Prepared for:

ALBANY
INTERNATIONAL AIRPORT

Airport Master Plan

Albany International Airport

DRAFT Working Paper #1

November 2021

Prepared by:

CHA

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1 Introduction

The Albany County Airport Authority (ACAA) has retained CHA Consulting, Inc. ('CHA') to prepare a Master Plan Update (Study) for the Albany International Airport ('ALB' or 'the Airport'). The purpose of the study is to evaluate the current utilization and operational characteristics of the airfield, general aviation and support facilities, ground access, and land development considerations. It is the intent to consider all alternatives that can be developed in a logical and financially-feasible manner that ensure the best use of space for the continued improvements necessary to accommodate projected aviation activity throughout the 20-year planning period.

This introductory chapter provides a description of the project and a background overview of the Airport and its facilities. Additional information about the Airport and the Study can be found on its website at www.alb-master-plan.com. The Airport's website has airport information including maps, driving directions, ground transportation, and parking information.

1.1 Project Description

The airport master planning process assesses how well an airport services existing users, is equipped to meet future demands, and fulfills Federal Aviation Administration (FAA) safety and design standards. The process includes the development of activity forecasts, the identification and evaluation of financial, physical, and environmental issues, and the recommendation of feasible improvements.

An airport master plan is a comprehensive study of an airport that is conducted via a systematic process that evaluates existing facility, identifies anticipated facility needs, and formulates short-, medium-, and long-term development plans to meet future aviation demand. The process, methods and ultimate products are guided by Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*. Consistent with this guidance, this Master Plan Update provides recommendations for the improvement and development of the Airport. The recommendations are intended to satisfy aviation demand, minimize environmental impacts, and address community concerns. The study follows the format and design criteria outlined in all Advisory Circulars, including:

- FAA Advisory Circular 150/5070-6B, "*Airport Master Plans*"
- FAA Advisory Circular 150/5300-13A "*Airport Design*"
- Federal Aviation Regulation (FAR) Part 77, "*Safe, Efficient Use, and Preservation of the Navigable Airspace*"

The products of the study include this narrative report and an Airport Layout Plan (ALP). The ALP illustrates the existing and proposed airport facilities and will be formally approved by the ACAA and FAA. Several additional drawings that illustrate the surrounding airspace, adjacent land use,

and airport property support the ALP. The combined set of drawings is called the ALP Drawing Set.

Note that approval of the ALP does not represent a commitment by the ACAA or the FAA to undertake or financially support the proposed projects, nor does it constitute any environmental approval. However, the FAA's approval of the Forecast and ALP, and acceptance of the Master Plan Update is necessary for specific projects to become eligible for federal and state funding.

1.2 Regional and Airport Overview

ALB is the sole scheduled service airport in the Upper Hudson and Lower Lake Champlain Valley, serving the Greater Capital District and fifteen counties within the Primary Airport Market Area. ALB is a public-use airport owned and operated by the Albany County Airport Authority. According to the FAA's 2021 – 2025 National Plan of Integrated Airport Systems (NPIAS) Report, ALB is designated as a Primary Commercial Service Small Hub Airport.

1.3 Airport History

ALB is derived from the country's first municipal airport located at a former polo field on Loudonville Road, three miles north of the city. The Airport then relocated to Westerlo Field before moving to its current location on Albany Shaker Road in 1928 with the help of the Watervliet Shakers.

The Airport was officially opened on October 3, 1928 as the Albany Municipal Airport. The original airfield consisted of three runways ranging from 2,200 feet to 2,500 feet in length. Within the first year, commercial service flights were provided to Montreal, New York City, Cleveland, Newark, Boston, and Springfield. In 1939, the Airport was closed due to unsuitable airport conditions. After improvements, the Airport was opened for daytime use in 1940, and then full time use in 1942. Since its reopening, the airport has had uninterrupted flight service.

The Airport was sold from the City of Albany to Albany County due to financial concerns in 1960. During the span of its new ownership, the Airport received a new passenger terminal building and the north-south runway was extended to 6,000 feet.

In 1993, the ACAA was established to oversee the airport's operations. Recently, the airport received $42 million in funding to modernize terminal and parking garage facilities.

2 Inventory of Existing Conditions

Understanding the background of an airport and the region it serves is essential to making informed decisions pertaining to airport-related improvements. Therefore, to develop a well-rounded understanding of ALB, an inventory of key airport elements was conducted and discussed in the subsequent sections.

2.1 Airport Location

ALB is located within the Town of Colonie, New York and is approximately five miles north of the City of Albany. Albany and Colonie are within Albany County, approximately 135 miles north of New York City (Midtown Manhattan). **Figure 2-1** depicts the location of ALB relative to both the State of New York and the New England region.

Figure 2-1 – Albany International Airport (ALB) Location

2.2 Airport Components

A primary role in the master planning process is to develop a detailed listing of recommended facilities and improvements for implementation over the planning period. As such, the first step in this process is to inventory existing facilities and components and review their current condition.

Airport facilities are often described as either airside or landside, depending upon the type of operation they support. Airside facilities are those related to the landing, takeoff, and taxiing of aircraft in the airfield environment. Examples of airside facilities include: the runway and taxiway system; airfield lighting, marking and visual aids. Landside facilities are those related to the transition from air to ground movement or vice versa. Examples of landside facilities include: the airport terminal building, aircraft refueling area, aircraft storage, and vehicle parking.

Additionally, the airspace surrounding the airport must be inventoried and evaluated. These include various surfaces extending upwards and away from the airport and its runways to ensure the safety of pilots navigating around, towards, and away ALB. Examples of airspace surfaces include approach surfaces, departure surfaces, and FAR Part 77 Surfaces. The purpose of these

surfaces is to prevent any obstructions that could be deemed dangerous for aircraft navigation such as trees, cell towers, buildings, etc. Airspace surfaces will be discussed in further detail in later chapters.

2.2.1 Inventory of Airfield Facilities

Airside facilities refer to all areas accessible to aircraft. This includes runways, taxiways, and any additional airfield infrastructure such as navigational aids, lighting, and marking.

2.2.1.1 Runways

The existing airfield configuration at ALB consists of two active runways: Runway 1-19 and Runway 10-28. Runway 1-19 serves as the primary air carrier runway and is 8,500 feet in length and 150 feet in width. Runway 10-28 serves as the secondary runway and is 7,200 feet in length and 150 feet in width.

Table 2-1 – Runway Data

	Runway 1-19		Runway 10-28	
Runway Length (feet)	8,500’		7,200’	
Displaced Threshold (feet)	N/A	N/A	N/A	1,192
Width (feet)	150’		150’	
Runway End Elevation (feet above MSL)	284’	279’	276’	276’
Pavement Type	Asphalt / Grooved		Asphalt/Grooved	
Pavement Load Bearing	400,000 lbs. (Double Tandem)		80,000 lbs. (Double Wheel)	
Effective Runway Gradient	.05%		0%	
Aircraft Approach Category	C		C	
Airplane Design Group	IV		IV	
Runway Markings	Precision		Precision	
Runway and Approach Lighting	HIRL, C/L **Runway 1:** MALSR, PAPI-4, TDZL **Runway 19:** MALSR, PAPI-4, TDZL		MIRL, REIL, C/L **Runway 28:** PAPI-4	
Navigational Aids	ILS/DME, RNAV (GPS, RNP)		VOR/DME, RNAV (GPS)	
Runway Design Code	C-IV-1200	C-IV-2400	C-IV-5000	C-IV-5000

Sources: AirNav.com; FAA Form 5010-1, CHA, 2019.

C/L – Centerline Lights

DME – Distance Measuring Equipment

GPS – Global Positioning System

HIRL – High Intensity Runway Lights

ILS – Instrument Landing System

MALSR Medium-Intensity Approach Lighting System with Runway Alignment Indicator

MIRL – Medium-Intensity Runway Lighting

PAPI-4 – Four-Box Precision Approach Path Indicator

PAPI-2 – Two-Box Precision Approach Path Indicator

REIL – Runway End Identifier Lights

RNAV – Area Navigation

RNP – Required Navigational Performance

TDZL – Touchdown Zone Lights

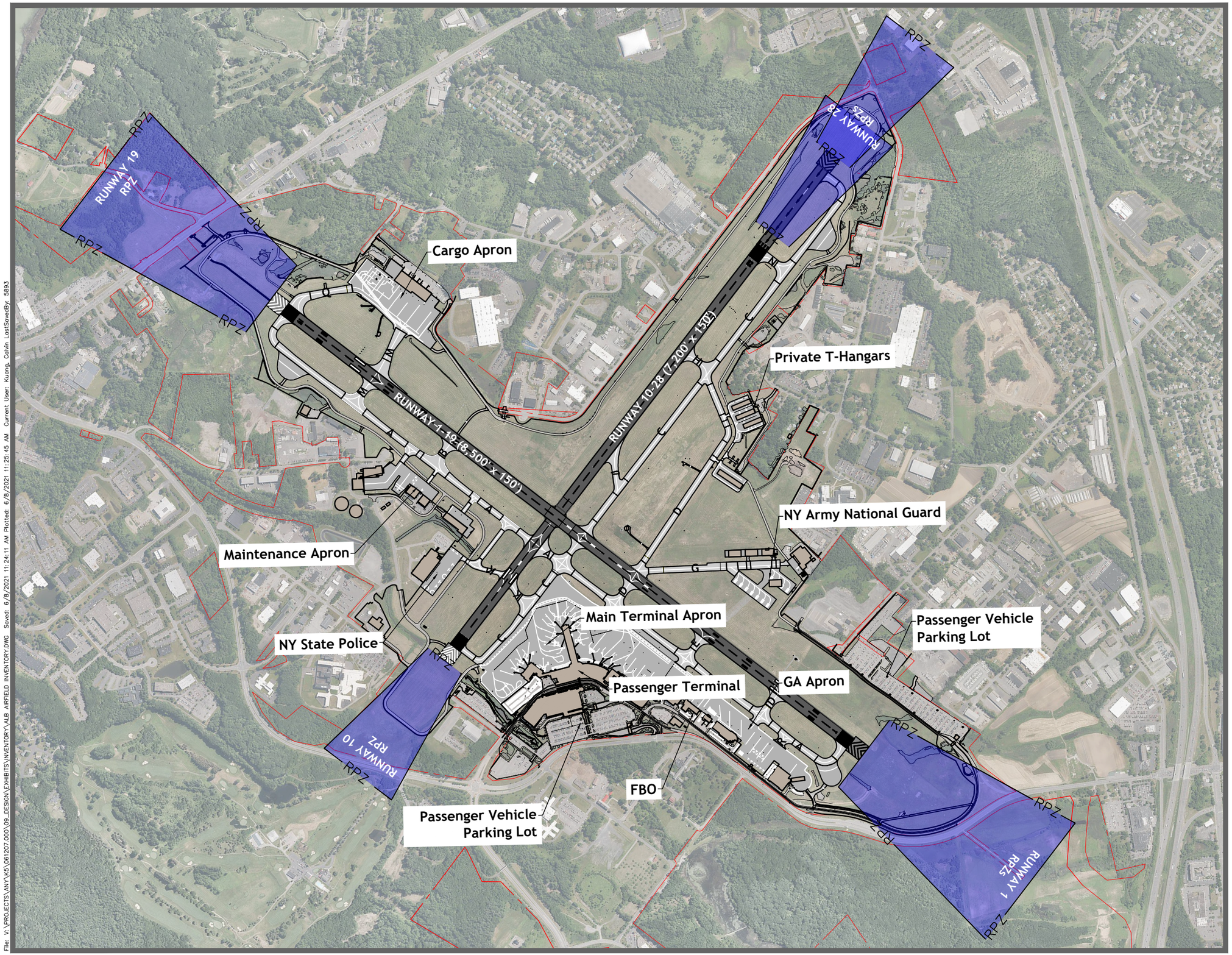
2.2.1.2 Taxiways

An airport's taxiway system connects the runways to aircraft parking aprons, storage hangars, and other facilities. ALB contains 15 named taxiways in its system. **Table 2-2** displays the existing taxiway system at ALB, as well as the specifications of each taxiway.

Table 2-2 – Taxiway Data

`	Description	Width (feet)	Taxiway Design Group (TDG)
A	Full parallel providing access to Runway 1-19. Southern portion is adjacent to the Main Apron (Passenger Terminal Building, FBO facilities)	75	5
B	Connects RWY 1-19 to TWY 'A'	95	5
C	Full parallel providing access to Runway 10-28. Western portion is adjacent to the Main Apron (Passenger Terminal Building)	75	5
D	Connects TWY 'A' to RWY 1-19, and RWY 1-19 to TWY 'C'. Provides access to Hangars 'A', 'B', 'C', and 'D'	75	5
E	Connects RWY 1-19 to TWY 'A'.	90	5
F	Connects RWY 1-19 to TWY 'A'.	90	5
G	Provides access to New York Army National Guard Apron	75	5
H	Connects RWY 10-28 to TWY 'C'	80	5
J	Connects RWY 10-28 to TWY 'C'	75	5
K	Connects RWY 10-28 to TWY 'C'	80	5
M	Connects RWY 1-19 to TWY 'A'. Provides access to Cargo Ramp	80	5
N	Connects RWY 10-28 to TWY 'C'	85	5
P	Connects TWY 'A' to TWY 'K'	50	3
Q	Connects RWY 1-19 to Cargo Ramp	80	5
R	Connects TWY 'A' to the General Aviation Apron	120	5

Source: FAA 5010-1 Form, CHA, 2020.



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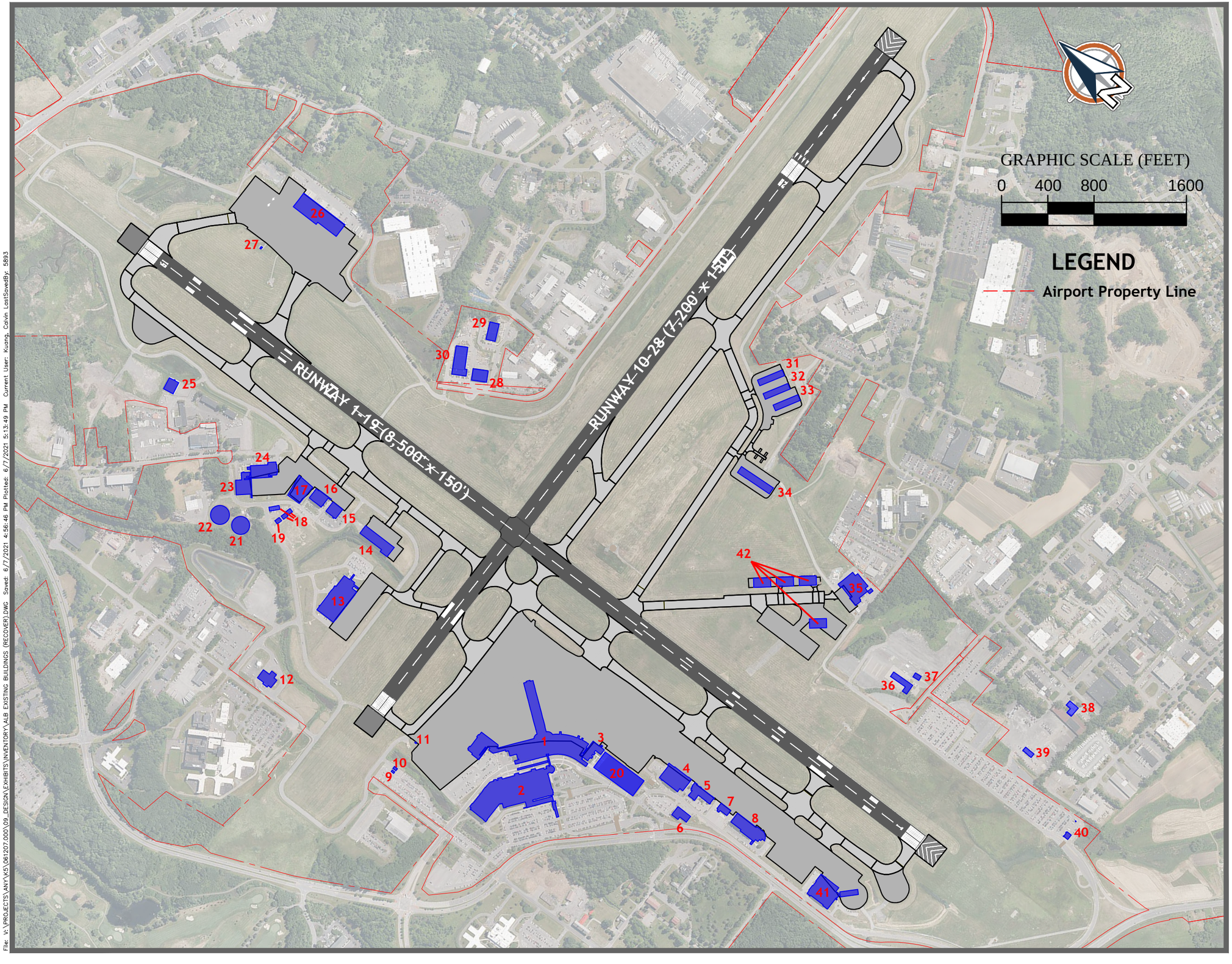
GRAPHIC SCALE (FEET)

0 550 1100 2200

LEGEND

Airport Property Line

Figure 2-2
Existing Airfield Layout



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#	Name of Existing Facility
1	Main Terminal Complex
2	Passenger Parking Garage
3	ACAA Offices
4	FBO Hangar
5	ARFF Facility
6	Sand Storage Building
7	Hangar
8	FBO Offices
9	TSA Storage
10	Triturator
11	Security Checkpoint
12	Fuel Farm
13	NY Police Facility
14	Hangar
15	Hangar
16	Hangar
17	Ground Run-up Enclosure (GRE)
18	Glycol Treatment Facility
19	Storage Facility
20	Parking Garage
21	Glycol Tank
22	Glycol Tank
23	Hangar
24	Hangar
25	Sand Storage Building
26	Air Cargo Facility
27	Air Cargo Glycol Pump Station
28	Vehicle Maintenance Garage
29	Air Traffic Control Tower (ATCT)
30	Airfield Maintenance Offices
31	T-Hangar A
32	T-Hangar B
33	T Hangar C
34	T Hangar D
35	NY Army National Guard Facility
36	ACAA Garage
37	ACAA Offices
38	Rental Car Offices
39	Rental Car Storage
40	ACAA Offices
41	Hangar
42	NY Nat'l Guard Hangars

Figure 2-3
Existing Buildings

2.2.1.3 Navigational Aids

Pilots utilize a variety of navigational aids (NAVAIDs) and instrument procedures using ground-based equipment and/or satellite technology. Examples include Very High Frequency (VHF) Omni Direction Range (VOR), Localizer (LOC), Glideslope, Distance Measuring Equipment (DME), Nondirectional Beacons (NDB), approach lighting systems (ALS), airfield lighting, rotating beacons, and Global Positioning System (GPS) technology. NAVAIDs assist pilots to safely and efficiently locate airports, land and taxi aircraft, and depart from airports during nearly all meteorological conditions.

Instrument Approach Procedures

Instrument Approach Procedures (IAPs) are designed by the FAA to establish airborne routes of ingress and egress to/from the runway environment by providing point-to-point guidance information or position data. IAPs can use either ground-based equipment or GPS technology. There are currently three types of IAPs:

- **Precision Approach (PA):** Precision IAPs provide both vertical and lateral course guidance meeting international precision approach standards (i.e., ICAO Annex 10). Precision IAPs include the Instrument Landing System (ILS), Precision Approach Radar (PAR) approaches, and Ground Based Augmentation Landing System (GLS). Both Runway 1 and 19 are equipped with an ILS.
- **Approach Procedure with Vertical Guidance (APV):** This type of IAP also provides vertical and lateral course guidance but does not meet international requirements for a precision IAP. Area navigation (RNAV) and GPS approaches providing vertical guidance (e.g,. Baro-VNAV, LDA with glidepath, LNAV/VNAV and LPV) are considered APV IAPs. Runways 1, 19, and 28 are currently equipped with GPS-based APV approaches.
- **Non-Precision Approach (NPA):** This type of IAP only provides lateral course guidance. Aircraft must accordingly descend at established fixes or distances from the runway. These type of IAPs use either ground-based equipment (e.g., VOR, NDB, LOC) or GPS technology (e.g., lateral navigation [LNAV] or Localizer Performance [LP]). Runways 10 and 28 are equipped with NPA procedures.

Table 2-3 summarizes the Airport's existing IAPs by runway along with the associated NAVAIDs.

Table 2-3 – Navigational Aids

Runway	Runway Markings	Lighting	Instrument Approach Types
1	Precision	MALSR, HIRL, PAPI-4	ILS (Cat I & II) or LOC, RNAV (RNP, GPS)
19	Precision	MALSR, HIRL, PAPI-4	ILS or LOC, RNAV (RNP, GPS)
10	Non-Precision	MIRL, REIL	RNAV (GPS)
28	Non-Precision	MIRL, PAPI-4, REIL	RNAV (GPS), VOR

Source: FAA Form 5010-1, CHA, 2019.

Approach Lighting Systems

An Approach Lighting System (ALS) is a lighted approach path along the extended centerline of the runway. During low visibility conditions and at night, an ALS provides aircraft an indication of the runway environment via a series of sequentially flashing lights leading to the runway threshold. Per FAA standards, an ALS is required when an IAP provides a landing visibility minimum of less than ¾ statute mile.

At ALB, Runway 1 and 19 utilize Medium Intensity Approach Lighting Systems (MALS), along with Runway Alignment Indicator Lights (RAILs). Together, these systems form the Medium Intensity Approach Lighting Systems with Runway Alignment Indicator Lights (MALSR).

MALS

According to FAA Order 6850.2B, Visual Guidance Lighting Systems, the MALSR consists of a threshold light bar and seven five-light bars located on the extended runway centerline, the first bar being located 200 feet from the runway threshold, with the remaining bars each at 200-foot intervals out to 1,400 feet from the threshold. One additional five-light bar is located on each side of the centerline bar, 1,000 feet from the runway threshold, to form a 66-foot-long crossbar known as a roll bar. The individual lights in all bars are approximately 2½ feet apart and are aimed into the approach to the runway, away from the runway threshold. All lights in the MALSR system are steady burning white, except for the threshold lights, which have green filters. The threshold lights are a row of lights on 10-foot centers located coincident with and within the runway edge lights near the threshold and extend across the runway threshold.***RAILs***

RAILs consist of five sequenced flashers located on the extended runway center line, the first

being located 200 feet beyond the approach end of the MALS with successive units at each 200-foot interval, out to 2,400 feet from the runway threshold. All lights are aimed into the approach to the runway, away from the runway threshold, and flash in sequence toward the threshold at the rate of twice per second.

The resulting combination of the two lighting systems, MALSR, provides visual information to pilots on runway alignment, height perception, roll guidance, and horizontal references for Category I Precision Approaches.

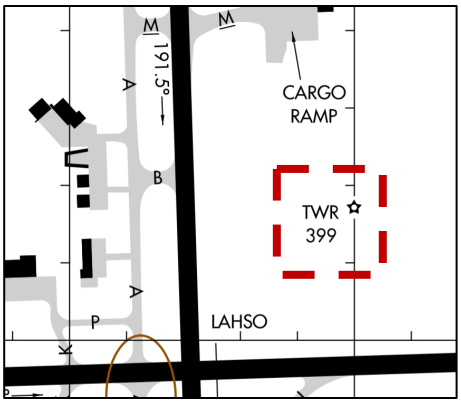
Standard Instrument Departures

Standard Instrument Departure (SID) routes, also known as departure procedures, are published flight procedures followed by aircraft on an IFR flight plan immediately after takeoff from an airport. SIDs provide a common departure procedure that considers terrain and obstacle avoidance, noise abatement (if necessary), and other airspace management considerations.

ALB has one SID for departing IFR aircraft. The SID, identified as *ALBANY SEVEN*, instructs aircraft to maintain runway heading after departure and expect ATC to advise the radar vectors to the assigned departure. Additionally, ALB utilizes Special Take-Off Minimums/Departure Procedures in order to avoid obstacles. As outlined within FAA Advisory Circular 150/5300-13A and Engineering Brief 99A, evaluation of obstacles within the 40:1 runway Departure Surface may impact design of a SID.

2.2.1.4 Airfield Lighting

In addition to the visual aids previously described, lighting on the airfield includes the rotating beacon, Precision Approach Path Indicator (PAPI) lights, runway threshold lighting, runway edge lighting, Runway End Identifier Lights (REILs), runway centerline lights, Runway Touchdown Zone Lights (TDZLs), taxiway edge lighting and apron lighting. Each of the lighting systems/types are described below.



Rotating Beacon:

The rotating beacon functions as the universal indicator for locating an airport at night or during IFR conditions. For a civilian airport, it has one clear and one green lens 180-degrees apart and is generally visible 10 miles from the airport. The rotating beacon at ALB is located on top of the Air Traffic Control Tower. Location of an airport's rotating beacon is indicated via a start on the airport diagram.

Precision Approach Path Indicator Lights:

Precision Approach Path Indicator Light (PAPI) systems are located near runway ends to provide visual glideslope guidance information during an approach to the runway. PAPI system can consist of either two- or four-light units that are angled to inform aircraft if they are above, below, or on the correct approach glidepath. Glidepath aiming angles for PAPIs can vary based upon terrain and obstacles but are generally less than four-degrees for runways serving turbine aircraft. PAPIs have an effective visual range of at least three miles during the day and up to 20 miles at night. Runways 1, 19, and 28 are equipped with PAPI-4 (four-light unit) systems.

Runway End Identifier Lights:

Runway End Identifier Lights (REILs) are located at the corners of the runway end and consist of a pair of white, unidirectional flashing lights pointed outward into the approach corridor. Similar to an ALS, REILs provide identification of the runway environment during low visibility conditions at nighttime. Both Runway 10 and 28 are equipped with REILs.

Runway Threshold Lighting:

Runway threshold lighting indicates the approach and stop ends of runways at night by emitting green light outward from the runway (approach end) and red light inward toward the runway (stop end). The green lights indicate the landing threshold to arriving aircraft, whereas the red lights indicate the end of the runway for departing aircraft. The red and green lights are usually combined into a single, split lens fixture to emit the desired light in the appropriate direction. For displaced thresholds, the red and green lights are in separate fixtures. The fixtures containing the green lights are positioned at the displaced threshold, while the fixtures containing the red lighting are located in the area before the threshold. At ALB, Runways 1, 19, and 10 have standard runway threshold lighting. Runway 28 has a 1,192-foot displaced threshold; thereby utilizing a displaced threshold lighting system.

Runway Edge Lighting:

Runway edge lighting is white in color and is used to outline the edges of a runway during periods of darkness or restricted visibility. The runway edge lights are positioned parallel to the runway centerline 10 feet from the edge of the full-strength pavement. The spacing of the light units must not exceed 200 feet. These systems are classified according to their intensity, or brightness: High-Intensity Runway Light (HIRL), Medium-Intensity Runway Light (MIRL), and Low-Intensity Runway Light (LIRL). Runway 1-19 is equipped with a HIRL, while Runway 10-28 is equipped with a MIRL system.

Runway Centerline Lights:

Runway centerline lights are required for Category (CAT) II and III precision approach runways, as well as CAT I approaches with Runway Visual Range (RVR) operations less than 2,400 feet. The lighting system consists of embedded lights located along the centerline at 50-foot, equally spaced, longitudinal intervals. The lights are white in color, except for the last 3,000 feet. Between 3,000 feet to 1,000 feet of remaining runway, the centerline lights consist of alternating red and white lights, with the last 1,000 feet being all red. Both Runway 1-19 and 10-28 have runway centerline lights.

Runway Touchdown Zone Lights:

The runway Touchdown Zone Lights (TDZLs) indicate the touchdown zone when landing under low visibility conditions and at night. The TDZLs consist of two rows of white lights beginning 100 feet beyond the landing threshold and extend to 3,000 feet beyond the landing threshold or to

the midpoint of the runway, whichever is less. All ALB runways have touchdown point markings, but only Runway 1-19 has TDZLs.

Taxiway Edge Lighting:

Taxiway lighting delineates the taxiway's edge and provides guidance to pilots during periods of low visibility and at night. The most commonly used type of taxiway lighting is a series of blue fixtures, which are sometimes supplemented by blue edge reflectors, set at 200-foot intervals along the taxiway edges, but not more than 10 feet outward from the edge of the full-strength pavement.

2.2.1.5 Aprons

Airport aprons, also referred to as ramps, provide space for short-term and long-term aircraft parking and deicing operations, as well as the loading/unloading of passengers and goods. ALB has six aprons: a terminal apron, a New York State Police apron, a New York Army National Guard apron, a cargo apron, and two general aviation aprons.

Terminal Apron

The terminal apron consists of approximately 1,500,000 square feet of cement/concrete pavement. Activities on the terminal apron primarily include passenger airline and belly cargo loading and unloading. The terminal has 18 gate positions.

General Aviation Apron

The GA apron is contiguous with the terminal apron to the south as delineated by a red "Secured Area" pavement marking. The apron is approximately 550,000 square feet, providing 12 designated tie-downs and additional Remain Overnight parking for transient aircraft.

Air Cargo Apron

The air cargo-dedicated area, which is shared by FedEx, UPS, and Mobil Air Transport, is serviced by one apron of approximately 370,000 square feet and is located in the northern portion of the airfield. The apron provides nine designated aircraft parking spots is used for cargo transfer operations, and aircraft storage and maintenance.

Table 2-4 – Existing Apron Areas

Apron Area		Approximate Size (SF)
Terminal Apron	Main Passenger Terminal Complex	1,500,000
General Aviation Apron	Million Air 9FBO) Air Rescue & Fire Fighting	550,000
Air Cargo Apron	FedEx/UPS/Mobil Air Transport	370,000

Source: ALB Airport Management, CHA, 2019.

2.2.2 Landside Inventory

Regional Roadway Access

Access to ALB is provided from and to the south, east, and north via a newly constructed interchange number three with Interstate 87, the Northway. This interchange, which opened in November 2019, provides direct access to Albany-Shaker Road, along which are the Airport entry and exit roadways. Albany-Shaker Road can also be accessed from the west via New York State Route 7.

Curbside Roadways

Two curbside roadways provide passenger unloading and loading space adjacent to the terminal building. The four-lane inner roadway is comprised of a southern portion intended for passenger drop-off activities and a northern portion intended for passenger pickup activities. Commercial vehicles access the two-lane outer roadway via revenue control access gates with AVI equipment.

Public Parking Facilities

Airline passengers park at ALB in either the passenger terminal area or in a remote surface lot, known as Lot E, accessed via Albany-Shaker Road south of the airfield. One off-airport parking facility also exists, known as Colonial Parking. Within the terminal area, short-term parking is provided in the garage, while long-term parking is provided in the surface parking lots south and east of the garage. A second garage east of Airport Terminal Road was recently opened in March 2020. **Table 2-5** shows the capacity and maximum daily rate of the various parking products offered, along with their status as of February 2021, at the time of this inventory. A cell phone lot with approximately 25 spaces is located along northbound Albany-Shaker Road.

Table 2-5 – Public Parking Facilities

Facility	Capacity (spaces)	Maximum Daily Rate	Status as of February 2021
Short-Term	222	$24	Open
Garage	1912 North 1000 South	$10	Open
Long-Term	1278	$6	Closed
Valet	200	Same as long-term	Closed
Lot E	???	N/A	Closed

Source: ALB Airport Management, CHA Team, 2021.

Rental Car Facilities

The Airport is served by Avis, Budget, Enterprise, Hertz, National/Alamo, and Dollar rental car companies. Counters are located inside the passenger terminal building with additional kiosks in the ready/return area of the north garage. Customers both pick up and return rental cars on the ground level of the North Garage. Vehicles are serviced on sites located to the north of Runway 10, along Old Albany-Shaker Road.

2.2.3 Passenger Terminal Facilities

Albany International Airport's Passenger Terminal Building is a three-level terminal which currently serves all commercial airlines operating at the airport. While functioning as a single terminal, the building is composed of three primary components built over separate building campaigns. The oldest portion, Concourse A, was built in 1979 as an addition to the 1959 terminal. The 1959 terminal was replaced by the current Terminal Building in 1998 and its associated Concourse B. The facility was expanded two years later in 2000 with expansion of Concourse C. Passenger and baggage processing is located on Level 1 along with back-of-house and apron support. Level 2 contains security and the airside concourse (and access to the level 1 ground-load gates). Airport offices and a public observation deck are located on Level 3. A breakdown of the terminal areas is summarized in **Table 2-6.**

Figure 2-4 – Albany International Airport Terminal Components

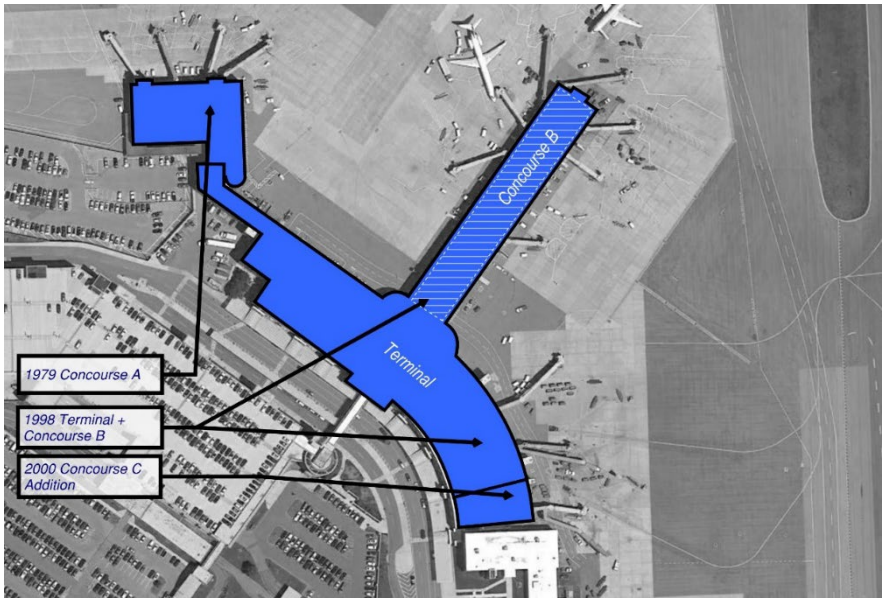


Table 2-6 – Terminal Program Areas (rounded to nearest hundred)

	Arrivals Level	Departures Level	Mezzanine Level	*TOTAL*
Airport Ops	8,700sf	1,000sf	3,300sf	***13,000sf***
Airline Ops	20,400sf	---	---	***20,400sf***
Other Ops	1,800sf	---	300sf	***2,100sf***
Support + MEP	17,900sf	16,000sf	5,200sf	***39,100sf***
Inbound Baggage	7,600sf	---	---	***7,600sf***
Baggage Makeup	15,400sf	---	---	***15,400sf***
Baggage Claim	10,600sf	---	---	***10,600sf***
Circulation	35,200sf	17,300sf	8,600sf	***61,100sf***
Restrooms	3,900sf	6,400sf	800sf	***11,100sf***

Concessions	1,100	24,800sf	---	***25,900sf***
Ticketing	6,100sf	---	---	***6,100sf***
Security Screening	6,000sf	4,100sf	1,000sf	***11,100sf***
Holdrooms	6,200sf	23,700sf	---	***29,900sf***
TOTAL	***140,900sf***	***93,300sf***	***19,200sf***	***253,400sf***

Figure 2-5 – Existing Level 1

Passenger Check-In Area

The Passenger Check-In Hall is located on the eastern end of Level 1 and consists of 60 check-in positions at 30 podiums. Baggage take-away belts run along the back wall parallel to and behind the podium line. The banks of six podium positions on either end are each served by a single belt while the remaining 18 podiums have six belts serving three podiums each. Airline offices are located behind their respective podiums with their bag screening and make-up areas beyond. Each take-way belt leads directly to an in-line screening device serving that line. Currently, there

is no ability to divert bags from one line to another to provide redundancy during maintenance or downtimes.

Figure 2-6 – Check-In Hall Looking East

The center of the building contains the elevators, escalators, and stairs which lead to/from security and the airside gates on Level 2 above. The eastern escalators and stair are situated opposite the three westernmost check-in podiums (currently American Airlines). This creates a significant circulation constraint and results in crowding situations during peak times. A small concession unit is provided along the exterior wall (currently housing the Mario and Matilda Cuomo Pavilion) with male and female public restrooms (each with 13 fixtures) accessed at the back wall.

Baggage Claim Area

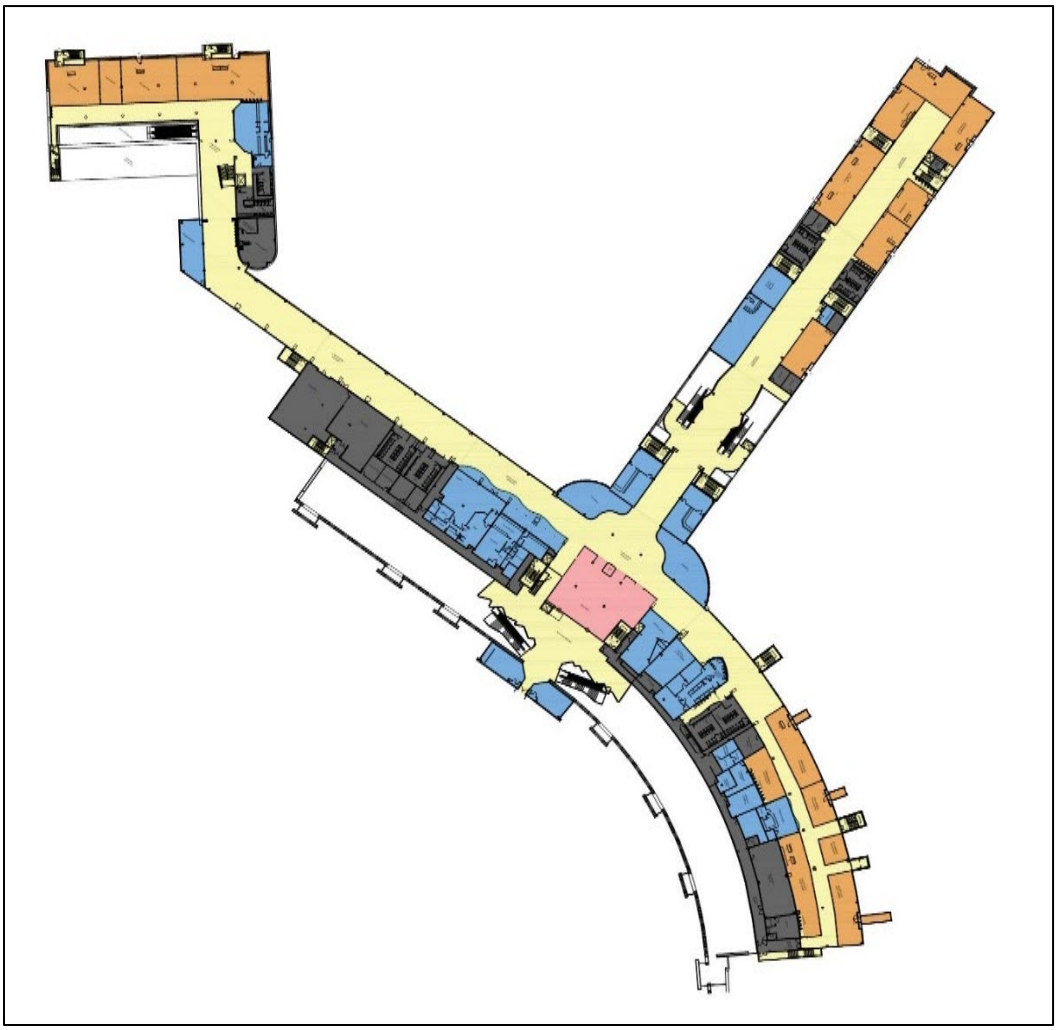
The double-height Meeter/Greeter Hall and adjacent single level Baggage Claim Hall are located at the western end of the Level 1 processor. Baggage Claim provides three flat-plate thru-wall devices with 130-foot presentation length each. Rental car counters line the exterior wall sitting between the three vestibules while Bag Services Offices are situated on either side of the hall.

During tenant interviews it was noted that these offices are undersized for their current functions. The depth of the hall is approximately 90-feet from back wall to face of the rental car counters. While glass walls within the tenant spaces do allow for some visibility, the Rental Car Counters obstruct views between curbside and the interior, resulting in a potential reliance on signage for wayfinding rather than direct lines of sight to the curb providing intuitive wayfinding.

Figure 2-7 – Baggage Claim Hall Looking West

To the west of Baggage Claim, beyond the Baggage Services Offices is the loading dock and servicing areas. The dock has two uncovered bays leading directly to a receiving area and service elevator.

Figure 2-8 – Existing Level 2

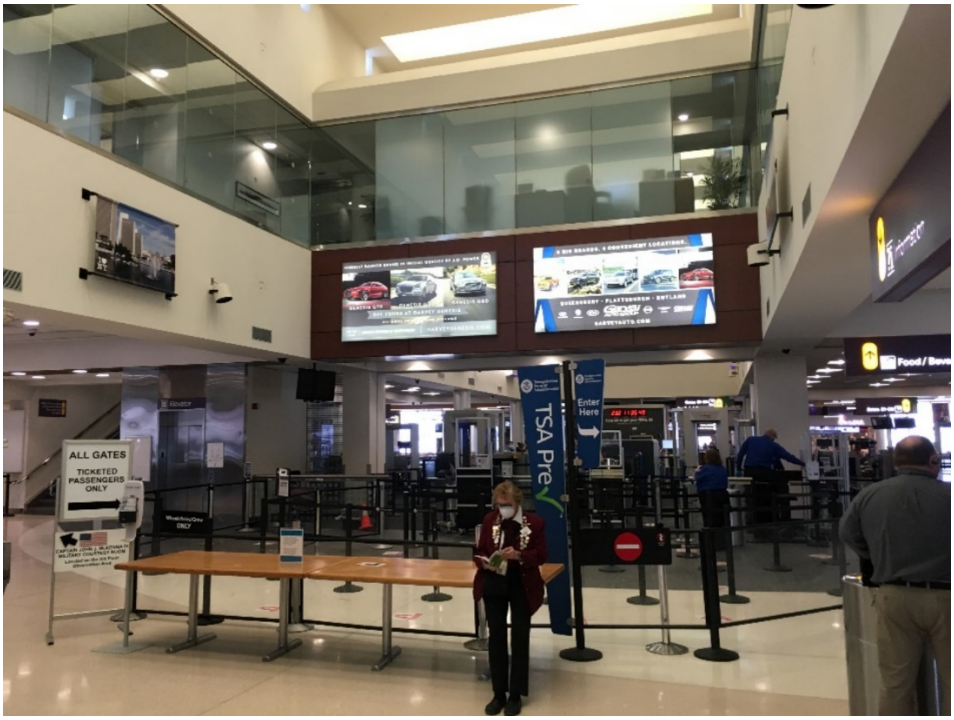


Passenger access to Level 2 airside is through the central Security Screening Checkpoint. With escalators and stairs leading to/from both Check-In and Baggage Claim, to the Meeter/Greeter area on the left side of the Checkpoint. This small pre-security zone is a balcony or mezzanine overlooking the two halls below. This area also connects directly to the parking garage via a bridge, the entrance to which is framed by two concession units. While their location at the top of the escalator/stair pairs and at the entrance to the bridge provides visibility and footfall, this concentration of flows creates a potential moment of crowding and obstruction. In addition, at peak overflow times, flows may conflict as passengers entering from the garage make their way to the escalators to reach the Check-In Hall below.

Security Checkpoint

The 6-lane Security Screening Checkpoint is situated on Level 2 at the center of the terminal and leads directly to the majority of gates. While this location reduces average walking distances and eases wayfinding, the checkpoint does have several significant concerns. The Checkpoint is bounded to the east and west by vertical circulation and mechanical cores which may inhibit checkpoint growth. To the south, the balcony offers minimal queue area resulting in overflow down the escalators to Level 1 below. These factors may impact the overall future resiliency of this space should additional lanes or larger equipment be required. The Airport is currently advancing a terminal expansion project that will address the Level 2 space constraints and will be discussed in more detail in the Alternative Development chapter.

Figure 2-9 – Presecurity Looking Towards Checkpoint



Terminal Concourses

The entirety of the sterile passenger terminal facility is located on Level 2. To either side of the security checkpoint is a continuous band of concessions and support spaces which run along the entire length of the Terminal. This sits between the double-height spaces along landside and the continuous band of holdrooms and circulation that run along the airside façade. To each side of the checkpoint, continuous service corridors provide access to back-of-house spaces (MEP and support) and concession units. The eastern band contains the holdrooms serving the three

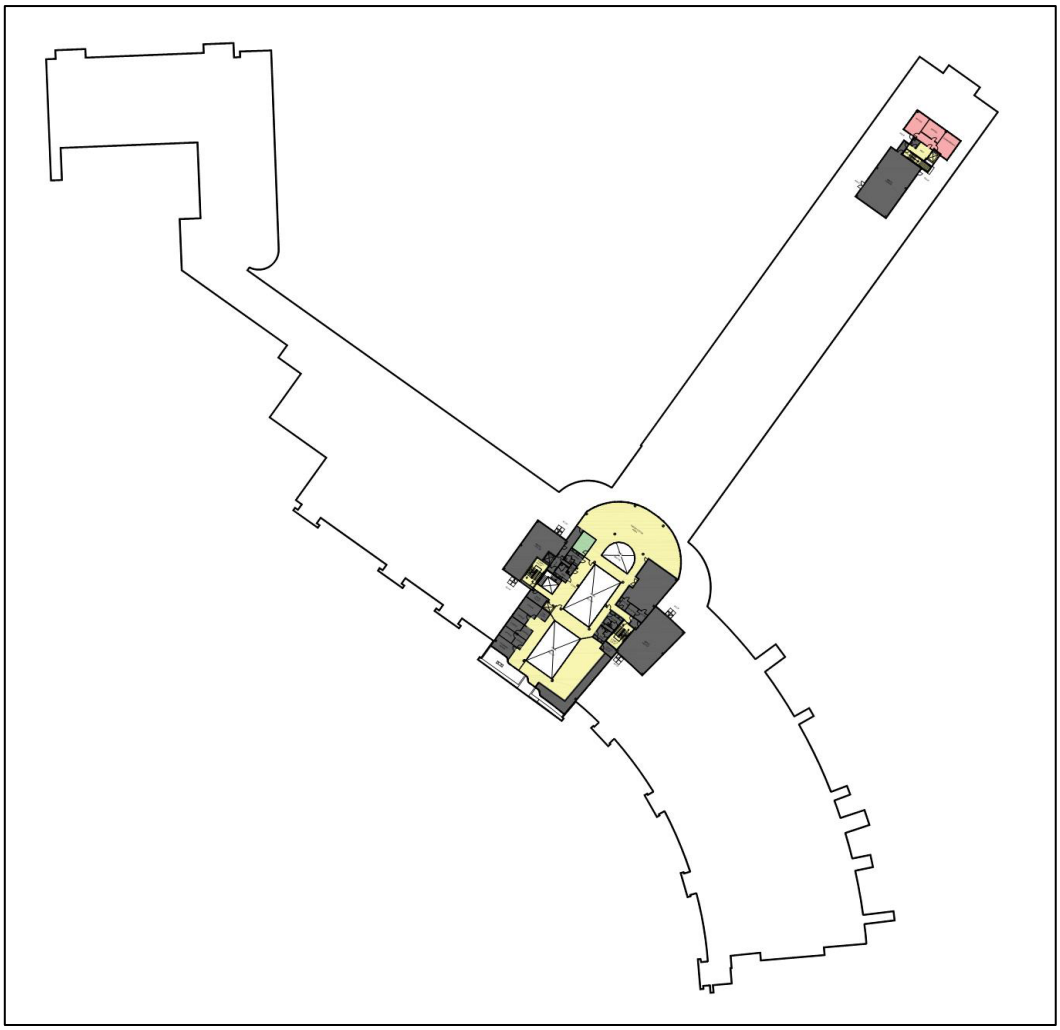
contact C-Gates. The western band provides a public circulation zone used to access Concourse A. Two banks of male and female restrooms are located on either side of security.

Concourse B sits perpendicular to the landside portions of the terminal and is axially aligned with the security checkpoint. At the base of the concourse, directly opposite the checkpoint, is a recently renovated marketplace area including concessions and general purpose seating. This arrangement provides those concessions with maximum exposure through the 100% footfall generated by all passengers entering airside at this one location. From this one spot, wayfinding is simplified by three primary choices: A-Gates, B-Gates, or C-Gates. However, this simplicity is the result of the location of security to the south of the circulation zone and might be impacted should security be expanded to the north. This location experiences congestion during peak passenger activity.

The concourse is laid-out in a traditional double-loaded fashion, with a central circulation zone and gates and concessions/support lining either side. Seven contact gates are clustered around the end of the pier. Additional gate capacity is provided by the ground-load holdrooms accessed via vertical circulation to either side at the neck of the concourse. Restrooms are located between the contact and ground-load holdrooms with male and female facilities. Additional public restrooms are located in the ground-load holdrooms.

Concourse A is located at the western end of the terminal and is accessed via an airside circulation zone. The concourse has four contact gates accessed from a consolidated holdroom area. Between the holdroom and the circulation to Concourse B are two concession units, one located adjacent to the holdroom area and another at the entrance to the connector to B. A restroom block provides five fixtures each for men and women.

Figure 2-10 – Existing Level 3



Miscellaneous Terminal Facilities

At the center of the terminal, located above the security checkpoint, a small Level 3 area provides offices for the Airport as well as a public observation area. Open wells at this level, offer views to Level 2 below. Two public restroom blocks (each with a male and female restroom) provide a total of four female fixtures and five male fixtures. An additional small penthouse area above the end of Concourse B contains MEP as well as a small TSA office space. Additional TSA offices, support, and ground-load holdrooms are located throughout Level 1: below Concourse B, at the center of the Terminal Building, and below Concourse A in two separate locations.

2.2.4 Inventory of Support Facilities

Support facilities provide vital functions related to the overall operation of the Airport, and typically include facilities related to: air cargo, GA/FBO, aircraft refueling and deicing, aircraft rescue and fire fighting (ARFF), and airfield maintenance.

Air Cargo Facilities

The cargo ramp is located on the northeast quadrant of the airfield. The 370,000 square foot apron and 70,000 square foot hangar are shared by FedEx, UPS, and Mobil Air Transport.

General Aviation Facilities

Million Air is ALB's sole Fixed Based Operator, operating from their terminal complex on the GA apron located in the Southwest quadrant of the airport. Additionally, they operate three hangars: two on the GA apron and one in the Northwest quadrant.

The Albany County Airport Authority (ACAA) manages 4 T-Hangar facilities equipped with self-serve AvGas on the Southeast quadrant of the airfield

Aircraft Refueling Stations

Million Air is responsible for fuel services at ALB via the fuel farm located in the Northwest quadrant of the airfield. Both Jet-A and Avgas fuel is stored one of the nine tanks. Additionally, a self-service Avgas facility is located in the T-Hangar complex in the Southeast quadrant for GA use.

Aircraft Rescue and Fire Fighting Facilities

ARFF vehicles are designed to provide an invaluable service to the commercial and private users of the Airport and the passengers and cargo they transport to ensure continuous safety of passengers, pilots, and ground crew. The requirements of ARFF equipment and facilities for a specific airport are determined using the metrics described in Title 14 CFR Part 139.315, *Aircraft Rescue and Firefighting: Index Determination*. ALB operates as an ARFF Index E, which exceeds the requirements based on daily operations due to its role as a dedicated diversion airport for John F Kennedy International Airport located in New York City. Currently, the ARFF facility is equipped with three 3,000 gallon capacity airfield firefighting trucks and additional utility vehicles for firefighting on landside facilities (i.e. passenger vehicle parking garages).

The ARFF facility is located in the Southwest quadrant on the GA Apron.

Airfield Maintenance Facilities

Maintaining the airfield to ensure safe and continuous use is of utmost importance. ALB has a dedicated airfield maintenance building and garage located in the Northeast quadrant adjacent to the Control Tower. Additional storage facilities for vehicles and sand (for winter conditions) can be found in the Southwest and Northwest quadrant.

2.3 Inventory of Operations, Airspace, and ATCT Procedures

In addition to facilities, the Master Plan accounts for how the airport is operated and used in order to better understand and address any areas of concern that will ultimately guide the design and development of the future alternatives.

2.3.1 Air Traffic and Passenger Activity

An aircraft operation is defined as either a landing or a takeoff. Thus, each flight includes at least two operations; one takeoff and one landing. According to data provided by the Air Traffic Control Tower, there were approximately 75,000 annual operations at ALB in 2019, which amounts to an average of 100 landings per day. Of that total, itinerant and local operations were approximately split 80-20 respectively. Local flights are conducted mostly by based aircraft, and primarily include single- and multi-engine piston aircraft conducting training and recreational flights. Itinerant operations (i.e., those arriving from outside of the local area) are conducted by a mix of based and transient or visiting aircraft, namely from commercial service.

Passenger enplanements is defined as a boarding of an aircraft by a revenue passenger for a commercial service flight, air taxi flight, or private charter flight. According to the FAA Terminal Area Forecast, ALB has a total of approximately 1,500,000 enplanements.

2.3.2 Airfield Use

Wind Data

A factor influencing the infrastructure requirements on airfield are the local weather conditions and their effect on both airport operations and capacity. Wind conditions affect all airplanes in varying degrees, generally the smaller the airplane, the more affected its operations are by wind, particularly crosswind components. As such, crosswind components of airfields are evaluated based on FAA guidelines of 10.5, 13, 16, and 20 knots, considering the aircraft types and each individual runway.

Based on the aircraft types and their corresponding Runway Design Code operating at ALB (see **Table 2-10**), the following crosswind components are applicable (per FAA Advisory Circular 150/5300-13A):

- Light single and twin-engine (A/B-I) = 10.5 knots
- Turboprop aircraft and light jets (A/ B-II) = 13 knots
- Corporate & Regional Jets (A/B-III, C/D-I thru C/D-III) = 16 knots
- Commercial Jets (all AAC E and all ADG IV) = 20 knots

Furthermore, wind data is evaluated under All Weather (AW), Visual Flight Rules (VFR), and Instrument Flight Rules (IFR) conditions. Per FAA, for a runway to have adequate wind coverage,

it must have a 95% wind coverage for the aircraft accommodated. Should a runway fall below 95%, a crosswind runway may be necessary for safety of operations at the airport.

This study utilizes weather observations for the period of 2010 to 2019 recorded by the Automated Weather Observing Station (AWOS) and are the basis of the wind rose analysis. **Table 2-7** lists the wind coverage for the runways at ALB. Both runways provide similar coverage, providing the desired wind coverage of 16 knots for the large commercial jet aircraft operating at ALB. As shown in the table, both runways provide 99.6% all-weather wind coverage for a 16-knot crosswind component.

Runway 1-19 provides slightly better wind coverage during fair weather or VFR conditions, and during inclement or poor weather conditions Runway 10-28 is the preferred runway from a wind standpoint.

Table 2-7 - Wind Data

	Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
AW	1-19	90.26%	94.16%	97.80%	99.50%
	10-28	90.40%	94.49%	98.07%	99.48%
	All Combined	96.70%	98.76%	99.64%	99.93%
VFR	1-19	89.15%	94.40%	98.57%	99.68%
	10-28	90.24%	94.34%	98.09%	99.54%
	VFR Combined	96.76%	98.87%	99.72%	99.96%
IFR	1-19	87.36%	92.21%	96.35%	98.84
	10-28	91.17%	95.22%	98.05%	99.25%
	IFR Combined	96.56%	98.36%	99.29%	99.80%

Source: NOAA National Climatic Data Center (Albany International Airport 2010-2019), CHA, 2020.

2.3.2.1 Runway Designations

The FAA classifies each airport runway as either primary, crosswind, secondary, or additional as per the ***Airport Improvement Program (AIP) Handbook***, FAA Order 5100.38D. All but 'additional' runways are eligible for FAA funding.

Table 2-8 – Primary Runway Determination Factors

Potential Primary Runway Criteria	Runway 1-19	Runway 10-28
Runway Length	8,500'	7,200'
Runway Width	150'	150'
Runway Utilization*	49% estimated	51% estimated
Approach Capabilities	ILS (1/2 mile – 200' DH)	RNAV LPV (1 3/4 mile, 400' MDA)
Hourly Capacity	XX	XX
Proximity to Facilities	Good	Good

*Based on wind data.

The above data are used in the primary runway determination; however, the FAA does not provide a specific formula or rubric to identify the primary vs crosswind or secondary runway.

- **Runway 1-19** provides a longer length and the only ILS.

- **Runway 10-28** provides slightly better crosswind coverage during IFR conditions.

While all runways provide the necessary ≥95% wind coverage for the larger Group C commercial aircraft, only Runway 10-28 provides the 95% wind coverage for smaller Group A and B general aviation aircraft. As such, per FAA Order 5100.38D, a crosswind runway is justified to serve the lighter aircraft.

It is noted that while Runway 1-19 has a slightly lower runway usage from a wind perspective, the longer length combined with the available ILS designated it as the primary runway; with Runway 10-28 as the crosswind runway.

Table 2-9 – ALB Current Runway Designation

Runway	Classification
Runway 1-19	Primary
Runway 10-28	Crosswind/Secondary

2.3.2.2 Runway classification by aircraft category

The FAA uses a classification system, known as the Airport Reference Code (ARC), to signify the airport's highest Runway Design Code (RDC), the design standards to which the runway is to be built. RDC consists of three components:

- aircraft approach speed (AAC),

- airplane design group (ADG) relating to either the aircraft wingspan or tail height (whichever is more restrictive), and
- visibility minimums.

The overall ARC is determined by taking the highest RDC minus the visibility component. ARC affects runway and taxiway dimensions, separation standards, pavement marking standards, and other safety standards. Furthermore, it is used for airport planning and design but does not limit the aircraft that may be able to operate safely at the airport. The relationship between the ARC and design standards is further detailed in FAA AC 150/5300-13A, *Airport Design* and summarized in **Table 2-10**. Based on the FAA Traffic Flow Management System Count (TFMSC) Data and airport flight schedule, ALB is currently designated with an ARC C-IV, with over 1,500 annual Boeing 757 operations. Consequently, ALB falls under the standards outlined forRDC C-IV-1200 on Runway 1/19 and C-IV-5000 on Runway 10/28.

Table 2-10 – FAA Airport Reference Code Classification

Approach Categories			
Approach Category	**Airspeed (Knots)**		**Example Aircraft**
A	<91		Cessna 152
B	91 ≤ 121		Citation X
C	121 ≤ 141		Gulfstream 450
D	141 ≤ 166		Boeing 757
E	166+		B-2 Spirit
Airplane Design Group			
Design Group	**Tail Height (feet)**	**Wingspan (feet)**	**Example Aircraft**
I	<20	<49	Piper Cherokee
II	20-<30	49 ≤ 79	King Air B250
III	30-<45	79 ≤ 118	Gulfstream 550
IV	45-<60	118 ≤ 171	Boeing 757
V	60-<66	171 ≤ 214	Boeing 747
VI	66-<80	214 ≤ 262	Airbus A380
Visibility Minimums			
RVR	**Instrument Flight Visibility Category (statute mile)**		
5000	Not lower than 1 mile		
4000	Lower than 1 mile but not lower than ¾ mile		
2400	Lower than ¾ mile but not lower than ½ mile		
1600	Lower than ½ mile but not lower than ¼ mile		
1200	Lower than ¼ mile		

Source: FAA AC 150/5300-13A *Airport Design*, CHA, 2019.

3 Forecast

3.1 Introduction

This report describes the forecasts of future aviation activity at Albany International Airport (ALB or the Airport) that will be used to guide the Master Plan Update (Master Plan) process. Activity forecasts represent critical inputs to the Master Plan as they are used to determine the required level of airport facility development needed to accommodate expected levels of future demand. The forecasts for this Master Plan have been prepared using the base fiscal year of 2019 and cover a 21-year planning horizon (2019 to 2040). Note 2019 was used as the base year, rather than 2020, due to the decline in aviation activity in 2020 resulting from the COIVD-19 pandemic, however the 2020 activity levels are considered in this forecast.

The purpose of this chapter is to describe the analysis conducted and rational behind adopting the 2020 Terminal Area Forecast (TAF) produced by the Federal Aviation Administration (FAA) for use as the forecast of enplanements, operations and based aircraft for the Master Plan. The TAF is produced annually and the information in this forecast chapter is based on the draft 2020 TAF which was distributed to the Airport in November 2020. The Airport and Master Plan Team understand and considered the methodologies used to develop the TAF for ALB when considering its use in this Master Plan. This Forecast chapter will validate the reasonableness of the TAF and appropriateness for use in the Master Plan.

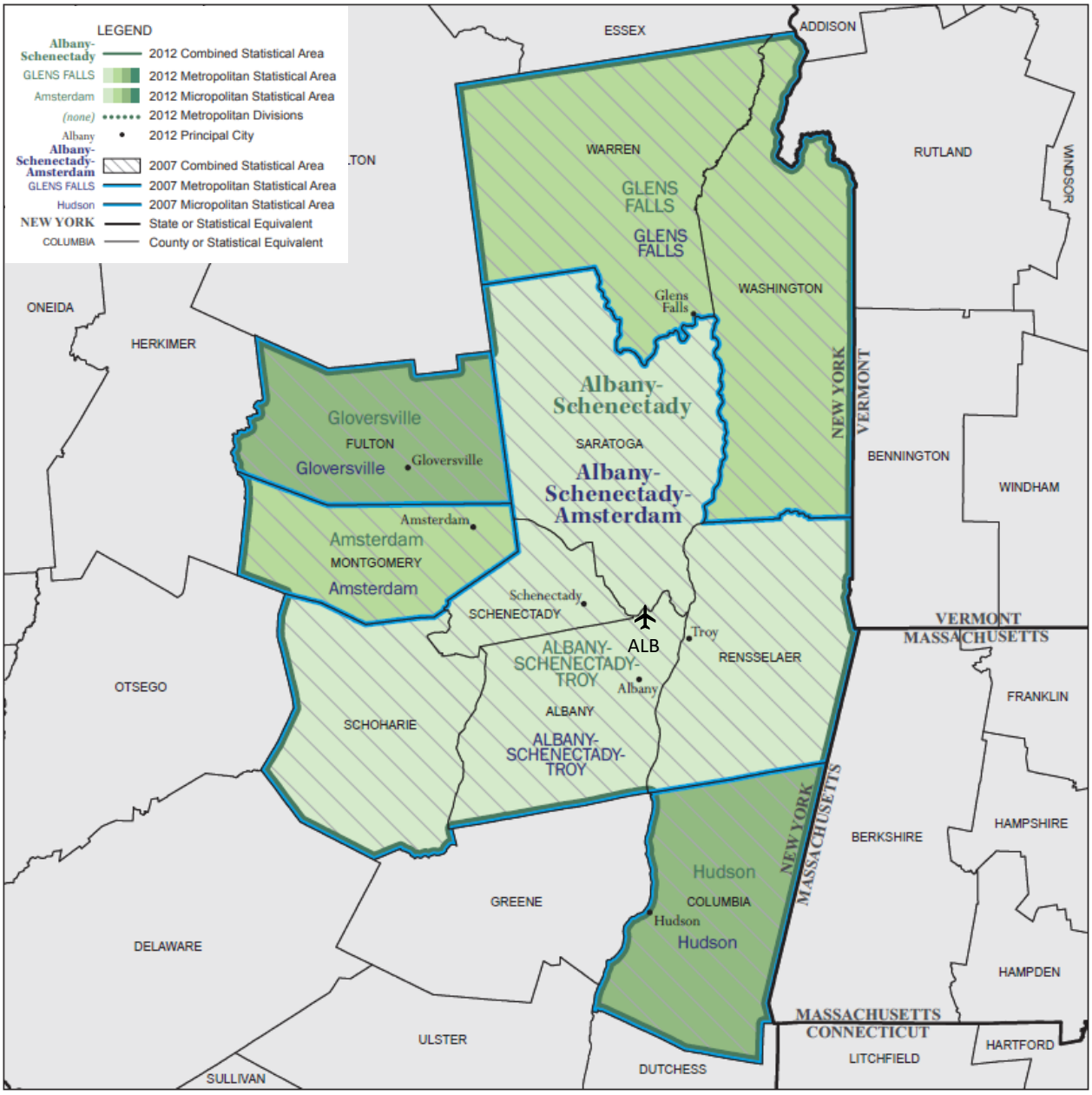
The forecast also includes projections out to 2045 for information purposes. The recovery from the pandemic is anticipated to take up to five years. However, activity recovery rates are uncertain with factors like vaccine distribution, future business travel, and other lasting impacts of the pandemic. Providing an additional five years of activity projections may help to better inform the facility requirements if a quicker long-term recovery were to occur.

Key activities measured in the forecast include commercial airline passenger enplanements, commercial aircraft operations, cargo, based aircraft, and general aviation (GA), air taxi/commuter, and military operations.

3.2 Socioeconomic Review of the Albany Market Area

A review of historical and projected socioeconomic data for the Airport market area is helpful to support the aviation demand forecast. The Albany International Airport market area consists of the Albany-Schenectady-Troy Metropolitan Statistical Area (Albany MSA or MSA). The MSA is in upstate New York and includes the cities of Albany, Schenectady, Troy, and Saratoga Springs. According to the US Office of Management and Budget and MSA includes the counties of Albany, Saratoga, Schenectady, Schoharie, and Rensselaer. **Figure 3-1** shows the counties within the MSA along with the location of Albany International Airport.

Figure 3-1 - Albany-Schenectady-Troy MSA Statistical Area Map



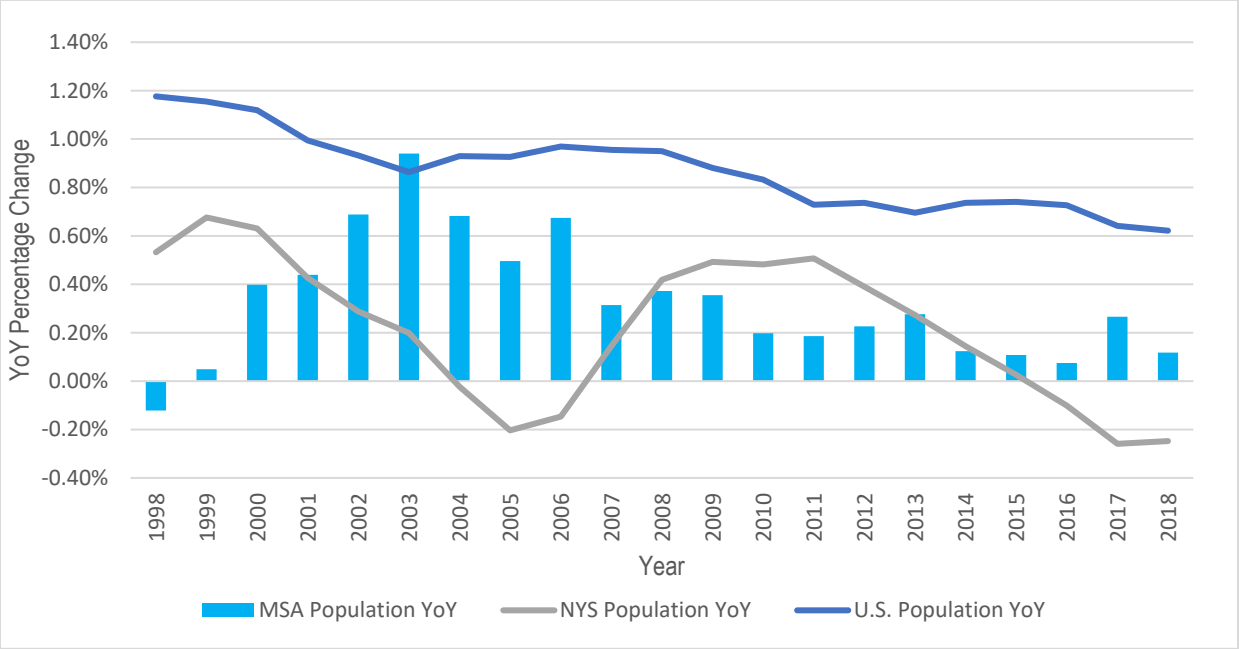
Source: www.census.gov.

3.2.1 Population

As of 2018, the population of the Albany-Schenectady-Troy MSA represents 4.4 percent of the total New York state population and approximately 0.3% percent of the total U.S. population. According to Woods and Poole's 2018 estimates, the MSA had a population of approximately 883,000. Between 2008 and 2018, the MSA population increased an average of 0.5 percent per year and has been growing ahead of the rate of the rest of New York State but less than the U.S., which grew 0.2 percent and 1.0 percent per year, respectively, during the same ten-year period,

as shown in **Figure 3-2** Figure 3-2 - Historic Annual Population Percentage Growth (CY 1998-2018)**.**

Figure 3-2 - Historic Annual Population Percentage Growth (CY 1998-2018)



Source: Woods and Poole Economics, 2020

Over the next ten years, the population growth in the MSA and for the State of New York is forecast by Woods and Poole to increase at a compound annual growth rate (CAGR) of approximately 0.3 and 0.2 percent respectively, which is slightly behind the anticipated U.S. compound growth rate of 0.6 percent, from 2018 to 2038. By 2038, the MSA's share of the total state population is expected to increase slightly from 4.5 percent today to 4.6 percent by 2038, as shown in **Table 3-1.**

Table 3-1 - Historical and Forecast Population Growth (CY 1998-2038)

	Historical			Forecast	
	1998	2008	2018	2028	2038
Population (000s)					
Albany-Schenectady-Troy MSA	824	866	883	908	923
New York	18,756	19,212	19,542	19,914	20,101
United States	275,854	304,094	327,168	348,771	369,119
Albany-Schenectady-Troy MSA Share					
% of New York	4.4%	4.5%	4.5%	4.6%	4.6%
% of United States	0.3%	0.3%	0.3%	0.3%	0.3%

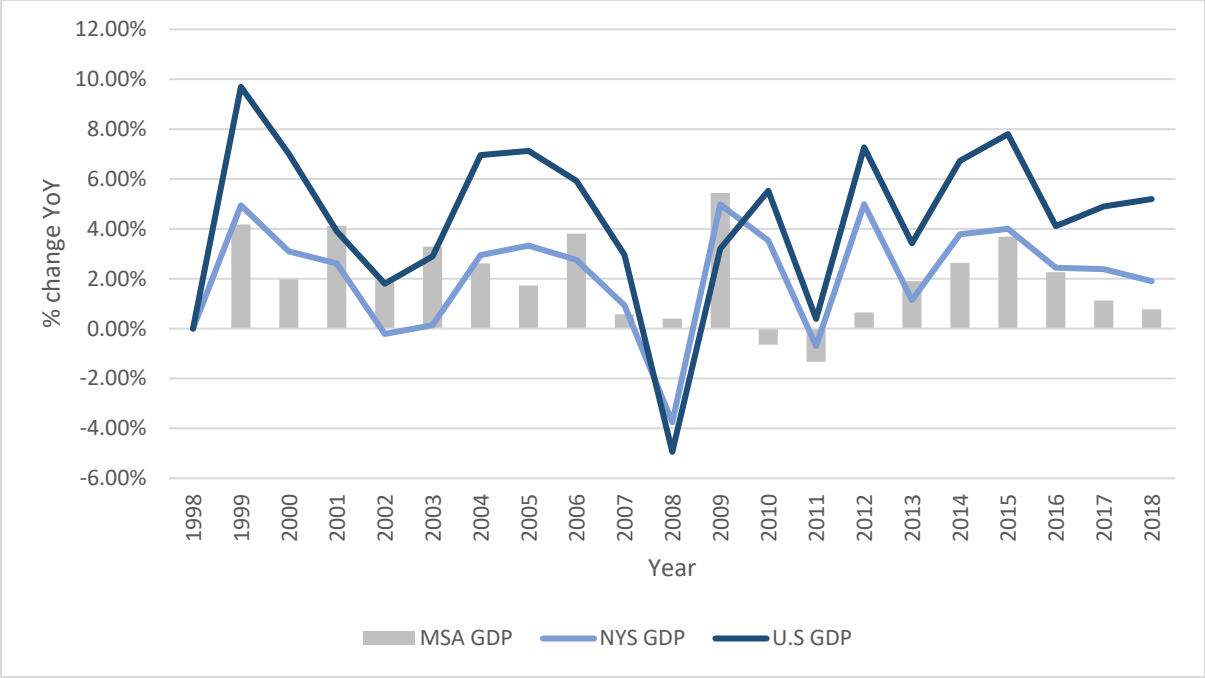
Compound Annual Growth	10 Year (2008-2018)	20 Year (2008-2028)	10 Year (2018-2028)	20 Year (2018-2038)
Albany-Schenectady-Troy MSA	0.5%	0.4%	0.3%	0.2%
New York	0.2%	0.2%	0.2%	0.1%
United States	1.0%	0.9%	0.6%	0.6%

Source: Woods and Poole Economics, 2020

3.2.2 Gross Regional Trends and Forecast

Figure 3-3 shows historical Year-over-Year (YoY) Gross Domestic Product growth for the Albany-Schenectady-Troy MSA (also known as Gross Metropolitan Product or GMP), the State of New York, and the United States between 1998 and 2018. GMP growth within the MSA historically lagged the U.S. and State percentage growth; however, was not hit as hard in 2008 recession as the rest of the country or the State. Overall, between 2008 and 2018, the MSA GMP grew at a compound annual growth rate (CAGR) of 1.6 percent, compared to 2.0 percent GDP growth for the nation. Over the next 10 and 20 years, Woods and Poole Economics projects that the MSA GMP will grow at rates slightly below the national average. The GMP is expected to grow at a CAGR of 1.5 percent between 2018 and 2028 and by 1.6 percent between 2018 and 2038, as shown in **Figure 3-3**.

Figure 3-3 - Historic Annual GDP/GMP Growth (CY 1998-2018)



Source: Woods and Poole Economics, 2020

3.2.3 Employment Trends

Employment in the MSA in 2018 totaled 577,600 which is 4.6 percent of the State of New York and 0.3 percent of the U.S. total employment. Woods and Poole projection suggest that employment in the MSA will grow at CAGR of 0.9 percent over the next ten years (2018 to 2028) and 0.8 percent over the next twenty years (2018 to 2038). This represents a slightly lower CAGR than the State of New York and U.S over the same timeframes. **Table 3-2** provides a summary of the employment projections.

Table 1.2 – Historical and Projected Employment

	Historical Employment (000s)			Forecast Employment (000s)	
	1998	2008	2018	2028	2038
Albany-Schenectady-Troy MSA	500.4	543.9	577.6	634.6	677.7
New York	9,901.4	11,197.7	12,692.6	14,361.6	15,745.6
United States	158,481.3	179,213.9	200,746.0	229,400.9	255,750.5
Albany-Schenectady-Troy MSA Share					
% of New York	5.1%	4.9%	4.6%	4.4%	4.3%
% of United States	0.3%	0.3%	0.3%	0.3%	0.3%

Compound Annual Growth Rate (CAGR)	10 Year (2008-2018)	20 Year (2008-2028)	10 Year (2018 -2028)	20 Year (2018-2038)
Albany-Schenectady-Troy MSA	0.6%	0.8%	0.9%	0.8%
State of New York	1.3%	1.3%	1.2%	1.2%
United States	1.1%	1.2%	1.3%	1.2%

Source: Woods and Poole Economics, 2020

The New York Department of Labor identified 11 industries as being significant to the Albany-Schenectady-Troy MSA (referred to by the State of New York as the "Capital Region"). These industries, shown in **Table 3-3**, were identified as exhibiting at least one of the following characteristics: 1) industry experiencing above-average job growth; 2) industry employs a significant number of jobs (>8,000); 3) above average growth projected for 2016-2026; or, 4) industry pays above-average wages. In total, the Department of Labor estimates a 11.2 percent growth in employment between 2016 and 2026.

Table 3-2 - Significant Industries

Industry Name	Jobs		Net Change in Jobs, 2013-2018	% Change in Jobs, 2013-2018	Projected % Change in Jobs, 2016-2026	Why Industry is Significant**
	2013*	2018*				
Total, all industries (all ownerships)	**502,400**	**529,300**	**26,900**	**5.4**	**11.2**	**N/A**
Construction of buildings	5,300	6,000	700	13.2	6.7	G, W
Specialty trade contractors	12,500	13,900	1,400	11.2	11.3	G, J, P, W
Chemical manufacturing	3,800	5,700	1,900	50.0	19.1	G, P, W
Computer and electronic product manufacturing	3,800	4,800	1,000	26.3	53.9	G, P, W
Warehousing and storage	2,800	3,200	400	14.3	19.0	G, P
Insurance carriers and related activities	13,700	14,500	800	5.8	0.0	G, J, W
Professional, scientific, and technical services	31,200	31,700	500	1.6	16.2	J, P, W
Educational services	52,700	55,000	2,300	4.4	9.9	J
Ambulatory health care services	21,400	23,700	2,300	10.7	39.4	G, J, P, W
Nursing and residential care facilities	20,000	22,100	2,100	10.5	25.4	G, J, P
Accommodation	6,100	8,400	2,300	37.7	9.9	G, J

Notes:

*Represents both private and public job sectors.

**Key:

G: Industry experienced above-average job growth; can be net or percentage growth
J: Industry employs a significant number of jobs (>8,000)
P: Above-average growth projected for 2016-2026
W: Industry pays above-average wages

Source: New York Department of Labor, *Significant Industries: A Report to the Workforce Development System – Capital Region*, 2019.

3.3 Forecast Methodology

The FAA prepares the Terminal Area Forecast (TAF) annually for each airport in the National Plan of Integrated Airport System (NPIAS). The TAF is an unconstrained forecast and is typically published at the beginning of each year. It includes forecasts for enplanements, and operations by type, as well as based aircraft. This master plan forecast uses the TAF, as directed by Airport staff. The forecast will help to define future facility requirements for the Airport.

The 2020 COVID-19 pandemic has had a severe effect on the aviation industry as whole. Significant reductions in both international and domestic air travel are reflected in the 2020 enplanements and operations at commercial service airports such as Albany International. The

TAF includes actual activity counts for 2019 (pre-pandemic) and estimate of activity levels for 2020. Although these are only estimates, they do reflect this reduction in activity due to the pandemic. The pandemic is not anticipated to have significant long-term impacts on the aviation industry but does significantly impact the short-term (0-5 years) activity levels as demonstrated in the TAF. This forecast includes the TAF projections out to 2045 since it is anticipated to take up to five years to recover from the effects of the pandemic. However, if aviation activity at ALB recovers more quickly than anticipated, extending the forecast for an additional five years will help to inform facility requirements within the 20-year planning period that takes into account a more aggressive recovery.

3.4 Historical Aviation Activity

3.4.1 Historical Enplanements

The 2020 TAF considers the drop in enplanements in 2020 due to the pandemic. The 2020 estimate of enplanements for Albany International is 837,090 which is approximately 44 percent lower than the actual 2019 enplanements. **Table 3-3** provides the historical enplanement levels from 2009 to 2019 and the 2020 estimate as outlined in the TAF. In the past 10 years (2009 to 2019) the enplanements at Albany International Airport have grown at a Compound Annual Growth Rate (CAGR) of 1.3 percent. However, 2009 was a high year for enplanements and between 2014 and 2019 enplanement grew at a significantly higher CAGR of 4.5 percent prior to the pandemic.

The enplanements are broken down by Air Carrier and Commuter. Air carrier enplanements are revenue passengers boarding a scheduled service flight with more than 60 seats. Similarly, commuter enplanements are revenue passengers boarding a scheduled service flight with 60 seats or less. Since 2003 the TAF has defined commuter enplanements as "…revenue passenger enplanements for those airlines whose primary function is to provide feed to mainline carriers, regardless of aircraft size." The percentage of air carrier enplanements has grown over the past ten years from 58.1 percent in 2009 to 72.1 percent in 2019. A corresponding decrease in the percentage of commuter enplanements is noted indicating that a shift from commuter enplanements to air carrier enplanements has been occurring at ALB. This is likely due to a decrease in regional feeder flights and more reliance on direct mainline carriers.

Table 3-3 - Historical Enplanements by Type

Year	Air Carrier Enplanements	% Air Carrier Enplanements	Commuter Enplanements	% Commuter Enplanements	Total Enplanements
2009	762,478	58.1%	549,937	41.9%	1,312,415
2010	684,734	54.5%	570,749	45.5%	1,255,483
2011	689,436	56.6%	528,639	43.4%	1,218,075
2012	717,373	58.5%	509,145	41.5%	1,226,518
2013	684,316	56.9%	517,465	43.1%	1,201,781
2014	752,221	62.7%	448,033	37.3%	1,200,254
2015	858,942	68.5%	394,591	31.5%	1,253,533
2016	1,002,959	73.2%	367,243	26.8%	1,370,202
2017	1,023,161	73.6%	367,138	26.4%	1,390,299
2018	1,006,132	70.7%	417,070	29.3%	1,423,202
2019	1,075,425	72.1%	416,880	27.9%	1,492,305
2020 (TAF Estimate)	559,703	71.1%	227,236	28.9%	786,939
2009-2019 CAGR	3.50%		-2.73%		1.29%
2014-2019 CAGR	7.41%		-1.43%		4.45%
Annual % Change 2019-2020	-47.96%		-45.49%		-47.27%

Source: FAA 2020 Terminal Area Forecast

3.4.2 Historical Air Carrier Operations

Air carrier operations at Albany International in 2019 totaled 24,541. The TAF 2020 estimate of air carrier operation is 17, 825, representing a -27.4 percent decrease over 2019 levels that is attributed to the pandemic. Over the past 10 years from 2009 to 2019 the air carrier operations had a slightly negative CAGR of -0.4 percent. As with the enplanements, 2009 was a high year and between 2009 and 2014 air carrier operations grew at a CAGR of 2.0 percent. **Table 3-4** presents the historical air carrier operations as well as the TAF 2020 estimate for ALB.

Table 3-4 - Historical Air Carrier Operations

Year	Air Carrier Operations
2009	25,629
2010	25,058
2011	23,421
2012	23,784
2013	22,249
2014	22,244
2015	21,625
2016	22,647
2017	23,684
2018	23,381
2019	24,541
2020 (TAF Estimate)	17,825
2009-2019 CAGR	-0.4%
2014-2019 CAGR	2.0%
Annual % Change 2019-2020	-27.4%

Source: FAA 2020 Terminal Area Forecast

3.4.3 Historical Air Taxi/Commuter Operations

Air taxi and commuter operations are included in one category in the TAF. Commuter operations are defined as regularly scheduled commercial flights by aircraft with 60 seats or less, while air taxi operations are conducted by similar aircraft but are on demand and unscheduled. Air taxi/commuter operations at Albany international in 2019 totaled 20,577. The TAF 2020 estimate of air taxi/commuter operations is 11,864 a -42.3 percent decrease over 2019 levels that is attributed to the pandemic. Over the past 10 years from 2009 to 2019 the air taxi/commuter operations had a negative CAGR of -4.9 percent. As with the enplanements, 2009 was a high year and between 2009 and 2014 air taxi operations declined at a lower CAGR of -1.9 percent. **Table 3-5** presents the historical air carrier operations as well as the TAF 2020 estimate for ALB.

Table 3-5 - Historical Air Taxi/Commuter Operations

Year	Air Taxi Operations
2009	34,077
2010	31,250
2011	32,183
2012	27,723
2013	25,705
2014	22,646
2015	22,066
2016	23,781
2017	23,646
2018	23,594
2019	20,577
2020 (TAF Estimate)	11,864
2009-2019 CAGR	-4.9%
2014-2019 CAGR	-1.9%
Annual % Change 2019-2020	-42.3%

Source: FAA 2020 Terminal Area Forecast

3.4.4 Historical General Aviation Operations

General aviation operations at ALB include both itinerant and local operations. In the past ten years the total general aviation operations at Albany International Airport has decreased from 28,580 operations in 2009 to 20,043 in 2019. This represents a CAGR rate of approximately -3.5 percent. The 2009 GA operations total is a high point and in the last five years (2014 to 2019) the CAGR showed a slightly lower rate of decline at -1.3 percent. The decrease in GA over the past ten years is likely due to a shift of GA operations to nearby reliever airports in the region. The 2020 TAF estimate of general aviation operations, however; shows an increase of 12.7 percent for a total of 22,588 operation. Itinerant operations made up the majority of GA operations ranging from 73.4 percent in 2018 to 60.9 percent in 2020. The increase in 2020 GA operations is likely due to an increase in private charter GA flights serving business clientele that opted to not fly on the airlines due to pandemic concerns. **Table 3-6** provides a summary of the historical and 2020 estimate of GA operations by type.

Table 3-6 - Historical General Aviation Operations

Year	GA Itinerant	% Itinerant	GA Local	% Local	GA Total
2009	18,113	63.4%	10,467	36.6%	28,580
2010	17,449	58.8%	12,203	41.2%	29,652
2011	16,003	68.2%	7,467	31.8%	23,470
2012	14,836	69.0%	6,663	31.0%	21,499
2013	13,811	64.5%	7,592	35.5%	21,403
2014	13,811	64.5%	7,592	35.5%	21,403
2015	13,390	58.3%	9,584	41.7%	22,974
2016	14,472	63.0%	8,501	37.0%	22,973
2017	14,905	70.8%	6,135	29.2%	21,040
2018	14,599	73.4%	5,282	26.6%	19,881
2019	13,689	68.3%	6,354	31.7%	20,043
2020 (TAF Estimate)	13,759	60.9%	8,829	39.1%	22,588
2009-2019 CAGR	-2.8%		-4.9%		-3.5%
2014-2019 CAGR	-0.2%		-3.5%		-1.3%
Annual % Change 2019-2020	0.5%		39.0%		12.7%

Source: FAA 2020 Terminal Area Forecast

3.4.5 Historical Air Cargo Operations

The TAF does not provide a breakdown of air cargo operations but are part of the air carrier and air taxi operations. However, the FAA Traffic Flow Management system provides a summary of operations by type of activity including Freight. **Table 3-7** provides a summary of the air cargo operations for the past 10 years. In addition, historical air cargo tonnage is provided from the Bureau of Transportation Statistics T-3 U.S. Air Carrier Airport Activity Statistics. In the past ten years the air cargo operations showed a slight decline with a -0.03 percent CAGR, but for the past five years grew at a positive 0.5 percent CAGR. Air cargo tonnage grew at a CAGR of 1.1 percent between 2014 to 2019. Air cargo operations and tonnage for 2020 do not reflect a full year but appear to suggest that both operations and cargo tonnage will show positive growth over 2019 activity.

Table 3-7 - Historical Air Cargo Activity

Year	Air Cargo Operations	Tonnage
2009	2,075	9,796
2010	2,013	9,643
2011	2,017	9,631
2012	1,988	9,695
2013	1,989	9,628
2014	2,011	9,779
2015	2,032	9,462
2016	1,975	10,043
2017	2,040	10,118
2018	2,095	10,191
2019	2,069	10,334
2020*	2,113	8,264*
CAGR 2009-2019	-0.03%	0.5%
CAGR 2014-2019	0.6%	1.1%

Source: TFMSC and Bureau of Transportation Statistics T-3 US Air Carrier Airport Activity Statistics
*2020 total is for nine months through September 2020 for Tonnage and November 2020 for Air Cargo Operations

3.4.6 Historical Military Operations

Military operations at Albany International Airport have fluctuated throughout the past 10 years as shown in **Table 3-8**. In general, military operations have remained relatively low, compared to other activity generators. However, the TAF 2019 records indicate an increase of approximately 20 percent in military operations compared to 2018, which is not estimated to be sustained in 2020.

Table 3-8 - Historical Military Operations

Year	Military Operations
2009	9,251
2010	4,592
2011	4,328
2012	4,737
2013	4,737
2014	4,477
2015	4,015
2016	5,046
2017	5,202
2018	5,799
2019	6,229
2020 (TAF Estimate)	6,230
CAGR 2009-2019	-3.9%
CAGR 2014-2019	6.8%

Source: FAA 2020 Terminal Area Forecast

3.4.7 Historical Based Aircraft

Historical based aircraft have fluctuated over the past ten years at ALB as shown in **Table 3-9**. In 2019 the based aircraft totaled 102. This is higher than past totals and between 2014 and 2019 the based aircraft increased at a CAGR of 1.4 percent. The 2020 based aircraft total is 100 and

Table 3-9 - Historical Based Aircraft

Year	Based Aircraft
2009	93
2010	83
2011	72
2012	83
2013	95
2014	95
2015	82
2016	88
2017	97
2018	100
2019	102
2020 (TAF Estimate)	100
2009-2019 CAGR	0.9%
2014-2019 CAGR	1.4%
Annual % Change 2019-2020	0.00%

Source: FAA 2020 Terminal Area Forecast

according to the FBO, approximately 15 percent of the 100 based aircraft are jets, 11 percent multi engine and 74 percent are single engine aircraft. **Table 3-10** provides the current breakdown of based aircraft by type.

Table 3-10 - 2021 Based Aircraft by Type

	Aircraft (#)	Percent of Based Aircraft
Single Engine	60	62%
Multi Engine	7	7%
Jet	19	20%
Helicopters	11	11%
Total	97	100%

Source: FAA Airport Master Record (5010 Form)

3.5 Aviation Activity Forecast

The Master Plan forecast is based on the Terminal Area Forecast (TAF) which is the official FAA forecast. For airports with over 100,000 enplanements like Albany International, a bottom-up approach is taken. The TAF forecast for both commercial enplanements and operations is projected using a forecast model that considers market demand by origin and destination. The model uses regression analysis with variables such as fares, demographic data and other variables. For GA operations the TAF uses a time series type analysis to project future activity.

3.5.1 Enplanement Forecast

Table 3-11 provides a summary of the 2020 TAF forecast of enplanements for ALB through FY 2045. As noted, the TAF projects that the enplanements will recover back to 2019 levels by approximately 2025 and then will grow to over 2.01 million and 2.15 million enplanements by 2040 and 2045, respectively. This represents a CAGR of 1.4 percent increase between 2019 and 2040. The breakdown between air carrier and air taxi enplanements remains around 71 percent air carrier and 29 percent air taxi throughout the forecast period.

Table 3-11 - Enplanement Forecast

Year	Air Carrier	% Air Carrier	Commuter	% Commuter	Total
2019	1,075,425	72.1%	416,880	27.9%	1,492,305
2020	559,703	71.1%	227,236	28.9%	786,939
2021	417,194	71.5%	166,334	28.5%	583,528
2022	563,267	70.9%	231,391	29.1%	794,658
2023	753,515	70.9%	309,459	29.1%	1,062,974
2024	939,764	70.9%	385,879	29.1%	1,325,643
2025	1,060,714	70.9%	435,462	29.1%	1,496,176
2026	1,128,175	70.9%	463,113	29.1%	1,591,288
2027	1,156,929	70.9%	474,873	29.1%	1,631,802
2028	1,176,365	70.9%	482,848	29.1%	1,659,213
2029	1,196,689	70.9%	491,190	29.1%	1,687,879
2030	1,217,071	70.9%	499,551	29.1%	1,716,622
2031	1,239,311	70.5%	518,162	29.5%	1,757,473
2032	1,262,423	71.3%	508,677	28.7%	1,771,100
2033	1,285,253	71.3%	518,162	28.7%	1,803,415
2034	1,306,679	71.2%	527,531	28.8%	1,834,210
2035	1,326,969	70.9%	544,649	29.1%	1,871,618
2036	1,347,513	70.9%	553,079	29.1%	1,900,592
2037	1,367,967	70.9%	561,473	29.1%	1,929,440
2038	1,387,894	70.9%	569,650	29.1%	1,957,544
2039	1,407,477	70.9%	577,687	29.1%	1,985,164
2040	1,426,714	70.9%	585,580	29.1%	2,012,294
2041	1,446,925	70.9%	593,873	29.1%	2,040,798
2042	1,467,114	70.9%	602,158	29.1%	2,069,272
2043	1,487,230	70.9%	610,411	29.1%	2,097,641
2044	1,507,077	70.9%	618,555	29.1%	2,125,632
2045	1,526,928	70.9%	626,701	29.1%	2,153,629
CAGR 2019-2030	1.1%		1.7%		1.3%
CAGR 2019-2040	1.4%		1.6%		1.4%
CAGR 2019-2045	1.4%		1.6%		1.4%

Source: FAA 2020 Terminal Area Forecast

3.5.2 Air Carrier and Air Taxi/Commuter Operations Forecast

The Air carrier and air taxi/commuter operations forecast is provided in **Table 3-12** - Air Carrier and Air Taxi/Commuter Operations Forecast. Although the air carrier operations forecast shows a recovery within 5 years, the air taxi/commuter operations forecast does not recover and continues to trend downward. With the reduction in air taxi/commuter operations, the combined total of air carrier and air taxi/commuter operations does not recover until 2035. The CAGR for air carrier between 2019 and 2040 is 2.4 percent while air taxi/commuter operations

are anticipated to decrease at -3.9 percent CAGR between the same period. This offset likely reflects anticipated up-gauging of the aircraft fleet, such as the transition away from CRJ-200 and Embraer-135 and -145 aircraft in favor of CRJ-700 and Embraer-175 aircraft which are consider air carrier operations. The combined air carrier and air taxi/commuter operations are projected to have a modest CAGR of .5 percent between 2019 and 2040.

Table 3-12 - Air Carrier and Air Taxi/Commuter Operations Forecast

Year	Air Carrier	% AC	Air Taxi	% AT	Total
2019	24,541	54.4%	20,577	45.6%	45,118
2020	17,825	60.0%	11,864	40.0%	29,689
2021	16,663	66.4%	8,434	33.6%	25,097
2022	19,523	70.6%	8,149	29.4%	27,672
2023	24,097	77.2%	7,124	22.8%	31,221
2024	27,642	79.7%	7,023	20.3%	34,665
2025	29,884	80.1%	7,407	19.9%	37,291
2026	31,985	80.9%	7,565	19.1%	39,550
2027	32,944	81.1%	7,669	18.9%	40,613
2028	33,502	81.2%	7,761	18.8%	41,263
2029	34,085	81.3%	7,855	18.7%	41,940
2030	34,670	81.3%	7,949	18.7%	42,619
2031	35,307	81.4%	8,047	18.6%	43,354
2032	35,968	81.5%	8,147	18.5%	44,115
2033	36,622	81.6%	8,247	18.4%	44,869
2034	37,239	81.7%	8,346	18.3%	45,585
2035	37,825	81.8%	8,444	18.2%	46,269
2036	38,419	81.8%	8,544	18.2%	46,963
2037	39,011	81.9%	8,644	18.1%	47,655
2038	39,589	81.9%	8,744	18.1%	48,333
2039	40,159	82.0%	8,845	18.0%	49,004
2040	40,720	82.0%	8,946	18.0%	49,666
2041	41,308	82.0%	9,049	18.0%	50,357
2042	41,896	82.1%	9,153	17.9%	51,049
2043	42,483	82.1%	9,258	17.9%	51,741
2044	43,063	82.1%	9,364	17.9%	52,427
2045	43,644	82.2%	9,471	17.8%	53,115
CAGR 2019-2030	3.2%		-8.3%		-0.5%
CAGR 2019-2040	2.4%		-3.9%		0.5%
CAGR 2019-2045	2.2%		-2.9%		0.6%

Source: FAA 2020 Terminal Area Forecast.
Note: Air carrier/ air taxi operations are itinerant operations.

3.5.3 General Aviation Operations

The forecast of general aviation operations is provided in **Table 3-13**. For the purpose of this Master Plan, itinerant GA and local GA operations are combined for ease of use in developing facility requirements for the airfield. As noted, the GA itinerant operations are forecast to remain constant over the planning period and a slight increase was estimated between 2019 and 2020. GA local traffic however did show a decline due to the pandemic and is not anticipated to recover to 2019 levels until 2025. Total GA operations are projected to increase at a CAGR of 0.3 percent between 2019 and 2040 with a slightly higher CAGR between 2019 and 2030 (0.5 percent) during the recovery period.

Table 3-13 – General Aviation Operations Forecast

Year	GA Itinerant	% Itinerant	GA Local	% Local	GA Total
2019	13,759	60.9%	8,829	39.1%	22,588
2020	14,668	73.9%	5,189	26.1%	19,857
2021	14,668	77.7%	4,213	22.3%	18,881
2022	14,668	72.1%	5,688	27.9%	20,356
2023	14,668	67.4%	7,110	32.6%	21,778
2024	14,668	64.2%	8,176	35.8%	22,844
2025	14,668	62.0%	8,994	38.0%	23,662
2026	14,668	61.9%	9,031	38.1%	23,699
2027	14,668	61.8%	9,068	38.2%	23,736
2028	14,668	61.7%	9,105	38.3%	23,773
2029	14,668	61.6%	9,142	38.4%	23,810
2030	14,668	61.5%	9,180	38.5%	23,848
2031	14,668	61.4%	9,217	38.6%	23,885
2032	14,668	61.3%	9,255	38.7%	23,923
2033	14,668	61.2%	9,293	38.8%	23,961
2034	14,668	61.1%	9,331	38.9%	23,999
2035	14,668	61.0%	9,370	39.0%	24,038
2036	14,668	60.9%	9,408	39.1%	24,076
2037	14,668	60.8%	9,446	39.2%	24,114
2038	14,668	60.7%	9,485	39.3%	24,153
2039	14,668	60.6%	9,524	39.4%	24,192
2040	14,668	60.5%	9,563	39.5%	24,231
2041	14,668	60.4%	9,602	39.6%	24,270
2042	14,668	60.3%	9,642	39.7%	24,310
2043	14,668	60.2%	9,681	39.8%	24,349
2044	14,668	60.1%	9,721	39.9%	24,389
2045	14,668	60.0%	9,761	40.0%	24,429
CAGR 2019-2030	0.6%		0.4%		0.5%
CAGR 2019-2040	0.0%		0.4%		0.3%
CAGR 2019-2045	0.2%		0.4%		0.3%

Source: FAA 2020 Terminal Area Forecast

3.5.4 Air Cargo Operations

The TAF does not forecast air cargo operations as they are typically part of the air carrier and air taxi operations forecast. As noted earlier the air cargo operations grew at ALB at a CAGR of 0.6 and tonnage grew at a CAGR of 1.1 percent between 2014 and 2019. For the past ten years (2009-2019) however, the CAGR was slightly negative for operations and significantly lower (0.6 percent) for air cargo tonnage. Considering the recent growth in e-commerce and its reliance on air cargo it is recommended to use the past five years CAGR to project future growth since it is more reflective of the recent trends.

The FAA Aerospace Forecast (2019-2039) projects that the Revenue-Ton-Miles (RTM) will increase at a CAGR of 1.1 percent for domestic freight. RTM is an indicator of overall growth in the industry and indicates that the domestic air cargo is anticipated to continue to rise nationally at a modest growth rate. This supports using the higher CAGR demonstrated in the past five years at ALB to generate the air cargo forecast.

Applying the last five-years' CAGR to the air cargo operations and tonnage yields a total air cargo operations and tonnage or 2,346 operations and 13,734 tons of cargo by 2040 at shown in **Table 3-14.**

Table 3-14 - Air Cargo Operations and Tonnage Forecast

Year	Air Cargo Operations	Tonnage
2019	2,069	10,334
2020	2,081	10,448
2021	2,094	10,563
2022	2,106	10,679
2023	2,119	10,796
2024	2,132	10,915
2025	2,145	11,035
2026	2,157	11,156
2027	2,170	11,279
2028	2,183	11,403
2029	2,197	11,529
2030	2,210	11,656
2031	2,223	11,784
2032	2,236	11,913
2033	2,250	12,044
2034	2,263	12,177
2035	2,277	12,311
2036	2,290	12,446
2037	2,304	12,583
2038	2,318	12,722
2039	2,332	12,861
2040	2,346	13,003
2041	2,360	13,146
2042	2,374	13,291
2043	2,388	13,437
2044	2,403	13,585
2045	2,417	13,734
CAGR 2019-2030	0.6%	1.1%
CAGR 2019-2040	0.6%	1.1%
CAGR 2019-2045	0.6%	1.1%

Source: TFMSC and Bureau of Transportation Statistics T-3 US Air Carrier Airport Activity Statistics

3.5.5 Military Operations

The TAF estimates that military operations remained steady between 2019 and 2020. Military operations are then held constant throughout the remaining planning period. The CAGR between 2019 and 2040 is -0.6 percent. Military operations are broken down into itinerant and local operations. The TAF holds the split constant at 64 percent itinerant and 36 percent local military operations throughout the planning period.

Table 3-15 - Military Operations Forecast

Year	Itinerant	Local	Total
2019	3,698	2,531	6,229
2020	3,997	2,233	6,230
2021	3,997	2,233	6,230
2022	3,997	2,233	6,230
2023	3,997	2,233	6,230
2024	3,997	2,233	6,230
2025	3,997	2,233	6,230
2026	3,997	2,233	6,230
2027	3,997	2,233	6,230
2028	3,997	2,233	6,230
2029	3,997	2,233	6,230
2030	3,997	2,233	6,230
2031	3,997	2,233	6,230
2032	3,997	2,233	6,230
2033	3,997	2,233	6,230
2034	3,997	2,233	6,230
2035	3,997	2,233	6,230
2036	3,997	2,233	6,230
2037	3,997	2,233	6,230
2038	3,997	2,233	6,230
2039	3,997	2,233	6,230
2040	3,997	2,233	6,230
2041	3,997	2,233	6,230
2042	3,997	2,233	6,230
2043	3,997	2,233	6,230
2044	3,997	2,233	6,230
2045	3,997	2,233	6,230
CAGR 2019-2030	0.7%	-1.1%	0.0%
CAGR 2019-2040	0.4%	-0.6%	0.0%
CAGR 2019-2045	0.3%	-0.6%	0.0%

Source: FAA 2020 Terminal Area Forecast

3.5.6 IFR/VFR Forecast

The FAA Traffic Flow Management System Count (TFMSC) records all Instrument Flight Rules (IFR) operations at an airport. For the past three years, the recorded IFR operations have been between 50 and 52 percent of the total operations at the ALB. The VFR activity at ALB primarily consists of general aviation operations and military helicopters. Since 2012, this activity has been stable at the Airport, and the TAF holds these operations constant throughout the planning period. Therefore, to forecast future IFR/VFR operations split, the breakdown is kept constant at 50/50 throughout the planning period. **Table 3-16** below provides a summary of the IFR/VFR

operations forecast. The total operations, as well as the VFR and IFR operations are anticipated to increase at a CAGR of -0.2 percent between 2019 and 2030 and 0.4 percent between 2019 and 2040.

Table 3-16 - IFR/VFR Operations Forecast

YEAR	IFR	% IFR	VFR	%VFR	Total Operations
2019	36,968	50%	36,968	50%	73,935
2020	27,888	50%	27,888	50%	55,776
2021	25,104	50%	25,104	50%	50,208
2022	27,129	50%	27,129	50%	54,258
2023	29,615	50%	29,615	50%	59,229
2024	31,870	50%	31,870	50%	63,739
2025	33,592	50%	33,592	50%	67,183
2026	34,740	50%	34,740	50%	69,479
2027	35,290	50%	35,290	50%	70,579
2028	35,633	50%	35,633	50%	71,266
2029	35,990	50%	35,990	50%	71,980
2030	36,349	50%	36,349	50%	72,697
2031	36,735	50%	36,735	50%	73,469
2032	37,134	50%	37,134	50%	74,268
2033	37,530	50%	37,530	50%	75,060
2034	37,907	50%	37,907	50%	75,814
2035	38,269	50%	38,269	50%	76,537
2036	38,635	50%	38,635	50%	77,269
2037	39,000	50%	39,000	50%	77,999
2038	39,358	50%	39,358	50%	78,716
2039	39,713	50%	39,713	50%	79,426
2040	40,064	50%	40,064	50%	80,127
2041	40,429	50%	40,429	50%	80,857
2042	40,795	50%	40,795	50%	81,589
2043	41,160	50%	41,160	50%	82,320
2044	41,523	50%	41,523	50%	83,046
2045	41,887	50%	41,887	50%	83,774
CAGR 2019-2030	-0.2%		-0.2%		-0.2%
CAGR 2019-2040	0.4%		0.4%		0.4%
CAGR 2019-2045	1.6%		1.6%		1.6%

Note: 2019 TFMSC IFR operations were 50 percent of total operations.
Source: FAA 2020 Terminal Area Forecast

3.5.7 Peak Hour Operations and Enplanements

To generate the peak hour forecast for operations the 2019 TFMSC data is reviewed. For total operations the peak month was August 2019, as identified from the TFMSC. According to the TFMSC the August 2019 activity accounted for 9.2 percent total annual operations that year. Using this information and the TAF estimates, the following steps were used to generate the peak hour forecast.

- Apply the peak month percentage (9.2 percent) to the annual operations
- Divide by 31 to calculate the average day peak month (ADPM)
- Apply the peak hour percentage (assume 10% of total ADPM)

The peak hour enplanement forecast is generated using the same methodology, but the percentage peak month (9.6%) percentage peak hour (18.1%) are derived from the Bureau of Transportation Statistics T-100 Market data for 2019.

Table 3-17 below provides a summary of the peak hour forecast for operations and enplanements. As noted, the peak hour operations are projected to increase from 22 in 2019 to 25 by 2040 and peak hour enplanements are projected to increase from 834 in 2019 to 1,024 by 2040.

Table 3-17 - Peak Hour Forecast

Operations	2019	2020	2025	2030	2035	2040	2045
Annual Operations	73,936	55,776	67,183	72,697	76,537	80,127	83,774
Peak Month (9.2%)	6,802	5,131	6,181	6,688	7,041	7,372	7,707
ADPM (Peak Month/31)	219	166	199	216	227	238	249
Peak Hour (10%)	22	17	20	22	23	24	25
Enplanements	**2019**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
Annual Enplanements	1,492,305	786,939	1,496,176	1,716,622	1,871,618	2,012,294	2,153,629
Peak Month (9.6%)	142,743	75,273	143,113	164,200	179,026	192,482	206,001
ADPM (Peak Month/31)	4,605	2,428	4,617	5,297	5,775	6,209	6,645
Peak Hour (18%)	834	440	836	960	1,046	1,125	1,204

Source: FAA 2020 Terminal Area Forecast, BTS T-100, TFMSC

3.5.8 Based Aircraft Forecast

The TAF projects an increase in the number of based aircraft over the planning period. Based aircraft projections show a CAGR of 2.3 percent from 2019 to 2040, which is slightly lower than the projected 2.4 percent CAGR from 2019 to 2030. The TAF projection of based aircraft at Albany is provided in **Table 3-18** - Based Aircraft Forecast. The 2021distribution of 20 percent jet, 7

percent multi engine, 62 percent single engine aircraft and 11 percent helicopters is held constant throughout the planning period.

Table 3-18 - Based Aircraft Forecast

Year	Jets	Multi Engine	Single Engine	Helicopters	Total Based Aircraft
2019	20	7	62	11	100
2020	20	7	62	11	100
2021	19	7	60	11	97
2022	21	8	66	12	107
2023	22	8	68	12	110
2024	22	8	69	13	112
2025	23	8	71	13	115
2026	23	9	73	13	118
2027	24	9	75	14	121
2028	24	9	77	14	124
2029	25	9	79	14	127
2030	25	9	80	15	130
2031	26	10	82	15	133
2032	27	10	84	15	136
2033	27	10	86	16	139
2034	28	10	88	16	142
2035	28	10	90	16	145
2036	29	11	92	17	148
2037	30	11	93	17	151
2038	30	11	95	17	154
2039	31	11	97	18	157
2040	32	12	100	18	161
2041	32	12	102	19	165
2042	33	12	105	19	169
2043	34	12	107	20	173
2044	35	13	109	20	177
2045	35	13	112	21	181
CAGR 2019-2030	2.4%	2.4%	2.4%	2.4%	2.4%
CAGR 2019-2040	2.3%	2.3%	2.3%	2.3%	2.3%
CAGR 2019-2045	2.3%	2.3%	2.3%	2.3%	2.3%

Note: Maintains 2019 distribution of aircraft type.
Source: FAA 2020 Terminal Area Forecast

3.5.9 Critical Aircraft Forecast

The critical aircraft forecast uses historical information to project the largest or most demanding aircraft anticipated to conduct a minimum of 500 annual operations at the Airport. This designation is used to size runways and taxiways in the master plan.

Based on a review of the TFMSC for 2019 and 2020, the Boeing 737-800 and 757-200 represent the most demanding aircraft that conduct a minimum of 500 annual operations. The B737-8 has a Runway Design Code (RDC) of D-III while the B757-200 has an RDC of C-IV. To accommodate both the D-III and C-IV aircraft the existing critical aircraft has a combined RDC of D-IV. **Table 3-19** provides a summary of the estimated operations by each aircraft for 2019 and 2020 (the latter through November 2020). Based on discussion with the Airport Authority the fleet mix is not anticipated to significantly change throughout the planning period. The B757-200 is largely used for freight operations and if phased out during the planning period would likely be replaced by aircraft with similar Aircraft Design Group (ADG), Aircraft Approach Category (AAC), and TDG characteristics. Likewise, air carriers upguaging aircraft to the B737-900 would not change the RDC or TDG for the Airport. Therefore, the forecast critical aircraft remains a group of similar aircraft with an RDC of D-IV with a TDG of 4.

At ALB, both runways accommodate each of these aircraft types, with Runway 10/28 in use during strong westerly winds. As such, the existing and future critical aircraft for both runways is D-IV. Changes are not anticipated during the planning period.

Table 3-19 - Historical Critical Aircraft Operations

Aircraft	Aircraft Approach Category (AAC)	Aircraft Design Group (ADG)	Taxiway Design Group (TDG)	2019	2020*
737-800	D	III	4	3,091	1,662
757-200	C	IV	4	1,550	1,359

Source: TFMSC 2019 and 2020, FAA AC 150/5300-13A
* 2020 data is from January through November

3.6 Summary of Aviation Forecast

Based on the Airport and Master Plan Team's review of the 2020 TAF for ALB it is reasonable, and therefore recommended, to utilize the TAF for purposes of this Master Plan. When considering its use, the Airport understands how the TAF was developed, including assumptions, methods and calculations used, and is making a conscious decision to use the TAF.

Table 3-20 and **Table 3-21** provide summaries of the forecast. The forecast, along with the peak activity data, will be utilized to develop facility requirements for ALB as part of the airport master

plan process. The forecast is taken directly from the 2020 TAF and therefore a comparison to the TAF, which is often provided in the forecast chapter, is not needed.

Table 3-20 - Forecast Summary

	ENPLANEMENTS			AIRPORT OPERATIONS									
				Itinerant Operations					Local Operations				
	Air Carrier	Commuter	Total Enp	Air Carrier	AT & Commuter	GA	Military	Total	Civil	Military	Total	Total Ops	Based AC
2009	762,478	549,937	1,312,415	25,629	34,077	18,113	2,880	80,699	10,467	2,409	12,876	93,575	93
2010	684,734	570,749	1,255,483	25,058	31,250	17,449	3,963	77,720	12,203	5,288	17,491	95,211	83
2011	689,436	528,639	1,218,075	23,421	32,183	16,003	2,871	74,478	7,467	1,721	9,188	83,666	72
2012	717,373	509,145	1,226,518	23,784	27,723	14,836	2,970	69,313	6,663	1,358	8,021	77,334	83
2013	684,316	517,465	1,201,781	22,249	25,705	13,811	3,018	64,783	7,592	1,719	9,311	74,094	95
2014	752,221	448,033	1,200,254	22,244	22,646	13,390	2,295	60,575	9,584	2,182	11,766	72,341	82
2015	858,942	394,591	1,253,533	21,625	22,066	14,472	2,631	60,794	8,501	1,384	9,885	70,679	88
2016	1,002,959	367,243	1,370,202	22,647	23,781	14,905	3,236	64,569	6,135	1,810	7,945	72,514	97
2017	1,023,161	367,138	1,390,299	23,684	23,646	14,599	3,303	65,232	5,282	1,899	7,181	72,413	100
2018	1,006,132	417,070	1,423,202	23,381	23,594	13,689	3,700	64,364	6,354	2,099	8,453	72,817	102
2019	1,075,425	416,880	1,492,305	24,541	20,577	13,759	3,698	62,575	8,829	2,531	11,360	73,935	100
2020	559,703	227,236	786,939	17,825	11,864	14,668	3,997	48,354	5,189	2,233	7,422	55,776	100
2021	417,194	166,334	583,528	16,663	8,434	14,668	3,997	43,762	4,213	2,233	6,446	50,208	97
2022	563,267	231,391	794,658	19,523	8,149	14,668	3,997	46,337	5,688	2,233	7,921	54,258	107
2023	753,515	309,459	1,062,974	24,097	7,124	14,668	3,997	49,886	7,110	2,233	9,343	59,229	110
2024	939,764	385,879	1,325,643	27,642	7,023	14,668	3,997	53,330	8,176	2,233	10,409	63,739	112
2025	1,060,714	435,462	1,496,176	29,884	7,407	14,668	3,997	55,956	8,994	2,233	11,227	67,183	115
2026	1,128,175	463,113	1,591,288	31,985	7,565	14,668	3,997	58,215	9,031	2,233	11,264	69,479	118
2027	1,156,929	474,873	1,631,802	32,944	7,669	14,668	3,997	59,278	9,068	2,233	11,301	70,579	121
2028	1,176,365	482,848	1,659,213	33,502	7,761	14,668	3,997	59,928	9,105	2,233	11,338	71,266	124
2029	1,196,689	491,190	1,687,879	34,085	7,855	14,668	3,997	60,605	9,142	2,233	11,375	71,980	127
2030	1,217,071	499,551	1,716,622	34,670	7,949	14,668	3,997	61,284	9,180	2,233	11,413	72,697	130
2031	1,239,311	508,677	1,747,988	35,307	8,047	14,668	3,997	62,019	9,217	2,233	11,450	73,469	133
2032	1,262,423	518,162	1,780,585	35,968	8,147	14,668	3,997	62,780	9,255	2,233	11,488	74,268	136
2033	1,285,253	527,531	1,812,784	36,622	8,247	14,668	3,997	63,534	9,293	2,233	11,526	75,060	139
2034	1,306,679	536,324	1,843,003	37,239	8,346	14,668	3,997	64,250	9,331	2,233	11,564	75,814	142

	ENPLANEMENTS			AIRPORT OPERATIONS									
				Itinerant Operations					Local Operations				
	Air Carrier	Commuter	Total Enp	Air Carrier	AT & Commuter	GA	Military	Total	Civil	Military	Total	Total Ops	Based AC
2035	1,326,969	544,649	1,871,618	37,825	8,444	14,668	3,997	64,934	9,370	2,233	11,603	76,537	145
2036	1,347,513	553,079	1,900,592	38,419	8,544	14,668	3,997	65,628	9,408	2,233	11,641	77,269	148
2037	1,367,967	561,473	1,929,440	39,011	8,644	14,668	3,997	66,320	9,446	2,233	11,679	77,999	151
2038	1,387,894	569,650	1,957,544	39,589	8,744	14,668	3,997	66,998	9,485	2,233	11,718	78,716	154
2039	1,407,477	577,687	1,985,164	40,159	8,845	14,668	3,997	67,669	9,524	2,233	11,757	79,426	157
2040	1,426,714	585,580	2,012,294	40,720	8,946	14,668	3,997	68,331	9,563	2,233	11,796	80,127	161
2041	1,446,925	593,873	2,040,798	41,308	9,049	14,668	3,997	69,022	9,602	2,233	11,835	80,857	165
2042	1,467,114	602,158	2,069,272	41,896	9,153	14,668	3,997	69,714	9,642	2,233	11,875	81,589	169
2043	1,487,230	610,411	2,097,641	42,483	9,258	14,668	3,997	70,406	9,681	2,233	11,914	82,320	173
2044	1,507,077	618,555	2,125,632	43,063	9,364	14,668	3,997	71,092	9,721	2,233	11,954	83,046	177
2045	1,526,928	626,701	2,153,629	43,644	9,471	14,668	3,997	71,780	9,761	2,233	11,994	83,774	181

Source: FAA 2020 Terminal Area Forecast

Note: Air cargo operations are considered part of the air carrier and air taxi/commuter category in the TAF. The Air Cargo forecast is provided in Section 1.5.4

Table 3-21 - Forecast Summary by 5-Year Increments

	Base Year (2019)	Base Yr.+1yr.	Base Yr.+6yrs.	Base Yr.+11 yrs.	Base Yr.+16 yrs.	Base Yr. + 21 yrs.
Operations						
Itinerant						
Air carrier	24,541	17,825	29,884	34,670	37,825	40,720
AT/Commuter	20,577	11,864	7,407	7,949	8,444	8,946
GA	13,759	14,668	14,668	14,668	14,668	14,668
Military	3,698	3,997	3,997	3,997	3,997	3,997
Local						
GA	8,829	5,189	8,994	9,180	9,370	9,563
Military	2,531	2,233	2,233	2,233	2,233	2,233
TOTAL OPERATIONS	**73,935**	**55,776**	**67,183**	**72,697**	**76,537**	**80,127**
Peak Hour Operations	22	17	20	22	23	24
Critical Aircraft	Combo B757-200/B737-800 (D-IV)	Combo B757-200/ B737-800 (D-IV)	Combo B757-200/ B737-800 (D-IV)	Combo B757-200/ B737-800 (D-IV)	Combo 757-200/ B737-800 (D-IV)	Combo 757-200/ B737-800 (D-IV)
Based Aircraft						
Single-Engine	62	62	71	80	90	100
Multi-Engine	7	7	8	9	10	12
Jet	20	20	23	25	28	32
Helicopter	11	11	12	15	16	18
Grand Total	**100**	**100**	**115**	**130**	**145**	**161**

Source: FAA 2020 Terminal Area Forecast

3.7 Recent Aviation Activity

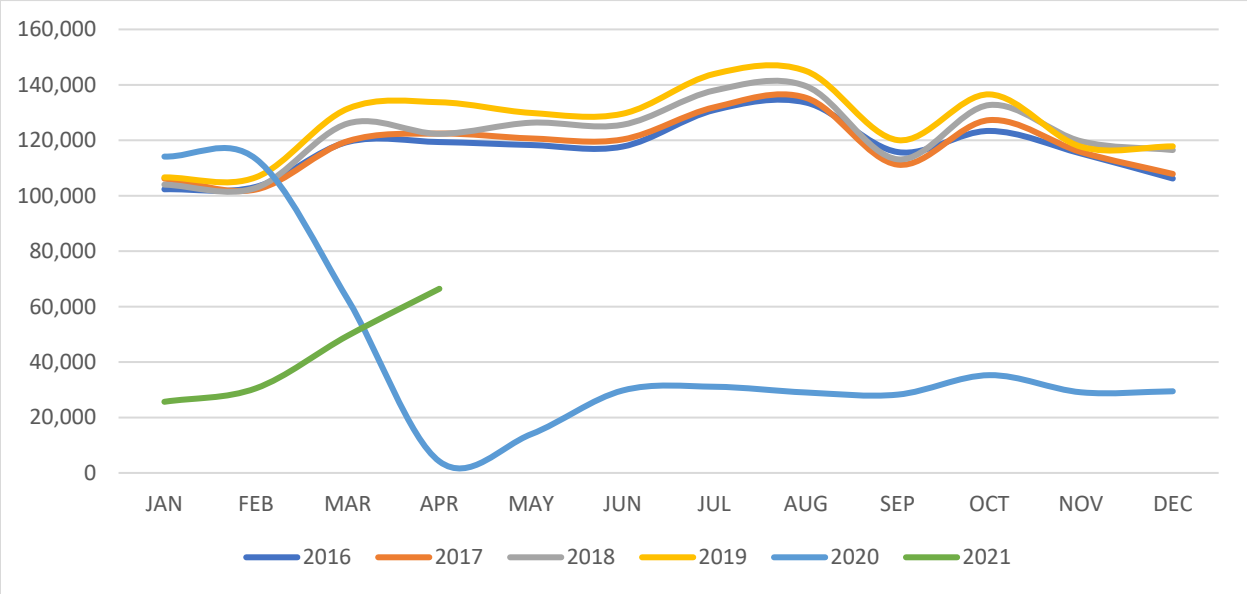
There is great interest in the speed at which aviation activity will recover from the COVID-19 pandemic, which will affect the timing of the forecast presented above. Monthly enplanements data are currently available through April 2021. A summary of enplanements by month for the past 5 years is shown in **Table 3-22**. The change is depicted graphically in **Figure 3-4**. As noted, the April 2021 enplanement numbers are approximately 50 percent of the April 2019 enplanements. For the first 4 months (Jan-Apr), the 2021 enplanements are 36 percent of the 2019 enplanements for January to April. The TAF projection for 2021 suggests that total enplanements will be 39 percent of the 2019 annual enplanements. However, if the enplanement levels in April continue throughout the year the total enplanements for 2021 will be significantly higher than that projected by the TAF indicating that the Airport may recover quicker than anticipated.

Table 3-22 – Monthly Enplanements (Jan 2016- May 2021)

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2016	102,325	103,214	119,403	119,362	118,293	117,743	130,930	133,612	115,752	123,374	115,220	106,206
2017	106,168	102,255	119,677	122,423	120,665	120,316	131,916	135,306	111,208	127,281	115,758	107,862
2018	104,011	102,852	126,052	122,342	126,345	125,618	137,983	139,520	113,139	132,723	119,639	116,482
2019	106,622	106,670	131,398	133,722	129,868	129,585	143,957	144,967	120,058	136,558	117,662	117,812
2020	114,119	113,232	62,622	4,147	13,968	29,752	31,092	29,022	28,257	35,274	29,089	29,455
2021	25,665	30,538	49,504	66,433	-	-	-	-	-	-	-	-

Source: Albany International Airport, May 2021

Figure 3-4 – Monthly Enplanements (Jan 2016- May 2021)



Source: Albany International Airport, May 2021