, Taxiway H	Northern half of Rwy 18-36	Portion of Taxiway H	Taxiway H, Taxiway A & A1
Access to ATCT Site	New (connect to Perimeter Drive)	New (connect to Cedar Point Road)	New (across Taxiway K)	New (connect to Airbus Way)
Environmental Issues	Site preparation to develop building site and access road will require permitting	Site preparation to develop building site and access road will require permitting	None	None
Other Potential Issues	Site acquisition	Site acquisition	None	None

Source: LeighFisher, June 2020.

8. AIRCRAFT RESCUE AND FIREFIGHTING (ARFF) FACILITIES

The existing ARFF facility at BFM is located on the airfield between Runway 14/32 and Runway 18/36; however, since the existing facility is located within the Airbus leasehold, it must be relocated. The planning team developed four alternative concepts for the relocation of the ARFF station at BFM. As shown in Chapter 3, Section 7.1, the ARFF station at BFM must satisfy the requirements of an Index B classification, which is described in Table 8.1.

Table 8.1: ARFF Index B Requirements

ARFF Index	Aircraft Length (feet)	Required # of Vehicles	Minimum Requirements of Extinguishing Agent
B	90 ≤ X < 126	1	500 lbs of sodium-based dry chemical or halon 1211 or clean agent; or clean agent and 1,500 gallons of water and the commensurate quantity of AFFF for foam production
		2	One vehicle carrying the extinguish agents as specified for Index A; and one vehicle carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons
Source: LeighFisher, June 2020.			

8.1 Preliminary Sites

The location of an ARFF station must meet or exceed FAR Part 139.319[4] ARFF vehicle response time requirements for certification purposes. In general, at least one required aircraft rescue and firefighting vehicle must be able to reach the midpoint of the farthest runway within 3 minutes from the time of the alarm. ARFF sites should provide immediate, straight access to the airfield network, as well as unimpeded access routes with a minimum of turns to the airfield network and aircraft aprons. Figure 8.1 depicts the potential sites considered for the relocation of the BFM ARFF station.

Site 1 is located within the Airport property boundary near the intersection of Taxiway K and Runway 18/36. Its site access is not ideal because the ARFF staff and controllers must cross Taxiway K. Site 1a is a modified version of Site 1. It is located directly north of Taxiway K from Site 1 and allows access without crossing Taxiway K. Site 2 is located off-Airport, east of Runway 18/36. Lastly, Site 3 is located on Airport property, west of Runway 14/32 near its midway point.

[4] FAR Part 139.319, Aircraft Rescue and Firefighting: Operational Requirements, https://www.govinfo.gov/content/pkg/CFR-2012-title14-vol3/pdf/CFR-2012-title14-vol3-sec139-319.pdf.

Source: LeighFisher, 2020

Figure 8.1: Potential ARFF Sites

8.2 Methodology

ARFF vehicle response time is obtained by adding the turn-out time (activation time) to the travel time. The turn-out time (activation time) is the time from when the alarm is struck to when the first ARFF apparatus begins to move. The planning team obtained travel time using a computer analysis to simulate the ARFF vehicles' travel route and travel time. Esri ArcMap 10.6.1 was used to model the airfield configuration, including airfield service roads and the airfield network. The airfield network was simulated using actual centerlines of each element, and different speeds were allocated based on the airfield network. ARFF vehicles speeds were assumed to attain 40 mph in a straight line and 15 mph in turns.

Source: LeighFisher, 2020

Figure 8.2: ARFF Sites Analysis

8.3 Site Comparison

Table 8.2 summarizes the site characteristics and the planning team's analysis of the four potential sites.

Table 8.2: ARFF Site Comparison Chart

Item Description	Site 1	Site 1a	Site 2	Site 3
Latitude	**30°37'38.87"N**	30°37'44.56"N	30°37'31.19"N	30°37'20.80"N
Longitude	**88°4'3.82"W**	88° 4'2.80"W	88° 3'45.63"W	88° 4'18.66"W
On/off Airport Property	**On**	On	Off	On
Access to ARFF Site	**Connect to Airbus Way**	Connect to Airbus Way	New Access Required	New Access Required
Environmental Issues	**None**	None	Site preparation to develop building site and access road will require permitting	None
Other Potential Issues	**None**	None	Site Acquisition	Part 77 Transitional Penetration
Time to:				
Runway 14 End	**02:22**	02:16	03:34	01:48
Runway 18 End	**02:03**	01:56	02:30	03:41
Runway 32 End	**02:52**	02:42	02:47	02:03
Runway 36 End	**01:24**	01:15	01:20	01:29
Terminal Building	**03:26**	03:20	04:38	03:52
Distance to:				
Runway 14 End	**5,207**	5,152	9,523	5,109
Runway 18 End	**5,823**	5,764	6,938	10,493
Runway 32 End	**6,827**	6,773	6,053	5,449
Runway 36 End	**3,438**	3,388	2,664	2,711
Terminal Building	**7,144**	7,100	9,267	8,015

Note: Time to reference point does not include Activation Time. The speed of the trucks is assumed to be 40 mph in straight line and 15 mph in the turns.
Source: LeighFisher, June 2020.

8.4 Identification of a Preferred Concept

As shown in Table 8.2, the preferred site is Site 1, as this site is on Airport property, does not require land acquisition, and is centrally located.

As mentioned in Section 7.4, under the current configuration, ARFF personnel must cross Taxiway K in order to access the new ARFF facility. To provide landside access to the site, the existing Taxiway K should be converted to a landside access road and a replacement Taxiway K should be constructed south of the maintenance facility and electrical vault.

9. MILITARY USE AREAS

The U.S. Army Reserve Center area is adjacent to the airfield but does not use the airfield. As discussed in Section 2.2.2, the area impedes the development of a full-length parallel taxiway on the east side of Runway 18/36. When its lease ends, alternatives for the relocation of the Army Reserve, either within the Aeroplex or to MOB, should be assessed in more detail. In the short-term, the MAA should work with the Army Reserve to modify the lease line/fence to clear the Runway 18/36 ROFA.

Other military operations at BFM are transient and based at other facilities. While they require use of the airfield, no additional physical facilities will need to be developed to support their use.

10. AIRCRAFT WASH RACK

To allow for the expansion of the Airbus leasehold, the MAA relocated the Airport's wash rack to just north of the interim terminal building on the passenger terminal apron. However, the interim wash rack at BFM is located within the proposed passenger terminal area. To accommodate the new passenger terminal complex, a permanent location for the wash rack is needed. Working with the MAA, the planning team identified a new permanent location for the wash rack between VT MAE Hangar 8-1 and 8-2 and Continental Building 96 that will be returned to the MAA, along the north edge of the terminal apron area. VT MAE is one of the primary users of the wash rack, and one of the benefits of this location is its close proximity to their facilities.

11. AIR CARGO FACILITIES

As detailed in Section 3, all commercial flights operating out of the temporary terminal building will eventually be relocated to the new passenger terminal complex at BFM. The temporary terminal building, opened in May 2019, is a retrofitted 22,800-square-foot facility that is housed inside a larger 50,000-square-foot building. To make use of this space, the temporary terminal building should be converted to a belly cargo facility, including a parking and loading area. The new belly cargo facility will be able to accommodate any cargo that the commercial airlines operate and will be serviced by a new cargo access road via Perimeter Road that runs south of the new rental car facility.

If the colocation of the future belly cargo facility in the temporary passenger terminal building is not feasible, the planning team recommends building a new facility near the future passenger terminal to accommodate a belly cargo office and warehouse.

Finally, Chapter 3 indicated that belly cargo at the Airport would only need approximately 3,000 square feet of space through PAL 4. Unless there is significant growth in cargo activity at BFM over the planning period, the 50,000-square-foot facility will likely be more space than is needed for belly cargo. As such, another potential use for the interim terminal building could be additional space for airport maintenance facilities.

Appendix A: Facility Requirements Summary

Functional Element	Estimated total requirements 2025	2030	2035	2040	Period-over-period requirement 2025 (Opening Day)	2030	2035	2040
BASIS FOR REQUIREMENTS (DEMAND FORECASTS)								
Total annual passengers	1,046,000	1,176,500	1,229,000	1,281,500	n/a	n/a	n/a	n/a
Aircraft operations	82,830	84,860	85,490	86,110	n/a	n/a	n/a	n/a
AIRFIELD								
Number of Runways	1 primary plus 1 crosswind	1 primary plus 1 crosswind	1 primary plus 1 crosswind	1 primary plus 1 crosswind	n/a	n/a	n/a	n/a
Critical Aircraft	A-300	A-300	A-300	A-300				
Runway Length (feet)								
Runway 14/32	9,618	9,618	9,618	9,618	n/a	n/a	n/a	n/a
Runway 18/36	7,800	7,800	7,800	7,800	n/a	n/a	n/a	n/a
Instrument Approach Capability	CAT II/III	CAT II/III	CAT II/III	CAT II/III	n/a	n/a	n/a	n/a
PASSENGER TERMINAL COMPLEX								
Aircraft gates and parking								
Total gates	8	8	8	8	n/a	0	0	0
Remote/RON parking	2	2	2	2	n/a	0	0	0
Holdrooms (area in square feet)								
Total holdroom area	7,119	7,447	7,447	7,447	n/a	328	0	0
Airline Check-in							0	
Number of processors					n/a	0	0	0
Agent counters	5	6	6	6	n/a	1	0	0
Kiosks	3	3	4	4	n/a	0	1	0
Bag Drops	2	2	2	2	n/a	0	0	0
Total	10	11	12	12	n/a	1	1	0
Lobby queue area (square feet)	5,644	5,644	5,644	5,644	n/a	0	0	0
Passenger Security Screening							0	0
Number of screening lanes	3	4	4	4	n/a	1	0	0
Security queue area (square feet)	3,739	4,985	4,985	4,985	n/a	1,246	0	0
Baggage Security Screening							0	0
Number of primary EDS machines	2	2	2	2	n/a	0	0	0
Number of OSR Stations	1	1	1	1	n/a	0	0	0
Number of ETD Units	1	1	1	1	n/a	0	0	0
Total area (square feet)	1,740	1,740	1,740	1,740	n/a	0	0	0
Outbound Baggage Make Up							0	0
Total make up area (square feet)	5,900	5,900	5,900	5,900	n/a	0	0	0
Inbound Baggage Handling							0	0
Total offload frontage (linear feet)	60	60	60	60	n/a	0	0	0
Baggage Claim					n/a	0	0	0
Total presentation frontage (linear feet)	200	200	200	200		0	0	0
Total area for claiming baggage (square feet)	12,000	12,000	12,000	12,000		0	0	0
Concessions						0	0	0
Total area (square feet)	10,000	10,000	10,000	10,000	n/a	0	0	0

Functional Element	Estimated total requirements				Period-over-period requirement			
	2025	2030	2035	2040	2025 (Opening Day)	2030	2035	2040
GROUND TRANSPORTATION AND PARKING								
Public, employee, and commercial parking								
Low Scenario (spaces)	2,400	2,600	2,600	2,600	n/a	200	0	0
High Scenario (spaces)	3,000	3,400	3,400	3,500	n/a	400	0	100
Rental car facilities- Low (square feet)						10,000	4,000	5,000
Low Scenario (square feet)	84,000	94,000	98,000	103,000	n/a	19,000	8,000	8,000
High Scenario (square feet)	157,000	176,000	184,000	192,000	n/a	0	0	0
Roadways (number of lanes)								
Broad St E of Michigan Ave eastbound- Link ID 6	2	2	2	2	n/a	0	0	0
Broad St E of Michigan Ave westbound- Link ID 6	1	2	2	2	n/a	1	0	0
I-10 westbound on ramp- Link ID 10	1	2	2	2	n/a	1	0	0
I-10 eastbound on ramp- Link ID 11	3	3	3	3	n/a	0	0	0
I-10 eastbound exit right turn lane- Link ID 12	3	3	3	3	n/a	0	0	0
Curbside								
Loading & unloading (linear feet)	625	675	675	725	n/a	50	0	50
Roadway (lanes)	2	2	2	2	n/a	0	0	0
Commercial vehicle facilities								
Parking stalls	49	55	58	30	n/a	6	3	-28
Square feet	18,000	20,000	21,000	22,000	n/a	2,000	1,000	1,000
AIR CARGO							0	0
Belly cargo total area (square feet)	2,696	2,785	2,841	2,895	n/a	89	56	54
GENERAL AVIATION							0	0
Parcel area (acres)	3	3	3	3	n/a	0	0	0
Apron area (acres)	7	7	7	7	n/a	0	0	0
Total area (acres)	10	10	10	10	n/a	0	0	0
AIRPORT AND AIRLINE SUPPORT								
Aircraft Rescue and Firefighting (ARFF) Facilities								
Building size (square feet)	9,000	9,000	9,000	9,000	n/a	0	0	0
Number of vehicles	2	2	2	2	n/a	0	0	0
Air Traffic Control Tower (acres)	3	3	3	3	n/a	0	0	0
Airport Administration Facilities (square feet)	22,906	24,240	25,574	26,908	n/a	1,334	1,334	1,334
Fuel Storage								
Quantity (gallons)	116,000	117,600	117,900	118,300	n/a	1,600	300	400
MRO Facilities (acres)	55	56	57	58	n/a	1	1	1
Ground Support Equipment (GSE)					n/a	0	0	0
Total staging and storage area (square feet)	27,700	28,116	28,200	28,285				
Airport Maintenance Facility (square feet)	26,700	26,700	26,700	26,700	n/a	0	0	0
Maintenance building (square feet)	8,131	8,172	8,180	8,188	n/a	41	8	8
Maintenance yard (square feet)	20,064	20,164	20,184	20,204	n/a	100	20	20
Utilities								
Terminal peak hour water usage (gal/hr)	24,062	24,428	24,590	24,758	n/a	366	162	168
Terminal electrical transformer (kVA)	1,500	1,500	1,500	1,500	n/a	0	0	0
ConRAC electrical transformer (amps)	200-400	200-400	200-400	200-400	n/a	0	0	0
Natural gas consumption rate (cubic ft/hour)	25,000	25,000	25,000	25,000	n/a	0	0	0

Leigh|Fisher

in association with

Hanson Professional Services, Inc.

Corporate Environmental Risk Management, LLC

Jacobsen|Daniels

MPACT Public Affairs Consulting

Quantum Spatial, Inc.

TECHNICAL MEMORANDUM No. 5 – DEVELOPMENT PLAN

MASTER PLAN

Mobile Downtown Airport

Prepared for

Mobile Airport Authority
Mobile, Alabama

July 2020

Mobile Airport Authority

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ACRONYMS AND ABBREVIATIONS

Term	Definition
AIP	Airport Improvement Program
ARFF	Aircraft Rescue and Fire Fighting
ATCT	Airport Traffic Control Tower
CPI-U	Consumer Price Index for All Urban Customers
FBO	Fixed Base Operator
ILS	Instrument Landing System
MAA	Mobile Airport Authority
MALSF	Medium Intensity Approach Lighting System with Sequenced Flashing Lights
MOB	Mobile Regional Airport
MRO	Maintenance, Repair, Overhaul
PAL	Planning Activity Level
ROFA	Runway Object Free Area
RVR	Runway Visibility Range

1. BACKGROUND

Following the analysis of alternatives and the identification of preferred concepts, the planning team assembled a recommended development phasing plan for Mobile Downtown Airport (BFM or the Airport) for the Mobile Airport Authority (MAA). The development plan addresses each of the functional areas that were evaluated and analyzed in the previous chapters and prepares high-level land use drawings of the recommended plan at each planning activity level (PAL). Table 1.1 shows the aviation demand associated with each PAL. The recommended development plan is organized by PALs rather than years to allow the MAA to better tie development to user needs.

Although the planning team recommends specific projects that should be completed for each PAL, the development plan should not be seen as a strict framework for implementation. Rather, the separate phases described in this report should act as a set of guiding principles for the future development of the Airport. As such, the following sections provide a general outline and land use plan for the Airport throughout the planning period. Figure 1.1, which depicts the existing land uses and boundaries at the Airport was used as the basis for the development plan and the associated drawings.

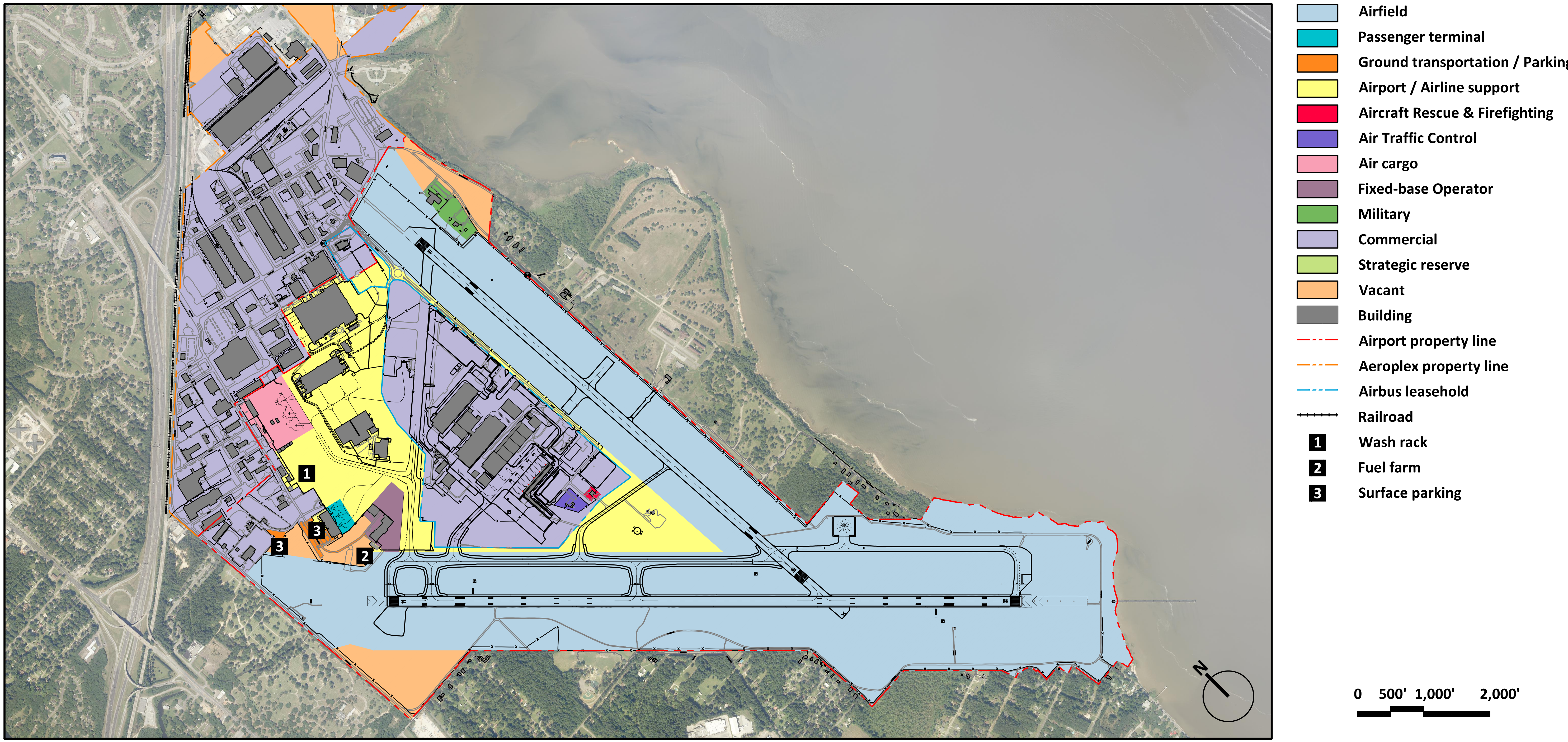
In addition to a recommended phasing and development plan, this chapter also includes preliminary projected cost estimates for the major projects associated with each PAL. Near-term costs have been prepared in greater detail, while the longer-term costs should be viewed as magnitude of cost estimates. Cost estimates were prepared using 2020 dollars, however, the Consumer Price Index for All Urban Customers (CPI-U) should be used to project 2020 dollars into future years. Furthermore, future cost estimates might be impacted by local conditions and other projects occurring in the same area.

Funding for the Master Plan projects is anticipated to have several sources, ranging from FAA grants to private investment. The *Financial Plan* chapter will address the likely funding sources in greater detail.

Table 1.1: Aviation Demand Forecasts

	Baseline (2018)	PAL 1 (2025)	PAL 2 (2030)	PAL 3 (2035)	PAL 4 (2040)
Enplaned Passengers					
MOB (a)	303,871	-	-	-	-
BFM	-	523,000	588,250	614,500	640,750
Aircraft Operations					
Commercial					
MOB	13,986	-	-	-	-
BFM	4,468	24,360	26,180	26,600	27,000
General Aviation					
MOB	9,253	9,190	9,310	9,450	9,580
BFM	14,359	14,800	15,010	15,220	15,440
Military					
MOB	48,373	49,970	49,970	49,970	49,970
BFM	45,267	43,670	43,670	43,670	43,670
Total Aircraft Operations					
MOB	**71,612**	**59,160**	**59,280**	**59,420**	**59,550**
BFM	**64,094**	**82,830**	**84,860**	**85,490**	**86,110**

Sources: Historical—Mobile Airport Authority; OAG Aviation Worldwide Ltd., *OAG Analyser* database, accessed August 2019.
Forecast—LeighFisher, October 2019.
(a) Enplanements/operations are shown for both BFM and MOB to capture the total Mobile market demand



Base Map Source: Hanson Professional Services, June 2020
Land Use Overlay: LeighFisher, July 2020

Figure 1.1: Existing Development Plan

Mobile Downtown Airport

2. PLANNING ACTIVITY LEVEL 1

The development plan phasing for PAL 1 is the most intensive of the four planning activity levels. In PAL 1 the planning team recommends the construction of the new passenger terminal complex, parking facilities, and terminal access roadway, in addition to expansion of the terminal apron and retrofitting of other existing facilities. The various projects associated with PAL 1 are depicted graphically in Figure 2.2 and are summarized in the following sections.

2.1 Passenger Terminal Complex

The development of the new passenger terminal at BFM is the primary focus of PAL 1. The new terminal development will include required environmental study, design, site preparation, and construction activities. Specifically, the planning team recommends that a total of 112,000 ft^2 of the new terminal building, along with 5 aircraft parking gates, be built in PAL 1. The terminal building square footage also includes space for MAA administrative offices.

To support the construction of the terminal and supporting facilities, a portion of Rabby Creek that starts on the site will need to be enclosed. In PAL 1, the MAA should also work with tenants displaced by the construction of the new passenger terminal to find suitable facilities for their relocation.

The projected cost estimates for the new passenger terminal complex and apron reconstruction are summarized in Table 2.1.

2.2 Airfield

The planning team recommends the commencement of major projects related to the airfield in PAL 1. Most importantly, by PAL 1, Runway 14/32 will undergo rehabilitation as part of an $8 million FAA grant. In order to increase the approach minimums at the Airport, Runway 14/32 should be upgraded from a CAT I instrument landing system (ILS) to a CAT II/III ILS. A CAT II ILS can provide minimums as low as a 100-foot ceiling and a runway visibility range (RVR) of 1,200 feet and a CAT III as low as 600 RVR with suitably equipped aircraft and appropriately qualified crews, thus maximizing the accessibility of BFM. Additionally, in PAL 1 Runway 14/32 edge lighting should be replaced. Cost estimates for these projects are detailed in Table 2.1.

2.3 Ground Transportation and Parking

Along with the construction of the new passenger terminal complex, several improvements to the ground transportation and parking facilities at BFM will need to be made by PAL 1. For the opening day of the new passenger terminal building, the planning team recommends the construction of three new surface parking lots adjacent to the terminal providing at least 12 acres of parking. The size of the new surface parking lots assumes continued use of the existing and expanded auto parking at the interim terminal. However, as passenger traffic at BFM grows, approximately 5 acres of surface parking across from the future terminal will be replaced with a parking garage.

Additionally, to provide access to the passenger terminal building, a new terminal access loop road, originating east from Perimeter Road, must also be built in PAL 1. Other key roadway projects that the planning team recommends for PAL 1 are the construction of a new access road to the temporary terminal area and improvements on Perimeter Road from Michigan Avenue including signage and other aesthetics to enhance the terminal entrance. Finally, the existing Penske property should be retrofitted to accommodate a new rental car facility for the Airport. Projected costs for ground transportation and parking projects are detailed in Table 2.1.

2.4 Additional Airport Areas

Several other projects should also be completed in PAL 1 to facilitate the transfer of commercial traffic from Mobile Regional Airport (MOB) to BFM. These include repurposing the interim terminal building, adding fuel storage tanks, relocating the wash rack, and extending Airport utilities.

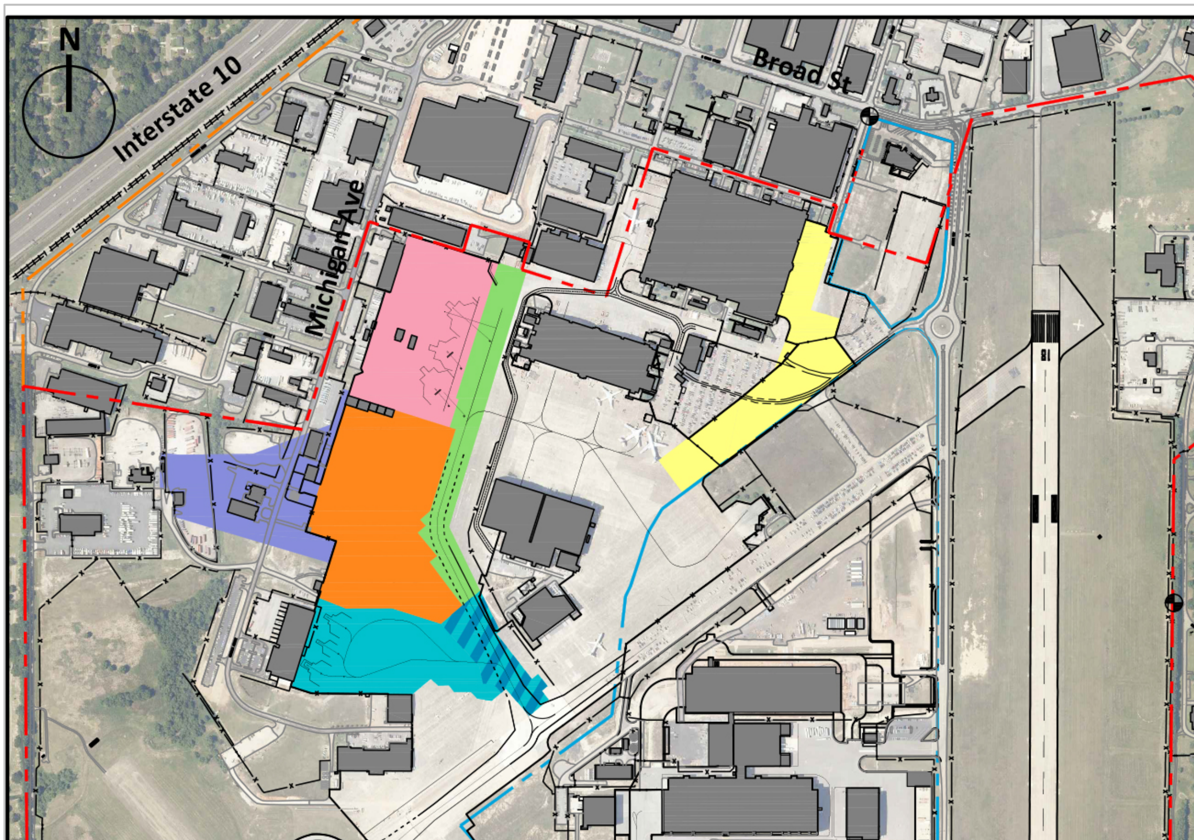
In PAL 1, all commercial flights operating out of the temporary terminal building will be relocated to the new passenger terminal complex. As such, the planning team recommends converting the temporary terminal building to a belly cargo facility, including a parking and loading area. The new belly cargo facility will be able to accommodate any cargo that the commercial airlines operate and will be serviced by a new cargo access road via Perimeter Road that runs south of the new rental car facility.

As part of the construction of the passenger terminal complex, the planning team recommends expansion of the apron area that will serve the new passenger terminal. In addition to expanding the terminal apron, the existing apron area that serves the interim terminal, fixed base operator (FBO), maintenance, overhaul and repair (MRO) facility, and cargo providers is in need of reconstruction. Due to the size of the apron, its reconstruction is planned in five phases, excluding the phase currently under design, see Figure 2.1. In Phase 1, approximately 59,500 yd^2 of the existing apron near the interim terminal will need to be reconstructed along with an additional 75,000 yd^2 of existing apron near the new terminal complex in Phase 2. Other phases on apron construction are included in later PALs.

The Mobile Airport Authority is also highly interested in the acquisition of property owned by the Mobile Housing Authority, located northwest of the Airport. These parcels, which were originally part of the Brookley Air Force Base, could be used to serve a multitude of aviation needs in the future.

Furthermore, in PAL 1 the penetration of the Runway Object Free Area (ROFA) on Runway 18 by the perimeter fence of the Army Reserve Center should be addressed.

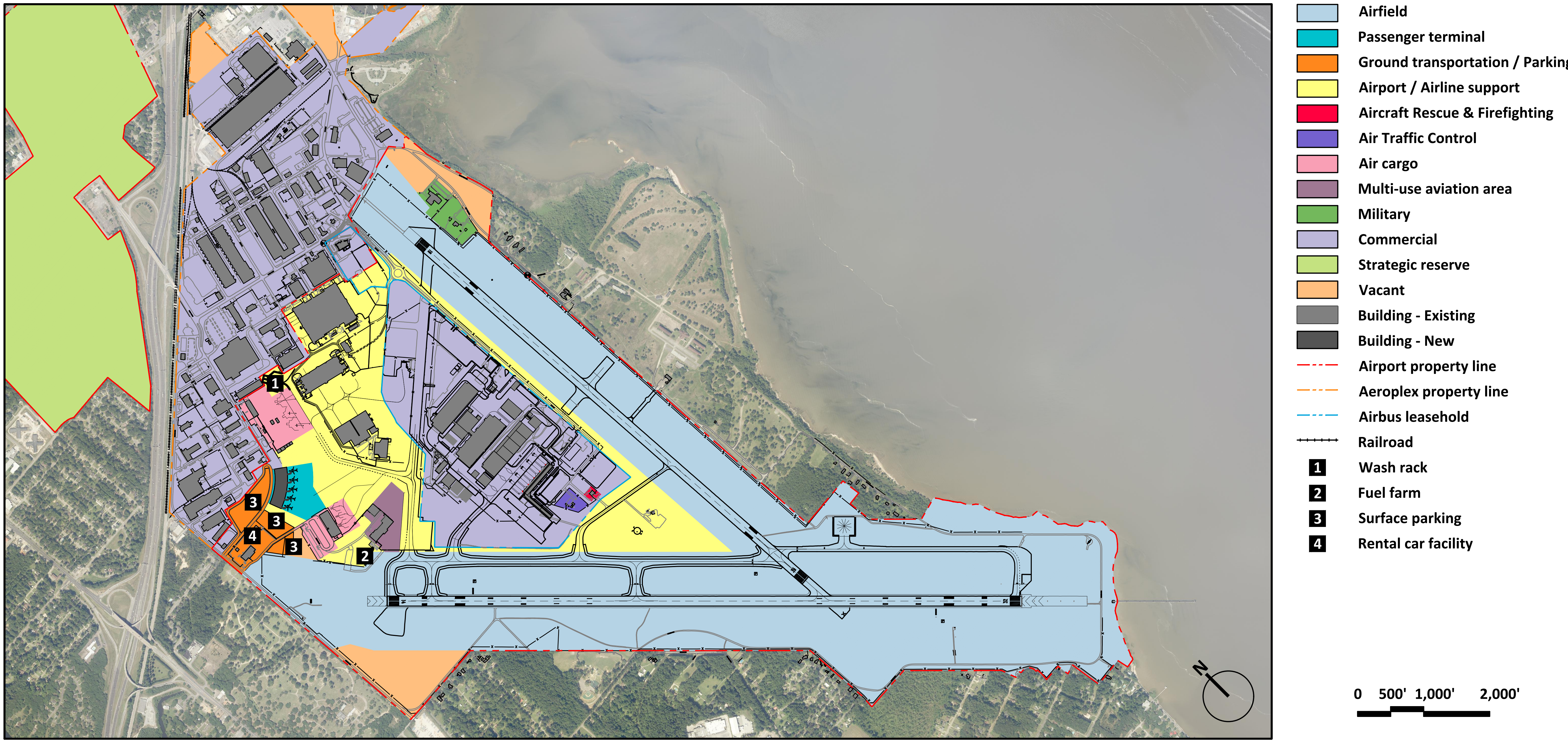
To meet fuel requirements for the Airport, the planning team recommends adding 1 new 15,000-gallon Jet-A fuel tank and 1 new 12,000-gallon Jet-A fuel tank to the existing fuel farm. Finally, in PAL 1 the MAA must relocate the existing wash rack and make other utility upgrades around the new passenger terminal complex and apron area. Cost estimates for these projects are detailed in Table 2.1



Terminal Apron - Phase 1 (59,500 yd^2)
Terminal Apron - Phase 1 - Bid Package 1 (15,500 yd^2)
Terminal Apron - Phase 2 (75,000 yd^2)
Terminal Apron - Ultimate (75,000 yd^2)
Apron Taxilane (31,500 yd^2)
Cargo Apron (56,000 yd^2)
Hangar 3 and 5 Apron (45,000 yd^2)
Airport property line
Aeroplex property line
Airbus leasehold
Railroad

Source: Mobile Airport Authority & LeighFisher, 2020.
Note: The airport layout shown is the existing condition.

Figure 2.1: Apron Reconstruction



Base Map Source: Hanson Professional Services, June 2020
Land Use Overlay: LeighFisher, July 2020

Figure 2.2: PAL 1 Development Plan

Mobile Downtown Airport

Table 2.1: PAL 1 Projected Development Costs

Project	Projected Cost
Passenger Terminal Complex	
Environmental study, survey, geotechnical investigation	$810,000
New air carrier terminal planning and design	$4,450,000
Relocate existing tenants in terminal footprint and building demolition	$10,560,000
Enclose Raby Creek	$5,850,000
Construct terminal building (125,000 ft^2 and 5 boarding bridges)	$67,500,000
Expand terminal apron (29,300 yd^2)	$10,150,000
Construct permanent wash rack	$3,590,000
Install utility systems	$5,000,000
Subtotal (Passenger Terminal Complex)	**$107,910,000**
Airfield	
Install Runway 14/32 CAT II/III ILS (new localizer, glideslope, RVR and ALSF)	$11,700,000
Replace Runway 14/32 edge lighting (HIRLS)	$1,000,000
Subtotal (Airfield)	**$12,700,000**
Ground Transportation and Parking	
Construct surface parking lots (12 acres)	$7,070,000
Construct terminal access loop road	$3,110,000
Convert Penske truck operation to rental car facility	$200,000
Improve Perimeter Road from Michigan Avenue	$2,190,000
Construct replacement access road to existing terminal	$1,800,000
Subtotal (Ground Transportation and Parking)	**$14,370,000**
Additional Airport Areas	
Install new 15,000-and 12,000-gallon Jet A tank at existing fuel farm*	$1,050,000
Ground service equipment (GSE) maintenance area (5,000 ft^2 plus apron)	$1,390,000
New belly cargo at existing terminal	$300,000
Reconstruct apron phase 1 (59,500 yd^2)	$15,010,000
Reconstruct apron phase 2 (75,000 yd^2)	$28,460,000
Address ROFA penetrations on Runway 18	$870,000
Subtotal (Additional Airport Areas)	**$47,080,000**

*Anticipated to be funded with private investment.
Source: Hanson Professional Services, 2020

3. PLANNING ACTIVITY LEVEL 2

In PAL 2, the planning team recommends improvements to the Airport that will further ease the transition of commercial traffic from MOB to BFM. After the opening of the new passenger terminal complex, the next focus of the development plan is to relocate the Aircraft Rescue and Fire Fighting (ARFF) station and Airport Traffic Control Tower (ATCT) outside of the area identified for Airbus' leasehold. These and other projects recommended for PAL 2 are illustrated in Figure 4 and detailed in the following sections. Additionally, preliminary cost estimates for PAL 2 projects are shown in Table 3.1.

3.1 Airfield

In PAL 2, multiple improvements should be made to the airfield. These include continuing the apron area reconstruction, runway rehabilitation, and taxiway extensions, among other projects.

The first airfield improvement recommended for PAL 1 is reconstructing approximately 31,500 yd^2 of the apron within the taxilane area that provides access to the interim and future terminal, cargo area and maintenance hangars to ensure the pavement remains in good condition. To improve the instrument approach to Runway 14, a MASLF approach lighting system should be installed, which would provide lower visibility minimums.

With the development of the new Continental Aerospace Technologies (Continental) World Headquarters at BFM, Continental is returning some previous leasehold to the Airport. PAL 2 has been identified as the most likely phase to extend a taxiway and redevelop this area as a north aviation expansion area. It is envisioned a large aviation hangar would be developed, potentially as an expansion of MRO activities. However, to open this area for development, the existing buildings would need to be removed.

Other recommended activities for this phase of the development plan encompass preservation and enhancement projects associated with Runways 18/36 and 14/32. On Runway 18/36, the planning team recommends replacing the medium intensity runway lights (MIRLs), in addition to constructing full-length parallel taxiway for Runway 18/36 (Taxiway B). On Runway 14/32, a 1,400-foot-long medium intensity approach lighting system with sequenced flashing lights (MALSF) should be installed to reduce visibility minimums. Also, shoulders should be added, and fillets improved on Taxiway A south of its intersection with Runway 18/36.

The ATCT siting analysis indicated that the replacement ATCT site with the best visibility is south of existing Taxiway K. Under the current configuration, air traffic controllers and ARFF personnel must cross Taxiway K in order to access the new ARFF and ATCT facilities. Since the ATCT must have both airside and landside access, the existing Taxiway K should be converted to a landside access road and a replacement Taxiway K should be constructed south of the maintenance facility and electrical vault.

Cost estimates associated with the airfield improvement projects for PAL 2 are detailed in Table 3.1.

3.2 Passenger Terminal Complex

For PAL 2, the planning team recommends constructing an 8,500 ft^2 south concourse for the terminal building to accommodate 1 extra gate. This expansion would bring the total area of the terminal up to 120,500 ft^2 with 6 aircraft parking gates. The passenger terminal apron should be concurrently expanded.

3.3 Ground Transportation and Parking

Although most of the landside projects associated with the development of the new passenger terminal complex should be completed in PAL 1, the planning team recommends several additional roadway improvements in PAL 2. Specifically, improvements should be made to increase access to the passenger terminal from Dauphin Island Parkway. Gatotkoco Drive is a two-lane road that connects Perimeter Road to Dauphin Island Parkway. In an effort to increase access to Perimeter Road, and thus, the passenger terminal complex, the MAA should consider widening the existing lanes on Gatotkoco Drive to allow for increased traffic flow.

3.4 Additional Airport Areas

The most significant projects recommended for PAL 2 in the development plan are the relocation and construction of the new ARFF facility and ATCT, both of which must be moved to make room for the expansion of the Airbus leasehold. As discussed in Section 8 of the *Alternatives* chapter, and as shown in Figure 3.1, the planning team recommends building the new ARFF facility south of the existing Taxiway K between Runway 18/36 and Taxiway A, near the maintenance facility and electrical vault. The new ARFF facility will have landside access from an extended Airbus Way and airside access to the new Taxiway K.

Additionally, as described in Section 7 of the *Alternatives* chapter, the planning team conducted a shadow study and line of sight study to determine the optimal location of the future ATCT. A site in between Runway 18/36 and Runway 14/32, and adjacent to Taxiway A was identified as the preferred alternative. However, further detailed siting analysis is required to finalize the actual ATCT location.

Projected cost estimates for both the ARFF facility and ATCT are detailed in Table 3.1. It is, however, important to note that both of these facilities were constructed using Airport Improvement Program (AIP) grant funds and have a useful life of at least 20 years. If they are relocated before having met their useful life, the MAA might be required to pay back the value of their unrealized useful life. The projected development costs, however, do not include payback of unrealized useful life as the exact timing of the facilities' relocation is unknown.

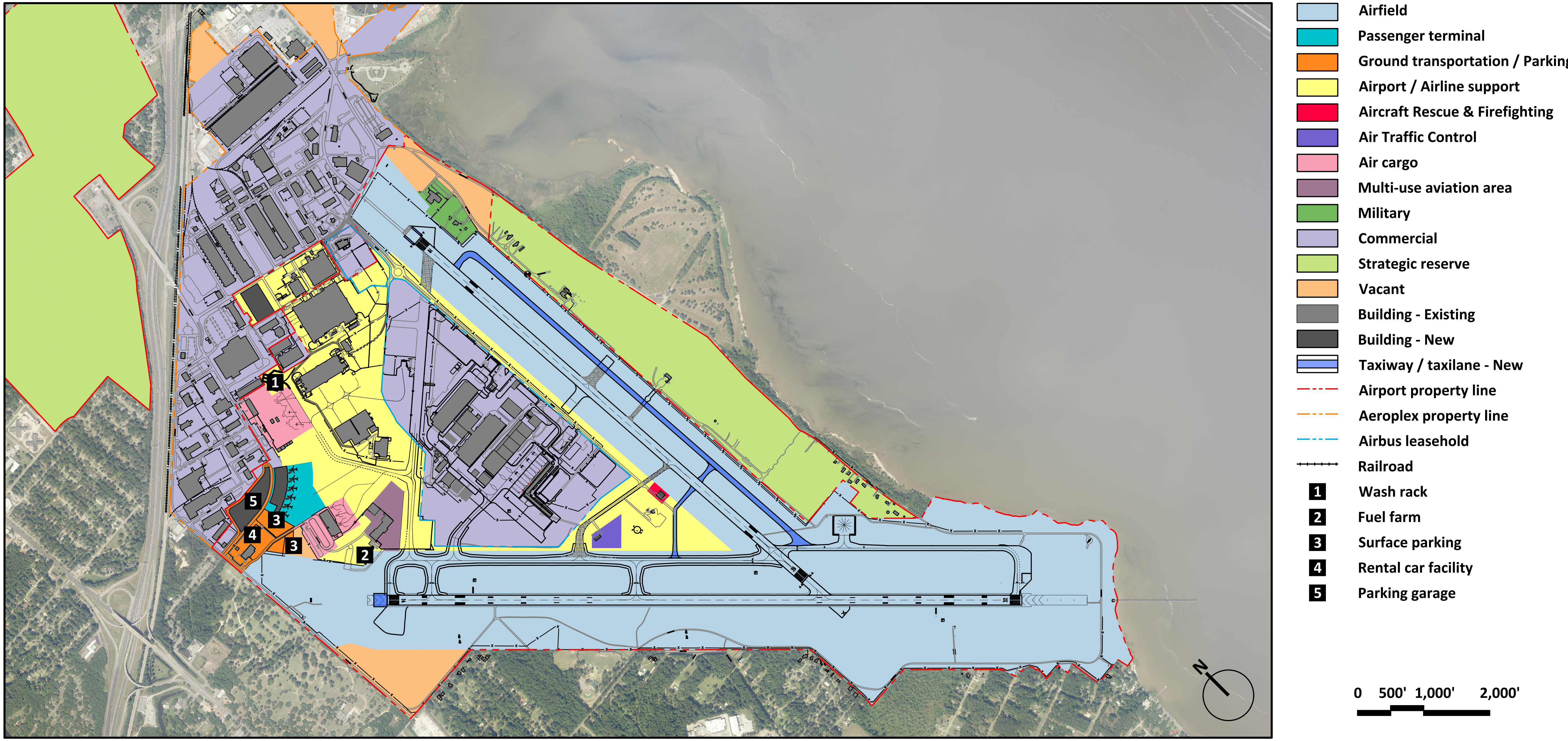
The construction of a new 150,000 ft^2 MRO hangar south of Broad Street and the replacement of airfield drainage infrastructure is also recommended in this phase of the development plan.

Finally, the MAA should consider acquiring parcels of land east of Runway 18/36 from the University of South Alabama Foundation for possible future development opportunities. The land is undeveloped and currently for sale, and if acquired, could be used to expand the Airport property.

Table 3.1: PAL 2 Projected Development Costs

Project	Projected Cost
Passenger Terminal Complex	
Expand new terminal apron (6,200 yd^2)	$3,570,000
Add 8,500 ft^2 to terminal and one boarding bridge	$6,720,000
Subtotal (Passenger Terminal Complex)	**$10,290,000**
Airfield	
Reconstruct apron taxilane (31,500 yd2)	$14,180,000
Install Runway 14 MALSF	$1,800,000
Add shoulders and improve fillets on Taxiway A south of Runway 36	$1,860,000
Extend taxilane for large aviation hangar	$4,130,000
Rehabilitate Runway 18/36	$38,300,000
Replace Runway 18/36 edge lighting (MIRLs) and regulator	$720,000
Construct initial phase of Taxiway B (parallel to Runway 18/36)	$26,000,000
Subtotal (Airfield)	**$86,990,000**
Ground Transportation and Parking	
Construct 5 level parking garage (5.5 acres footprint, 240,500 ft^2 per floor)	$77,790,000
Improve access from Dauphin Island Parkway	$4,000,000
Subtotal (Ground Transportation and Parking)	**$81,790,000**
Additional Airport Areas	
Relocate Taxiway K, convert existing Taxiway K to access road	$5,230,000
Extend Airbus Way to Taxiway K	$380,000
Construct new ATCT	$19,600,000
Construct new ARFF	$5,000,000
Replace airfield drainage infrastructure	$4,430,000
Demolish buildings in MRO expansion area	$2,360,000
Construct 150,000 ft^2 aviation hangar*	$18,600,000
Acquire USA Property (120 acres)	$3,000,000
Subtotal (Additional Airport Areas)	**$58,600,000**

*Anticipated to be funded with private investment.
Source: Hanson Professional Services, 2020



Base Map Source: Hanson Professional Services, June 2020
Land Use Overlay: LeighFisher, July 2020

Figure 3.1: PAL 2 Development Plan

Mobile Downtown Airport

4. PLANNING ACTIVITY LEVEL 3

To support continued growth in passenger operations at BFM, the key development objective for PAL 3 is to relocate the existing FBO operated by Signature Flight Support and other general aviation functions to a new multi-use aviation area on the southwest side of Runway 14. As shown in Figure 4.1, the relocation of the general aviation facilities will allow for a dual taxilane to be developed to serve the passenger terminal, which will in turn reduce congestion on the terminal apron. The multi-use aviation area will be connected to Runway 14/32 with a new taxiway, and new access roads should be constructed around Runway 14 to increase landside access to the new facilities.

The multi-use general aviation area is planned to accommodate not only the FBO, but to enable the development of privately funded hangars for general aviation aircraft. As these additional hangars are anticipated to be privately developed, only the infrastructure to open the sites for development is included in the development costs shown in Table 4.1.

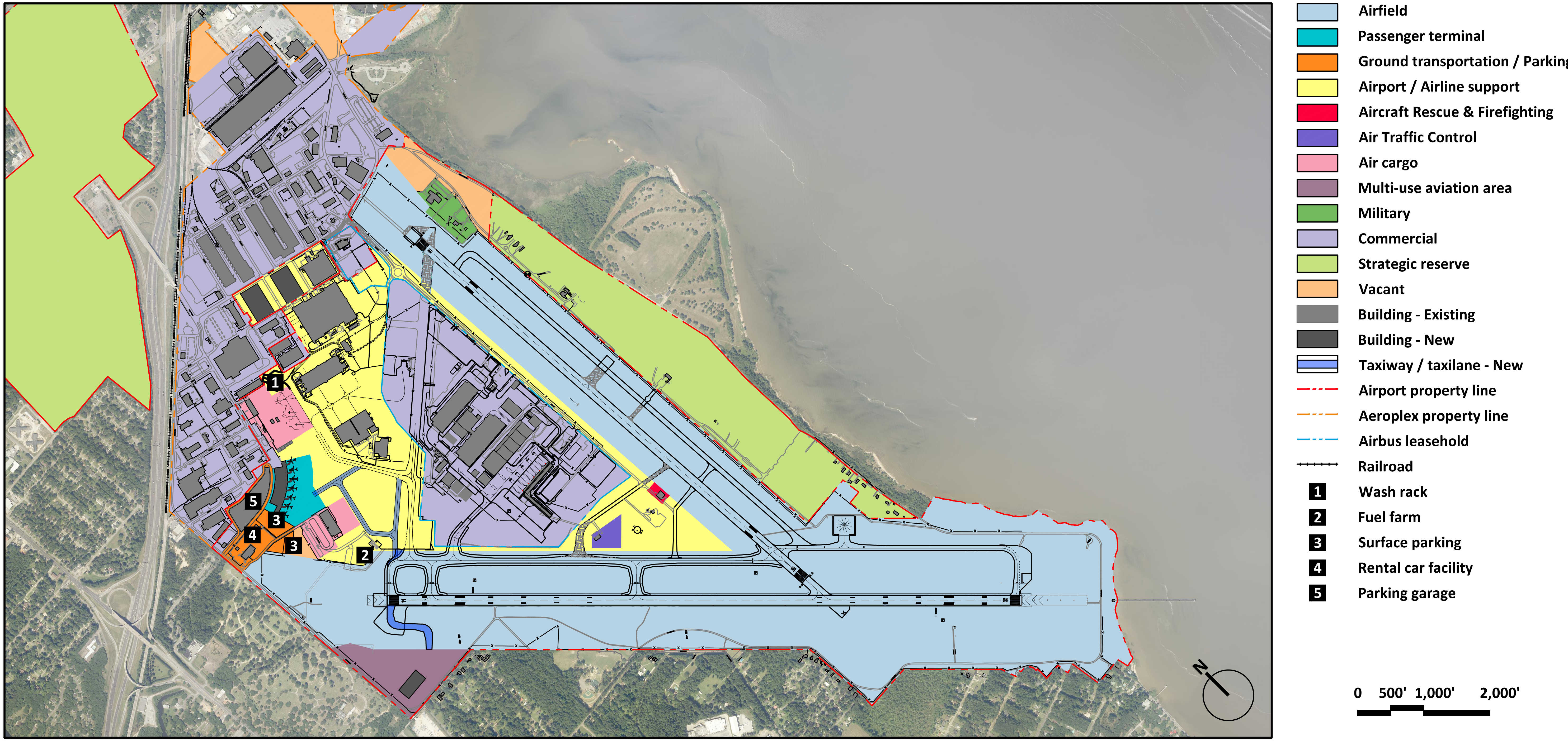
By PAL 3, the planning team also recommends increasing the size of the passenger terminal building by adding a 5,500 ft^2 north concourse to accommodate one new gate. With this expansion, the total terminal building area will be 126,000 ft^2 with 7 gates. The passenger terminal apron should be concurrently expanded.

In addition to the projects mentioned above, by PAL 3 the MAA should also reconstruct approximately 56,000 yd^2 of apron area serving cargo operations to improve its pavement strength and construct a new 150,000 ft^2 MRO hangar south of Broad Street. Finally, the planning team recommends the construction of a new 5,000 ft^2 airport maintenance building near the terminal.

Table 4.1: PAL 3 Projected Development Costs

Project	Projected Cost
Passenger Terminal Complex	
Add 5,500 ft^2 to terminal and one boarding bridge	$4,800,000
Subtotal (Passenger Terminal Complex)	**$4,800,000**
Airfield	
Construct taxiway connection to multi-use aviation area	$4,300,000
Construct dual Taxiway H	$1,100,000
Reconstruct apron cargo area (56,000 yd^2)	$25,200,000
Construct access road around Runway 14	$1,410,000
Construct access road to Airbus (from apron to Taxiway L)	$300,000
Subtotal (Airfield)	**$32,310,000**
Additional Airport Areas	
Relocate FBO facilities (apron, buildings and parking lot)	$34,680,000
Airport maintenance building near terminal (5,000 ft^2 plus paved lot)	$1,460,000
Construct 150,000 ft^2 aviation hangar*	$18,600,000
Subtotal (Additional Airport Areas)	**$54,740,000**

*Anticipated to be funded with private investment.
Source: Hanson Professional Services, 2020



Base Map Source: Hanson Professional Services, June 2020
Land Use Overlay: LeighFisher, July 2020

Figure 4.1: PAL 3 Development Plan

Mobile Downtown Airport

5. PLANNING ACTIVITY LEVEL 4

The final phase of the development plan includes several airfield improvement projects as well as additions to the passenger terminal building. The specific initiatives recommended for PAL 4 are shown graphically in Figure 5.1 and detailed below with preliminary cost estimates for these projects summarized in Table 5.1.

To complete the construction of the passenger terminal complex for the planning period, the terminal building should be increased by adding 5,500 ft^2 to the north concourse to accommodate one new gate. This will bring the terminal building to 131,500 ft^2 and eight aircraft parking gates.

Another key development objective in PAL 4 is the relocation of the U.S. Army Reserve Center to allow the existing buildings to be removed for the extension of Taxiway B to the end of Runway 18. Since the relocation of the Army Reserve is a long-term project, a new location for the facility has not yet been identified. Nonetheless, for the purposes of the cost estimates, it was assumed that the new Army Reserve Center would be a similar type and size as the existing facility, and that the new location would not require land acquisition.

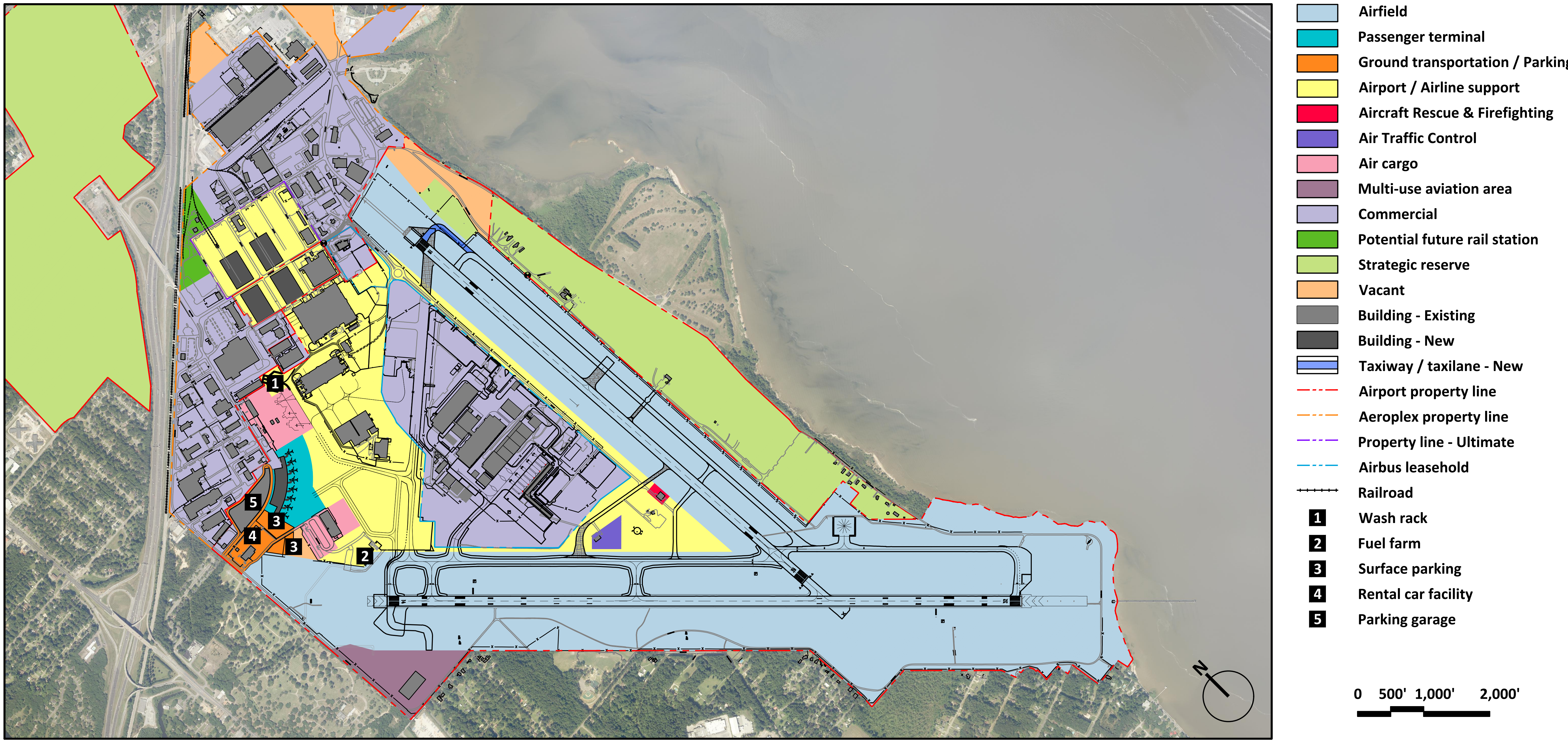
In addition to the extension of Taxiway B, the planning team also recommends further extending the taxilane between VT MAE Hangars 4 and 6 to the north to allow for the construction of a new MRO hangar. The final phase of the terminal apron that serves Hangars 3 and 5 (45,000 yd^2) is proposed to be reconstructed in this phase. PAL 4 is anticipated to be the phase in which Broad Street, between 3rd Street and 9th Street, is closed to allow for additional expansion of aviation activity to the north. Two new 150,000 ft^2 MRO hangars can be constructed north of Broad Street in PAL 4. A route using 15th Street to 3rd Street via Avenue C is planned to carry the traffic that currently uses Broad Street. This expansion is planned in PAL 4 to allow time for the nonaviation tenants currently located in the aviation expansion area to relocate. If aviation demand for this area occurs sooner, development activities could be accelerated.

Finally, there is potential for the construction of a passenger rail station in PAL 4. One potential site is shown on Figure 5.1. The preferred site of the rail station will be subject to further consultation with the MAA, Amtrak, City of Mobile, Federal Railroad Administration, and other stakeholders, as appropriate.

In summary, the recommended development plan is an aggressive improvement program with numerous big-ticket items justified and planned for the future of BFM. As mentioned, this plan is not necessarily a strict step-by-step manual, but rather a guiding framework for how BFM should be developed. Throughout the planning period, the MAA will need to continue to monitor user needs and facility conditions to allow development to occur as needed and avoid expending funds before required.

Table 5.1: PAL 4 Projected Development Costs

Project	Projected Cost
Passenger Terminal Complex	
Add 5,500 ft^2 to terminal and one boarding bridge	$4,800,000
Subtotal (Passenger Terminal Complex)	**$4,800,000**
Airfield	
Reconstruct apron Hangars 3 & 5 pavement (45,000 yd^2)	$16,370,000
Extend Taxiway B to end of Runway 18	$3,960,000
Extend Taxilane for MRO hangar	$4,130,000
Subtotal (Airfield)	**$24,460,000**
Ground Transportation and Parking	
Close Broad Street between 3rd and 9th Streets and improve alternate route	$2,900,000
Subtotal (Ground Transportation and Parking)	**$2,900,000**
Additional Airport Areas	
Relocate U.S. Army Reserve (facilities only)	$5,160,000
Demolish buildings in redevelopment area north of Broad St. area	$6,180,000
Construct two new 150,000 ft^2 aviation hangars*	$37,210,000
Construct additional connector to multi-use aviation area	$2,470,000
Subtotal (Additional Airport Areas)	**$51,020,000**
*Anticipated to be funded with private investment. Source: Hanson Professional Services, 2020	



Base Map Source: Hanson Professional Services, June 2020 Land Use Overlay: LeighFisher, October 2020

Figure 5.1: PAL 4 Development Plan

Mobile Downtown Airport

Leigh|Fisher

in association with

Hanson Professional Services, Inc.
Corporate Environmental Risk Management, LLC
Jacobsen|Daniels
MPACT Public Affairs Consulting
Quantum Spatial, Inc.

TECHNICAL MEMORANDUM No. 6 – ON-AIRPORT LAND USE PLAN

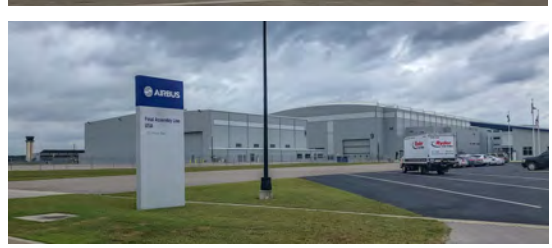
MASTER PLAN
Mobile Downtown Airport

Prepared for

Mobile Airport Authority
Mobile, Alabama

July 2020

Mobile Airport Authority



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ACRONYMS AND ABBREVIATIONS

Term	Definition
Aeroplex	Mobile Aeroplex at Brookley
AIDT	Alabama Industrial Development Training
BFM, or the Airport	The Mobile Downtown Airport
EDPA	Economic Development Partnership of Alabama
FAA	Federal Aviation Administration
FBO	Fixed Base Operator
MAA	Mobile Airport Authority
MRO	Maintenance, Repair, and Overhaul

1. BACKGROUND

The Mobile Downtown Airport (BFM, or the Airport) and the Mobile Aeroplex at Brookley (Aeroplex) are significant generators of economic activity for the City of Mobile and State of Alabama. The recommended development plan, detailed in the *Development Plan* chapter of the Master Plan, focused on land uses specifically at the Airport. This portion of the planning study also considers the existing land uses and opportunities in the Aeroplex.

The Mobile Area Chamber of Commerce identifies seven primary target industry clusters in the region for recruiting industries. These include:

- Aviation/Aerospace
- Chemicals and Manufacturing
- Healthcare
- Technology
- Logistics and Transportation
- Maritime
- Oil and Gas

The Aeroplex is Mobile's aerospace industry hub, home to Airbus' U.S. Manufacturing Facility, Airbus Engineering, Safran, Continental Aerospace Technologies, ST Engineering Aerospace (VT Mobile Aerospace Engineering), MAAS Aviation, Aerostar and others. An estimated 3,500[1] workers are employed by Mobile area aviation and aerospace companies.

The Aeroplex offers a unique combination of assets with infrastructure to support the target businesses, such as:

- Three interstate interchanges within one mile of the Aeroplex
- Rail services provided by CSX and Illinois Central Railroad
- Property with and without airfield access
- Home to significant aerospace businesses
- Close proximity to the port of Mobile, including a barge facility at BFM
- On-site retail, restaurant, and financial service businesses
- Located within Foreign Trade Zone #82
- Renewal Community Zone tax incentives

[1] Mobile Area Chamber of Commerce, Industry Clusters, https://mobilechamber.com/economic-development/doing-business-in-mobile/industry-clusters/#1496164915485-fi6c0443f4-01ca, accessed July 2, 2020.

To support the aerospace workforce, the Aeroplex is also home to aerospace education programs provided by Alabama Industrial Development Training (AIDT) and Coastal Alabama Community College – Alabama Aviation Center and Flight Works Alabama.

In addition to aerospace businesses, the Aeroplex's location relative to I-10, I-65, and the CSX rail line makes it a hub for logistics and transportation companies.

The goal of the On-Airport Land Use Plan is to 1) provide guidance regarding development opportunities for on-Airport properties, 2) identify potential targets for future land acquisition, and 3) outline other actions that can support future community economic development and drive revenue and jobs creation in the area.

2. CURRENT STATE OF AIRPORT LAND USE

The existing facilities at the Aeroplex are a mix of new development and repurposed uses of the former Air Force Base buildings. While this has made BFM and, in particular, the Aeroplex a successful location for local employment, the existing land use arrangement, in addition to the deterioration of many buildings does not offer BFM the best long-term revenue generation potential per available building square foot or ground leased acre. Many of the buildings at BFM have far exceeded their useful life, and a high level of annual maintenance costs is required to keep the buildings habitable.

Additionally, in certain areas, the current arrangement of leased buildings and associated land use does not lend itself to an aesthetic that would be compatible with the changeover to an air-carrier role at BFM. A softening of the look, feel and aesthetic of BFM in the short term would be required as land use changes occur and as the airport matures in its new air carrier role

Finally, there are businesses within the Aeroplex that would not be considered aviation, aviation support or logistics support that over time would erode the MAA's ability to maximize the revenue potential of their property. For the overall aesthetic and revenue producing capability of the BFM land, it is necessary to modify existing land uses over time to be more compatible with the intended new role of the facility.

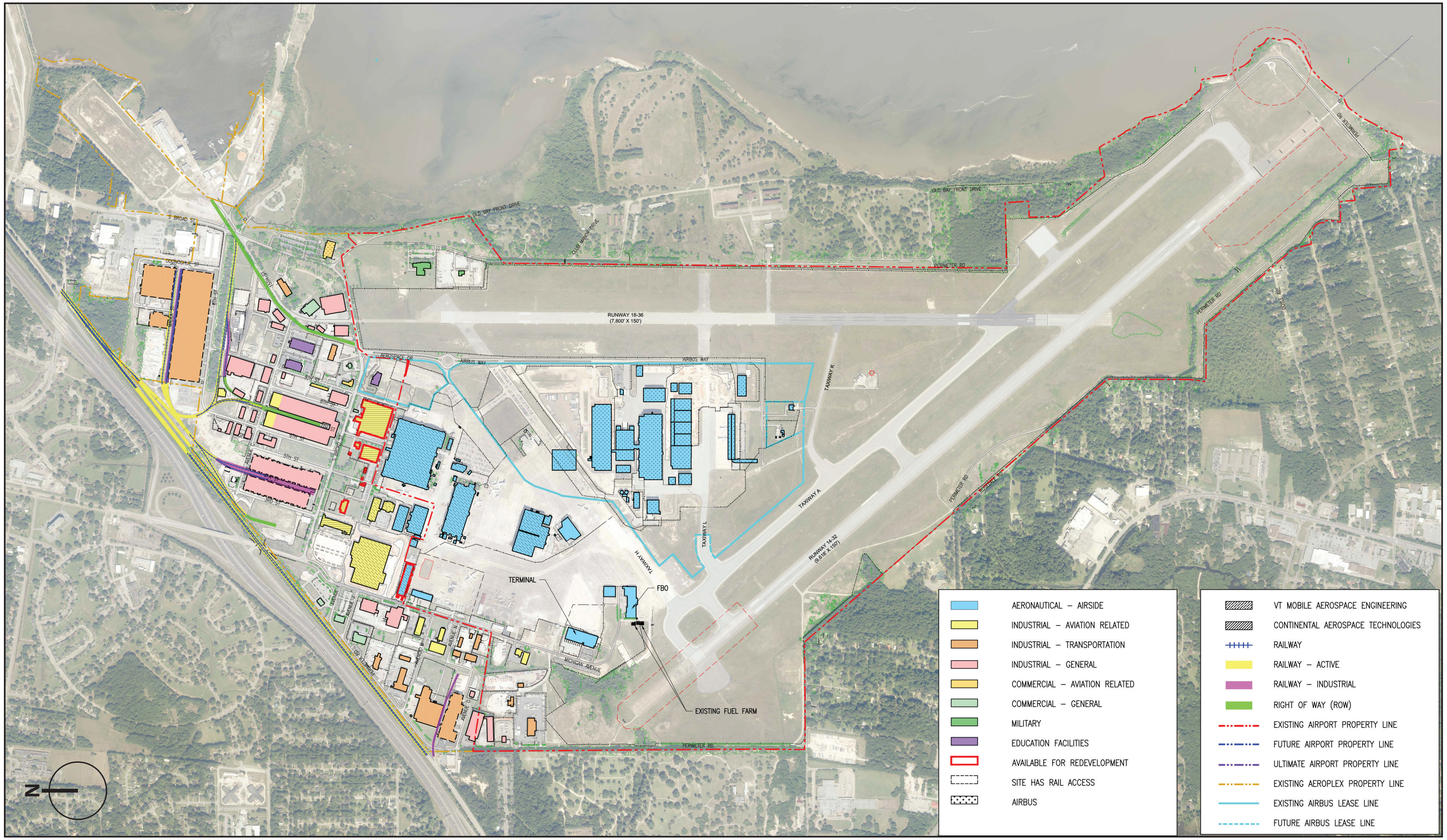
The existing land use at the Airport and Aeroplex is illustrated on Figure 2.1.

2.1 Existing Airport Properties

As per the MAA rent roll database, there are 149 properties identified at the Airport and Aeroplex, of which 103 are currently leased and 46 vacant, including tenant owned buildings for which there is $0 rent payable. Table 2.1 and Table 2.2 show the number of leased properties grouped by land use category and property size. In total, the airport has approximately 14.7 million square feet of land and 2.2 million square feet of building space available to lease to tenants.

There are currently 54 buildings and a further 49 ground parcels currently identified at the Airport. When classified by building use type, there are 20 properties considered Aeronautical use, with 16 of these on the landside part of the airport. There are 26 Industrial buildings with 17 considered General Industrial use. There are at least 12 buildings of more than 20,000 square feet identified in the rent roll.

For ground leases, there are 13 sites leased for aeronautical uses, 5 for commercial uses, and 26 for industrial. Industrial transportation companies, such as logistics operators, distributors and cold storage companies, occupy some of the large ground properties.



Source: Hanson Professional Services, September 2020

Figure 2.1: Existing BFM Land Use Map

Mobile Downtown Airport

Table 2.1: Airport Properties by Land Use and Size (Building)

Building Use	Unknown ft²	Small (<2,000 ft²)	Med (2,000-20,000 ft²)	Large (>20,000 ft²)	Total Building Leases
Aeronautical – Airside	-	-	1	3	4
Aeronautical - Landside	-	6	8	2	16
Commercial – Aviation	-	-	-	-	-
Commercial - General	1	2	2	-	5
Industrial - Aviation Related	-	-	-	3	3
Industrial - General	4	2	8	3	17
Industrial - Transportation	2	1	3	-	6
School/Training	1	-	-	-	1
Other	-	1	-	1	2
Total	**8**	**12**	**22**	**12**	**54**
Source: MAA Rent Roll, 2020					

Table 2.2: Airport Properties by Land Use and Size (Ground)

Land Use	Unknown ft².	Small Ground (<50,000 ft²)	Med Ground (50,000-200,000 ft²)	Large Ground (>200,000 ft²)	Total Ground Leases
Aeronautical – Airside	-	-	5	3	8
Aeronautical - Landside	1	3	-	1	5
Commercial – Aviation	-	-	-	-	-
Commercial - General	2	1	8	2	13
Industrial - Aviation Related	-	-	-	-	-
Industrial - General	-	2	2	1	5
Industrial - Transportation	3	2	5	4	14
School/Training	2	-	1	1	4
Other	-	-	-	-	-
Total	**8**	**8**	**21**	**12**	**49**
Source: MAA Rent Roll, 2020					

2.2 Key Tenants

There are several key tenants at the Airport that support economic growth in the region by creating jobs for local workers. Airbus occupies 37% of leasable land, with Continental, and AMPAC also occupying more than 10% of the available site. Collectively, these tenants generate more than 50% of the rental revenues from MAA property leases.

Table 2.3: Key Airport and Aeroplex Tenants

Tenant	Industry	% of Building Space Rented	% of Ground Space Rented
Airbus	**Aerospace** - Conceptual design engineering	6%	37%
Continental	**Aerospace** - Manufacturing of piston engines	7%	14%
VT MAE	**Aerospace** - Maintenance, repair, and overhaul of aircrafts	53%	6%
Spill Tech	**Environmental** - Manufacturer of industrial absorbents	11%	0%
AMPAC	**Warehousing** - Manufacturing and distribution of paper packaging supplies	0%	11%
	% of Non-Vacant Airport Total	**78%**	**67%**
Source: MAA Rent Roll, 2020			

2.3 Vacancy Rates

In 2018, the Airport had 45 properties vacant out of the total 149 properties on site, equivalent to a vacancy rate of 30%. However, many of these are smaller properties. At present, there is a similar vacancy rate as 46 properties are vacant. A large number of the vacant properties are located in Buildings 14 and 23, which lie between 3rd and 8th St, to the north of the airfield. These are very old buildings and require significant renovation and investment before the unoccupied portions could be leased for uses other than general storage. ft^2

2.4 Rental Rates

Rental rates for properties vary depending on the size of space rented, land use type, and length of lease, among other factors. Table 2.4 and Table 2.5 list the rental rates per square foot for currently leased building and ground properties, respectively. The rates listed correspond to total annual revenue for a particular sub group divided by total square feet for that sub group.

Smaller buildings average the highest revenues on a per square foot basis, generating 3.8x more than medium sized facilities, which in turn generate more than 2.7x the largest facilities. Small buildings average $19.26 per square foot, medium buildings $5.10 per square foot and large buildings $1.86 per square foot. While aeronautical airside properties generate the lowest revenue on a per square foot basis, these are the tenants that generate significant economic activity and support many of the smaller, but higher revenue producing tenants.

General industrial rents average less than aeronautical and industrial aviation, so over time, the MAA could seek to repurpose sites and property to higher yielding tenants in these categories.

Table 2.4: Building Rental Rates ($ per Square foot)

Building Use	Small (<2,000 ft²)	Med (2,000-20,000 ft²)	Large (20,000+ ft²)	Average by Use Type
Aeronautical – Airside	-	3.61	0.97	0.99
Aeronautical - Landside	21.36	5.68	4.68	6.00
Commercial – Aviation	-	-	-	-
Commercial - General	8.45	9.20	-	9.14
Industrial - Aviation Related	-	-	7.14	7.14
Industrial - General	22.68	3.28	2.42	2.61
Industrial - Transportation	26.41	5.73	-	6.07
School/Training	-	-	-	-
Average Rent by Size	$19.26	$5.10	$1.86	$2.29
Rate Multiplier	3.8x	2.7x	1.0x	
Source: MAA Rent Roll, 2020				

Table 2.5: Ground Rental Rates ($ per Square foot)

Land Use	Small Ground (<50,000 ft²)	Med Ground (50,000-200,000 ft²)	Large Ground (200,000+ ft²)	Average by Cluster
Aeronautical – Airside	-	0.29	0.08	0.10
Aeronautical - Landside	0.33	-	0.15	0.20
Commercial – Aviation	-	-	-	-
Commercial - General	0.29	0.25	0.21	0.24
Industrial - Aviation Related	-	-	-	-
Industrial - General	0.53	0.39	0.02	0.07
Industrial - Transportation	0.35	0.31	0.17	0.22
Other/School/Training*	-	0.11	-	0.11
Average by Size	**$0.38**	**$0.28**	**$0.08**	**0.12**
Rate Multiplier	**1.3x**	**3.4x**	**1.0x**	
* Excludes U.S. Army Reserve Center lease (approximately 700,000 square feet at zero cost) Source: MAA Rent Roll, 2020				

Smaller land parcels average the highest revenues on a square foot basis, generating 1.3x more than medium sized sites, which in turn generate more than 3.4x the largest facilities. Small land parcels average $0.38 per square foot, medium parcels $0.28 per square foot and large sites $0.08 per square foot.

For the larger sites, general industrial rents average less than all other categories, so over time, the MAA could seek to repurpose these sites to higher yielding tenants in these categories.

3. POSSIBLE UPSIDE AND LAND ACQUISITION

The following sections detail the MAA's leasing policy, identifies existing leaseholds at the Airport and Aeroplex, and outlines possible areas for future acquisition.

3.1 MAA Leasing Policy

To guide future on-Airport development, the MAA has set leasing procedures that are developed in compliance with local, state, and federal requirements, as well as Federal Aviation Administration (FAA) policies. These leasing procedures are meant to:

- Maximize revenue to ensure Airport self-sustainability.
- Protect the MAA from land uses detrimental to its operation and mitigate any potential associated risks.
- Follow standard procedures for responding to entities expressing interest in Airport business.
- Ensure equitable treatment of current and future tenants and users of the Airport.
- Attract private investment and development of Airport facilities and land.

The MAA leasing policy includes two primary types of lease agreements and contracts: 1) Airport Use and Lease Agreements and 2) Airport Use Agreements. Airport Use and Lease Agreements are revenue-generating while Airport Use Agreements are non-revenue generating. Under these two types of agreements there are also aeronautical and nonaeronautical agreements.

Aeronautical agreements at the Airport include uses such as fixed base operators (FBO's), specialized aeronautical service operators, hangars, and other activities requiring airfield use. To encourage development and growth of air service at the Airport, aeronautical uses at the Airport are generally preferred to non-aeronautical uses. Under the leasing policy it is not as critical for aeronautical uses to generate revenue given that those sources have the greatest potential to generate growth at the Airport, in addition to playing an integral role in reducing airline rates and charges. Examples of non-aeronautical revenue include logistics, environmental services, and distribution. Furthermore, grant assurances require all airports developed with federal grant assistance funding to operate for the use and benefit of the public and for the Airport to be made available to all types of aeronautical activity.

However, any firm or company that wishes to initiate non-aeronautical activity at the Airport must submit a proposal that identifies the scope of services to be provided to the public. It is important that the Airport maximizes non-aeronautical revenue to decrease reliance on airline rates and charges. Additionally, any non-aeronautical uses must not interfere with aviation use, must not jeopardize future airport development, and must not create or contribute to a flight hazard.

MAA is now including reversion clauses for buildings constructed and owned by tenants. FAA regulations require that building ownership on airport property reverts to the airport sponsor at the end of lease term (subject to agreed options, extensions, or amendments). This not only increases revenues for the Authority, but ensures MAA maintains control over the facilities constructed at the airport, and can demolish or relocate buildings in order to meet aviation needs.

In general, the duration for ground leases is much longer than that for building leases. On average, ground leases run for 25 to 35 years while building leases run for 3-10 years. The MAA's suggested terms for development projects are driven by the ability of prospective tenants to secure adequate funding. To allow the developer to receive an appropriate return on their investment, the acceptable terms for specified levels of investment in Airport facilities and infrastructure are included in Table 3.1 below.

Table 3.1: MAA Recommended Lease Terms

Capital Investment Level	Recommended Lease Term
$0-$200,000	5-10 years
$200,001-$500,000	10-25 years
$500,001-$800,000	25-30 years
$800,001-$1,500,000	30-35 years
$150,000,001-$3,500,000	35-40 years
Over $3,500,001	Over 40 years
Source: MAA Leasing Policy, 2019	

In summary, the Airport must ensure that it structures its lease agreements 1) to protect current and future interests and 2) to generate sufficient revenue to operate the Airport. Well-structured lease agreements are essential to the Airport's future success and self-sustainability.

3.2 3.2 Lease Expirations

Table 3.2 and Table 3.3 show the current state of leaseholds and expiration periods of properties at the Airport and Aeroplex by size of property.

Table 3.2: Building Lease Expirations

Land Use	Unknown ft².	Small (<2,000 ft²)	Med (2,000-20,000 ft²)	Large (20,000+ ft²)	Total
Vacant	1	5	12	25	**43**
In holdover	1	1	3		**5**
Month to month	2	4	7		**13**
0-5 years	3	7	8	3	**21**
5-10 years	2		2	2	**6**
10-15 years			1	3	**4**
15-20 years				1	**1**
20+ years			1	3	**4**
Total	**9**	**17**	**34**	**37**	**97**
Source: MAA Rent Roll, 2020					

Table 3.3: Ground Lease Expirations

Land Use	Unknown ft^2.	Small Ground (<50,000 ft^2)	Med Ground (50,000-200,000 ft^2)	Large Ground (200,000+ ft^2)	Total
Vacant		2		1	**3**
In holdover			1		**1**
Month to month	2	3	1		**6**
0-5 years	2	3	10	2	**17**
5-10 years	1		3	3	**7**
10-15 years		1	1	2	**4**
15-20 years		1	1	2	**4**
20+ years	3		4	3	**10**
Total	**8**	**10**	**21**	**13**	**52**

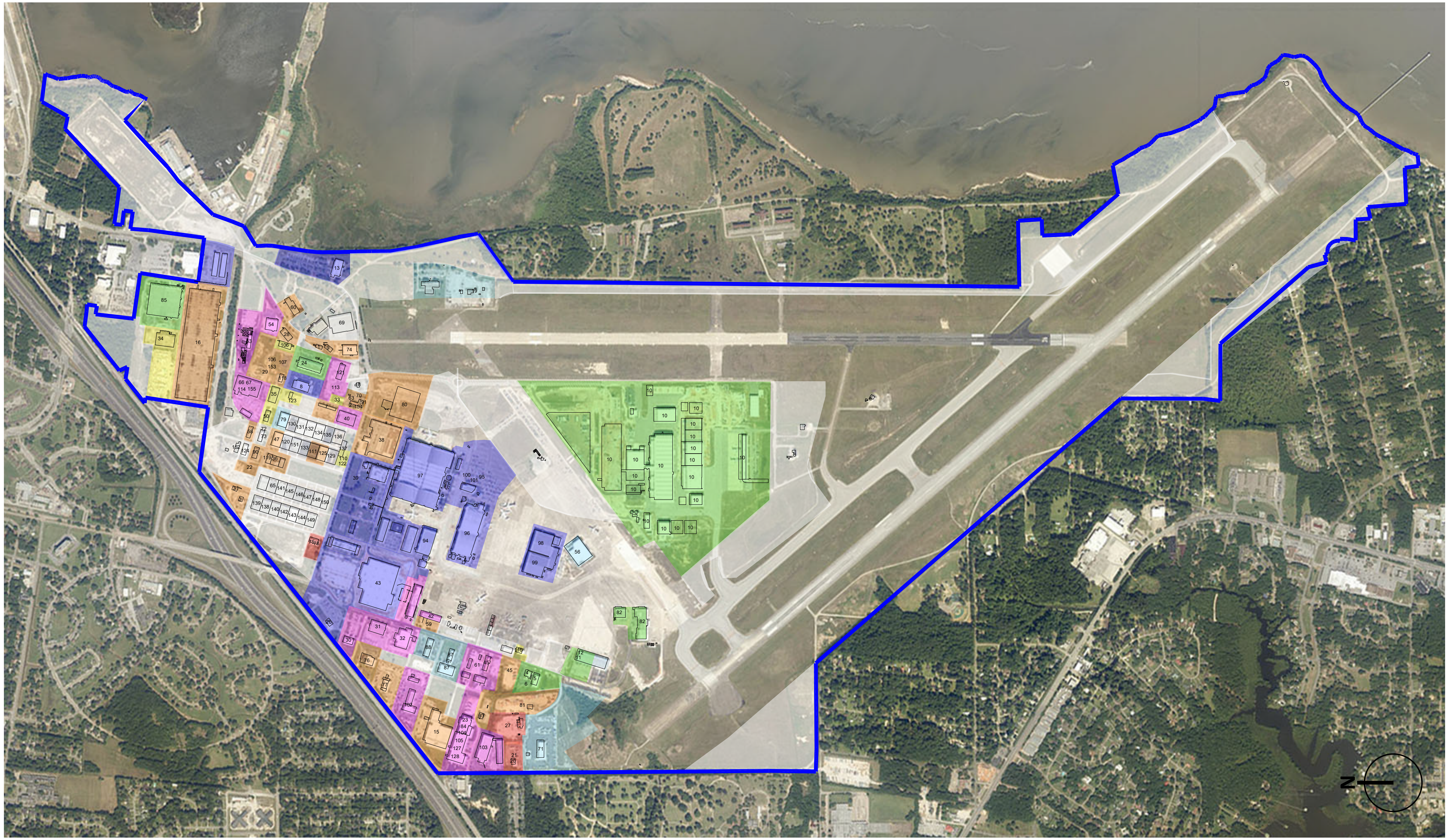
Source: MAA Rent Roll, 2020

There are 43 vacant buildings totaling approximately 723,000 square feet. which represents approximately 32% of total MAA building space. The three vacant land parcels total 855,000 square feet and represent 6% of vacant land. Figure 3.1 shows a map of the lease expiration data at the Airport and Aeroplex.

In addition to vacant properties, there are a further 25 leases either in a holdover situation or operating on month-to-month extensions. While none of these are the largest land or buildings, these sites could be considered for repurposing to alternate use categories or higher generating tenants.

A further 38 leases are due to expire in the next 5 years. This amounts to a quarter of all airport leases. The majority of these are medium sized - or larger spaces and some of these tenants pay below average rents and are not the higher priority aeronautical or aviation/transportation related businesses.

A total of 13 leases are due to expire in the next 5-10 years. 6 of the 7 land sites are either large or medium sized as are 4 of the 6 buildings. There are 27 leases with terms extending beyond 10 years, which is approximately a fifth of all airport leases. Most of these are large building leases or large ground leases and make up approximately 60% of total airport leasing space and generate 50% of total airport lease revenue.



- Vacant
- In holdover
- Month-to-month
- 0 - 5 years
- 5 - 10 years
- 10 - 15 years
- 15 - 20 years
- 20+ years

Source: LeighFisher, July 2020

Figure 3.1: Lease Expiration Map
Mobile Downtown Airport

3.3 Surrounding Competing Development

Business properties surrounding the airport can provide an indication for future development at the Aeroplex. The Economic Development Partnership of Alabama (EDPA) maintains a listing of buildings and sites available for lease or sale. Two of the sites are in close proximity to BFM: the Brookley by the Bay property that is for sale and the former Penske Building (1960 Broad Street) that is for lease.

Per EDPA, other properties available within approximately 10 miles or less of BFM as of July 2020 include:

Buildings

- Azalea Office Park, 572 Azalea Road, Mobile 22,772 ft^2 commercial/office building offered for sale at $1,390,000 or for lease at $12 per square foot
- Merchants Transfer Western, 551 Western Drive, Mobile, 11 acres, 220,845 ft^2 warehouse building, offered at $3.35 per square foot for 100,000+ ft^2
- Mobile South Buildings, 5155 Mobile South Street, Mobile – 272,750 ft^2 industrial buildings offered at $4.50 per square foot
- Sidney Phillip Drive, Mobile, Industrial Building – 21,000 ft^2 or 47,000 ft^2 space available. Offered at $4.50 per square foot for lease
- 67 Midtown Park, 67 Midtown Park Mobile, Call Center Building offered for lease at $5,500 per month
- Todd Acres Drive, Todd Acres Drive, Mobile, 265 acres, offered for lease at $5-$7 per square foot for build to suit

Land

- 1-10 Rangeline Industrial Park, 0 Rutgers Road, Mobile, 129 acres with rail access, offered for sale at $65,000 per acre or for lease at $8,000 per acre per year. This is equivalent to $0.02 per square foot per month.
- Laughlin Industrial Park, Halls Mill Road, Mobile - 35 acres , offered at $152,460 per acres with discount for multiple acres. This is equivalent to $0.29 per square foot per month.
- Millard Maritime, 7730 Deer River Road, Mobile – 280 acres with rail and water access offered at $30,000 per year per acre. This is equivalent to $0.06 per square foot per month.
- Mobile Commerce Park, Rangeline Road and Todd Acres Road, Mobile- 100 acres offered at $40,000 per acre. This is equivalent to $0.08/square foot per month.
- Tomly Barge Company, Dunlap Drive, Mobile, 21 acres with water access, offered for lease at $1,800,000 per year. This is equivalent to $0.16/square foot per month.
- Bender Yard #9, 909 Cochran Causeway, Mobile, 26 acres with deep water access offered for sale at $13,500,000 or for lease at $100,000 per month.
- Port City Commerce Park, 6450 Trippel Road, Mobile – 117 acres for sale $80,000 per acre at least 10 acres, intended for distribution and light manufacturing
- Southport Industrial Estate, South Hamilton Blvd., Mobile – 25 acres with rail access for sale for $3,950,000

3.4 Surrounding Synergies

In addition to understanding competing properties, identifying cooperative development opportunities is also of value. The Alabama State Port Authority operates the Port of Mobile. The portion of the Aeroplex land in closer proximity to the port facilities may have some opportunities to be used for logistics in support of port operations.

4. FUTURE LAND USE RECOMMENDATIONS

An evaluation of the Airport and Aeroplex's existing land use was conducted to assist in identifying opportunities for the MAA to enhance the land use over time as leases expire to drive economic growth.

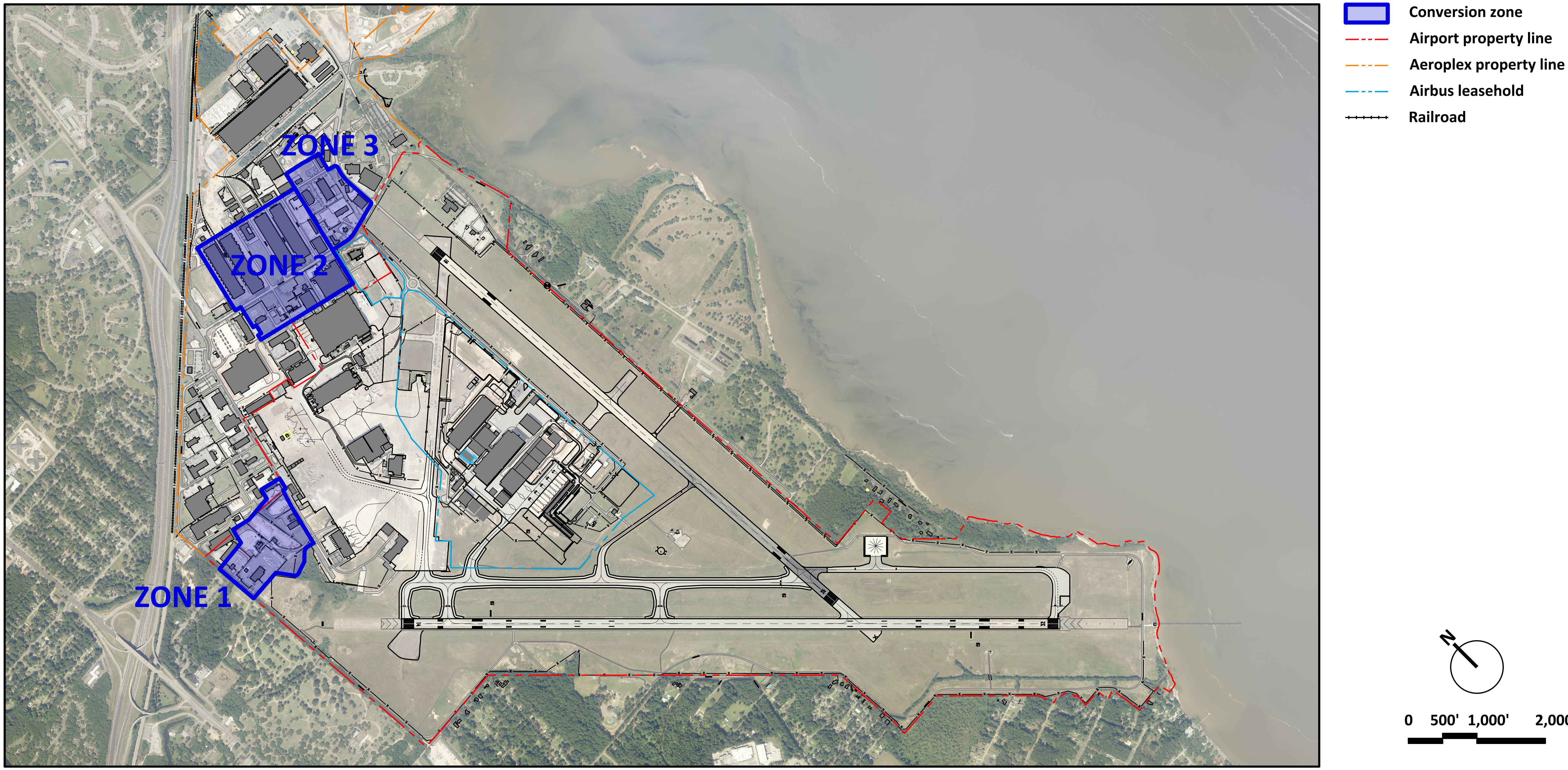
Given the transportation assets at BFM and the Aeroplex, it is recommended that future development continue to focus on the economic clusters of aerospace/aviation and logistics/transportation. Future aerospace/aviation-related development is anticipated to include both facilities that require airfield access and those that desire to be located in close proximity to the Airport to support key tenants, but do not require airfield access.

As shown in Figure 4.1, and as detailed in the following sections, the planning team identified three zones of the Aeroplex for conversion to airfield access, aviation, and commercial use. Additionally, a map detailing the future recommended land use at the Airport and Aeroplex is shown in Figure 4.4.

4.1 Conversion Overlay Zones

The following three conversion zones outline the recommended future land use strategy for the Aeroplex. However, in order to achieve the goals of this strategy it is critical that the following steps are met:

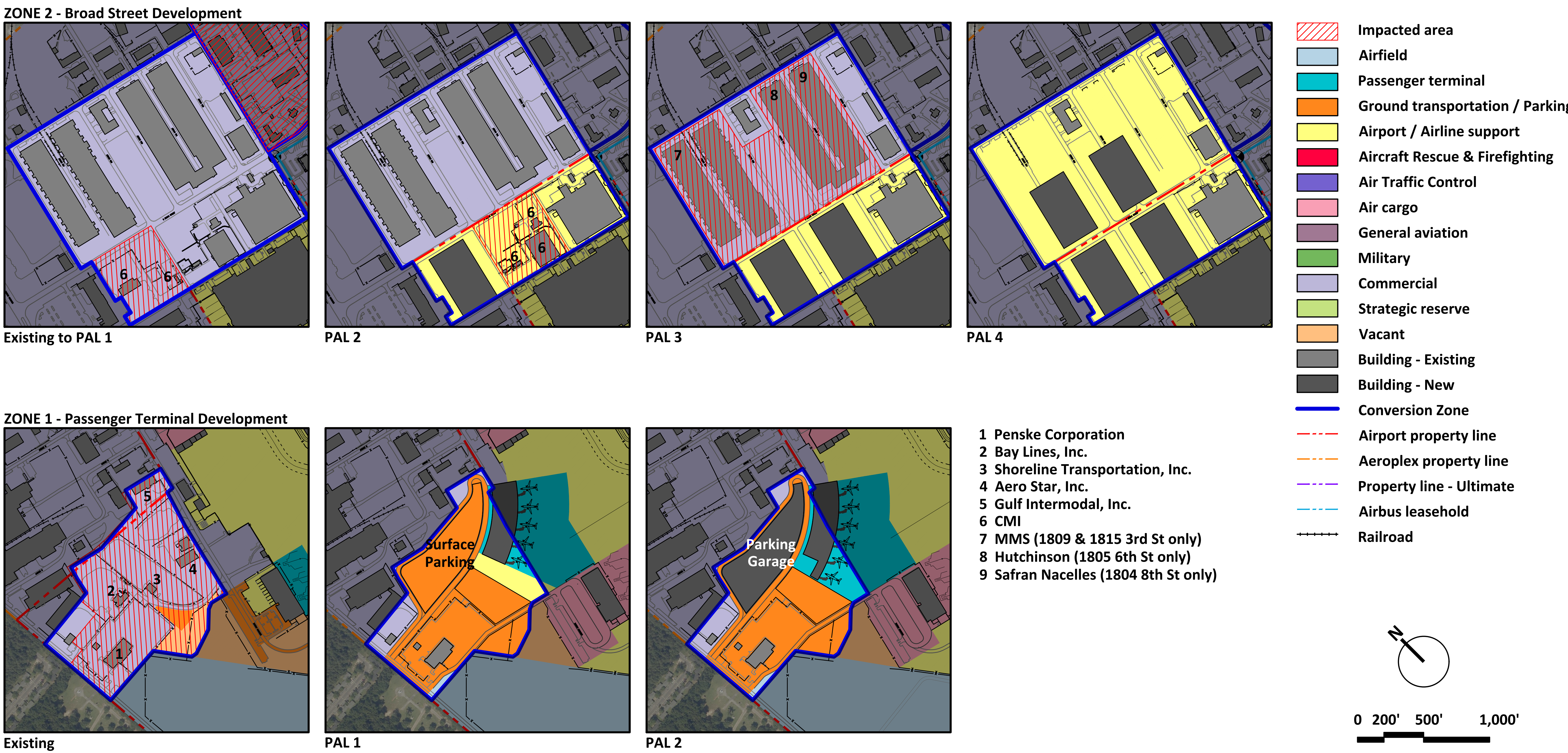
- Develop a listing of businesses and land uses that support the MAA's long-term goals for the role of BFM and the highest and best use of MAA land
- Develop architectural design standards for the conversion zones that reflect the Airport's role and the types of businesses expected to locate within the zones
- Convert the businesses within each zone over time to those that are most compatible with each zone while attracting new businesses to offer the MAA the highest and best use for their land with higher yielding revenues per acre
- Consider these conversion zones as an enhancement to the leasing policy to ensure that fairness to all tenants and prospective tenants is employed in every case



Base Map Source: Hanson Professional Services, June 2020
Conversion Zones and Land-use Overlay: LeighFisher, July 2020

Figure 4.1: Conversion Zones Overview

Mobile Downtown Airport



Base Map Source: Hanson Professional Services, June 2020
Conversion Zones and Land-use Overlay: LeighFisher, July 2020

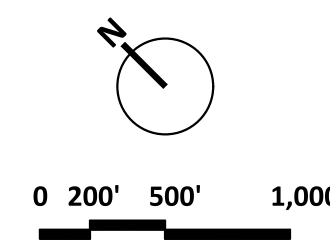
Figure 4.2: Conversion Zones Details - Zone 1 and 2
Mobile Downtown Airport

ZONE 3 - Educational / Commercial Cluster

Existing — PAL 1 — PAL 2

1 Multiple offices
  Derichebourg Aero
  SEZ Aerospace
  Broetje Automation
  B.L. Harbert
2 Casher Wrecker
3 AIDT Aviation Training Center
4 Coastal Community College
5 AAA
6 Air Inc.
7 RAM Tools
8 Tire Tech
9 Jubilee Landscape
10 Army Credit Union
11 Multiple offices
  Embry Riddle University
  Miller Transfer
  Panasonic
  Thales Aerospace
  AKKA
  MAA offices

- Impacted area
- Airfield
- Passenger terminal
- Ground transportation / Parking
- Airport / Airline support
- Aircraft Rescue & Firefighting
- Air Traffic Control
- Air cargo
- General aviation
- Military
- Commercial
- Strategic reserve
- Vacant
- Building - Existing
- Building - New
- Conversion Zone
- Airport property line
- Aeroplex property line
- Property line - Ultimate
- Airbus leasehold
- Railroad



Base Map Source: Hanson Professional Services, June 2020
Conversion Zones and Land-use Overlay: LeighFisher, July 2020

Figure 4.3: Conversion Zones Details - Zone 3

Mobile Downtown Airport

4.1.1 Zone 1- Terminal Conversion Zone

The first conversion zone, detailed in Figure 4.2, is between Michigan Avenue and Perimeter Road south of Avenue O. While minimizing impacts to tenants to the extent feasible, this area is planned to be converted to the passenger terminal and supporting facilities. Specifically, the terminal conversion zone seeks to:

- Support the new passenger terminal complex with room to accommodate business relocations that directly support the new terminal
- Convert the existing aesthetic of the area to be more compatible with the operation of the passenger terminal complex and the desired first impression of travelers coming to BFM

4.1.2 Zone 2 - Aircraft Maintenance and Aviation Support Conversion Zone

The second conversion zone, detailed in Figure 4.2, is intended to support the continued development of maintenance, repair, and overhaul (MRO) and other aviation support facilities at BFM. Specifically, this zone will:

- Provide space for the long-term support of MRO and other direct aviation-related businesses
- Provide space for aviation support businesses that will work synergistically with the direct aviation-related businesses with airfield access
- Work toward the longer-term relocation of those businesses that do not directly support aeronautical activities and are not a highest and best use of the existing land
- Soften the aesthetic in this zone utilizing design standards and to be more compatible with the new role of BFM

With the development of its new global headquarters, Continental Aerospace Technologies will soon be returning some of its previous leasehold to the MAA. This area is located near Broad Street, 9th Street, Avenue I and 3rd Street. With the closure of Avenue I, this area can be converted to aviation use, (subject to the ability to provide taxilane access would need to pass through the land currently occupied by VT MAE). The site could accommodate at least two 150,000 ft^2 hangars but can be flexible to accommodate the future tenants' needs.

Just north of Broad Street between 3rd and 9th Street extending to Avenue C are some of the original Air Force base buildings, historically referred to as Buildings 14A. 14B, 23A, and 23B. If Broad Street is closed, the area between 3rd and 9th Street extending north to Avenue C could be redeveloped for aviation use. This area is proposed to be converted to aviation use over a longer time period. As existing leases in this area expire, it is recommended that only short-term or month to month leases be executed to allow the MAA flexibility in the timing of the conversion of this area to aviation use.

4.1.3 Zone 3 – Commercial Office/Educational Zone

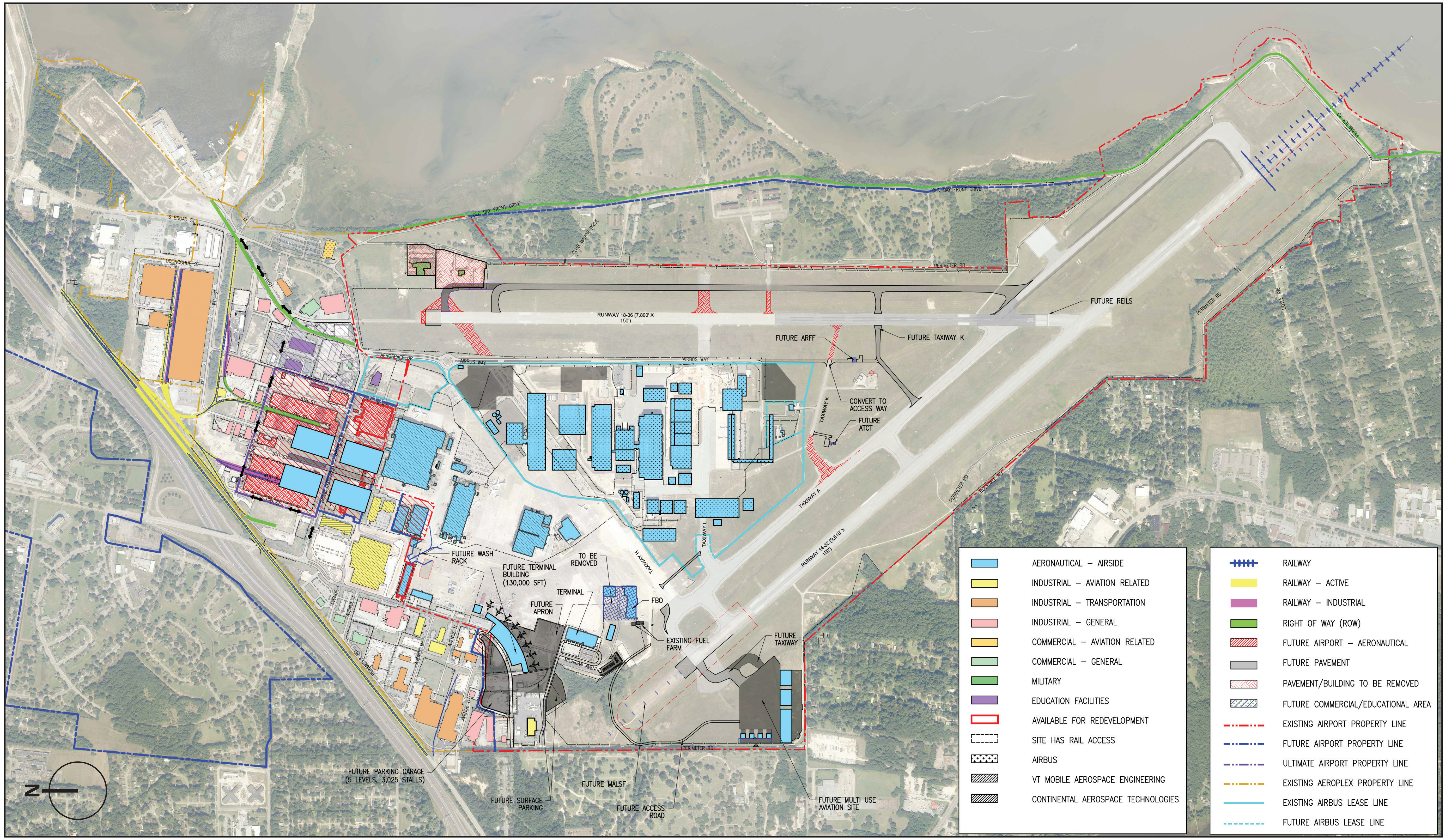
Conversion Zone 3, as shown in Figure 4.3, is envisioned as a commercial office and education zone primarily for non-aviation-related tenants and businesses. This conversion zone will:

- Provide space for commercial business that do not directly support aeronautical activities and accommodate displaced tenants from Zone 2 Conversion.
- Create a business park area and/or education hub at the Airport to improve per square foot revenue than if the space were retained for industrial land or building leases
- Consolidate smaller spaced leases into this zone and enable outlying areas to be used for aeronautical and transportation companies.

Towards the Northeast of the airport, there are a number of leased properties surrounding the AIDT Aviation Training Center and Coastal Community College that are due to expire in within the next 10 years.

The Training Center and the Community College have long term leases and are relatively new buildings, and, neighboring buildings could be repurposed in phases to enhance this cluster.

Current rental rates for land leases in this area of the Airport vary between $0.15-$0.30 per square foot, and building leases vary between $0.66-$19.28 per square foot. To generate the highest and best land use revenue, central areas surrounding the AIDT Training Center and Coastal Community College could be converted into sites for offices/commercial and/or educational use which could generate a premium over existing use. Depending on the level of demand for building and office space, this zone could be expanded to the North to include the buildings between 9th St. and 15th St.



Source: Hanson Professional Services, September 2020

Figure 4.4: Future BFM Land Use Map
Mobile DowntownAirport

4.2 Transportation Considerations

When considering the conversion of areas in the Aeroplex to airfield use, the existing roadway system and railroads need to be taken into consideration.

4.2.1 Roadways

Some of the roadways on the Aeroplex have City of Mobile investment and some are maintained by the MAA, as shown on Figure 4.2. Within the Terminal Conversion Zone, Perimeter Road and Michigan Avenue are both roadways supported by the City of Mobile, and will undergo significant modification as part of the construction of the new passenger terminal complex. The MAA should coordinate with the City of Mobile regarding their future development and use. Other roadways within the Terminal Conversion Zone are primarily MAA-owned and provide flexibility for the redevelopment of the area.

In the Aircraft Maintenance and Aviation Support Conversion Zone, Broad Street is supported by investment from the City of Mobile. To open the area north of Broad Street to aviation use, the through traffic on Broad Street is proposed to be rerouted onto 15th Street to Avenue C to 3rd Street with appropriate upgrades to those road to accommodate the additional traffic. With the exception of a portion of Avenue C between 9th and 6th Streets, the proposed reroute is on City of Mobile roads. As such, any future modifications or realignments to this corridor will require coordination with the City of Mobile.

4.2.2 Railroads

When the Air Force base was transferred to the City of Mobile in 1969, a nonexclusive easement for the use, maintenance, repair, operation, and upgrading of the existing railroad system was acquired by Louisville and Nashville Railroad Company and the Gulf, Mobile and Ohio Railroad Company. The easement is 15 feet wide each side of and parallel to the centerline of the track. However, through mergers and acquisitions with railroad companies, much of the current track is owned by CSX, who have an agreement with Illinois Central to provide service on their tracks. There are additional industry-owned tracks in the area.

The current active CSX tracks serve several businesses on the airport. In addition to the active tracks, CSX owns a significant amount of easements in the area. Some of the original railroad tracks have been removed, but this does not mean the railroad right of way has been extinguished. As part of redeveloping the Aircraft Maintenance and Aviation Support Conversion Zone, the railroad's right of way will need to be extinguished whether or not there are still tracks in place.

Leigh|Fisher

in association with

Hanson Professional Services, Inc.
Corporate Environmental Risk Management, LLC
Jacobsen|Daniels
MPACT Public Affairs Consulting
Quantum Spatial, Inc.

TECHNICAL MEMORANDUM No. 7 – ENVIRONMENTAL OVERVIEW

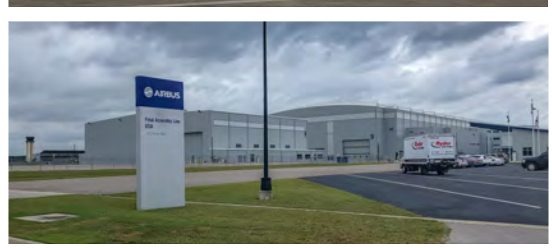
MASTER PLAN
Mobile Downtown Airport

Prepared for

Mobile Airport Authority
Mobile, Alabama

July 2020

Mobile Airport Authority



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ACRONYMS AND ABBREVIATIONS

Term	Definition
ACAMP	Alabama Coastal Area Management Program
ACRES	Assessment Cleanup and Redevelopment Exchange System
ACS	American Community Survey
ADA	Americans with Disabilities Act
ADCNR	Alabama Department of Conservation and Natural Resources
ADEM	Alabama Department of Environmental Management
ADO	Airports District Offices
AEDT	Aviation Environmental Design Tool
ALDOT	Alabama Department of Transportation
ALNHP	Alabama Natural Heritage Program
ASTs	Above-Ground Storage Tanks
ATADS	Air Traffic Activity Data System
ATCT	Airport Traffic Control Tower
BCC	Birds of Conservation Concern
BFM	Mobile Downtown Airport
CAAA	Clean Air Act Amendment
CAEP	Committee on Aviation Environmental Protection
CBRA	Coastal Barrier Resources Act
CBRS	Coastal Barrier Resources System
CEQ	Council on Environmental Quality
CERM	Corporate Environmental Risk Management
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DNL	Day-Night Average Sound Level
ECOS	Environmental Conservation Online System
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESAs	Environmental Site Assessments
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRMs	Flood Insurance Rate Maps

Term	Definition
FPPA	Farmland Protection Policy Act
GHG	Greenhouse Gas
ICAO	International Civil Aviation Organization
IPac	Information for Planning and Consultation
LRTP	Long-Range Transportation Plan
LUST	Leaking Underground Storage Tank
MAA	Mobile Airport Authority
MAWSS	Mobile Area Water and Sewer System
MOB	Mobile Regional Airport
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFA	No Further Action
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
PRP	Potential Responsible Party
RCRA Info	Resource Conservation and Recovery Act Information
SARPs	Standards and Recommended Practices
SIPs	State Implementation Plans
SPCC	Spill Prevention Control and Countermeasures
STIP	Statewide Transportation Improvement Program
TAP	Transportation Alternatives Program
TFMSC	Traffic Flow Management System Counts
TIGER	Transportation Investment Generating Economic Recovery
TMCGT	Three Mile Creek Greenway Trail
USA	University of South Alabama
USACE	U.S. Army Corps of Engineers

Term	Definition
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service

1. INTRODUCTION AND SUMMARY

This chapter provides an overview of existing environmental conditions within the Mobile Downtown Airport (BFM or the Airport) boundary and its broader surrounding area. The Environmental Overview seeks to provide a baseline of environmental resources in the vicinity of the Airport in an effort to support planning and development of proposed action alternatives identified in the master planning process.

New developments at airports have the potential to alter neighboring land uses and environmental and ecological resources. As such, it is important to identify potential impacts to the environment and surrounding community during the planning process. This allows for any planned developments to incorporate measures in accordance with federal, state, and local rules and regulations to avoid, minimize, or mitigate potential impacts to the environment.

1.1 Background

The Mobile Airport Authority (MAA) currently has two passenger service airports located within the Mobile metropolitan area. Those airports are the Mobile Regional Airport (MOB) and BFM. In July 2019, MOB had 18 average daily departures to four destinations, while BFM averaged less than one daily departure (five weekly departures) to two destinations. However, a feasibility study conducted in 2018 determined that it was both feasible and critical for the MAA to relocate all commercial airline passenger service from MOB to BFM.

The transfer of commercial service from MOB to BFM will increase service to the regional market through one centralized location and position the Airport as a competitive option for travelers. The relocation process is planned to be phased, with anticipation of new operations beginning at BFM in 2025. The exact timing of relocation, however, will be driven by passenger enplanement forecasts and financial metrics, among other factors.

1.2 Purpose and Need

The purpose of the proposed development actions by the Mobile Airport Authority at BFM is to accommodate and recapture the demand for commercial traffic in the Airport's catchment area due to the relocation of commercial operations from MOB to BFM.

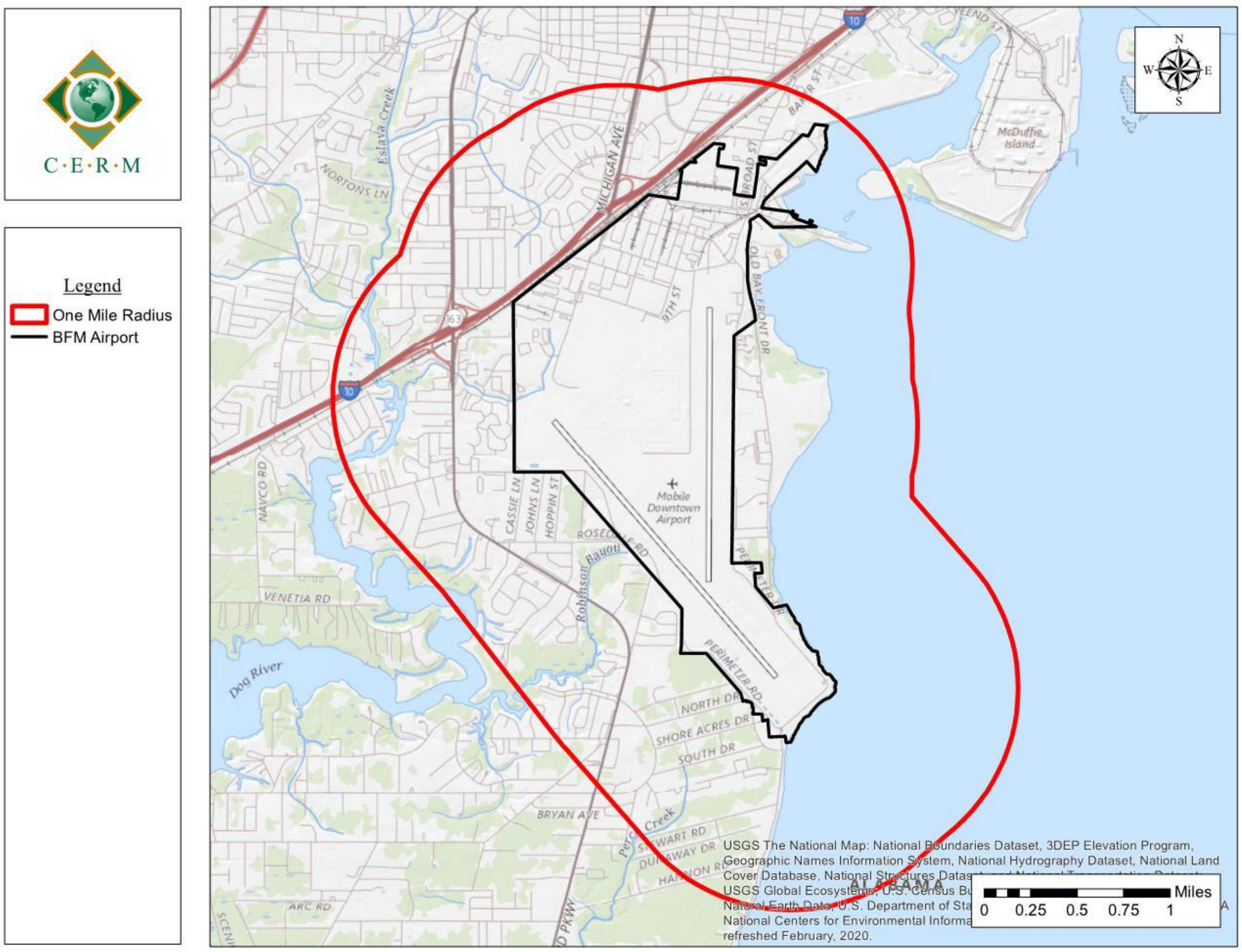
In order to facilitate the transition and accommodate the increase in demand for commercial air service at BFM, the MAA proposes to construct a new passenger terminal complex, apron, and parking garage, among other associated improvement projects.

The need for these projects is to provide a future level of service at the Airport that is both flexible and can accommodate future growth. Implementation of the Proposed Action aligns with the expansion of aviation development at the Mobile Aeroplex at Brookley and the long-time successful demonstration of commercial air service at BFM.

2. ENVIRONMENTAL STUDY AREA

BFM is four miles south of the city's downtown and is situated on the site of the former Brookley Air Force Base. The entire Airport property, which includes both aviation and non-aeronautical uses, encompasses 1,688 acres and is home to the Mobile Aeroplex at Brookley, a mixed-use industrial area.

For the purposes of this report, the Environmental Study Area includes a one-mile radius around the boundary of the Airport, as shown in Figure 2.1.



Source: Corporate Environmental Risk Management (CERM), 2020

Figure 2.1: Environmental Study Boundary

3. FEDERAL AND STATE ENVIRONMENTAL REVIEW REQUIREMENTS

When airports commence new development activity, the resulting construction and operation activities have the potential to impact the environment. Also known as "Proposed Actions," these activities, which can also have the potential to alter airport operations or obstruct airport navigation, must be evaluated according to the National Environmental Policy Act of 1969 (NEPA) and its implementing regulations issued by the Council on Environmental Quality (CEQ) [40 CFR Parts 1500-1508].

The FAA encourages airport sponsors to start the NEPA evaluation process early in its planning stages. FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures,* serves as the primary FAA guidance for compliance with NEPA and CEQ regulations. Additionally, FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Projects,* is the guide for NEPA compliance for major federal actions at public-use airports. The environmental categories that require evaluation for NEPA compliance are:

- Air Quality
- Biological Resources (Fish, Wildlife, and Plants)
- Climate
- Coastal Resources
- Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 (Public Land and Parks, Wildlife and Waterfowl Refuge)
- Farmlands
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historical, Architectural, Archaeological, and Cultural Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Noise-Compatible Land Use
- Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks
- Visual Effects (Light Emissions and Visual Impacts)
- Water Resources (Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)
- Cumulative Impacts

The Desk Reference supplement to FAA Order 1050.1F specifies a threshold for significant impact for only five of the environmental categories: biological resources, water resources, noise, air quality, and Section 4(f) sources. For all other environmental categories, factors that should be considered for impact are provided when determining whether a significant impact would result from a Proposed Action.

4. PROPOSED PROJECTS AND POSSIBLE IMPACTS

The projects proposed and evaluated for impact at the Airport include the following:

- Passenger terminal complex
- Parking garage and surface parking
- Apron
- Rental car facility
- Construction of roadways and improvements to existing roadways
- Taxilanes and taxiways

The information provided in this chapter and summarized in Table 4.1 will be carefully considered in the analysis of proposed projects at the Airport. Furthermore, in order to satisfy NEPA requirements, projects proposed in the Master Plan shall be reviewed in additional detail in subsequent environmental documentation. Information provided in the following sections is based on guidance obtained from Airport personnel and appropriate federal, state, and local resources.

Table 4.1: Environmental Impact Summary

Environmental Category	Resources in Study Area and Impacts Identified
Air Quality	In attainment area. Minimal increases in emissions foreseen.
Biological Resources	Eight (8) listed animal species and two (2) listed plant species found. Biological assessment will be required. NEPA process requires coordination with the U.S. Fish and Wildlife Service.
Climate	Energy footprint will increase; minimal impact to global climate change.
Coastal Resources	Within state coastal zone boundary (any area seaward of a 10-ft. contour line is defined as the coastal area). No structures are authorized seaward of the CCL line (line of prohibition).
DOT Section 4(f) Sources	Two (2) public parks adjacent to the Airport.
Farmlands	None present within the Study Area.
Hazardous Materials	Presence of hazardous sites (contaminated soil and groundwater, active and closed radioactive waste sites), brownfield sites, and closed-in-place underground storage tanks.
Historical, Architectural, Archaeological, and Cultural Resources	None identified. The NEPA process requires coordination with the Alabama Historic Commission.
Land Use	Land uses in the Study Area are compatible.
Natural Resources and Energy Supply	None anticipated.
Noise and Noise-Compatible Land Use	None anticipated.
Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risk	Minority population greater than 50% is observed within the Study Area. NEPA requires consideration of project effects to low-income and minority populations.
Water Resources (wetlands, floodplains, water quality)	Impacts expected in wetlands. All wetland impacts are subject to a formal wetland delineation and jurisdictional determination by the regulatory agency, including the U.S. Army Corps of Engineers, the Alabama Department of Environmental Management, and the Alabama Department of Conservation and Natural Resources.
Source: CERM, 2020	

5. AIR QUALITY

Pursuant to requirements of the Clean Air Act of 1970, the EPA has established National Ambient Air Quality Standards (NAAQS) for the protection of human health and the environment. NAAQS are developed for six criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO2), ozone (O3), particulate matter (PM), which includes particulate matter with a diameter of 10 microns or less (PM10) and a diameter of 2.5 microns or less (PM2.5), and sulfur dioxide (SO2). The EPA enforces compliance with the standards and designates each area across the country as either "attainment", "nonattainment" or "maintenance" for the NAAQS.

5.1 General Conformity Rule

Under the Clean Air Act Amendment of 1990 (CAAA), the General Conformity Rule requires individual states to develop a plan to attain and/or maintain compliance with the NAAQS's for each area designated "nonattainment." These plans, known as State Implementation Plans (SIPs), are developed by state and local air quality management agencies and are submitted to the EPA for approval.

The FAA is the primary agency responsible for ensuring that air-quality impacts associated with airport Proposed Actions adhere to the reporting and disclosure requirements of the EPA General Conformity Rule and SIPs. The General Conformity Rule prohibits the FAA from permitting or funding projects that do not conform to an applicable SIP. Further, the General Conformity Rule only applies to areas that are designated "nonattainment" or "maintenance" by the EPA.

Mobile County, Alabama is designated "attainment" for all criteria pollutants. Thus, a detailed air-quality analysis is not required under the General Conformity Rule. In addition, most Proposed Actions at the Airport will not cause or create a foreseeable significant increase in air emissions. The air-quality impact attributable to potential construction and long-term operations outside of increased aircraft activity and vehicle emissions are expected to be negligible. However, an increase in vehicle exhaust emissions, caused by future increases in aircraft activity and automobile traffic, may affect air quality. Finally, aircraft emissions are not regulated under the General Conformity Rule.

5.2 New and Existing Air Emission Sources at BFM

The Alabama Department of Environmental Management (ADEM) is responsible for the permitting of air pollutant sources regulated by the EPA. ADEM regulations for obtaining air permits for new construction and operation of air quality sources in "attainment" areas are found in ADEM Chapter 335-3-14-.03, *Standards for Granting Permits,* and Chapter 335-3-14-.04, A*ir Permits Authorizing Construction in Clean Air Areas (Prevention of Significant Deterioration)*. Air-quality sources of concern from the Proposed Actions could include, but not be limited to, fuel-burning sources such as boilers and emergency generators, fuel storage, and maintenance operations (e.g., painting, striping, etc.). The ADEM Director may deny an air permit if proposed construction and operation activities interfere with attaining or maintaining any primary or secondary NAAQS's. It is not expected that Proposed Actions associated with the Master Plan will have an impact on NAAQS for Mobile County.

6. BIOLOGICAL RESOURCES

Alabama is one of the most biologically diverse states in the United States. Biological resources studied in the Environmental Overview are the various types of flora (plants) and fauna (fish, birds, reptiles, amphibians, mammals, etc.) in the Study Area, including state and federally listed protected species. Biological resources also encompass the habitats supporting the various flora and fauna, such as rivers, lakes, wetlands, forests, and other ecological communities.

The Endangered Species Act of 1973 (ESA) is the primary law in the U.S. for protecting these resources once they become threatened and endangered. The ESA is administered by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). Under the ESA, a federally *threatened* species is defined as any resident species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. A federally *endangered* species is any resident species that is in danger of extinction throughout all or a significant portion of its range.

Additional field studies will be warranted prior to the start of construction to determine the presence of federally listed threatened and endangered species and state-protected species, particularly around undeveloped, forested, and wetland areas.

The USFWS Environmental Conservation Online System (ECOS) was queried to identify threatened and endangered fish, wildlife, and plant species within the Study Area. The ECOS findings are presented in the following sections. Further information on ecological communities, such as wetlands and regulated waterways, is presented in Section 17. Water Resources.

6.1 Federal Threatened and Endangered Species

Using the USFWS ECOS *Information for Planning and Consultation* (IPac) tool, there are five threatened and three endangered fish and wildlife species within the environmental Study Area boundary. The online system also identified 28 migratory birds from the USFWS Birds of Conservation Concern (BCC) list that may warrant special attention during construction activities. Additionally, the ECOS did not identify any plant or “critical habit” for federally listed threatened or endangered species. The list of ECOS federally protected threatened and endangered species is presented in Table 6.1.

Table 6.1: Federal Threatened and Endangered Species

Species	Common Name	Status	Jurisdiction	Critical Habitat Defined	Project Within Critical Habitat
Marine Mammals					
Tricheus manatus	West Indian Manatee	Threatened	USFWS	Yes	No
Birds					
Mycteria americana	Wood Stork	Threatened	USFWS	No	Unknown
Reptiles					
Pseudemys alabamensis	Alabama Red-Bellied Turtle	Endangered	USFWS	No	Unknown
Pituophis melanoleucus lodingi	Black Pine Snake	Threatened	USFWS	Yes	Unknown
Drymarchon corais couperi	Eastern Indigo Snake	Threatened	USFWS	No	Unknown
Lepidochelys kempii	Kemp's Ridley Sea Turtle	Endangered	NOAA	Proposed	Unknown
Caretta	Loggerhead Sea Turtle	Endangered	NOAA	Yes	No
Fish					
Acipenser oxyrinchus desotoi	Atlantic Sturgeon	Threatened	NOAA	Yes	No
Source: USFWS Environmental Conservation Online System IPac, site accessed May 2020					

6.2 State Listed Species

The Alabama Natural Heritage Program (ALNHP) data was accessed in April 2020 to identify species considered important by the State of Alabama for biodiversity conservation. It should be noted that Alabama does not have a state law equivalent to the federal Endangered Species Act. Therefore, Alabama's rare species of concern do not have the same regulatory protection as federal endangered or threatened species. However, some species do receive regulatory protection through the Alabama Regulations on Game Fish and Fur Bearing Animals administered by the Alabama Department of Conservation and Natural Resources (ADCNR).

The ALNHP rare species list is compiled by county to include rare state species and USFWS federal threatened and endangered species. According to the Encyclopedia of Alabama Report for Threatened and Endangered Species, Alabama currently has 23 plant species protected under the Endangered Species Act of which 14 are endangered plant species and nine are threatened plant species. The protected plant species for Mobile County are presented in Table 6.2.

Table 6.2: State Protected Plant Species for Mobile County

Species	Common Name	Status	Jurisdiction	Critical Habitat Defined	Project Within Critical Habitat
Schwalbea americana	American Chaffseed	Endangered	USFWS	No	Not likely
Isoetes louisianensis	Louisiana Quilwort	Endangered	USFWS	No	Not likely
Source: Encyclopedia of Alabama, “Threatened and Endangered Species,” updated February 2, 2018.					

7. CLIMATE

Climate change is attributed to increasing concentrations of greenhouse gases (GHGs) in the atmosphere. GHGs include carbon dioxide (CO2), methane (CH4), nitrous oxide (N20), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6).

Under Executive Order 13693, *Planning for Federal Sustainability*, federal agencies such as the FAA must make efforts to measure, report, and reduce their greenhouse gas (GHG) emissions from direct and indirect activities (i.e., electricity usage in buildings). The International Civil Aviation Organization (ICAO) is the primary agency responsible for setting standards to help regulate aircraft engine GHG emissions. The FAA and EPA work within the standards set by ICAO's Committee on Aviation Environmental Protection (CAEP). The CAEP is responsible for formulating new policies and adopting new Standards and Recommended Practices (SARPs) related to aircraft noise, local air quality, climate change, and other general aviation-related environmental impacts.

In 2016, the ICAO and the CAEP established international standards to regulate CO2 emissions from aircraft engines to support the reduction of GHG emissions. Activities to consider for reducing GHG emissions at airports include, but are not limited to, the following:

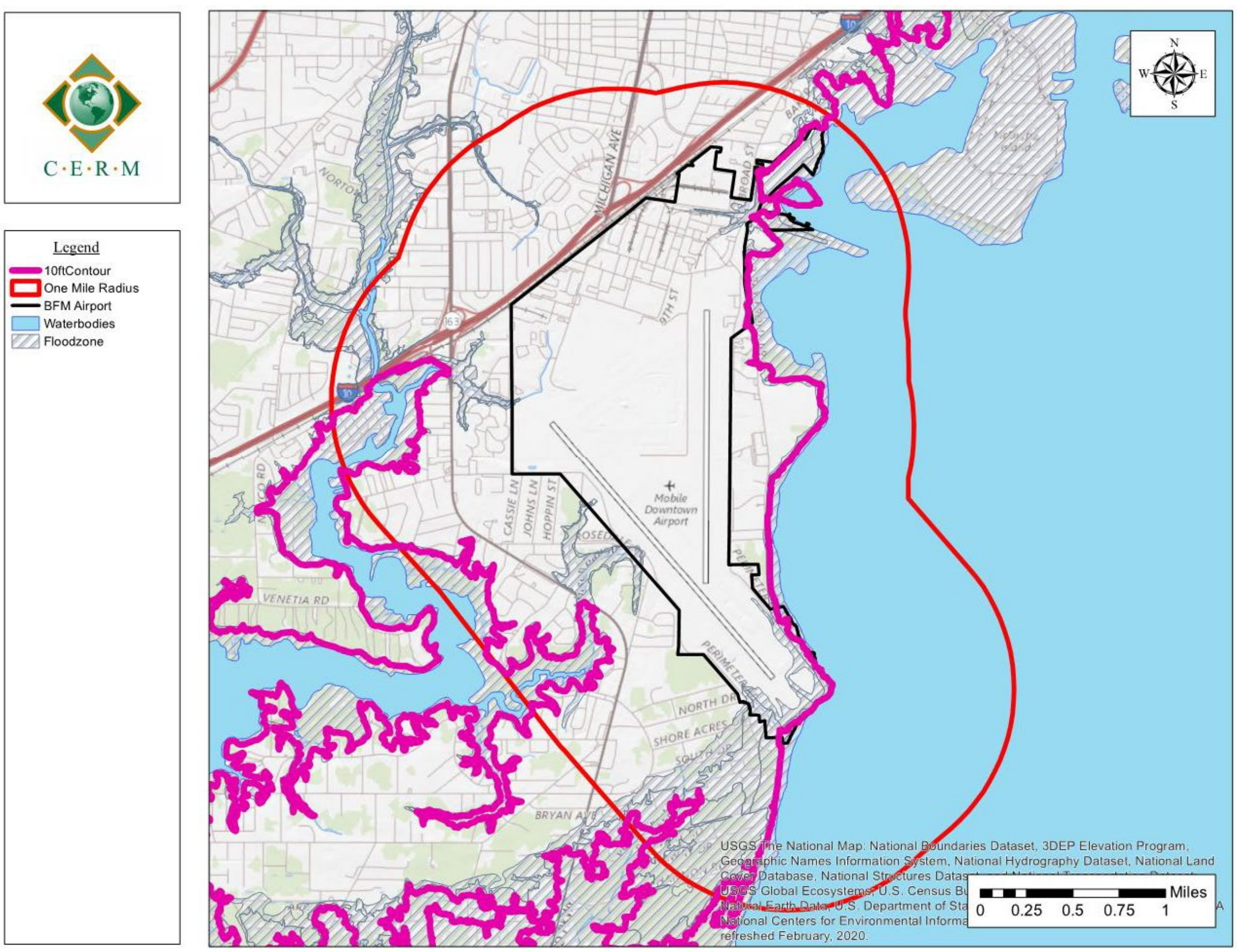
- Promoting energy conservation, efficiency, and management in buildings (terminals, concourses, etc.)
- Including clean energy as part of the footprint for buildings' electric energy supply

The FAA has not identified a significant threshold for GHG emissions at airports as there is no current accepted method of determining the level of significance applicable to airport projects. GHG emissions from proposed actions at BFM would be considered negligible in comparison with total annual U.S. emission estimates.

8. COASTAL RESOURCES

The federal Coastal Barrier Resources Act (CBRA) provides for review of federally funded projects undertaken within the Coastal Barrier Resources System (CBRS). The CBRS includes undeveloped coastal barriers along the coasts of the Atlantic Ocean, Gulf of Mexico, and the Great Lakes. BFM, however, is not located within a CBRS. Thus, the CBRA will not apply to any proposed actions at the Airport.

On the other hand, the federal Coastal Zone Management Act (CZMA) provides for the management and protection of the nation's ocean and Great Lakes coasts. The Alabama Department of Conservation and Natural Resources (ADCNR) and ADEM are the managing authorities that protect lands and waters located in Alabama's coastal area. The Alabama Coastal Area Management Program (ACAMP) is responsible for the regulation of activities on the state's coastal lands and waters seaward of the continuous 10-foot contour in Baldwin and Mobile counties. According to the ACAMP IV Alabama Coastal Area Boundary Map as shown in Figure 8.1, portions of the Airport boundary are within the Alabama Coastal Boundary Zone. Further consultation with the ADCNR and ADEM would be needed to determine if geographic areas of concern and/or preservation will be impacted by Proposed Actions at the Airport.



Source: CERM, 2020

Figure 8.1: Alabama Coastal Area Boundary Map

9. DEPARTMENT OF TRANSPORTATION SECTION 4(F)

The Department of Transportation Act of 1966, Section 4(f) stipulates that the Secretary of Transportation will not approve any program or project that requires the use of land from public parks, recreation areas, historic sites, or wildlife and waterfowl refuges of national, state, or local significance, as determined by the officials having jurisdiction thereof.

These lands are not to be used unless there is no feasible and prudent alternative to the use of such land. Further, any proposed projects must include all possible planning considerations to minimize harm resulting from their use. Lands within the BFM Study Area that meet these criteria, commonly referred to as Section 303(c) lands, include the following:

- Publicly owned parks (federal, state, or local parks)
- Recreation areas
- Wildlife and waterfowl refuges
- National, state, or locally significant historical sites

There are Section 303(c) lands in close proximity to the Airport. These include two public parks adjacent to the Airport – Arlington Park and Doyle Park. Additionally, the Pinto Island Wildlife Preserve is approximately 2.5 miles from the Airport. Details of historic sites of national, state, or local significance located close to the Airport are presented in Section 12, "Historical, Architectural, Archaeological and Cultural Resources."

10. FARMLANDS

The Farmland Protection Policy Act (FPPA), 7 Part 758, regulates federal actions that have the potential to convert farmland to non-agricultural uses. Airport property and surrounding land have been developed over the last 75 years. According to the Natural Resources Conservation Service (NRCS) Web Soil Survey, over 98% of the Airport property today is classified as urban land and there are no classified farmlands within the Study Area. The FPPA does not apply to land already committed to urban development. Thus, current airport utilization and development would not be subject to FPPA regulations.

11. HAZARDOUS MATERIALS, SOLID WASTE, AND POLLUTION PREVENTION

Handling, storage, and/or disposal of hazardous and solid wastes are regulated by local, state, and federal agencies. Existing Phase I Environmental Site Assessments (ESAs) and documents provided by the MAA were reviewed to determine the presence of hazardous material sites at the Airport. Personnel interviews and a review of the Spill Prevention Control and Countermeasure (SPCC) Plan for the Mobile Aeroplex at Brookley were also examined to evaluate the Airport's solid waste management and pollution prevention practices.

11.1 Hazardous Materials

The Phase I environmental assessment of hazardous materials covers a general one-mile radius or more around the central area of BFM. This is based on the Phase I studies for Flightworks and Continental Motors Inc. (CMI) to the north and Airbus's "35-Acre South Project" to the south. A summary of findings from the Phase I ESAs and other MAA documents are presented in Figure 11.1 and Table 11.1.

The EPA Geospatial Data Access website was also used to identify the location of hazardous waste sites at the Airport, as shown in Figure 11.1. The EPA geospatial data download includes records from the following sources:

- Superfund: toxic chemical release sites through 2019 National Priorities List (NPL)
- Resource Conservation and Recovery Act Information (RCRA Info) - EPA and State Treatment, Storage, and Disposal Facilities
- Toxics Release Inventory - Toxic Chemical Release Sites Through 2019)
- Assessment Cleanup and Redevelopment Exchange System (ACRES) - Brownfield Properties

Due to the risk that some chemicals pose to human health, it is important to evaluate the potential for encountering contaminants prior to actual construction activities. The MAA should conduct additional Phase I ESAs prior to construction activities at proposed project sites. The Phase I ESAs can provide perspective on what materials may have been used, stored, or possibly spilled on-site.

Finally, although they were not included in the EPA Geospatial Data Access website, there are several former shooting ranges along the eastern boundary of BFM and extending into Mobile Bay, which included both trap and shooting ranges. Most of the sites within the boundary of the land are not owned by the MAA, which presently buffers the airfield from Mobile Bay. Additionally, many of the ranges were located along the historical coast, which has subsequently been backfilled to increase the base land mass into Mobile Bay.

11.2 Solid Waste

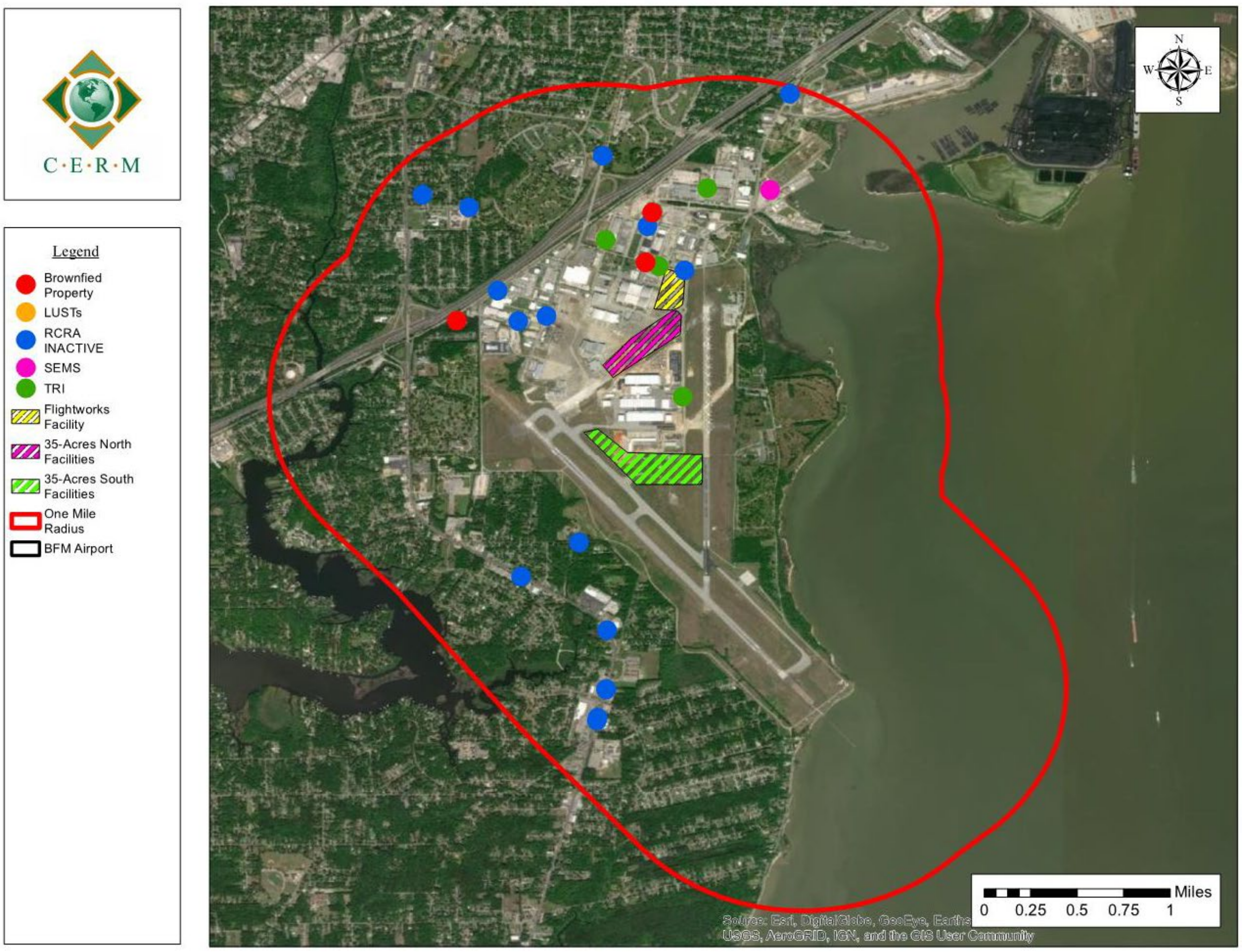
The Airport currently has a solid waste collection and disposal services contract with Republic Services, one of the largest waste management companies in the United States. Republic Services is active in recycling, reducing carbon emissions, and supporting composting and other community projects related to environmental conservation, sustainability, and education.

Solid waste from the Airport is transported off-site for disposal at Republic Services' Timberlands Landfill, located at 22800 Highway 41, Brewton, AL 36426. This landfill has capacity to accept up to 2,500 tons of waste per day.

11.3 Pollution Prevention

To comply with the requirements of the EPA Oil Pollution Act of 1990, 40 CFR Part 112, the MAA has developed and implemented an SPCC Plan for the Mobile Aeroplex at Brookley, which has been in place since 2002. The SPCC Plan provides guidance and procedures to prevent the occurrence of oil discharges and to prepare personnel to respond in a safe, effective, and timely manner in case of such an event.

The SPCC Plan also covers the Above-Ground Storage Tanks (ASTs) for the Airport's maintenance equipment facility to the north and the lighting vault emergency generator AST to the south. Tenants are responsible for management of their own facilities and fuel storage tanks. A full list of petroleum fuel storage tanks at the Airport can be found in the *Inventory* chapter of the Master Plan.



Source: CERM, 2020

Figure 11.1: Hazardous Materials Sites

Table 11.1: Hazardous Sites

Hazardous Material Environmental Review*	**Site Location**	**Status**
AOC -001 Landfill 1, *MAA MPU 2020*	Located east of Taxiway A at the south end and along the shore	Potential Responsible Party (PRP) site
AOC-002 Landfill 2, *MAA MPU 2020*	Located east of Taxiway A where Perimeter Drive makes a bend	No Further Action (NFA) – closed hazardous, toxic, and radioactive waste site
AOC-003 Landfill 3, *MAA MPU 2020*	Located north of the Runway 14 end	PRP site
AOC-004 Landfill 4, *MAA MPU 2020*	Located at the corner of Old Bay Drive and 15th Street	NFA – closed hazardous, toxic, and radioactive waste site
AOC-005 Landfill 5, *MAA MPU 2020*	Located between I-10, Perimeter Road, and Neshota Drive	PRP site
AOC-006 Landfill 6, *MAA MPU 2020*	Located south of the Runway 36 end, inside Perimeter Road	NFA – closed hazardous, toxic, and radioactive waste site
AOC-007 Hangar 17, *MAA MPU 2020*	Located at the south end of 5th Street	PRP site
AOC-008 Former locomotive maintenance shop	Located south of the railroad tracks and west of 9th Street	NFA – closed hazardous, toxic, and radioactive waste site
AOC-009, Former refuse oil burning pit, *MAA MPU 2020*	Located west of RWY 14/32, north of Rosedale Road, and west of Perimeter Road	Active hazardous, toxic, and radioactive waste site
AOC-010 Industrial maintenance Area, *MAA MPU 2020*	Bound by Michigan Avenue, Broad Street, 9th Street, and Hangar 17	Multiple underground storage tank closed-in-place locations
Solvent pipeline, *MAA MPU 2020*	Located on the east side of Michigan Avenue across from Avenue M	NFA
Phase I - Flight Works Parcels A & B, by Southern Earth Sciences Inc., 2018	S Broad Street at Aerospace Drive (-88.068889296, 30.644974389)	Hazardous sites – A.C. Reclamation Building and Insulation Burner; Transformer Cage and Maintenance Building (elevated concentrations of arsenic and PCB

Hazardous Material Environmental Review*	Site Location	Status
		in soil; elevated concentration of SVOCs, VOCs and metal in groundwater)
Phase I - 35-Acres North - 4 Parcels, by *Southern Earth Sciences Inc.*, 2018	Parcels 32-01-52-0-0069-001, 32-01-52-0-003-001, 32-04-34-0-001-001, 32-01-03-3-000-002	Hazardous site – Former Brookley AFB Fuel Delivery Station (elevated concentrations of chlorinated solvents and benzene detected in groundwater)
Phase I - 35-Acres South – 2 Parcels, by *Southern Earth Sciences Inc., 2018*	Parcels 32-01-10-2-00-002, 32-04-34-0-006-001	Leaking Underground Storage Tank (LUST) - NFA in Building 107
Phase I - CMI w/in Continental Motors Complex, by *Southern Earth Sciences Inc., 2019*	Avenue I (-88.075277, 30.6433185)	LUSTs - NFA at MAA Buildings 15, 18, 26, 89, 96, 107, 335, 337 at Brookley 3 Brownfield sites - MAA Buildings 1, 2, 14 at Brookley

Source: CERM, 2020

12. HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

As defined in 36 CFR Part 800, a historic property is "any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places (NRHP)." Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires that federal agencies such as the FAA consider the effects of their actions on historic properties via consultation with state historical commissions. Such effects and changes from the Airport Proposed Actions may include the following:

- Physical destruction, damage, or alteration of property
- Change in the character of the property's use or physical features within the setting that contribute to the property's historic significance
- Introduction of visual, atmospheric, audible, or other elements that diminish the integrity of the property's significant features

A preliminary review of historical and cultural resources in the Study Area indicates that there are no known historic properties listed or eligible for listing in the NRHP at the Airport. Table 12.1 lists four nationally registered historical sites within the three-mile radius of the Airport. It is not unusual for potential effects to be influenced by the geographic coverage of noise contours.

When a specific airport development is proposed, the required documentation, including detailed descriptions and pictures of structures to be affected, should be sent to the Alabama Historic Commission for a determination of that project's potential effect on historical or cultural resources.

Table 12.1: Nationally Registered Historical Sites

Site Name	Site Address	Relevant Distance (miles)	Established (Date)	Registered (Date)	Number of Structures
Martin Lindsey House	3112 Bayfront Road, Mobile	0.19	1915	1/24/1991	1
Magnolia Cemetery (including Mobile National Cemetery)	Ann and Virgin streets, Mobile	1.98	1836	6/13/1986	1
Saint Matthew's Catholic Church	1200 South Marine Street, Mobile	1.46	1913	7/31/1991	1
Maysville Historic District	451 Acre District (to the north of the project site), Mobile	1.14	Late 1890's	12/25/2013	Multiple
Source: National Register of Historic Places & Lyn Causey.					

13. LAND USE

There are several anticipated projects located within the Study Area that will bring additional development and amenities to the surrounding neighborhood. Key projects include:

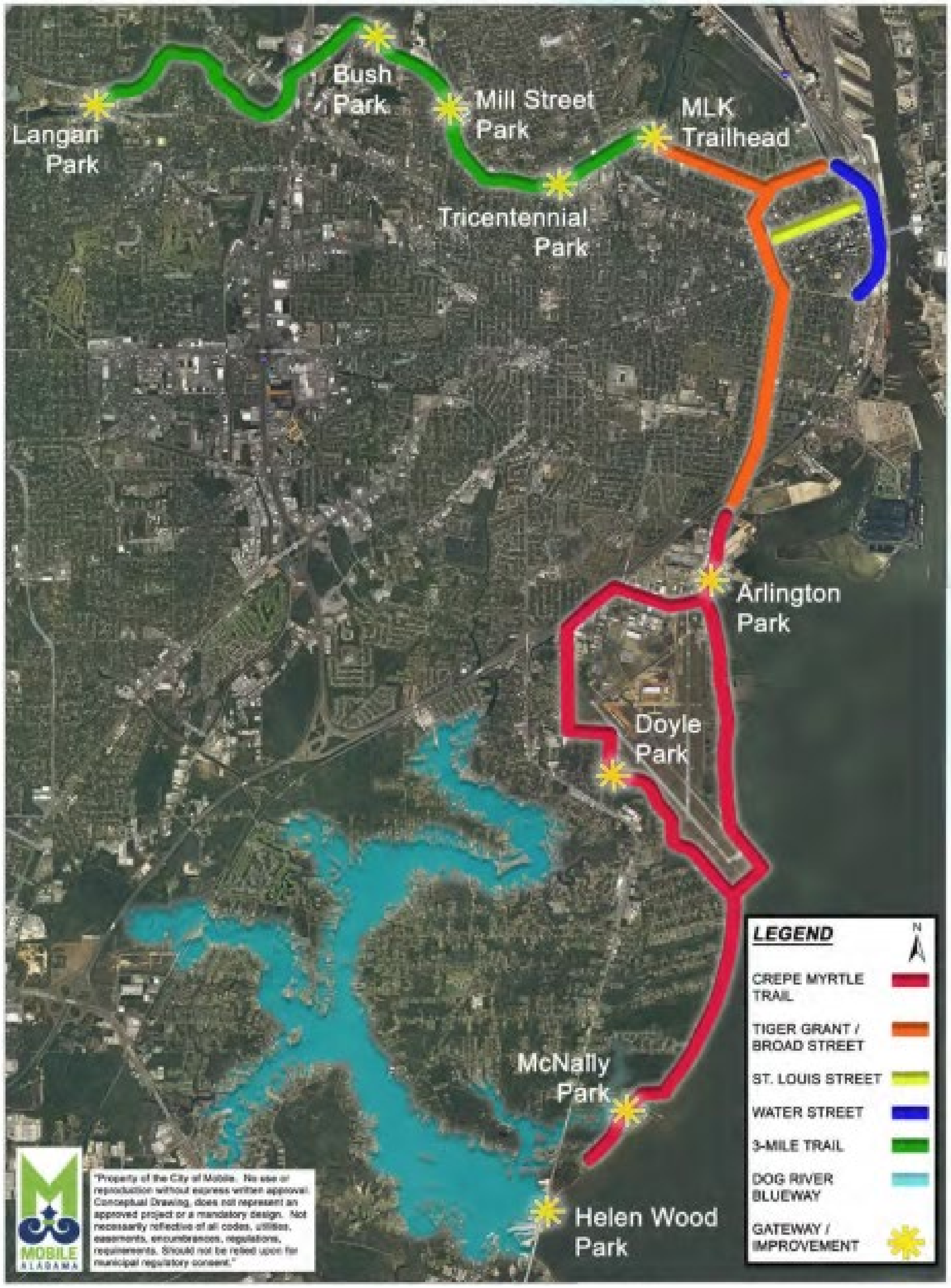
- **Crepe Myrtle Trail Brookley Leg:** Bike and pedestrian trail
- **"Miracle Mile":** Mixed-use area of Dauphin Island Parkway
- **Michigan Avenue Reconstruction:** Reconstruction of Michigan Avenue from US 90 to I-10

The Alabama Statewide Bicycle and Pedestrian Plan was completed in 2017 and seeks to expand and improve safety and connectivity across the state. There is an existing 1.7-mile trail, the Mobile Airport Perimeter Trail, running north from Bayfront Road to Doyle Park. The Crepe Myrtle Bike Trail currently runs from Helen Wood Park to Doyle Park along the coast, east of the Airport. An extension of the Crepe Myrtle Trail, "the Brookley Leg," is proposed to run farther north to Eslava Street near the Mobile Alabama Cruise Terminal. This extension ties into other connectivity and trail initiatives, such as *One Mobile: Reconnecting People, Work, and Play through Complete Streets* [a project largely funded by a federal Transportation Investment Generating Economic Recovery (TIGER) grant] and the Three Mile Creek Greenway Trail (TMCGT), as illustrated in Figure 13.1.

In addition to the aforementioned plans and initiatives, several organizations work to promote trail use in the Study Area. The Peninsula of Mobile organization sponsors events to support the development of the Crepe Myrtle Trail extension and other multi-use path initiatives in Mobile. BicycleMobile.org, an advocacy website, organizes clubs and group rides, at least one of which follows the western perimeter of the Airport.

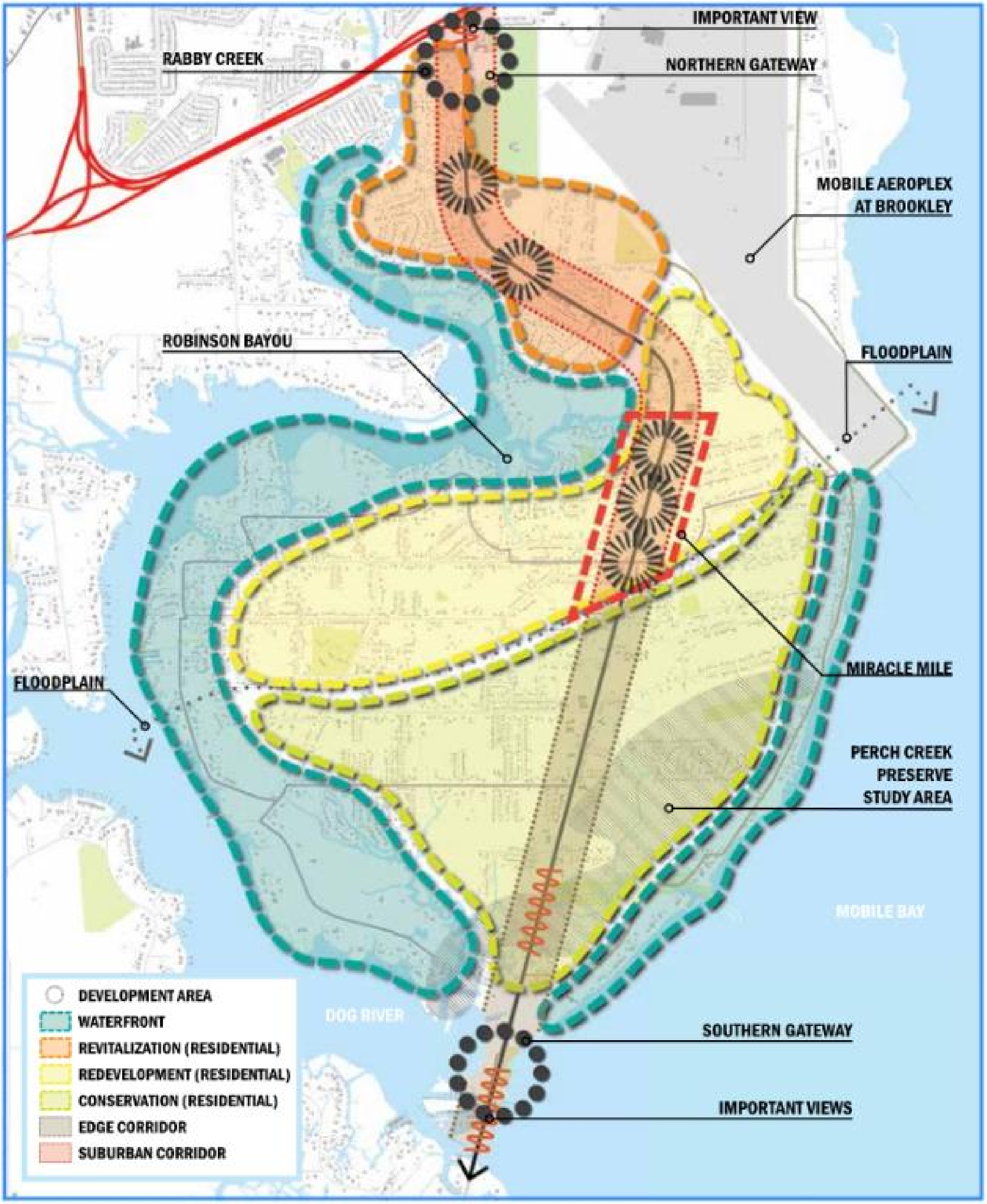
The Peninsula of Mobile organization created the Mobile Peninsula Corridor Master Plan in 2017. Directly adjacent to the southwest side of BFM, the Mobile Peninsula Corridor Master Plan Concept Map, as illustrated in Figure 13.2, includes waterfront and residential development, along with the "Miracle Mile," a one-mile section of Dauphin Island Parkway between Levene Road and Cedar Park Drive, currently inhabited by schools, restaurants, and retail establishments that serve the surrounding community. Furthermore, an Alabama Department of Transportation (ALDOT) Transportation Alternatives Program (TAP) grant is being used to improve and connect existing sidewalks and crosswalks for Americans With Disabilities Act (ADA) compliance. Lastly, a project to add sidewalks on Dauphin Island Parkway between I-10 and Old Military Road is programmed in the Statewide Transportation Improvement Program (STIP).

Another planning initiative located within the Study Area is the Michigan Avenue Reconstruction. This project is included in the Mobile Metropolitan Planning Organization (MPO) Long-Range Transportation Plan (LRTP), *Envision 2045*. The project seeks to completely reconstruct Michigan Avenue, as well as add bike and pedestrian facilities, to the section of roadway between US 90 and I-10, as shown in Figure 13.3. The MPO anticipates commencement of the project in FY2027 or FY2028.



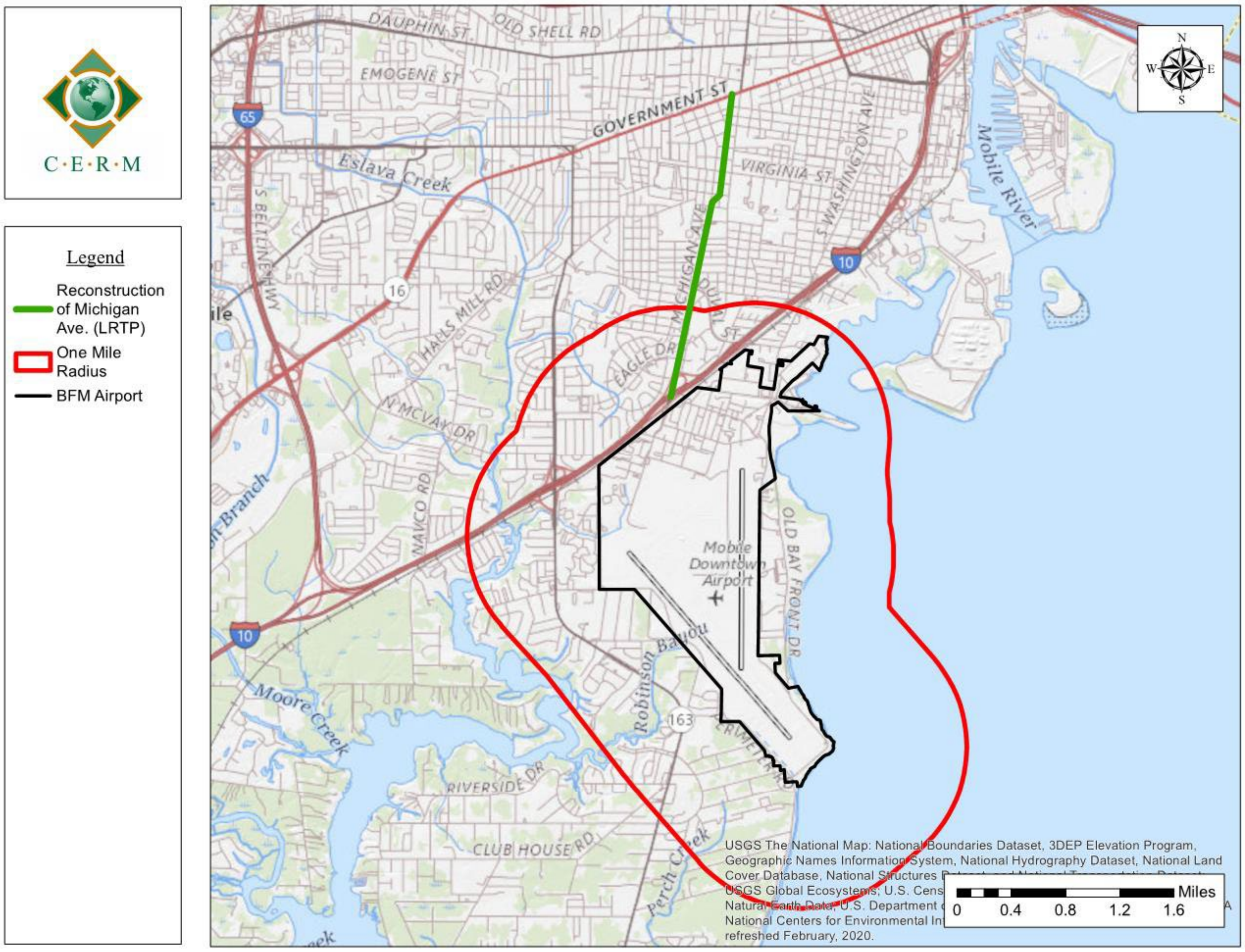
Source: Map for Mobile, 2015

Figure 13.1: Crepe Myrtle Trail, TIGER Grant, and TMCGT Location Map



Source: Mobile Peninsula Corridor Master Plan, 2016

Figure 13.2: Mobile Peninsula Corridor Master Plan Concept Map



Source: CERM, 2020.

Figure 13.3: Michigan Avenue Reconstruction

13.1 Other Development Activities

There are two additional properties adjacent to the Airport being marketed for development:

- Brookley Aeroplex – Three lots (at 3rd and Broad streets, on Michigan Avenue, and on Perimeter Road)
- The University of South Alabama (USA) Foundation – 300 acres of waterfront property adjacent to the east side of the Airport, 30 acres of which are to be preserved as wetlands

Besides the Peninsula of Mobile and USA Foundation organizations, Build Mobile and Map for Mobile are heavily involved with development in the Mobile Downtown Airport area.

14. NATURAL RESOURCES AND ENERGY USE

Available utilities at BFM include electricity, city water, natural gas, sewer, internet, telephone, and satellite television. Alabama Power is the electrical provider for BFM and the Mobile Area Water and Sewer System (MAWSS) is its potable water provider. BFM is within Spire's natural gas service area.

New development and anticipated growth at the Airport will result in an increase in the use of these utilities and natural resources. However, the anticipated increase is not of sufficient magnitude to alter regional energy demand or limit natural resource availability.

All proposed projects at the Airport should be evaluated for potential effects upon natural resources and energy uses. Further, methods to reduce potential energy uses should be considered during the environmental review process.

15. NOISE AND NOISE-COMPATIBLE LAND USE

The *Inventory* chapter provides a comprehensive review of land use and zoning designations within the general vicinity of the Airport. Most land immediately surrounding the Airport is low- or mixed-density residential use. Adjacent residential properties, as well as parks, religious institutions, hospitals, and schools located in the vicinity of the Airport, may be considered noise-sensitive.

A significant impact occurs if the proposed action would increase noise by a Day-Night Average Sound Level (DNL) 1.5 decibels (dB) or more for a noise-sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase (when compared to the no action alternative for the same time frame). The most recent noise analysis indicates that noise exposure levels outside of the Airport boundary are DNL 60 dB, with the exception of a small area exposed to DNL 65 dB levels just outside the northern boundary of the Airport, as shown in Figure 15.1. The noise analysis is detailed in the following sections.

15.1 Project Description

As part of the master planning process, an aircraft noise analysis was completed for the Airport. Results of this analysis revealed four distinct sets of noise contours, corresponding to existing and forecast aviation activity levels. To assess the potential for noise impacts due to increasing and changing aircraft activity, the FAA's Aviation Environmental Design Tool (AEDT) was used to evaluate future noise contours. The scope of the study was to use existing data and the FAA-approved forecasts. It did not include any field measurements.

15.2 Federal Regulations

In accordance with FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, sound is a physical phenomenon consisting of pressure fluctuations that travel through a medium, such as air, and are sensed by the human ear. Noise is considered unwanted sound that can disturb routine activities (e.g., sleep, conversation, student learning) and can cause annoyance. Aviation noise primarily results from the operation of fixed- and rotary-wing aircraft, and is caused by departures, arrivals, overflights, taxiing, and engine run-ups. Noise is often considered the predominant aviation environmental concern of the public, and significant levels of aircraft noise in communities around airports tend to generate the most issues.

The FAA evaluates noise impact through DNL, used to reflect a person's average exposure to sound over a 24-hour period, expressed as the noise level for the average day of the year on the basis of annual aircraft operations. DNL calculations utilize a number of variables, including aircraft models and engine types, approach and departure tracks, number of operations, and time of day. A 10-dB penalty (double the noise level) is added to noise occurring during the nighttime (between 10 p.m. and 7 a.m.) to account for peoples' higher sensitivity to noise and expectation for quieter noise levels during these hours. DNL uses the A-Weighted decibel (dBA) measure, which account for how the human ear hears noise. The purpose of DNL noise contours generated by the AEDT is to depict the generally expected average, annualized noise exposure at a relative location, not noise levels occurring in a specific location or for a single aircraft event.

The FAA and EPA have set a guideline of 65 DNL to determine compatible land use around airports. Noise metrics describe noise exposure and help predict community response to various noise exposure levels. Finally, noise complaints can and will occur in areas impacted by lesser noise levels because individual human perception of noise is subjective.

15.3 Computer Modeling

Existing and future aircraft noise contours for BFM were modeled using the AEDT. According to the FAA, "AEDT is a software system that models aircraft performance in space and time to estimate fuel consumption, emissions, noise, and air quality consequences. AEDT is a comprehensive tool that provides information to FAA stakeholders on each of these specific environmental impacts. AEDT facilitates environmental review activities required under NEPA by consolidating the modeling of these environmental impacts in a single tool."[1]

The first public release of the AEDT was version 2a in 2012. The latest version, AEDT version 3c, was released on March 6, 2020, and was used in noise modeling for 1H2. AEDT creates maps of an airport's noise environment expressed in DNL to assist in potential impact assessment. Accurate noise contours are dependent on the use of reliable and accurate aircraft operational data.

15.4 Data Input

Input data for the noise model falls into five general categories: aircraft operations, fleet mix, runway utilization, approach and departure profiles, and flight tracks. Historic Airport Traffic Control Tower (ATCT) operations counts are reported to the FAA's Air Traffic Activity Data System (ATADS) and were used as the baseline operations level. Operations from the FAA's Traffic Flow Management System Counts (TFMSC), based on data from instrument flight plans, was used to identify specific types of aircraft using BFM. These data sources were further enhanced through interviews with the MAA and ATCT staff. Data were submitted to the FAA Airports District Offices (ADO) for review prior to preparing the noise contours.

The 2018 baseline activity is from the ATCT counts as reported to ATADS. The operations totals from the FAA-approved aviation activity forecasts were utilized to determine contours for planning activity levels (PALs) 1, 2, and 4, which correspond to 2025, 2030, and 2040, respectively. The assumed aircraft operations used in this analysis are summarized in Table 15.1.

Table 15.1: Forecast Aircraft Operations

Year	Commercial Operations	General Aviation Operations	Military Operations	Total Operations
Baseline (2018)	4,468	14,359	45,267	64,094
PAL 1 (2025)	24,360	14,800	43,670	82,830
PAL 2 (2030)	26,180	15,010	43,670	84,860
PAL 4 (2040)	27,000	15,440	43,670	86,110
Source: Hanson Professional Services, 2020				

1 Federal Aviation Administration. (n.d.) Aviation Environmental Design Tool (AEDT). Retrieved from https://aedt.faa.gov/.

Air carrier operating characteristics were modeled based on airline schedules at Mobile Regional Airport (MOB) under normal conditions and the forecast level of future activity.

To perform the noise analyses for BFM, a representative fleet mix composed of 40 aircraft was selected based on the forecast data and interviews. A total of more than 1,600 unique operations with distinct variables were entered into the model for analysis. Operations were calculated for a daily average and then annualized for DNL metric calculations. Additionally, arrivals and departures were assumed to be split evenly (50% and 50%) for each aircraft. While the representative aircraft are listed in Table 15.2, more detailed operations inputs are included in Appendix A. Some aircraft are repeated due to being representative aircraft for multiple forecast categories (such as appearing in military and general aviation).

Table 15.2: Representative Aircraft

Aircraft	ANP ID	Airframe Model
A220 – Airbus A220 All Series	737700	Airbus A220-300
A306 – Airbus A300 B4-600	A300B4-203	Airbus A300B4-600 Series
A319 – Airbus 319	A319-131	Airbus A319-100 Series
A320 – Airbus A320 All Series	A320-211	Airbus A320-200 Series
A321 – Airbus A321 All Series	A321-232	Airbus A321-200 Series
Airbus EC35 EuroCopter	EC130	Eurocopter EC-130
B350 – Beech Super King Air 350	DHC6	Raytheon Super King Air 300
B737 – Boeing 737	737300	Boeing 737-300 Series
B752 – Boeing 757-200	757300	Boeing 757-300 Series
B763 – Boeing 767-300	767300	Boeing 767-300 Series
B772 – Boeing 777-200	777200	Boeing 777-200-ER
BE30 – Raytheon 300 Super King Air	DHC6	Raytheon Super King Air 300
BE36 – Beech Bonanza 36	GASEPV	Raytheon Beech Bonanza 36
BE58 – Beech 58	BEC58P	Raytheon Beech 55 Baron
BE9L – Beech King Air 90	DHC6	Raytheon King Air 90
Bell 206L Long Ranger	B206L	Bell 206 JetRanger
Bell TH-57 Sea Ranger	B206L	Bell 206 JetRanger
Bombardier Challenger 300 (C/D-II Jets)	CL600	Bombardier Challenger 300
Bombardier Learjet 25 (C/D-I Jets)	LEAR25	Bombardier Learjet 25
C130 – Lockheed 130 Hercules	C130	Lockheed C-130 Hercules
C-146 (Dornier 328)	DO328	Dornier 328-100 Series
C172 – Cessna Skyhawk 172/Cutlass	CAN172	Cessna 172 Skyhawk
C208 – Cessna 208 Caravan	CAN208	Cessna 208 Caravan
Cessna 525 CitationJet (B/C-II Jets)	CAN525C	Cessna 525 CitationJet

Aircraft	ANP ID	Airframe Model
Challenger 600	CL600	Bombardier Challenger 600
CRJ-200 Canadair Regional Jet 200	CL600	Bombardier CRJ-200
CRJ-700 Canadair Regional Jet 700	CRJ9-ER	Bombardier CRJ-700
CRJ-900 Canadair Regional Jet 900	CRJ9-ER	Bombardier CRJ-900
ERJ 145 Embraer 145	EMB145	Embraer ERJ145
ERJ 175 Embraer 175	EMB175	Embraer ERJ175
MH-60 Sea Hawk	S70	Sikorsky SH-60 Sea Hawk
P-8 Poseidon	737800	Boeing 737-800 Poseidon
PA46 – Piper Malibu	GASEPV	Piper PA46 Malibu (FAS)
PC12 – Pilatus PC-12	CAN208	Pilatus PC-12
Sikorsky S-61	S61	Sikorsky SH-3 Sea King
SR22 – Cirrus SR 22	COMSEP	Cirrus SR22
T-1 Jayhawk	ECLIPSE500	Hawker Beechcraft Corp Beechjet 400T T-1A Jayhawk
T-6A Texan II	CAN208	Beechcraft T-6 Texan 2 (FAS)
Source: Hanson Professional Services, 2020		

The percentage of daytime and nighttime operations and split of aircraft arriving and departing for each runway end were determined based on conversations with airport staff and the tower manager to confirm the information in previous BFM noise studies. Different aircraft were assigned different runway usage percentages and day/night splits. For example, commercial service aircraft were only assigned to primary Runway 14/32. Generally, higher activity was modeled on the primary runway and during the daytime. As increasing commercial operations are forecast for each future year, the runway usage percentages slightly shift toward the primary runway.

Straight-in arrival tracks and straight-out departure tracks were utilized for operations on all runway ends. The averages, across all operations (more than 1,600) for each forecast year, for Day/Night Split, as shown in Table 15.3, and Runway Usage, as listed in Table 15.4, follow. Fleet mix and other variables were all vetted through Airport staff and sent to the FAA prior to performing any calculations.

Table 15.3: Day/Night Split

Year	Day (7 AM - 10 PM)	Night (10 PM - 7 AM)
Baseline (2018)	97%	3%
PAL 1 (2025)	96%	4%
PAL 2 (2030)	96%	4%
PAL 4 (2040)	96%	4%
Source: Hanson Professional Services, 2020		

Table 15.4: Runway Usage

Forecast Year	Primary Runway 14	Primary Runway 32	Crosswind Runway 18	Crosswind Runway 36
Baseline (2018)	52.5%	35.0%	7.5%	5.0%
PAL 1 (2025)	52.6%	37.4%	5.9%	4.1%
PAL 2 (2030)	52.7%	37.5%	5.8%	4.0%
PAL 4 (2040)	52.8%	37.6%	5.7%	3.9%
Source: Hanson Professional Services, 2020				

15.5 Output

The calculated 65, 70, and 75 DNL noise contours, relative to the Airport's runways and property line for PAL 4 (2040), are shown in Figure 15.1. Baseline Airport noise contours, in addition to those calculated for PAL 1 (2025) and PAL 2 (2030), are included in Appendix B. Table 15.5 lists the area of the 65, 70, and 75 DNL contours for each of the forecast years. The largest contour, the 65 DNL, covers an area of approximately 0.60 square miles for the baseline year (2018), and increases to 0.73 square miles by PAL 4 (2040). The 65 DNL extends beyond the Airport property for the future conditions, beyond the Runway 14 end over a wooded cemetery area. To the west of Runway 14/32, the future 65 DNL contours lay almost exactly on top of the Airport property line, barely extending on to a few private properties with residences.

Table 15.5: Noise Analysis Results Summary

Contour	Metric	On- or Off- Airport	Area (square miles)
Baseline (2018)			
65	DNL	On-Airport	0.599178
70	DNL	On-Airport	0.295616
75	DNL	On-Airport	0.136206
PAL 1 (2025)			
65	DNL	On-Airport	0.690301
70	DNL	On-Airport	0.328874
75	DNL	On-Airport	0.15349
PAL 2 (2030)			
65	DNL	On-Airport	0.704944
70	DNL	On-Airport	0.334353
75	DNL	On-Airport	0.156448
PAL 4 (2040)			
65	DNL	On-Airport	0.725207
70	DNL	On-Airport	0.342173
75	DNL	On-Airport	0.160716

Source: Hanson Professional Services, 2020.

Figure 15.1: PAL 4 BFM Noise Contours

16. SOCIOECONOMIC CONDITIONS, ENVIRONMENTAL JUSTICE, CHILDREN'S ENVIRONMENTAL HEALTH, AND SAFETY RISKS

The following sections detail potential impacts related to socioeconomic conditions, environmental justice (EJ), and other health and safety risks.

16.1 Socioeconomics and Environmental Justice

Executive Order 12898, F*ederal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* directs federal agencies to consider the potential disproportionate and adverse effects of federal actions upon low-income and minority populations.

An environmental justice screening of the area within the 3-mile radius of the Airport was conducted using the EPA's EJ mapping and screening tool, EJSCREEN. The EJSCREEN for this report evaluated select demographic indicators such as percent minority, percent low-income, and demographic index (a combination of percent minority and percent low-income) calculated from the Census Bureau's American Community Survey (ACS) 5-year estimates for the period 2013-2018. According to the report, the population within the 3-mile area surrounding the Airport is 73% minority. Most residents identify as black (70%), with 28% identifying as white. Further, 42% of the households in the Study Area earn $25,000 or less annually.

It is unknown if the Proposed Actions associated with the Master Plan will require the acquisition of land outside Airport property. Land acquisition may displace residences, community facilities, local businesses, institutions, and parks/recreational spaces. If land acquisition is required and involuntary displacements occur, Title II of the Uniform Relocation Assistance and Real Properties Acquisition Acts of 1970 (42 U.S.C. Section 4601 et. seq.) provides a uniform policy for the fair and equitable treatment of persons displaced by federally funded or assisted programs. The MAA may provide additional services to help displaced residents and business owners with the transition. Examples of this support include providing details about community and family resources, contacts for available properties to rent or purchase, and information on local schools.

16.2 Children's Environmental Health and Safety Risks

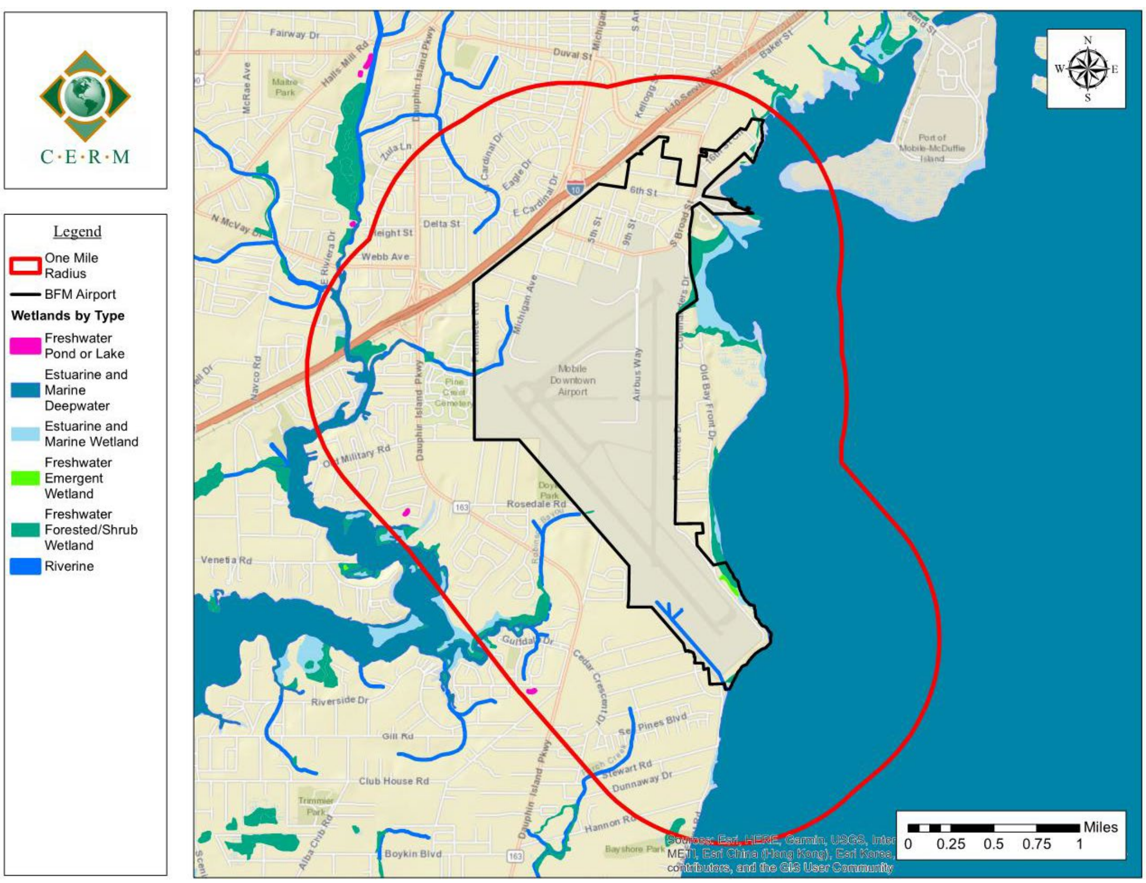
With respect to children's environmental health and safety risks, a significant impact may occur if the Proposed Actions have the potential to lead to a disproportionate health or safety risk to children. Proposed Actions may require the evaluation of health and safety risks attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or other products to which they might be exposed.

17. WATER RESOURCES

This section describes the streams, open waters, wetlands, floodplains, wild and scenic rivers, aquifers, and public water supply sources within or available to the Airport. A field survey would be required to further confirm the presence and location of any navigable waters of the United States regulated under the Clean Water Act (CWA).

17.1 Wetlands

Based on the National Wetlands Inventory Map developed by the USFWS, there are over 120 acres of wetlands in the vicinity of the Airport. As shown in Figure 17.1, there are approximately 3.4 acres of wetlands within the Airport boundary on the west, in the vicinity of the Proposed Action. Impacts to wetlands and other aquatic habitats are subject to regulation under Section 404 of the CWA and other state and federal statutes. A field survey will be required to delineate the presence of wetlands at proposed action sites. In addition, future proposed projects will take measures in design and construction to avoid, minimize, or mitigate any possible adverse impacts to wetland resources to the degree possible. Mitigation is required by the U.S. Army Corps of Engineers (USACE) when impacts to federally regulated wetlands exceed 0.10 acres. Wetland mitigation efforts can come in the form of restoration, establishment, enhancement, and/or preservation of wetlands.



Source: CERM, 2020.

Figure 17.1: National Wetlands Inventory

17.2 Floodplains

Based on the effective Flood Insurance Rate Maps (FIRMs) developed by the Federal Emergency Management Agency (FEMA), the Airport, in general, is a low flood risk. The floodplains map for the Airport and surrounding area is shown in Figure 17.2.

Source: CERM, 2020

Figure 17.2: Floodplains

17.3 Surface Water

The Airport is situated in the Greater Dog River Watershed, which includes Garrow's Bend, Upper Dog River, Lower Dog River, and Halls Mill Creek. The Airport's northwest property area, including the Proposed Action area, is situated within the Upper Dog River and the Garrow's Bend Watershed. Additionally, waterbodies located in the vicinity of the Airport include the Dog River, Perch Creek, and Robinson Bayou. The federal CWA requires states to assess and describe the quality of its waters every two years to determine if each waterbody is supporting its designated use (fishing, recreation, or drinking water). The ADEM is responsible for preparing a CWA Section 305(b) report that serves as the waterbody assessment. If the waterbody is not supporting its designated use, that waterbody is placed on the ADEM 303(d) list as an impaired stream. The 2020 ADEM 305(b)/303(d) list of impaired streams for the Upper Dog River Watershed does not identify any impaired streams near the Airport boundary. Thus, operations from the Airport are not currently contributing to any surface water impairments. (It is noted that ADEM does not identify Garrow's Bend Watershed.)

17.3.1 NPDES General Construction Permit

A National Pollutant Discharge Elimination System (NPDES) Construction Permit will be required if Airport construction activities disturb more than one acre of land with the potential to discharge pollutants into surface waters (streams, tributaries, waterways, etc.). Authorized discharges from construction include activities that result in a total land disturbance of one acre or greater, and for sites less than one acre but are part of a common plan of development or sale. During construction, stormwater management best practices, including erosion and sediment control measures, will be maintained to address and protect the area of disturbed land against potential water quality and runoff issues until such area is stabilized.

17.3.2 NPDES Stormwater Discharges

As authorized by the CWA, the NPDES Permit for Stormwater Pollution Prevention controls water pollution by regulating point sources that discharge pollutants into the waters of the United States. The discharge of stormwater from Airport operations is covered by the ADEM Transportation NPDES Permit No. ALG140261, which authorizes certain stormwater discharge into all waters of the state of Alabama not designated outstanding national resource water or outstanding Alabama water. Authorized stormwater discharges associated with transportation industries and warehousing include non-contact cooling water; uncontaminated condensate; cooling tower blowdown; boiler blowdown; demineralizer wastewater; vehicle and equipment wash water; stormwater from fueling, petroleum storage, and handling; equipment storage, maintenance areas; and wastewater associated with airfield pavement de-icing from existing and new primary airports with 1,000 or more annual jet (non-propeller aircraft) departures.

17.4 Ground Water

There are no sole source aquifers at the Airport. Potable water is provided to the Airport from MAWSS.

17.5 Wild and Scenic Rivers

The National Wild and Scenic Rivers Act provides protection for several of the nation's free-flowing rivers that exhibit exceptional natural, cultural, and recreational values. The Act provides for protection of selected rivers and river segments within the state that possess unique or outstanding scenic, recreational, geologic, botanical, fish, wildlife, historic, or cultural values. According to the National Wild and Scenic Rivers System map, there are no wild or scenic rivers at the Airport.

18. ENVIRONMENTAL SUMMARY

The study of existing environmental conditions at the Airport did not reveal any factors that restrict the development of a new passenger terminal complex. Key environmental considerations for future development at the Airport are potential impacts to wetlands situated immediately in the vicinity of the proposed new terminal location, as well as the potential for hazardous wastes in the Study Area. Special consideration should also be given to stormwater management to mitigate any flood and water quality impacts on downstream waterbodies.

The information from this chapter was used to evaluate the preliminary alternative concepts from an environmental perspective. Specifically, the planning team qualitatively weighed potential environmental impacts from each alternative against the Airport's future development needs. The five alternative concepts, detailed in the *Alternatives* chapter, were developed to meet the FAA-approved forecast for passenger demand through 2040.

Table 18.1 describes each of the alternative concepts in more detail. The alternatives were evaluated against 19 different environmental criteria and then ranked based on their potential impacts to the environment. In Alternative Concepts 1, 2, and 4, the new terminal building would be built directly over a small portion of wetland area, while Alternative Concepts 3 and 5 avoid this. Nonetheless, wetlands could be impacted by the new apron and parking surfaces associated with these two options.

The environmental evaluation matrix indicates that Alternative Concept 3 is the preferred alternative from an environmental perspective, as seen in Table 18.2. In addition to minimizing impact to wetlands, this option presents the smallest overall footprint for development. It requires the least amount of pavement and impervious surface for the new apron, which in turn reduces the total amount of future stormwater runoff. Additionally, Alternative Concept 3 requires the least number of buildings to be demolished, thus reducing the potential number of tenant relocations and reducing risk to hazardous material exposure from building demolition. The environmental criteria ratings used to evaluate each alternative are presented in Table 18.3.

Table 18.1: Description of Preliminary Alternatives

New Terminal and Associated Projects	Alternative Concept 1	Alternative Concept 2	Alternative Concept 3	Alternative Concept 4	Alternative Concept 5	Environmental Factors
Bldg (ft^2)	130,000	130,000	130,000	130,000	130,000	(energy use)
Curb Length (ft)	600	600	530	530	600	(stormwater runoff)
Total Garage & Surface Parking (acres)	31	31	31	31	31	(land disturbance, impervious surface-stormwater runoff impact, construction runoff)
New Apron (yd2)	45,000	52,300	35,500	70,600	35,000	(impervious surface, stormwater runoff)
Buildings Affected	18	11	9	14	14	(demo - asbestos, lead-based paint; hazardous sites)
New Taxilane	Extended taxilane	Extended taxilane	Shorter taxilane	Extended taxilane	Extended taxilane	(impervious surface, stormwater runoff)
Roadway	Roadway improvements, new road	Roadway improvements, new road	Roadway improvements, new road	Roadway improvements, new road	Roadway improvements, new road	(air quality, land disturbance, right of way, acquisition, etc.)
Rental Car Center (RAC)	New RAC at Penske facility	New RAC at Penske facility	New RAC at Penske facility	New RAC at Penske facility	New RAC at Penske facility	(air quality, stormwater runoff, vehicle washing)
Other	Wetland	Wetland, encroach Penske property	New terminal avoids wetland, Michigan Avenue terminates (reroute roadway)	Wetland, Michigan Avenue terminates (reroute roadway), no option for future expansion	New terminal avoids wetland, Michigan Avenue terminates (reroute roadway), no option for future expansion	Wetland
Source: CERM, 2020						

Table 18.2: Preliminary Alternatives Ranking Matrix

Environmental Criteria	Criteria Weight	Passenger Terminal Option 1		Passenger Terminal Option 2		Passenger Terminal Option 3		Passenger Terminal Option 4		Passenger Terminal Option 5	
		Rating	Weighted Ranking	Rating	Weighted Ranking	Rating	Weighted Ranking	Rating	Weighted Ranking	Rating	Weighted Ranking
Wetlands (acres)	**3**	1	3	1	3	3	9	1	3	3	9
Floodplains	**3**	5	15	5	15	5	15	5	15	5	15
Surface Water Quality	**2**	3	6	2	4	3	6	2	4	3	6
Air Quality	**2**	3	6	3	6	4	8	3	6	3	6
Fish and Wildlife	**2**	3	6	3	6	3	6	3	6	3	6
Plants	**2**	4	8	4	8	4	8	4	8	4	8
Migratory Birds	**2**	3	6	3	6	3	6	3	6	3	6
Climate	**1**	5	5	4	4	4	4	4	4	4	4
Coastal Resources	**1**	4	4	4	4	4	4	4	4	4	4
Parks	**1**	5	5	5	5	5	5	5	5	5	5
Public Land	**1**	5	5	5	5	5	5	5	5	5	5
Wildlife and Waterfowl Refuge	**1**	5	5	5	5	5	5	5	5	5	5
Farmlands	**1**	5	5	5	5	5	5	5	5	5	5
Hazardous Materials	**3**	1	3	1	3	2	6	1	3	1	3
Historical/Cultural Resources	**1**	5	5	5	5	5	5	5	5	5	5
Land Use	**2**	2	4	2	4	3	6	2	4	2	4
Natural Resources and Energy Supply	**1**	3	3	3	3	3	3	3	3	3	3

Environmental Criteria	Criteria Weight	Passenger Terminal Option 1		Passenger Terminal Option 2		Passenger Terminal Option 3		Passenger Terminal Option 4		Passenger Terminal Option 5	
		Rating	Weighted Ranking	Rating	Weighted Ranking	Rating	Weighted Ranking	Rating	Weighted Ranking	Rating	Weighted Ranking
Noise- and Noise-Compatible Land Use for sensitive areas (schools, churches, hospitals, historic sites, parks)	**1**	4	4	4	4	4	4	4	4	4	4
Environmental Justice	**2**	3	6	3	6	2	4	2	4	2	4
			104		101		114		99		107

Criteria Weight:

3	Potential for Significant Impact	<70	High Impact
2	Potential for Significant Impact	70-109	Medium Impact
1	Potential for Significant Impact	>109	Low to No Impact

Source: CERM, 2020

Table 18.3: Environmental Criteria Ratings

Criteria Evaluated	Criteria Ratings		Criteria Evaluated	Criteria Ratings		Criteria Evaluated	Criteria Ratings	
Wetlands	5	No impact	**Coastal Resources**	4	No impact	**Climate**	4	No impact
	4	Low impact		3	Low impact		3	Low impact
	3	Medium impact/minimization		2	Medium impact		2	Medium impact
	2	Significant impact/mitigation		1	Significant Impact		1	Significant Impact
	1	Significant impact						
Floodplains	5	No impact	**Parks**	5	Not present	**Land Use**	4	No impact
	4	Low impact		4	Likely not present		3	Low impact
	3	Medium Impact/minimization		3	Unknown		2	Medium impact
	2	Significant Impact/mitigation		2	Likely Present		1	Significant Impact
	1	Significant Impact		1	Present			
Air Quality	4	No impact	**Public Land**	5	Not present	**Natural Resources and Energy Supply**	4	No impact
	3	Low impact		4	Likely not present		3	Low impact
	2	Medium impact		3	Unknown		2	Medium impact
	1	Significant Impact		2	Likely Present		1	Significant Impact
				1	Present			

Criteria Evaluated		Criteria Ratings	Criteria Evaluated		Criteria Ratings	Criteria Evaluated		Criteria Ratings
Fish and Wildlife	5	Not present	**Wildlife/Waterfowl Refuge**	5	Not present	**Noise- and Noise Compatible Land Use**	4	No impact
	4	Likely not present		4	Likely not present		3	Low impact
	3	Unknown		3	Unknown		2	Medium impact
	2	Likely Present		2	Likely Present		1	Significant Impact
	1	Present		1	Present			
Plants	5	Not present	**Farmlands**	5	Not present	**Historical/Cultural Resources**	5	Not present
	4	Likely not present		4	Likely not present		4	Likely not present
	3	Unknown		3	Unknown		3	Unknown
	2	Likely Present		2	Likely Present		2	Likely Present
	1	Present		1	Present		1	Present
Migratory Birds	5	Not present	**Hazardous Materials**	5	Not present			
	4	Likely not present		4	Likely not present			
	3	Unknown		3	Unknown			
	2	Likely Present		2	Likely Present			
	1	Present		1	Present			
Source: CERM, 2020								

Appendix A. Noise Model Detailed Operations Inputs

A.1 Baseline (2018) Detailed Operations Inputs

Aircraft	ANP ID	Code	Model	Total %	Runway 14 %	Runway 32 %	Runway 18 %	Runway 36 %	Day %	Night %
B763 - Boeing 767-300	767300	1RR011	RB211-524H	4%	55%	45%	0%	0%	100 %	0%
B772 - Boeing 777-200	777200	1PW041	PW4056	8%	55%	45%	0%	0%	100 %	0%
B752 - Boeing 757-200	757300	3RR028	RB211-535E4	10%	55%	45%	0%	0%	100 %	0%
B737 - Boeing 737	737300	1CM007	CFM56-3C-1	2%	55%	45%	0%	0%	100 %	0%
A321 - Airbus A321 All Series	A321-232	3CM023	CFM56-5B1/P	15%	55%	45%	0%	0%	100 %	0%
A220 - Airbus A220 All Series	737700	20PW13 0	PW1524G	5%	55%	45%	0%	0%	100 %	0%
A306 - Airbus A300 B4-600	A300B4-203	CF680C	CF6-80CB42	48%	55%	45%	0%	0%	75%	25%
A320 - Airbus A320 All Series	A320-211	2CM018	CFM56-5B4/2	8%	55%	45%	0%	0%	100 %	0%
A319 - Airbus 319	A319-131	3CM027	CFM56-5B5/P	0%	0%	0%	0%	0%	0%	0%
CRJ-700 Canadair Regional Jet 700	CRJ9-ER	8GE110	CF34-8C5	0%	0%	0%	0%	0%	0%	0%
CRJ-900 Canadair Regional Jet 900	CRJ9-ER	8GE110	CF34-8C5	0%	0%	0%	0%	0%	0%	0%
ERJ 175 Embraer 175	EMB175	8GE105	CF34-8E5A1	0%	0%	0%	0%	0%	0%	0%
C208 - Cessna 208 Caravan	CNA208	P6114A	PT6A-114A	65%	55%	37%	6%	2%	50%	50%

Aircraft	ANP ID	Code	Model	Total %	Runway 14 %	Runway 32 %	Runway 18 %	Runway 36 %	Day %	Night %
PC12 - Pilatus PC-12	CNA208	PT67B	PT6A-67B	25%	52%	44%	2%	2%	95%	5%
BE30 - Raytheon 300 Super King Air	DHC6	PT660A	PT6A-60A	10%	52%	44%	2%	2%	100 %	0%
CRJ-200 Canadair Regional Jet 200	CL600	1GE035	CF34-3A1	0%	0%	0%	0%	0%	0%	0%
ERJ 145 Embraer 145	EMB145	6AL008	AE3007A1/1	0%	0%	0%	0%	0%	0%	0%
C130 - Lockheed 130 Hercules	C130	4AL003	AE3007A	1%	50%	50%	0%	0%	100 %	0%
T-1 Jayhawk	ECLIPSE50 0	1PW037	JT15D-5, -5A, -5B	5%	60%	30%	6%	4%	98%	2%
Bell TH-57 Sea Ranger	B206L	250B17	250B17B	5%	40%	40%	12%	8%	98%	2%
MH-60 Sea Hawk	S70	T70041	T700-GE-401 - 401C	5%	40%	40%	12%	8%	98%	2%
C-146 (Dornier 328)	DO328	PW119B	PW119B	2%	50%	50%	0%	0%	100 %	0%
P-8 Poseidon	737800	11CM07 7	CFM56-7B27E	1%	50%	50%	0%	0%	100 %	0%
PC12 - Pilatus PC-12	CNA208	PT67B	PT6A-67B	20%	55%	35%	5%	5%	100 %	0%
T-6A Texan II	CNA208	PT6A64	PT6A-64	61%	55%	29%	10%	6%	98%	2%
C525 - Cessna 525 CitationJet	CNA525C	10PW09 9	PW4090	40%	50%	40%	6%	4%	98%	2%
CL300- Bombardier Challenger 300	LEAR25	PW610F	PW610F	18%	52%	46%	2%	0%	98%	2%
LJ25 - Bombardier Learjet 25	CL600	6AL006	AE3007A1	20%	52%	46%	2%	0%	98%	2%
B350 - Beech Super King Air 350	DHC6	PT660A	PT6A-60A	15%	45%	45%	6%	4%	98%	2%

Aircraft	ANP ID	Code	Model	Total %	Runway 14 %	Runway 32 %	Runway 18 %	Runway 36 %	Day %	Night %
BE58 - Beech 58	BEC58P	TIO540	TIO-540-J2B2	5%	40%	40%	12%	8%	100 %	0%
Challenger 600	CL600	1TL001	ALF 502L-2	2%	52%	48%	0%	0%	98%	2%
C172 - Cessna Skyhawk 172/Cutlass	CNA172	IO320	IO-320-D1AD	35%	48%	41%	6%	5%	98%	2%
BE36 - Beech Bonanza 36	GASEPV	TIO540	TIO-540-J2B2	15%	48%	41%	6%	5%	100 %	0%
PA46 - Piper Malibu	GASEPV	TIO540	TIO-540-J2B2	15%	48%	41%	6%	5%	100 %	0%
SR22 - Cirrus SR 22	COMSEP	TIO540	TIO-540-J2B2	10%	48%	41%	6%	5%	98%	2%
BE9L - Beech King Air 90	DHC6	PT6A41	PT6A-41	5%	48%	42%	5%	5%	95%	5%
BE58 - Beech 58	BEC58P	TIO540	TIO-540-J2B2	5%	48%	42%	5%	5%	95%	5%
Airbus EC35 EuroCopter	EC130	TPE3	TPE331-3	5%	48%	42%	5%	5%	98%	2%
Sikorsky S-61	S61	T585	T58-GE-5	5%	48%	42%	5%	5%	98%	2%
Bell 206L Long Ranger	B206L	250B17	250B17B	5%	48%	42%	5%	5%	98%	2%

Source: Hanson Professional Services, 2020

A.2 PAL 1 (2025) Detailed Operations Inputs

Aircraft	ANP ID	Code	Model	Total %	Runway 14 %	Runway 32 %	Runway 18 %	Runway 36 %	Day %	Night %
B763 - Boeing 767-300	767300	1RR011	RB211-524H	1%	55%	45%	0%	0%	100%	0%
B772 - Boeing 777-200	777200	1PW041	PW4056	2%	55%	45%	0%	0%	100%	0%
B752 - Boeing 757-200	757300	3RR028	RB211-535E4	3%	55%	45%	0%	0%	100%	0%
B737 - Boeing 737	737300	1CM007	CFM56-3C-1	5%	55%	45%	0%	0%	99%	1%
A321 - Airbus A321 All Series	A321-232	3CM023	CFM56-5B1/P	4%	55%	45%	0%	0%	100%	0%
A220 - Airbus A220 All Series	737700	20PW130	PW1524G	2%	55%	45%	0%	0%	100%	0%
A306 - Airbus A300 B4-600	A300B4-203	CF680C	CF6-80CB42	13%	55%	45%	0%	0%	75%	25%
A320 - Airbus A320 All Series	A320-211	2CM018	CFM56-5B4/2	11%	55%	45%	0%	0%	99%	1%
A319 - Airbus 319	A319-131	3CM027	CFM56-5B5/P	1%	55%	45%	0%	0%	100%	0%
CRJ-700 Canadair Regional Jet 700	CRJ9-ER	8GE110	CF34-8C5	4%	55%	45%	0%	0%	100%	0%
CRJ-900 Canadair Regional Jet 900	CRJ9-ER	8GE110	CF34-8C5	37%	55%	45%	0%	0%	97%	3%
ERJ 175 Embraer 175	EMB175	8GE105	CF34-8E5A1	16%	55%	45%	0%	0%	100%	0%
C208 - Cessna 208 Caravan	CNA208	P6114A	PT6A-114A	15%	55%	37%	6%	2%	50%	50%
PC12 - Pilatus PC-12	CNA208	PT67B	PT6A-67B	6%	52%	44%	2%	2%	95%	5%
BE30 - Raytheon 300 Super King Air	DHC6	PT660A	PT6A-60A	2%	52%	44%	2%	2%	100%	0%
CRJ-200 Canadair Regional Jet 200	CL600	1GE035	CF34-3A1	36%	52%	44%	2%	2%	96%	4%
ERJ 145 Embraer 145	EMB145	6AL008	AE3007A1/1	41%	52%	44%	2%	2%	95%	5%

Aircraft	ANP ID	Code	Model	Total %	Runway 14 %	Runway 32 %	Runway 18 %	Runway 36 %	Day %	Night %
C130 - Lockheed 130 Hercules	C130	4AL003	AE3007A	1%	50%	50%	0%	0%	100%	0%
T-1 Jayhawk	ECLIPSE500	1PW037	JT15D-5, -5A, -5B	5%	60%	30%	6%	4%	98%	2%
Bell TH-57 Sea Ranger	B206L	250B17	250B17B	5%	40%	40%	12%	8%	98%	2%
MH-60 Sea Hawk	S70	T70041	T700-GE-401 -401C	5%	40%	40%	12%	8%	98%	2%
C-146 (Dornier 328)	DO328	PW119B	PW119B	2%	50%	50%	0%	0%	100%	0%
P-8 Poseidon	737800	11CM077	CFM56-7B27E	1%	50%	50%	0%	0%	100%	0%
PC12 - Pilatus PC-12	CNA208	PT67B	PT6A-67B	20%	55%	35%	5%	5%	100%	0%
T-6A Texan II	CNA208	PT6A64	PT6A-64	61%	55%	29%	10%	6%	98%	2%
C525 - Cessna 525 CitationJet	CNA525C	10PW099	PW4090	40%	50%	40%	6%	4%	98%	2%
CL300- Bombardier Challenger 300	LEAR25	PW610F	PW610F	18%	52%	46%	2%	0%	98%	2%
LJ25 - Bombardier Learjet 25	CL600	6AL006	AE3007A1	20%	52%	46%	2%	0%	98%	2%
B350 - Beech Super King Air 350	DHC6	PT660A	PT6A-60A	15%	45%	45%	6%	4%	98%	2%
BE58 - Beech 58	BEC58P	TIO540	TIO-540-J2B2	5%	40%	40%	12%	8%	100%	0%
Challenger 600	CL600	1TL001	ALF 502L-2	2%	52%	48%	0%	0%	98%	2%
C172 - Cessna Skyhawk 172/Cutlass	CNA172	IO320	IO-320-D1AD	35%	48%	41%	6%	5%	98%	2%
BE36 - Beech Bonanza 36	GASEPV	TIO540	TIO-540-J2B2	15%	48%	41%	6%	5%	100%	0%
PA46 - Piper Malibu	GASEPV	TIO540	TIO-540-J2B2	15%	48%	41%	6%	5%	100%	0%
SR22 - Cirrus SR 22	COMSEP	TIO540	TIO-540-J2B2	10%	48%	41%	6%	5%	98%	2%

Aircraft	ANP ID	Code	Model	Total %	Runway 14 %	Runway 32 %	Runway 18 %	Runway 36 %	Day %	Night %
BE9L - Beech King Air 90	DHC6	PT6A41	PT6A-41	5%	48%	42%	5%	5%	95%	5%
BE58 - Beech 58	BEC58P	TIO540	TIO-540-J2B2	5%	48%	42%	5%	5%	95%	5%
Airbus EC35 EuroCopter	EC130	TPE3	TPE331-3	5%	48%	42%	5%	5%	98%	2%
Sikorsky S-61	S61	T585	T58-GE-5	5%	48%	42%	5%	5%	98%	2%
Bell 206L Long Ranger	B206L	250B17	250B17B	5%	48%	42%	5%	5%	98%	2%
Source: Hanson Professional Services, 2020										

A.3 PAL 2 (2030) Detailed Operations Inputs

Aircraft	ANP ID	Code	Model	Total %	Runway 14 %	Runway 32 %	Runway 18 %	Runway 36 %	Day %	Night %
B763 - Boeing 767-300	767300	1RR011	RB211-524H	1%	55%	45%	0%	0%	100%	0%
B772 - Boeing 777-200	777200	1PW041	PW4056	2%	55%	45%	0%	0%	100%	0%
B752 - Boeing 757-200	757300	3RR028	RB211-535E4	2%	55%	45%	0%	0%	100%	0%
B737 - Boeing 737	737300	1CM007	CFM56-3C-1	6%	55%	45%	0%	0%	99%	1%
A321 - Airbus A321 All Series	A321-232	3CM023	CFM56-5B1/P	4%	55%	45%	0%	0%	100%	0%
A220 - Airbus A220 All Series	737700	20PW130	PW1524G	2%	55%	45%	0%	0%	100%	0%
A306 - Airbus A300 B4-600	A300B4-203	CF680C	CF6-80CB42	12%	55%	45%	0%	0%	75%	25%
A320 - Airbus A320 All Series	A320-211	2CM018	CFM56-5B4/2	11%	55%	45%	0%	0%	99%	1%
A319 - Airbus 319	A319-131	3CM027	CFM56-5B5/P	0%	0%	0%	0%	0%	0%	0%
CRJ-700 Canadair Regional Jet 700	CRJ9-ER	8GE110	CF34-8C5	6%	55%	45%	0%	0%	100%	0%
CRJ-900 Canadair Regional Jet 900	CRJ9-ER	8GE110	CF34-8C5	37%	55%	45%	0%	0%	97%	3%
ERJ 175 Embraer 175	EMB175	8GE105	CF34-8E5A1	17%	55%	45%	0%	0%	100%	0%
C208 - Cessna 208 Caravan	CNA208	P6114A	PT6A-114A	15%	55%	37%	6%	2%	50%	50%
PC12 - Pilatus PC-12	CNA208	PT67B	PT6A-67B	6%	52%	44%	2%	2%	95%	5%
BE30 - Raytheon 300 Super King Air	DHC6	PT660A	PT6A-60A	2%	52%	44%	2%	2%	100%	0%
CRJ-200 Canadair Regional Jet 200	CL600	1GE035	CF34-3A1	36%	52%	44%	2%	2%	96%	4%
ERJ 145 Embraer 145	EMB145	6AL008	AE3007A1/1	41%	52%	44%	2%	2%	95%	5%
C130 - Lockheed 130 Hercules	C130	4AL003	AE3007A	1%	50%	50%	0%	0%	100%	0%

Aircraft	ANP ID	Code	Model	Total %	Runway 14 %	Runway 32 %	Runway 18 %	Runway 36 %	Day %	Night %
T-1 Jayhawk	ECLIPSE500	1PW037	JT15D-5, -5A, -5B	5%	60%	30%	6%	4%	98%	2%
Bell TH-57 Sea Ranger	B206L	250B17	250B17B	5%	40%	40%	12%	8%	98%	2%
MH-60 Sea Hawk	S70	T70041	T700-GE-401 -401C	5%	40%	40%	12%	8%	98%	2%
C-146 (Dornier 328)	DO328	PW119B	PW119B	2%	50%	50%	0%	0%	100%	0%
P-8 Poseidon	737800	11CM077	CFM56-7B27E	1%	50%	50%	0%	0%	100%	0%
PC12 - Pilatus PC-12	CNA208	PT67B	PT6A-67B	20%	55%	35%	5%	5%	100%	0%
T-6A Texan II	CNA208	PT6A64	PT6A-64	61%	55%	29%	10%	6%	98%	2%
C525 - Cessna 525 CitationJet	CNA525C	10PW099	PW4090	40%	50%	40%	6%	4%	98%	2%
CL300- Bombardier Challenger 300	LEAR25	PW610F	PW610F	18%	52%	46%	2%	0%	98%	2%
LJ25 - Bombardier Learjet 25	CL600	6AL006	AE3007A1	20%	52%	46%	2%	0%	98%	2%
B350 - Beech Super King Air 350	DHC6	PT660A	PT6A-60A	15%	45%	45%	6%	4%	98%	2%
BE58 - Beech 58	BEC58P	TIO540	TIO-540-J2B2	5%	40%	40%	12%	8%	100%	0%
Challenger 600	CL600	1TL001	ALF 502L-2	2%	52%	48%	0%	0%	98%	2%
C172 - Cessna Skyhawk 172/Cutlass	CNA172	IO320	IO-320-D1AD	35%	48%	41%	6%	5%	98%	2%
BE36 - Beech Bonanza 36	GASEPV	TIO540	TIO-540-J2B2	15%	48%	41%	6%	5%	100%	0%
PA46 - Piper Malibu	GASEPV	TIO540	TIO-540-J2B2	15%	48%	41%	6%	5%	100%	0%
SR22 - Cirrus SR 22	COMSEP	TIO540	TIO-540-J2B2	10%	48%	41%	6%	5%	98%	2%
BE9L - Beech King Air 90	DHC6	PT6A41	PT6A-41	5%	48%	42%	5%	5%	95%	5%

Aircraft	ANP ID	Code	Model	Total %	Runway 14 %	Runway 32 %	Runway 18 %	Runway 36 %	Day %	Night %
BE58 - Beech 58	BEC58P	TIO540	TIO-540-J2B2	5%	48%	42%	5%	5%	95%	5%
Airbus EC35 EuroCopter	EC130	TPE3	TPE331-3	5%	48%	42%	5%	5%	98%	2%
Sikorsky S-61	S61	T585	T58-GE-5	5%	48%	42%	5%	5%	98%	2%
Bell 206L Long Ranger	B206L	250B17	250B17B	5%	48%	42%	5%	5%	98%	2%
Source: Hanson Professional Services, 2020										

A.4 PAL 4 (2040) Detailed Operations Inputs

Aircraft	ANP ID	Code	Model	Total %	Runway 14 %	Runway 32 %	Runway 18 %	Runway 36 %	Day %	Night %
B763 - Boeing 767-300	767300	1RR011	RB211-524H	1%	55%	45%	0%	0%	100%	0%
B772 - Boeing 777-200	777200	1PW041	PW4056	2%	55%	45%	0%	0%	100%	0%
B752 - Boeing 757-200	757300	3RR028	RB211-535E4	2%	55%	45%	0%	0%	100%	0%
B737 - Boeing 737	737300	1CM007	CFM56-3C-1	6%	55%	45%	0%	0%	99%	1%
A321 - Airbus A321 All Series	A321-232	3CM023	CFM56-5B1/P	3%	55%	45%	0%	0%	100%	0%
A220 - Airbus A220 All Series	737700	20PW130	PW1524G	2%	55%	45%	0%	0%	100%	0%
A306 - Airbus A300 B4-600	A300B4-203	CF680C	CF6-80CB42	11%	55%	45%	0%	0%	75%	25%
A320 - Airbus A320 All Series	A320-211	2CM018	CFM56-5B4/2	10%	55%	45%	0%	0%	99%	1%
A319 - Airbus 319	A319-131	3CM027	CFM56-5B5/P	0%	0%	0%	0%	0%	0%	0%
CRJ-700 Canadair Regional Jet 700	CRJ9-ER	8GE110	CF34-8C5	9%	55%	45%	0%	0%	100%	0%
CRJ-900 Canadair Regional Jet 900	CRJ9-ER	8GE110	CF34-8C5	35%	55%	45%	0%	0%	97%	3%
ERJ 175 Embraer 175	EMB175	8GE105	CF34-8E5A1	19%	55%	45%	0%	0%	100%	0%
C208 - Cessna 208 Caravan	CNA208	P6114A	PT6A-114A	18%	55%	37%	6%	2%	50%	50%
PC12 - Pilatus PC-12	CNA208	PT67B	PT6A-67B	7%	52%	44%	2%	2%	95%	5%
BE30 - Raytheon 300 Super King Air	DHC6	PT660A	PT6A-60A	3%	52%	44%	2%	2%	100%	0%
CRJ-200 Canadair Regional Jet 200	CL600	1GE035	CF34-3A1	34%	52%	44%	2%	2%	96%	4%
ERJ 145 Embraer 145	EMB145	6AL008	AE3007A1/1	39%	52%	44%	2%	2%	95%	5%

Aircraft	ANP ID	Code	Model	Total %	Runway 14 %	Runway 32 %	Runway 18 %	Runway 36 %	Day %	Night %
C130 - Lockheed 130 Hercules	C130	4AL003	AE3007A	1%	50%	50%	0%	0%	100%	0%
T-1 Jayhawk	ECLIPSE500	1PW037	JT15D-5, -5A, -5B	5%	60%	30%	6%	4%	98%	2%
Bell TH-57 Sea Ranger	B206L	250B17	250B17B	5%	40%	40%	12%	8%	98%	2%
MH-60 Sea Hawk	S70	T70041	T700-GE-401 - 401C	5%	40%	40%	12%	8%	98%	2%
C-146 (Dornier 328)	DO328	PW119B	PW119B	2%	50%	50%	0%	0%	100%	0%
P-8 Poseidon	737800	11CM077	CFM56-7B27E	1%	50%	50%	0%	0%	100%	0%
PC12 - Pilatus PC-12	CNA208	PT67B	PT6A-67B	20%	55%	35%	5%	5%	100%	0%
T-6A Texan II	CNA208	PT6A64	PT6A-64	61%	55%	29%	10%	6%	98%	2%
B/C-II Jets (Cessna 5xx)	CNA525C	10PW099	PW4090	40%	50%	40%	6%	4%	98%	2%
C/D-I Jets (Learjets)	LEAR25	PW610F	PW610F	18%	52%	46%	2%	0%	98%	2%
C/D-II Jets (Challenger 300, G150/G280)	CL600	6AL006	AE3007A1	20%	52%	46%	2%	0%	98%	2%
B350 - Beech Super King Air 350	DHC6	PT660A	PT6A-60A	15%	45%	45%	6%	4%	98%	2%
BE58 - Beech 58	BEC58P	TIO540	TIO-540-J2B2	5%	40%	40%	12%	8%	100%	0%
Challenger 600	CL600	1TL001	ALF 502L-2	2%	52%	48%	0%	0%	98%	2%
C172 - Cessna Skyhawk 172/Cutlass	CNA172	IO320	IO-320-D1AD	35%	48%	41%	6%	5%	98%	2%
BE36 - Beech Bonanza 36	GASEPV	TIO540	TIO-540-J2B2	15%	48%	41%	6%	5%	100%	0%
PA46 - Piper Malibu	GASEPV	TIO540	TIO-540-J2B2	15%	48%	41%	6%	5%	100%	0%

Aircraft	ANP ID	Code	Model	Total %	Runway 14 %	Runway 32 %	Runway 18 %	Runway 36 %	Day %	Night %
SR22 - Cirrus SR 22	COMSEP	TIO540	TIO-540-J2B2	10%	48%	41%	6%	5%	98%	2%
BE9L - Beech King Air 90	DHC6	PT6A41	PT6A-41	5%	48%	42%	5%	5%	95%	5%
BE58 - Beech 58	BEC58P	TIO540	TIO-540-J2B2	5%	48%	42%	5%	5%	95%	5%
Airbus EC35 EuroCopter	EC130	TPE3	TPE331-3	5%	48%	42%	5%	5%	98%	2%
Sikorsky S-61	S61	T585	T58-GE-5	5%	48%	42%	5%	5%	98%	2%
Bell 206L Long Ranger	B206L	250B17	250B17B	5%	48%	42%	5%	5%	98%	2%
Source: Hanson Professional Services, 2020										

Appendix B. Noise Contours

B.1 Baseline (2018) BFM Noise Contours

Source: Hanson Professional Services, 2020

B.2 PAL 1 (2025) BFM Noise Contours

Source: Hanson Professional Services, 2020

B.3 PAL 2 (2030) BFM Noise Contours

Source: Hanson Professional Services, 2020

B.4 PAL 4 (2040) BFM Noise Contours

Source: Hanson Professional Services, 2020

Leigh|Fisher

in association with

Hanson Professional Services, Inc.

Corporate Environmental Risk Management, LLC

Jacobsen|Daniels

MPACT Public Affairs Consulting

Quantum Spatial, Inc.

TECHNICAL MEMORANDUM No. 8 – FACILITIES IMPLEMENTATION AND FINANCIAL FEASIBILITY

MASTER PLAN

Mobile Downtown Airport

Prepared for

Mobile Airport Authority
Mobile, Alabama

July 2020

Mobile Airport Authority

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Figures

ACRONYMS AND ABBREVIATIONS

Term	Definition
AIP	Airport Improvement Program
BFM	Mobile Downtown Airport
CARES Act	Coronavirus Aid, Relief, and Economic Security Act
CFC	Customer Facility Charge
CIP	Capital Improvement Plan
COVID-19	Coronavirus Disease – 2019
CPE	Cost Per Enplanement
DCOH	Days Cash on Hand
DPE	Debt Per Enplanement
FAA	Federal Aviation Administration
FY	Fiscal Year
MAA	Mobile Airport Authority
MOB	Mobile Regional Airport
PAL	Planning Activity Level
PFC	Passenger Facility Charge

1. INTRODUCTION AND BACKGROUND

This section describes the Financial Plan for the Mobile Airport Authority (MAA), with the purpose of determining the financial affordability of the overall long-term development program. The Financial Plan considers the financial capacity of the MAA in terms of projected cash on hand and the ability to service future debt payments while considering key financial metrics such as days cash on hand, debt service coverage and cost per enplanement (CPE).

In light of the rapidly evolving situation related to the COVID-19 virus and its impact on global aviation, the aviation activity and financial projections and forecasts described herein are characterized by a high degree of uncertainty. Actual results may vary from the projections and forecasts, and the variance could be material.

2. ORGANIZATION AND MANAGEMENT

2.1 Mobile Airport Authority

The MAA is a customer service-oriented public corporation which operates under a five-member board of directors and Alabama State statutes for the purpose of planning, constructing and operating public airports and an industrial complex. The Authority was created under Act No 331 enacted at the 1977 Regular Session of the Legislature of Alabama (codified as Article 2 of Chapter 3 of Title 4 of the Code of Alabama of 1975, as amended), and was incorporated pursuant to a Certificate of Incorporation approved by resolution of the Board of Commissioners of the City of Mobile, Alabama adopted February 5, 1980.

Under the provisions of the enabling statute, the Authority is empowered, among other things, to issue bonds; acquire real and personal property; acquire, construct, equip, enlarge, improve, maintain and operate the Mobile Regional Airport (MOB or Regional), the Mobile Downtown Airport, and the Mobile Aeroplex at Brookley; to mortgage, pledge, or otherwise convey its property and its revenues from any source; and to fix, establish, collect, and alter landing fees, rents and other charges for the use of any airport or other facility or property owned or controlled by it.

Members of the Board of Directors (the Board) are appointed or reappointed by the Mayor of the City of Mobile for staggered six-year terms and approved by the City Council. The offices of the Authority consist of a Chairman, Vice Chairman, Treasurer, Secretary, and Assistant Treasurer/Secretary; each are elected by the Board for one-year terms. The President of the Airport Authority reports to the Board of Directors, while the management staff reports to the President.

2.2 Mobile Regional Airport (MOB)

In addition to Mobile Downtown Airport (BFM) and the Aeroplex properties in this master plan, MOB is also included in the combined financial reporting of the Authority. Therefore, this financial summary includes the combined debt obligations, revenue and expenses projections, and capital requirements of all entities under the Authority. MOB covers more than 1,700 acres and includes two runways. Runway 15/33 is 8,500 feet long and 150 feet wide, and 18/36 is 4,400 feet long and 150 feet wide. A single fixed-based operator provides general aviation services at Regional. The terminal covers approximately 165,000 square feet and includes a concourse with eight gate positions. Services within the terminal include car rental agencies, restaurants, lounge, a gift shop, and other concessions. There are more than 1,800 spaces available for public parking. Major airlines operating out of MOB include American Airlines, Delta Air Lines, and United Airlines.

This financial plan assumes that the new passenger terminal will be operational at BFM by 2025 and that all related activity will transfer from MOB, including parking and rental car operations, ground transportation, and terminal concessions. This master plan does not consider future uses for MOB once passenger activity relocates to BFM. For financial projections, it is assumed that the level of operating expenses will be equivalent to the level of revenues remaining at the airport from existing land and building leases from non-passenger activity.

The Board is considering adding St. Elmo Airport, a general aviation airport, to the MAA system of Airports. As this agreement has not been finalized, the master plan financial projections do not include any impact for this airport—either for revenues and expenses or capital needs.

3. OUTSTANDING BONDS

3.1 Master Indenture

The Master Indenture establishes certain funds and accounts and the priority for the flow of Revenues to such funds and accounts. All Revenues are applied to funds and accounts in the order of priority listed below.

1. **Revenue Fund.** All Gross Revenues are deposited into the Revenue Fund. The Authority is required, on or before the last day of each month, to transfer moneys on deposit in the Revenue Fund into the Bond Fund, the Reserve Fund and, to the extent of any excess after making good any deficits in the aforesaid funds, into the Development Fund.
2. **Bond Fund.** The Authority is required to deposit one-sixth of the interest payable, and one-twelfth of the principal payable in the Bond Fund each month.
3. **Reserve Fund.** The Reserve Fund provides a reserve for the payment of principal, premium, if any, and interest on Bonds issued. The Reserve Fund is to be the lesser of (i) the maximum Annual Debt Service Requirement and (ii) 125% of the average Annual Debt Service Requirement. The MAA still maintains a Reserve Fund, but the cash in the fund was substituted with a bond surety agreement.
4. **Development Fund.** After paying Operating Expenses, making transfers to the Bond Fund, and making good any deficiencies in other funds, any moneys remaining in the Revenue Fund on the last day of each month are to be transferred to the Development Fund. Moneys on deposit in the Development Fund may be applied for any lawful purpose; provided, however, that moneys are required to be transferred to the Bond Fund if necessary, to prevent a default in payment of the bonds.

3.2 Conditions for Issuing Additional Obligations Secured by Net Revenues

The issuance of additional bonds is subject to delivery of a report of an airport consultant setting forth estimates of Annual Net Revenues for the years following completion of bond funded capital improvements. This is to be accompanied by a certificate of the Chairman of the Board of Directors of the Authority certifying that the Annual Net Revenue during subsequent years is not less than 125% of the maximum Annual Debt Service Requirement following the issuance of the proposed additional bonds.

3.3 Rate Covenant

The Authority has covenanted that while any Series Bonds are outstanding under the Indenture, it will calculate rates and charges to provide in each fiscal year annual net revenue at least equal to the sum of (i) 1.10 times the Annual Debt Service Requirement for the bonds during such fiscal year, (ii) all amounts necessary to discharge all other indebtedness of the Authority payable during such fiscal year, and (iii) all amounts required to be deposited into the Reserve Fund during such fiscal year.

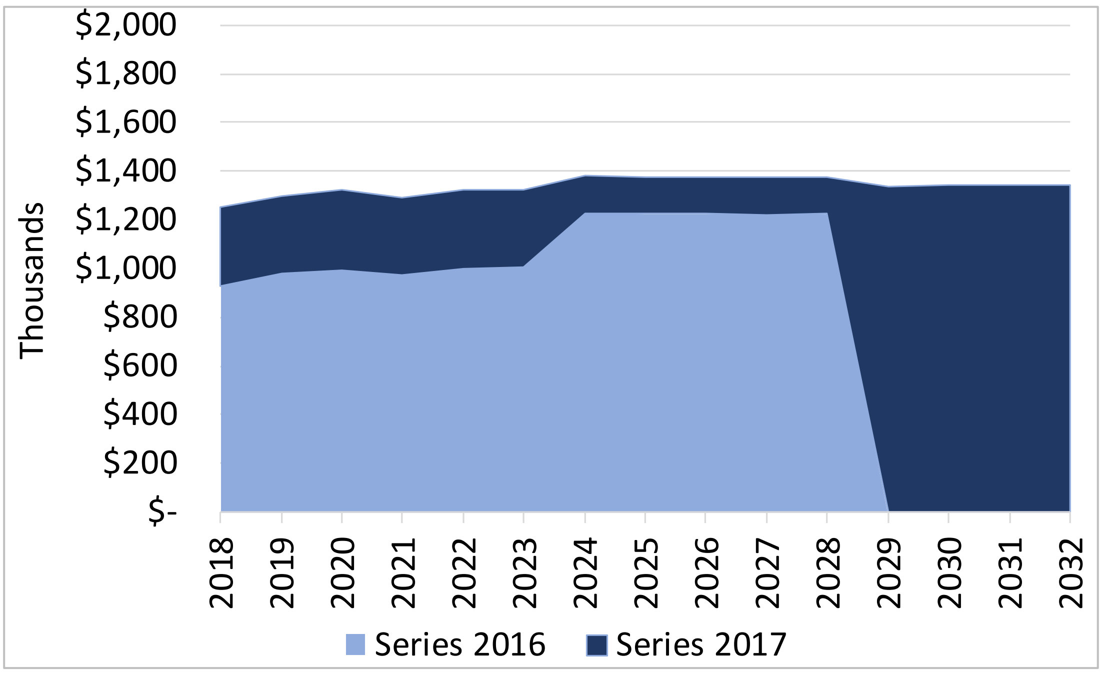
3.4 Outstanding Revenue Bonds

The Authority currently has two outstanding revenue bonds, the Series 2016 and Series 2017. The 2016 Bonds were issued in an amount of $11.07 million to fund the construction of Taxiway A at the Brookley Aeroplex. The Series 2017 Bonds were issued in the amount of $5.93 million for the purposes of advance refunding the Authority's outstanding Series 2011 Bonds and paying the expenses of issuing the Series 2017 Bonds.

The Authority has also aided various tenants of the Downtown Airport by issuing taxable industrial revenue bonds to finance construction and development of manufacturing facilities. These bonds are a limited non-recourse obligation of the Authority and are secured by lease payments made by tenants. These facility bonds are not included in the Authority's financial statements or this financial plan as they do not constitute a general obligation or a pledge of the faith or credit of the Authority.

3.5 Debt Service

As shown in Figure 3.1, the annual debt service profile for currently outstanding Bonds remains steady through 2032. Annual debt service obligations for the 2016 and 2017 bonds range from $1.29 million in 2021 to $1.38 million in 2024. Total outstanding debt as of March 2020 was $14.4 million.



Source: Mobile Airport Authority

Figure 3.1: Annual Debt Service by Series – Outstanding Debt

The MAA would likely need to issue new debt to fund portions of the capital program and facilitate moving commercial passenger operations from MOB to BFM in 2025. This master plan assumes that new bonds would be issued in 2023 and that there will be a two-year capitalized interest period during construction. Financial capacity for new debt is estimated based on financial metrics projected for 2025 when the additional debt service would become payable.

4. OTHER FUNDING SOURCES

4.1 Airport Improvement Grants

Airports often rely on Airport Improvement Program (AIP) grants to fund major airport projects. Entitlement grants are allocated among airports on a formula basis, primarily driven by passenger numbers. Discretionary grants are determined based on a priority system used to rank each request and determine which projects will occur during any given federal fiscal year. The priority system employed by the Federal Aviation Administration (FAA) has different criteria for different projects. Generally, projects that enhance the safety of aircraft operations and those that enhance capacity in the system are higher priority projects. The priority system also ranks projects based on the airport size and the number of aircraft and aircraft operations at the facility.

Grants typically cover between 90% and 95% of eligible project costs for small primary, reliever, and general aviation airports. Eligible projects include those related to enhancing airport safety, capacity, security, and environmental concerns. Sponsors can generally secure AIP funds for most airfield capital improvements or rehabilitation projects and, in certain situations, for terminals, hangars, and nonaviation development. Certain professional services that are necessary for eligible projects can also be eligible. Projects related to airport operations are not eligible for funding, and revenue producing assets such as car parking and rental car facilities, and terminal concessions are also ineligible.

LeighFisher estimates that, based on 2018 enplanements, MOB and BFM are eligible for approximately $2.6 million and $1.0 million in AIP grants, respectively.

Airports typically develop a five-year capital improvement plan (CIP) and discuss key projects with the local FAA Area District Office, to determine initial eligibility of projects and the potential availability of discretionary funds.

4.2 State Grants

MAA anticipates receiving grants from the State of Alabama to assist with completing planned upgrades at BFM. MAA assumes that state grants could fund portions of the local match in support of federal grants.

4.3 Passenger Facility Charges

Passenger Facility Charges (PFCs) are revenues received from a per-flight segment charge levied on air tickets, collected by the airlines, and remitted to airports (net of an $0.11 administrative fee). MOB imposed a $3 PFC until October 1, 2017, when it subsequently increased to $4.50 PFC. Revenues from PFCs can be leveraged to use on debt funded projects, but PFCs can only be spent on certain categories of projects that are approved by the FAA. PFCs are often used as the local 5 to 10% grant matching share of airport improvements.

The FAA has previously approved MAA to collect $19.4 million at MOB and a further $988,000 at BFM. Collections through September 2019, total approximately $17 million.

Per current applications, collection expiration dates are February 1, 2021 for MOB and November 1, 2026 for BFM. MAA has used PFCs to directly fund terminal, airfield, land acquisition, and other project costs on a pay-as-you-go basis.

In fiscal year (FY) 2018, MOB collected $1.1 million of PFC revenue (including a small amount of interest income on PFC cash balances) and, as of the start of FY 2020, had a PFC cash balance of $2.6 million. MAA intends to apply PFC funds to upcoming five-year CIP projects at MOB and BFM.

4.4 Cash on Hand

The MAA had $10.1 million of unrestricted cash on hand at September 30, 2019, and a further $2.6 million of PFCs as restricted funds. For the financial plan, it is assumed that after paying required debt service, remaining Net Revenues are added to cash balances and available for use on capital projects.

5. AIRPORT PROPERTY AND AIRLINE LEASES

The Authority's current airline agreement with tenant airlines operates on a month-to-month basis. The agreement imposes a compensatory method of rates and charges on the airlines operating at MOB. Under a compensatory methodology, the Authority recovers only those costs allocated to occupied facilities, meaning the airlines only pay for what they use. Approximately 50% of MOB revenues are derived from the airlines. The Authority assumes the underlying financial risk of operating at the Airport but retains all excess revenue for the Authority's own use. The airlines are charged the actual costs of the facilities and services they use, regardless of the revenue developed from other sources, such as from parking or concessions. The compensatory approach focuses on recovering the costs of a particular cost center or facility by allocating the corresponding operating expenses to the various Airport tenants. The costs are allocated based upon a prorated share of occupying and/or usage.

To develop financial projections, no change in airline rate methodology is assumed. Airline revenue projections were based on current levels of airline payments (CPE), growing with inflation and projected enplanements.

The Authority receives approximately $6 million in land and facility rents from BFM and Aeroplex properties. The MAA adopted a revised Leasing Policy in 2019 to establish departmental procedures for MAA property and apply these in a uniform manner to the greatest extent possible to ensure equitable treatment of Airport users. Policy goals include maximizing airport revenues, meeting federal obligations, protecting future development needs, attracting private investment, mitigating the Airport's overall risk exposure, and minimizing financial obligations for maintaining facilities and properties.

The financial projections for land and building leases assume the MAA follows the goals in the Leasing Policy to drive additional economic and revenue growth. Future revenue growth is driven by a combination of escalation clauses built into existing agreements, new leases for vacant properties, increased rents from expiring leases, and new building rents for properties reverting to Authority ownership at the end of initial leases.

6. CURRENT FINANCIAL POSITION

6.1 Current Financial Metrics

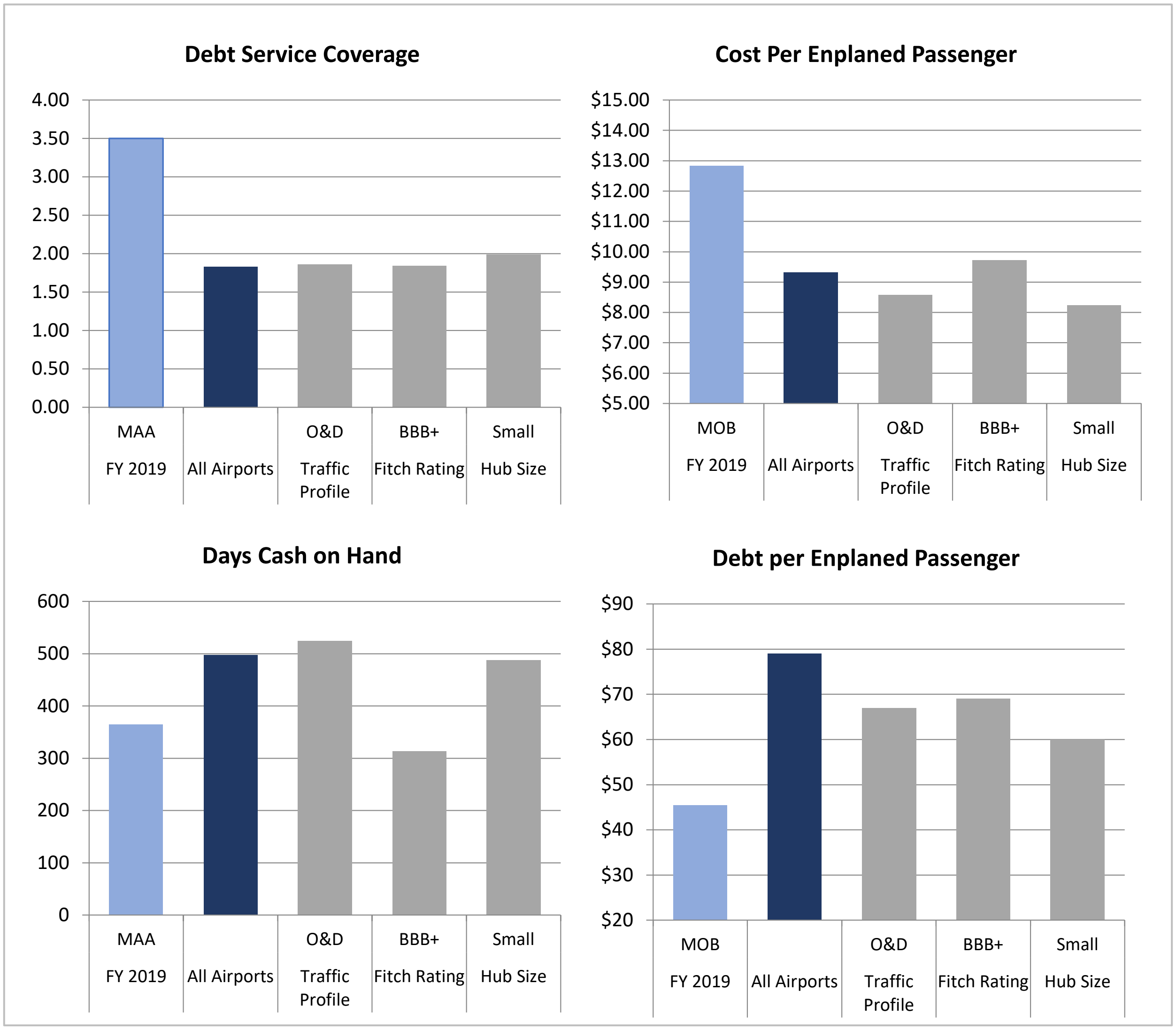
To evaluate key financial metrics, MAA was compared to other airports using Fitch Ratings' 2019 U.S. Airport Medians platform (Figure 6.1). This compares CPE, debt per enplanement (DPE), days cash on hand (DCOH), and debt service coverage. MAA was compared against four benchmark groups:

1. All airports rated by Fitch
2. Airports considered regional origination and destination markets (i.e., not connecting hubs)
3. Airports with a similar credit rating to MAA
4. Other small and non-hub airports rated by Fitch as classified by the FAA

Debt service coverage, DPE, and DCOH all reflect MAA as a whole, while CPE reflects the current level of airline charges at MOB.

With $4.5 million in net revenue and $1.3 million in debt service in 2019, MAA has debt service coverage of 3.5x, ranking well above sample medians. With a CPE of $12.80, MOB ranks higher than the sample medians. Unrestricted cash on hand of approximately $10.1 million equates to 364 days cash on hand, which is lower than all peer groups except other BBB+ airports.

CPE and DPE are not perfect measures when comparing airports against peers as these metrics do not consider the current lifecycle of airport facilities, or those financed or operated by tenant airlines. While a lower CPE or DPE is typically more favorable, older facilities nearing the end of their useful life may have lower debt payments or none at all, while new facilities have relatively higher levels of debt. A lower CPE may also be an indication of underinvestment or deferred maintenance. Both metrics are also subject to short-term changes in activity levels.



Source: MAA and Fitch Ratings Peer Review of U.S. Airports.

Figure 6.1: Comparison of Key Metrics

6.2 Current Financial Performance

As shown in Table 6.1, MOB contributed $11.6 million of total MAA revenues of $17.8 million in FY 2019. BFM and Brookley generated revenues of $2.9 million and $3.3 million, respectively.

Operating expenses at the three facilities totaled $13.3 million, including $7.7 million at MOB, $2.9 million at BFM, and $3.2 million at Brookley. MOB generated $3.9 million of MAA's $4.5 million operating surplus in FY 2019. Passenger facility charges (PFCs) are currently planned for capital projects on a pay as you go (PAYGO) basis. Customer facility charges (CFCs) from rental cars are also non-operating revenues but available for any Authority use.

Table 6.1: Summary of Net Income and Debt Service Coverage (2019)

	Mobile Regional Airport	Mobile Downtown Airport	Brookley Aeroplex	MAA Total
Operating Revenues ($ in thousands)	9,520	2,923	3,288	15,732
PFC Revenues ($ in thousands)	1,208			1,208
Other (CFC) ($ in thousands)	894			894
Total Revenues ($ in thousands)	**11,622**	**2,923**	**3,288**	**17,834**
Operations and Maintenance Expenses ($ in thousands)	(7,717)	(2,381)	(3,216)	(13,313)
Net Revenues Before Debt Service ($ in thousands)	**3,906**	**542**	**73**	**4,521**
Debt Service ($ in thousands)				1,298
Debt Service Coverage Ratio				3.48x

Sources: Draft FY2019 MAA Income Statement – Preliminary and unaudited (subject to change), and FAA Form 127 CATS

6.3 Forecast Financial Position

The financial plan forecast assumes that commercial operations shift from MOB to BFM at the start of 2025 with the opening of the new terminal. It is also assumed that the new location of the commercial service Airport is more convenient for a large portion of the region's air travelers, and an additional 145,000 enplanements will fly out of the BFM airport over the baseline projections for MOB airport. Other key assumptions related to revenues, expenses and debt include the following:

Revenues

- Airline revenues are projected based on recent costs-per-enplanement of $13.50 at MOB, growing with enplanements through 2024.
- A CPE of $5.00 is assumed for BFM for 2021 to 2024 and increasing in then-existing MOB levels from 2025.
- Nonairline revenues at MOB – including rental, parking, and concessions – grow at the same rate as passenger growth through 2024 and then fall to $0 in 2025. These revenues commence at BFM in 2025 at the same per-passenger rates.
- MOB, BFM and Brookley Aeroplex land and building revenues grow between 2 and 5% per year.
- A $4.50 PFC remains in effect at MOB and BFM, with 84% of passengers projected to pay the PFC. Non-revenues passengers, such as those on frequent flyer award tickets, do not pay the PFC.
- CFC revenues assumed to grow with passengers.

Expenses

- MOB expenses grow with passengers, plus an assumed inflation rate of 1.5%, through 2024 to approximately $8.5 million.
- Beginning in 2025, MOB expenses fall to a level equivalent to remaining MOB revenues (approximately $1.0 million per year) as passenger operations transition to BFM. The future use of MOB and a detailed analysis of operating expenses are not included in the scope of this master plan.
- BFM 2019 expenses of $2.4 million grow at 3% per year through 2024. Expenses at BFM increase to approximately $13 million in 2025 with the transition from MOB.

Debt

- Bond assumptions include a 30-year repayment period, 6% interest rate, and two-year capitalized interest period during construction and a target debt service coverage ratio of 1.5x.
- Debt is issued in 2023 to fund new terminal construction at BFM and it is assumed that PFCs could be available to support future debt issuances.

Table 6.2 provides a summary of MAA's projected cash flow and key financial metrics in 2025 under these assumptions. Total revenues increase from $17.8 million to $26.2 million and operating expenses increase from $13.3 million to $20.8 million. The result is an increase in net income, from $4.5 million to $5.4 million. Maintaining a 1.50x debt service coverage ratio, the MAA would have $3.6 million available for total debt service payments in 2025 (including existing debt). Based on the financing assumptions above, this could support a new bond issuance of $30.4 million and fund $24 million of capital projects. In addition, with $26.8 million of projected unrestricted cash on hand, after retaining $17 million to maintain 365 days of cash on hand, a further $9.8 million would be available for capital projects. The PFC fund is projected to contain a further $11.5 million in 2025 (prior to any withdrawals to fund the current five-year CIP).

This indicates that the Authority has the financial capacity to fund $45.3 million of capital projects through 2025 from a combination of debt, PFCs, and retained cash surpluses.

Table 6.2: Preliminary Capacity Analysis – Base Scenario (2025)

	Mobile Regional Airport	Mobile Downtown Airport	Brookley Aeroplex	MAA Total
Operating Revenues ($ in thousands)	1,032	17,928	4,175	23,134
PFC Revenues ($ in thousands)	-	1,972	-	1,972
Other (CFC) ($ in thousands)	-	1,113	-	1,113
Total Revenues ($ in thousands)	**1,032**	**21,013**	**4,175**	**26,220**
Operations and Maintenance Expenses ($ in thousands)	(1,032)	(15,933)	(3,840)	(20,804)
Net Revenues Before Debt Service ($ in thousands)	-	**5,080**	**335**	**5,415**
Debt Service	-	-	-	3,608
Debt Service Coverage Ratio	-	-	-	**1.50x**
Debt per Enplanement	$72	-	-	-
Total Cash on Hand	$38.3 million	-	-	-
PFC Account Balance – Restricted	$11.5 million	-	-	-
Unrestricted Cash on Hand	$26.8 million	-	-	-
Source: LeighFisher, 2020				

Changes to the assumed bond interest rate, required debt service coverage ratio, projected net revenues, and passenger enplanements can impact overall funding capacity. Examples include:

1. Lowering the bond interest rate from 6% to 5% increases the debt-funded project capacity by $3.5 million.
2. Lowering the debt service coverage ratio from 1.50x to 1.25x increases the debt-funded project capacity by $7.7 million.
3. Increasing net revenues by $1 million increases the debt-funded project capacity by $7.3 million.
4. Increasing enplanements by 50,000 increases the debt-funded project capacity by $2.7 million.
5. Making all four of the adjustments above increases the debt-funded project capacity to $50 million.

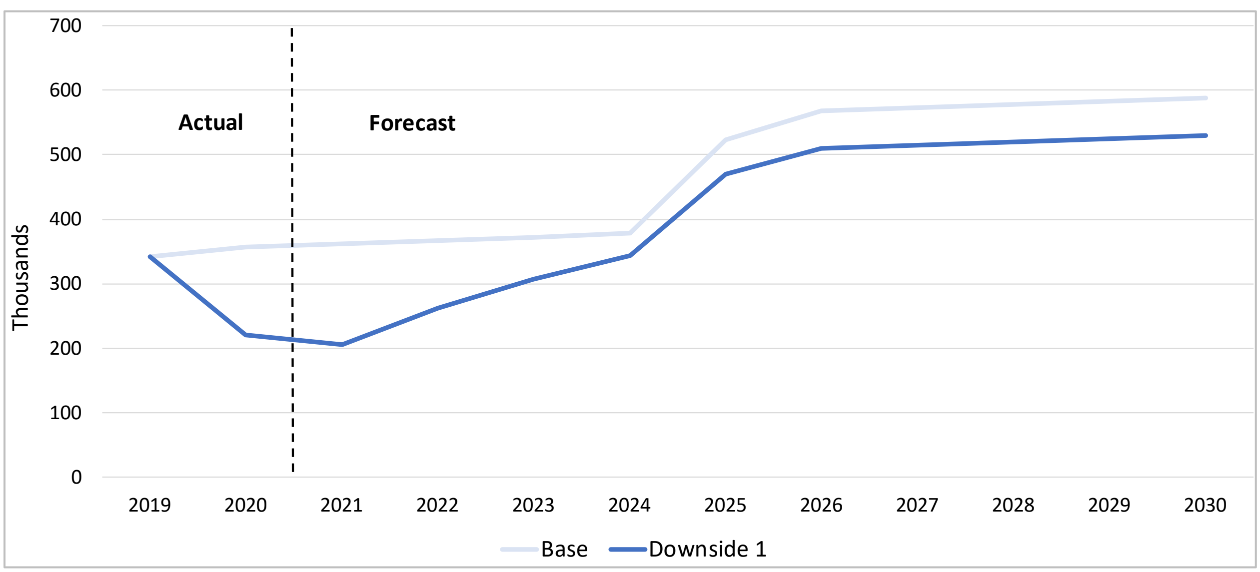
When added to available cash and PFC funds, funding capacity is projected to increase to over $70 million in 2025 from local sources.

6.4 COVID-19 Scenario

The global aviation industry has been impacted by the onset of COVID-19, a disease which emerged first in Wuhan, China, at the end of 2019 and quickly spread to most parts of the world. In March 2020, the World Health Organization declared COVID-19 a global pandemic. This prompted global governmental actions to slow the spread of the disease, often including mandatory business closures, stay-at-home orders for individuals, and limits to or cessation of group gatherings. These mandates have contributed to a severe contraction of the global economy and a rapid increase in job losses. This severe economic downturn, combined with continuing fears about contagion, has decimated demand for air travel, at least in the short- to medium-term. In response, air carriers have grounded most of the world's passenger airline fleets and drastically reduced air service.

In the U.S., state and local governments have recently begun planning a gradual return of economic activity, including travel. This should lead to a recovery in the economy followed by a recovery in aviation activity. However, there is no clarity regarding the strength and timing of the economic recovery. Given that the virus has significantly impacted public confidence in the aviation system, there is also little visibility at this time regarding the trajectory of a recovery in the system. Some airports now expect that it will take three years or more for passenger levels to recover to 2019 levels.

For the purposes of the financial projections included in this master plan, one downside scenario is included. This downside scenario is based on aviation system-wide projections developed by lenders, rating agencies, and airline industry groups, with the Airport's enplanements forecast to recover to FY 2019 levels by FY 2024. As illustrated in Figure 6.2, the Downside 1 scenario forecast represents a significant downward revision in total forecast enplanements over the Master Plan timeframe relative to the Base scenario forecast. Compared to the Base scenario forecast, the Authority would count just under 500,000 fewer enplanements from FY 2020 to FY 2023 and more than 800,000 fewer enplanements from FY 2020 to FY 2030.



Source: Mobile Airport Authority

Figure 6.2: MAA Base and Downside Enplanement Forecasts

Lower levels of passenger activity over a number of years would result in lower total revenues, and less accumulation of cash reserves. In 2025, projected net revenues fall from $5.4 million under the base case to $4.9 million. Maintaining a 1.50x debt service coverage ratio, the MAA would have $3.3 million available for debt service payments in 2025. Based on the financing assumptions above, this could support a bond issuance of $25.3 million and fund $20.3 million of capital projects. In addition, with $22.2 million of projected unrestricted cash on hand, after retaining $15.7 million to maintain 365 days of cash on hand, a further $6.5 million would be available for capital projects. The PFC fund would contain an additional $9.4 million in 2025 (prior to any withdrawals to fund the current 5yr CIP).

This indicates that the Authority has the financial capacity to undertake $36.2 million of capital projects through 2025.

6.5 CARES Act Funds

In March 2020, as a result of the significant negative impact of COVID-19 on the aviation industry, U.S. airports became eligible to receive $10 billion in U.S. federal government emergency aid under the terms of the Coronavirus Aid, Relief, and Economic Security (CARES) Act. These grants are not part of the AIP; rather, they come from the U.S. Treasury and are administered through the FAA's system for distributing grants to airports. Airport authorities may spend CARES Act funds for any lawful Airport purpose.

MAA has been awarded approximately $15.2 million in emergency CARES funding, including $15.1 million to MOB and $69,000 to BFM. As of July 2020, the Authority has received $1.3 million of CARES funds. This analysis assumes that these funds could be used to mitigate the effects of COVID-19 in the downside scenario and be available to meet the operating, financial, or capital needs of the Authority.

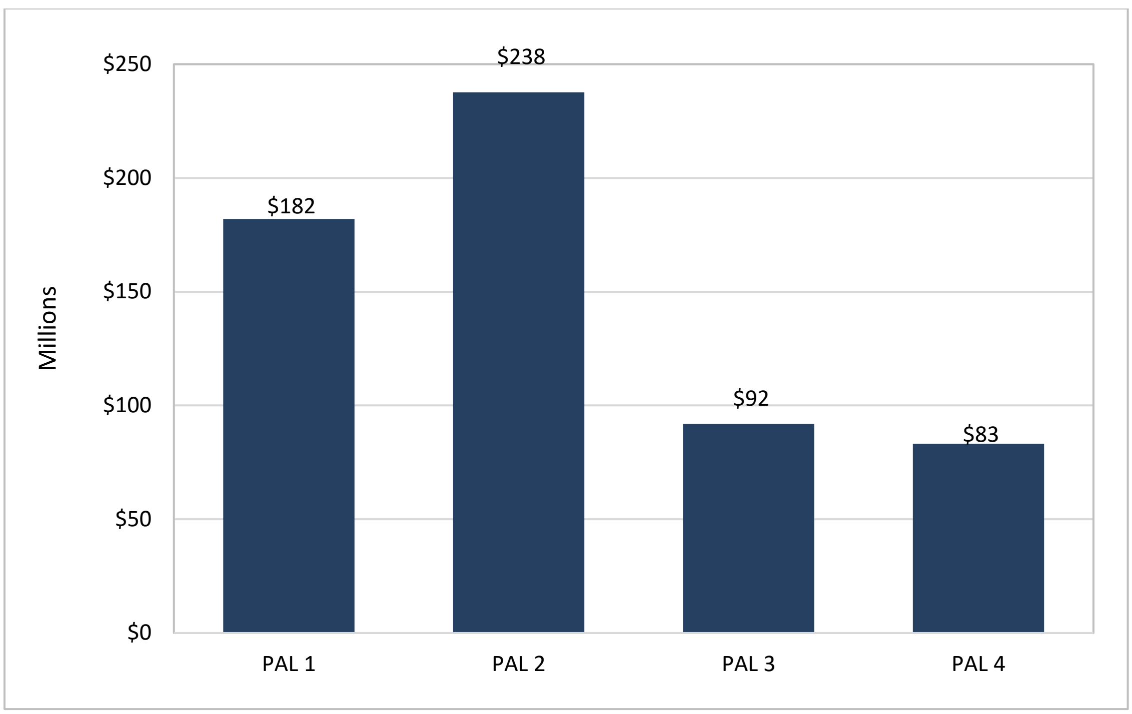
7. RECOMMENDED DEVELOPMENT PLAN

The recommended development plan includes the establishment of a new passenger terminal at BFM. In addition to the new terminal, the airport authority will need to continue maintenance and enhancement of the airfield. The development costs are grouped by related development program within each of the four planning activity levels (PALs).

All the probable development cost estimates are prepared in 2020 dollars. The Consumer Price Index for All Urban Customers should be used to project 2020 dollars into future years. Local conditions and other large projects occurring in the same area as the airport that consume construction resources can also influence future costs.

The funding for the development plan is anticipated to have several sources ranging from airport grant funding to private investment. The financial implementation plan will address the likely funding sources in greater detail.

This Master Plan update identified 58 projects for the future development and maintenance of MAA facilities over the four PALs. The total estimated cost of these projects is $594.8 million. As shown in Figure 7.1, construction costs are highest in PAL 2, at $238 million. PAL 1 projects costs totaling $182 million include 14 distinct projects associated with terminal construction at BFM. Total project costs in PAL 3 and PAL 4 are approximately $92 million and $83 million, respectively.



Source: LeighFisher, 2020

Figure 7.1: Total MAA Master Plan Construction Costs by PAL

7.1 Project Costs by PAL and Cost Center

Table 7.1 and Figure 7.1 detail the distribution of Master Plan project costs by PAL and cost center. Terminal and apron projects account for $151.4 million of $182.1 PAL 1 costs, while airfield project costs of $115.6 million account for just under half of PAL 2 total project costs of $237.7 million. PAL 1 and PAL 2 project costs together constitute 71% of total Master Plan project costs.

Table 7.1: Summary of Master Plan Project Costs by PAL and Cost Center ($000s)

Cost Center	PAL 1	PAL 2	PAL 3	PAL 4	Total
Airfield ($ in millions)	16,010	115,630	7,110	8,090	**146,840**
Terminal ($ in millions)	97,760	6,720	4,800	4,800	**114,080**
Apron ($ in millions)	53,620	3,570	25,200	16,370	**98,760**
Other buildings and areas ($ in millions)	7,400	33,960	54,740	53,920	**150,020**
Parking ($ in millions)	7,270	77,790	-	-	**85,060**
Total ($ in millions)	**182,060**	**237,670**	**91,850**	**83,180**	**594,760**
Source: LeighFisher, 2020					

7.2 Project Costs by PAL and Funding Source

LeighFisher evaluated each master plan project with respect to eligibility for federal and state AIP funding. Based on these determinations, it is projected that federal AIP grants could fund $312.6 million of total project costs of $594.8 million. As shown in Table 7.2, state AIP grants would contribute an additional $18 million. Local/MAA funding – including debt, unrestricted cash, and PFC cash – could cover $153.1 million of project costs, while other/third-party funding sources would contribute $111.0 million.

Federal and state AIP grants would fund 78%, or $142.2 million, of PAL 1 project costs, with local/other sources funding the remaining 22%, or $39.9 million.

Table 7.2: Summary of Master Plan Project Costs by PAL and Funding Source ($000s)

Funding Source	PAL 1	PAL 2	PAL 3	PAL 4	Total
Federal AIP Grants ($ in millions)	134,206	102,102	63,381	12,864	**312,553**
State AIP Grants ($ in millions)	7,947	5,747	3,575	768	**18,037**
Local/MAA ($ in millions)	39,897	87,621	6,295	19,334	**153,147**
Other/Third-Party ($ in millions)	-	42,200	18,600	50,214	**111,014**
Total ($ in millions)	**182,050**	**237,670**	**91,850**	**83,180**	**594,750**
Source: LeighFisher, 2020					

7.3 Affordability

Based on the assumptions described above, the Authority is projected to be able to fund $45 million of the local share of projects in PAL 1. This compares to an estimated $39.8 million in estimated project costs.

PAL 2 is estimated to require a further $87 million in local funds, and the MAA will likely need to prioritize projects, defer non-essential projects, and consider third-party funding options to compete all planned PAL projects.

The overall funding plan relies on a significant portion of Federal funds, including Discretionary AIP grants. Any Discretionary awards could vary from year to year based on availability of funds, the priority of eligible projects at other airports, the amount of carry-over funds from other airports, the amount of any letter of intent funds programed by the FAA, and other factors.

Should the amount of projected Discretionary Grants be less than anticipated, the Authority may need to evaluate other sources of funding. These funding sources could include the following:

- Disposal of surplus property
- Private sector investment through developer agreements, concessions, long-term leases, or other types of public-private-partnerships
- Pursuing federal funds outside of AIP Discretionary Grants, including stimulus funds, future infrastructure programs, or grants for programs with intermodal facilities, such as combined airport and seaport initiatives
- Local Funds through city, county, or state initiatives, possibly backed by tax initiatives on property or payroll taxes within development areas

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Corporate Environmental Risk Management, LLC
Jacobsen|Daniels
MPACT Public Affairs Consulting
Quantum Spatial, Inc.

TECHNICAL MEMORANDUM NO. 9 – AIRPORT LAYOUT PLAN

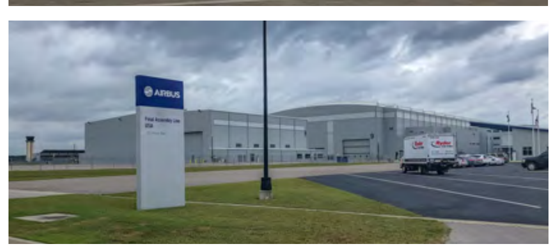
MASTER PLAN
Mobile Downtown Airport

Prepared for

Mobile Airport Authority
Mobile, Alabama

July 2020

Mobile Airport Authority



1. INTRODUCTION

This section presents information about the updated Airport Layout Plan (ALP) drawings for Mobile Downtown Airport (BFM). These drawings graphically present the current, future, and ultimate airfield, airside, and landside facilities. The ALP serves three primary purposes:

1. To preserve areas needed for future and ultimate facility development, showing the airport facility at the end of the planning period (20+ years)
2. To review Federal Aviation Administration (FAA) design standards in detail to assure that appropriate clear areas are protected
3. To provide an opportunity for the various divisions of the FAA to review the set of drawings so development requirements of each branch are considered to ensure the proposed development does not adversely affect the safety, utility, and efficiency of the airport or surrounding airspace

The FAA uses the approved ALP as the "plan on file" to protect the airspace when reviewing proposed development around BFM. As development is implemented, the airport sponsor should include an update to the ALP as part of the development project to meet the FAA's grant assurance requirement of maintaining a current ALP.

The BFM ALP drawing set includes sheets that show the existing and proposed future facilities at the airport, as well as the airport within the surrounding community. The ALP includes the following drawings:

- Title Sheet
- Airport Data Sheet
- Existing Airport Layout Drawing
- Future Airport Layout Drawing (depicting future and ultimate development)
- Airport Airspace Drawing
- Runway 14 Inner Portion of the Approach Surface Drawing
- Runway 32 Inner Portion of the Approach Surface Drawing
- Runway 14 and 32 Departure Surface Drawing
- Runway 14 Approach Obstruction Data Table
- Runway 32 Departure Obstruction Data Table
- Runway 32 Approach and Runway 14 Departure Obstruction Data Table
- Runway 18 Inner Portion of the Approach Surface Drawing
- Runway 36 Inner Portion of the Approach Surface Drawing
- Runway 18 and 36 Departure Surface Drawing
- Runway 18 Approach Obstruction Data Table
- Runway 36 Departure Obstruction Data Table
- Runway 36 Approach and Runway 18 Departure Obstruction Data Table
- Runway Profiles Drawing
- Terminal Area Drawings (four sheets)
- Terminal Area Building Data
- Airport Land Use Drawing

2. DESCRIPTION OF SHEETS

A half-size set of the ALP drawings has been included for reference in Appendix A. Full-size drawings should be referred to when analyzing specific development issues. The purpose of each drawing of the ALP set is as follows:

- **Title Sheet:** A sheet with airport name, date, location map, vicinity map, and approval-signature blocks.
- **Airport Data Sheet:** A data sheet that contains a summary of airport data, runway and approach data, taxiway data, and wind rose information. The aviation forecasts identified C-IV as both the existing and future critical aircraft Airport Reference Code for the airport.
- **Existing Airport Layout Drawing:** A sheet depicting the current detailed layout for BFM.
- **Future Airport Layout Drawing:** A sheet that provides detailed information about the future and ultimate development at BFM, including terminal and Airbus development.
- **Airport Airspace Drawing:** A drawing showing obstacle identification surfaces for the ultimate development, as defined in Federal Aviation Regulations Part 77, Objects Affecting Navigable Airspace, as well as noting objects penetrating the surfaces.
- **Inner Portion of Approach Surface Drawings:** Drawings containing the plan and profile views of the inner portion of the approach surface for each runway under existing and, where different, future or ultimate conditions. The drawing sheet is accompanied by a data table sheet listing all evaluated obstacles.
- **Runway Departure Surface Drawings:** A sheet depicting the applicable departure surfaces for runways designated for instrument departures. For BFM, both ends of each runway have departure surfaces.
- **Runway Profile Drawing:** A drawing illustrating the line-of-sight along the length of both runways, both of which meet FAA design standards.
- **Terminal Area Drawing:** A drawing showing the existing and proposed terminal area development, split across four sheets, at a larger scale than the future airport layout drawing. At BFM, this drawing depicts the inner airfield area that includes the terminal expansion, future Airbus development, Maintenance, Repair, and Overhaul expansion, and other development.
- **Airport Land Use Drawing:** A drawing showing the land uses, such as aeronautical and non-aeronautical, on and around the airport.

AIRPORT LAYOUT PLAN

FOR

MOBILE DOWNTOWN AIRPORT (BFM)

MOBILE, MOBILE COUNTY, AL

OCTOBER 12, 2020

FAA AIP 3-01-0050-035-2019

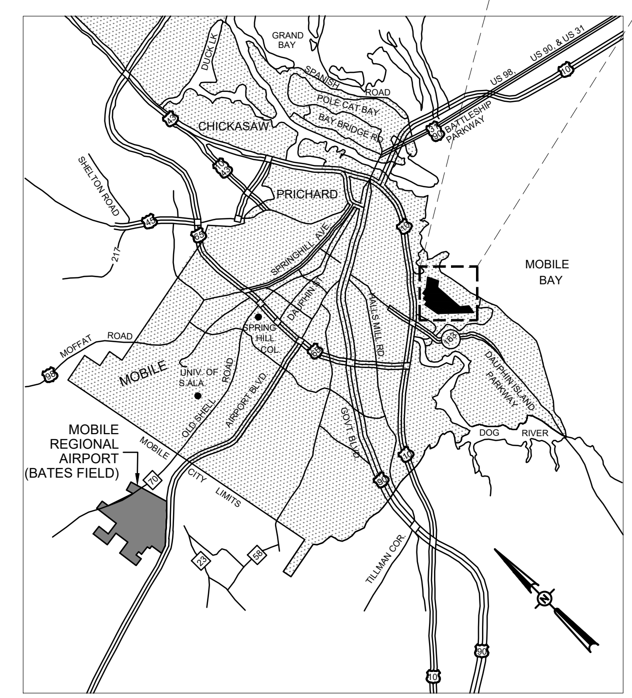
VICINITY MAP

INDEX OF SHEETS

MOBILE DOWNTOWN AIRPORT

STATE MAP

SHEET NO.	SHEET TITLE
1	TITLE SHEET
2	AIRPORT DATA SHEET
3	EXISTING AIRPORT LAYOUT DRAWING
4	FUTURE AIRPORT LAYOUT DRAWING
5	AIRPORT AIRSPACE DRAWING
6	RUNWAY 14 INNER PORTION OF THE APPROACH SURFACE DRAWING
7	RUNWAY 32 INNER PORTION OF THE APPROACH SURFACE DRAWING
8A	RUNWAY 14 AND 32 DEPARTURE SURFACE DRAWING
8B	RUNWAY 14 END DEPARTURE SURFACE DRAWING (STA. 0+00 – STA. 40+00)
9A	RUNWAY 14 APPROACH OBSTRUCTION DATA TABLE
9B	RUNWAY 32 DEPARTURE OBSTRUCTION DATA TABLE
10	RUNWAY 32 APPROACH & RUNWAY 14 DEPARTURE OBSTRUCTION DATA TABLE
11	RUNWAY 18 INNER PORTION OF THE APPROACH SURFACE DRAWING
12	RUNWAY 36 INNER PORTION OF THE APPROACH SURFACE DRAWING
13A	RUNWAY 18 AND 36 DEPARTURE SURFACE DRAWING
13B	RUNWAY 18 END DEPARTURE SURFACE DRAWING (STA. 0+00 – STA. 40+00)
14A	RUNWAY 18 APPROACH OBSTRUCTION DATA TABLE
14B	RUNWAY 36 DEPARTURE OBSTRUCTION DATA TABLE
15	RUNWAY 36 APPROACH & RUNWAY 18 DEPARTURE OBSTRUCTION DATA TABLE
16	RUNWAY PROFILES DRAWING
17A	TERMINAL AREA DRAWING – SHEET 1 (MIDFIELD)
17B	TERMINAL AREA DRAWING – SHEET 2 (NORTHWEST)
17C	TERMINAL AREA DRAWING – SHEET 3 (NORTH)
17D	TERMINAL AREA DRAWING – SHEET 4 (WEST)
17E	TERMINAL AREA BUILDING DATA
18	AIRPORT LAND USE DRAWING



LOCATION MAP

No.	Issue/Description	Date	By

ALABAMA DEPARTMENT OF TRANSPORTATION - AERONAUTICS
1409 COLISEUM BLVD.
MONTGOMERY, AL 36110

John Eagerton
Bureau Chief
Date

MOBILE DOWNTOWN AIRPORT
MOBILE AIRPORT AUTHORITY
1891 9TH ST, MOBILE, AL 36615

Chris Curry, C.M.
President
Date

Plans Prepared By:

Leigh|Fisher
https://www.leighfisher.com

HANSON
Engineering | Planning | Allied Services

This Airport Layout Plan (ALP) was prepared for the Mobile Airport Authority according to the applicable Advisory Circulars and the current version of FAA Standard Operating Procedure 2.0 ALP Review Checklist, and accurately depicts the airspace at the time of submittal. The ALP conforms with FAA design standards, except as noted.

Hanson Professional Services Inc.
https://www.hanson-inc.com/

Susan Zellers, P.E., AAE, ENV SP
Senior Project Manager
Date

RUNWAY DATA TABLE

ITEM	14/32 EXISTING RUNWAY END 14	14/32 EXISTING RUNWAY END 32	14/32 FUTURE RUNWAY END 14	14/32 FUTURE RUNWAY END 32	18/36 EXISTING RUNWAY END 18	18/36 EXISTING RUNWAY END 36	18/36 FUTURE RUNWAY END 18	18/36 FUTURE RUNWAY END 36
RUNWAY DESIGN CODE (RDC)	C-IV-4000	C-IV-1800	C-IV-4000	C-IV-1200	B-II-4000	B-II-4000	C-III-4000	C-III-4000
APPROACH REFERENCE CODE (APRC)	C-IV-4000	C-IV-1800	C-IV-4000	C-IV-1200	B-II-4000	B-II-4000	C-III-4000	C-III-4000
DEPARTURE RFERENCE CODE (DPRC)	C-IV		C-IV		B-II		C-III	
CRITICAL AIRCRAFT	A300		A300		A300		A320/B737	
PAVEMENT SURFACE TYPE	ASPHALT/CONCRETE		ASPHALT/CONCRETE		ASPHALT/CONCRETE		ASPHALT/CONCRETE	
PAVEMENT STRENGTH (WHEEL LOADING, IN THOUSANDS)	75 (SINGLE)/ 185 (DUAL)/ 325 (DUAL TANDEM)		76 (SINGLE)/ 185 (DUAL)/ 325 (DUAL TANDEM)		76 (SINGLE)/ 150 (DUAL)/ 320 (DUAL TANDEM)		76 (SINGLE)/ 150 (DUAL)/ 320 (DUAL TANDEM)	
PAVEMENT STRENGTH (PCN)	72 /F/B/X/T		72 /F/B/X/T		34 /R/B/X/T		34 /R/B/X/T	
SURFACE TREATMENT	GROOVED		GROOVED		GROOVED		GROOVED	
EFFECTIVE RUNWAY GRADIENT (%)	0.08%		0.08%		0.01%		0.01%	
MAXIMUM GRADIENT WITHIN RUNWAY	0.30%		0.30%		0.10%		0.10%	
RUNWAY MEETS LINE-OF-SIGHT	YES		YES		YES		YES	
WIND COVERAGE % (10.5/13/16/20 KTS)	97.27/98.76/99.73/99.93		97.27/98.76/99.73/99.93		95.77/97.82/99.38/N/A		95.77/97.82/99.38/N/A	
RUNWAY DIMENSIONS	9,618' x 150'		9,618' x 150'		7,800' x 150'		7,800' x 150'	
DISPLACED THRESHOLD	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
RUNWAY SAFETY AREA (RSA) - ACTUAL	11,618' X 500'		11,618' X 500'		8,400' X 150'		9,800' X 500'	
RSA STANDARD - LENGTH BEYOND DEPARTURE END	1,000'		1000'		300'		1000'	
RSA STANDARD - LENGTH BEFORE THRESHOLD	600'		600'		300'		600'	
RSA STANDARD - WIDTH	500'		500'		150'		500'	
RUNWAY END COORDINATES (NAD 83) LATITUDE	30° 37' 59.0834" N	30° 36' 47.5133" N	30° 37' 59.0834" N	30° 36' 47.5133" N	30° 38' 31.1793" N	30° 37' 13.9736" N	30° 38' 31.1793" N	30° 37' 13.9736" N
LONGITUDE	88° 04' 47.7832" W	88° 03' 35.2082" W	88° 04' 47.7832" W	88° 03' 35.2082" W	88° 03' 57.3011" W	88° 03' 57.2508" W	88° 03' 57.3011" W	88° 03' 57.2508" W
RUNWAY END ELEVATION (MSL)	26.1'	18.5'	26.1'	18.5'	25.4'	24.9'	25.4'	24.9'
DISPLACED THRESHOLD COORDINATES (NAD 83) LATITUDE	-	-	-	-	-	-	-	-
LONGITUDE	-	-	-	-	-	-	-	-
DISPLACED THRESHOLD ELEVATION (MSL)	-	-	-	-	-	-	-	-
RUNWAY LIGHTING TYPE	HIRL, CL	HIRL, CL, TDZL	HIRL, CL	HIRL, CL, TDZL	MIRL	MIRL	MIRL	MIRL
RUNWAY PROTECTION ZONE (IN/OUT/LENGTH)	1,000' X 1,510' X 1,700'	1,000' x 1,750' x 2,500'	1,000' X 1,510' X 1,700'	1,000' x 1,750' x 2,500'	500' x 700' x 1,000'	500' x 700' x 1,000'	1,000' x 1,510' x 1,700'	1,000' x 1,510' x 1,700'
RUNWAY MARKING TYPE	PRECISION	PRECISION	PRECISION	PRECISION	NONPRECISION	NONPRECISION	NONPRECISION	NONPRECISION
14 CFR FAR PART 77 APPROACH CATEGORY	NONPRECISION	PIR (CAT I)	NONPRECISION	PIR (CAT II/III)	NONPRECISION	NONPRECISION	NONPRECISION	NONPRECISION
14 CFR FAR PART 77 APPROACH TYPE	34:1	50:1/40:1	34:1	50:1/40:1	34:1	34:1	34:1	34:1
14 CFR FAR PART 77 APPROACH DIMENSIONS (IN/OUT/LENGTH)	1,000' x 3,500' x 10,000'	1,000' x 16,000' x 50,000'	1,000' x 4,000' x 10,000'	1,000' x 16,000' x 50,000'	1,000' x 4,000' x 10,000'	1,000' x 3,500' x 10,000'	1,000' x 4,000' x 10,000'	1,000' x 3,500' x 10,000'
VISIBILITY MINIMUMS	7/8 MILE	1800 RVR	3/4 MILE	1200 RVR	3/4 MILE	7/8 MILE	3/4 MILE	7/8 MILE
TYPE OF AERONAUTICAL SURVEY FOR APPROACH	VERTICALLY GUIDED	VERTICALLY GUIDED	VERTICALLY GUIDED	VERTICALLY GUIDED	VERTICALLY GUIDED	VERTICALLY GUIDED	VERTICALLY GUIDED	VERTICALLY GUIDED
DEPARTURE SURFACE	YES	YES	YES	YES	YES	YES	YES	YES
RUNWAY OBJECT FREE AREA (ROFA) - ACTUAL	11,618' X 800'		11,618' X 800'		8,400' X 500'		8,215' x 800' + 1,585' x 769'	
STANDARD - LENGTH BEYOND DEPARTURE END	1,000'		1000'		300'		1000'	
STANDARD - LENGTH BEFORE THRESHOLD	600'		600'		300'		600'	
STANDARD - WIDTH	800'		800'		500'		800'	
RUNWAY OBSTACLE FREE ZONE (ROFZ) WIDTH	400'	400'	400'	400'	400'	400'	400'	400'
LENGTH BEYOND THRESHOLD	200'	200'	200'	200'	200'	200'	200'	200'
THRESHOLD SITING SURFACE (TSS)	4, 6	5, 6	4, 6	5, 6	4, 6	4, 6	4, 6	4, 6
(OFFSET/IN/OUT/LENGTH)	200' x 400' x 3,400' x 10,000' @20:1	200' x 800' x 3,400' x 10,000' @34:1	200' x 400' x 3,400' x 10,000' @20:1	200' x 800' x 3,400' x 10,000' @34:1	200' x 400' x 3,400' x 10,000' @20:1	200' x 400' x 3,400' x 10,000' @20:1	200' x 400' x 3,400' x 10,000' @20:1	200' x 400' x 3,400' x 10,000' @20:1
VERTICAL GUIDANCE (OFFSET/IN/OUT/LENGTH)	0' X 350' X 1,520' X 10,000' @30:1	0' X 350' X 1,520' X 10,000' @30:1	0' X 350' X 1,520' X 10,000' @30:1	0' X 350' X 1,520' X 10,000' @30:1	0' X 350' X 1,520' X 10,000' @30:1	0' X 350' X 1,520' X 10,000' @30:1	0' X 350' X 1,520' X 10,000' @30:1	0' X 350' X 1,520' X 10,000' @30:1
VISUAL AND INSTRUMENT NAVAIDS	PAPI-4, REIL, RNAV(GPS), VOR	ILS, PAPI-4, RVR, MALSR, RNAV(GPS), VOR	PAPI-4, RNAV(GPS), MALSF, VOR	ILS - CAT II/III, PAPI-4, RVR, ALSF, RNAV(GPS), VOR	PAPI-4, RNAV(GPS), VOR	PAPI-4, RNAV(GPS)	PAPI-4, RNAV(GPS), VOR, REILS	PAPI-4, RNAV(GPS), REILS
TOUCHDOWN ZONE ELEVATION (MSL)	26.2'	25.1'	26.2'	25.1'	25.5'	26.0'	25.5'	26.0'
TAXIWAY AND TAXILANE WIDTH	75'	75'	75'	75'	50'	50'	50'	50'
TAXIWAY SAFETY AREA WIDTH (TSA)	171'	171'	171'	171'	79'	79'	118'	118'
TAXIWAY OBJECT FREE AREA WIDTH (TOFA)	259'	259'	259'	259'	131'	131'	186'	186'
TAXILANE OBJECT FREE AREA WIDTH	225'	225'	225'	225'	115'	115'	162'	162'
TAXIWAY CENTERLINE TO RUNWAY CENTERLINE SEPARATION	400'	400'	400'	400'	240'	240'	400'	400'
TAXIWAY CENTERLINE TO FIXED OR MOVABLE OBJECT	130'	130'	129.5'	129.5'	65.5'	65.5'	93'	93'
TAXILANE CENTERLINE TO FIXED OR MOVABLE OBJECT	113'	113'	112.5'	112.5'	57.5'	57.5'	81'	81'
TAXIWAY LIGHTING	MITL	MITL	MITL	MITL	MITL	MITL	MITL	MITL

NOTES:

1. IN THE FUTURE, WHEN ARC C-III IS TO BECOME THE CRITICAL AIRCRAFT FOR RUNWAY 18/36, A RPZ ANALYSIS WILL BE REQUIRED

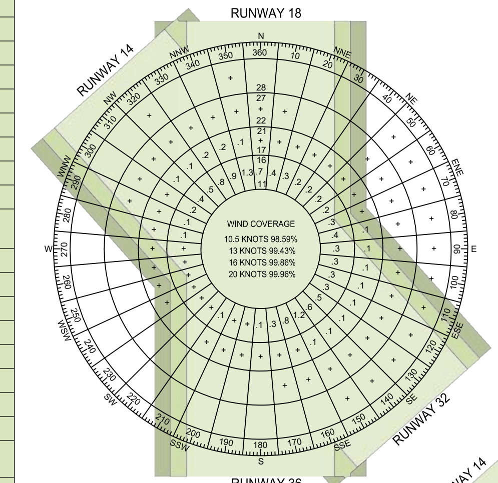
AIRPORT DATA TABLE

	EXISTING	FUTURE
AIRPORT REFERENCE CODE	C-IV	C-IV
MEAN MAX. TEMPERATURE HOTTEST MONTH (AUGUST)	91°F	91°F
AIRPORT ELEVATION (MSL)	26.2'	26.2'
AIRPORT NAVIGATIONAL AIDS	ILS/DME, LOC, VOR, GPS	CATII/III, ILS,LOC,VOR,GPS
AIRPORT REFERENCE POINT (NAD 83) LATITUDE	30° 37' 36.41" N	30° 37' 36.41" N
LONGITUDE	88° 04' 05.13" W	88° 04' 05.13" W
MISCELLANEOUS FACILITIES	ASOS, TOUCHDOWN RVR	ASOS, TOUCHDOWN, MIDPOINT & ROLL OUT RVR
CRITICAL DESIGN AIRCRAFT	AIRBUS A320/BOEING 737	AIRBUS A300
MAGNETIC VARIATION	2° 22' W CHANGING BY 0° 5' W PER YEAR	2° 22' W CHANGING BY 0° 5' W PER YEAR
NPIAS SERVICE LEVEL	COMMERCIAL SERVICE	PRIMARY
STATE SERVICE LEVEL	COMMERCIAL SERVICE	PRIMARY

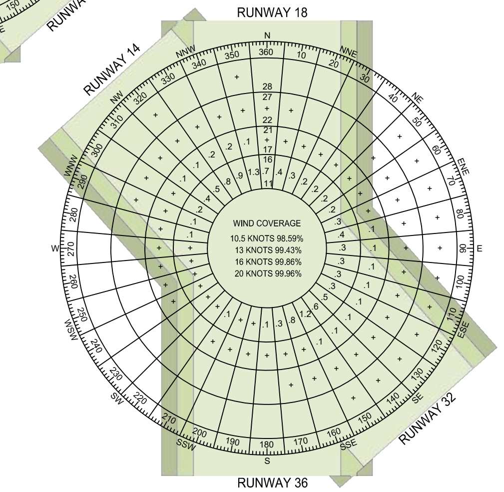
SOURCES:

1. MAGNETIC DECLINATION: NATIONAL OCEANIC AND ATOMSPHERIC ADMINISTRATION (NOAA) NATIONAL GEOPHYSICAL DATA CENTER.
2. AIRPORT REFERENCE POINT: CALCULATED USING NGS ARP COMPUTATION UTILITY.
3. BASE MAPPING: QUANTUM, DATED 2019.
4. AERIAL PHOTOGRAPHY: QUANTUM, DATED 2019.
5. MAPPING REFERENCES: LATITUDE AND LONGITUDE ARE BASED ON THE ALABAMA STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 1983. VERTICAL CONTROL REFERENCED TO NAVD 1988.

ALL WEATHER WIND ROSE



IFR WIND ROSE



MODIFICATION OF STANDARDS

STANDARD TO BE MODIFIED	DESCRIPTION	AIRSPACE CASE NO.	APPROVAL DATE
NONE			

DECLARED DISTANCES

DECLARED DISTANCES	RUNWAY 14	RUNWAY 32	RUNWAY 18	RUNWAY 36
TAKEOFF RUN AVAILABLE (TORA)	9,618'	9,618'	7,800'	7,800'
TAKEOFF DISTANCE AVAILABLE (TODA)	9,618'	9,618'	7,800'	7,800'
ACCELERATE STOP DISTANCE AVAILABLE (ASDA)	9,618'	9,618'	7,800'	7,800'
LANDING DISTANCE AVAILABLE (LDA)	9,618'	9,618'	7,800'	7,800'

BENCH MARK DATA

	LATITUDE	LONGITUDE	ELEVATION
BH0039	30° 38' 41.62585" N	88° 04' 08.35035" W	N/A
BH3174	30° 38' 15.48354" N	88° 03' 49.20991" W	N/A

WIND COVERAGE

RUNWAY	ALL WEATHER 10.5 KTS	ALL WEATHER 13 KNOTS	ALL WEATHER 16 KNOTS	ALL WEATHER 20 KNOTS	IFR 10.5 KNOTS	IFR 13 KNOTS	IFR 16 KNOTS	IFR 20 KNOTS
14-32	97.27%	98.76%	99.73%	99.93%	96.87%	98.42%	99.52%	99.85%
18-36	95.77%	97.82%	99.38%	-	95.76%	97.51%	98.92%	-
COMBINED	98.59%	99.43%	99.86%	-	98.29%	99.21%	99.72%	-

REFERENCES:

1. SOURCE: WIND DATA FROM NOAA'S INTEGRATED SURFACE DATABASE (ISD) FOR MOBILE DOWNTOWN AIRPORT (BFM), PERIOD OF RECORD 2009-2018.
2. IFR CONDITIONS CEIIING <1,000' AND/OR VISIBILITY < 3 MILES, BUT CEILING ≥200' AND VISIBILITY ≥0.5 MILES.

LeighFisher

HANSON
Engineering | Planning | Allied Services

Mobile Downtown Airport

MOBILE DOWNTOWN AIRPORT
2455 MICHIGAN AVE,
MOBILE, AL 36615

PHONE: (251) 281-2887

DRAFT

MOBILE DOWNTOWN AIRPORT (BFM)

AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION	DES	DWN	REV

ISSUE: September, 2020
PROJECT NO: 18A0120
CAD FILE: 2-DATA.DWG
DESIGN BY: NLD 9/24/2020
DRAWN BY: NLD 9/24/2020
REVIEWED BY: SZ 9/24/2020

SHEET TITLE

AIRPORT DATA SHEET

SEP 24, 2020 3:15 PM DUDAS01944
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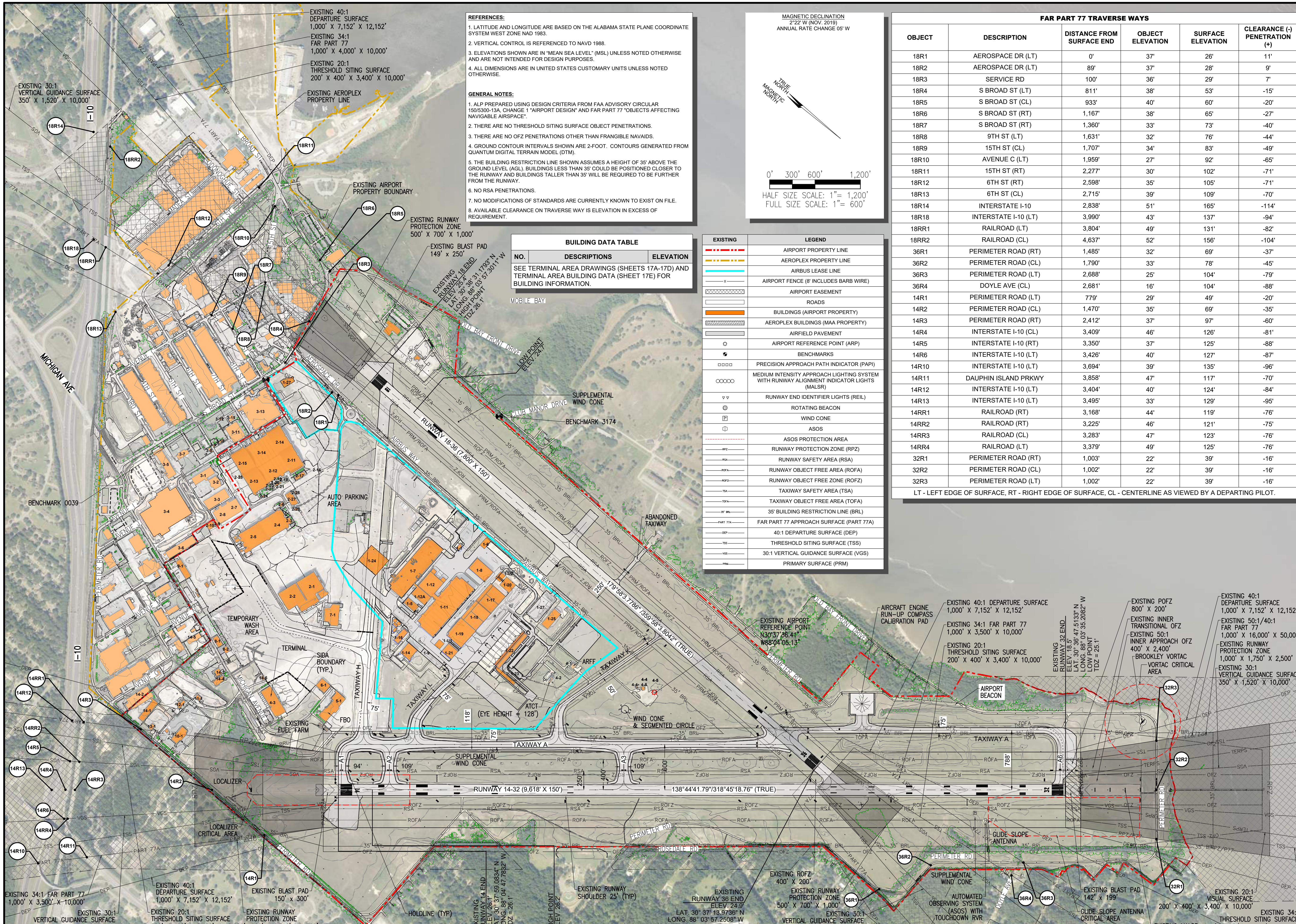

REFERENCES:

1. LATITUDE AND LONGITUDE ARE BASED ON THE ALABAMA STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 1983.
2. VERTICAL CONTROL IS REFERENCED TO NAVD 1988.
3. ELEVATIONS SHOWN ARE IN “MEAN SEA LEVEL” (MSL) UNLESS NOTED OTHERWISE AND ARE NOT INTENDED FOR DESIGN PURPOSES.
4. ALL DIMENSIONS ARE IN UNITED STATES CUSTOMARY UNITS UNLESS NOTED OTHERWISE.

GENERAL NOTES:

1. ALP PREPARED USING DESIGN CRITERIA FROM FAA ADVISORY CIRCULAR 150/5300-13A, CHANGE 1 "AIRPORT DESIGN" AND FAR PART 77 "OBJECTS AFFECTING NAVIGABLE AIRSPACE".
2. THERE ARE NO THRESHOLD SITING SURFACE OBJECT PENETRATIONS.
3. THERE ARE NO OFZ PENETRATIONS OTHER THAN FRANGIBLE NAVAIDS.
4. GROUND CONTOUR INTERVALS SHOWN ARE 2-FOOT. CONTOURS GENERATED FROM QUANTUM DIGITAL TERRAIN MODEL (DTM).
5. THE BUILDING RESTRICTION LINE SHOWN ASSUMES A HEIGHT OF 35' ABOVE THE GROUND LEVEL (AGL). BUILDINGS LESS THAN 35' COULD BE POSITIONED CLOSER TO THE RUNWAY AND BUILDINGS TALLER THAN 35' WILL BE REQUIRED TO BE FURTHER FROM THE RUNWAY.
6. NO RSA PENETRATIONS.
7. NO MODIFICATIONS OF STANDARDS ARE CURRENTLY KNOWN TO EXIST ON FILE.
8. AVAILABLE CLEARANCE ON TRAVERSE WAY IS ELEVATION IN EXCESS OF REQUIREMENT.

BUILDING DATA TABLE

NO.	DESCRIPTIONS	ELEVATION
	SEE TERMINAL AREA DRAWINGS (SHEETS 17A-17D) AND TERMINAL AREA BUILDING DATA (SHEET 17E) FOR BUILDING INFORMATION.	

MAGNETIC DECLINATION
2°22' W (NOV. 2019)
ANNUAL RATE CHANGE 05' W

TRUE NORTH
MAGNETIC NORTH

0' 300' 600' 1,200'
HALF SIZE SCALE: 1"= 1,200'
FULL SIZE SCALE: 1"= 600'

LEGEND

EXISTING	LEGEND
	AIRPORT PROPERTY LINE
	AEROPLEX PROPERTY LINE
	AIRBUS LEASE LINE
	AIRPORT FENCE (8' INCLUDES BARB WIRE)
	AIRPORT EASEMENT
	ROADS
	BUILDINGS (AIRPORT PROPERTY)
	AEROPLEX BUILDINGS (MAA PROPERTY)
	AIRFIELD PAVEMENT
	AIRPORT REFERENCE POINT (ARP)
	BENCHMARKS
	PRECISION APPROACH PATH INDICATOR (PAPI)
	MEDIUM INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR LIGHTS (MALSR)
	RUNWAY END IDENTIFIER LIGHTS (REIL)
	ROTATING BEACON
	WIND CONE
	ASOS
	ASOS PROTECTION AREA
	RUNWAY PROTECTION ZONE (RPZ)
	RUNWAY SAFETY AREA (RSA)
	RUNWAY OBJECT FREE AREA (ROFA)
	RUNWAY OBJECT FREE ZONE (ROFZ)
	TAXIWAY SAFETY AREA (TSA)
	TAXIWAY OBJECT FREE AREA (TOFA)
	35' BUILDING RESTRICTION LINE (BRL)
	FAR PART 77 APPROACH SURFACE (PART 77A)
	40:1 DEPARTURE SURFACE (DEP)
	THRESHOLD SITING SURFACE (TSS)
	30:1 VERTICAL GUIDANCE SURFACE (VGS)
	PRIMARY SURFACE (PRM)

FAR PART 77 TRAVERSE WAYS

OBJECT	DESCRIPTION	DISTANCE FROM SURFACE END	OBJECT ELEVATION	SURFACE ELEVATION	CLEARANCE (-) PENETRATION (+)
18R1	AEROSPACE DR (LT)	0'	37'	26'	11'
18R2	AEROSPACE DR (LT)	89'	37'	28'	9'
18R3	SERVICE RD	100'	36'	29'	7'
18R4	S BROAD ST (LT)	811'	38'	53'	-15'
18R5	S BROAD ST (CL)	933'	40'	60'	-20'
18R6	S BROAD ST (RT)	1,167'	38'	65'	-27'
18R7	S BROAD ST (RT)	1,360'	33'	73'	-40'
18R8	9TH ST (LT)	1,631'	32'	76'	-44'
18R9	15TH ST (CL)	1,707'	34'	83'	-49'
18R10	AVENUE C (LT)	1,959'	27'	92'	-65'
18R11	15TH ST (RT)	2,277'	30'	102'	-71'
18R12	6TH ST (RT)	2,598'	35'	105'	-71'
18R13	6TH ST (CL)	2,715'	39'	109'	-70'
18R14	INTERSTATE I-10	2,838'	51'	165'	-114'
18R18	INTERSTATE I-10 (LT)	3,990'	43'	137'	-94'
18RR1	RAILROAD (LT)	3,804'	49'	131'	-82'
18RR2	RAILROAD (CL)	4,637'	52'	156'	-104'
36R1	PERIMETER ROAD (RT)	1,485'	32'	69'	-37'
36R2	PERIMETER ROAD (CL)	1,790'	33'	78'	-45'
36R3	PERIMETER ROAD (LT)	2,688'	25'	104'	-79'
36R4	DOYLE AVE (CL)	2,681'	16'	104'	-88'
14R1	PERIMETER ROAD (LT)	779'	29'	49'	-20'
14R2	PERIMETER ROAD (CL)	1,470'	35'	69'	-35'
14R3	PERIMETER ROAD (RT)	2,412'	37'	97'	-60'
14R4	INTERSTATE I-10 (CL)	3,409'	46'	126'	-81'
14R5	INTERSTATE I-10 (RT)	3,350'	37'	125'	-88'
14R6	INTERSTATE I-10 (LT)	3,426'	40'	127'	-87'
14R10	INTERSTATE I-10 (LT)	3,694'	39'	135'	-96'
14R11	DAUPHIN ISLAND PRKWY	3,858'	47'	117'	-70'
14R12	INTERSTATE I-10 (LT)	3,404'	40'	124'	-84'
14R13	INTERSTATE I-10 (LT)	3,495'	33'	129'	-95'
14RR1	RAILROAD (RT)	3,168'	44'	119'	-76'
14RR2	RAILROAD (RT)	3,225'	46'	121'	-75'
14RR3	RAILROAD (CL)	3,283'	47'	123'	-76'
14RR4	RAILROAD (LT)	3,379'	49'	125'	-76'
32R1	PERIMETER ROAD (RT)	1,003'	22'	39'	-16'
32R2	PERIMETER ROAD (CL)	1,002'	22'	39'	-16'
32R3	PERIMETER ROAD (LT)	1,002'	22'	39'	-16'

LT - LEFT EDGE OF SURFACE, RT - RIGHT EDGE OF SURFACE, CL - CENTERLINE AS VIEWED BY A DEPARTING PILOT.

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MOBILE DOWNTOWN AIRPORT
2455 MICHIGAN AVE,
MOBILE, AL 36615

PHONE: (251) 281-2887

DRAFT

MOBILE DOWNTOWN AIRPORT (BFM)

AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION	DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE: 3-ALD-E.DWG
DESIGN BY: NLD 10/12/2020
DRAWN BY: NLD 10/12/2020
REVIEWED BY: SZ 10/12/2020

SHEET TITLE

EXISTING AIRPORT LAYOUT DRAWING

OCT 12, 2020 5:39 PM DO01853
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BUILDING DATA TABLE		
NO.	DESCRIPTIONS	ELEVATION
SEE TERMINAL AREA DRAWINGS (SHEETS 17A-17D) AND TERMINAL AREA BUILDING DATA (SHEET 17E) FOR BUILDING INFORMATION.		

REFERENCES:

1. LATITUDE AND LONGITUDE ARE BASED ON THE ALABAMA STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 1983.
2. VERTICAL CONTROL IS REFERENCED TO NAVD 1988.
3. ELEVATIONS SHOWN ARE IN “MEAN SEA LEVEL” (MSL) UNLESS NOTED OTHERWISE AND ARE NOT INTENDED FOR DESIGN PURPOSES.
4. ALL DIMENSIONS ARE IN UNITED STATES CUSTOMARY UNITS UNLESS NOTED OTHERWISE.

GENERAL NOTES:

1. ALP PREPARED USING DESIGN CRITERIA FROM FAA ADVISORY CIRCULAR 150/5300-13A, CHANGE 1 "AIRPORT DESIGN" AND FAR PART 77 "OBJECTS AFFECTING NAVIGABLE AIRSPACE".
2. THERE ARE NO THRESHOLD SITING SURFACE OBJECT PENETRATIONS.
3. THERE ARE NO OFZ PENETRATIONS OTHER THAN FRANGIBLE NAVAIDS.
4. GROUND CONTOUR INTERVALS SHOWN ARE 2-FOOT. CONTOURS GENERATED FROM QUANTUM DIGITAL TERRAIN MODEL (DTM).
5. THE BUILDING RESTRICTION LINE SHOWN ASSUMES A HEIGHT OF 35' ABOVE THE GROUND LEVEL (AGL). BUILDINGS LESS THAN 35' COULD BE POSITIONED CLOSER TO THE RUNWAY AND BUILDINGS TALLER THAN 35' WILL BE REQUIRED TO BE FURTHER FROM THE RUNWAY.
6. NO RSA OR ROFA PENETRATIONS.
7. NO MODIFICATIONS OF STANDARDS ARE CURRENTLY KNOWN TO EXIST ON FILE.
8. AVAILABLE CLEARANCE ON TRAVERSE WAY IS ELEVATION IN EXCESS OF REQUIREMENT.

EXISTING	FUTURE	ULTIMATE	LEGEND
			AIRPORT PROPERTY LINE
		N/A	AEROPLEX PROPERTY LINE
		N/A	AIRBUS LEASE LINE
N/A		N/A	CREPE MYRTLE TRAIL
—X—	N/A	N/A	AIRPORT FENCE (8' INCLUDES BARB WIRE)
			AIRPORT EASEMENT
			ROADS
			BUILDINGS (AIRPORT PROPERTY)
	N/A	N/A	AEROPLEX BUILDINGS (MAA PROPERTY)
			AIRFIELD PAVEMENT
N/A			PAVEMENT/BUILDING REMOVAL
		N/A	AIRPORT REFERENCE POINT (ARP)
		N/A	PRECISION APPROACH PATH INDICATOR (PAPI)
	N/A	N/A	MEDIUM INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR LIGHTS (MALSR)
N/A		N/A	APPROACH LIGHTING SYSTEM WITH SEQUENCED FLASHING LIGHTS II (ALSFII)
		N/A	RUNWAY END IDENTIFIER LIGHTS (REIL)
		N/A	ROTATING BEACON
		N/A	WIND CONE
		N/A	AWOS
	N/A	N/A	AWOS PROTECTION AREA
—RPZ—	—RPZ—	N/A	RUNWAY PROTECTION ZONE (RPZ)
—RSA—	—RSA—	N/A	RUNWAY SAFETY AREA (RSA)
—ROFA—	—ROFA—	N/A	RUNWAY OBJECT FREE AREA (ROFA)
—ROFZ—	—ROFZ—	N/A	RUNWAY OBJECT FREE ZONE (ROFZ)
—TSA—	—TSA—	—TSA—	TAXIWAY SAFETY AREA (TSA)
—TOFA—	—TOFA—	—TOFA—	TAXIWAY OBJECT FREE AREA (TOFA)
—BRL—	N/A	N/A	BUILDING RESTRICTION LINE (BRL)
—PART 77A—	N/A	N/A	FAR PART 77 APPROACH SURFACE (PART 77A)
—DEP—	N/A	N/A	DEPARTURE SURFACE (DEP)
—TSS—	N/A	N/A	THRESHOLD SITING SURFACE (TSS)
—VGS—	N/A	N/A	VERTICAL GUIDANCE SURFACE (VGS)
—PRM—	N/A	N/A	PRIMARY SURFACE (PRM)

FAR PART 77 TRAVERSE WAYS

OBJECT	DESCRIPTION	DISTANCE FROM SURFACE END	OBJECT ELEVATION	SURFACE ELEVATION	CLEARANCE (-) PENETRATION (+)
18R1	AEROSPACE DR (LT)	0'	37'	26'	11'
18R2	AEROSPACE DR (LT)	89'	37'	28'	9'
18R3	SERVICE RD	100'	36'	29'	7'
18R4	S BROAD ST (LT)	811'	38'	53'	-15'
18R5	S BROAD ST (CL)	933'	40'	60'	-20'
18R6	S BROAD ST (RT)	1,167'	38'	65'	-27'
18R7	S BROAD ST (RT)	1,360'	33'	73'	-40'
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18R9	15TH ST (CL)	1,707'	34'	83'	-49'
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18R12	6TH ST (RT)	2,598'	35'	105'	-71'
18R13	6TH ST (CL)	2,715'	39'	109'	-70'
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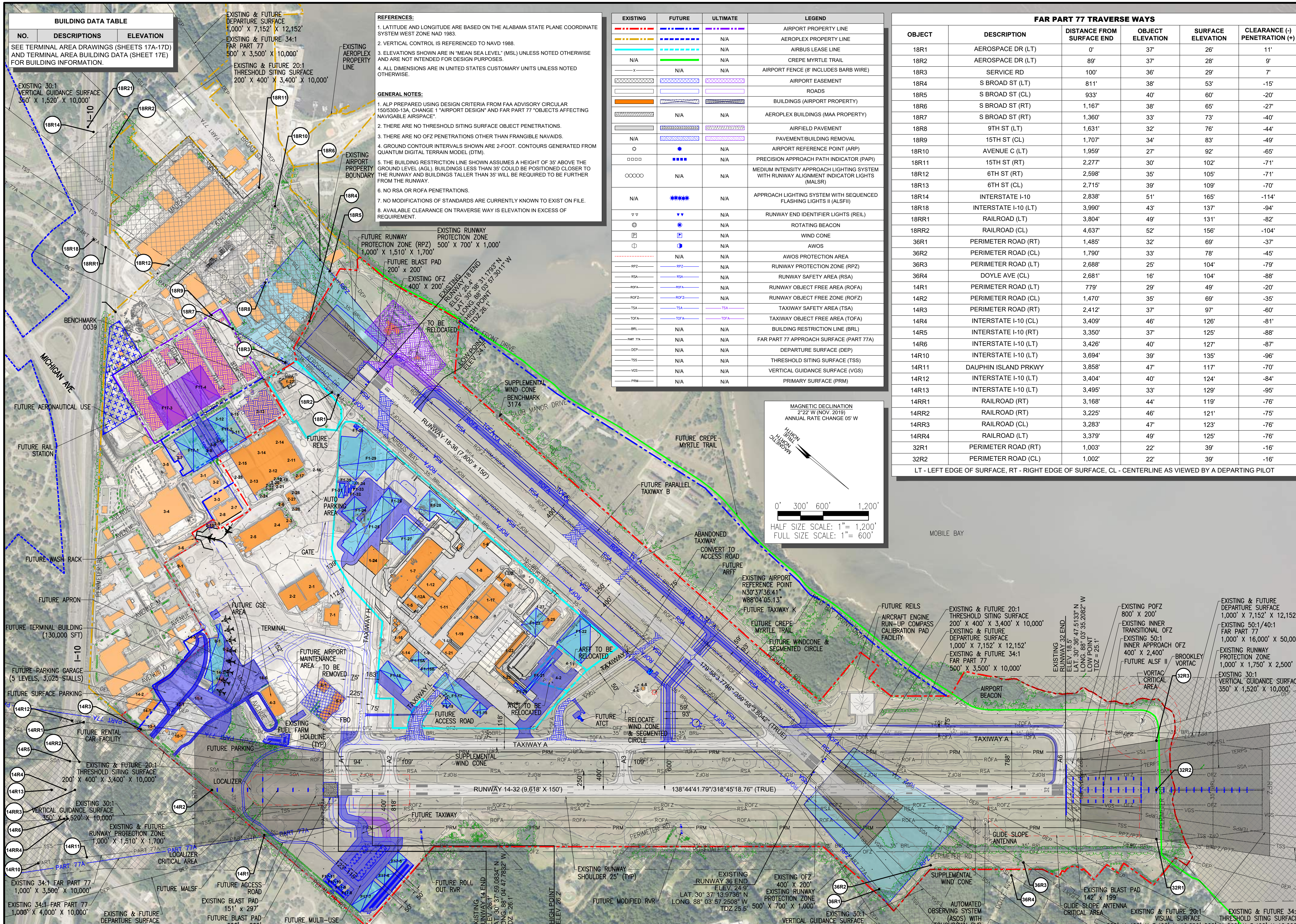
32R1	PERIMETER ROAD (RT)	1,003'	22'	39'	-16'
32R2	PERIMETER ROAD (CL)	1,002'	22'	39'	-16'
LT - LEFT EDGE OF SURFACE, RT - RIGHT EDGE OF SURFACE, CL - CENTERLINE AS VIEWED BY A DEPARTING PILOT					

MAGNETIC DECLINATION
2°22' W (NOV. 2019)
ANNUAL RATE CHANGE 05' W

HALF SIZE SCALE: 1"= 1,200'
FULL SIZE SCALE: 1"= 600'



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PHONE: (251) 281-2887

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MOBILE DOWNTOWN AIRPORT (BFM)

AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE: 4-ALD-F.DWG
DESIGN BY: NLD 10/9/2020
DRAWN BY: NLD 10/9/2020
REVIEWED BY: SZ 10/9/2020

SHEET TITLE

FUTURE AIRPORT LAYOUT DRAWING

OCT 09, 2020 2:43 PM DO01853
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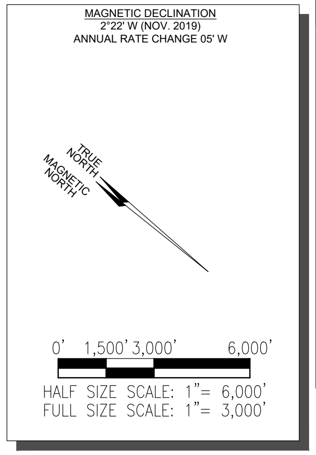
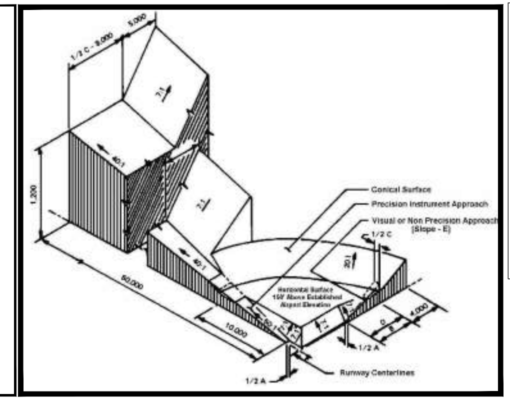


OBSTRUCTION IDENTIFICATION SURFACES
FEDERAL AVIATION REGULATIONS PART 77

DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON - PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY (PIR)
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON - PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		A	B	A	B		
					C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:01	20:01	20:01	34:01:00	34:01:00	*

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
Source: https://www.ngs.noaa.gov/AERO/oisspec.html

D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
* - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000



REFERENCES:

1. LATITUDE AND LONGITUDE ARE BASED ON THE ALABAMA STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 1983.
2. VERTICAL CONTROL IS REFERENCED TO NAVD 1988.
3. ELEVATIONS SHOWN ARE IN "MEAN SEA LEVEL" (MSL) UNLESS NOTED OTHERWISE AND ARE NOT INTENDED FOR DESIGN PURPOSES.
4. ALL DIMENSIONS ARE IN UNITED STATES CUSTOMARY UNITS UNLESS NOTED OTHERWISE.

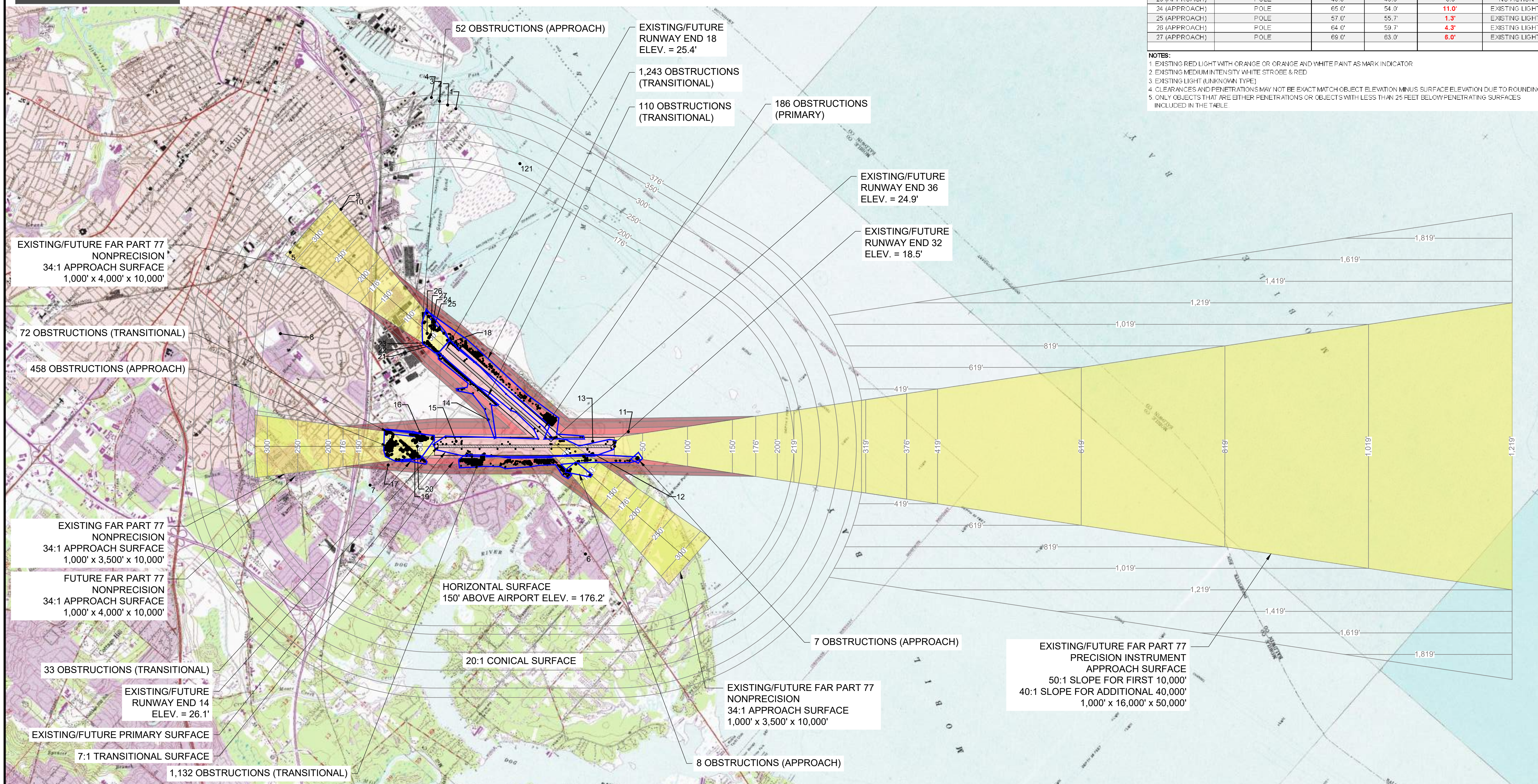
GENERAL NOTES:

1. ALP PREPARED USING DESIGN CRITERIA FROM FAA ADVISORY CIRCULAR 150/5300-13A, CHANGE 1 "AIRPORT DESIGN" AND FAR PART 77 "OBJECTS AFFECTING NAVIGABLE AIRSPACE".
2. OBJECT DATA (06/01/2020) FROM FAA OE/AAA WEBSITE AND FAA OBSTACLE REPOSITORY SERVICE DIGITAL OBSTACLE FILE (DOF) WAS EVALUATED. SEE OBSTRUCTION DATA TABLE OF THIS SHEET FOR PENETRATIONS FOUND.

OBSTRUCTION DATA TABLE

OBSTRUCTION ID	OBSTRUCTION DESCRIPTION	OBSTRUCTION TOP ELEVATION	PART 77 SURFACE ELEVATION	PART 77 SURFACE PENETRATIONS CLEARANCE (-) PENETRATION (+)	DISPOSITION
1 (CONICAL)	CRANE	380.0'	338.7'	41.3'	EXISTING LIGHT[1]
2 (CONICAL)	CRANE	380.0'	348.4'	31.6'	RED LIGHT[1]
3 (CONICAL)	CRANE	380.0'	358.8'	21.2'	EXISTING LIGHT[1]
4 (CONICAL)	CRANE	380.0'	370.0'	10.0'	EXISTING LIGHT[1]
5 (CONICAL)	TOWER	177.0'	177.6'	-0.6'	NO ACTION
6 (HORIZONTAL)	TOWER	183.0'	176.0'	7.0'	EXISTING LIGHT[2]
7 (HORIZONTAL)	TOWER	173.0'	176.0'	-3.0'	NO ACTION
8 (HORIZONTAL)	TOWER	190.0'	176.0'	14.0'	EXISTING LIGHT[2]
9 (HORIZONTAL)	TOWER	174.0'	176.0'	-2.0'	NO ACTION
10 (HORIZONTAL)	TOWER	179.0'	176.0'	3.0'	NO ACTION
11 (TRANSITIONAL)	BROOKLEY VORTAC	54.0'	66.4'	-12.4'	NO ACTION
12 (PRIMARY)	GLIDE SLOPE ANTENNA	62.0'	25.1'	36.9'	EXISTING LIGHT[2]
13 (PRIMARY)	POLE	25.0'	25.1'	-0.1'	NO ACTION
14 (TRANSITIONAL)	CONTROL TOWER	158.0'	163.5'	-5.5'	NO ACTION
15 (TRANSITIONAL)	POLE	31.0'	25.2'	5.8'	EXISTING LIGHT[2]
16 (TRANSITIONAL)	POLE	64.0'	77.6'	-13.6'	NO ACTION
17 (TRANSITIONAL)	SIGN	119.0'	133.2'	-14.2'	NO ACTION
18 (PRIMARY)	POLE	62.0'	26.1'	35.9'	EXISTING LIGHT[3]
19 (APPROACH)	NAVAID	38.0'	58.1'	-20.1'	NO ACTION
20 (APPROACH)	LOCALIZER	35.0'	54.3'	-19.3'	NO ACTION
21 (APPROACH)	POLE	50.0'	43.2'	6.8'	EXISTING LIGHT[3]
22 (APPROACH)	POLE	49.0'	46.0'	3.0'	EXISTING LIGHT[3]
23 (APPROACH)	POLE	48.0'	48.8'	-0.8'	NO ACTION
24 (APPROACH)	POLE	65.0'	54.0'	11.0'	EXISTING LIGHT[3]
25 (APPROACH)	POLE	57.0'	55.7'	1.3'	EXISTING LIGHT[3]
26 (APPROACH)	POLE	64.0'	59.7'	4.3'	EXISTING LIGHT[3]
27 (APPROACH)	POLE	69.0'	63.0'	6.0'	EXISTING LIGHT[3]

NOTES:
1. EXISTING RED LIGHT WITH ORANGE OR ORANGE AND WHITE PAINT AS MARK INDICATOR
2. EXISTING MEDIUM INTENSITY WHITE STROBE & RED
3. EXISTING LIGHT (UNKNOWN TYPE)
4. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING
5. ONLY OBJECTS THAT ARE EITHER PENETRATIONS OR OBJECTS WITH LESS THAN 25 FEET BELOW PENETRATING SURFACES INCLUDED IN THE TABLE.



PER FEDERAL GRANT ASSURANCES #20 AND #21, THE MOBILE AIRPORT AUTHORITY SHOULD, AT A MINIMUM, ENACT HEIGHT AND HAZARD ZONING AND/OR ORDINANCES BASED ON FEDERAL AVIATION REGULATION PART 77 SURFACES IN ORDER TO PROTECT AND PREVENT DEVELOPMENT OF AIRPORT HAZARDS BOTH ON AND AROUND THE AIRPORT AND ESPECIALLY IN THE APPROACH AND DEPARTURE AREAS OF THE RUNWAY TO THE EXTENT POSSIBLE.

SEP 24, 2020 3:17 PM DUDAS01944
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DRAFT

MOBILE DOWNTOWN AIRPORT (BFM)

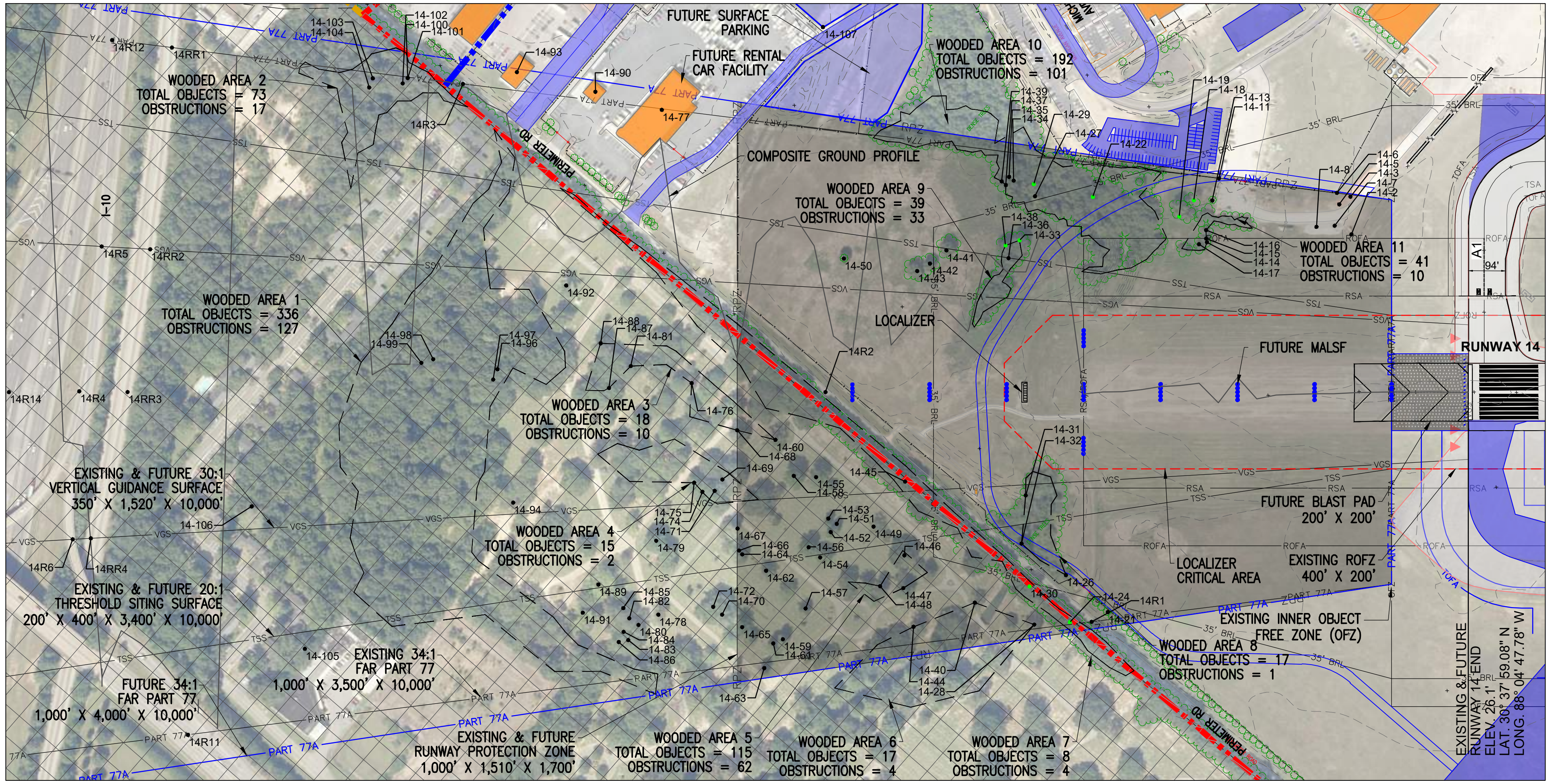
AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

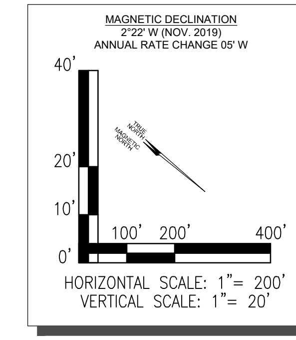
ISSUE: September, 2020
PROJECT NO: 18A0120
CAD FILE: 5-AIRS.DWG
DESIGN BY: NLD 9/24/2020
DRAWN BY: NLD 9/24/2020
REVIEWED BY: SZ 9/24/2020

SHEET TITLE

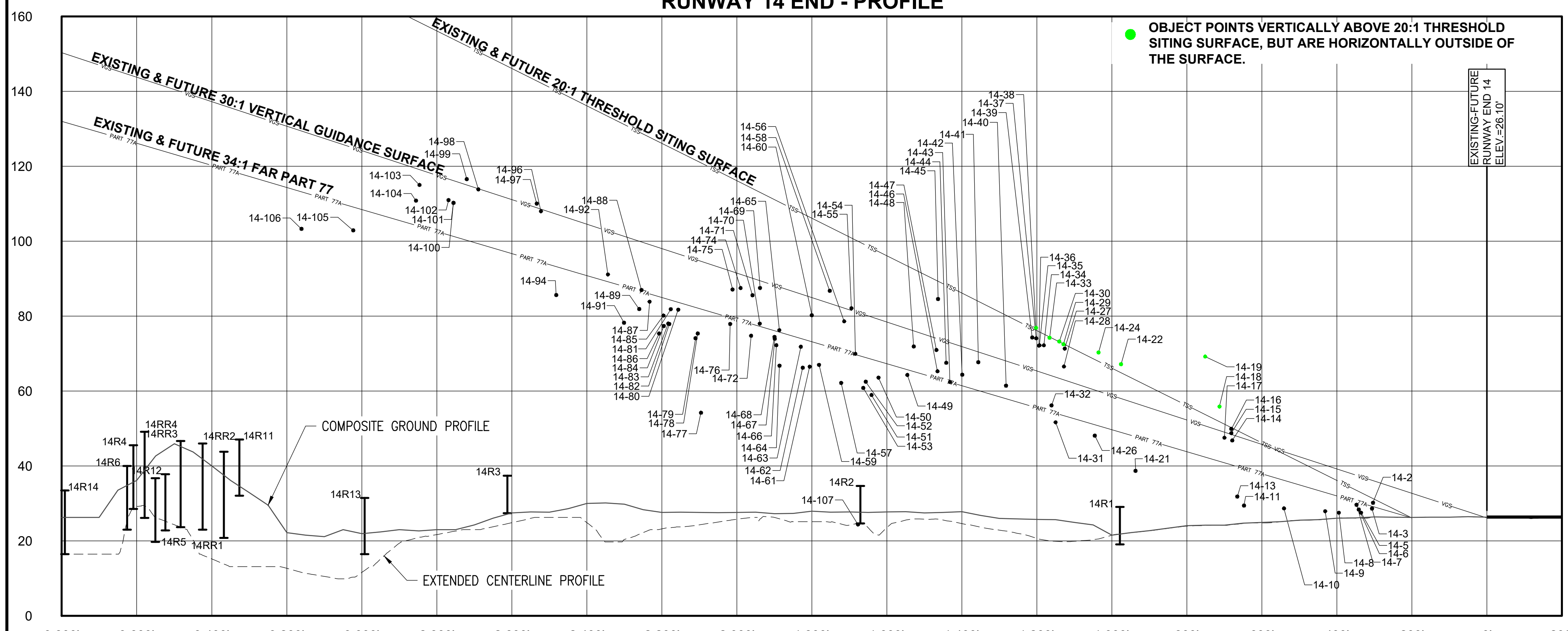
AIRPORT AIRSPACE DRAWING



RUNWAY 14 END - PLAN



RUNWAY 14 END - PROFILE



REFERENCES:

1. LATITUDE AND LONGITUDE ARE BASED ON THE ALABAMA STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 1983.
2. VERTICAL CONTROL IS REFERENCED TO NAVD 1988.
3. ELEVATIONS SHOWN ARE IN "MEAN SEA LEVEL" (MSL) UNLESS NOTED OTHERWISE AND ARE NOT INTENDED FOR DESIGN PURPOSES.
4. ALL DIMENSIONS ARE IN UNITED STATES CUSTOMARY UNITS UNLESS NOTED OTHERWISE.

GENERAL NOTES:

1. ALP PREPARED USING DESIGN CRITERIA FROM FAA ADVISORY CIRCULAR 150/5300-13A, CHANGE 1 "AIRPORT DESIGN" AND FAR PART 77 "OBJECTS AFFECTING NAVIGABLE AIRSPACE".
2. THERE ARE NO THRESHOLD SITING SURFACE OBJECT PENETRATIONS.
3. THERE ARE NO OFZ PENETRATIONS OTHER THAN FRANGIBLE NAVAIDS.
4. GROUND CONTOUR INTERVALS SHOWN ARE 2-FOOT. CONTOURS GENERATED FROM QUANTUM DIGITAL TERRAIN MODEL (DTM).
5. THE BUILDING RESTRICTION LINE SHOWN ASSUMES A HEIGHT OF 35' ABOVE THE GROUND LEVEL (AGL). BUILDINGS LESS THAN 35' COULD BE POSITIONED CLOSER TO THE RUNWAY AND BUILDINGS TALLER THAN 35' WILL BE REQUIRED TO BE FURTHER FROM THE RUNWAY.
6. NO RSA OR ROFA PENETRATIONS.
7. NO MODIFICATIONS OF STANDARDS ARE CURRENTLY KNOWN TO EXIST ON FILE.

OBSTRUCTION NOTES:

1. OBSTRUCTION INFORMATION OBTAINED FROM QUANTUM SPATIAL 12/11/2019.
2. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.
3. FUTURE OBJECTS TO BE SITED AND MITIGATED UNDER FUTURE PROJECTS.
4. TREE OBJECTS SHOWN MAY REPRESENT MULTIPLE TREES WITHIN THE WOODED AREAS. TREE OBJECTS SHOWN REPRESENT THE REPRESENTATIVE OBSTRUCTIONS OF THE AREAS.
5. SEE OBSTRUCTION DATA TABLE SHEET 9A.

EXISTING	FUTURE	ULTIMATE	LEGEND
		N/A	AIRPORT PROPERTY LINE
x	x	x	AIRPORT FENCE
	N/A	N/A	BUILDINGS (AIRPORT PROPERTY)
	N/A	N/A	AEROPLEX BUILDINGS (MAA PROPERTY)
			AIRFIELD PAVEMENT
		N/A	MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM WITH SEQUENCED FLASHING LIGHTS (MALSF)
N/A		N/A	APPROACH LIGHTING SYSTEM WITH SEQUENCED FLASHING LIGHTS II (ALSFII)
		N/A	RUNWAY END IDENTIFIER LIGHTS (REIL)
	N/A	N/A	ASOS PROTECTION AREA
RPZ	RPZ	N/A	RUNWAY PROTECTION ZONE (RPZ)
RSA	RSA	N/A	RUNWAY SAFETY AREA (RSA)
ROFA	ROFA	N/A	RUNWAY OBJECT FREE AREA (ROFA)
ROFZ	ROFZ	N/A	RUNWAY OBJECT FREE ZONE (ROFZ)
TSA	TSA	TSA	TAXIWAY SAFETY AREA (TSA)
TOFA	TOFA	TOFA	TAXIWAY OBJECT FREE AREA (TOFA)
BRL	N/A	N/A	BUILDING RESTRICTION LINE (BRL)
PART 77A	N/A	N/A	FAR PART 77 APPROACH SURFACE (PART 77A)
TSS	N/A	N/A	THRESHOLD SITING SURFACE (TSS)
VGS	N/A	N/A	VERTICAL GUIDANCE SURFACE (VGS)

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MOBILE DOWNTOWN AIRPORT (BFM)

AIRPORT LAYOUT PLAN

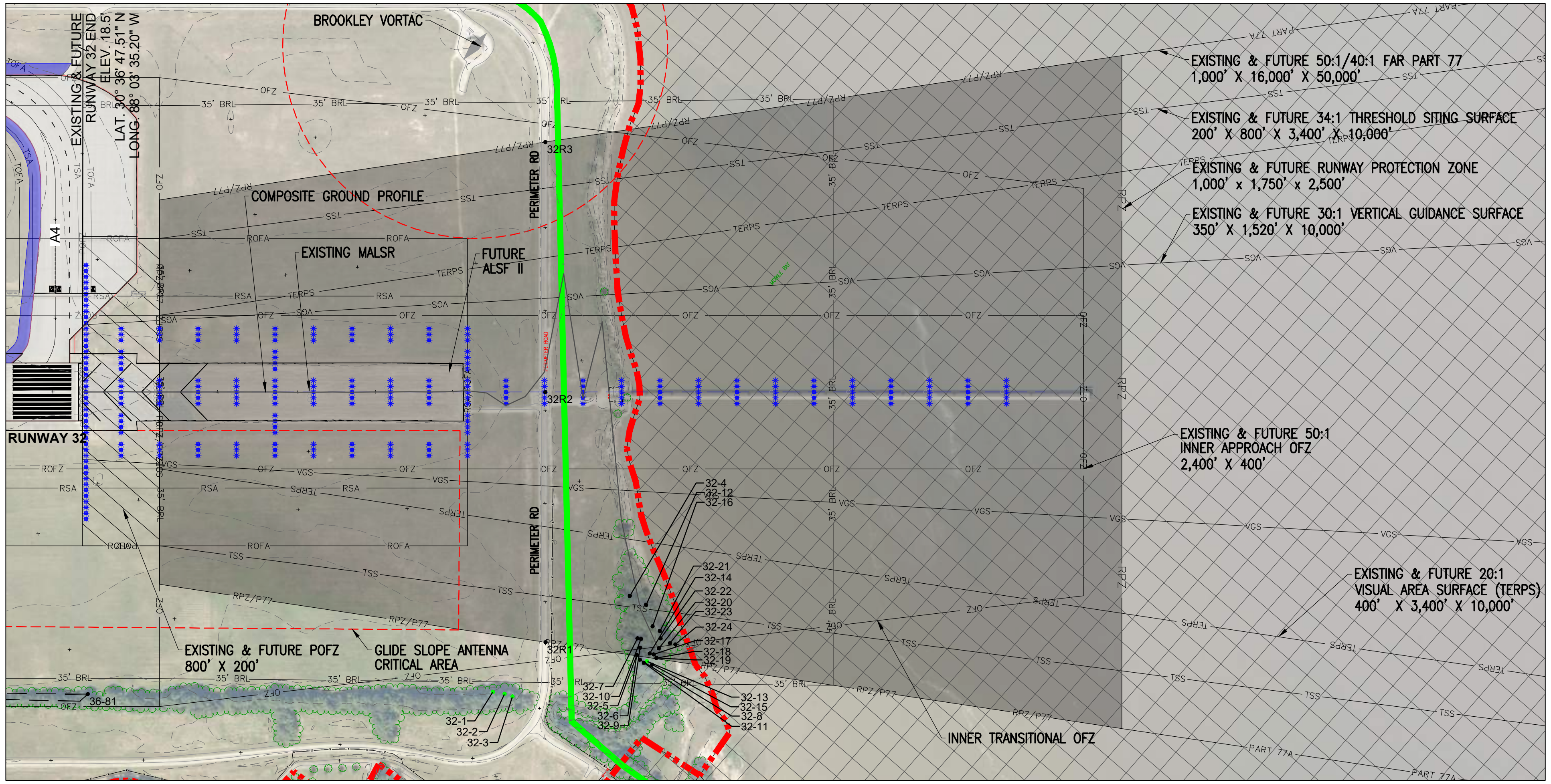
NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE:
DESIGN BY: NLD 10/12/2020
DRAWN BY: NLD 10/12/2020
REVIEWED BY: SZ 10/12/2020

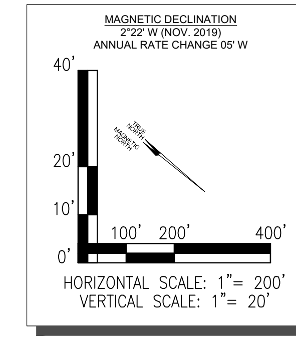
SHEET TITLE

RUNWAY 14 INNER PORTION OF THE APPROACH SURFACE DRAWING

OCT 12, 2020 5:09 PM DO01853
I:\18JOBS\18A0120\CAD\AIRPORT\SHEET6-RWYINNER.DWG



RUNWAY 32 END - PLAN



REFERENCES:

1. LATITUDE AND LONGITUDE ARE BASED ON THE ALABAMA STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 1983.
2. VERTICAL CONTROL IS REFERENCED TO NAVD 1988.
3. ELEVATIONS SHOWN ARE IN “MEAN SEA LEVEL” (MSL) UNLESS NOTED OTHERWISE AND ARE NOT INTENDED FOR DESIGN PURPOSES.
4. ALL DIMENSIONS ARE IN UNITED STATES CUSTOMARY UNITS UNLESS NOTED OTHERWISE.

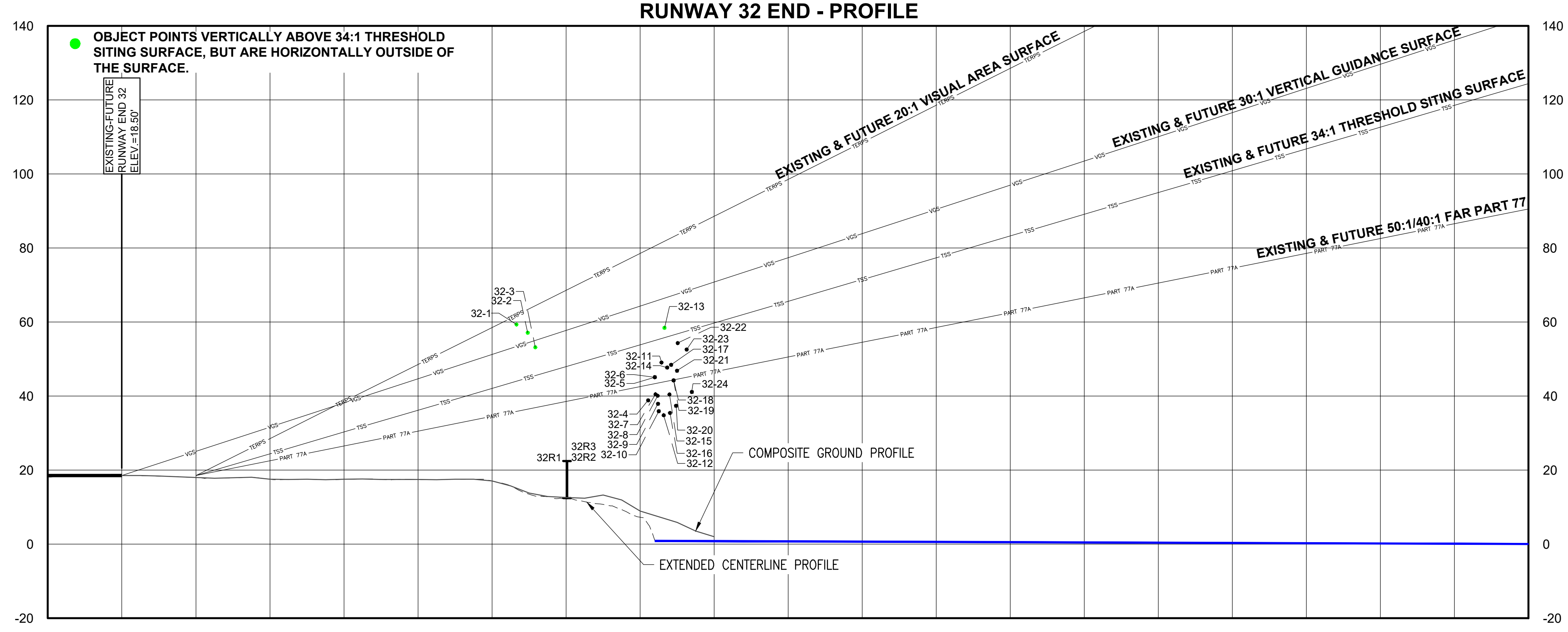
GENERAL NOTES:

1. ALP PREPARED USING DESIGN CRITERIA FROM FAA ADVISORY CIRCULAR 150/5300-13A, CHANGE 1 "AIRPORT DESIGN" AND FAR PART 77 "OBJECTS AFFECTING NAVIGABLE AIRSPACE".
2. SEE SHEET 10 FOR THRESHOLD SITING SURFACE OBJECT PENETRATIONS.
3. THERE ARE NO OFZ PENETRATIONS OTHER THAN FRANGIBLE NAVAIDS.
4. GROUND CONTOUR INTERVALS SHOWN ARE 2-FOOT. CONTOURS GENERATED FROM QUANTUM DIGITAL TERRAIN MODEL (DTM).
5. THE BUILDING RESTRICTION LINE SHOWN ASSUMES A HEIGHT OF 35' ABOVE THE GROUND LEVEL (AGL). BUILDINGS LESS THAN 35' COULD BE POSITIONED CLOSER TO THE RUNWAY AND BUILDINGS TALLER THAN 35' WILL BE REQUIRED TO BE FURTHER FROM THE RUNWAY.
6. NO RSA OR ROFA PENETRATIONS.
7. NO MODIFICATIONS OF STANDARDS ARE CURRENTLY KNOWN TO EXIST ON FILE.

OBSTRUCTION NOTES:

1. OBSTRUCTION INFORMATION OBTAINED FROM QUANTUM SPATIAL 12/11/2019.
2. PER FAR PART 77, “OBJECTS AFFECTING NAVIGABLE AIRSPACE”, RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.
3. FUTURE OBJECTS TO BE SITED AND MITIGATED UNDER FUTURE PROJECTS.
4. TREE OBJECTS SHOWN MAY REPRESENT MULTIPLE TREES WITHIN THE WOODED AREAS. TREE OBJECTS SHOWN REPRESENT THE REPRESENTATIVE OBSTRUCTIONS OF THE AREAS.
5. SEE OBSTRUCTION DATA TABLE SHEET 10.

RUNWAY 32 END - PROFILE



EXISTING	FUTURE	ULTIMATE	LEGEND
	N/A	N/A	AIRPORT PROPERTY LINE
x	x	x	AIRPORT FENCE
	N/A	N/A	MEDIUM INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR LIGHTS (MALSR)
N/A		N/A	APPROACH LIGHTING SYSTEM WITH SEQUENCED FLASHING LIGHTS II (ALSFII)
	N/A	N/A	ASOS PROTECTION AREA
RPZ	RPZ	N/A	RUNWAY PROTECTION ZONE (RPZ)
RSA	RSA	N/A	RUNWAY SAFETY AREA (RSA)
ROFA	ROFA	N/A	RUNWAY OBJECT FREE AREA (ROFA)
ROFZ	ROFZ	N/A	RUNWAY OBJECT FREE ZONE (ROFZ)
TSA	TSA	TSA	TAXIWAY SAFETY AREA (TSA)
BRL	N/A	N/A	BUILDING RESTRICTION LINE (BRL)
PART 77A	N/A	N/A	FAR PART 77 APPROACH SURFACE (PART 77A)
TSS	N/A	N/A	THRESHOLD SITING SURFACE (TSS)
VGS	N/A	N/A	VERTICAL GUIDANCE SURFACE (VGS)
TERPS	N/A	N/A	VISUAL SURFACE (TERPS)

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MOBILE DOWNTOWN AIRPORT
2455 MICHIGAN AVE,
MOBILE, AL 36615

PHONE: (251) 281-2887

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MOBILE DOWNTOWN AIRPORT (BFM)

AIRPORT LAYOUT PLAN

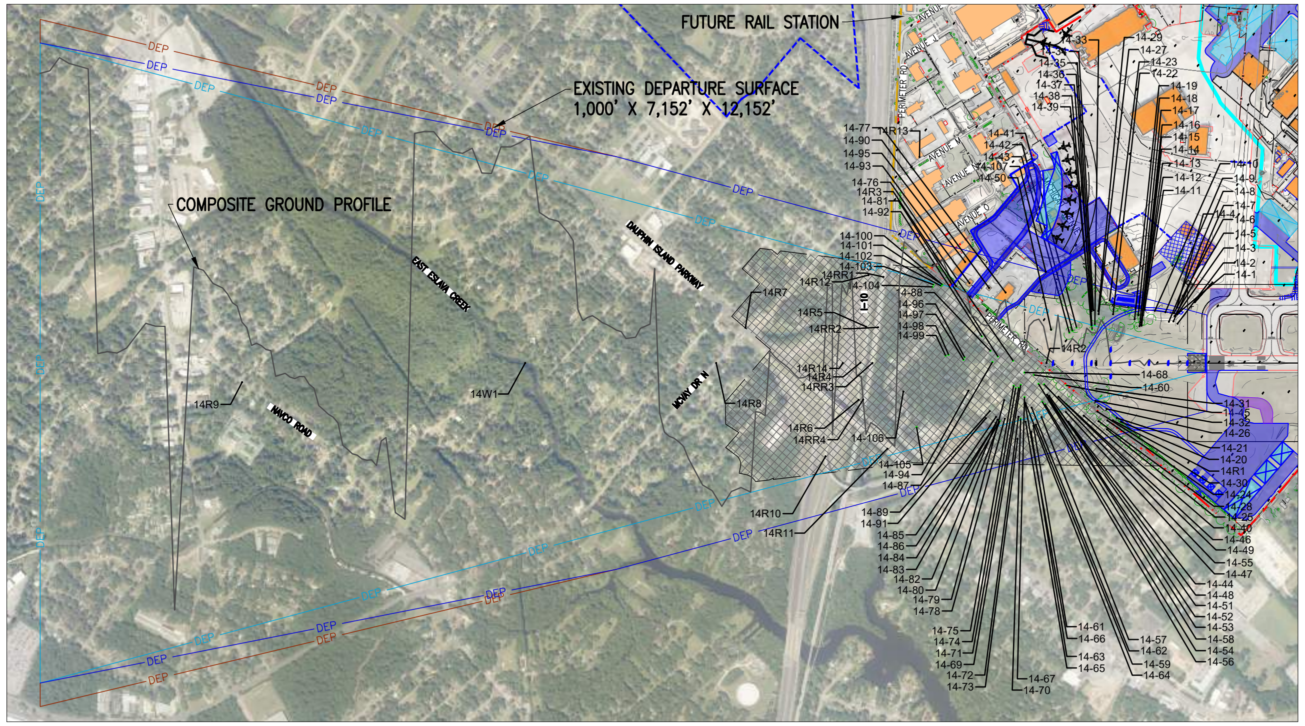
NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE:
DESIGN BY: NLD 10/12/2020
DRAWN BY: NLD 10/12/2020
REVIEWED BY: SZ 10/12/2020

SHEET TITLE

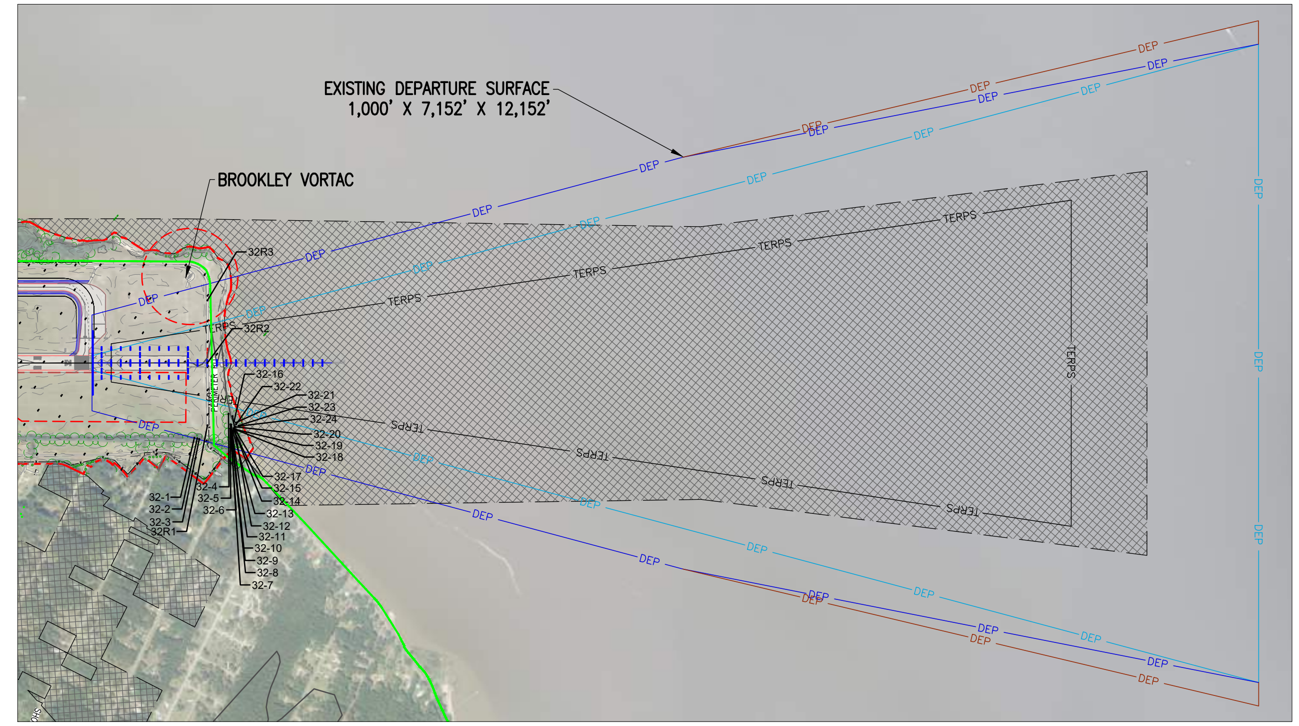
RUNWAY 32 INNER PORTION OF THE APPROACH SURFACE DRAWING

OCT 12, 2020 5:10 PM DO01853
I:\18JOBS\18A0120\CAD\AIRPORT\SHEET16-RWYINNER.DWG



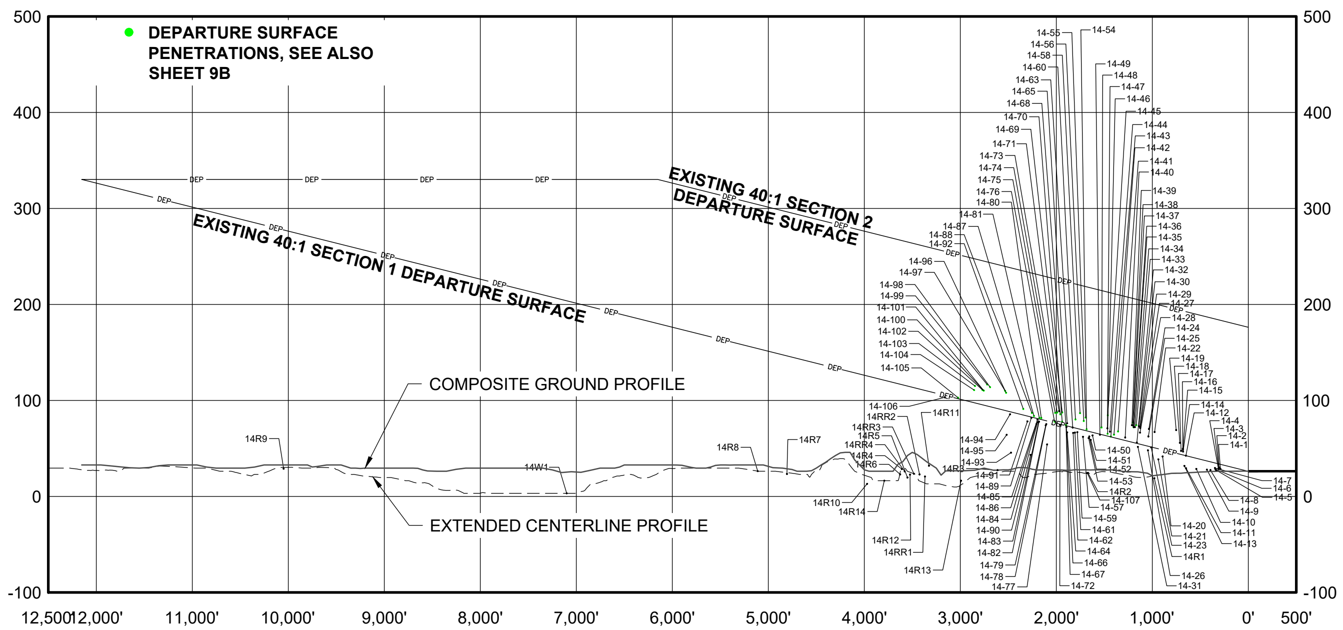
SEE SHEET 8B FOR AN ENLARGED PORTION OF RUNWAY 14 DEPARTURE SURFACE STATION 0+00 TO STATION 40+00

RUNWAY 14 END - PLAN

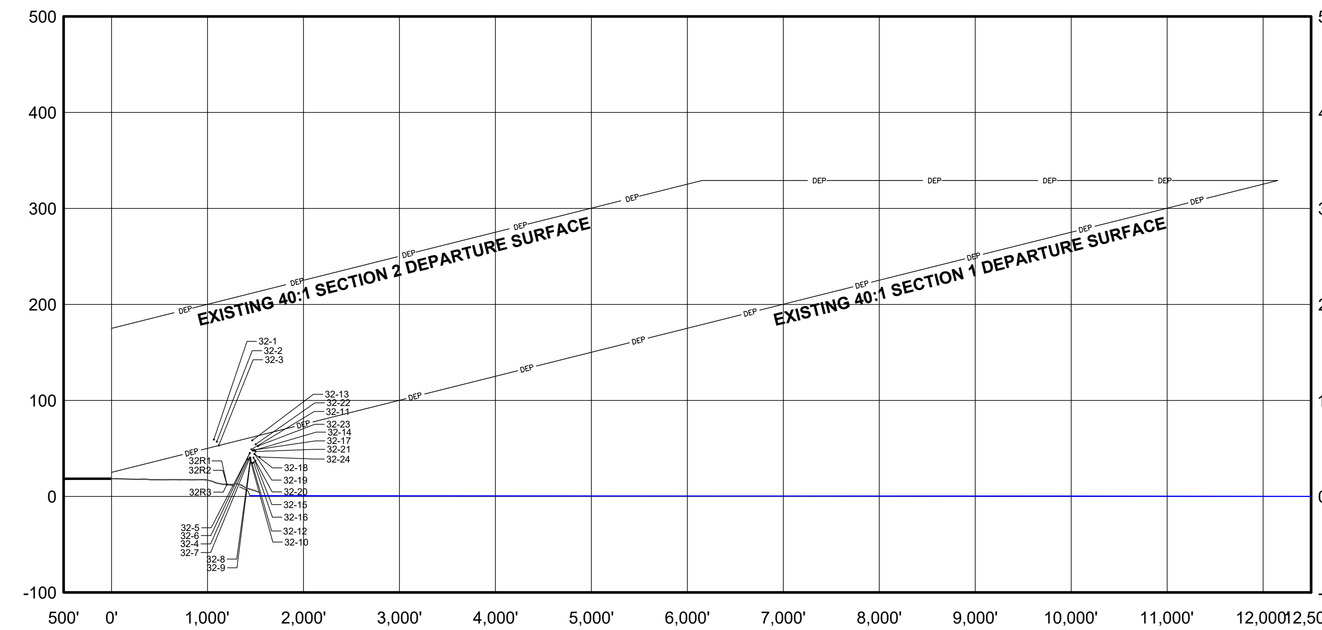


RUNWAY 32 END - PLAN

RUNWAY 14 END - PROFILE



RUNWAY 32 END - PROFILE



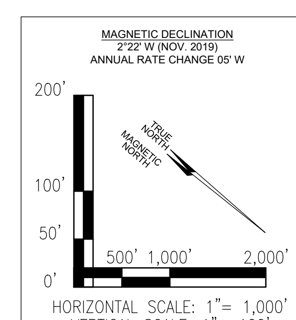
REFERENCES:

1. LATITUDE AND LONGITUDE ARE BASED ON THE ALABAMA STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 1983.
2. VERTICAL CONTROL IS REFERENCED TO NAVD 1988.
3. ELEVATIONS SHOWN ARE IN "MEAN SEA LEVEL" (MSL) UNLESS NOTED OTHERWISE AND ARE NOT INTENDED FOR DESIGN PURPOSES.
4. ALL DIMENSIONS ARE IN UNITED STATES CUSTOMARY UNITS UNLESS NOTED OTHERWISE.

1. ALP PREPARED USING DESIGN CRITERIA FROM FAA ADVISORY CIRCULAR 150/5300-13A, CHANGE 1 "AIRPORT DESIGN" AND FAR PART 77 "OBJECTS AFFECTING NAVIGABLE AIRSPACE".
2. GROUND CONTOUR INTERVALS SHOWN ARE 2-FOOT. CONTOURS GENERATED FROM QUANTUM DIGITAL TERRAIN MODEL (DTM).

OBSTRUCTION NOTES:

1. OBSTRUCTION INFORMATION OBTAINED FROM QUANTUM SPATIAL 12/11/2019.
2. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.
3. FUTURE OBJECTS TO BE SITED AND MITIGATED UNDER FUTURE PROJECTS.
4. TREE OBJECTS SHOWN MAY REPRESENT MULTIPLE TREES WITHIN THE WOODED AREAS. TREE OBJECTS SHOWN REPRESENT THE REPRESENTATIVE OBSTRUCTIONS OF THE AREAS.
5. SEE OBSTRUCTION DATA TABLE SHEETS 9B & 10.



EXISTING	FUTURE	ULTIMATE	LEGEND
			AIRPORT PROPERTY LINE
		N/A	AEROPLEX PROPERTY LINE
	N/A	N/A	AIRPORT EASEMENT
	N/A	N/A	AIRPORT FENCE
	N/A	N/A	ROADS
	N/A	N/A	BUILDINGS (AIRPORT PROPERTY)
	N/A	N/A	AEROPLEX BUILDINGS (MAA PROPERTY)
			AIRFIELD PAVEMENT
DEP	N/A	N/A	DEPARTURE SURFACE (DEP) - SECTION 1
DEP	N/A	N/A	DEPARTURE SURFACE (DEP) - SECTION 2
DEP	N/A	N/A	DEPARTURE SURFACE (DEP) - LEVEL SECTION

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MOBILE DOWNTOWN AIRPORT (BFM)

AIRPORT LAYOUT PLAN

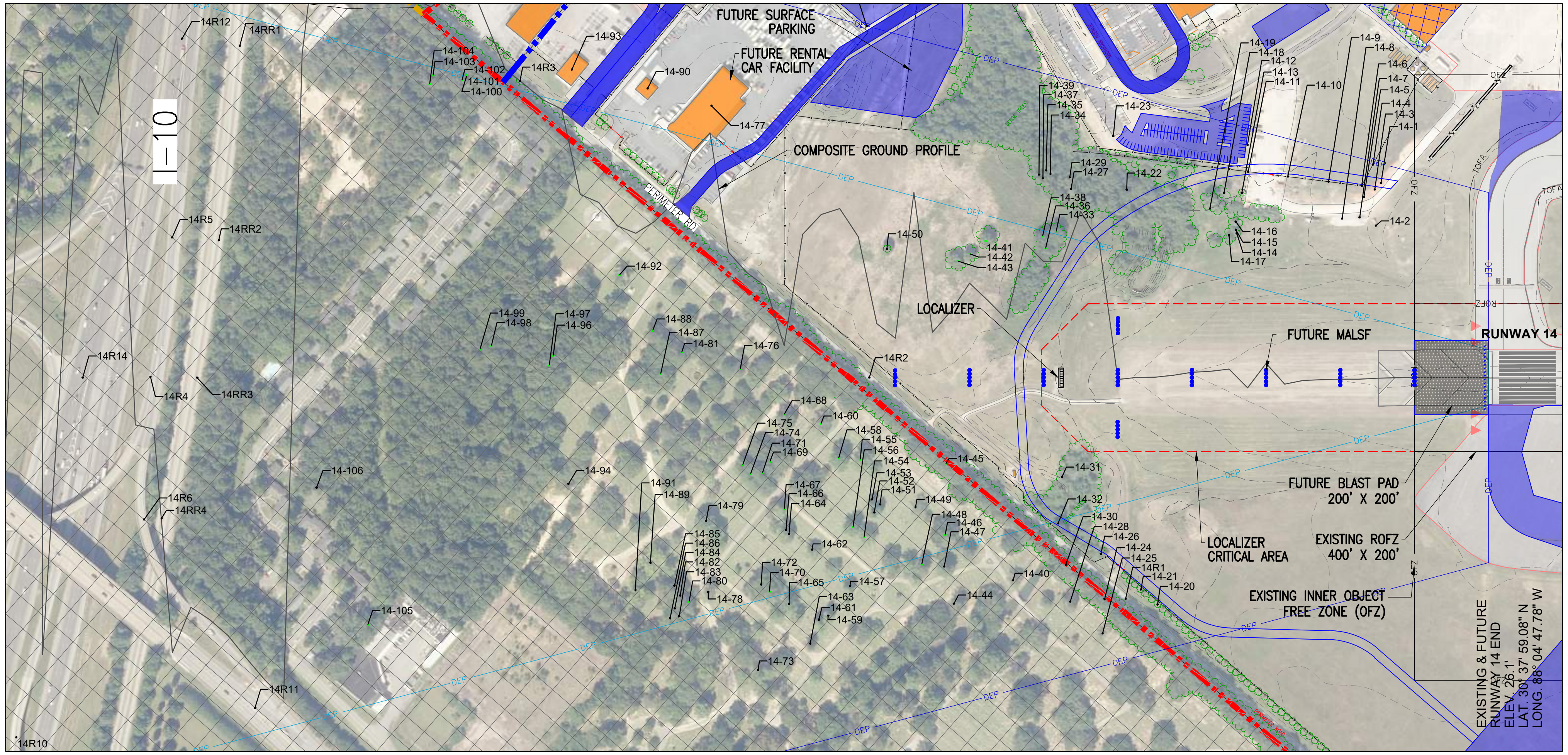
NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE: 7-RWYDEP.DWG
DESIGN BY: NLD 10/9/2020
DRAWN BY: NLD 10/9/2020
REVIEWED BY: SZ 10/9/2020

SHEET TITLE

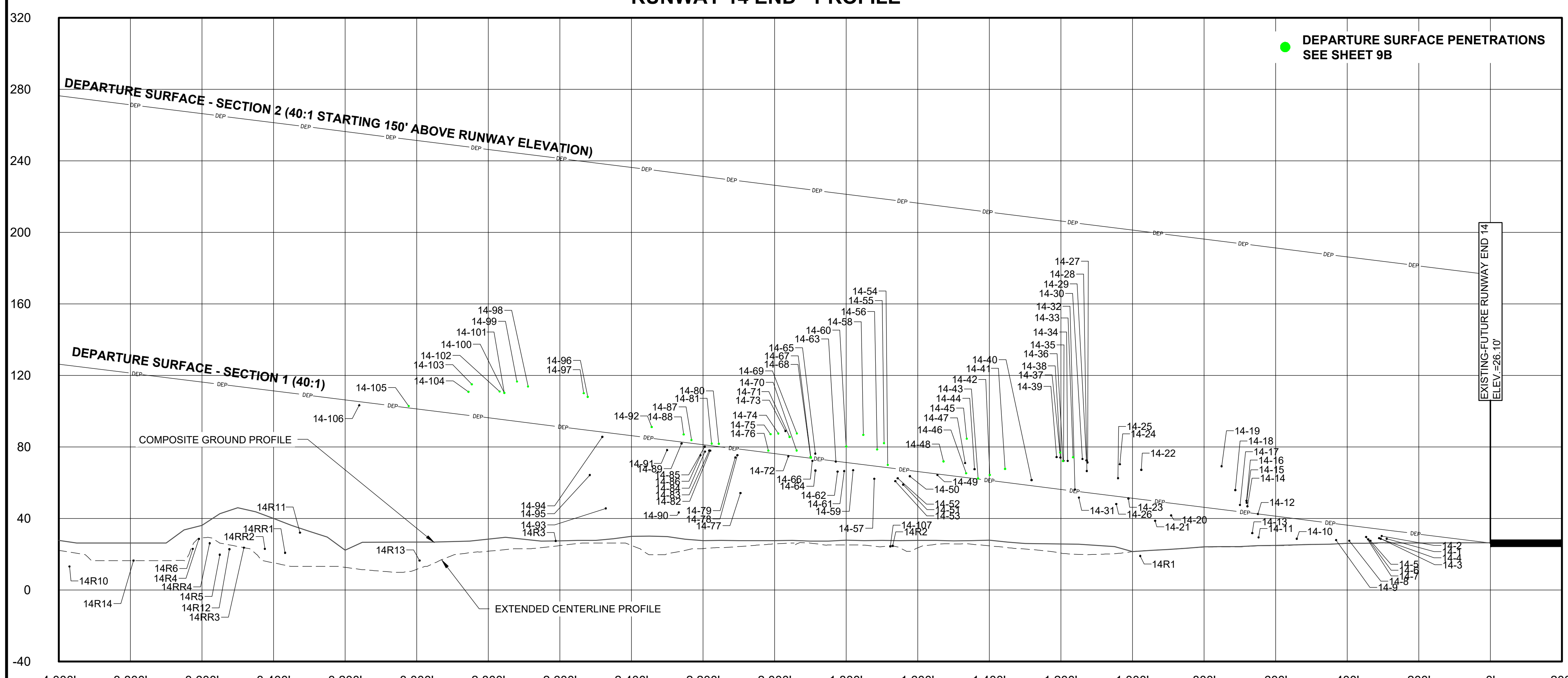
RUNWAY 14 AND 32 DEPARTURE SURFACE DRAWING

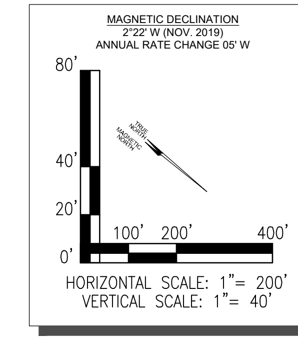
OCT 09, 2020 5:49 PM DO01853
I:\18JOBS\18A0120\CAD\AIRPORT\SHEET7-RWYDEP.DWG



RUNWAY 14 END - PLAN

RUNWAY 14 END - PROFILE





REFERENCES:

1. LATITUDE AND LONGITUDE ARE BASED ON THE ALABAMA STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 1983.
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OBSTRUCTION NOTES:

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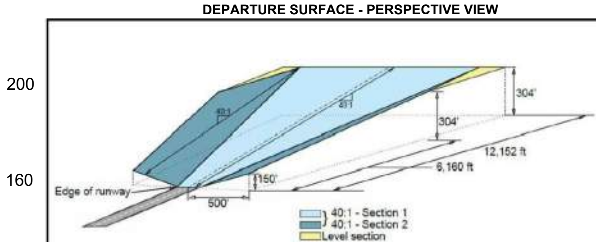
4. TREE OBJECTS SHOWN MAY REPRESENT MULTIPLE TREES WITHIN THE WOODED AREAS. TREE OBJECTS SHOWN REPRESENT THE REPRESENTATIVE OBSTRUCTIONS OF THE AREAS.
5. SEE OBSTRUCTION DATA TABLE SHEET 9B

EXISTING	FUTURE	ULTIMATE	LEGEND
			AIRPORT PROPERTY LINE
		N/A	AEROPLEX PROPERTY LINE
	N/A	N/A	AIRPORT EASEMENT
x	N/A	N/A	AIRPORT FENCE
	N/A	N/A	ROADS
	N/A	N/A	BUILDINGS (AIRPORT PROPERTY)
	N/A	N/A	AEROPLEX BUILDINGS (MAA PROPERTY)
			AIRFIELD PAVEMENT
DEP	N/A	N/A	DEPARTURE SURFACE (DEP) - SECTION 1
DEP	N/A	N/A	DEPARTURE SURFACE (DEP) - SECTION 2
DEP	N/A	N/A	DEPARTURE SURFACE (DEP) - LEVEL SECTION

DEPARTURE SURFACE - PERSPECTIVE VIEW



Source: FAA Engineering Brief 99A

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AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE:
DESIGN BY: NLD 10/12/2020
DRAWN BY: NLD 10/12/2020
REVIEWED BY: SZ 10/12/2020

SHEET TITLE

RUNWAY 14 END DEPARTURE SURFACE DRAWING (STA. 0+00 - STA. 40+00)

OCT 12, 2020 8:31 AM DO01853
I:\18JOBS\18A0120\CAD\AIRPORT\SHEET17-RWYDEP-14.DWG

RUNWAY 14 APPROACH OBSTRUCTION DATA

ID	DESCRIPTION	OBJECT TOP ELEVATION	EXISTING/FUTURE OBSTRUCTION DISPOSITION: 34:1 FAR PART 77		20:1 THRESHOLD SITTING		30:1 VERTICAL GUIDANCE		PROPOSED ACTIONS
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
14-2	POST	30'	29'	1'	-	-	-	-	APPLY TSS/RELOCATE
14-3	DIRT PILE	29'	29'	-1'	-	-	-	-	NO ACTION
14-5	DIRT PILE	28'	30'	-3'	-	-	-	-	NO ACTION
14-6	FENCE	28'	28'	0'	-	-	-	-	NO ACTION
14-7	DIRT PILE	30'	30'	-1'	-	-	-	-	NO ACTION
14-8	DIRT PILE	28'	32'	-4'	-	-	-	-	NO ACTION
14-9	FENCE	28'	28'	0'	-	-	-	-	NO ACTION
14-10	FENCE	29'	29'	0'	-	-	-	-	NO ACTION
14-11	FENCE	29'	39'	-10'	-	-	-	-	NO ACTION
14-13	TREE	32'	40'	-8'	-	-	-	-	NO ACTION
14-14	TREE	47'	40'	7'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-15	TREE	49'	40'	8'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-16	TREE	50'	40'	10'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-17	TREE	48'	41'	7'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-18	TREE	56'	41'	15'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-19	TREE	69'	42'	27'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-21	TREE	39'	48'	-9'	-	-	-	-	NO ACTION
14-22	TREE	67'	49'	18'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-24	TREE	70'	51'	20'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-26	TREE	48'	51'	-3'	-	-	-	-	NO ACTION
14-27	TREE	71'	53'	18'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-28	TREE	67'	53'	13'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-29	TREE	72'	53'	19'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-30	TREE	73'	54'	19'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-31	TREE	52'	54'	-2'	74'	-22'	-	-	NO ACTION
14-32	TREE	56'	54'	2'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-33	TREE	74'	55'	20'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-34	TREE	72'	55'	17'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-35	TREE	72'	55'	17'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-36	TREE	72'	55'	17'	76'	-4'	-	-	APPLY TSS/TRIM/REMOVE
14-37	TREE	74'	56'	18'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-38	TREE	77'	56'	21'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-39	TREE	74'	56'	18'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-40	TREE	61'	58'	3'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-41	TREE	68'	60'	8'	84'	-16'	-	-	APPLY TSS/TRIM/REMOVE
14-42	TREE	64'	61'	3'	86'	-22'	-	-	APPLY TSS/TRIM/REMOVE
14-43	TREE	62'	62'	0'	88'	-25'	-	-	APPLY TSS/TRIM/REMOVE
14-44	TREE	68'	63'	5'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-45	TREE	85'	63'	21'	89'	-5'	74'	11'	TRIM/REMOVE
14-46	TREE	65'	63'	2'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-47	TREE	71'	63'	8'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-48	TREE	72'	65'	7'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-49	TREE	64'	66'	-1'	93'	-29'	-	-	NO ACTION
14-50	TREE	64'	68'	-4'	97'	-34'	-	-	NO ACTION
14-51	TREE	59'	68'	-10'	98'	-39'	-	-	NO ACTION
14-52	TREE	62'	69'	-6'	99'	-36'	-	-	NO ACTION
14-53	TREE	61'	69'	-8'	99'	-38'	-	-	NO ACTION
14-54	TREE	70'	70'	0'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-55	TREE	82'	70'	12'	101'	-19'	81'	1'	TRIM/REMOVE
14-56	TREE	79'	71'	8'	102'	-23'	-	-	APPLY TSS/TRIM/REMOVE
14-57	TREE	62'	71'	-9'	-	-	-	-	NO ACTION
14-58	TREE	87'	72'	15'	104'	-17'	83'	3'	TRIM/REMOVE
14-59	TREE	67'	73'	-6'	-	-	-	-	NO ACTION
14-60	TREE	80'	73'	7'	106'	-26'	85'	-5'	APPLY TSS/TRIM/REMOVE
14-61	TREE	66'	73'	-7'	-	-	-	-	NO ACTION
14-62	TREE	66'	74'	-8'	-	-	-	-	NO ACTION
14-63	TREE	72'	72'	0'	-	-	-	-	NO ACTION
14-64	TREE	67'	76'	-9'	110'	-44'	-	-	NO ACTION
14-65	TREE	76'	76'	1'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-66	TREE	72'	76'	-4'	111'	-39'	-	-	NO ACTION
14-67	TREE	74'	76'	-2'	111'	-37'	-	-	NO ACTION
14-68	TREE	74'	76'	-2'	111'	-37'	88'	-14'	NO ACTION
14-69	TREE	87'	77'	10'	113'	-26'	89'	-2'	APPLY TSS/TRIM/REMOVE
14-70	TREE	78'	77'	1'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-71	TREE	86'	78'	8'	114'	-28'	90'	-5'	APPLY TSS/TRIM/REMOVE
14-72	TREE	75'	78'	-3'	-	-	-	-	NO ACTION
14-74	TREE	87'	79'	9'	116'	-28'	91'	-4'	APPLY TSS/TRIM/REMOVE
14-75	TREE	87'	79'	8'	117'	-30'	92'	-5'	APPLY TSS/TRIM/REMOVE
14-76	TREE	78'	80'	-2'	117'	-39'	92'	-14'	NO ACTION
14-77	BUILDING	54'	82'	-28'	-	-	-	-	NO ACTION
14-78	TREE	75'	82'	-7'	-	-	-	-	NO ACTION
14-79	TREE	74'	82'	-8'	122'	-48'	-	-	NO ACTION
14-80	TREE	82'	84'	-2'	-	-	-	-	NO ACTION
14-81	TREE	82'	84'	-2'	125'	-43'	97'	-15'	NO ACTION
14-82	TREE	78'	84'	-6'	-	-	-	-	NO ACTION
14-83	TREE	78'	84'	-6'	-	-	-	-	NO ACTION
14-84	TREE	77'	85'	-7'	-	-	-	-	NO ACTION
14-85	TREE	80'	85'	-5'	-	-	-	-	NO ACTION
14-86	TREE	75'	85'	-10'	-	-	-	-	NO ACTION
14-87	TREE	84'	86'	-2'	128'	-44'	99'	-15'	NO ACTION

NOTES:

1. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING.

2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

3. OBJECTS MAY NOT BE ALL SHOWN IN THE TABLE AS SOME ARE LOCATED IN DEPARTURE SURFACE BOUNDARY BUT MAY BE LOCATED OUTSIDE OF THE APPROACH SURFACES. ONLY OBJECTS THAT ARE EITHER PENETRATIONS OR OBJECTS WITH LESS THAN 30 FEET BELOW PENETRATING PART 77 APPROACH SURFACE INCLUDED IN TABLE. ALL TRAVERSE WAY POINTS ARE INCLUDED.

4. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.

RUNWAY 14 APPROACH OBSTRUCTION DATA (CONT.)

ID	DESCRIPTION	OBJECT TOP ELEVATION	EXISTING/FUTURE OBSTRUCTION DISPOSITION: 34:1 FAR PART 77		20:1 THRESHOLD SITTING		30:1 VERTICAL GUIDANCE		PROPOSED ACTIONS
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
14-88	TREE	87'	87'	0'	129'	-42'	100'	-13'	APPLY TSS/TRIM/REMOVE
14-89	TREE	82'	87'	-5'	129'	-47'	-	-	NO ACTION
14-91	TREE	78'	88'	-10'	-	-	-	-	NO ACTION
14-92	TREE	91'	89'	2'	133'	-42'	103'	-12'	APPLY TSS/TRIM/REMOVE
14-94	TREE	86'	93'	-8'	140'	-55'	107'	-22'	NO ACTION
14-96	TREE	108'	94'	14'	142'	-34'	109'	-1'	APPLY TSS/TRIM/REMOVE
14-97	TREE	110'	95'	15'	143'	-33'	109'	1'	TRIM/REMOVE
14-98	TREE	114'	99'	14'	151'	-37'	114'	0'	APPLY TSS/TRIM/REMOVE
14-99	TREE	117'	100'	16'	152'	-36'	115'	2'	TRIM/REMOVE
14-100	TREE	110'	101'	9'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-101	TREE	110'	101'	9'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-102	TREE	111'	102'	9'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-103	TREE	115'	104'	11'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-104	TREE	111'	104'	7'	-	-	-	-	APPLY TSS/TRIM/REMOVE
14-105	TREE	103'	109'	-6'	-	-	-	-	NO ACTION
14-106	TREE	103'	113'	-10'	174'	-71'	129'	-26'	NO ACTION
14-107	PARKING GARAGE	24'	-	-	-	-	-	-	-
14R1	PERIMETER ROAD	29'	49'	-20'	-	-	-	-	NO ACTION
14R2	PERIMETER ROAD	35'	69'	-35'	100'	-65'	81'	-46'	NO ACTION
14R3	PERIMETER ROAD	37'	97'	-60'	-	-	-	-	NO ACTION
14R4	INTERSTATE (I-10)	46'	126'	-81'	197'	-151'	144'	-99'	NO ACTION
14R5	INTERSTATE (I-10)	37'	125'	-88'	194'	-157'	-	-	NO ACTION
14R6	INTERSTATE (I-10)	40'	127'	-87'	197'	-157'	145'	-105'	NO ACTION
14R7	DAUPHIN ISLAND PARKWAY	38'	162'	-123'	256'	-218'	183'	-145'	NO ACTION
14R8	MCVAY DR N	41'	171'	-129'	272'	-230'	193'	-152'	NO ACTION
14R9	NAVCO ROAD	44'	316'	-272'	519'	-475'	354'	-311'	NO ACTION
14R10	INTERSTATE (I-10)	39'	135'	-96'	-	-	-	-	NO ACTION
14R11	DAUPHIN ISLAND PARKWAY	47'	117'	-70'	-	-	-	-	NO ACTION
14R12	INTERSTATE (I-10)	40'	124'	-84'	-	-	-	-	NO ACTION
14R13	INTERSTATE (I-10)	33'	132'	-98'	206'	-172'	150'	-117'	NO ACTION
14RR1	RAILROAD	44'	119'	-76'	-	-	-	-	NO ACTION
14RR2	RAILROAD	46'	121'	-75'	187'	-141'	138'	-92'	NO ACTION
14RR3	RAILROAD	47'	123'	-76'	190'	-144'	140'	-93'	NO ACTION
14RR4	RAILROAD	49'	125'	-76'	195'	-146'	143'	-94'	NO ACTION
14W1	E ESLAVA CREEK	3'	229'	-226'	371'	-368'	258'	-255'	NO ACTION

NOTES:

1. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING.

2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

3. OBJECTS MAY NOT BE ALL SHOWN IN THE TABLE AS SOME ARE LOCATED IN DEPARTURE SURFACE BOUNDARY BUT MAY BE LOCATED OUTSIDE OF THE APPROACH SURFACES. ONLY OBJECTS THAT ARE EITHER PENETRATIONS OR OBJECTS WITH LESS THAN 30 FEET BELOW PENETRATING PART 77 APPROACH SURFACE INCLUDED IN TABLE. ALL TRAVERSE WAY POINTS ARE INCLUDED.

4. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.

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AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION		
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ISSUE: October, 2020
PROJECT NO: 18A0120
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DESIGN BY: NLD 10/9/2020
DRAWN BY: NLD 10/9/2020
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SHEET TITLE

RUNWAY 14 APPROACH OBSTRUCTION DATA TABLE

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RUNWAY 32 DEPARTURE OBSTRUCTION DATA

ID	DESCRIPTION	OBJECT TOP ELEVATION	EXISTING OBSTRUCTION 40:1 DEPARTURE SURFACE		PROPOSED ACTIONS
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
14-1	DIRT PILE	29'	165'	-136'	NO ACTION
14-2	POST	30'	123'	-93'	NO ACTION
14-3	DIRT PILE	29'	158'	-129'	NO ACTION
14-4	FENCE	29'	181'	-152'	NO ACTION
14-5	DIRT PILE	28'	149'	-121'	NO ACTION
14-6	FENCE	28'	159'	-131'	NO ACTION
14-7	DIRT PILE	30'	128'	-99'	NO ACTION
14-8	DIRT PILE	28'	124'	-96'	NO ACTION
14-9	FENCE	28'	156'	-129'	NO ACTION
14-10	FENCE	29'	154'	-125'	NO ACTION
14-11	FENCE	29'	151'	-121'	NO ACTION
14-12	POLE UTILITY	42'	176'	-134'	NO ACTION
14-13	TREE	32'	129'	-98'	NO ACTION
14-14	TREE	47'	90'	-43'	NO ACTION
14-15	TREE	49'	93'	-45'	NO ACTION
14-16	TREE	50'	101'	-51'	NO ACTION
14-17	TREE	48'	87'	-39'	NO ACTION
14-18	TREE	56'	126'	-70'	NO ACTION
14-19	TREE	69'	109'	-40'	NO ACTION
14-20	TREE	42'	154'	-112'	NO ACTION
14-21	TREE	39'	137'	-98'	NO ACTION
14-22	TREE	67'	111'	-44'	NO ACTION
14-23	POLE LIGHT	51'	160'	-109'	NO ACTION
14-24	TREE	70'	139'	-69'	NO ACTION
14-25	TREE	63'	171'	-109'	NO ACTION
14-26	TREE	48'	95'	-47'	NO ACTION
14-27	TREE	71'	101'	-30'	NO ACTION
14-28	TREE	67'	135'	-68'	NO ACTION
14-29	TREE	72'	112'	-40'	NO ACTION
14-30	TREE	73'	99'	-26'	NO ACTION
14-31	TREE	52'	55'	-3'	NO ACTION
14-32	TREE	56'	58'	-2'	NO ACTION
14-33	TREE	74'	58'	16'	DEP. PROCEDURE/TRIM/REMOVE
14-34	TREE	72'	112'	-39'	NO ACTION
14-35	TREE	72'	114'	-42'	NO ACTION
14-36	TREE	72'	56'	16'	DEP. PROCEDURE/TRIM/REMOVE
14-37	TREE	74'	106'	-32'	NO ACTION
14-38	TREE	77'	56'	21'	DEP. PROCEDURE/TRIM/REMOVE
14-39	TREE	74'	109'	-35'	NO ACTION
14-40	TREE	61'	104'	-42'	NO ACTION
14-41	TREE	68'	60'	8'	DEP. PROCEDURE/TRIM/REMOVE
14-42	TREE	64'	61'	3'	DEP. PROCEDURE/TRIM/REMOVE
14-43	TREE	62'	62'	0'	DEP. PROCEDURE/TRIM/REMOVE
14-44	TREE	68'	115'	-47'	NO ACTION
14-45	TREE	85'	63'	22'	DEP. PROCEDURE/TRIM/REMOVE
14-46	TREE	65'	63'	2'	DEP. PROCEDURE/TRIM/REMOVE
14-47	TREE	71'	78'	-7'	NO ACTION
14-48	TREE	72'	72'	0'	DEP. PROCEDURE/TRIM/REMOVE
14-49	TREE	64'	65'	-1'	NO ACTION
14-50	TREE	64'	67'	-3'	NO ACTION
14-51	TREE	59'	67'	-8'	NO ACTION
14-52	TREE	62'	68'	-5'	NO ACTION
14-53	TREE	61'	68'	-7'	NO ACTION
14-54	TREE	70'	68'	2'	DEP. PROCEDURE/TRIM/REMOVE
14-55	TREE	82'	69'	13'	DEP. PROCEDURE/TRIM/REMOVE
14-56	TREE	79'	69'	10'	DEP. PROCEDURE/TRIM/REMOVE
14-57	TREE	62'	79'	-17'	NO ACTION
14-58	TREE	87'	70'	17'	DEP. PROCEDURE/TRIM/REMOVE
14-59	TREE	67'	103'	-36'	NO ACTION
14-60	TREE	80'	71'	9'	DEP. PROCEDURE/TRIM/REMOVE
14-61	TREE	66'	105'	-38'	NO ACTION
14-62	TREE	66'	72'	-6'	NO ACTION
14-63	TREE	72'	126'	-54'	NO ACTION
14-64	TREE	67'	73'	-7'	NO ACTION
14-65	TREE	76'	84'	-8'	NO ACTION
14-66	TREE	72'	74'	-1'	NO ACTION
14-67	TREE	74'	74'	0'	DEP. PROCEDURE/TRIM/REMOVE
14-68	TREE	74'	74'	1'	DEP. PROCEDURE/TRIM/REMOVE
14-69	TREE	87'	75'	13'	DEP. PROCEDURE/TRIM/REMOVE
14-70	TREE	78'	75'	3'	DEP. PROCEDURE/TRIM/REMOVE
14-71	TREE	86'	75'	10'	DEP. PROCEDURE/TRIM/REMOVE
14-72	TREE	75'	75'	-1'	NO ACTION
14-73	TREE	89'	141'	-52'	NO ACTION
14-74	TREE	87'	76'	11'	DEP. PROCEDURE/TRIM/REMOVE
14-75	TREE	87'	77'	11'	DEP. PROCEDURE/TRIM/REMOVE
14-76	TREE	78'	77'	1'	DEP. PROCEDURE/TRIM/REMOVE
14-77	BUILDING	54'	113'	-59'	NO ACTION
14-78	TREE	75'	79'	-4'	NO ACTION
14-79	TREE	74'	79'	-5'	NO ACTION
14-80	TREE	82'	80'	2'	DEP. PROCEDURE/TRIM/REMOVE

NOTES:

1. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING.

2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

3. OBJECTS PENETRATE OR BELOW PENETRATING DEPARTURE SURFACE INCLUDED IN THE TABLE WERE SELECTED AND CALCULATED PRIOR ENGINEERING BRIEF 99A RELEASE ON JULY 24, 2020. THUS, OBJECTS INCLUDED MAY HAVE HIGH CLEARANCE FROM PENETRATING DEPARTURE SURFACE.

4. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.

5. RUNWAY 32 HAS PUBLISHED TAKE OFF OBSTACLE NOTES.

RUNWAY 32 DEPARTURE OBSTRUCTION DATA

ID	DESCRIPTION	OBJECT TOP ELEVATION	EXISTING OBSTRUCTION 40:1 DEPARTURE SURFACE		PROPOSED ACTIONS
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
14-81	TREE	82'	81'	1'	DEP. PROCEDURE/TRIM/REMOVE
14-82	TREE	78'	81'	-3'	NO ACTION
14-83	TREE	78'	81'	-3'	NO ACTION
14-84	TREE	77'	81'	-4'	NO ACTION
14-85	TREE	80'	81'	-1'	NO ACTION
14-86	TREE	75'	81'	-6'	NO ACTION
14-87	TREE	84'	82'	2'	DEP. PROCEDURE/TRIM/REMOVE
14-88	TREE	87'	83'	4'	DEP. PROCEDURE/TRIM/REMOVE
14-89	TREE	82'	83'	-1'	NO ACTION
14-90	BUILDING	43'	118'	-74'	NO ACTION
14-91	TREE	78'	84'	-6'	NO ACTION
14-92	TREE	91'	85'	6'	DEP. PROCEDURE/TRIM/REMOVE
14-93	BUILDING	46'	121'	-76'	NO ACTION
14-94	TREE	86'	88'	-3'	NO ACTION
14-95	BUILDING	64'	196'	-132'	NO ACTION
14-96	TREE	108'	89'	19'	DEP. PROCEDURE/TRIM/REMOVE
14-97	TREE	110'	90'	20'	DEP. PROCEDURE/TRIM/REMOVE
14-98	TREE	114'	93'	20'	DEP. PROCEDURE/TRIM/REMOVE
14-99	TREE	117'	94'	22'	DEP. PROCEDURE/TRIM/REMOVE
14-100	TREE	110'	96'	14'	DEP. PROCEDURE/TRIM/REMOVE
14-101	TREE	110'	96'	14'	DEP. PROCEDURE/TRIM/REMOVE
14-102	TREE	111'	95'	15'	DEP. PROCEDURE/TRIM/REMOVE
14-103	TREE	115'	97'	18'	DEP. PROCEDURE/TRIM/REMOVE
14-104	TREE	111'	98'	13'	DEP. PROCEDURE/TRIM/REMOVE
14-105	TREE	103'	102'	1'	DEP. PROCEDURE/TRIM/REMOVE
14-106	TREE	103'	105'	-2'	NO ACTION
14-107	PARKING GARAGE	24'	218'	-194'	NO ACTION
14R1	PERIMETER ROAD	29'	142'	-113'	NO ACTION
14R2	PERIMETER ROAD	35'	68'	-33'	NO ACTION
14R3	PERIMETER ROAD	37'	101'	-64'	NO ACTION
14R4	INTERSTATE (I-10)	46'	116'	-71'	NO ACTION
14R5	INTERSTATE (I-10)	37'	115'	-78'	NO ACTION
14R6	INTERSTATE (I-10)	40'	117'	-77'	NO ACTION
14R7	DAUPHIN ISLAND PARKWAY	38'	146'	-108'	NO ACTION
14R8	MCVAY DR N	41'	154'	-113'	NO ACTION
14R9	NAVCO ROAD	44'	278'	-234'	NO ACTION
14R10	INTERSTATE (I-10)	39'	126'	-87'	NO ACTION
14R11	DAUPHIN ISLAND PARKWAY	47'	109'	-62'	NO ACTION
14R12	INTERSTATE (I-10)	40'	114'	-74'	NO ACTION
14R13	INTERSTATE (I-10)	33'	121'	-88'	NO ACTION
14RR1	RAILROAD	39'	110'	-71'	NO ACTION
14RR2	RAILROAD	48'	112'	-64'	NO ACTION
14RR3	RAILROAD	46'	113'	-67'	NO ACTION
14RR4	RAILROAD	49'	116'	-67'	NO ACTION
14W1	E ESLAVA CREEK	3'	204'	-201'	NO ACTION

NOTES:

1. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING.

2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

3. OBJECTS PENETRATE OR BELOW PENETRATING DEPARTURE SURFACE INCLUDED IN THE TABLE WERE SELECTED AND CALCULATED PRIOR ENGINEERING BRIEF 99A RELEASE ON JULY 24, 2020. THUS, OBJECTS INCLUDED MAY HAVE HIGH CLEARANCE FROM PENETRATING DEPARTURE SURFACE.

4. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.

5. RUNWAY 32 HAS PUBLISHED TAKE OFF OBSTACLE NOTES.

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AIRPORT LAYOUT PLAN

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REVIEWED BY: SZ 10/9/2020

SHEET TITLE

RUNWAY 32 DEPARTURE OBSTRUCTION DATA TABLE

RUNWAY 32 APPROACH OBSTRUCTION DATA

ID	DESCRIPTION	OBJECT TOP ELEVATION	EXISTING/FUTURE OBSTRUCTION DISPOSITION: 50:1 FAR PART 77		34:1 THRESHOLD SITTING		30:1 VERTICAL GUIDANCE		PROPOSED ACTIONS
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
32-1	TREE	59'	-	-	-	-	-	-	NO ACTION
32-2	TREE	57'	-	-	-	-	-	-	NO ACTION
32-3	TREE	53'	-	-	-	-	-	-	NO ACTION
32-4	TREE	39'	43'	-4'	54'	-16'	-	-	NO ACTION
32-5	TREE	45'	43'	2'	-	-	-	-	APPLY TSS/TRIM/REMOVE
32-6	TREE	45'	43'	2'	-	-	-	-	APPLY TSS/TRIM/REMOVE
32-7	TREE	40'	43'	-3'	-	-	-	-	NO ACTION
32-8	TREE	40'	-	-	-	-	-	-	NO ACTION
32-9	TREE	38'	43'	-6'	-	-	-	-	NO ACTION
32-10	TREE	36'	44'	-8'	-	-	-	-	NO ACTION
32-11	TREE	49'	-	-	-	-	-	-	NO ACTION
32-12	TREE	35'	44'	-9'	56'	-21'	-	-	NO ACTION
32-13	TREE	58'	-	-	-	-	-	-	NO ACTION
32-14	TREE	48'	44'	4'	-	-	-	-	APPLY TSS/TRIM/REMOVE
32-15	TREE	40'	-	-	-	-	-	-	NO ACTION
32-16	TREE	35'	44'	-9'	-	-	-	-	NO ACTION
32-17	TREE	48'	44'	4'	-	-	-	-	APPLY TSS/TRIM/REMOVE
32-18	TREE	44'	44'	0'	-	-	-	-	NO ACTION
32-19	TREE	44'	44'	0'	-	-	-	-	NO ACTION
32-20	TREE	37'	44'	-7'	-	-	-	-	NO ACTION
32-21	TREE	47'	44'	2'	-	-	-	-	APPLY TSS/TRIM/REMOVE
32-22	TREE	54'	45'	10'	-	-	-	-	APPLY TSS/TRIM/REMOVE
32-23	TREE	53'	45'	8'	-	-	-	-	APPLY TSS/TRIM/REMOVE
32-24	TREE	41'	45'	-4'	-	-	-	-	NO ACTION
32R1	PERIMETER ROAD	22'	39'	-16'	-	-	-	-	NO ACTION
32R2	PERIMETER ROAD	22'	39'	-16'	48'	-26'	58'	-35'	NO ACTION
32R3	PERIMETER ROAD	22'	39'	-16'	-	-	-	-	NO ACTION

NOTES:

1. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING.

2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

3. OBJECTS MAY NOT BE ALL SHOWN IN THE TABLE AS SOME ARE LOCATED IN DEPARTURE SURFACE BOUNDARY BUT MAY BE LOCATED OUTSIDE OF THE APPROACH SURFACES. ONLY OBJECTS THAT ARE EITHER PENETRATIONS OR OBJECTS WITH LESS THAN 30 FEET BELOW PENETRATING PART 77 APPROACH SURFACE INCLUDED IN TABLE.

4. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.

RUNWAY 14 DEPARTURE OBSTRUCTION DATA

ID	DESCRIPTION	OBJECT TOP ELEVATION	EXISTING OBSTRUCTION: 40:1 DEPARTURE SURFACE		PROPOSED ACTIONS
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
32-1	TREE	59'	200'	-140'	NO ACTION
32-2	TREE	57'	199'	-142'	NO ACTION
32-3	TREE	53'	200'	-147'	NO ACTION
32-4	TREE	39'	87'	-48'	NO ACTION
32-5	TREE	45'	140'	-95'	NO ACTION
32-6	TREE	45'	140'	-95'	NO ACTION
32-7	TREE	40'	124'	-84'	NO ACTION
32-8	TREE	40'	144'	-104'	NO ACTION
32-9	TREE	38'	133'	-95'	NO ACTION
32-10	TREE	36'	124'	-88'	NO ACTION
32-11	TREE	49'	146'	-97'	NO ACTION
32-12	TREE	35'	92'	-57'	NO ACTION
32-13	TREE	58'	144'	-85'	NO ACTION
32-14	TREE	48'	136'	-88'	NO ACTION
32-15	TREE	40'	146'	-106'	NO ACTION
32-16	TREE	35'	111'	-75'	NO ACTION
32-17	TREE	48'	136'	-88'	NO ACTION
32-18	TREE	44'	139'	-95'	NO ACTION
32-19	TREE	44'	139'	-95'	NO ACTION
32-20	TREE	37'	130'	-92'	NO ACTION
32-21	TREE	47'	114'	-67'	NO ACTION
32-22	TREE	54'	120'	-66'	NO ACTION
32-23	TREE	53'	123'	-70'	NO ACTION
32-24	TREE	41'	123'	-82'	NO ACTION
32R1	PERIMETER ROAD	22'	145'	-122'	NO ACTION
32R2	PERIMETER ROAD	22'	55'	-33'	NO ACTION
32R3	PERIMETER ROAD	22'	145'	-122'	NO ACTION

NOTES:

1. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING.

2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

3. OBJECTS MAY NOT BE ALL SHOWN IN THE TABLE AS SOME ARE LOCATED IN DEPARTURE SURFACE BOUNDARY BUT MAY BE LOCATED OUTSIDE OF THE APPROACH SURFACES. ONLY OBJECTS THAT ARE EITHER PENETRATIONS OR OBJECTS WITH LESS THAN 26 FEET BELOW PENETRATING DEPARTURE SURFACE INCLUDED IN TABLE.

4. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.

5. RUNWAY 14 HAS PUBLISHED TAKE OFF MINIMUMS.

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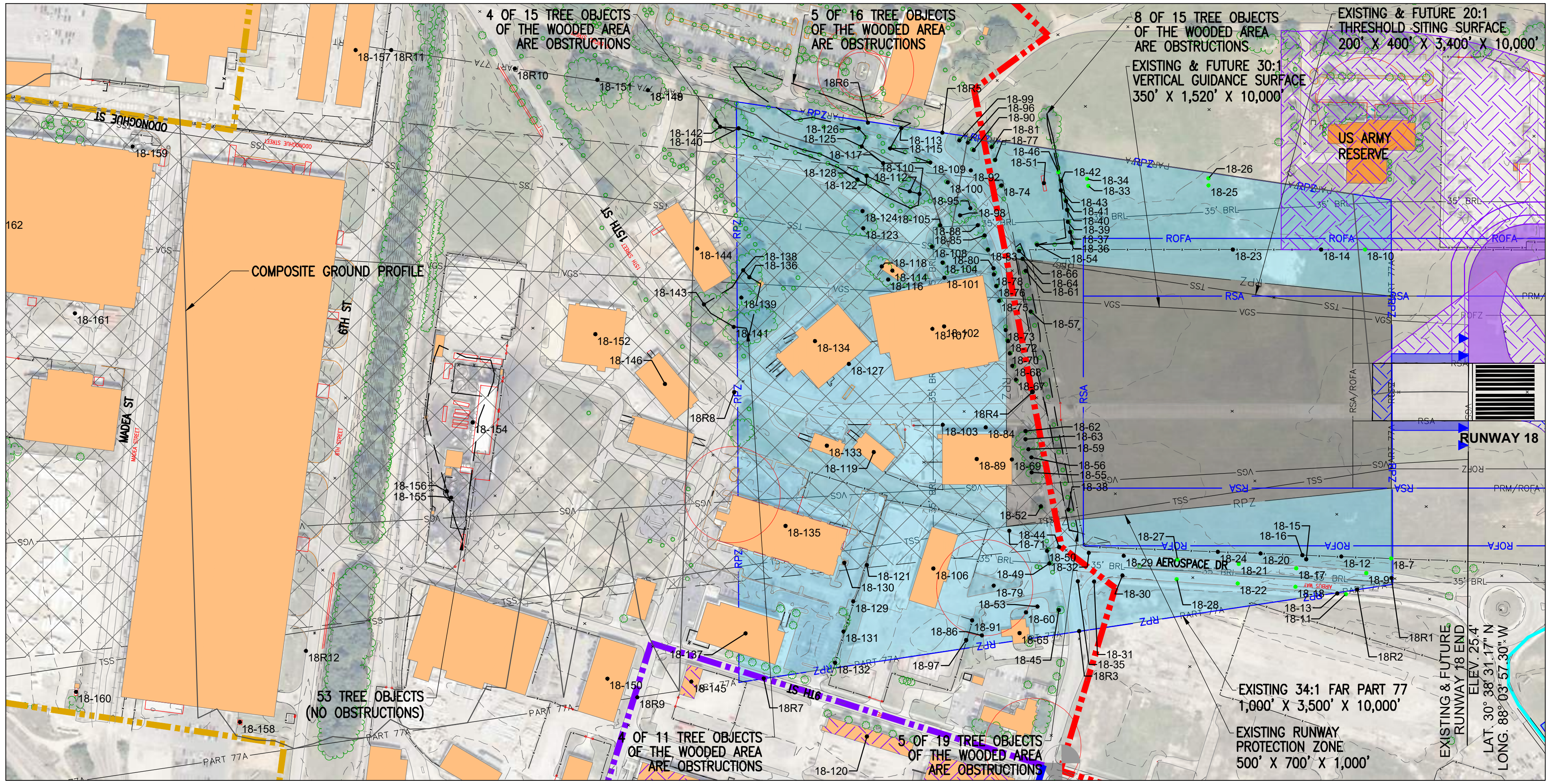
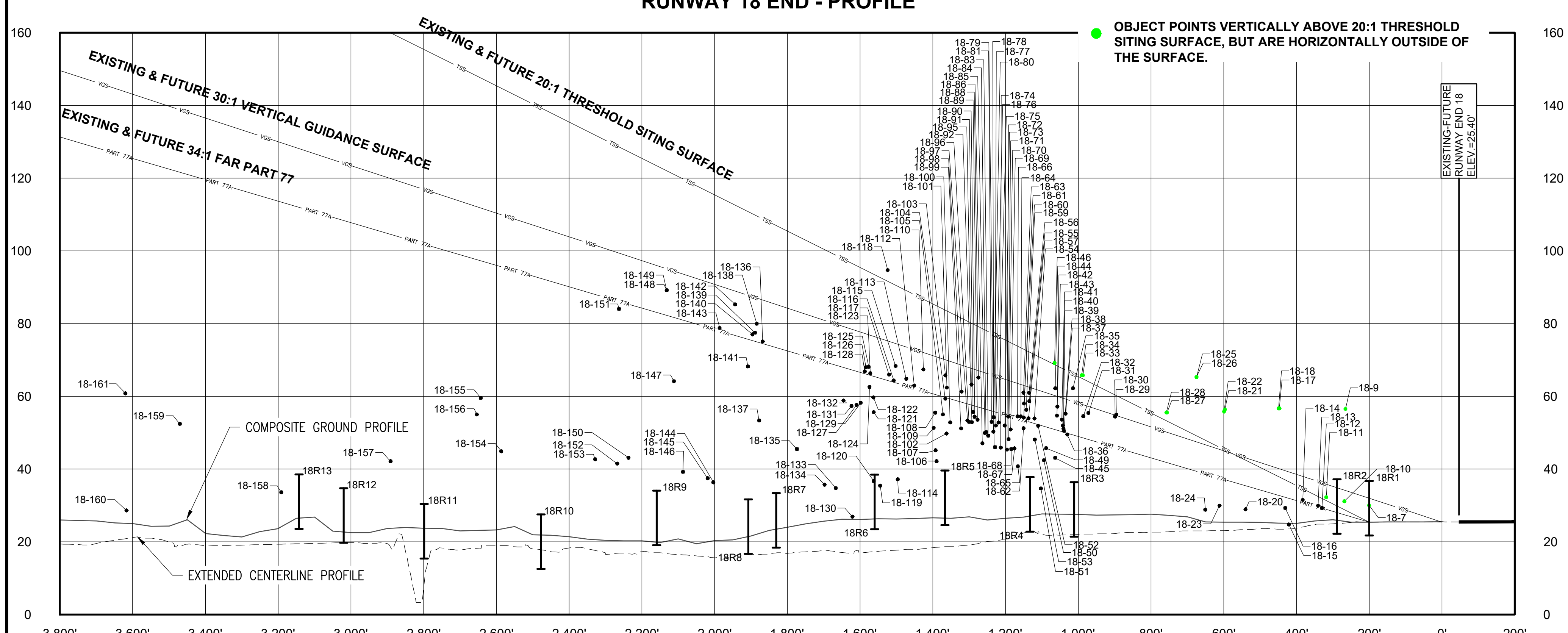
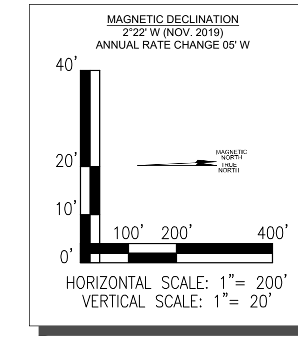
RUNWAY 32 APPROACH & RUNWAY 14 DEPARTURE OBSTRUCTION DATA TABLE



RUNWAY 18 END - PLAN

RUNWAY 18 END - PROFILE





REFERENCES:

1. LATITUDE AND LONGITUDE ARE BASED ON THE ALABAMA STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 1983.
2. VERTICAL CONTROL IS REFERENCED TO NAVD 1988.
3. ELEVATIONS SHOWN ARE IN "MEAN SEA LEVEL" (MSL) UNLESS NOTED OTHERWISE AND ARE NOT INTENDED FOR DESIGN PURPOSES.
4. ALL DIMENSIONS ARE IN UNITED STATES CUSTOMARY UNITS UNLESS NOTED OTHERWISE.

GENERAL NOTES:

1. ALP PREPARED USING DESIGN CRITERIA FROM FAA ADVISORY CIRCULAR 150/5300-13A, CHANGE 1 "AIRPORT DESIGN" AND FAR PART 77 "OBJECTS AFFECTING NAVIGABLE AIRSPACE".
2. THERE ARE NO THRESHOLD SITING SURFACE OBJECT PENETRATIONS.
3. THERE ARE NO OFZ PENETRATIONS OTHER THAN FRANGIBLE NAVAIDS.
4. GROUND CONTOUR INTERVALS SHOWN ARE 2-FOOT. CONTOURS GENERATED FROM QUANTUM DIGITAL TERRAIN MODEL (DTM).
5. THE BUILDING RESTRICTION LINE SHOWN ASSUMES A HEIGHT OF 35' ABOVE THE GROUND LEVEL (AGL). BUILDINGS LESS THAN 35' COULD BE POSITIONED CLOSER TO THE RUNWAY AND BUILDINGS TALLER THAN 35' WILL BE REQUIRED TO BE FURTHER FROM THE RUNWAY.
6. EXISTING FENCE PENETRATES ROFA.
7. NO MODIFICATIONS OF STANDARDS ARE CURRENTLY KNOWN TO EXIST ON FILE.

OBSTRUCTION NOTES:

1. OBSTRUCTION INFORMATION OBTAINED FROM QUANTUM SPATIAL 12/11/2019.
2. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.
3. FUTURE OBJECTS TO BE SITED AND MITIGATED UNDER FUTURE PROJECTS.
4. TREE OBJECTS SHOWN MAY REPRESENT MULTIPLE TREES WITHIN THE WOODED AREAS. TREE OBJECTS SHOWN REPRESENT THE REPRESENTATIVE OBSTRUCTIONS OF THE AREAS.
5. SEE OBSTRUCTION DATA TABLE SHEET 14A.

EXISTING	FUTURE	ULTIMATE	LEGEND
		N/A	AIRPORT PROPERTY LINE
	x	x	AIRPORT FENCE
	N/A	N/A	BUILDINGS (AIRPORT PROPERTY)
	N/A	N/A	AEROPLEX BUILDING (MAA PROPERTY)
			AIRFIELD PAVEMENT
			PAVEMENT REMOVAL
▽	▼	N/A	RUNWAY END IDENTIFIER LIGHTS (REIL)
	N/A	N/A	ASOS PROTECTION AREA
RPZ	RPZ	N/A	RUNWAY PROTECTION ZONE (RPZ)
RSA	RSA	N/A	RUNWAY SAFETY AREA (RSA)
ROFA	ROFA	N/A	RUNWAY OBJECT FREE AREA (ROFA)
ROFZ	ROFZ	N/A	RUNWAY OBJECT FREE ZONE (ROFZ)
TSA	TSA	TSA	TAXIWAY SAFETY AREA (TSA)
TOFA	TOFA	TOFA	TAXIWAY OBJECT FREE AREA (TOFA)
BRL	N/A	N/A	BUILDING RESTRICTION LINE (BRL)
PART 77A	N/A	N/A	FAR PART 77 APPROACH SURFACE (PART 77A)
TSS	N/A	N/A	THRESHOLD SITING SURFACE (TSS)
VGS	N/A	N/A	VERTICAL GUIDANCE SURFACE (VGS)

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Mobile Downtown Airport

MOBILE DOWNTOWN AIRPORT
2455 MICHIGAN AVE,
MOBILE, AL 36615

PHONE: (251) 281-2887

DRAFT

MOBILE DOWNTOWN AIRPORT (BFM)

AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE:
DESIGN BY: NLD 10/12/2020
DRAWN BY: NLD 10/12/2020
REVIEWED BY: SZ 10/12/2020

SHEET TITLE

RUNWAY 18 INNER PORTION OF THE APPROACH SURFACE DRAWING

OCT 12, 2020 5:11 PM DO01853
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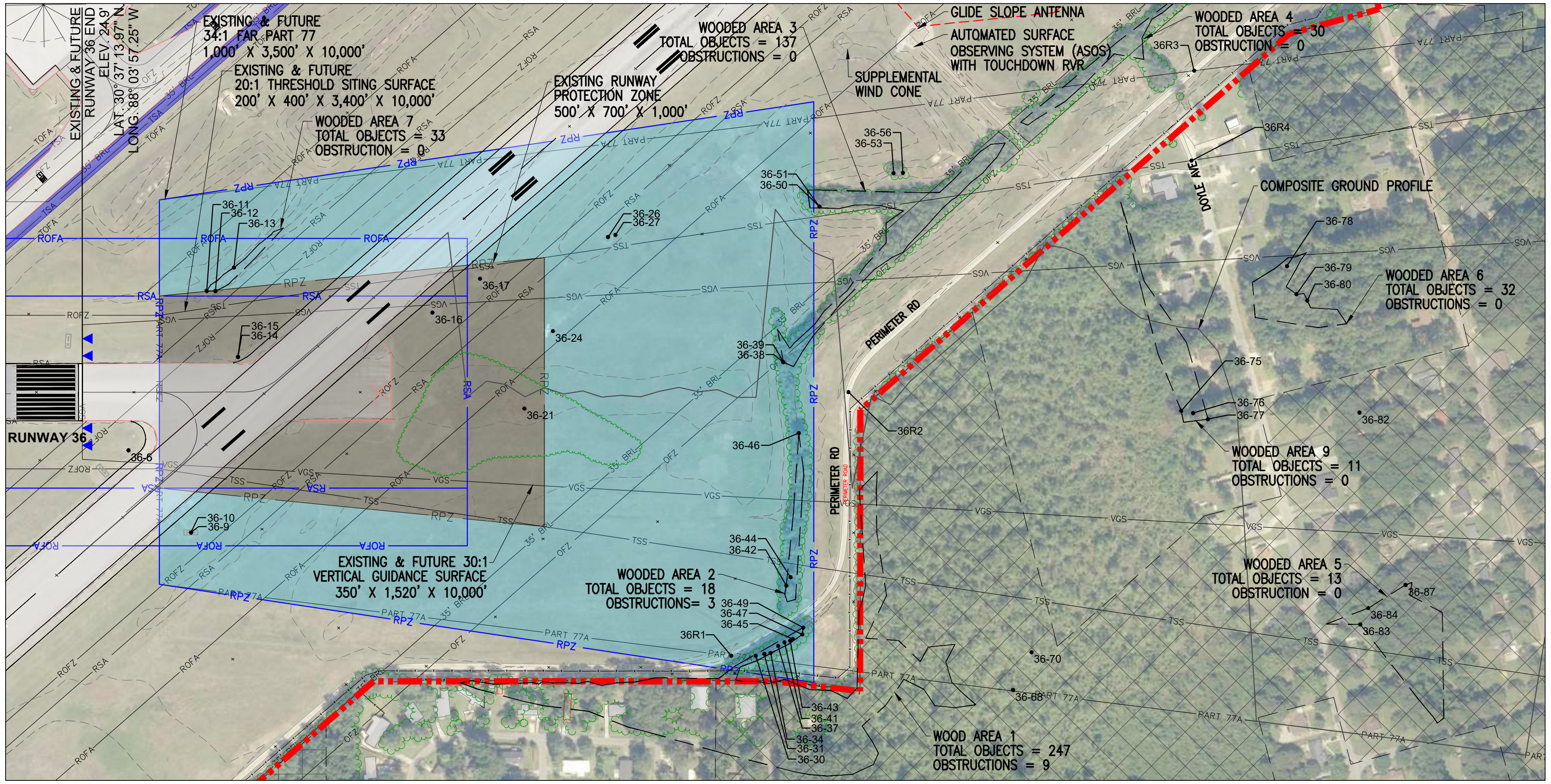
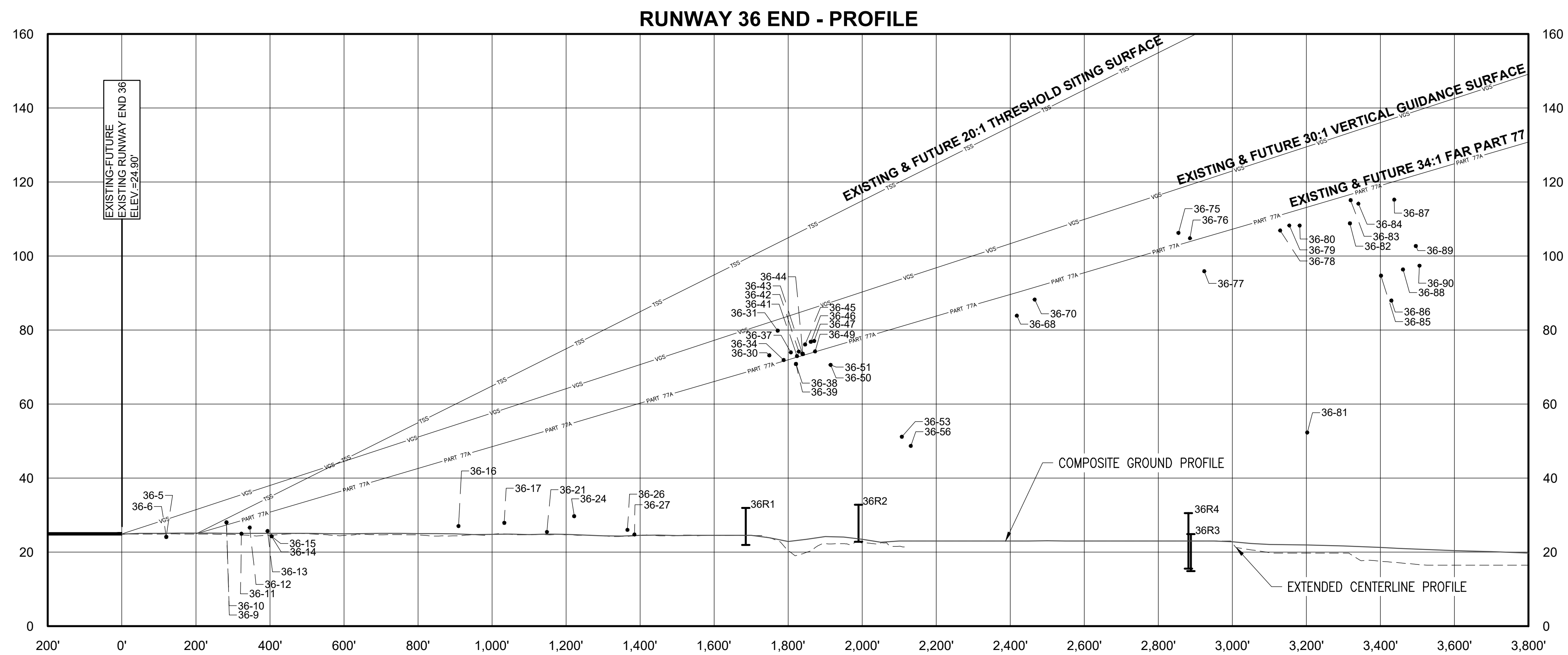
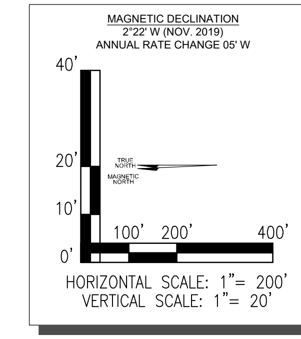


RUNWAY 36 END - PLAN

RUNWAY 36 END - PROFILE





REFERENCES:

1. LATITUDE AND LONGITUDE ARE BASED ON THE ALABAMA STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 1983.

2. VERTICAL CONTROL IS REFERENCED TO NAVD 1988.

3. ELEVATIONS SHOWN ARE IN "MEAN SEA LEVEL" (MSL) UNLESS NOTED OTHERWISE AND ARE NOT INTENDED FOR DESIGN PURPOSES.

4. ALL DIMENSIONS ARE IN UNITED STATES CUSTOMARY UNITS UNLESS NOTED OTHERWISE.

GENERAL NOTES:

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2. THERE ARE NO THRESHOLD SITING SURFACE OBJECT PENETRATIONS.

3. THERE ARE NO OFZ PENETRATIONS OTHER THAN FRANGIBLE NAVAIDS.

4. GROUND CONTOUR INTERVALS SHOWN ARE 2-FOOT. CONTOURS GENERATED FROM QUANTUM DIGITAL TERRAIN MODEL (DTM).

5. THE BUILDING RESTRICTION LINE SHOWN ASSUMES A HEIGHT OF 35' ABOVE THE GROUND LEVEL (AGL). BUILDINGS LESS THAN 35' COULD BE POSITIONED CLOSER TO THE RUNWAY AND BUILDINGS TALLER THAN 35' WILL BE REQUIRED TO BE FURTHER FROM THE RUNWAY.

6. NO RSA OR ROFA PENETRATIONS.

7. NO MODIFICATIONS OF STANDARDS ARE CURRENTLY KNOWN TO EXIST ON FILE.

OBSTRUCTION NOTES:

1. OBSTRUCTION INFORMATION OBTAINED FROM QUANTUM SPATIAL 12/11/2019.

2. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.

3. FUTURE OBJECTS TO BE SITED AND MITIGATED UNDER FUTURE PROJECTS.

4. TREE OBJECTS SHOWN MAY REPRESENT MULTIPLE TREES WITHIN THE WOODED AREAS. TREE OBJECTS SHOWN REPRESENT THE REPRESENTATIVE OBSTRUCTIONS OF THE AREAS.

5. SEE OBSTRUCTION DATA TABLE SHEET 15.

EXISTING	FUTURE	ULTIMATE	LEGEND
(red dash-dot line)	N/A	N/A	AIRPORT PROPERTY LINE
—— x ——	—— x ——	—— x ——	AIRPORT FENCE
(red dashed line)	N/A	N/A	ASOS PROTECTION AREA
—— RPZ ——	—— RPZ ——	N/A	RUNWAY PROTECTION ZONE (RPZ)
—— RSA ——	—— RSA ——	N/A	RUNWAY SAFETY AREA (RSA)
—— ROFA ——	—— ROFA ——	N/A	RUNWAY OBJECT FREE AREA (ROFA)
—— ROFZ ——	—— ROFZ ——	N/A	RUNWAY OBJECT FREE ZONE (ROFZ)
—— TSA ——	—— TSA ——	—— TSA ——	TAXIWAY SAFETY AREA (TSA)
—— BRL ——	N/A	N/A	BUILDING RESTRICTION LINE (BRL)
—— PART 77A ——	N/A	N/A	FAR PART 77 APPROACH SURFACE (PART 77A)
—— TSS ——	N/A	N/A	THRESHOLD SITING SURFACE (TSS)
—— VGS ——	N/A	N/A	VERTICAL GUIDANCE SURFACE (VGS)

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DRAFT

MOBILE DOWNTOWN AIRPORT (BFM)

AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE:
DESIGN BY: NLD 10/12/2020
DRAWN BY: NLD 10/12/2020
REVIEWED BY: SZ 10/12/2020

SHEET TITLE

RUNWAY 36 INNER PORTION OF THE APPROACH SURFACE DRAWING

OCT 12, 2020 5:12 PM DO01853
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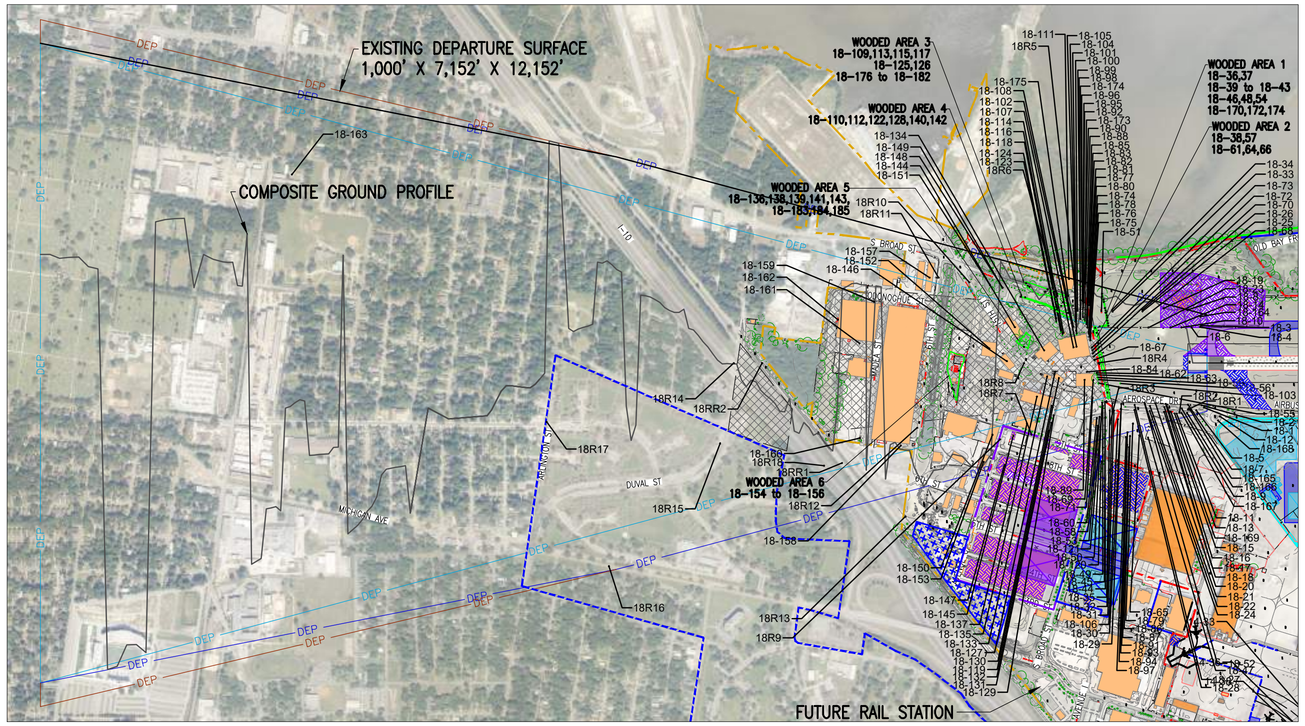
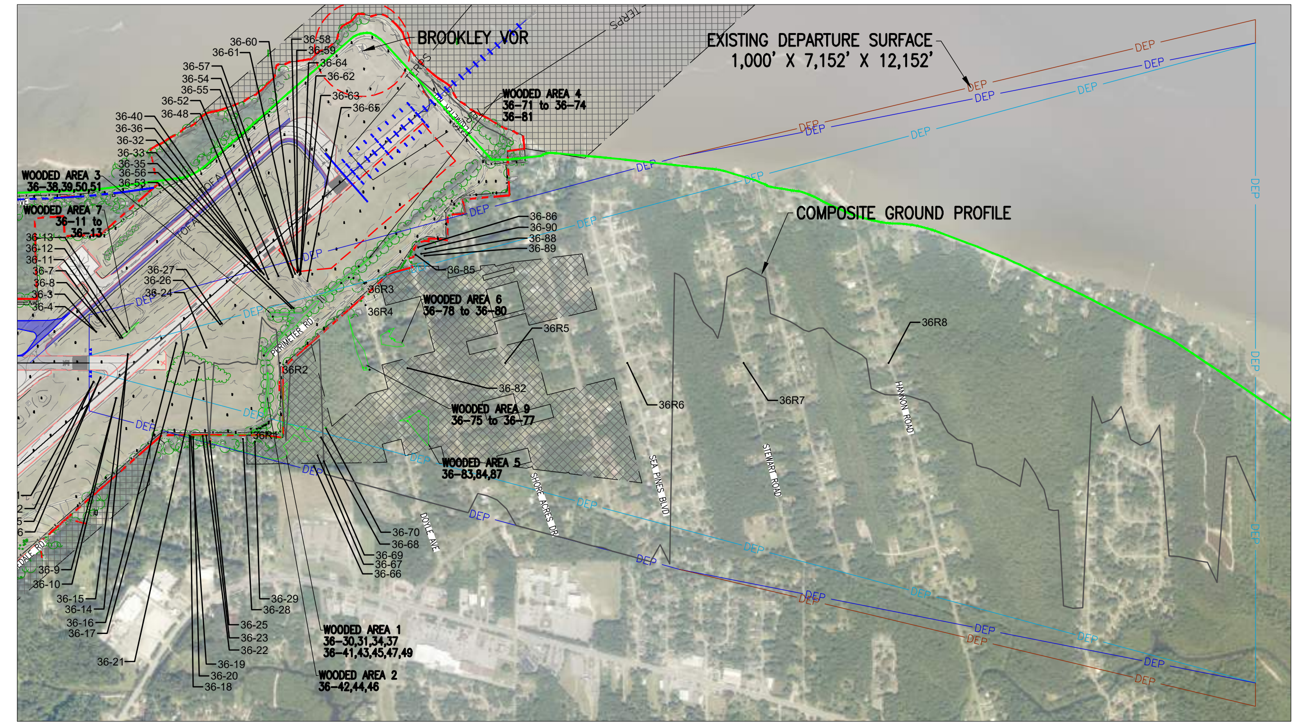


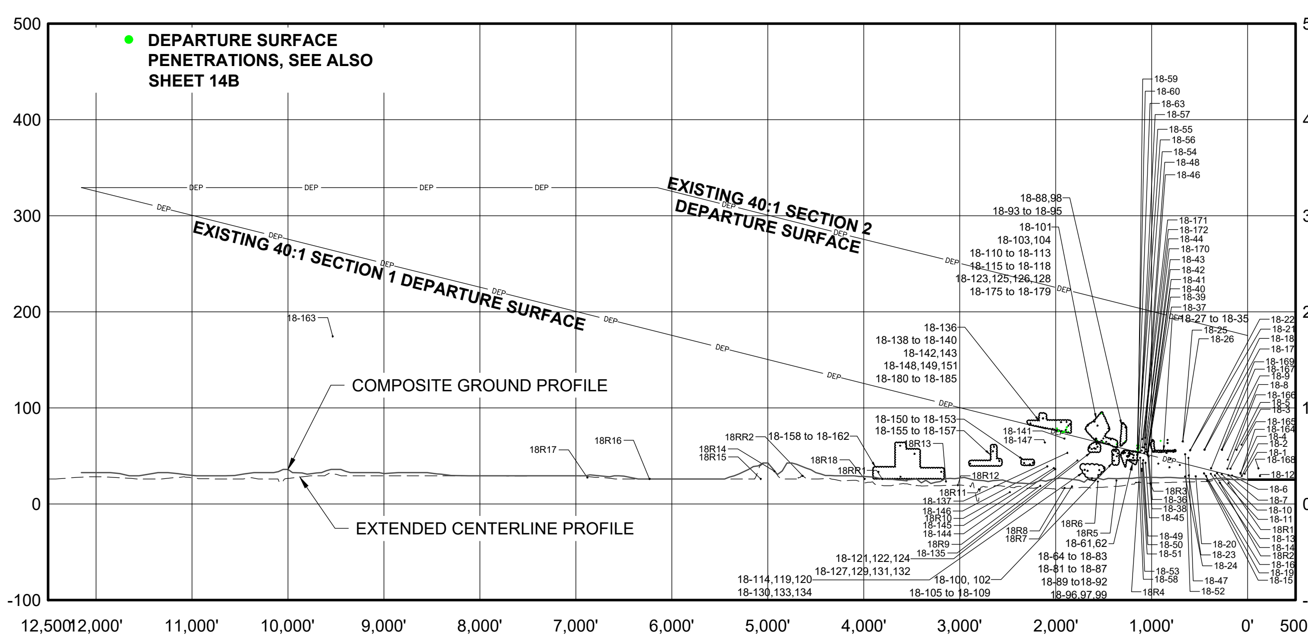
SEE SHEET 13B FOR AN ENLARGED PORTION OF RUNWAY 18 DEPARTURE SURFACE STATION 0+00 TO STATION 40+00

RUNWAY 18 END - PLAN

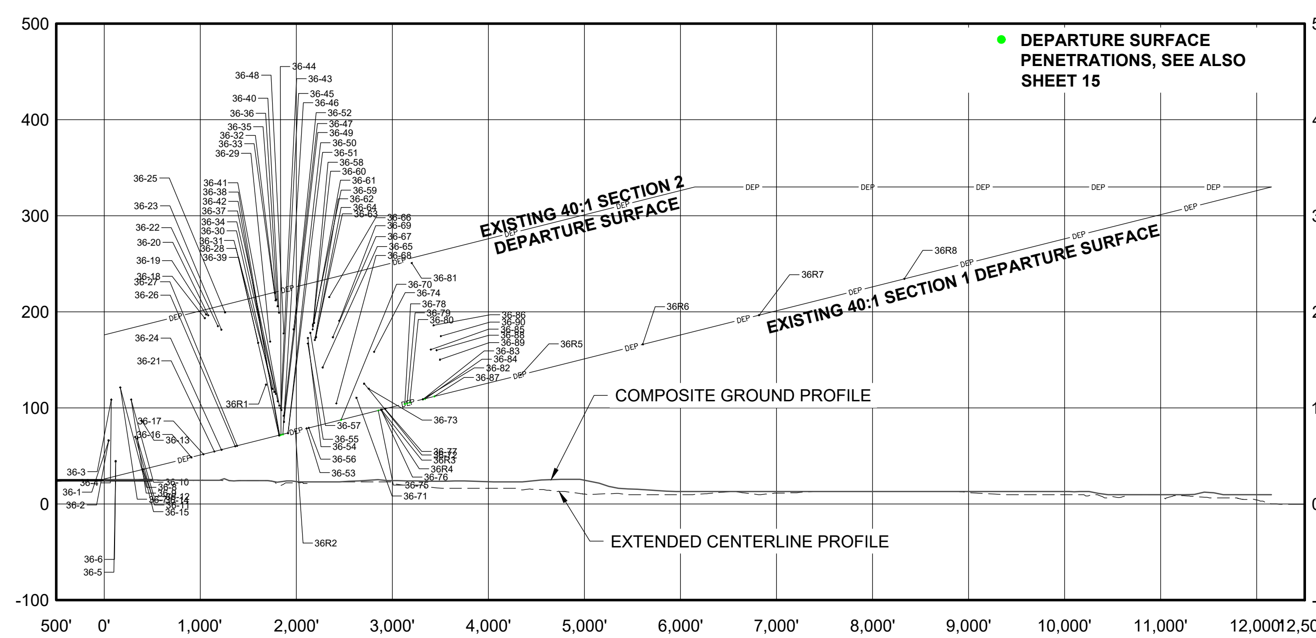


RUNWAY 36 END - PLAN

RUNWAY 18 END - PROFILE



RUNWAY 36 END - PROFILE



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6. NO RSA PENETRATIONS.
7. NO MODIFICATIONS OF STANDARDS ARE CURRENTLY KNOWN TO EXIST ON FILE.

OBSTRUCTION NOTES:

1. OBSTRUCTION INFORMATION OBTAINED FROM QUANTUM SPATIAL 12/11/2019..
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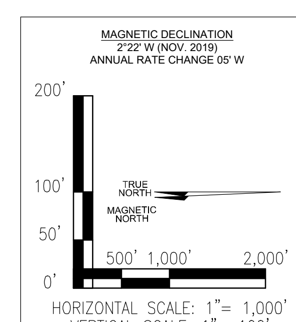
5. ELECTRICAL OBJECTS SHOWN MAY REPRESENT MULTIPLE ELECTRICAL OBSTRUCTIONS. THE SHOWN OBJECT REPRESENTS THE HIGHEST ELEVATION FROM MULTIPLE OBSTRUCTIONS.
6. SEE OBSTRUCTION DATA TABLE SHEETS 14B & 15.



EXISTING	FUTURE	ULTIMATE	LEGEND
			AIRPORT PROPERTY LINE
		N/A	AEROPLEX PROPERTY LINE
	N/A	N/A	AIRPORT EASEMENT
	N/A	N/A	AIRPORT FENCE
	N/A	N/A	ROADS
	N/A	N/A	BUILDINGS (AIRPORT PROPERTY)
	N/A	N/A	AEROPLEX BUILDINGS (MAA PROPERTY)
			AIRFIELD PAVEMENT
	N/A	N/A	DEPARTURE SURFACE (DEP) - SECTION 1
	N/A	N/A	DEPARTURE SURFACE (DEP) - SECTION 2
	N/A	N/A	DEPARTURE SURFACE (DEP) - LEVEL SECTION

OCT 09, 2020 5:50 PM DO01853
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2455 MICHIGAN AVE,
MOBILE, AL 36615

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MOBILE DOWNTOWN AIRPORT (BFM)

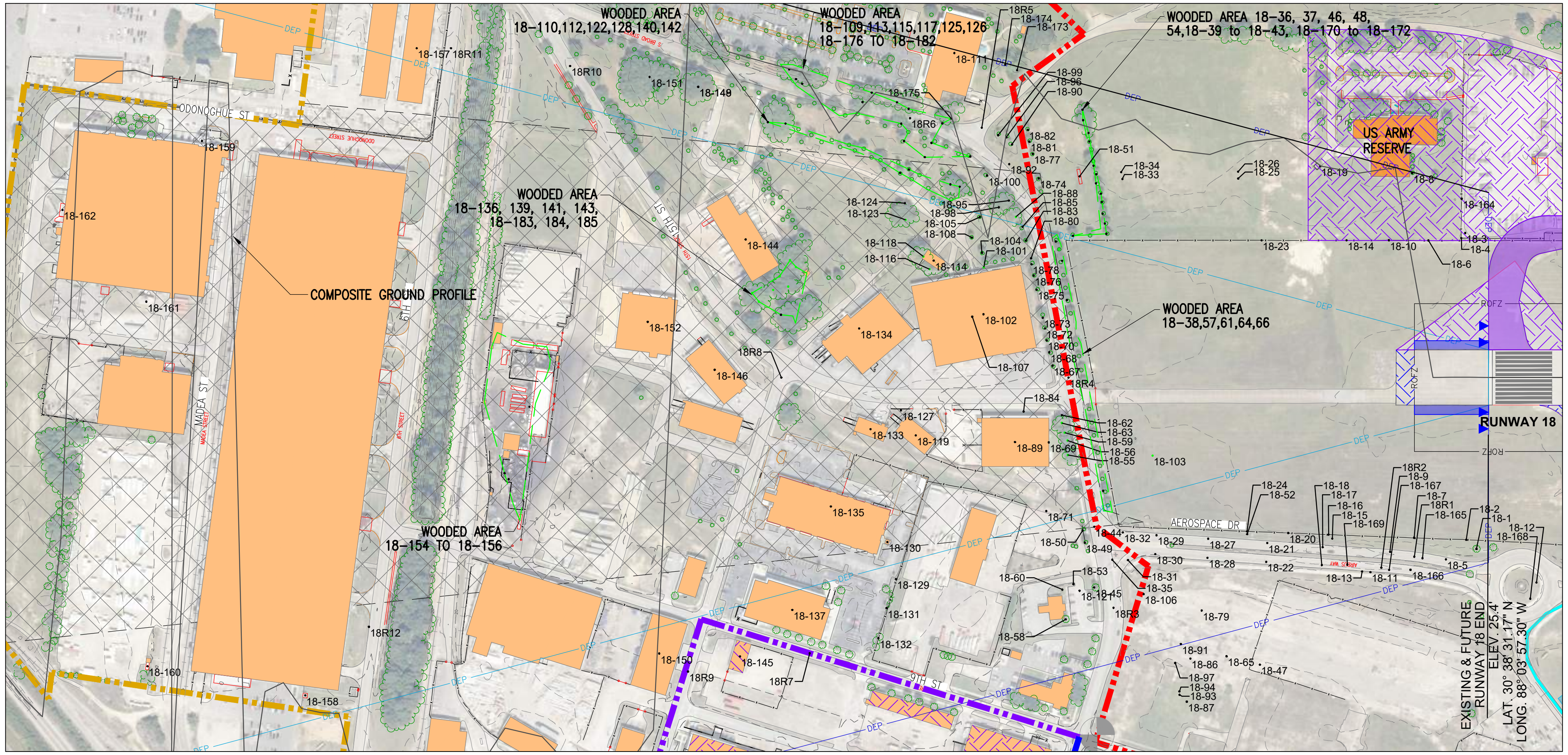
AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE: 7-RWYDEP.DWG
DESIGN BY: NLD 10/9/2020
DRAWN BY: NLD 10/9/2020
REVIEWED BY: SZ 10/9/2020

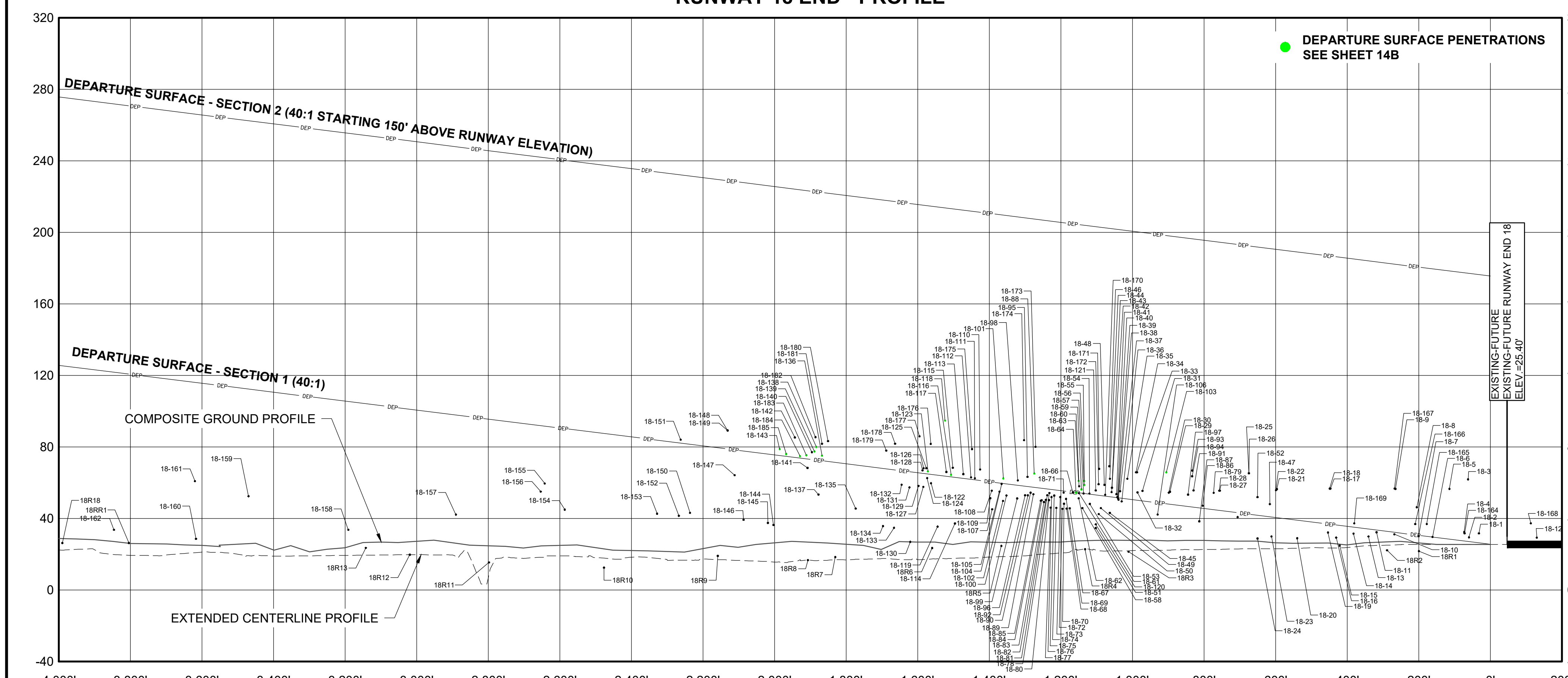
SHEET TITLE

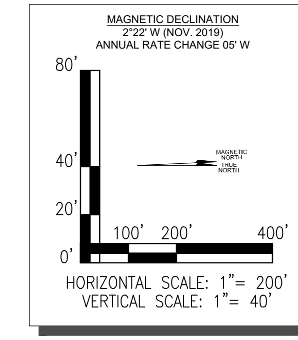
RUNWAY 18 AND 36 DEPARTURE SURFACE DRAWING



RUNWAY 18 END - PLAN

RUNWAY 18 END - PROFILE





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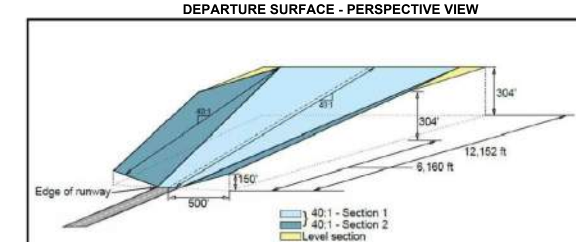
5. SEE OBSTRUCTION DATA TABLE SHEET 14B.

EXISTING	FUTURE	ULTIMATE	LEGEND
			AIRPORT PROPERTY LINE
		N/A	AEROPLEX PROPERTY LINE
	N/A	N/A	AIRPORT EASEMENT
x	N/A	N/A	AIRPORT FENCE
	N/A	N/A	ROADS
	N/A	N/A	BUILDINGS (AIRPORT PROPERTY)
	N/A	N/A	AEROPLEX BUILDINGS (MAA PROPERTY)
			AIRFIELD PAVEMENT
DEP	N/A	N/A	DEPARTURE SURFACE (DEP) - SECTION 1
DEP	N/A	N/A	DEPARTURE SURFACE (DEP) - SECTION 2
DEP	N/A	N/A	DEPARTURE SURFACE (DEP) - LEVEL SECTION

DEPARTURE SURFACE - PERSPECTIVE VIEW



Source: FAA Engineering Brief 99A

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AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE:
DESIGN BY: NLD 10/12/2020
DRAWN BY: NLD 10/12/2020
REVIEWED BY: SZ 10/12/2020

SHEET TITLE

RUNWAY 18 END DEPARTURE SURFACE DRAWING (STA. 0+00 - STA. 40+00)

OCT 12, 2020 8:43 AM DO01853
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RUNWAY 18 APPROACH OBSTRUCTION DATA

ID	DESCRIPTION	OBJECT TOP ELEVATION	EXISTING/FUTURE OBSTRUCTION DISPOSITION						PROPOSED ACTIONS
			34:1 FAR PART 77		20:1 THRESHOLD SITTING		30:1 VERTICAL GUIDANCE		
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
18-1	TREE	32'	-	-	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-2	FENCE	29'	-	-	-	-	-	-	RELOCATE
18-3	POLE LIGHT	62'	-	-	-	-	-	-	RELOCATE
18-4	FENCE	32'	-	-	-	-	-	-	RELOCATE
18-5	POLE LIGHT	57'	-	-	-	-	-	-	RELOCATE
18-6	FENCE	30'	-	-	-	-	-	-	RELOCATE
18-7	FENCE	30'	25'	5'	-	-	-	-	RELOCATE
18-8	TREE	46'	-	-	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-9	POLE LIGHT	57'	27'	29'	-	-	-	-	RELOCATE
18-10	FENCE	31'	27'	4'	-	-	-	-	RELOCATE
18-11	STREET SIGN	32'	32'	0'	-	-	-	-	NO ACTION
18-12	FENCE	29'	29'	0'	-	-	-	-	RELOCATE
18-13	STREET SIGN	30'	30'	0'	-	-	-	-	NO ACTION
18-14	FENCE	32'	31'	1'	-	-	-	-	RELOCATE
18-15	FIRE HYDRANT	25'	32'	-7'	-	-	-	-	NO ACTION
18-16	FENCE	29'	32'	-3'	-	-	-	-	NO ACTION
18-17	POLE LIGHT	57'	33'	24'	-	-	-	-	RELOCATE
18-18	POLE LIGHT	57'	33'	24'	-	-	-	-	RELOCATE
18-19	FENCE	32'	-	-	-	-	-	-	RELOCATE
18-20	FENCE	29'	35'	-7'	-	-	-	-	NO ACTION
18-21	POLE LIGHT	56'	37'	19'	-	-	-	-	RELOCATE
18-22	POLE LIGHT	56'	37'	19'	-	-	-	-	RELOCATE
18-23	FENCE	30'	38'	-8'	-	-	-	-	NO ACTION
18-24	FENCE	29'	39'	-10'	-	-	-	-	NO ACTION
18-25	FIELD GOAL POLE	65'	39'	26'	-	-	-	-	RELOCATE
18-26	FIELD GOAL POLE	65'	39'	26'	-	-	-	-	RELOCATE
18-27	POLE LIGHT	56'	42'	14'	-	-	-	-	RELOCATE
18-28	POLE LIGHT	56'	42'	14'	-	-	-	-	RELOCATE
18-29	POLE LIGHT	55'	46'	9'	-	-	-	-	RELOCATE
18-30	POLE LIGHT	54'	46'	8'	-	-	-	-	RELOCATE
18-31	POLE LIGHT	55'	48'	7'	-	-	-	-	RELOCATE
18-32	POLE LIGHT	55'	49'	6'	-	-	-	-	RELOCATE
18-33	FIELD GOAL POLE	66'	49'	17'	-	-	-	-	RELOCATE
18-34	FIELD GOAL POLE	66'	49'	17'	-	-	-	-	RELOCATE
18-35	TRAFFIC LIGHT/SIGNAL	62'	49'	13'	-	-	-	-	RELOCATE
18-36	TREE	49'	50'	0'	-	-	-	-	NO ACTION
18-37	TREE	55'	50'	5'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-38	TREE	50'	50'	0'	67'	-17'	-	-	APPLY TSS/TRIM/REMOVE
18-39	TREE	51'	50'	1'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-40	TREE	52'	50'	2'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-41	TREE	54'	50'	3'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-42	TREE	57'	51'	7'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-43	TREE	55'	51'	4'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-44	TRAFFIC LIGHT/SIGNAL	62'	51'	11'	-	-	-	-	RELOCATE
18-45	TREE	43'	51'	-8'	-	-	-	-	NO ACTION
18-46	TREE	69'	51'	18'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-47	POLE LIGHT	48'	-	-	-	-	-	-	RELOCATE
18-48	TREE	59'	-	-	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-49	TREE	46'	52'	-6'	-	-	-	-	NO ACTION
18-50	TREE	42'	52'	-9'	-	-	-	-	NO ACTION
18-51	TANK/BUILDING	35'	52'	-17'	-	-	-	-	NO ACTION
18-52	TREE	52'	52'	0'	71'	-19'	-	-	NO ACTION
18-53	POLE LIGHT	48'	52'	-4'	-	-	-	-	NO ACTION
18-54	TREE	54'	52'	1'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-55	TREE	59'	53'	6'	72'	-13'	62'	-4'	APPLY TSS/TRIM/REMOVE
18-56	TREE	61'	53'	8'	72'	-11'	63'	-2'	APPLY TSS/TRIM/REMOVE
18-57	TREE	54'	53'	1'	72'	-18'	63'	-9'	APPLY TSS/TRIM/REMOVE
18-58	TREE	46'	-	-	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-59	TREE	56'	53'	3'	73'	-16'	63'	-7'	APPLY TSS/TRIM/REMOVE
18-60	FLAGPOLE	58'	53'	5'	-	-	-	-	RELOCATE
18-61	TREE	54'	53'	1'	73'	-19'	-	-	APPLY TSS/TRIM/REMOVE
18-62	POLE UTILITY	51'	53'	-2'	73'	-22'	63'	-12'	NO ACTION
18-63	TREE	61'	53'	8'	73'	-12'	63'	-2'	APPLY TSS/TRIM/REMOVE
18-64	TREE	54'	54'	1'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-65	TANK/BUILDING	41'	54'	-13'	-	-	-	-	NO ACTION
18-66	TREE	54'	54'	1'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-67	TREE	46'	54'	-8'	74'	-29'	64'	-18'	NO ACTION
18-68	TREE	45'	54'	-9'	75'	-29'	64'	-19'	NO ACTION
18-69	BUILDING	51'	54'	-3'	75'	-24'	64'	-13'	NO ACTION
18-70	TREE	48'	55'	-6'	75'	-27'	64'	-16'	NO ACTION
18-71	POLE LIGHT	54'	55'	0'	-	-	-	-	NO ACTION
18-72	TREE	45'	55'	-9'	75'	-30'	64'	-19'	NO ACTION
18-73	TREE	52'	55'	-3'	76'	-24'	65'	-13'	NO ACTION
18-74	TREE	46'	55'	-9'	-	-	-	-	NO ACTION
18-75	TREE	53'	55'	-3'	76'	-24'	65'	-12'	NO ACTION
18-76	TREE	52'	56'	-4'	77'	-25'	-	-	NO ACTION
18-77	TREE	46'	56'	-10'	-	-	-	-	NO ACTION
18-78	TREE	54'	56'	-2'	77'	-23'	-	-	NO ACTION
18-79	POLE UTILITY	54'	56'	-1'	-	-	-	-	NO ACTION
18-80	POLE UTILITY	50'	56'	-6'	77'	-27'	-	-	NO ACTION
18-81	TREE	53'	56'	-3'	-	-	-	-	NO ACTION
18-82	TREE	50'	-	-	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-83	TREE	49'	56'	-7'	-	-	-	-	NO ACTION
18-84	POLE UTILITY	50'	56'	-6'	78'	-28'	66'	-16'	NO ACTION
18-85	TREE	50'	56'	-7'	-	-	-	-	NO ACTION
18-86	POLE LIGHT	47'	57'	-10'	-	-	-	-	NO ACTION
18-87	TANK/BUILDING	38'	-	-	-	-	-	-	RELOCATE
18-88	TREE	65'	57'	8'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-89	TANK/BUILDING	54'	57'	-4'	79'	-26'	67'	-14'	NO ACTION

NOTES:

1. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING.

2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

3. OBJECTS MAY NOT BE ALL SHOWN IN THE TABLE AS SOME ARE LOCATED IN DEPARTURE SURFACE BOUNDARY BUT MAY BE LOCATED OUTSIDE OF THE APPROACH SURFACES. ONLY OBJECTS THAT ARE EITHER PENETRATIONS OR OBJECTS WITH LESS THAN 30 FEET BELOW PENETRATING PART 77 APPROACH SURFACE INCLUDED IN TABLE.ALL BUILDING AND TRAVERSE WAY POINTS ARE INCLUDED.

4. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.

RUNWAY 18 APPROACH OBSTRUCTION DATA (CONT)

ID	DESCRIPTION	OBJECT TOP ELEVATION	EXISTING/FUTURE OBSTRUCTION DISPOSITION						PROPOSED ACTIONS
			34:1 FAR PART 77		20:1 THRESHOLD SITTING		30:1 VERTICAL GUIDANCE		
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
18-90	TREE	54'	57'	-3'	-	-	-	-	NO ACTION
18-91	POLE UTILITY	56'	57'	-2'	-	-	-	-	NO ACTION
18-92	POLE UTILITY	53'	58'	-5'	-	-	-	-	NO ACTION
18-93	POLE UTILITY	67'	-	-	-	-	-	-	RELOCATE
18-94	POLE UTILITY	64'	-	-	-	-	-	-	RELOCATE
18-95	TREE	63'	58'	6'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-96	TREE	53'	58'	-5'	-	-	-	-	NO ACTION
18-97	POLE UTILITY	53'	58'	-5'	-	-	-	-	NO ACTION
18-98	TREE	61'	58'	3'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-99	TREE	51'	58'	-7'	-	-	-	-	NO ACTION
18-100	TREE	53'	59'	-7'	-	-	-	-	NO ACTION
18-101	POLE UTILITY	62'	60'	3'	83'	-21'	-	-	RELOCATE
18-102	BUILDING	50'	60'	-10'	84'	-34'	70'	-20'	NO ACTION
18-103	POLE UTILITY	66'	60'	6'	84'	-18'	70'	-4'	RELOCATE
18-104	TREE	59'	60'	0'	84'	-24'	-	-	NO ACTION
18-105	TREE	55'	60'	-5'	-	-	-	-	NO ACTION
18-106	TANK/BUILDING	42'	60'	-18'	-	-	-	-	NO ACTION
18-107	TANK/BUILDING	45'	60'	-15'	85'	-40'	71'	-26'	NO ACTION
18-108	TREE	55'	61'	-5'	85'	-30'	-	-	NO ACTION
18-109	TREE	51'	61'	-9'	-	-	-	-	NO ACTION
18-110	TREE	67'	61'	6'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-111	TANK/BUILDING	62'	-	-	-	-	-	-	RELOCATE
18-112	TREE	63'	62'	1'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-113	TREE	65'	63'	2'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-114	TANK/BUILDING	37'	64'	-26'	90'	-53'	-	-	NO ACTION
18-115	POLE UTILITY	68'	64'	5'	-	-	-	-	RELOCATE
18-116	TREE	64'	64'	0'	91'	-26'	-	-	APPLY TSS/TRIM/REMOVE
18-117	POLE UTILITY	66'	64'	2'	-	-	-	-	RELOCATE
18-118	TREE	95'	64'	30'	92'	3'	-	-	APPLY TSS/TRIM/REMOVE
18-119	TANK/BUILDING	35'	65'	-30'	93'	-57'	76'	-40'	NO ACTION
18-120	TANK/BUILDING	37'	37'	0'	-	-	-	-	NO ACTION
18-121	POLE UTILITY	56'	65'	-10'	-	-	-	-	NO ACTION
18-122	TREE	60'	65'	-6'	-	-	-	-	NO ACTION
18-123	TREE	66'	66'	1'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-124	POLE UTILITY	63'	66'	-3'	-	-	-	-	NO ACTION
18-125	TREE	68'	66'	2'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-126	TREE	68'	66'	2'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-127	POLE UTILITY	58'	66'	-9'	95'	-37'	77'	-20'	NO ACTION
18-128	TREE	67'	66'	1'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-129	POLE UTILITY	58'	67'	-8'	-	-	-	-	NO ACTION
18-130	TANK/BUILDING	27'	67'	-40'	-	-	-	-	NO ACTION
18-131	POLE UTILITY	57'	67'	-10'	-	-	-	-	NO ACTION
18-132	POLE UTILITY	59'	68'	-9'	-	-	-	-	NO ACTION
18-133	TANK/BUILDING	35'	69'	-34'	99'	-64'	80'	-45'	NO ACTION
18-134	TANK/BUILDING	36'	69'	-34'	100'	-65'	81'	-45'	NO ACTION
18-135	TANK/BUILDING	45'	72'	-26'	104'	-59'	-	-	NO ACTION
18-136	TREE	75'	74'	1'	109'	-34'	-	-	APPLY TSS/TRIM/REMOVE
18-137	TANK/BUILDING	53'	75'	-21'	-	-	-	-	NO ACTION
18-138	TREE	80'	75'	5'	110'	-30'	-	-	APPLY TSS/TRIM/REMOVE
18-139	TREE	77'	75'	2'	110'	-32'	87'	-10'	APPLY TSS/TRIM/REMOVE
18-140	TREE	77'	75'	2'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-141	TREE	68'	76'	-7'	111'	-43'	88'	-20'	NO ACTION
18-142	TREE	85'	77'	9'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-143	TREE	79'	78'	1'	115'	-36'	90'	-12'	APPLY TSS/TRIM/REMOVE
18-144	TANK/BUILDING	36'	78'	-42'	116'	-79'	-	-	NO ACTION
18-145	TANK/BUILDING	37'	79'	-41'	-	-	-	-	NO ACTION
18-146	TANK/BUILDING	39'	81'	-42'	120'	-81'	94'	-54'	NO ACTION
18-147	TANK/BUILDING	64'	64'	0'	-	-	-	-	NO ACTION
18-148	TREE	89'	82'	7'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-149	TREE	89'	82'	7'	-	-	-	-	APPLY TSS/TRIM/REMOVE
18-150	TANK/BUILDING	43'	85'	-42'	-	-	-	-	NO ACTION
18-151	TREE	84'	84'	0'	-	-	-	-	NO ACTION
18-152	TANK/BUILDING	41'	86'	-45'	129'	-87'	100'	-58'	NO ACTION
18-153	TANK/BUILDING	43'	43'	0'	-	-	-	-	NO ACTION
18-154	TANK/BUILDING	45'	96'	-51'	145'	-100'	110'	-65'	NO ACTION
18-155	TANK/BUILDING	60'	97'	-38'	148'	-88'	112'	-52'	NO ACTION
18-156	TANK/BUILDING	55'	98'	-43'	148'	-93'	112'	-57'	NO ACTION
18-157	TANK/BUILDING	42'	105'	-62'	-	-	-	-	NO ACTION
18-158	TANK/BUILDING	34'	113'	-80'	-	-	-	-	NO ACTION
18-159	TANK/BUILDING	52'	122'	-69'	189'	-137'	-	-	NO ACTION
18-160	TANK/BUILDING	29'	126'	-97'	-	-	-	-	NO ACTION
18-161	TANK/BUILDING	61'	126'	-65'	196'	-136'	144'	-83'	NO ACTION
18-162	TANK/BUILDING	34'	133'	-99'	208'	-174'	-	-	NO ACTION
18-163	CELL TOWER	174'	174'	0'	-	-	-	-	NO ACTION
18R1	AEROSPACE DR	37'	26'	11'	-	-	-	-	APPLY TSS
18R2	AEROSPACE DR	37'	28'	9'	-	-	-	-	APPLY TSS
18R3	SERVICE RD	36'	49'	-13'	-	-	-	-	NO ACTION
18R4	S BROAD ST	38'	53'	-15'	72'	-34'	62'	-25'	NO ACTION
18R5	S BROAD ST	40'	60'	-20'	-	-	-	-	NO ACTION
18R6	S BROAD ST	38'	65'	-27'	-	-	-	-	NO ACTION
18R7	S BROAD ST	33'	73'	-40'	-	-	-	-	NO ACTION
18R8	9TH ST	32'	76'	-44'	111'	-79'	88'	-56'	NO ACTION
18R9	15TH ST	34'	83'	-49'	-	-	-	-	NO ACTION
18R10	AVENUE C	27'	92'	-65'	-	-	-	-	NO ACTION
18R11	15TH ST	30'	102'	-71'	-	-	-	-	NO ACTION
18R12	6TH ST	35'	108'	-74'	-	-	-	-	NO ACTION
18R13	6TH ST	39'	-	-	-	-	-	-	RELOCATE
18R14	INTERSTATE (I-10)	51'	165'	-113'	262'	-211'	187'	-135'	NO ACTION
18R15	DUVAL STREET	41'	169'	-127'	269'	-228'	-	-	NO ACTION
18R16	MICHIGAN AVE	41'	-	-	-	-	-	-	RELOCATE
18R17	ARLINGTON STREET	43'	222'	-179'	359'	-317'	-	-	NO ACTION
18R18	INTERSTATE (I-10)	43'	137'	-94'	-	-	-	-	NO ACTION
18RR1	RAILROAD	49'	131'	-82'	-	-	-	-	NO ACTION
18RR2	RAILROAD	52'	156'	-104'	247'	-195'	177'	-125'	NO ACTION

NOTES:

1. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING.

2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

3. OBJECTS MAY NOT BE ALL SHOWN IN THE TABLE AS SOME ARE LOCATED IN DEPARTURE SURFACE BOUNDARY BUT MAY BE LOCATED OUTSIDE OF THE APPROACH SURFACES. ONLY OBJECTS THAT ARE EITHER PENETRATIONS OR OBJECTS WITH LESS THAN 30 FEET BELOW PENETRATING PART 77 APPROACH SURFACE INCLUDED IN TABLE. ALL BUILDING AND TRAVERSE WAY POINTS ARE INCLUDED.

4. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.

Leigh|Fisher

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DRAFT

MOBILE DOWNTOWN AIRPORT (BFM)

AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE: 8-OBSTDATA.DWG
DESIGN BY: NLD 10/9/2020
DRAWN BY: NLD 10/9/2020
REVIEWED BY: SZ 10/9/2020

SHEET TITLE

RUNWAY 18 APPROACH OBSTRUCTION DATA TABLE

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RUNWAY 36 DEPARTURE OBSTRUCTION DATA

ID	DESCRIPTION	OBJECT TOP ELEVATION	EXISTING OBSTRUCTION 40:1 DEPARTURE SURFACE		PROPOSED ACTIONS
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
18-1	TREE	32'	160'	-129'	NO ACTION
18-2	FENCE	29'	149'	-120'	NO ACTION
18-3	POLE LIGHT	62'	133'	-71'	NO ACTION
18-4	FENCE	32'	127'	-95'	NO ACTION
18-5	POLE LIGHT	57'	164'	-108'	NO ACTION
18-6	FENCE	30'	119'	-89'	NO ACTION
18-7	FENCE	30'	138'	-108'	NO ACTION
18-8	TREE	46'	180'	-133'	NO ACTION
18-9	POLE LIGHT	57'	147'	-90'	NO ACTION
18-10	FENCE	31'	111'	-80'	NO ACTION
18-11	STREET SIGN	32'	162'	-130'	NO ACTION
18-12	FENCE	29'	-	-	-
18-13	STREET SIGN	30'	160'	-130'	NO ACTION
18-14	FENCE	32'	103'	-72'	NO ACTION
18-15	FIRE HYDRANT	25'	123'	-98'	NO ACTION
18-16	FENCE	29'	119'	-89'	NO ACTION
18-17	POLE LIGHT	57'	130'	-73'	NO ACTION
18-18	POLE LIGHT	57'	147'	-90'	NO ACTION
18-19	FENCE	32'	169'	-137'	NO ACTION
18-20	FENCE	29'	110'	-81'	NO ACTION
18-21	POLE LIGHT	56'	115'	-59'	NO ACTION
18-22	POLE LIGHT	56'	133'	-77'	NO ACTION
18-23	FENCE	30'	87'	-57'	NO ACTION
18-24	FENCE	29'	100'	-72'	NO ACTION
18-25	FIELD GOAL POLE	65'	142'	-77'	NO ACTION
18-26	FIELD GOAL POLE	65'	148'	-83'	NO ACTION
18-27	POLE LIGHT	56'	100'	-45'	NO ACTION
18-28	POLE LIGHT	56'	118'	-63'	NO ACTION
18-29	POLE LIGHT	55'	87'	-32'	NO ACTION
18-30	POLE LIGHT	54'	105'	-50'	NO ACTION
18-31	POLE LIGHT	55'	105'	-50'	NO ACTION
18-32	POLE LIGHT	55'	78'	-24'	NO ACTION
18-33	FIELD GOAL POLE	66'	120'	-54'	NO ACTION
18-34	FIELD GOAL POLE	66'	126'	-60'	NO ACTION
18-35	TRAFFIC LIGHT/SIGNAL	62'	102'	-40'	NO ACTION
18-36	TREE	49'	64'	-15'	NO ACTION
18-37	TREE	55'	74'	-19'	NO ACTION
18-38	TREE	50'	52'	-1'	NO ACTION
18-39	TREE	51'	83'	-32'	NO ACTION
18-40	TREE	52'	94'	-42'	NO ACTION
18-41	TREE	54'	102'	-48'	NO ACTION
18-42	TREE	57'	119'	-62'	NO ACTION
18-43	TREE	55'	111'	-56'	NO ACTION
18-44	TRAFFIC LIGHT/SIGNAL	62'	67'	-5'	NO ACTION
18-45	TREE	43'	125'	-82'	NO ACTION
18-46	TREE	69'	127'	-58'	NO ACTION
18-47	POLE LIGHT	48'	-	-	-
18-48	TREE	59'	157'	-98'	NO ACTION
18-49	TREE	46'	81'	-35'	NO ACTION
18-50	TREE	42'	69'	-26'	NO ACTION
18-51	TANK/BUILDING	35'	114'	-80'	NO ACTION
18-52	TREE	52'	103'	-51'	NO ACTION
18-53	POLE LIGHT	48'	118'	-70'	NO ACTION
18-54	TREE	54'	56'	-2'	NO ACTION
18-55	TREE	59'	54'	5'	DEP. PROCEDURE/TRIM/REMOVE
18-56	TREE	61'	54'	7'	DEP. PROCEDURE/TRIM/REMOVE
18-57	TREE	54'	54'	0'	NO ACTION
18-58	TREE	46'	150'	-104'	NO ACTION
18-59	TREE	56'	54'	2'	DEP. PROCEDURE/TRIM/REMOVE
18-60	FLAGPOLE	58'	121'	-63'	NO ACTION
18-61	TREE	54'	54'	0'	NO ACTION
18-62	POLE UTILITY	51'	54'	-3'	NO ACTION
18-63	TREE	61'	54'	7'	DEP. PROCEDURE/TRIM/REMOVE
18-64	TREE	54'	54'	0'	DEP. PROCEDURE/TRIM/REMOVE
18-65	TANK/BUILDING	41'	-	-	-
18-66	TREE	54'	55'	0'	NO ACTION
18-67	TREE	46'	55'	-9'	NO ACTION
18-68	TREE	45'	55'	-10'	NO ACTION
18-69	BUILDING	51'	55'	-4'	NO ACTION
18-70	TREE	48'	55'	-7'	NO ACTION
18-71	POLE LIGHT	54'	55'	-1'	NO ACTION
18-72	TREE	45'	55'	-10'	NO ACTION
18-73	TREE	52'	56'	-4'	NO ACTION
18-74	TREE	46'	104'	-59'	NO ACTION
18-75	TREE	53'	56'	-3'	NO ACTION
18-76	TREE	52'	56'	-4'	NO ACTION
18-77	TREE	46'	127'	-81'	NO ACTION
18-78	TREE	54'	56'	-2'	NO ACTION
18-79	POLE UTILITY	54'	167'	-113'	NO ACTION
18-80	POLE UTILITY	50'	56'	-6'	NO ACTION
18-81	TREE	53'	138'	-85'	NO ACTION
18-82	TREE	50'	149'	-98'	NO ACTION
18-83	TREE	49'	57'	-8'	NO ACTION
18-84	POLE UTILITY	50'	57'	-7'	NO ACTION
18-85	TREE	50'	57'	-7'	NO ACTION
18-86	POLE LIGHT	47'	-	-	-
18-87	TANK/BUILDING	38'	-	-	-
18-88	TREE	65'	64'	2'	DEP. PROCEDURE/TRIM/REMOVE
18-89	TANK/BUILDING	54'	57'	-4'	NO ACTION

NOTES:

1. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING.

2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

3. OBJECTS PENETRATE OR BELOW PENETRATING DEPARTURE SURFACE INCLUDED IN THE TABLE WERE SELECTED AND CALCULATED PRIOR ENGINEERING BRIEF 99A RELEASE ON JULY 24, 2020. THUS, OBJECTS INCLUDED MAY HAVE HIGH CLEARANCE FROM PENETRATING DEPARTURE SURFACE.

4. RUNWAY 36 HAS PUBLISHED DEPARTURE PROCEDURE.

RUNWAY 36 DEPARTURE OBSTRUCTION DATA

ID	DESCRIPTION	OBJECT TOP ELEVATION	EXISTING OBSTRUCTION 40:1 DEPARTURE SURFACE		PROPOSED ACTIONS
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
18-90	TREE	54'	132'	-78'	NO ACTION
18-91	POLE UTILITY	56'	195'	-140'	NO ACTION
18-92	POLE UTILITY	53'	113'	-60'	NO ACTION
18-93	POLE UTILITY	67'	-	-	-
18-94	POLE UTILITY	64'	-	-	-
18-95	TREE	63'	78'	-15'	NO ACTION
18-96	TREE	53'	138'	-85'	NO ACTION
18-97	POLE UTILITY	53'	-	-	-
18-98	TREE	61'	69'	-8'	NO ACTION
18-99	TREE	51'	138'	-87'	NO ACTION
18-100	TREE	53'	98'	-45'	NO ACTION
18-101	POLE UTILITY	62'	60'	3'	DEP. PROCEDURE
18-102	BUILDING	50'	60'	-10'	NO ACTION
18-103	POLE UTILITY	66'	48'	18'	DEP. PROCEDURE
18-104	TREE	59'	60'	0'	NO ACTION
18-105	TREE	55'	60'	-5'	NO ACTION
18-106	TANK/BUILDING	42'	141'	-99'	NO ACTION
18-107	TANK/BUILDING	45'	60'	-15'	NO ACTION
18-108	TREE	55'	60'	-5'	NO ACTION
18-109	TREE	51'	113'	-61'	NO ACTION
18-110	TREE	67'	82'	-14'	NO ACTION
18-111	TANK/BUILDING	62'	208'	-146'	NO ACTION
18-112	TREE	63'	82'	-19'	NO ACTION
18-113	TREE	65'	139'	-74'	NO ACTION
18-114	TANK/BUILDING	37'	63'	-26'	NO ACTION
18-115	POLE UTILITY	68'	118'	-50'	NO ACTION
18-116	TREE	64'	63'	1'	DEP. PROCEDURE/TRIM/REMOVE
18-117	POLE UTILITY	66'	103'	-38'	NO ACTION
18-118	TREE	95'	64'	31'	DEP. PROCEDURE/TRIM/REMOVE
18-119	TANK/BUILDING	35'	64'	-29'	NO ACTION
18-120	TANK/BUILDING	37'	-	-	-
18-121	POLE UTILITY	56'	126'	-70'	NO ACTION
18-122	TREE	60'	89'	-29'	NO ACTION
18-123	TREE	66'	65'	1'	DEP. PROCEDURE/TRIM/REMOVE
18-124	POLE UTILITY	63'	65'	-2'	NO ACTION
18-125	TREE	68'	115'	-47'	NO ACTION
18-126	TREE	68'	131'	-63'	NO ACTION
18-127	POLE UTILITY	58'	65'	-8'	NO ACTION
18-128	TREE	67'	84'	-17'	NO ACTION
18-129	POLE UTILITY	58'	80'	-22'	NO ACTION
18-130	TANK/BUILDING	27'	66'	-39'	NO ACTION
18-131	POLE UTILITY	57'	106'	-49'	NO ACTION
18-132	POLE UTILITY	59'	133'	-74'	NO ACTION
18-133	TANK/BUILDING	35'	67'	-32'	NO ACTION
18-134	TANK/BUILDING	36'	68'	-32'	NO ACTION
18-135	TANK/BUILDING	45'	70'	-24'	NO ACTION
18-136	TREE	75'	72'	3'	DEP. PROCEDURE/TRIM/REMOVE
18-137	TANK/BUILDING	53'	90'	-37'	NO ACTION
18-138	TREE	80'	73'	7'	DEP. PROCEDURE/TRIM/REMOVE
18-139	TREE	77'	73'	5'	DEP. PROCEDURE/TRIM/REMOVE
18-140	TREE	77'	109'	-32'	NO ACTION
18-141	TREE	68'	73'	-5'	NO ACTION
18-142	TREE	85'	107'	-22'	NO ACTION
18-143	TREE	79'	75'	4'	DEP. PROCEDURE/TRIM/REMOVE
18-144	TANK/BUILDING	36'	76'	-39'	NO ACTION
18-145	TANK/BUILDING	37'	124'	-87'	NO ACTION
18-146	TANK/BUILDING	39'	78'	-39'	NO ACTION
18-147	TANK/BUILDING	64'	227'	-163'	NO ACTION
18-148	TREE	89'	128'	-39'	NO ACTION
18-149	TREE	89'	128'	-39'	NO ACTION
18-150	TANK/BUILDING	43'	107'	-63'	NO ACTION
18-151	TREE	84'	128'	-44'	NO ACTION
18-152	TANK/BUILDING	41'	82'	-41'	NO ACTION
18-153	TANK/BUILDING	43'	200'	-157'	NO ACTION
18-154	TANK/BUILDING	45'	90'	-45'	NO ACTION
18-155	TANK/BUILDING	60'	92'	-32'	NO ACTION
18-156	TANK/BUILDING	55'	92'	-37'	NO ACTION
18-157	TANK/BUILDING	42'	112'	-70'	NO ACTION
18-158	TANK/BUILDING	34'	105'	-72'	NO ACTION
18-159	TANK/BUILDING	52'	112'	-60'	NO ACTION
18-160	TANK/BUILDING	29'	116'	-87'	NO ACTION
18-161	TANK/BUILDING	61'	116'	-55'	NO ACTION
18-162	TANK/BUILDING	34'	122'	-88'	NO ACTION
18-163	CELL TOWER	174'	264'	-89'	NO ACTION
18-164	FENCE	32'	165'	-133'	NO ACTION
18-165	PRIMARY ROAD	37'	159'	-122'	NO ACTION
18-166	PRIMARY ROAD	37'	168'	-131'	NO ACTION
18-167	POLE LIGHT	57'	164'	-107'	NO ACTION
18-168	PRIMARY ROAD	37'	-	-	-
18-169	PRIMARY ROAD	37'	151'	-114'	NO ACTION
18-170	TREE	53'	149'	-96'	NO ACTION
18-171	TREE	68'	168'	-101'	NO ACTION
18-172	TREE	59'	178'	-119'	NO ACTION
18-173	TREE	80'	204'	-124'	NO ACTION
18-174	TREE	84'	207'	-123'	NO ACTION
18-175	TREE	79'	145'	-66'	NO ACTION
18-176	TREE	82'	146'	-65'	NO ACTION
18-177	TREE	86'	151'	-65'	NO ACTION
18-178	TREE	82'	155'	-73'	NO ACTION

NOTES:

1. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING.

2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

3. OBJECTS PENETRATE OR BELOW PENETRATING DEPARTURE SURFACE INCLUDED IN THE TABLE WERE SELECTED AND CALCULATED PRIOR ENGINEERING BRIEF 99A RELEASE ON JULY 24, 2020. THUS, OBJECTS INCLUDED MAY HAVE HIGH CLEARANCE FROM PENETRATING DEPARTURE SURFACE.

4. RUNWAY 36 HAS PUBLISHED DEPARTURE PROCEDURE.

RUNWAY 36 DEPARTURE OBSTRUCTION DATA

ID	DESCRIPTION	OBJECT TOP ELEVATION	EXISTING OBSTRUCTION 40:1 DEPARTURE SURFACE		PROPOSED ACTIONS
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
18-179	TREE	78'	144'	-66'	NO ACTION
18-180	TREE	83'	150'	-67'	NO ACTION
18-181	TREE	82'	154'	-72'	NO ACTION
18-182	TREE	85'	162'	-76'	NO ACTION
18-183	TREE	75'	73'	2'	DEP. PROCEDURE/TRIM/REMOVE
18-184	TREE	75'	74'	1'	DEP. PROCEDURE/TRIM/REMOVE
18-185	TREE	76'	75'	1'	DEP. PROCEDURE/TRIM/REMOVE
18R1	AEROSPACE DR	37'	156'	-119'	NO ACTION
18R2	AEROSPACE DR	37'	160'	-123'	NO ACTION
18R3	SERVICE RD	36'	148'	-112'	NO ACTION
18R4	S BROAD ST	38'	54'	-16'	NO ACTION
18R5	S BROAD ST	40'	142'	-103'	NO ACTION
18R6	S BROAD ST	38'	138'	-99'	NO ACTION
18R7	S BROAD ST	33'	135'	-101'	NO ACTION
18R8	9TH ST	32'	73'	-42'	NO ACTION
18R9	15TH ST	34'	129'	-95'	NO ACTION
18R10	AVENUE C	27'	124'	-96'	NO ACTION
18R11	15TH ST	30'	118'	-88'	NO ACTION
18R12	6TH ST	35'	101'	-66'	NO ACTION
18R13	6TH ST	39'	-	-	-
18R14	INTERSTATE (I-10)	51'	149'	-98'	NO ACTION
18R15	DUVAL STREET	41'	152'	-111'	NO ACTION
18R16	MICHIGAN AVE	41'	312'	-271'	NO ACTION
18R17	ARLINGTON STREET	43'	198'	-155'	NO ACTION
18R18	INTERSTATE (I-10)	43'	125'	-82'	NO ACTION
18R20	RAILROAD	49'	121'	-71'	NO ACTION
18R21	RAILROAD	52'	141'	-89'	NO ACTION

NOTES:

1. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING.

2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

3. OBJECTS PENETRATE OR BELOW PENETRATING DEPARTURE SURFACE INCLUDED IN THE TABLE WERE SELECTED AND CALCULATED PRIOR ENGINEERING BRIEF 99A RELEASE ON JULY 24, 2020. THUS, OBJECTS INCLUDED MAY HAVE HIGH CLEARANCE FROM PENETRATING DEPARTURE SURFACE.

4. PER FAR PART 77, “OBJECTS AFFECTING NAVIGABLE AIRSPACE”, RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.

5. RUNWAY 36 HAS PUBLISHED DEPARTURE PROCEDURE.

LeighFisher

HANSON
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Mobile Downtown Airport

MOBILE DOWNTOWN AIRPORT
2455 MICHIGAN AVE,
MOBILE, AL 36615

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DRAFT

MOBILE DOWNTOWN AIRPORT (BFM)

AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE: 8-OBSTDATA.DWG
DESIGN BY: NLD 10/9/2020
DRAWN BY: NLD 10/9/2020
REVIEWED BY: SZ 10/9/2020

SHEET TITLE

RUNWAY 36 DEPARTURE OBSTRUCTION DATA TABLE

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RUNWAY 36 APPROACH OBSTRUCTION DATA

EXISTING/FUTURE OBSTRUCTION DISPOSITION

ID	DESCRIPTION	OBJECT TOP ELEVATION	34:1 FAR PART 77		20:1 THRESHOLD SITTING		30:1 VERTICAL GUIDANCE		PROPOSED ACTIONS
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
36-1	SIGN	27'	-	-	-	-	-	-	-
36-2	SIGN	27'	-	-	-	-	-	-	-
36-3	GROUND	23'	-	-	-	-	-	-	-
36-4	GROUND	23'	-	-	-	-	-	-	-
36-5	GROUND	24'	24'	0'	-	-	29'	-5'	NO ACTION
36-6	GROUND	24'	24'	0'	-	-	29'	-5'	NO ACTION
36-7	GROUND	24'	-	-	-	-	-	-	-
36-8	GROUND	24'	-	-	-	-	-	-	-
36-9	SIGN	28'	27'	1'	-	-	-	-	APPLY TSS
36-10	SIGN	28'	27'	1'	-	-	-	-	APPLY TSS
36-11	BUSH	25'	29'	-4'	-	-	-	-	NO ACTION
36-12	BUSH	27'	29'	-3'	-	-	-	-	NO ACTION
36-13	BUSH	26'	31'	-5'	-	-	-	-	NO ACTION
36-14	GROUND	24'	31'	-7'	35'	-11'	38'	-14'	NO ACTION
36-15	GROUND	24'	31'	-7'	35'	-11'	38'	-14'	NO ACTION
36-16	SIGN	27'	46'	-19'	60'	-33'	55'	-28'	NO ACTION
36-17	SIGN	28'	49'	-22'	67'	-39'	-	-	NO ACTION
36-18	BUILDING	32'	-	-	-	-	-	-	-
36-19	BUILDING	32'	-	-	-	-	-	-	-
36-20	BUILDING	32'	-	-	-	-	-	-	-
36-21	GROUND	25'	53'	-27'	72'	-47'	62'	-37'	NO ACTION
36-22	BUILDING	31'	-	-	-	-	-	-	-
36-23	BUILDING	30'	-	-	-	-	-	-	-
36-24	AIRCRAFT	30'	55'	-25'	76'	-46'	65'	-35'	NO ACTION
36-25	BUILDING	31'	-	-	-	-	-	-	-
36-26	BUSH	26'	59'	-33'	-	-	-	-	NO ACTION
36-27	BUSH	25'	60'	-35'	-	-	-	-	NO ACTION
36-28	BUILDING	37'	-	-	-	-	-	-	-
36-29	BUILDING	36'	-	-	-	-	-	-	-
36-30	TREE	73'	70'	3'	-	-	-	-	APPLY TSS/TRIM/REMOVE
36-31	TREE	80'	71'	9'	-	-	-	-	APPLY TSS/TRIM/REMOVE
36-32	PAPI	24'	-	-	-	-	-	-	-
36-33	SIGN	25'	-	-	-	-	-	-	-
36-34	TREE	72'	72'	0'	-	-	-	-	APPLY TSS/TRIM/REMOVE
36-35	PAPI	24'	-	-	-	-	-	-	-
36-36	PAPI	24'	-	-	-	-	-	-	-
36-37	TREE	74'	72'	2'	-	-	-	-	APPLY TSS/TRIM/REMOVE
36-38	TREE	71'	73'	-2'	106'	-35'	84'	-14'	NO ACTION
36-39	TREE	71'	73'	-2'	106'	-35'	84'	-14'	NO ACTION
36-40	PAPI	24'	-	-	-	-	-	-	-
36-41	TREE	73'	73'	0'	-	-	-	-	APPLY TSS/TRIM/REMOVE
36-42	TREE	74'	73'	1'	-	-	-	-	APPLY TSS/TRIM/REMOVE
36-43	TREE	74'	73'	0'	-	-	-	-	APPLY TSS/TRIM/REMOVE
36-44	TREE	73'	73'	0'	-	-	-	-	APPLY TSS/TRIM/REMOVE
36-45	TREE	76'	73'	3'	-	-	-	-	APPLY TSS/TRIM/REMOVE
36-46	TREE	77'	74'	3'	108'	-31'	86'	-9'	APPLY TSS/TRIM/REMOVE
36-47	TREE	77'	74'	3'	-	-	-	-	APPLY TSS/TRIM/REMOVE
36-48	PAPI_CONTROL_BOX	21'	-	-	-	-	-	-	-
36-49	TREE	74'	74'	0'	-	-	-	-	APPLY TSS/TRIM/REMOVE
36-50	TREE	71'	75'	-5'	-	-	-	-	NO ACTION
36-51	TREE	71'	75'	-5'	-	-	-	-	NO ACTION
36-52	WINDSOCK	24'	-	-	-	-	-	-	-
36-53	TREE	51'	81'	-30'	-	-	-	-	NO ACTION
36-54	AWOS	36'	-	-	-	-	-	-	-
36-55	MISC_UTIL	19'	-	-	-	-	-	-	-
36-56	TREE	49'	82'	-33'	-	-	-	-	NO ACTION
36-57	POLE	29'	-	-	-	-	-	-	-
36-58	POLE	50'	-	-	-	-	-	-	-
36-59	BUILDING	32'	-	-	-	-	-	-	-
36-60	BUILDING	27'	-	-	-	-	-	-	-
36-61	ANTENNA	50'	-	-	-	-	-	-	-
36-62	UTIL_BOX	24'	-	-	-	-	-	-	-
36-63	ELEC_BOX	20'	-	-	-	-	-	-	-
36-64	UTIL_BOX	24'	-	-	-	-	-	-	-
36-65	BUILDING	19'	-	-	-	-	-	-	-
36-66	TREE	115'	115'	0'	-	-	-	-	NO ACTION
36-67	TREE	109'	-	-	-	-	-	-	-
36-68	TREE	84'	90'	-6'	-	-	-	-	NO ACTION
36-69	TREE	110'	110'	0'	-	-	-	-	NO ACTION

NOTES:

1. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING.

2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

3. OBJECTS MAY NOT BE ALL SHOWN IN THE TABLE AS SOME ARE LOCATED IN DEPARTURE SURFACE BOUNDARY BUT MAY BE LOCATED OUTSIDE OF THE APPROACH SURFACES. ONLY OBJECTS THAT ARE EITHER PENETRATIONS OR OBJECTS WITH LESS THAN 30 FEET BELOW PENETRATING PART 77 APPROACH SURFACE INCLUDED IN TABLE. ALL TRAVERSE WAY POINTS ARE INCLUDED.

4. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.

RUNWAY 36 APPROACH OBSTRUCTION DATA (CONT)

EXISTING/FUTURE OBSTRUCTION DISPOSITION

ID	DESCRIPTION	OBJECT TOP ELEVATION	34:1 FAR PART 77		20:1 THRESHOLD SITTING		30:1 VERTICAL GUIDANCE		PROPOSED ACTIONS
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
36-70	TREE	88'	92'	-3'	-	-	-	-	NO ACTION
36-71	TREE	55'	-	-	-	-	-	-	-
36-72	TREE	60'	-	-	-	-	-	-	-
36-73	TREE	58'	-	-	-	-	-	-	-
36-74	TREE	53'	-	-	-	-	-	-	-
36-75	TREE	106'	103'	3'	158'	-51'	118'	-12'	APPLY TSS/TRIM/REMOVE
36-76	TREE	105'	104'	1'	159'	-54'	119'	-14'	APPLY TSS/TRIM/REMOVE
36-77	TREE	96'	105'	-9'	161'	-65'	120'	-25'	NO ACTION
36-78	TREE	107'	111'	-4'	171'	-64'	127'	-20'	NO ACTION
36-79	TREE	108'	112'	-4'	173'	-64'	128'	-20'	NO ACTION
36-80	TREE	108'	113'	-4'	174'	-66'	129'	-21'	NO ACTION
36-81	TREE	52'	52'	0'	-	-	-	-	NO ACTION
36-82	TREE	109'	117'	-8'	181'	-72'	133'	-24'	NO ACTION
36-83	TREE	115'	117'	-2'	181'	-66'	-	-	NO ACTION
36-84	TREE	114'	117'	-3'	182'	-68'	-	-	NO ACTION
36-85	TREE	95'	95'	0'	-	-	-	-	NO ACTION
36-86	TREE	88'	88'	0'	-	-	-	-	NO ACTION
36-87	TREE	115'	120'	-5'	187'	-72'	-	-	NO ACTION
36-88	TREE	96'	96'	0'	-	-	-	-	NO ACTION
36-89	TREE	103'	103'	0'	-	-	-	-	NO ACTION
36-90	TREE	97'	97'	0'	-	-	-	-	NO ACTION
36R1	PERIMETER ROAD	32'	69'	-37'	-	-	-	-	NO ACTION
36R2	PERIMETER ROAD	33'	78'	-45'	114'	-82'	90'	-57'	NO ACTION
36R3	PERIMETER ROAD	25'	104'	-79'	-	-	-	-	NO ACTION
36R4	DOYLE AVE	31'	104'	-73'	159'	-128'	-	-	NO ACTION

NOTES:

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2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

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4. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.

RUNWAY 18 DEPARTURE OBSTRUCTION DATA

ID	DESCRIPTION	OBJECT TOP ELEVATION	EXISTING OBSTRUCTION 40:1 DEPARTURE SURFACE		PROPOSED ACTIONS
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
36-1	SIGN	27'	66'	-39'	NO ACTION
36-2	SIGN	27'	66'	-39'	NO ACTION
36-3	GROUND	23'	109'	-86'	NO ACTION
36-4	GROUND	23'	109'	-86'	NO ACTION
36-5	GROUND	24'	45'	-21'	NO ACTION
36-6	GROUND	24'	45'	-21'	NO ACTION
36-7	GROUND	24'	121'	-98'	NO ACTION
36-8	GROUND	24'	121'	-98'	NO ACTION
36-9	SIGN	28'	109'	-81'	NO ACTION
36-10	SIGN	28'	109'	-81'	NO ACTION
36-11	BUSH	25'	70'	-45'	NO ACTION
36-12	BUSH	27'	68'	-42'	NO ACTION
36-13	BUSH	26'	86'	-61'	NO ACTION
36-14	GROUND	24'	36'	-12'	NO ACTION
36-15	GROUND	24'	36'	-12'	NO ACTION
36-16	SIGN	27'	49'	-22'	NO ACTION
36-17	SIGN	28'	52'	-24'	NO ACTION
36-18	BUILDING	32'	194'	-162'	NO ACTION
36-19	BUILDING	32'	197'	-166'	NO ACTION
36-20	BUILDING	32'	196'	-165'	NO ACTION
36-21	GROUND	25'	55'	-29'	NO ACTION
36-22	BUILDING	31'	185'	-155'	NO ACTION
36-23	BUILDING	30'	181'	-151'	NO ACTION
36-24	AIRCRAFT	30'	57'	-27'	NO ACTION
36-25	BUILDING	31'	200'	-168'	NO ACTION
36-26	BUSH	26'	60'	-34'	NO ACTION
36-27	BUSH	25'	61'	-36'	NO ACTION
36-28	BUILDING	37'	168'	-131'	NO ACTION
36-29	BUILDING	36'	169'	-133'	NO ACTION
36-30	TREE	73'	120'	-47'	NO ACTION
36-31	TREE	80'	117'	-37'	NO ACTION
36-32	PAPI	24'	220'	-196'	NO ACTION
36-33	SIGN	25'	212'	-188'	NO ACTION
36-34	TREE	72'	115'	-43'	NO ACTION
36-35	PAPI	24'	213'	-189'	NO ACTION
36-36	PAPI	24'	206'	-182'	NO ACTION
36-37	TREE	74'	107'	-33'	NO ACTION
36-38	TREE	71'	72'	-1'	NO ACTION
36-39	TREE	71'	72'	-1'	NO ACTION
36-40	PAPI	24'	199'	-176'	NO ACTION
36-41	TREE	73'	102'	-29'	NO ACTION
36-42	TREE	74'	72'	2'	DEP. PROCEDURE/TRIM/REMOVE
36-43	TREE	74'	100'	-26'	NO ACTION
36-44	TREE	73'	72'	1'	DEP. PROCEDURE/TRIM/REMOVE
36-45	TREE	76'	98'	-22'	NO ACTION
36-46	TREE	77'	73'	4'	DEP. PROCEDURE/TRIM/REMOVE
36-47	TREE	77'	92'	-15'	NO ACTION
36-48	PAPI CONTROL BOX	21'	178'	-157'	NO ACTION
36-49	TREE	74'	85'	-11'	NO ACTION
36-50	TREE	71'	74'	-3'	NO ACTION

NOTES:

1. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING.

2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

3. OBJECTS PENETRATE OR BELOW PENETRATING DEPARTURE SURFACE INCLUDED IN THE TABLE WERE SELECTED AND CALCULATED PRIOR ENGINEERING BRIEF 99A RELEASE ON JULY 24, 2020. THUS, OBJECTS INCLUDED MAY HAVE HIGH CLEARANCE FROM PENETRATING DEPARTURE SURFACE.

4. RUNWAY 18 HAS PUBLISHED TAKEOFF OBSTACLE NOTE.

RUNWAY 18 DEPARTURE OBSTRUCTION DATA (CONT.)

ID	DESCRIPTION	OBJECT TOP ELEVATION	EXISTING OBSTRUCTION 40:1 DEPARTURE SURFACE		PROPOSED ACTIONS
			SURFACE ELEVATION	CLEARANCE (-) OR PENETRATION (+)	
36-51	TREE	71'	74'	-3'	NO ACTION
36-52	WINDSOCK	24'	182'	-157'	NO ACTION
36-53	TREE	51'	79'	-28'	NO ACTION
36-54	AWOS	36'	173'	-137'	NO ACTION
36-55	MISC UTILITY	19'	167'	-148'	NO ACTION
36-56	TREE	49'	79'	-31'	NO ACTION
36-57	POLE	29'	178'	-149'	NO ACTION
36-58	POLE	50'	182'	-132'	NO ACTION
36-59	BUILDING	32'	187'	-155'	NO ACTION
36-60	BUILDING	27'	185'	-158'	NO ACTION
36-61	ANTENNA	50'	188'	-138'	NO ACTION
36-62	UTILITY BOX	24'	171'	-147'	NO ACTION
36-63	ELECTRICAL BOX	20'	173'	-153'	NO ACTION
36-64	UTILITY BOX	24'	174'	-150'	NO ACTION
36-65	BUILDING	19'	142'	-123'	NO ACTION
36-66	TREE	115'	215'	-100'	NO ACTION
36-67	TREE	109'	174'	-64'	NO ACTION
36-68	TREE	84'	105'	-21'	DEP. PROCEDURE/TRIM/REMOVE
36-69	TREE	110'	191'	-81'	NO ACTION
36-70	TREE	88'	88'	1'	DEP. PROCEDURE/TRIM/REMOVE
36-71	TREE	55'	111'	-55'	NO ACTION
36-72	TREE	60'	125'	-65'	NO ACTION
36-73	TREE	58'	120'	-62'	NO ACTION
36-74	TREE	53'	158'	-105'	NO ACTION
36-75	TREE	106'	97'	9'	DEP. PROCEDURE/TRIM/REMOVE
36-76	TREE	105'	98'	7'	DEP. PROCEDURE/TRIM/REMOVE
36-77	TREE	96'	99'	-3'	NO ACTION
36-78	TREE	107'	104'	3'	DEP. PROCEDURE/TRIM/REMOVE
36-79	TREE	108'	105'	3'	DEP. PROCEDURE/TRIM/REMOVE
36-80	TREE	108'	106'	3'	DEP. PROCEDURE/TRIM/REMOVE
36-81	TREE	52'	251'	-199'	NO ACTION
36-82	TREE	109'	109'	0'	NO ACTION
36-83	TREE	115'	109'	6'	DEP. PROCEDURE/TRIM/REMOVE
36-84	TREE	114'	110'	5'	DEP. PROCEDURE/TRIM/REMOVE
36-85	TREE	95'	161'	-66'	NO ACTION
36-86	TREE	88'	186'	-98'	NO ACTION
36-87	TREE	115'	112'	3'	DEP. PROCEDURE/TRIM/REMOVE
36-88	TREE	96'	160'	-64'	NO ACTION
36-89	TREE	103'	150'	-48'	NO ACTION
36-90	TREE	97'	175'	-77'	NO ACTION
36R1	PERIMETER ROAD	32'	124'	-92'	NO ACTION
36R2	PERIMETER ROAD	33'	76'	-43'	NO ACTION
36R3	PERIMETER ROAD	25'	98'	-73'	NO ACTION
36R4	DOYLE AVE	31'	98'	-68'	NO ACTION
36R5	SHORE ACRES DR	30'	134'	-104'	NO ACTION
36R6	SEA PINES BLVD	25'	166'	-141'	NO ACTION
36R7	STEWART ROAD	25'	197'	-172'	NO ACTION
36R8	HANNON ROAD	28'	234'	-206'	NO ACTION

NOTES:

1. CLEARANCES AND PENETRATIONS MAY NOT BE EXACT MATCH OBJECT ELEVATION MINUS SURFACE ELEVATION DUE TO ROUNDING.

2. SELECTED OBJECTS FOR THE OBSTRUCTION ANALYSIS ARE OBJECTS THAT ARE LOCATED WITHIN THE DEPARTURE SURFACE BOUNDARY. THEN, OBJECTS ARE FURTHER ANALYZED AS CLEARANCE OR PENETRATION ACCORDING TO THE SURFACES APPLIED TO RUNWAY END.

3. OBJECTS PENETRATE OR BELOW PENETRATING DEPARTURE SURFACE INCLUDED IN THE TABLE WERE SELECTED AND CALCULATED PRIOR ENGINEERING BRIEF 99A RELEASE ON JULY 24, 2020. THUS, OBJECTS INCLUDED MAY HAVE HIGH CLEARANCE FROM PENETRATING DEPARTURE SURFACE.

4. PER FAR PART 77, "OBJECTS AFFECTING NAVIGABLE AIRSPACE", RAILWAYS CONSIDERED AS 23' OBJECTS, INTERSTATE HIGHWAYS AS 17', PUBLIC ROADS AS 15', PRIVATE ROADS AS 10', OR THE HIGHEST OBJECT USING THE ROAD.

5. RUNWAY 18 HAS PUBLISHED TAKEOFF OBSTACLE NOTE.

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MOBILE DOWNTOWN AIRPORT (BFM)

AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION	DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE: 8-OBSTDATA.DWG
DESIGN BY: NLD 10/9/2020
DRAWN BY: NLD 10/9/2020
REVIEWED BY: SZ 10/9/2020

SHEET TITLE

RUNWAY 36 APPROACH & RUNWAY 18 DEPARTURE OBSTRUCTION DATA TABLE

OCT 09, 2020 12:08 PM DO01653
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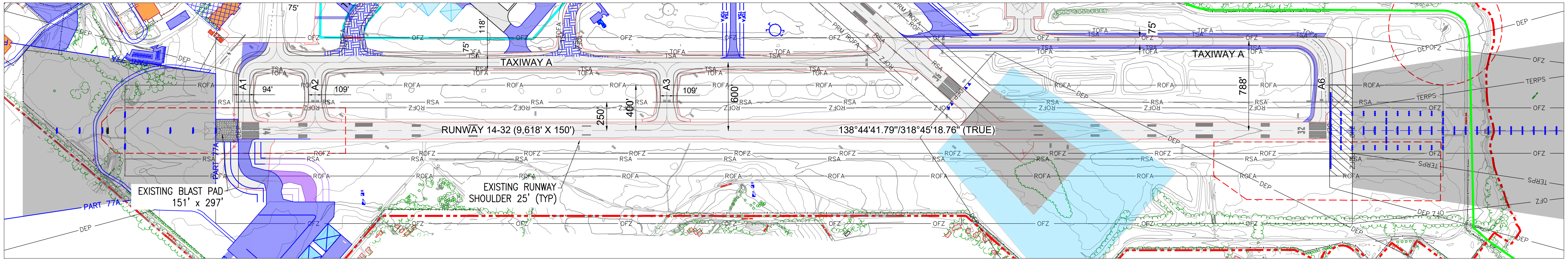
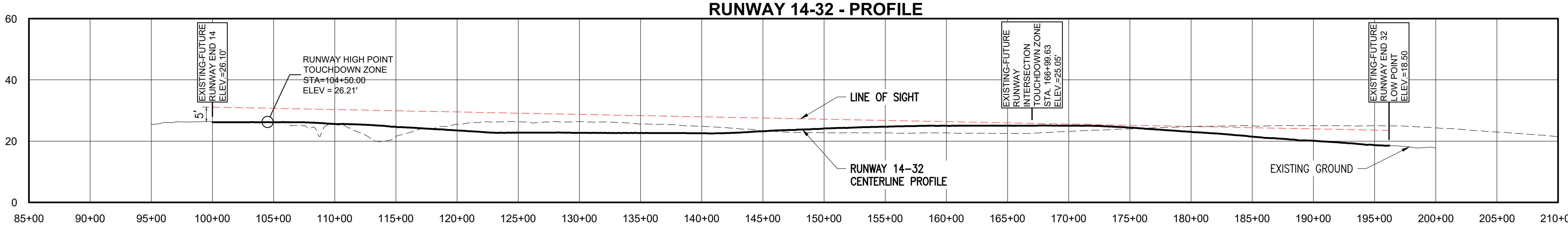
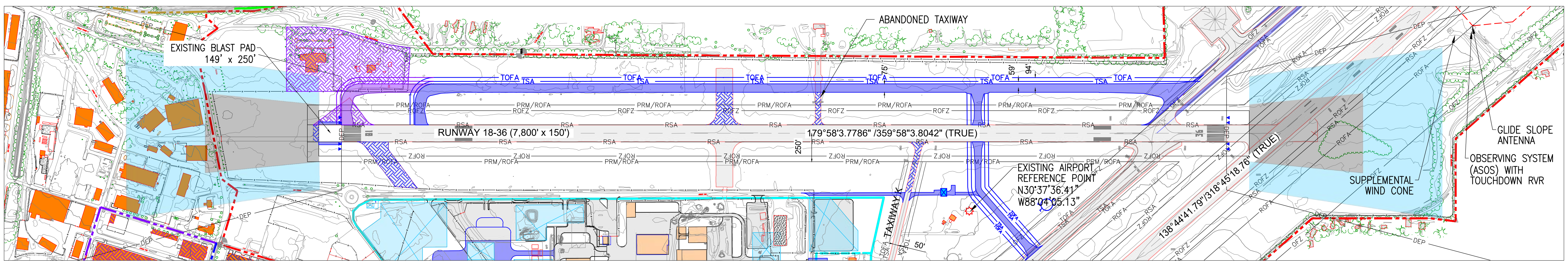


RUNWAY 14-32 - PLAN

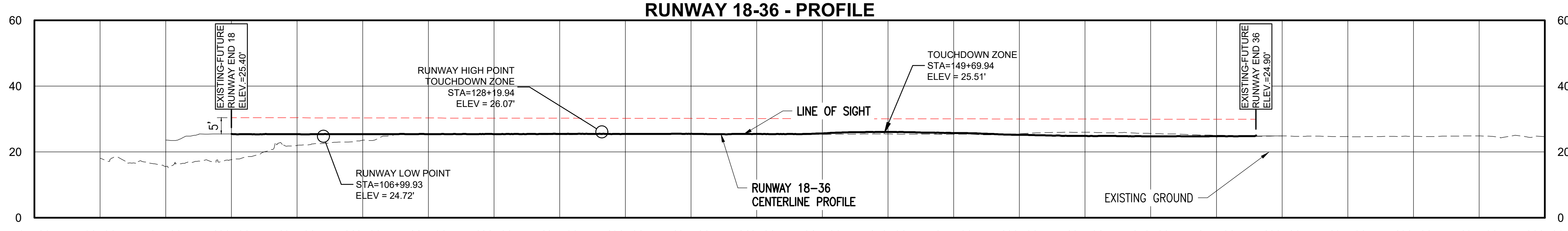
RUNWAY 14-32 - PROFILE

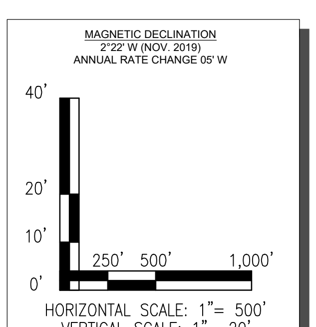




RUNWAY 18-36 - PLAN

RUNWAY 18-36 - PROFILE





1. ALP PREPARED USING DESIGN CRITERIA FROM FAA ADVISORY CIRCULAR 150/5300-13A, CHANGE 1 "AIRPORT DESIGN" AND FAR PART 77 "OBJECTS AFFECTING NAVIGABLE AIRSPACE".
2. THERE ARE NO THRESHOLD SITING SURFACE OBJECT PENETRATIONS.
3. THERE ARE NO OFZ PENETRATIONS OTHER THAN FRANGIBLE NAVAIDS.
4. NO RSA PENETRATIONS.
5. GROUND CONTOUR INTERVALS SHOWN ARE 2-FOOT. CONTOURS GENERATED FROM QUANTUM DIGITAL TERRAIN MODEL (DTM).
6. THE BUILDING RESTRICTION LINE SHOWN ASSUMES A HEIGHT OF 35' ABOVE THE GROUND LEVEL (AGL). BUILDINGS LESS THAN 35' COULD BE POSITIONED CLOSER TO THE RUNWAY AND BUILDINGS TALLER THAN 35' WILL BE REQUIRED TO BE FURTHER FROM THE RUNWAY.
7. NO MODIFICATIONS OF STANDARDS ARE CURRENTLY KNOWN TO EXIST ON FILE.

REFERENCES:

1. LATITUDE AND LONGITUDE ARE BASED ON THE ALABAMA STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 1983.
2. VERTICAL CONTROL IS REFERENCED TO NAVD 1988.
3. ELEVATIONS SHOWN ARE IN "MEAN SEA LEVEL" (MSL) UNLESS NOTED OTHERWISE AND ARE NOT INTENDED FOR DESIGN PURPOSES.
4. ALL DIMENSIONS ARE IN UNITED STATES CUSTOMARY UNITS UNLESS NOTED OTHERWISE.

EXISTING	FUTURE	ULTIMATE	LEGEND
			AIRPORT PROPERTY LINE
	N/A	N/A	AEROPLEX PROPERTY LINE
	N/A	N/A	AIRBUS LEASE LINE
N/A		N/A	CREPE MYRTLE TRAIL
	N/A	N/A	AIRPORT FENCE (8' INCLUDED BARB WIRE)
			AIRPORT EASEMENT
			ROADS
			BUILDINGS (AIRPORT PROPERTY)
	N/A	N/A	BUILDINGS (OFF AIRPORT PROPERTY)
			AIRFIELD PAVEMENT
N/A			PAVEMENT REMOVAL

OCT 12, 2020 5:40 PM DO01853
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AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
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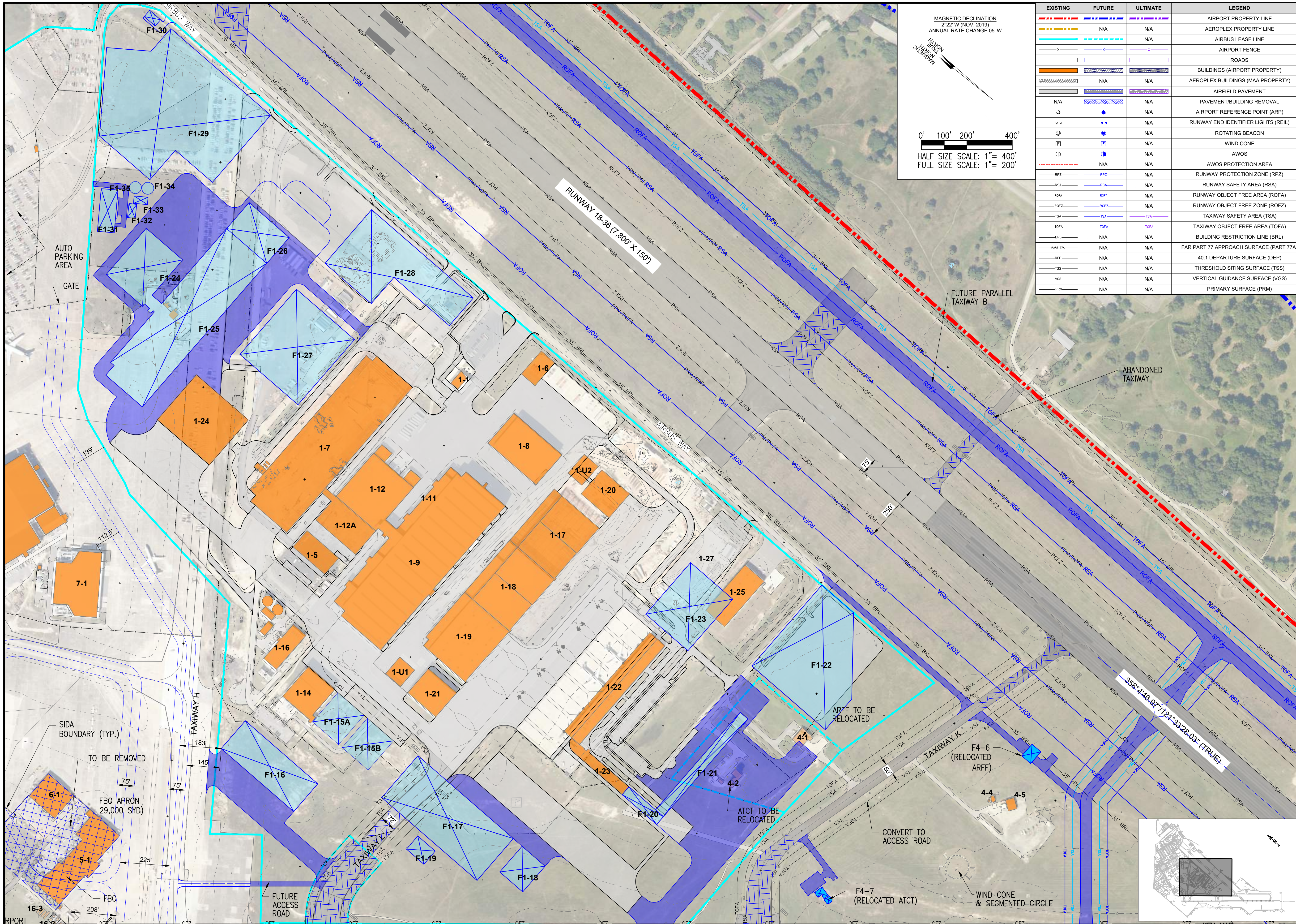
DRAWN BY: NLD 10/12/2020
REVIEWED BY: SZ 10/12/2020

SHEET TITLE

RUNWAY PROFILES DRAWING



EXISTING	FUTURE	ULTIMATE	LEGEND
			AIRPORT PROPERTY LINE
	N/A	N/A	AEROPLEX PROPERTY LINE
		N/A	AIRBUS LEASE LINE
X	X	X	AIRPORT FENCE
			ROADS
			BUILDINGS (AIRPORT PROPERTY)
	N/A	N/A	AEROPLEX BUILDINGS (MAA PROPERTY)
			AIRFIELD PAVEMENT
N/A		N/A	PAVEMENT/BUILDING REMOVAL
		N/A	AIRPORT REFERENCE POINT (ARP)
		N/A	RUNWAY END IDENTIFIER LIGHTS (REIL)
		N/A	ROTATING BEACON
		N/A	WIND CONE
		N/A	AWOS
	N/A	N/A	AWOS PROTECTION AREA
RPZ	RPZ	N/A	RUNWAY PROTECTION ZONE (RPZ)
RSA	RSA	N/A	RUNWAY SAFETY AREA (RSA)
ROFA	ROFA	N/A	RUNWAY OBJECT FREE AREA (ROFA)
ROFZ	ROFZ	N/A	RUNWAY OBJECT FREE ZONE (ROFZ)
TSA	TSA	TSA	TAXIWAY SAFETY AREA (TSA)
TOFA	TOFA	TOFA	TAXIWAY OBJECT FREE AREA (TOFA)
BRL	N/A	N/A	BUILDING RESTRICTION LINE (BRL)
PART 77A	N/A	N/A	FAR PART 77 APPROACH SURFACE (PART 77A)
DEP	N/A	N/A	40:1 DEPARTURE SURFACE (DEP)
TSS	N/A	N/A	THRESHOLD SITING SURFACE (TSS)
VGS	N/A	N/A	VERTICAL GUIDANCE SURFACE (VGS)
PRM	N/A	N/A	PRIMARY SURFACE (PRM)

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AIRPORT LAYOUT PLAN

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		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE: 10-TERM.DWG
DESIGN BY: NLD 10/9/2020
DRAWN BY: NLD 10/9/2020
REVIEWED BY: SZ 10/9/2020

SHEET TITLE

TERMINAL AREA DRAWING - SHEET 1 (MIDFIELD)

OCT 09, 2020 4:34 PM DO01853
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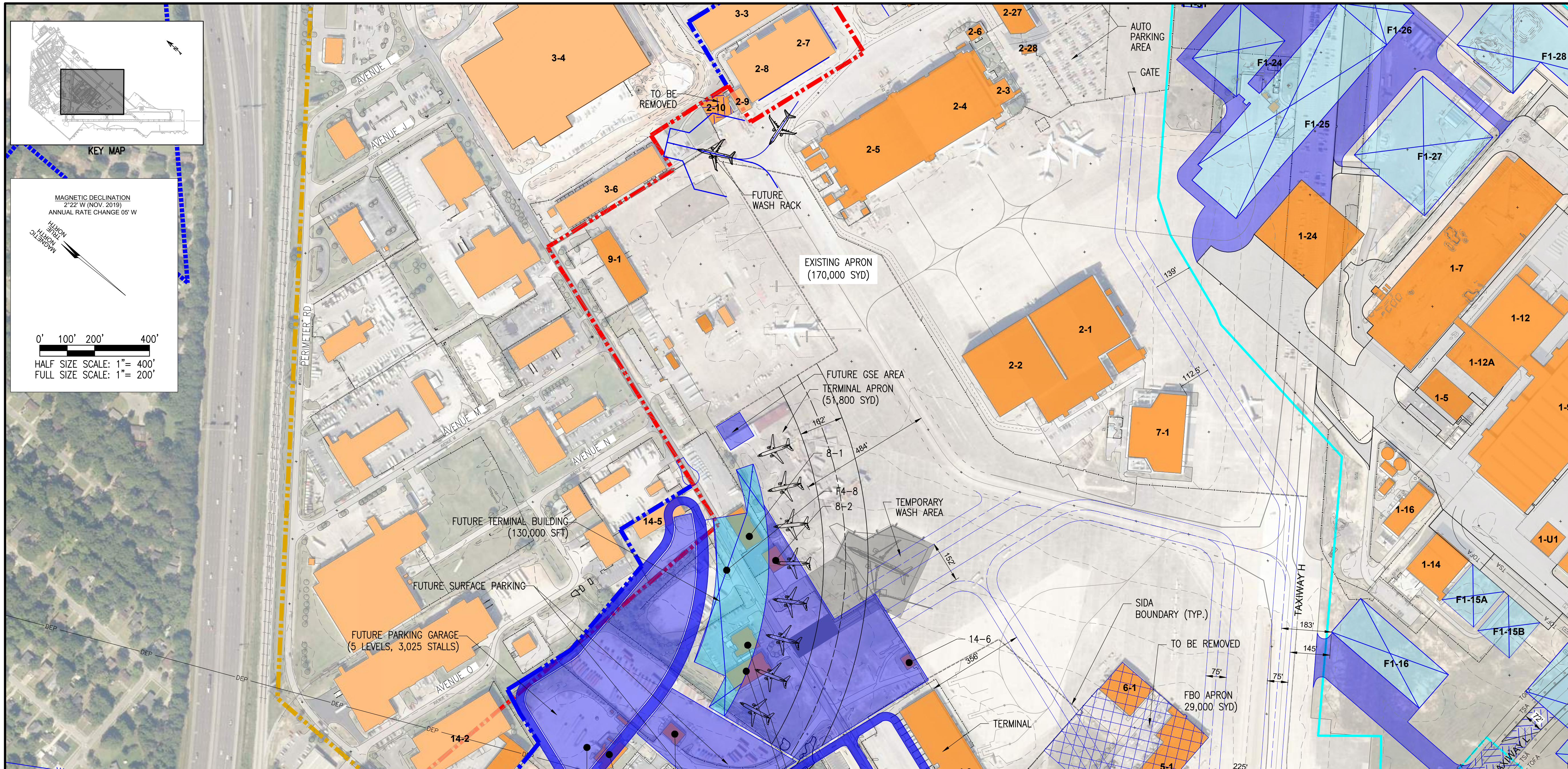

EXISTING	FUTURE	ULTIMATE	LEGEND
			AIRPORT PROPERTY LINE
		N/A	AEROPLEX PROPERTY LINE
		N/A	AIRBUS LEASE LINE
—X—	—X—	—X—	AIRPORT FENCE
			ROADS
			BUILDINGS (AIRPORT PROPERTY)
	N/A	N/A	AEROPLEX BUILDINGS (MAA PROPERTY)
			AIRFIELD PAVEMENT
N/A		N/A	PAVEMENT/BUILDING REMOVAL
		N/A	AIRPORT REFERENCE POINT (ARP)
		N/A	RUNWAY END IDENTIFIER LIGHTS (REIL)
		N/A	ROTATING BEACON
		N/A	WIND CONE
		N/A	AWOS
	N/A	N/A	AWOS PROTECTION AREA
—RPZ—	—RPZ—	N/A	RUNWAY PROTECTION ZONE (RPZ)
—RSA—	—RSA—	N/A	RUNWAY SAFETY AREA (RSA)
—ROFA—	—ROFA—	N/A	RUNWAY OBJECT FREE AREA (ROFA)
—ROFZ—	—ROFZ—	N/A	RUNWAY OBJECT FREE ZONE (ROFZ)
—TSA—	—TSA—	—TSA—	TAXIWAY SAFETY AREA (TSA)
—TOFA—	—TOFA—	—TOFA—	TAXIWAY OBJECT FREE AREA (TOFA)
—BRL—	N/A	N/A	BUILDING RESTRICTION LINE (BRL)
—PART 77A—	N/A	N/A	FAR PART 77 APPROACH SURFACE (PART 77A)
—DEP—	N/A	N/A	40:1 DEPARTURE SURFACE (DEP)
—TSS—	N/A	N/A	THRESHOLD SITING SURFACE (TSS)
—VGS—	N/A	N/A	VERTICAL GUIDANCE SURFACE (VGS)
—PRM—	N/A	N/A	PRIMARY SURFACE (PRM)

OCT 09, 2020 4:35 PM DO01853
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AIRPORT LAYOUT PLAN

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		DES	DWN	REV

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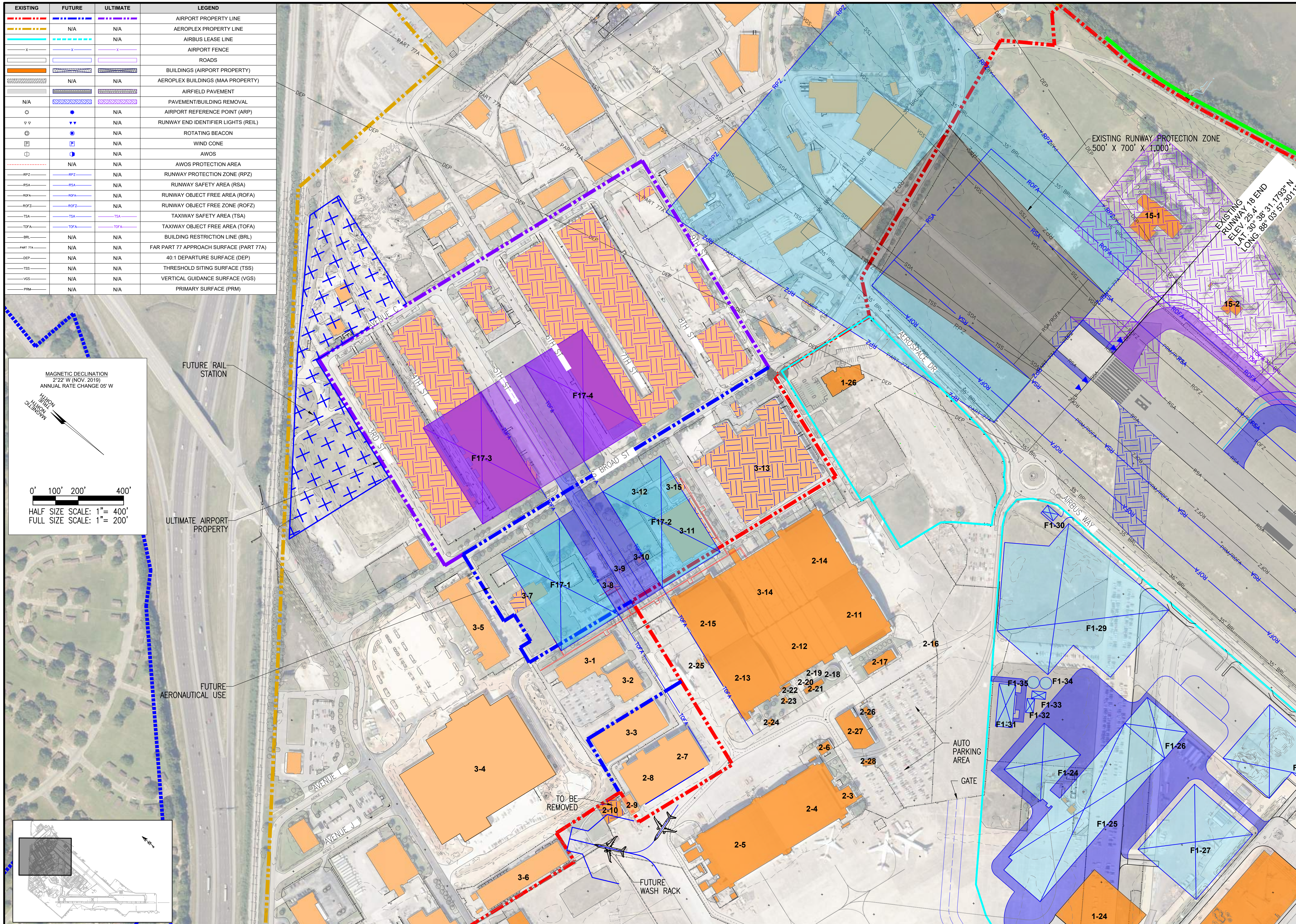
DRAWN BY: NLD 10/9/2020
REVIEWED BY: SZ 10/9/2020

SHEET TITLE

TERMINAL AREA DRAWING - SHEET 2 (NORTHWEST)



EXISTING	FUTURE	ULTIMATE	LEGEND
			AIRPORT PROPERTY LINE
	N/A	N/A	AEROPLEX PROPERTY LINE
		N/A	AIRBUS LEASE LINE
X	X	X	AIRPORT FENCE
			ROADS
			BUILDINGS (AIRPORT PROPERTY)
	N/A	N/A	AEROPLEX BUILDINGS (MAA PROPERTY)
			AIRFIELD PAVEMENT
N/A			PAVEMENT/BUILDING REMOVAL
		N/A	AIRPORT REFERENCE POINT (ARP)
		N/A	RUNWAY END IDENTIFIER LIGHTS (REIL)
		N/A	ROTATING BEACON
		N/A	WIND CONE
		N/A	AWOS
	N/A	N/A	AWOS PROTECTION AREA
RPZ	RPZ	N/A	RUNWAY PROTECTION ZONE (RPZ)
RSA	RSA	N/A	RUNWAY SAFETY AREA (RSA)
ROFA	ROFA	N/A	RUNWAY OBJECT FREE AREA (ROFA)
ROFZ	ROFZ	N/A	RUNWAY OBJECT FREE ZONE (ROFZ)
TSA	TSA	TSA	TAXIWAY SAFETY AREA (TSA)
TOFA	TOFA	TOFA	TAXIWAY OBJECT FREE AREA (TOFA)
BRL	N/A	N/A	BUILDING RESTRICTION LINE (BRL)
PART 77A	N/A	N/A	FAR PART 77 APPROACH SURFACE (PART 77A)
DEP	N/A	N/A	40:1 DEPARTURE SURFACE (DEP)
TSS	N/A	N/A	THRESHOLD SITING SURFACE (TSS)
VGS	N/A	N/A	VERTICAL GUIDANCE SURFACE (VGS)
PRM	N/A	N/A	PRIMARY SURFACE (PRM)

OCT 09, 2020 4:36 PM DO01853
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AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION		
		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
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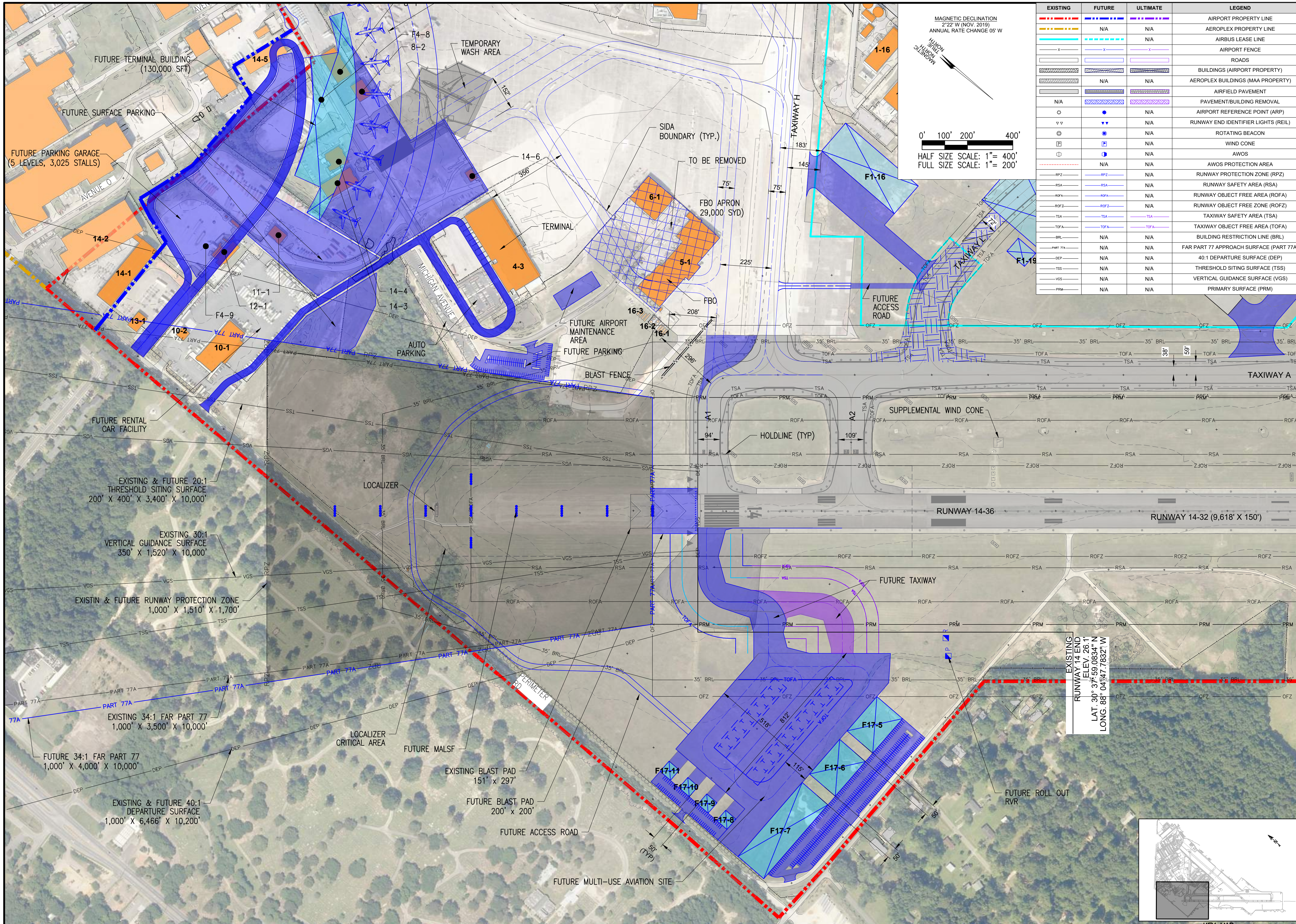
SHEET TITLE

TERMINAL AREA DRAWING - SHEET 3 (NORTH)



EXISTING	FUTURE	ULTIMATE	LEGEND
			AIRPORT PROPERTY LINE
	N/A	N/A	AEROPLEX PROPERTY LINE
	N/A	N/A	AIRBUS LEASE LINE
			AIRPORT FENCE
			ROADS
			BUILDINGS (AIRPORT PROPERTY)
	N/A	N/A	AEROPLEX BUILDINGS (MAA PROPERTY)
			AIRFIELD PAVEMENT
N/A			PAVEMENT/BUILDING REMOVAL
		N/A	AIRPORT REFERENCE POINT (ARP)
		N/A	RUNWAY END IDENTIFIER LIGHTS (REIL)
		N/A	ROTATING BEACON
		N/A	WIND CONE
		N/A	AWOS
	N/A	N/A	AWOS PROTECTION AREA
RPZ	RPZ	N/A	RUNWAY PROTECTION ZONE (RPZ)
RSA	RSA	N/A	RUNWAY SAFETY AREA (RSA)
ROFA	ROFA	N/A	RUNWAY OBJECT FREE AREA (ROFA)
ROFZ	ROFZ	N/A	RUNWAY OBJECT FREE ZONE (ROFZ)
TSA	TSA	TSA	TAXIWAY SAFETY AREA (TSA)
TOFA	TOFA	TOFA	TAXIWAY OBJECT FREE AREA (TOFA)
BRL	N/A	N/A	BUILDING RESTRICTION LINE (BRL)
PART 77A	N/A	N/A	FAR PART 77 APPROACH SURFACE (PART 77A)
DEP	N/A	N/A	40:1 DEPARTURE SURFACE (DEP)
TSS	N/A	N/A	THRESHOLD SITING SURFACE (TSS)
VGS	N/A	N/A	VERTICAL GUIDANCE SURFACE (VGS)
PRM	N/A	N/A	PRIMARY SURFACE (PRM)

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		DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
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REVIEWED BY: SZ 10/9/2020

SHEET TITLE

TERMINAL AREA DRAWING - SHEET 4 (WEST)

OCT 09, 2020 4:37 PM DO01853
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BUILDING DATA TABLE		
#	DESCRIPTION	TOP ELEVATION
AIRBUS		
1-1	EXISTING FAL USE MAIN GATE	54.7'
1-5	EXISTING CANTEEN	25.4'
1-6	EXISTING TRANS-SHIPMENT STAGING (A220)	127.0'
1-7	EXISTING FAL ASSEMBLY LINE HANGAR (A220)	127.0'
1-8	EXISTING TRANS-SHIPMENT HANGAR	86.5'
1-9	EXISTING FINAL ASSEMBLY LINE HANGAR (A320)	127.0'
1-11	EXISTING SERVICE BUILDING	127.0'
1-12	EXISTING LOGISTICS CENTER	127.0'
1-12A	EXISTING LOGISTICS CENTER (36K FT2 EXPANSION)	127.0'
1-14	EXISTING PAINT SHOP	86.6'
F1-15A	FUTURE PAINT SHOP	26.3'
F1-15B	FUTURE PAINT SHOP	24.6'
F1-16	FUTURE HANGAR 1	76' (est.)
F1-17	FUTURE HANGARS 2 & 3	97' (est.)
F1-18	FUTURE BUILDING 1	75' (est.)
F1-19	FUTURE FOAM TANK	-
F1-20	FUTURE DELIVERY CENTER (BOTH PROGRAMS)	65' (est.)
F1-21	FUTURE DELIVERY CENTER	65' (est.)
F1-22	FUTURE PARKING	72' (est.)
F1-23	FUTURE HANGAR 1	99' (est.)
F1-24	FUTURE BUILDING 2	62' (est.)
F1-25	FUTURE BUILDING 3	119' (est.)
F1-26	FUTURE BUILDING 4	85' (est.)
F1-27	FUTURE BUILDING 5	75' (est.)
F1-28	FUTURE PARKING 1	73' (est.)
F1-29	FUTURE PARKING 2	73' (est.)
F1-30	FUTURE GATE	47' (est.)
F1-31	FUTURE BUILDING 5	45' (est.)
F1-32	FUTURE STORAGE	54' (est.)
F1-33	FUTURE STORAGE	54' (est.)
F1-34	FUTURE STORAGE	54' (est.)
F1-35	FUTURE STORAGE	55' (est.)
1-16	EXISTING POWER HOUSE	51.8'
1-17	EXISTING FINAL PHASE HANGAR (BAYS 5 & 6)	99.6'
1-18	EXISTING FINAL PHASE HANGAR (BAYS 3 & 4)	99.6'
1-19	EXISTING FLIGHTLINE HANGAR (BAYS 1 & 2)	99.6'
1-20	EXISTING CALIBRATION HANGAR	78.0'
1-21	EXISTING GAUGING HANGAR	80.1'
1-22	EXISTING FLIGHTLINE (BOTH PROGRAMS)	67.4'
1-23	EXISTING DELIEVERY CENTER (BOTH PROGRAMS)	67.4'
1-24	DUAL BAY FLIGHT LINE HANGAR (HANGAR 24)	98.3'
1-25	DB SCHRENKER	59.9'
1-26	FLIGHT WORK	73.4'
1-27	PARKING LOT	38.0'
1-U1	BELOW GRADE TANK	N/A
1-U2	BELOW GRADE TANK	N/A

BUILDING DATA TABLE (CONT.)		
#	DESCRIPTION	TOP ELEVATION
ST ENGINEERING AEROSPACE		
2-1	EXISTING HANGAR 7-1	120.5'
2-2	EXISTING HANGAR 7-2	120.5'
2-3	ADMIN BUILDING	115.7'
2-4	EXISTING HANGAR 1	115.7'
2-5	EXISTING HANGAR 2	115.7'
2-6	ENGINE STORAGE BUILDING	52.0'
2-7	EXISTING HANGAR 8-1	98.4'
2-8	EXISTING HANGAR 8-2	98.4'
2-9	FACILITIES WAREHOUSE	54.8'
2-10	WELD SHOP	49.7'
2-11	EXISTING HANGAR 3	115.9'
2-12	EXISTING BUILDING	115.9'
2-13	EXISTING HANGAR 4	115.9'
2-14	EXISTING HANGAR 5	115.9'
2-15	EXISTING HANGAR 6	115.9'
2-16	DELIVERY TRUCK GUARD SHACK	34.3'
2-17	TRAINING BUILDING	51.5'
2-18	WATER TANK	48.6'
2-19	CONCRETE PAD	-
2-20	CONNEX BOX	-
2-21	PUMP HOUSE	46.0'
2-22	OFFICE TRAILER (PORTABLE)	10.0'
2-23	COMPRESSION HOUSE	43.4'
2-24	CANOPY COVER (COOKOUTS)	40.5'
2-25	BREAKROOM (PORTABLE)	37.2'
2-26	DOUBLE WIDE PORTABLE BUILDING	36.8'
2-27	MATERIALS WAREHOUSE/SHIPPING AND RECEIVING	58.9'
2-28	MAIN GUARD HOUSE	37.8'

BUILDING DATA TABLE (CONT.)		
#	DESCRIPTION	TOP ELEVATION
CONTINENTAL AEROSPACE TECHNOLOGIES		
3-1	EXISTING BUILDING 32	53.2'
3-2	EXISTING BUILDING 31	-
3-3	EXISTING BUILDING 39	57.9'
3-4	EXISTING MANUFACTURING PLANT	63.1'
3-5	EXISTING BUILDING 26	68.2'
3-6	EXISTING BUILDING 96	56.5'
3-7	EXISTING BUILDING 18	64.9'
3-8	EXISTING BUILDING 373	38.8'
3-9	GROUND/SECURITY BUILDING	36.4'
3-10	EXISTING BUILDING 80	37.3'
3-11	EXISTING BUILDING 21	54.0'
3-12	CHEMICAL STORAGE	32.9'
3-13	EXISTING BUILDING 15	60.0'
3-14	EXISTING BUILDING 16	115.9'
3-15	EXISTING BUILDING 20	47.6'

BUILDING DATA TABLE (CONT.)		
#	DESCRIPTION	TOP ELEVATION
MOBILE AIRPORT AUTHORITY AND OTHERS		
4-1	ARFF STATION	51.2'
4-2	AIR TRAFFIC CONTROL TOWER	142.1'
4-3	PASSENGER TERMINAL	54.2'
4-4	ELECTRICAL VAULT	33.5'
4-5	MAINTENANCE BUILDING	36.6'
F4-6	FUTURE AIRCRAFT RESCUE AND FIREFIGHTING (ARFF)	51' (est.)
F4-7	FUTURE AIR TRAFFIC CONTROL TOWER (ATCT)	167' (est.)
F4-8	FUTURE TERMINAL BUILDING	52' (est.)
F4-9	FUTURE PARKING GARAGE	83' (est.)
5-1	SIGNATURE FLIGHT SUPPORT (2495 MICHIGAN AVE)	54.8'
6-1	ERA HELICOPTER (2495 MICHIGAN AVE)	51.4'
7-1	MAAS AVIATION	88.0'
8-1	2253 MICHIGAN AVE - BUIDLING 1	49.5'
8-2	2253 MICHIGAN AVE - BUIDLING 2	53.5'
9-1	FED EX (2117 MICHIGAN AVE)	44.2'
10-1	PENSKE TRUCK RENTAL	54.2'
10-2	COVERED SPACE	43.3'
11-1	2240 MICHIGAN AVE	39.2'
12-1	2241 MICHIGAN AVE	46.1'
13-1	2329 PERIMETER RD	45.6'
14-1	AS4 2301 PERIMETER RD	64.3'
14-2	AS4 2301 PERIMETER RD	65.5'
14-3	2248 MICHIGAN AVE - AEROSTAR	46.5'
14-4	2249 MICHIGAN AVE - AEROSTAR	33.1'
14-5	2225 MICHIGAN AVE - GULF INTERMODAL	47.9'
14-6	SIGNATURE FLIGHT SERVICE BUILDING	42.4'
15-1	ARMY RESERVCE BUILDING	50.5'
15-2	ARMY RESERVCE BUILDING	45.2'
16-1	FUEL FARM	35.6'
16-2	FUEL FARM	50.8'
16-3	FUEL FARM	35.6'
F17-1	FUTURE HANGAR (500' x 300')	120' (est.)
F17-2	FUTURE HANGAR (500' x 300')	120' (est.)
F17-3	ULTIMATE HANGAR (500' x 300')	120' (est.)
F17-4	ULTIMATE HANGAR (500' x 300')	120' (est.)
F17-5	FUTURE HANGAR (150' x 200')	68' (est.)
F17-6	FUTURE HANGAR (150' x 200')	73' (est.)
F17-7	FUTURE HANGAR (150' x 430')	83' (est.)
F17-8	FUTURE HANGAR (60' x 60')	75' (est.)
F17-9	FUTURE HANGAR (60' x 60')	75' (est.)
F17-10	FUTURE HANGAR (60' x 60')	75' (est.)
F17-11	FUTURE HANGAR (60' x 60')	75' (est.)

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Engineering | Planning | Allied Services

Mobile Downtown Airport

MOBILE DOWNTOWN AIRPORT
2455 MICHIGAN AVE,
MOBILE, AL 36615

PHONE: (251) 281-2887

DRAFT

MOBILE DOWNTOWN AIRPORT (BFM)

AIRPORT LAYOUT PLAN

NO.	DATE	DESCRIPTION	DES	DWN	REV

ISSUE: October, 2020
PROJECT NO: 18A0120
CAD FILE: 10-TERM.DWG
DESIGN BY: NLD 10/9/2020
DRAWN BY: NLD 10/9/2020
REVIEWED BY: SZ 10/9/2020

SHEET TITLE

TERMINAL AREA BUILDING DATA

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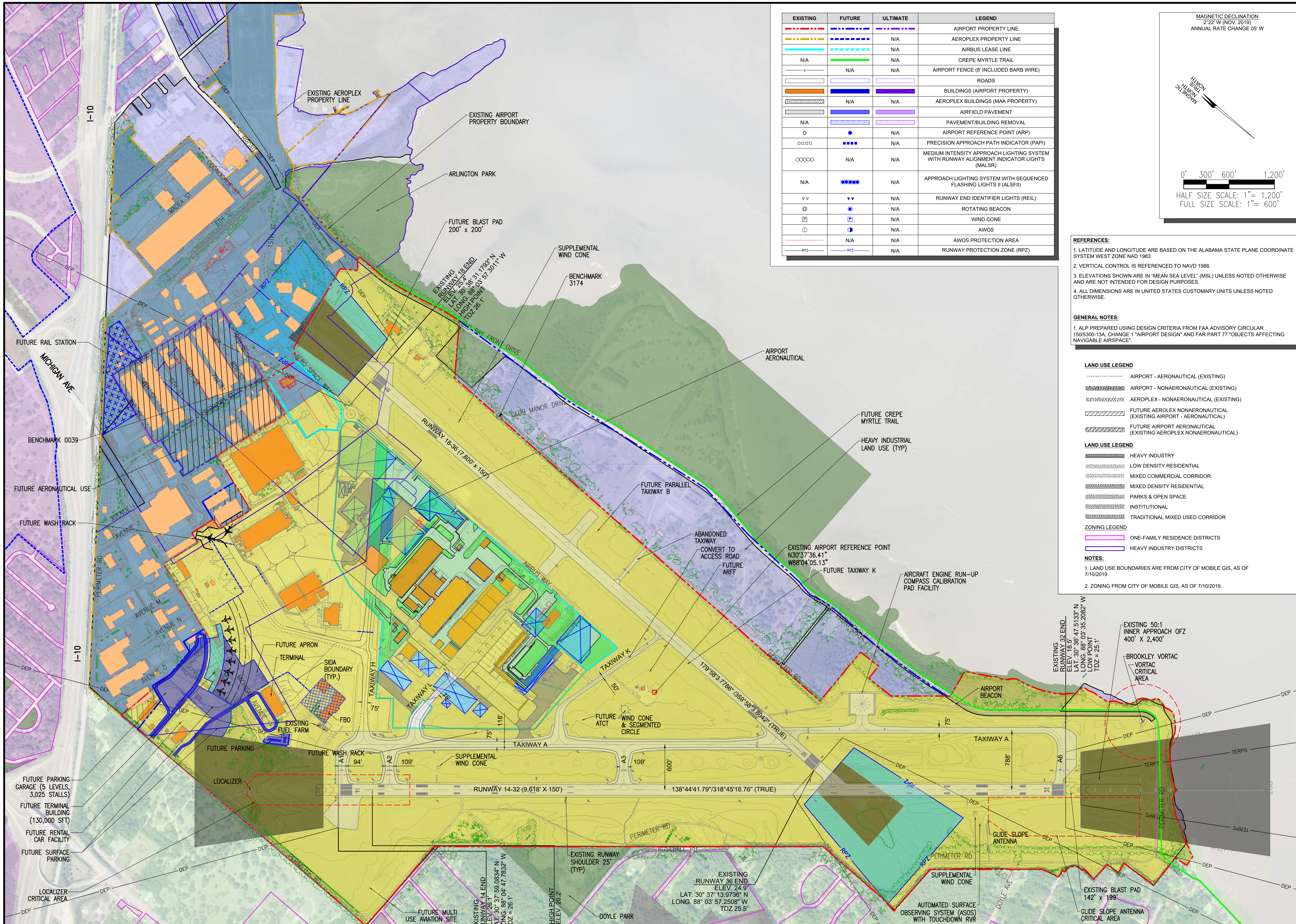

EXISTING	FUTURE	ULTIMATE	LEGEND
			AIRPORT PROPERTY LINE
		N/A	AEROPLEX PROPERTY LINE
		N/A	AIRBUS LEASE LINE
N/A		N/A	CREPE MYRTLE TRAIL
	N/A	N/A	AIRPORT FENCE (8' INCLUDED BARB WIRE)
			ROADS
			BUILDINGS (AIRPORT PROPERTY)
	N/A	N/A	AEROPLEX BUILDINGS (MAA PROPERTY)
			AIRFIELD PAVEMENT
N/A			PAVEMENT/BUILDING REMOVAL
		N/A	AIRPORT REFERENCE POINT (ARP)
		N/A	PRECISION APPROACH PATH INDICATOR (PAPI)
	N/A	N/A	MEDIUM INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR LIGHTS (MALSR)
N/A		N/A	APPROACH LIGHTING SYSTEM WITH SEQUENCED FLASHING LIGHTS II (ALSFII)
		N/A	RUNWAY END IDENTIFIER LIGHTS (REIL)
		N/A	ROTATING BEACON
		N/A	WIND CONE
		N/A	AWOS
	N/A	N/A	AWOS PROTECTION AREA
RPZ	RPZ	N/A	RUNWAY PROTECTION ZONE (RPZ)

REFERENCES:

1. LATITUDE AND LONGITUDE ARE BASED ON THE ALABAMA STATE PLANE COORDINATE SYSTEM WEST ZONE NAD 1983.
2. VERTICAL CONTROL IS REFERENCED TO NAVD 1988.
3. ELEVATIONS SHOWN ARE IN “MEAN SEA LEVEL” (MSL) UNLESS NOTED OTHERWISE AND ARE NOT INTENDED FOR DESIGN PURPOSES.
4. ALL DIMENSIONS ARE IN UNITED STATES CUSTOMARY UNITS UNLESS NOTED OTHERWISE.

GENERAL NOTES:

1. ALP PREPARED USING DESIGN CRITERIA FROM FAA ADVISORY CIRCULAR 150/5300-13A, CHANGE 1 "AIRPORT DESIGN" AND FAR PART 77 "OBJECTS AFFECTING NAVIGABLE AIRSPACE".

LAND USE LEGEND

- AIRPORT - AERONAUTICAL (EXISTING)
- AIRPORT - NONAERONAUTICAL (EXISTING)
- AEROPLEX - NONAERONAUTICAL (EXISTING)
- FUTURE AEROLEX NONAERONAUTICAL (EXISTING AIRPORT - AERONAUTICAL)
- FUTURE AIRPORT AERONAUTICAL (EXISTING AEROPLEX NONAERONAUTICAL)

LAND USE LEGEND

- HEAVY INDUSTRY
- LOW DENSITY RESIDENTIAL
- MIXED COMMERCIAL CORRIDOR
- MIXED DENSITY RESIDENTIAL
- PARKS & OPEN SPACE
- INSTITUTIONAL
- TRADITIONAL MIXED USED CORRIDOR

ZONING LEGEND

- ONE-FAMILY RESIDENCE DISTRICTS
- HEAVY INDUSTRY DISTRICTS

NOTES:

1. LAND USE BOUNDARIES ARE FROM CITY OF MOBILE GIS, AS OF 7/10/2019
2. ZONING FROM CITY OF MOBILE GIS, AS OF 7/10/2019.

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SHEET TITLE

AIRPORT LAND USE DRAWING

OCT 12, 2020 5:47 PM DO01853
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