Asheville
REGIONAL AIRPORT

Asheville Regional Airport Master Plan Update

Working Paper #1 – Inventory

February 2022

CHA

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CHAPTER ONE

Introduction

1 INTRODUCTION

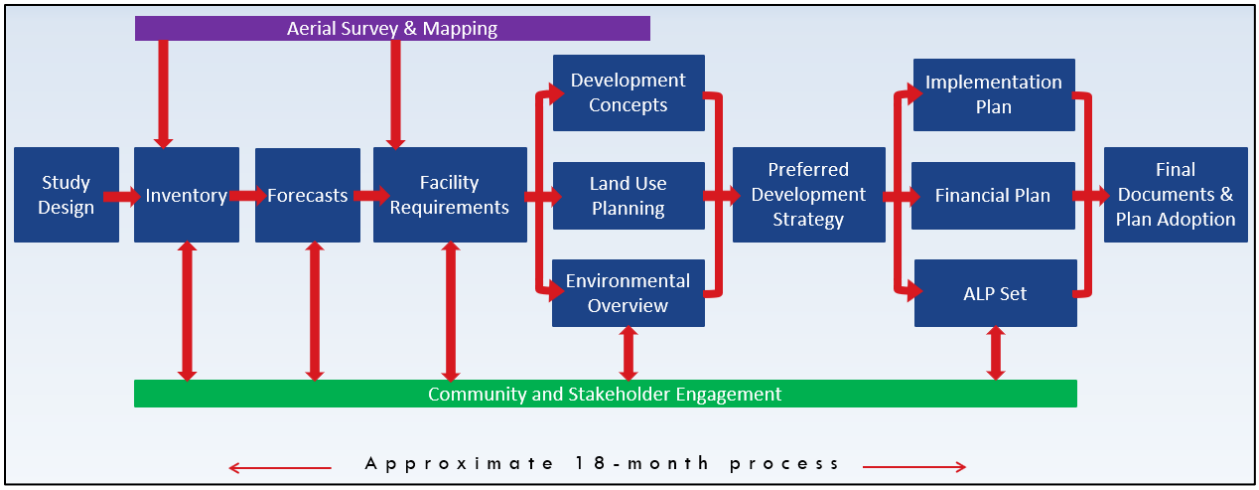
The Greater Asheville Regional Airport Authority ('GARAA' or 'the Authority') has retained CHA Consulting, Inc. ('CHA') to prepare a Master Plan Update (Study) for the Asheville Regional Airport ('AVL or 'the Airport'). The purpose of the Study is to evaluate the current space utilization and operational characteristics of the airfield, terminal facility, support facilities, ground access, and land development considerations. The Study will then identify and consider alternatives for the best use of space and logical guidance for the continued improvements necessary to accommodate projected aviation activity in a logical and financially-feasible manner 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 the Airport's website. The website also has destination and flight information, airport maps, driving directions, ground transportation, and parking information.

1.1 PROJECT DESCRIPTION

An airport master plan is a comprehensive study that is conducted via a systematic process that evaluates existing facility and market conditions, identifies anticipated stakeholders' 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, the process followed for preparing the AVL Master Plan Update is outlined in **Figure 1-1**.

Figure 1-1 – Master Planning Process



1.1.1 Purpose and Objectives

The purpose of this study is to provide long-term guidance for continued airport improvements necessary to satisfy projected aviation demand in a logical and financially-feasible manner. Consistent with this purpose, the Authority has indicated that the goals and objectives of the study should include, at a minimum, the following:

- Airfield safety and standards, such as Runway Safety Areas (RSAs), Runway Protection Zones (RPZs), etc.
- Long-term passenger terminal facility needs
- Surface access/parking considerations
- Development of General Aviation (GA) and support facilities and evaluation of existing infrastructure
- Land use/economic development issues, such as infrastructure, access, and best use of surplus lands for aeronautical and non-aeronautical development
- Environmental considerations, including air quality, storm water management, and sustainability
- Financial viability of recommended actions

In addition to addressing these objectives, this study will also fulfill the broad master planning goals set forth by the FAA in AC 150/5070-6B *Airport Master Plans*. These goals are:

- Document issues that the proposed development will address.
- Justify the proposed development through the technical, economic and environmental investigation of concepts and alternatives.
- Provide an effective graphic presentation of the development of the Airport and anticipated land uses in the vicinity of the Airport.
- Establish a realistic schedule for the implementation of the development proposed in the study, particularly the short-term capital improvement program.
- Propose an achievable financial plan to support the implementation schedule.
- Provide sufficient project definition and detail for subsequent environmental evaluations that may be required before the project is approved.
- Present a plan that adequately addresses the issues and satisfies local, state, and federal regulations.
- Document policies and future aeronautical demand to support municipal or local deliberations on spending, debt, land use controls, and other policies necessary to preserve the integrity of the Airport and its surroundings.
- Set the stage and establish the framework for a continuing planning process. Such a process should monitor key conditions and permit changes in plan recommendations as required.

1.1.2 Public and Stakeholder Involvement Program

Public and stakeholder involvement is an integral part of any significant airport planning study, as it encourages information-sharing and collaboration among the community and airport stakeholders that hold a collective interest in the outcome of the Study. For the purpose of this study, stakeholders include the airport sponsor, airlines, general aviation representatives, tenants, users and travelers, local businesses, military interests, residents, resource agencies, local jurisdiction planning representatives, and the general public. A variety of forums, such as committees, public information meetings/workshops, and public awareness campaigns, are necessary to mitigate setbacks that may arise from having a large, diverse stakeholder group.

For this Study, a Planning Advisory Committee (PAC) has been established. The PAC consists of technical level representatives of the Authority, airlines, airport tenants, general aviation users, the FAA, the North Carolina Department of Aviation, Division of Aviation (NCDOT), and other key agencies and interest groups. In addition, the PAC includes representation from local municipalities, regional planning agencies, economic development organizations, and land use and transportation planning groups. The PAC will be asked to provide guidance and advice on technical and local issues and will also review working papers at various milestones throughout the course of the project to ensure that all relevant issues were adequately addressed. The PAC will also be asked to provide broad input and insight on non-technical issues affecting the community.

Meeting	Date
Project Kickoff Meeting	09-16-2021
PAC Meeting #1 (Introduction and Inventory)	11-17-2021
PAC Meeting #2 (Forecasts and Facility Requirements)	TBD
PAC Meeting #3 (Development Alternatives)	TBD
Public Meeting #1	TBD
Public Meeting #2	TBD
Project Meetings (As Needed)	TBD
Meetings on Technical Issues	TBD
Briefings for the Airport Authority Board	TBD

At least three PAC meetings, as well as project meetings (as necessary), will be held throughout the duration of the program as part of a coordinated series of meetings at key decision points in the study process. In addition to the PAC meetings and project meetings, up to three briefings for the Airport Authority Board and two public meetings will be held. The Airport Authority Board briefings will be scheduled, as needed, and will cover topics of special concern or interest to the Authority. The purpose of the public meetings and workshops is to provide opportunities for the Authority to engage the public in purposeful conversation about the Airport and the Master Plan Update. Other briefings may be organized with key agencies, stakeholders, or public officials as needed for various topics. A Master Plan Update website, located on the Airport's website, will enable the public to conveniently access project specific information in a narrative and graphical format throughout the study's duration. The table above lists each of the key involvement briefings, workshops, and meetings carried out and planned, to date.

1.2 AIRPORT BACKGROUND

Understanding the background of an airport and the region it serves is essential in making informed decisions pertaining to airport-related improvements. This section discusses AVL in the context of its history, location, service area, and role in the National Airspace System (NAS).

1.2.1 History

The greater Asheville region was previously served by a nearby, much smaller airport, just east of the existing location. In 1957, municipal leadership began making plans for development of the present Asheville Regional Airport. Significant milestones in its history include:

- **1961** – Air service begins at Asheville Regional Airport; present-day Terminal facility and Air Traffic Control Tower (ATCT) open; Instrument Landing System (ILS) capabilities begin one year later
- **1979** – The Asheville Regional Airport Authority Board was established under North Carolina Statutes by Buncombe County and the City of Asheville to maintain, operate, regulate, and improve the airport while enhancing the economy of the region
- **1980** – Runway increased to present length of 8,001 feet; Terminal facility undergoes first major expansion to baggage claim and gate areas
- **1992** – Terminal facility again significantly expanded, increasing ticketing, baggage claim, holdroom/gate space, and administrative space; New loop road developed to improve access from Airport Road
- **2003** – Terminal facility again expands holdroom/gate areas
- **2006** – Terminal apron and maintenance/support facilities expanded
- **2008** – Consolidated rental car service/QTA facility developed
- **2010** – Fourth major expansion/renovation to Terminal facility completed
- **2012** – The North Carolina legislature voted to change the structure of the board to a state-sanctioned independent Airport Authority with more regional representation and governance. The Greater Asheville Regional Airport Authority (GARAA) is now the governing body for the Airport and is comprised of seven members
- **2017** – Parking garage and rental car pick-up/return facility developed
- **2018** – Terminal Building Assessment Study concluded that existing and forecast growth would best be served by a new Terminal facility, built around the existing apron, parking, and curbside.
- **2020** – Planning and design commences for a new terminal and ATCT
- **2021** – Airfield improvement program completed, reconstructing runway and taxiways

1.2.2 Location and Service Area

Asheville Regional Airport is the primary gateway for Western North Carolina. As shown in **Figure 1-2** and **Figure 1-3**, the Airport is approximately 15 miles south of downtown Asheville and 12 miles north of downtown Hendersonville, located directly off of Interstate 26. As the primary commercial service airport in the region, the Airport's service area extends beyond Asheville and into all parts of Western North Carolina and portions of northern South Carolina. AVL's location, regarding time[1] and distance in nautical miles (nm), in comparison to other major airports in the region is as follows:

- Charlotte Douglas International Airport (CLT) – 80 nm; 1-hour,40-minute drive; east of AVL
- Greenville-Spartanburg International Airport (GSP) – 40 nm; 1-hour drive; south of AVL
- McGhee Tyson Airport (TYS) – 75 nm; 2-hour drive; west of AVL
- Tri-Cities Airport (TRI) – 65 nm; 1 ½-hour drive; north of AVL

The Airport is located within the Asheville NC Metropolitan Statistical Area (MSA). The MSA, with a population of approximately 420,000 per the latest census data, consists of the following counties:

- Buncombe
- Haywood
- Henderson
- Madison
- Transylvania

1.2.3 Airport Role

In addition to connecting Western North Carolina to the global transportation network, the Airport plays a significant role in the nation's air travel system. The National Plan of Integrated Airports Systems (NPIAS) identifies existing and proposed airports that are important to national air transportation and provides a forward-looking estimate of the type and cost of Airport Improvement Program (AIP)-eligible development needed to meet the needs of civil aviation. Airports included in the NPIAS are considered significant to national air transportation and are eligible to receive grants under the FAA's Airport Improvement Program (AIP).

The NPIAS further categorizes the nation's airports based on types of service provided and quantity of passengers enplaned. In the 2021-2025 NPIAS, AVL is classified as a small-hub primary commercial service airport. Small hubs are defined as airports that enplane 0.05 percent to 0.25 percent of total U.S. passenger enplanements. The 72 small hub airports account for nine percent of all U.S. enplanements. **Table 1-1** outlines the specifics of each NPIAS category and provides examples of each type in the region.

[1] Drive times may be impacted during certain times of the day due to traffic congestion and/or construction activity.

Table 1-1 – NPIAS Airport Classifications

Airport Classifications		Hub Type: % of Annual Passenger Boardings	Example Airport
Commercial Service: *Publicly owned airports that have at least 2,500 passenger boardings each calendar year and receive scheduled passenger service*	**Primary**: *Have more than 10,000 passenger boardings each year*	**Large Hub**: *1% or more*	Charlotte Douglas International Airport (CLT)
		Medium Hub: *At least .25%, but less than 1%*	Raleigh-Durham International Airport (RDU)
		Small Hub: *At least .05%, but less than .25%*	**Asheville Regional Airport (AVL)**
		Non-hub Primary: *More than 10,000, but less than .05%*	Coastal Carolina Regional Airport (EWN)
	Non-primary	**Non-primary Commercial Service**: *At least 2,500, and no more than 10,000*	McKellar-Sipes Regional Airport (MKL)
Non-primary (*Except Commercial Service*)		**Reliever**	Charlotte-Monroe Executive Airport (EQY)
		General Aviation	Jackson County Airport (24A)

Source: FAA 2021-2025 NPIAS Report.

Figure 1-2 – Location Map

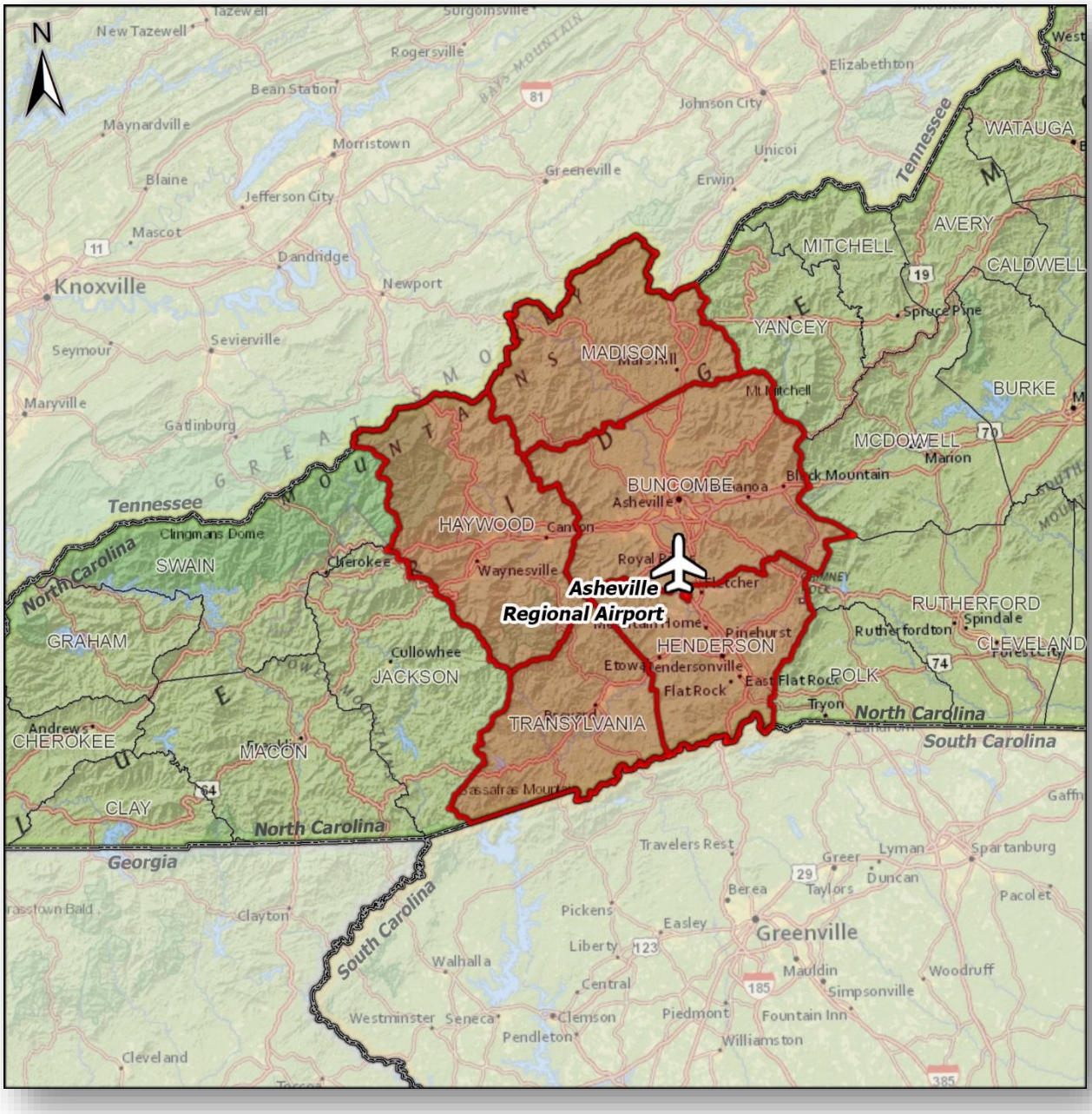
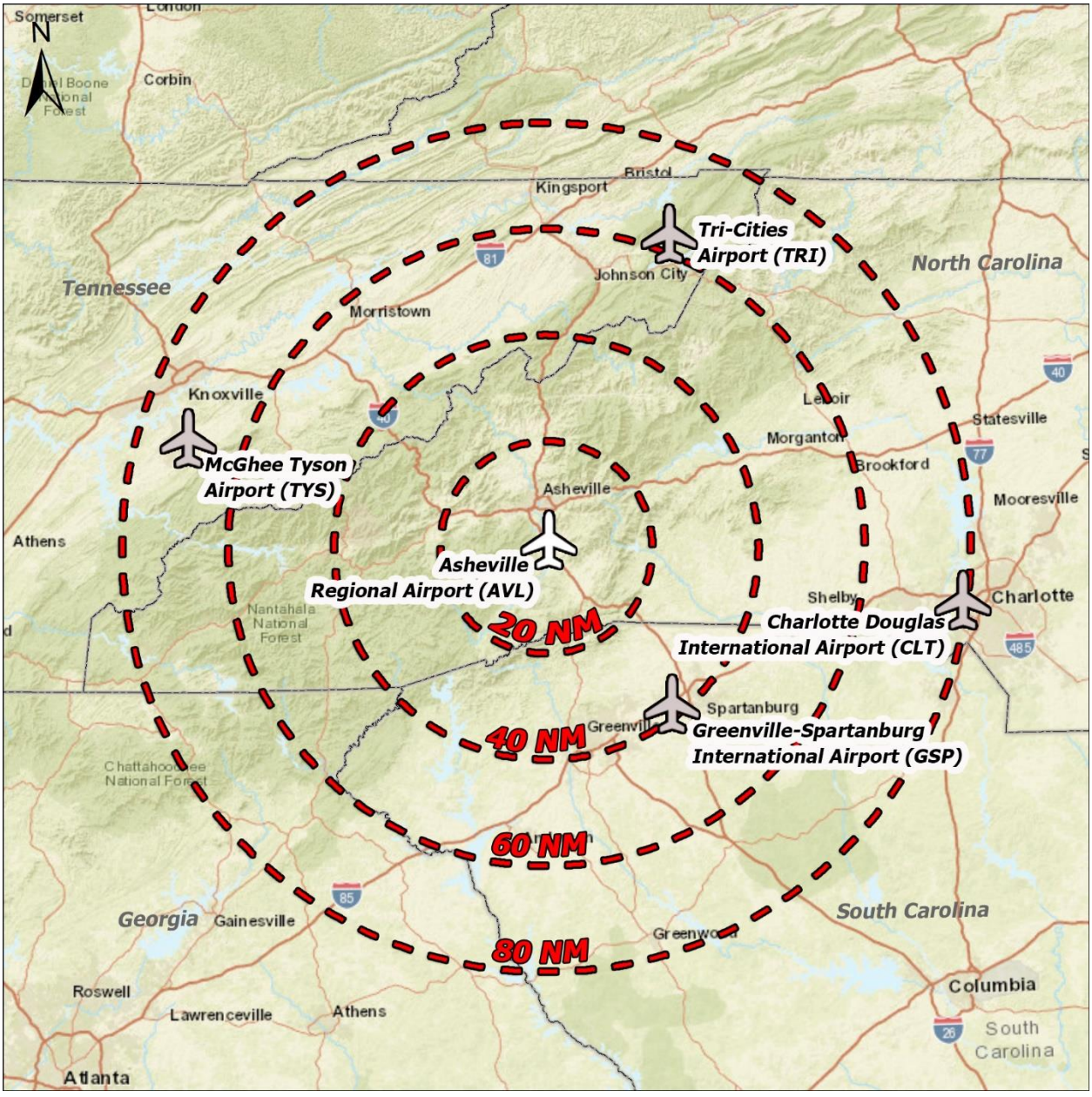


Figure 1-3 – Vicinity Map



1.3 AIRPORT GOVERNANCE

The GARAA is a political subdivision of the State of North Carolina and is an independent airport authority. The Authority is governed by a seven-member Board of Commissioners consisting of representation from the Asheville City Council, Buncombe County Commission, Henderson County Commission, and one regional at-large appointment by the six board members.

1.4 MAJOR AIRPORT TENANTS

The Airport hosts a variety of aviation and non-aviation tenants that provide services to the traveling public and aviation community. The major tenants include the airlines, general aviation businesses, FBO/GA users, federal government (FAA/TSA), concessionaires, and rental car companies, as well as the DreamCatcher Hotel and the Broadmoor Golf Links.

1.4.1 Passenger Airlines

According to the FAA, in 2021, AVL was ranked as the 107th busiest airport in the United States in passenger arrivals and departures, serving 1.6 million total passengers annually (2019, pre-COVID). Five airlines currently provide scheduled passenger service at the Airport. Between these airlines, AVL offers daily, non-stop service to 25 domestic destinations, as depicted in **Table 1-2** and **Figure 1-4**, Domestic service is primarily to key markets and hubs in the Northeast, Midwest, and South, as well as leisure markets in Florida.

In 2022, the commercial passenger service airlines operating at AVL are:

Allegiant Air (Allegiant)

American Airlines (American)

Delta Air Lines (Delta)

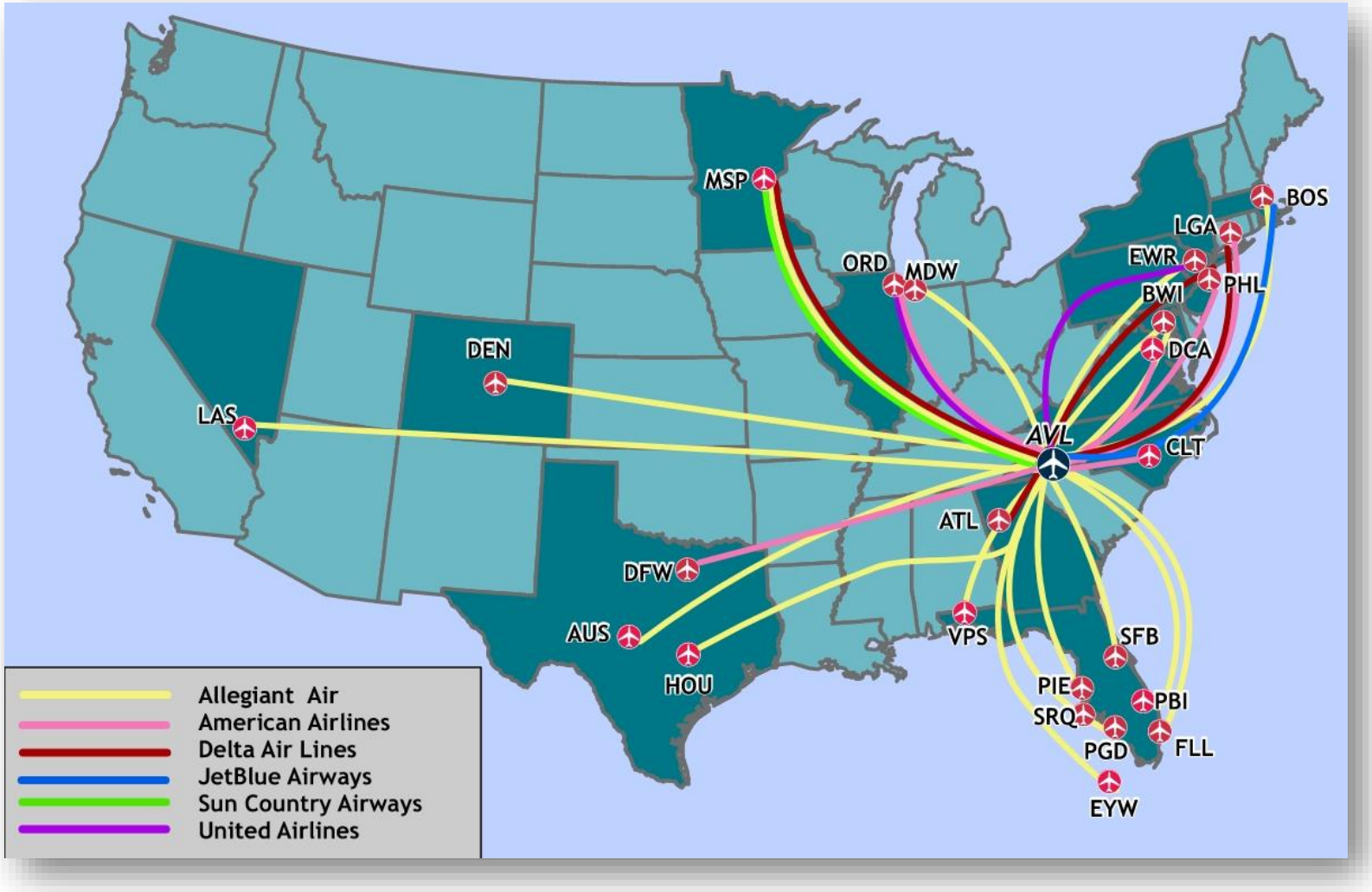
JetBlue Airways (JetBlue)[2]

Sun Country Airlines (Sun Country)

United Airlines (United)

[2] JetBlue Airways is scheduled to inaugurate service in June of 2022.

Figure 1-4 – Air Service Destinations



Delta Air Lines scheduled to begin service to MSP on April 16, 2022; JetBlue Airways scheduled to inaugurate service to BOS in June of 2022.

Table 1-2 – Current Non-Stop Air Service Destinations

Airlines	Destinations
Allegiant	Austin-Bergstrom (AUS)*, Baltimore-Washington (BWI), Boston Logan (BOS)*, Chicago-Midway (MDW)*, Denver (DEN), Destin/Fort Walton Beach (VPS), Fort Lauderdale-Hollywood (FLL), Houston-Hobby (HOU)*, Key West (EYW), Las Vegas-McCarran (LAS), Minneapolis/St. Paul (MSP), Newark Liberty (EWR), Orlando/Sanford (SFB), Punta Gorda (PGD), St. Petersburg/Clearwater (PIE), Sarasota/Bradenton (SRQ), Palm Beach (PBI)
American	Charlotte Douglas (CLT), Chicago-O'Hare (ORD)*, Dallas/Fort Worth (DFW), New York-LaGuardia (LGA)*, Philadelphia (PHL)*, Washington-Reagan (DCA)*
Delta	Atlanta Hartsfield-Jackson (ATL), New York-LaGuardia (LGA)*
Sun Country	Minneapolis/St. Paul (MSP)
United	Chicago-O'Hare (ORD), Newark Liberty (EWR)*

Source: GARAA, 2022.
*indicates seasonal service

In addition to the air service and destinations noted above, JetBlue Airways will be starting service to Boston Logan (BOS) in June of 2022, and Delta will begin seasonal service to Minneapolis/St. Paul (MSP) on April 16, 2022.

1.4.2 Rental Car Companies

As of December 2021, eight rental car companies provide services at AVL. Each on-site company has grouped counters accordingly, in the baggage claim area, dedicated ready parking and return parking in the parking garage, with Quick Turn Around (QTA) services and vehicle maintenance located in a consolidated area south of the terminal and parking areas along Rental Car Drive.

The rental car companies operating at AVL are:

Alamo

Avis

Budget

Dollar Rent a Car

Enterprise

Hertz

National

Thrifty

1.4.3 Concessionaires

Concessionaires at an airport provide travelers in the sterile and non-sterile/non-secured areas, as well as meeters/greeters in the non-sterile area, with amenities such as restaurants / food vendors, newsstands, and gift shops. All concessions at AVL are operated by Paradies Lagardere.

1.4.4 Department of Homeland Security

The Department of Homeland Security provides AVL with services from the Transportation Security Administration (TSA). Airports and Airlines are required to meet security regulations established in Title 49 Code of Federal Regulations (CFR) Part 1542, *Airport Security,* and Title 49 CFR Part 1540, *Civil Aviation Security: General Rules*. As set forth in Title 49 CFR Part 1540.5, the "sterile area" refers to the most restrictive areas of the Airport (e.g., the concourses) and cannot be accessed by the public or badged personnel until being processed through security measures specified in 49 CFR Part 1542. "Secured areas" are areas outside the concourse that are accessible only to badged personnel (proximity of baggage makeup and aircraft parking). "Non-sterile/non-secure areas" do not have regulated security measures and are accessible to the general public.

1.4.5 Fixed-Base Operator (FBO)

Signature Flight Support is the full-service FBO providing aviation services and amenities to the airlines, GA users, and pilots operating out of AVL. Signature Flight Support is the world's largest FBO and distribution network for business aviation services. A summary of the services offered by Signature includes aircraft fueling, deicing, ground handling, hangar storage, and tie-down areas, as well as a business center, conference rooms with conference call capabilities, crew transportation services and capabilities, and crew rooms and rest areas. In addition to Signature Flight Support, WNC Aviation and Belle Aircraft Maintenance provide services to general aviation users at the Airport. WNC Aviation is a flight school providing Private Pilot, Instrument, Commercial, Multi-Engine, CFI, CFII, MEI and Airline Transport Pilot training. Belle Aircraft Maintenance provides annual inspections, aircraft maintenance and repair, and aircraft detailing services.

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CHAPTER TWO

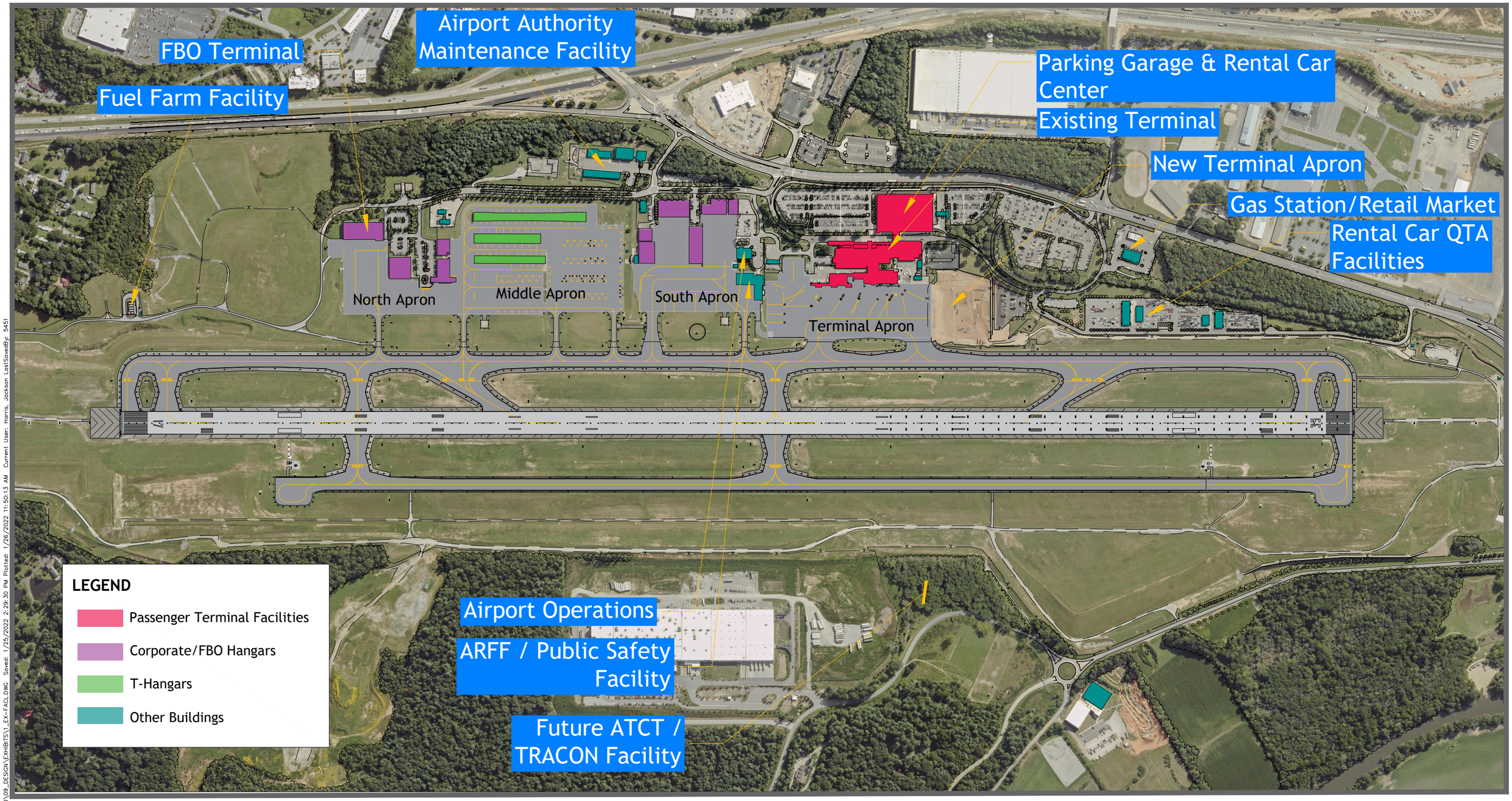
Inventory of Existing Facilities and Conditions

2 INVENTORY OF EXISTING FACILITIES AND CONDITIONS

The initial step in the master planning process is to develop an inventory of the existing physical conditions and operational characteristics of the Airport and its surroundings. The information presented in this chapter is the basis for evaluating the Airport's existing and future facility requirements. The following elements are detailed in this chapter:

- Airfield
  - Airport Design Criteria
  - Runway System
  - Taxiway System
  - Aircraft Parking Aprons
  - Airfield Markings
  - Airfield Signage
  - Airside Pavement Condition
- Navigational Aids (NAVAIDs) and Instrument Procedures
  - Types of Instrument Approach Procedures and Instrument Approach NAVAIDs
  - Standard Instrument Departures
  - Airfield Lighting
- Terminal Facility
  - Terminal Facility Layout
  - Terminal Building Functional Areas
  - Airline Ticketing Lobby
  - Checked Baggage Screening
  - Passenger Security Screening
  - Airline Gates and Holdrooms
  - Terminal Concessions and Amenities
  - Baggage Claim
  - Rental Car Counters
- Automobile Access and Parking
  - Passenger Parking
  - Rental Car QTA & Parking
  - Consolidated Rental Car Service Facility
  - Employee Parking
  - Ground Transportation
  - Vehicular Circulation
  - Signage and Wayfinding
- Support Facilities
  - Airport Perimeter Fence
  - Airport Equipment Storage and Maintenance
  - Air Traffic Control Tower (ATCT)
  - Aircraft Rescue and Firefighting (ARFF)
  - Aircraft Fueling
  - Snow and Ice Control
  - General Aviation (GA) Facilities and Activities
- Airspace Environment
- Meteorological Conditions
  - Local Climate
  - Wind Coverage

The existing facilities, as well as the Airport's general layout and key areas are depicted in **Figure 2-1**.



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MASTER PLAN UPDATE

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Figure 2-1
Existing Facilities

2.1 AIRFIELD

The Airport's airside and airfield facilities generally include the facilities located within the airport perimeter fence that are most closely associated with the movement and operation of aircraft, such as taxiing, takeoff, landing, and parking. Additional elements related to airfield activity and infrastructure include the runway and taxiway systems, aircraft parking aprons and hangars, and airfield pavement, markings, signage, lighting, and NAVAIDs.

2.1.1 Airport Design Criteria

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. ARC is determined by taking the highest RDC minus the visibility component. It affects runway and taxiway dimensions, separation standards, pavement marking standards, and other safety standards. Furthermore, it is used for planning and design only and 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 described in FAA AC 150/5300-13A, *Airport Design*. Typical aircraft types operating at AVL are shown in **Table 2-1**, while the characteristics of the RDC are shown in **Table 2-2**.

Table 2-1 – Typical Aircraft Types Operating at AVL

As noted, the ARC is based on an aircraft's approach speed and wingspan or tail height, whichever is most restrictive. The most demanding aircraft is commonly referred to as the critical, or design, aircraft and must account for a minimum of 500 annual itinerant operations. An itinerant operation is the takeoff or landing of an aircraft going from one airport to another, at least 20-miles from each other. The ARC consists of a letter designating the aircraft approach category and a Roman numeral designating the Airplane Design Group (ADG).

Approach categories A and B include small piston-engine aircraft and corporate jets with approach speeds of less than 121 knots, while categories C, D, and E include larger aircraft with approach speeds of 121 knots or greater (those typically associated with commercial or military use).

Similarly, design groups I and II typically include small piston-engine aircraft and light to midsize corporate jets, as well as single- and twin-engine turboprop aircraft. Design groups III, IV, and V include larger corporate jets and the majority of the commercial jet fleet, as well as numerous military aircraft. Design group VI includes very large jets such as the Airbus A380 and the military C-5 transport aircraft.

While the 737-800 is currently the most demanding aircraft with over 500 itinerant operations, the runway has been designed to ARC C-IV standards, with the critical aircraft established as the Boeing 757-200. The existing and future ARC will be analyzed in greater detail in **Chapter 4**, *Facility Requirements*.

Table 2-2 – Airport Reference Code

Approach Categories		
Approach Category	**Airspeed (Knots)**	**Example Aircraft**
A	<91	Beechcraft-E33 Bonanza, Cessna 152
B	91 ≤ 121	CRJ-200, ERJ-135/140/145
C	121 ≤ 141	B737-700W, MD-88
D	141 ≤ 166	A300, B757
E	166+	B-52H, B-2 Spirit

Airplane Design Group			
Design Group	**Tail Height (feet)**	**Wingspan (feet)**	**Example Aircraft**
I	<20	<49	Beechcraft-E33 Bonanza, Cessna 152
II	20-<30	49 ≤ 79	CRJ-700, ERJ-145
III	30-<45	79 ≤ 118	A319, CRJ-900
IV	45-<60	118 ≤ 171	Boeing 757, MD 11
V	60-<66	171 ≤ 214	A300, B757
VI	66-<80	214 ≤ 262	B-52H, B-2 Spirit

Source: FAA AC 150/5300-13 *Airport Design*, CHA, 2021.

2.1.2 Runway System

The existing airfield configuration at AVL consists of a single runway, identified as Runway 17-35, oriented in a north/south direction. This runway is newly reconstructed, opening in December 2020, replacing the Airport's original runway, in the same orientation (Runway 16-34). **Table 2-3** presents the characteristics of the runway.

The runway, situated west of the terminal building, is 150 feet wide and has a length of 8,001 feet, with no displacements. It is constructed of asphalt, has a grooved surface, and is supplemented by 25-foot wide, paved shoulders along the entire length. The runway's load-bearing capacity is 120,000 pounds single-wheel; 219,000 pounds dual-wheel; and 404,000 pounds dual tandem landing gear.

Table 2-3 – Existing Runway Specifications

	Runway 17-35
Runway Length (feet)	8,001
Displaced Threshold (feet)	N/A
Width (feet)	150
Runway End Elevation (feet above MSL)	**Runway 17:** 2,164 **Runway 35:** 2,117
Pavement Type	Asphalt /Grooved
Maximum Pavement Load Bearing	404,000 lbs. (Dual Tandem)
Effective Runway Gradient	0.67%
Aircraft Approach Category	C
Airplane Design Group	IV
Runway Markings	PIR
Runway and Approach Lighting	HIRL **Runway 17:** PAPI-4, MALSR **Runway 35:** PAPI-4, MALSR
Navigational Aids	ILS/DME, RNAV (GPS)
Runway Design Code	C-IV

Sources: AirNav.com; FAA Form 5010-1, *Airport Master Record-November 2021*, CHA, 2021.

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
PAPI-4 – Four-Box Precision Approach Path Indicator
RNAV – Area Navigation

2.1.3 Taxiway System

An airport's taxiway system connects the runways to aircraft parking aprons, storage hangars and other facilities. AVL has parallel taxiways on both sides or the runway, and 19 stub or connector taxiways, for a total of 21 operative and designated taxiways. The Airfield does not provide taxiway holding bays for runway approach end, but both ends are equipped with by-pass taxiways. While individual Taxiway Design Groups vary, the overall TDG for the Airport was classified as TDG-5 in the August 2016 runway design report; additionally, while the FAA-approved TDG and ADG vary by taxiway, much of the infrastructure has been designed to accommodate up to ADG V. **Table 2-4** provides the characteristics and specifications of each taxiway. **Figure 2-2** displays the existing taxiway system at AVL.

Table 2-4 – Existing Taxiway Specifications

Taxiway	Description	Width (feet)	Airplane Design Group (ADG)	Taxiway Design Group (TDG)	Taxiway Shoulder (feet)
A	Parallel to east side of RW 17-35, providing access to aprons	75	V	5	25
B	Parallel to west side of RW 17-35	75	V	5	12.5
C, D	Connects Terminal Apron to TW A	75+	V	5	0
E	Connects South FBO Apron to TW A	35	IV	2	0
F	Connects South FBO Apron to TW A	50	V	4	0
G	Connects Middle FBO Apron to TW A	35	II	2	0
H	Connects Middle FBO Apron to TW A	35	II	2	0
J	Connects Middle FBO Apron to TW A	35	II	2	0
K	Connects North FBO Apron to TW A	35	II	2	0
A1, A2	Connectors for TW A at RW 35 End	75	V	5	25
A3, A5	High-Speed Exit Taxiway Connectors to TW A	75	V	5	25
A4, A6	Connectors to TW A	75	V	5	25
A7, A8	Connectors for TW A at RW 17 End	75	V	5	25
B1, B3, B5	Connectors to TW B	75	V	5	25

Source: FAA Airport Diagram, AC 150/5300-13A, CHA 2021.

RW – Runway

TW – Taxiway

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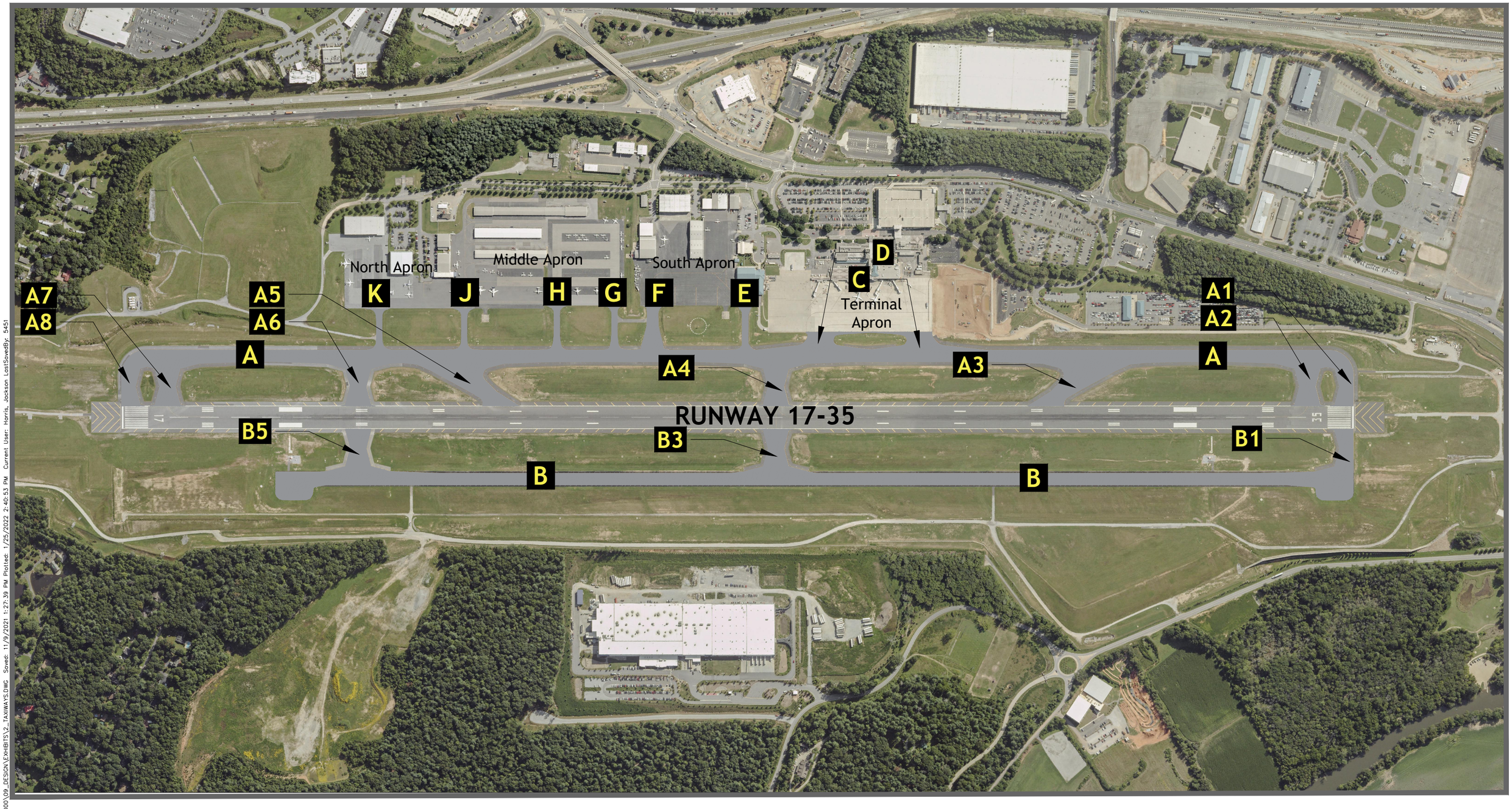

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MASTER PLAN UPDATE

GRAPHIC SCALE (FEET)
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Figure 2-1
Taxiway Configuration

2.1.4 Aircraft Parking 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. As depicted in **Figure 2-3** and described below, AVL has various aprons for the terminal and general aviation/hangar areas.

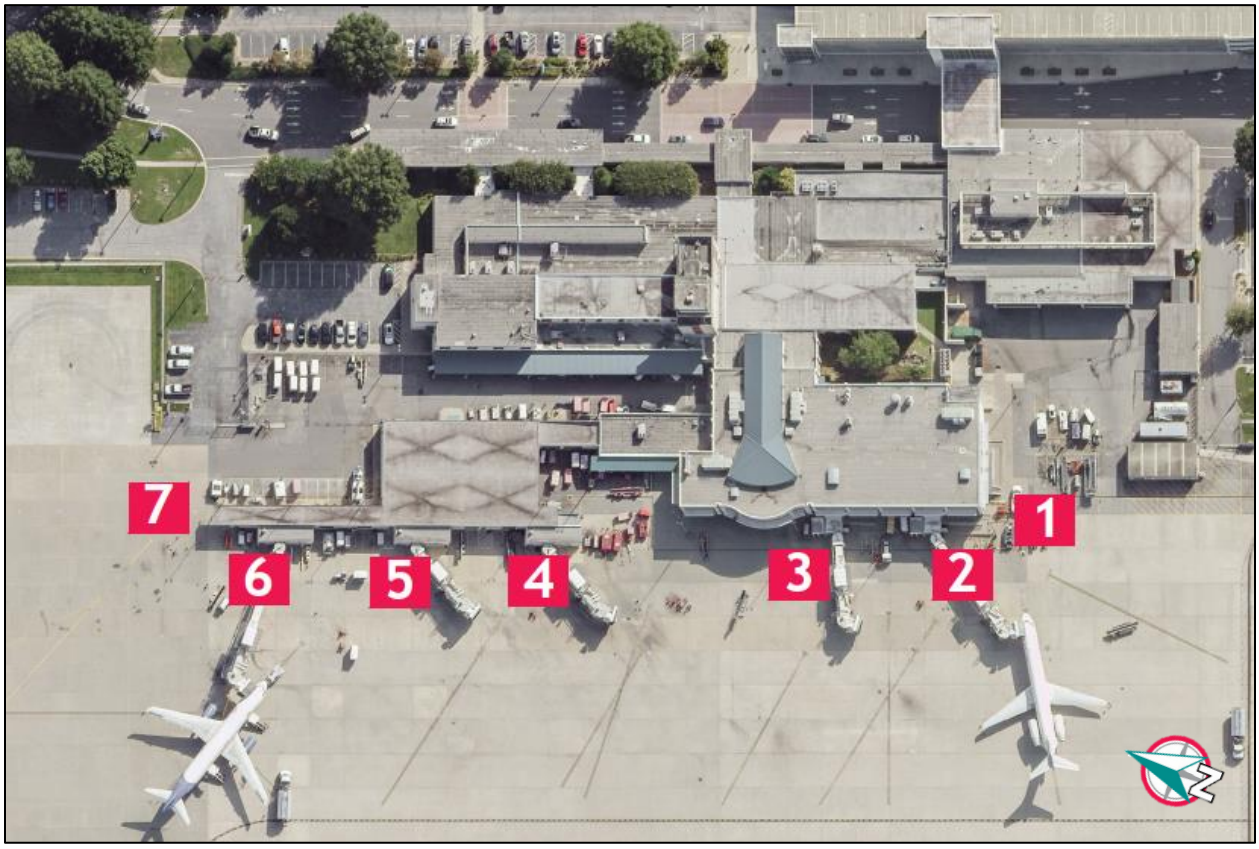
Figure 2-3 – Aircraft Parking Aprons

Source: CHA 2021.

Terminal Apron

The terminal apron consists of approximately 45,850 square yards of concrete pavement. Activities on the terminal apron primarily include passenger airline and belly cargo loading and unloading. The terminal currently has seven gate positions, with three on the south half and four along the northern half. Additionally, the apron is currently being expanded to the south in association with the Airport's ongoing Terminal Facility Improvement Program. This will add approximately 13,500 square yards of additional apron space. A schematic of the current gate layout is presented in **Figure 2-4**.

Figure 2-4 – Gate Layout



Source: CHA, 2021.

General Aviation (GA) Use Aprons

AVL maintains three separate aprons for General Aviation use; the North Apron (22,300 square yards), the Middle Apron (75,870 square yards, with tiedown areas), and the South Apron (40,350 square yards). The North Apron contains the Fixed Base Operator (FBO) facilities for Signature Flight Support and the GA Terminal, as well as three corporate hangars. The Middle Apron contains three T-Hangars and the two tiedown ramps for transient aircraft. Finally, the South Apron maintains seven box/corporate hangars and is the location of the Airport's Operations Building. The South GA Apron has recently been converted into a Remain Overnight (RON) aircraft ramp that accommodates three large commercial aircraft simultaneously. The Authority is in the design phase of having this apron area reconstructed to improve the integrity and strength of the pavement, allowing it to serve as a large aircraft parking apron over the long-term period. Additionally, the Aircraft Rescue and Firefighting (ARFF) facility is located between the South GA Apron and the Terminal Apron, with direct access to Taxiway A and the terminal building.

2.1.5 Airfield Markings

FAA AC150/5340-1L, *Standards for Airport Markings*, provides the standards for surface markings used on airfield roadways and airfield pavements, such as runways, taxiways, and aprons, assuming the surfaces are built in accordance with the standard dimensions and layouts in AC 15/5300-13, *Airport Design* (this excludes privately owned apron areas). The most recent version of this guidance was published in September 2013, however, FAA released a draft version of FAA AC 150/5340-1M in March 2021, and includes new standards for enhanced taxiway centerline markings, surface-painted hold sign markings and the extension of the runway holding position markings onto the paved shoulders.

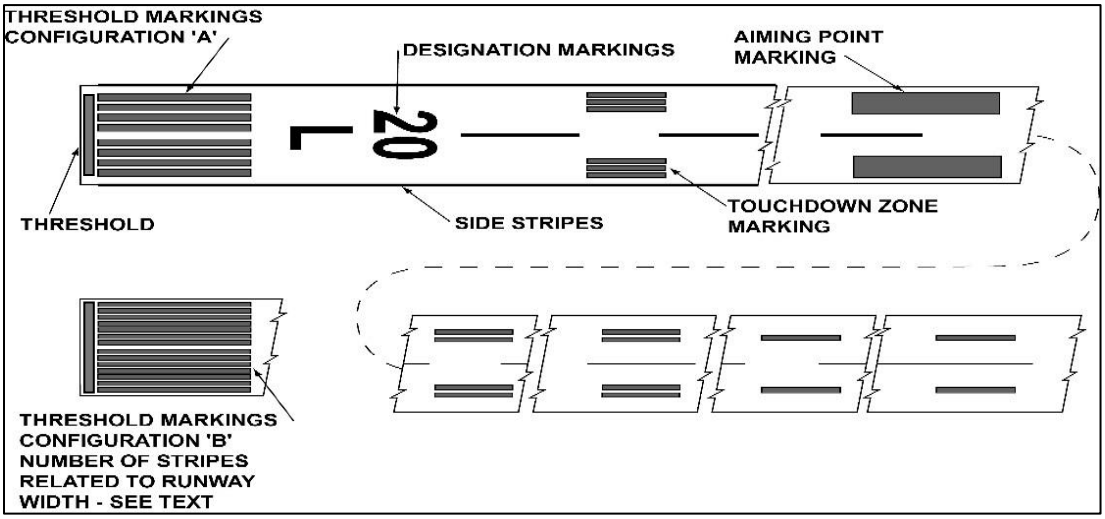
These standards apply to all airports certificated under Title 14 CFR Part 139, which establishes certification requirements for airports serving scheduled air carrier operations. Examples of airfield markings are provided in **Table 2-5**, **Figure 2-5**, and **Table 2-6**.

Table 2-5 – Runway Markings

Type of Marking	Purpose of Marking
Designation	Numbers and letters are determined from approach direction; labeled according to Compass Rose. Runway 17 is short for a magnetic bearing of approximately 170 degrees.
Centerline	Identifies the center of the runway; Provides alignment guidance during takeoff and landings
Threshold	Delineates the beginning of the runway that is available for landing
Aiming Point	Serve as a visual aiming point for a landing aircraft, located approximately 1,000 feet from the landing threshold
Touchdown Zone	Identify the touchdown zone for landing operations and are coded to provide distance information in 500 feet increments
Runway Edge Marking	Define the edge of the usable, full-strength surface

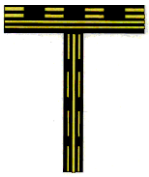
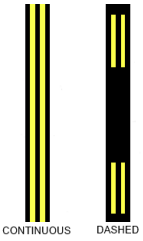
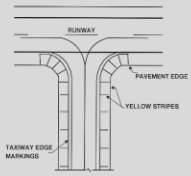
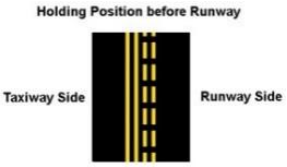
Source: FAA AC 150/5340-18F.

Figure 2-5 – Runway Markings



Source: FAA AC 150/5340-18F.

Table 2-6 – Taxiway Markings

Type of Marking	Purpose of Marking	Visual Representation of Marking
Normal Centerline	Provides a visual cue to permit taxiing along a designated path	
Enhanced Centerline	Intended to warn the pilot that he/she is approaching a runway holding position marking and should prepare to stop unless he/she has been cleared onto or across the runway by ATC; Usually at larger, commercial service airports	
ILS Hold Line	Identifies runway holding position where a pilot stops until being cleared onto or across the runway by ATC; at boundary of ILS Critical Area	
Edge Markings	Continuous- Define the taxiway edge from the shoulder or other abutting paved surface not intended for use by aircraft; Dashed- Defines the taxiway edge from the adjoining pavement intended for use by aircraft	
Shoulder Markings	Identifies paved shoulders (areas intended to prevent blast and water erosion); not intended for use by aircraft (may not be full-strength pavement)	
Runway Holding Position	Indicate where an aircraft is supposed to stop when approaching a runway	
Taxiway/Taxiway Intersection	Indicate where an aircraft is supposed to stop when approaching intersecting taxiways	

Source: FAA AC 150/5340-18F.

2.1.6 Airfield Signage

According to Title 14 CFR Part 139.311, *Marking, Signs, and Lighting*, each certificate holder, such as AVL, must provide and maintain sign systems for air carrier operations on the airport that are authorized by the Administrator and consist of at least the following:

- Signs identifying taxiing routes on the movement area.
- Holding position signs.
- Instrument Landing System (ILS) critical area signs.

The holding position signs, as well as the ILS critical area signs, must be internally illuminated. FAA AC 150/5340-18F, *Standards for Airport Sign Systems*, contains all regulations pertaining to airfield signage for Part 139 airports, while specifications are contained in AC 150/5345-44K, *Specifications for Runway and Taxiway Signs*. A further description of typical airfield signage is included in **Table 2-7**. See AC 150/5340-18F, Glossary of sign types, for additional sign type descriptions.

Upon visual inspection, lighted airfield signage currently found on AVL's airfield consists of all required signage for a Part 139 certificated airport including airfield location signage, mandatory instruction signage, and runway hold position signage. Additional signage may be required to accommodate future improvements or additions to airfield pavements.

Table 2-7 – Airfield Signage

Type of Sign	Purpose of Sign	Visual Description of Sign
Mandatory Instruction Sign	Denote taxiway/runway intersections, runway/runway intersections, Instrument Landing System (ILS) critical areas, Precision Obstacle Free Zone (POFZ) boundaries, runway approach areas, CAT II/III operations area, military zones, and no entry zones	White Inscription/Red Background
Location Sign	Identify the taxiway or runway apron upon which the aircraft is located	Yellow Inscription/Black Background
Boundary Sign	Identify the boundary of the Runway Safety Area (RSA)/Object Free Zone (OFZ), or ILS critical area for a pilot exiting the runway	Black Inscription/Yellow Background
Directional Sign	Indicate directions of other taxiways leading out of an intersection	Black Inscription/Yellow Background; Always Contains an Arrow
Destination Sign	Indicate the direction to a remote location	Black Inscription/Yellow Background; Always Contains an Arrow
Runway Distance Remaining Sign	Provide distance remaining information to pilots during takeoff and landing operations	White Inscription/Black Background
Taxiway End Sign	Indicates the termination of the taxiway, located at the far end of the final intersection	Yellow Crosshatch/Black Background

Source: FAA AC 150/5340-18F.

2.1.7 Runway Pavement Condition

The load-carrying capacity of airfield pavement for unrestricted operations is expressed as a Pavement Classification Number (PCN). According to AC 150/5335-5C, *Standardized Method of Reporting Airport Pavement Strength-PCN*, in 1977, the International Civil Aviation Organization (ICAO) adopted the Aircraft Classification Number-Pavement Classification Number (ACN-PCN) method. The PCN is a five-part number which includes a numerical PCN value [indicating the load-carrying capacity of a pavement (between 0 and 100)], pavement type (flexible-F or rigid-R), subgrade category (high-A, medium-B, low-C, ultra-low-D), allowable tire pressure (unlimited/no pressure-W, high/pressure limited to 254 psi-X, medium/pressure limited to 181 psi-Y, and low/pressure limited to 73psi-Z), and the method used to determine the PCN (via technical study-T or evaluation based on using aircraft experience-U). The PCN for the runway at AVL is shown in **Table 2-8**.

Table 2-8 – Runway Pavement Condition

Runway	PCN Classification	Numerical Value (0-100)	Pavement Type	Subgrade Strength Category	Allowable Tire Pressure	Method
17-35	54 F/B/X/U	54	Flexible	Medium	Unlimited / No-Pressure	Evaluation

Source: GARAA, 2021.
psi: pounds per square inch

2.1.8 Navigational Aids (NAVAIDs) and Instrument Procedures

Pilots utilize a variety of navigational aids (NAVAIDs), instrument approach procedures (IAPs) approach lighting systems (ALS), airfield lighting, and rotating beacons. By providing point-to-point guidance information or position data, NAVAIDs assist pilots to safely and efficiently locate airports, land aircraft, taxi aircraft, and depart from airports during nearly all meteorological conditions. **Table 2-9** summarizes the Airport's existing instrument approach procedures, by runway, and the NAVAIDs required.

Table 2-9 – Navigational Aids (NAVAIDs) and Airfield Lighting

Runway	Runway Markings	Navigational Aids	Lighting	Minimum Ceiling (AGL)/ Visibility	Instrument Approach Types
17	Precision	ILS/DME, GPS	HIRL, PAPI-4, MALSR	200 ft. / ½ mile	ILS or LOC, RNAV (GPS)
35	Precision	ILS/DME, GPS	HIRL, PAPI-4, MALSR	200 ft. / ½ mile	ILS or LOC, RNAV (GPS)

Source: FAA Airport Master Record (Form 5010), Accessed 2021.

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
PAPI-4 – Four-Box Precision Approach Path Indicator
RNAV – Area Navigation

2.1.9 Types of Instrument Approach Procedures (IAPs) and Instrument Approach NAVAIDs

Based on current FAA classifications, there are four types of instrument approach categories:

- Visual (V) – Approaches performed under visual flight rules only, when meteorological conditions include a cloud ceiling height of 1,000 feet or greater and visibility of 3 miles or greater. All runways enable Visual Approaches, but AVL does not operate strictly under this category.
- Non-Precision Approach (NPA) – Instrument approach procedures providing only lateral guidance with a ceiling minimum of 400 feet above the threshold. These can include VHF Omnidirectional Range (VOR), non-directional beacon (NDB), area navigation (RNAV), lateral navigation (LNAV), localizer performance (LP), and localizer (LOC) equipment. Both runway ends have a NPA procedure.
- Approach Procedure with Vertical Guidance (APV) – Instrument approach procedures providing vertical guidance minimums of 250 feet above the threshold and visibility minimums as low as ¾ mile. These can include an ILS, LNAV/Visual Navigation Aids (VNAV), Localizer Performance with Vertical Guidance (LPV) or Area Navigation (RNAV) Required Navigation Performance (RNP). Both runway ends maintain this type of procedure.
- Precision Approach (PA) – Instrument approach procedures providing vertical guidance less than 250 feet above the threshold and visibility minimums lower than ¾ mile. These can include an ILS, LPV, and Global Navigation Satellite System (GNSS) Landing System (GLS). This category applies to both runway ends.

The precision approaches enable the lowest ceiling and visibility for each runway (i.e., minimums).Variables that may influence the minimums include obstructions to the approach, buildings, terrain, etc. The NAVAIDs that make up the ground-based equipment required to perform the approach procedures are divided into two categories: precision and non-precision. The NAVAIDs supporting traditional ground-based precision approaches are collectively called an Instrument Landing System (ILS). According to FAA Order 6750.16E, *Siting Criteria for Instrument Landing Systems*, the ILS provides guidance to pilots of properly equipped aircraft to assist them in landing safely under the lowest conditions of reduced ceilings and lowered visibility. The Airport operates an ILS for approaches to Runway 17 and Runway 35.

Two components of an ILS include: a localizer (LOC) and a glide slope (GS). A localizer is situated 1,000 feet past the departure-end of the runway that has the approach and provides lateral positioning guidance to pilots. It utilizes radio frequencies (RF) to transmit signals to aircraft by focusing the RF beam down the centerline of the runway toward the approach end of the runway for approximately 10 miles, focused within 35 degrees to the left or right of the runway centerline. The glide slope is located near the runway approach end at a distance from the threshold to provide optimum crossing height, with a preferred offset of 400 feet from the runway centerline.

It transmits a signal for approximately 10 nautical miles, with a horizontal coverage of eight degrees on each side of the localizer course, measured from the origin of the glide slope beam. The glide slope must be established between 2.0 and 4.0 degrees and is typically established with a glide path angle of 3.00 degrees.

Additionally, the runway utilizes Global Positioning System (GPS) based technology to enable vertically-guided instrument approach procedures with approach capabilities similar to ILS approaches without the need for the traditional ground-based ILS NAVAID components. All precision and vertically guided procedures at AVL have a 3.0-degree glide slope and a Threshold Crossing Height (TCH) of 55 or 56 feet.

Approach Lighting Systems (ALS)

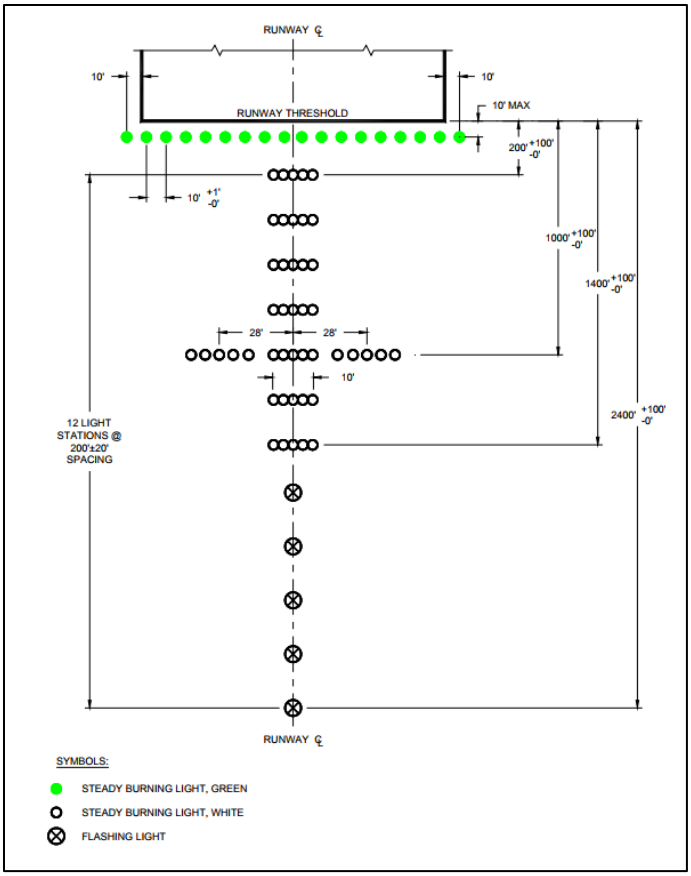
The third component of an ILS, in addition to the localizer and glideslope, is the approach lighting system (ALS). The ALS provides a lighted approach path along the extended centerline of the runway. Runway alignment indicator lights flash in sequence as a series of white lights moving toward the runway threshold, which emphasize runway centerline alignment. Roll indication is emphasized by a single row of white lights located on either side of, and symmetrically, along the column of approach lights.

Typically, airports with precision approaches 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) that are utilized for precision runways, such as Runway 17 and Runway 35 at AVL.

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.

RAIL's 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. A diagram for the commonly used MALSR configuration is depicted in **Figure 2-6**.

Figure 2-6 – MALSR Configuration



Source: FAA Order 6850.2B, *Visual Guidance Lighting Systems*.

2.1.10 Standard Instrument Departures (SIDs)

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. They provide an easy-to-understand departure procedure that airports use to balance terrain and obstacle avoidance, noise abatement (if necessary), and other airspace management considerations. SIDs are always printed graphically and textually.

AVL has one SID procedure for departing IFR aircraft. The SID, identified as *ASHEVILLE SEVEN*, instructs aircraft to climb on an assigned heading after departure and expect ATC to advise the radar vectors to the assigned route. AVL also has published Special Take-Off Minimums based on height of terrain that surrounds the airport.

2.1.11 Airfield Lighting

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

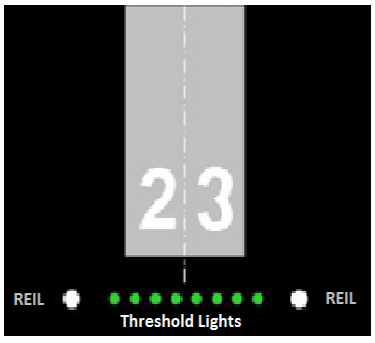
Rotating Beacon:

The rotating beacon functions as the universal indicator for locating an airport at night. For a civilian airport, it has one clear and one green lens, 180 degrees apart, and is generally visible 10 miles from the airport. According to the Aeronautical Information Manual, October 2021, at Class C airports, the operation of the airport beacon during the hours of daylight often indicates that the ground visibility is less than three miles, and/or the ceiling is less than 1,000 feet. The rotating beacon at AVL is currently located atop the Air Traffic Control Tower. In light of the fact that the Air Traffic Control Tower is being relocated with the ongoing Terminal Facility Improvement Program, the rotating beacon will be relocated as well. This will be further discussed in subsequent chapters.

Precision Approach Path Indicator (PAPI) Lights:

A PAPI is a system of lights located near a runway end. It provides pilots with visual glide slope guidance information during an approach to the runway. PAPIs typically have an effective visual range of at least three miles during the day and up to 20 miles at night and inform pilots if they are high, low or on the correct approach descent path for the threshold. Both runway ends are equipped with PAPI-4 (four-light unit) systems.

Runway Threshold Lighting:



Runway threshold lighting emits green light outward from the runway and red light toward the runway to mark the ends of the runway. The green lights indicate the landing threshold to arriving aircraft, whereas the red lights indicate the end of the runway for landing aircraft. The red and green lights are usually combined into single fixtures and special lenses or filters are used to emit the desired light in the appropriate direction.

Runway Edge Lighting:

Runway edge lighting varies in color (white, except for the last 3,000-feet in length, where it is amber) 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: At AVL, High-Intensity Runway Lights (HIRL) are provided with threshold lights owned by the Airport.

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 100-foot intervals along the taxiway edges, 10 feet outward from the edge of the full-strength pavement. All of the Airport's taxiways are equipped with Medium-Intensity Taxiway Lighting (MITL).

Apron Lighting:

Apron floodlight systems illuminate the Terminal Apron, and the General Aviation Aprons.

Helipad Lighting:

AVL maintains two helipads: one where Taxiway E meets the South Apron, and one where Taxiway J meets the North Apron. Typical heliport lighting, required for heliports supporting nighttime operations, surround the designated Touchdown and Liftoff area (TLOF) and Final Approach and Takeoff (FATO) area. At AVL, perimeter lights are installed around the TLOF area. Nine perimeter lights surround each heliport and access taxiway, spaced 30 feet apart. The latest guidance prescribed in FAA AC 150/5930-2C *Heliport Design* recommend green lights, which are in use at AVL.

2.2 TERMINAL FACILITY

A thorough assessment of the existing AVL terminal was completed in 2018. This study, the *Asheville Regional Airport Terminal Building Assessment Study* was used as a guide for this Inventory effort, as well as discussions with Airport tenants regarding recent changes. This section provides a general understanding of the existing terminal facility. It is important to note that a terminal replacement program is currently underway and is presently in the design stage. This new terminal will ultimately replace the entire existing building on the existing location and is expected to be completed in 2025. The new terminal will utilize the existing terminal facility roadways, curbside, parking, and aircraft apron.

2.2.1 Terminal Facility Layout

The terminal facility at AVL is comprised of two levels and is categorized into the following main functional areas:

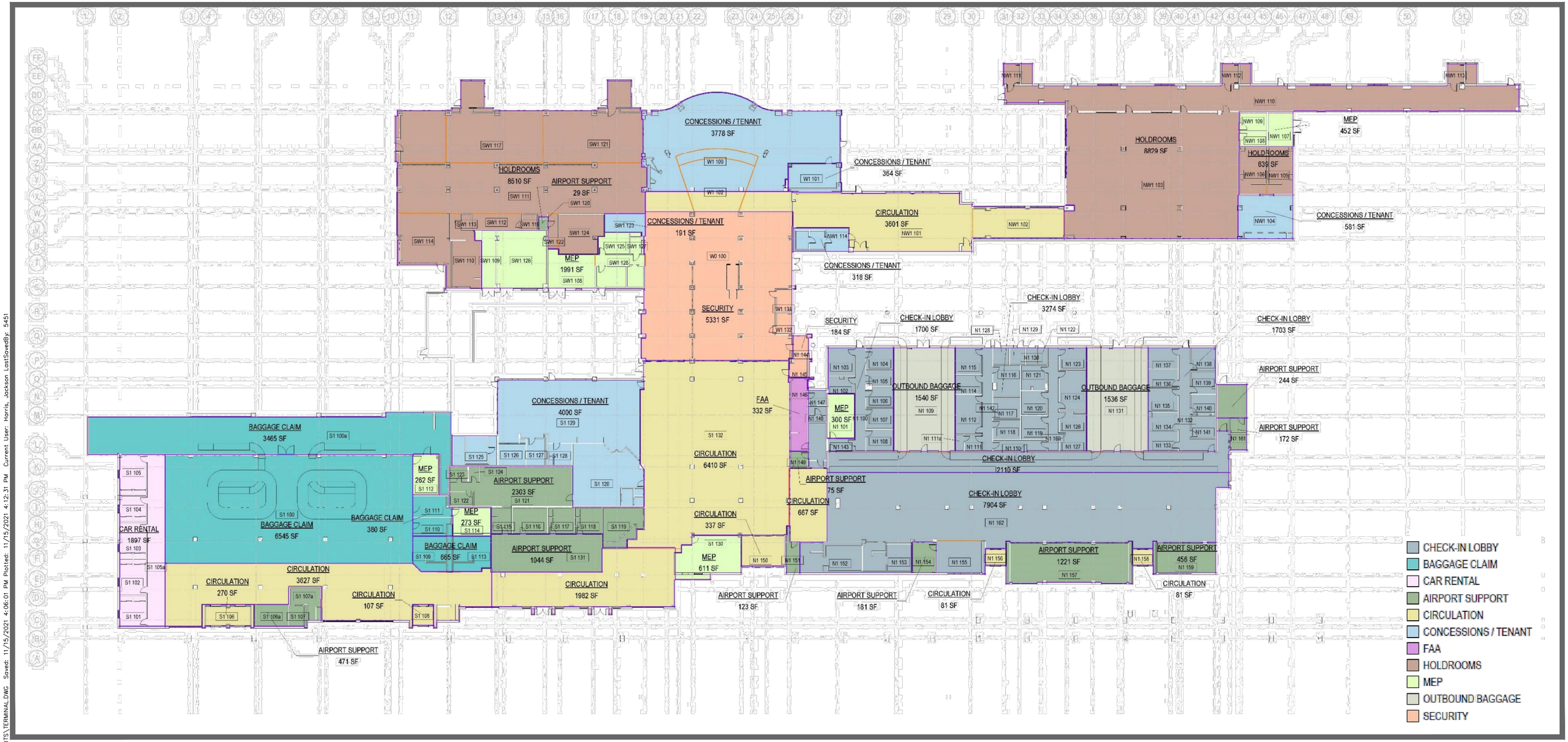
- Ticketing/Check-in Lobby
- Checked Baggage Inspection System (CBIS) and Baggage Make-up (BMU)
- Passenger Security Screening Checkpoint (SSCP)
- Holdrooms
- Baggage Claim Lobby and Inbound Baggage Handling
- Concessions
- Rental Car Facilities
- Other Areas

The existing lower-level and upper-level building floor plans are shown in **Figure 2-7** and **Figure 2-8**.

The airlines currently serving AVL (January 2022) include Allegiant Air (G4), American Airlines (AA), Delta Air Lines (DL), Sun Country Airlines (SY), and United Airlines (UA). JetBlue Airways (B6) is scheduled to begin service in June of 2022.

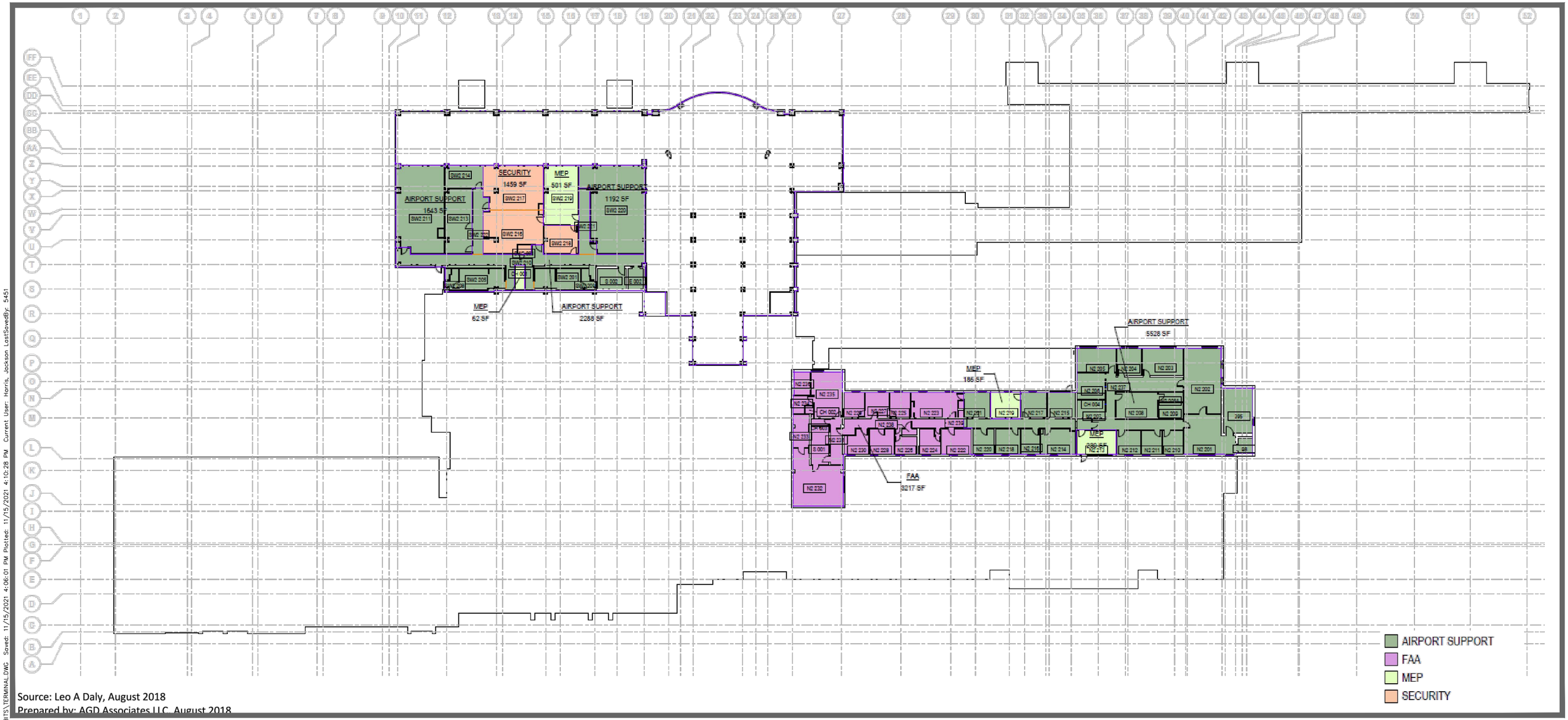
As part of the existing facility analysis, the space was analyzed as a complete system for each functional category and not subdivided by the individual airlines.

It should be noted that in some cases, functional areas being used for other purposes are included as part of the total functional area for that category. As an example, airline operations is occupying space that would be classified as check-in facilities, therefore the space has been categorized as check-in facilities.



MASTER PLAN UPDATE

Figure 2-7
Passenger Terminal - First Level



Source: Leo A Daly, August 2018
Prepared by: AGD Associates LLC, August 2018

Asheville REGIONAL AIRPORT
MASTER PLAN UPDATE

Figure 2-8
Passenger Terminal - Second Level

2.2.2 Check-in Lobby

The check-in lobby consists of the functional spaces between the departures curb and the airline ticket offices (ATO), located behind the passenger check-in facilities. The functional areas include: two entry vestibules; non-secure public circulation; public amenities such as restrooms and seating areas; airline check-in facilities with full-service agent positions, self-service kiosk positions; queuing areas for check-in facilities. **Table 2-10** shows the area of the various elements of the existing check-in lobby.

Table 2-10 – Check-In Lobby Functional Areas

Function Area	Size	
Check-In Facilities (includes Queue Area and Circulation)	39 Positions	2,110 SF
Check-In Lobby	7,904 SF	
Airline Ticketing Office (ATO)	6,116 SF	
Other Public Areas	1,698 SF	
Public Restrooms	845 SF	
TOTAL CHECK-IN LOBBY	**18,673 SF**	

Source: Leo Daly Associates/CHA, 2018.

2.2.3 CBIS and BMU

The Checked Baggage Inspection System (CBIS) functional space includes the area needed for baggage screening equipment such as explosive detection system (EDS) machines, on-screen resolution (OSR) or electronic trace detection (ETD) stations as well as the conveyor equipment needed to queue the baggage before and after the CBIS equipment. The existing screening function consists of four in-line screening devices behind the ticketing counter back wall where bags are screened and directly loaded onto baggage carts. No separate resolution area is currently provided. The baggage make-up area consists of an accumulation device to collect bags once they have been screened, cart staging area adjacent to the accumulation device and circulation space for baggage tug and cart maneuvering. **Table 2-11** shows the area of the elements of the existing CBIS and baggage make-up (BGU) functions.

Table 2-11 – Existing CBIS and Baggage Make-Up Areas

Function Area	Size
CBIS/Outbound Baggage Make-Up Area	8,553 SF

Source: Leo Daly Associates/CHA, 2018.

2.2.4 Security Screening Checkpoint (SSCP)

The SSCP at AVL is used for all passenger and employee screening. The functional areas include queuing space, Transportation Security Administration (TSA) passenger screening lanes consisting of document check positions, walk-through metal detectors, carry-on baggage screening machines/devices, advanced imaging technology (AIT) whole-body imaging devices, passenger divestiture and recomposing areas, and TSA space to support the passenger/employee screening operations. **Table 2-12** shows the area of the existing SSCP functions.

Table 2-12 – Existing Security Screening Checkpoint (SSCP)

Function Area	Size
Security Screening Checkpoint	3,243 SF
Other TSA Spaces	2,112 SF
TOTAL SSCP	**5,355 SF**

Source: Leo Daly Associates/CHA, 2018.

2.2.5 Holdrooms

Holdrooms at AVL are located on the ground level. The lower level holdroom areas are large, combined spaces for gates 4 through 7 and use a common corridor for enplaning and deplaning passenger flows. There are designated areas for seating and passenger enplaning and deplaning; as well as a separate corridor flanking the north and south holdrooms. **Table 2-13** shows the area for the various elements of the existing holdrooms.

Table 2-13 – Existing Holdrooms

Function Area	Size
Gates	7
NW Holdroom	8,829 SF
SW Holdroom	8,510 SF
Restrooms	**18,643 SF**

Source: Leo Daly Associates/CHA, 2018.

2.2.6 Baggage Claim Lobby

The existing baggage claim lobby has two baggage claim devices with active queue and baggage retrieval area. Additionally, the lobby includes entry vestibules, non-secure public circulation, and public amenities such as restrooms and seating areas. The rental car counters are adjacent to the baggage claim lobby and share the public circulation corridor with the baggage claim function. **Table 2-14** shows the area for the various elements of the baggage claim.

Table 2-14 – Baggage Claim Lobby

Function Area	Size	
Baggage Claim Device	2	1,532 SF
Baggage Claim Queue/Retrieval Area	6,475 SF	
Circulation	5,489 SF	
Other Areas	1,945 SF	
Rental Car Facilities	1,800 SF	
TOTAL BAG CLAIM LOBBY	**17,241 SF**	

Source: Leo Daly Associates/CHA, 2018.

2.2.7 Concessions

Concessions at AVL can be categorized into two main groups – Pre-SSCP concessions and Post-SSCP concessions. Within each group are food and beverage, retail/news-gift, and specialty. It is important to note that the pre-SSCP Concessions facilities were closed in 2020 due to the COVID-19 pandemic and has not yet reopened (as of December 2021). This space is currently being utilized for storage. The available area is shown in **Table 2-15**.

Table 2-15 – Existing Concessions

Function Area	Size
Pre-SSCP Concessions/Storage	4,000 SF
Post-SSCP Concessions/Storage	5,232 SF
TOTAL CONCESSIONS	**9,232 SF**

Source: Leo Daly Associates/CHA, 2018.

2.2.8 Other Functional Areas

The last major category of space is referred to as Other Areas. This category is used mainly to capture the remaining functional space within a terminal facility that is not calculated based on passenger volumes. These other areas are either a direct requirement expressed by the airport operator or a percentage of total functional areas typical at other airport terminal facilities. The functional areas contained is this category include:

- Non-secure (pre-SSCP) public circulation not listed above
- Non-public circulation includes egress stairs and corridors
- Mechanical, electrical plumbing and building systems (walls, structure, etc.)
- Airport operators' administrative spaces
- Welcome and information centers (i.e., display areas, business centers, and pet relief areas)
- TSA offices, custodial spaces, etc.

These spaces are non-revenue generating but provided significant value to the Airport users and Airport Operator. These areas also include factors for net to gross area allowing for structure, wall thicknesses, mechanical shafts, etc. that are necessary, but do not contribute to useable space.

2.3 AUTOMOBILE ACCESS AND PARKING

This section of the report details the existing inventory of parking. The data presented was gathered from a variety of sources, including on-site observations by CHA, information provided by the Airport, its parking operator (LAZ Parking), and other public data sources.

2.3.1 Existing AVL Parking

The on-Airport parking facilities are owned by GARAA and operated by LAZ Parking, and provide parking for a combination of public parkers, GARAA and other airport employees, rental cars, and other ground transportation operators.

The Airport parking functions consist of: one five-level parking garage, which has rental car ready-return operations on the first level; an Hourly lot directly across from the Terminal; a series of Daily parking lots (lettered G-M); three Employee lots (lettered A, B, and C); Shuttle lots (N and O) located across Airport Road, along with a Cell Phone Waiting Lot initiating construction in Spring 2022; and a Ground Transportation lot directly adjacent to the baggage claim area. The Airport estimates that there is an excess of up to 18% beyond capacity at some of these times, leaving passengers parking in grass areas. This will be further discussed in **Chapter 4**, *Facility Requirements*.

Ground Transportation Lot and Employee Lots

The Ground Transportation lot is immediately south of the Terminal, adjacent to the Baggage Claim area. This lot serves as both a staging area, and a pick-up area for taxis, courtesy vehicles, and TNC/rideshare operators (Uber, Lyft, etc.). TNC operators and users are directed to a designated pick-up point in this lot, and drop-off passengers along the departures curbside. Employee parking is at multiple lots around the Airport, primarily south of the Terminal (near the Overflow lots), immediately north of the Terminal, and adjacent to the Operations building. It is important to note that the Terminal reconstruction program will significantly alter the location of some of these Employee lots.

Shuttle Lots and Cell Phone Waiting Lot

The two Shuttle Lots are located remotely, across Airport Road. Shuttle buses are currently used to transport passengers from the Shuttle lots across Airport Road to the Terminal facility. Passengers park at these lots and then board shuttle buses to take them to the Terminal. Additionally, there is a 53-space Cell Phone Waiting Lot initiating construction in Spring 2022, located adjacent to these two lots.

Table 2-16, **Table 2-17**, **Table 2-18**, and **Figure 2-9** present a breakdown of the existing AVL parking inventory by facility and type of user served.

2.3.2 Rental Car Operations

When picking up rental cars, passengers first proceed to the rental car counters, located in the Baggage Claim area of the Terminal. After being processed, passengers pick up rental cars at the Rental Car Ready area, located on the first floor of the Airport Parking Garage. Rental cars can be returned to the proper rental car company at the Rental Car Return Facility (ready/return lot), located on the first floor of the Parking Garage. When dropping off vehicles, passengers will see signage in the parking lot corresponding to each rental car agency. Rental car operators have booths in this part of the garage, where passengers can complete rental return paperwork. After rental cars have been returned, the vehicles are taken to a remote Quick Turn Around (QTA) facility, located south of the Terminal complex, along Terminal Drive.

Table 2-16 – Existing Garage Parking Facilities

	Public	Rental Car	Employee	
Level One	0	224	0	
Level Two	265	0	0	
Level Three	277	0	0	
Level Four	291	0	0	
Level Five	248	0	0	
Total	1,081	224	0	**1,305**

Source: GARAA, LAZ Parking, 2021.

Table 2-17 – Existing Surface Lot Parking Facilities

Lot	Use	Spaces	
		Regular	ADA Accessible
A	Employee	40	0
B	Employee	14	1
C	Employee	12	0
D	Employee	22	0
E	Employee	120	0
F	Employee	48	0
G	Daily	102	0
H	Daily	167	0
I	Daily	126	0
J	Daily	149	0
K	Daily	175	0
M	Daily	319	0
	Hourly	100	16
N	Shuttle	193	0
O	Shuttle	84	0
Total		**1,688**	

Source: GARAA, LAZ Parking, 2021.

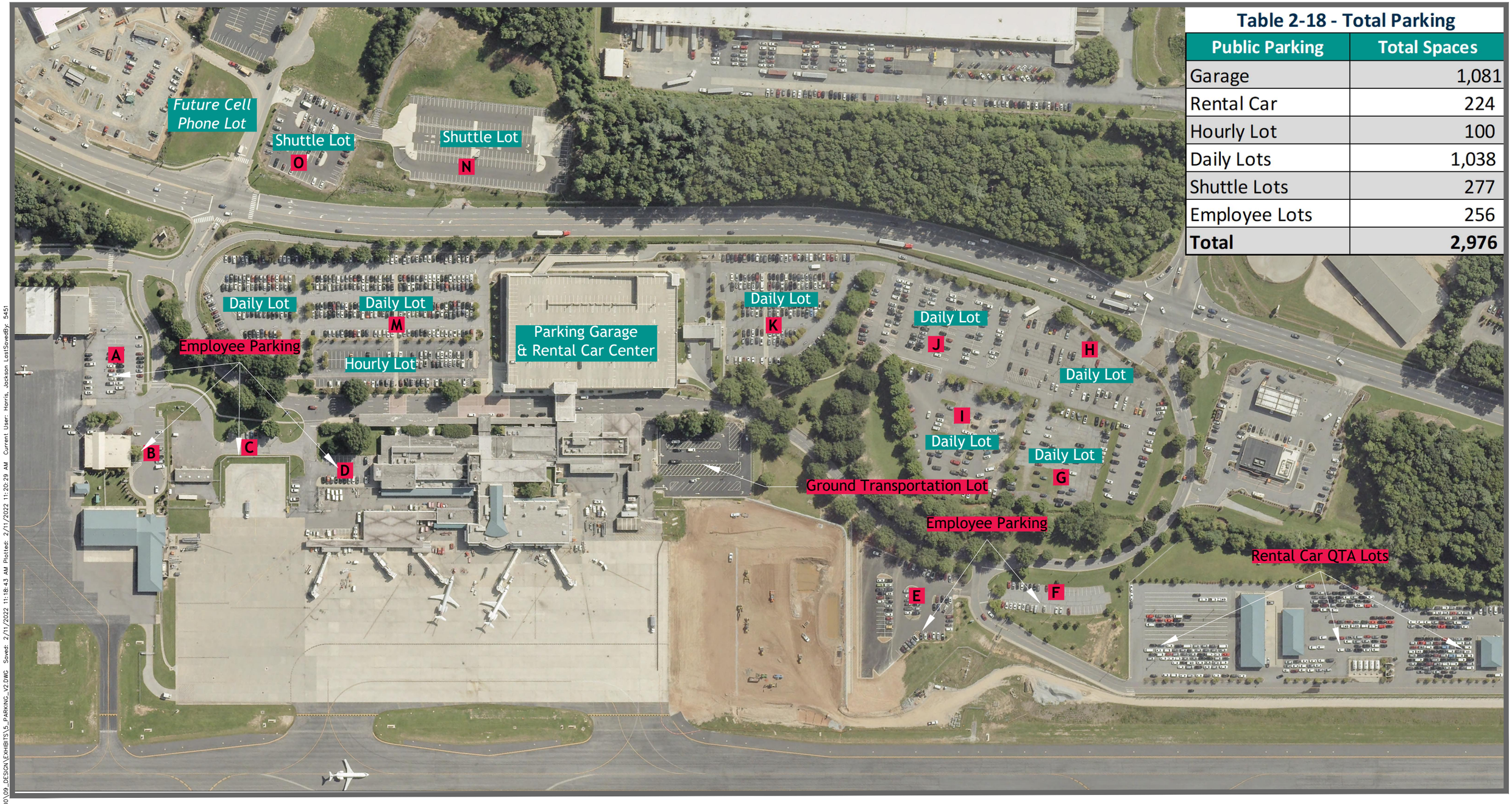


Table 2-18 - Total Parking	
Public Parking	**Total Spaces**
Garage	1,081
Rental Car	224
Hourly Lot	100
Daily Lots	1,038
Shuttle Lots	277
Employee Lots	256
Total	**2,976**

GRAPHIC SCALE (FEET)

0 100 200 400

Figure 2-9
Public Parking

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One central toll plaza, immediately south of the parking garage, serves revenue collection for all public parking facilities (including the shuttle lot). Additionally, two electric vehicle charging stations are located at no cost in the Hourly lot.

2.3.3 Current Parking Rates

Table 2-19 presents the current rates charged for public parking in each of the AVL facilities.

Table 2-19 – Existing AVL Public Parking Facility Rates

Facilities	Current Parking Rates
Hourly Lot	First 30 Minutes - $1.00 Each Additional 30 Mins - $1.00 4+ Hours/Daily Max - $25.00
Daily Lot	First Hour - $2.00 Each Additional Hour - $2.00 4+ Hours/Daily Max - $10.00 Weekly Max - $60.00
Garage	First Hour - $2.00 Each Additional Hour - $2.00 4+ Hours/Daily Max - $13.00 Weekly Max - $78.00
Shuttle Lot	First Hour - $2.00 Each Additional Hour - $2.00 4+ Hours/Daily Max - $10.00 Weekly Max - $60.00

Source: LAZ Parking, 2021.

2.3.4 Off-Airport Competing Parking

At this time, independent companies do not offer off-airport competing parking locations in the vicinity of AVL. However, some local hotels are providing this service to their guests.

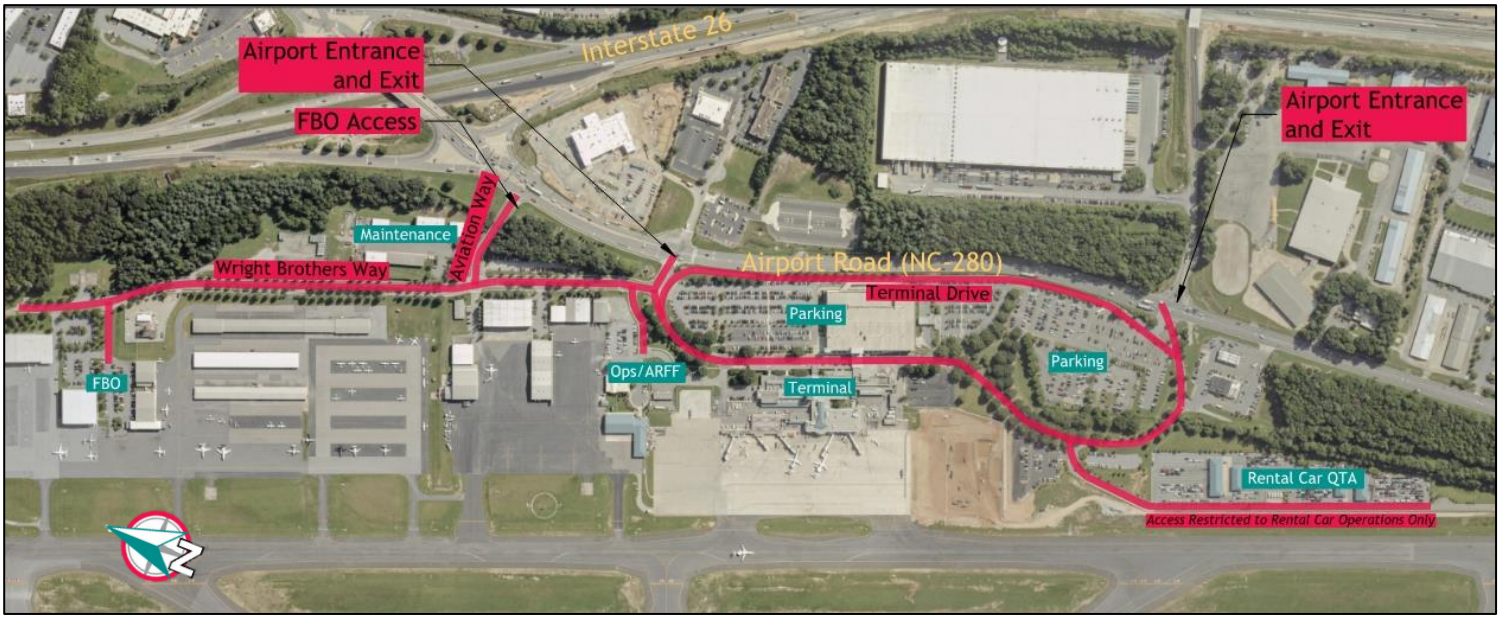
2.3.5 Regional Roadway Network

Primary regional access to the airport terminal is provided from Airport Road (NC-280) via Interstate-26. Access to all existing functional areas of the Airport is provided from Airport Road.

Interstate-26 is a six-lane Interstate providing access to Asheville to the north, and Hendersonville to the south. Airport Road is a currently a four-lane arterial road that is being expanded to six lanes. It connects the Airport with I-26, US Highway 25, and points to the north and south.

Together, these and other adjacent roads provide convenient access to the local and regional roadway network. Access in and out of the Airport, and circulation within the Airport is shown in **Figure 2-10**.

Figure 2-10 – Existing Airport Circulation



Source: CHA, 2021.

2.4 BASED AND ITINERANT GA AIRCRAFT STORAGE

The operations and facilities of Signature Flight Support include hangars, a terminal building, and apron space. Signature operates a GA Terminal, two bulk hangars for itinerant aircraft, T-hangars (with 68 total bays), and approximately 140,000 square yards of ramp space. The FBO also operates a passenger lounge area which includes office space and conference rooms. Additional hangar and apron space development is currently being pursued, discussed in later chapters.

A large apron area that can provide up to 89 tie-down positions (depending on aircraft size), is used for short term storage of transient aircraft parking. In addition to supporting GA parking and infrastructure, Signature provides fueling services to tenants and operators at AVL. Aircraft maintenance is handled by a third party, Belle Aircraft Maintenance. A detailed depiction of Signature Flight Support's facilities is shown in **Table 2-20** and **Figure 2-11**.

Table 2-20 – Existing Based Aircraft Storage

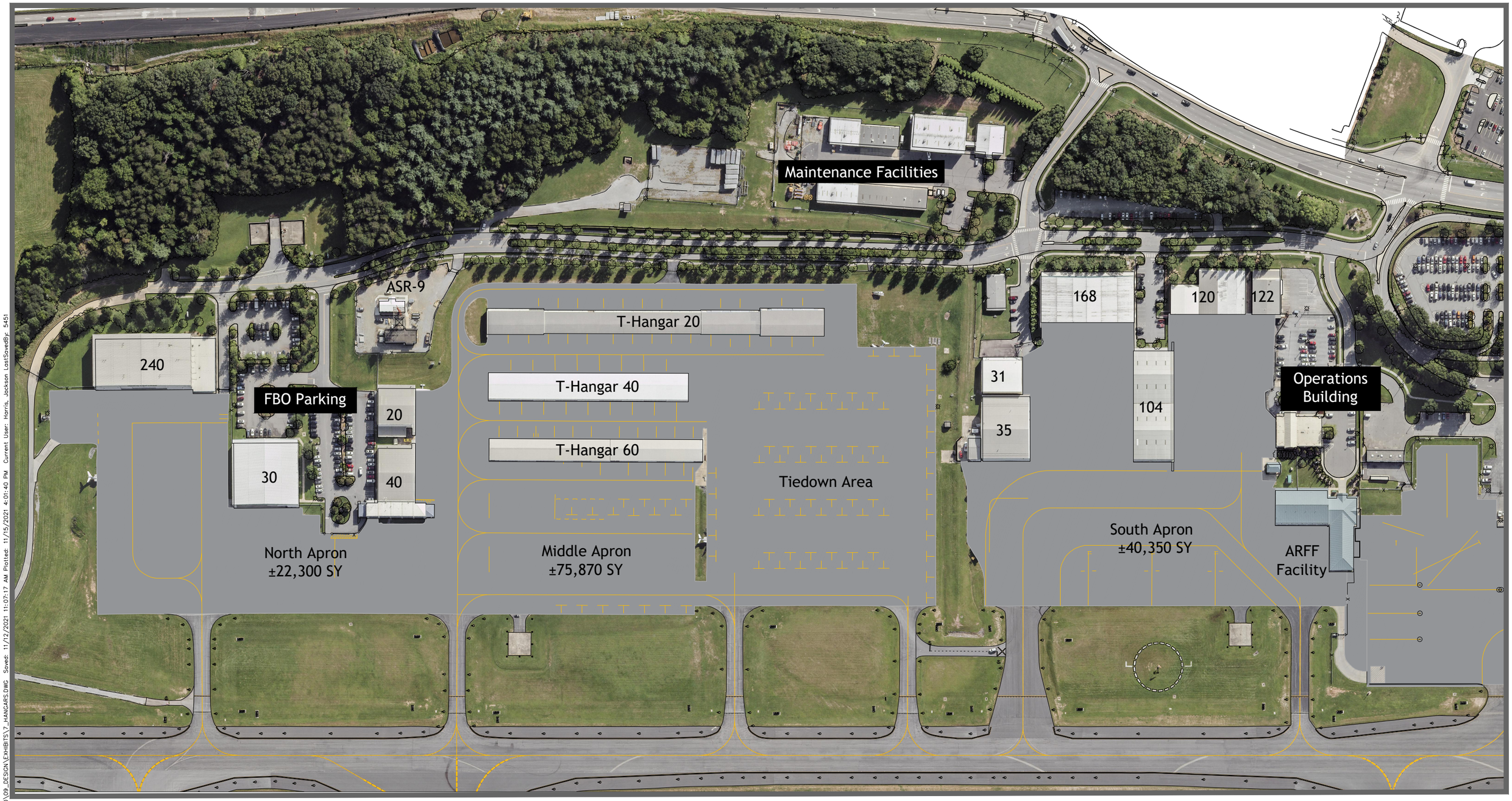
Building Number	Description	Size (SF)
20	Bulk Hangar with Office	8,480
30	Bulk Hangar*	19,600
31	Bulk Hangar	7,130
35	Bulk Hangar with Office	14,730
40	FBO Facility and Bulk Hangar*	15,220
104	Bulk Hangar	10,920
104	Bulk Hangar	10,920
120	Bulk Hangar with Office**	14,430
122	Bulk Hangar**	6,090
168	Bulk Hangar*	28,648
240	FBO Facility and Bulk Hangar	31,980
T-Hangar 20	T-Hangar (30 bays)	22,830
T-Hangar 40	T-Hangar (17 bays)*	26,490
T-Hangar 60	T-Hangar (21 bays)	39,370

Source: CHA, GARAA, 2021.

**Buildings 30, 40, 168, and T-Hangar 40 are currently leased to Signature Flight Support.*

***Buildings 120 and 122 are currently leased to Allegiant Air for storage of aircraft parts and Equipment.*

In total, the 11 bulk hangars comprise nearly 170,000 square feet of space. Additionally, the three T-Hangars include approximately 88,000 square feet with the 72 individual hangar bays.



Asheville REGIONAL AIRPORT

MASTER PLAN UPDATE

GRAPHIC SCALE (FEET)

0 100 200 400

Figure 2-11

General Aviation Facilities

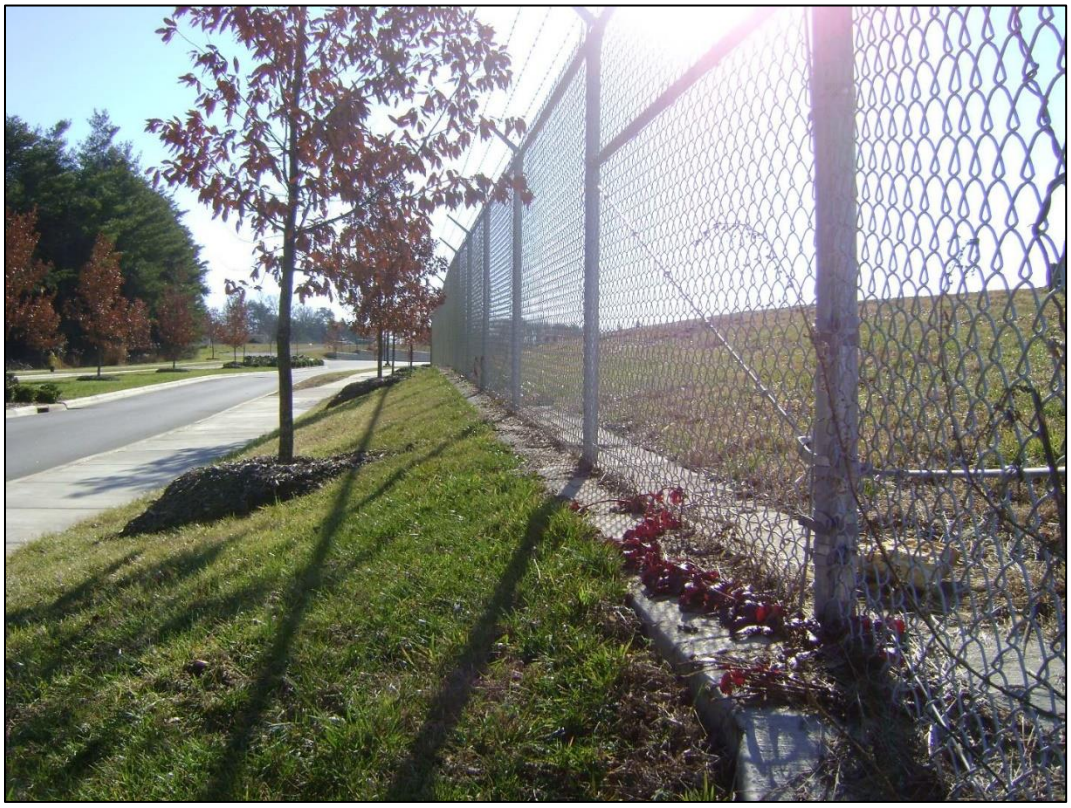
2.5 SUPPORT FACILITIES

Support facilities provide vital functions related to the overall operation of the Airport. At AVL, these facilities include: airport fencing and security systems, airport equipment storage and maintenance, Air Traffic Control Tower (ATCT), Aircraft Rescue and Firefighting (ARFF), aircraft fueling, snow and ice control, and rental car operations.

2.5.1 Airport Perimeter Fence

As required by FAA regulations, the airfield is currently protected by a security fence that encloses the runways, taxiways, and aircraft movement and non-movement areas. The airfield chain-link fence has 28 vehicle gates and 7 pedestrian gates that provide access to various points of the airfield. The barrier is eight feet high, with various areas of fencing reaching 10 feet high for wildlife hazard mitigation. The fence, in its geometry, also includes a 35' retaining wall with an anti-climb system at the near southwest corner. The entire airfield fence is topped with three-strands of barbed wire, totaling approximately one-foot high.

Figure 2-12 – Airport Perimeter Fence



Source: GARAA, 2022.

2.5.2 Airport Equipment Storage and Maintenance

Essential AVL maintenance, storage, and equipment is located on Aviation Way, near the intersection of Wright Brothers Way. GARAA presently operates four buildings devoted to airport equipment and storage, as documented in **Table 2-21** and depicted in **Figure 2-13**. The maintenance facility buildings can be subdivided into two groups: the main office building which contains GARAA staff offices, bunk rooms, a conference room, and a kitchen—while the other three maintenance facilities are primarily devoted to vehicle bays, storage, and shops.

The maintenance buildings store equipment for service on airport grounds, which includes mowers, tractors, vehicles, snow removal related equipment, a vehicle lift, an overhead crane, and various necessary supplies.

Figure 2-13 – Airport Maintenance Facilities

Source: CHA, 2021.

Table 2-21 – Airport Maintenance Facilities

GARAA Owned Maintenance Building	Size (Square Feet)	Use
Main Office Building	3,600	GARAA Staff and Support Facilities
Adjoining Shop	8,468	Vehicle Bays, Storage
Building B	3,500	Storage/ Shops
Building A	3,360	Storage/ Shops

Source: CHA, 2021.

2.5.3 Air Traffic Control Tower (ATCT)

Presently, AVL's ATCT is located on top of the terminal building complex. Built in 1961, this tower serves administrative and support facilities for local FAA operations at AVL, while also containing the Asheville Tower Terminal Radar Approach Control (TRACON) facility. The control tower serves to assist safe approaches of aircraft that are on final approach, climb out post departure, and vehicle/ aircraft traffic on the airfield—with this, the TRACON facility provides guidance for safe entry/ departure of AVL's airspace. This tower manages traffic within the AVL airspace, with radar coverage provided by an ASR-9 (Airport Surveillance Radar) system with a six-level weather detection capability. This ASR-9 system is located between the FBO facilities and Maintenance facility. The ATCT tower operates daily from 6:30 a.m. to 11 p.m. EST. It is important to note that along with the ongoing Terminal Building Improvement Program, the ATCT will be relocated to an entirely new site on the western side of the Airfield. This will be further discussed in subsequent chapters.

Figure 2-14 – Air Traffic Control Tower

Source: GARAA, 2022.

2.5.4 Aircraft Rescue and Firefighting (ARFF)

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. The aviation industry is reliant on prompt and effective fire and rescue services during aircraft emergencies. These services include fire containment and suppression, passenger and crew rescue, airframe and cargo preservation, and maintenance of the site to aid in after-incident investigations. The vehicles that airport fire departments employ serve as the medium to deliver firefighters, specialized tools and equipment, and firefighting agents to the scene of an aircraft incident. They are designed to perform specific functions, constructed for longevity and ease of maintenance, and tailored to the airport's needs.

Figure 2-15 – ARFF and Operations Facilities

Per FAA requirements, within three minutes from the initial alarm, a minimum of one required ARFF vehicle must be able to reach the midpoint of the farthest runway serving air carrier aircraft from its assigned post or must reach any other specified point of comparable distance on the movement area that is available to air carriers and begin application of the extinguishing agent. Within four minutes from the initial alarm, all other required vehicles must reach the previously stated locations and begin application of the extinguishing agent. AVL has one ARFF facility located near the center of Airport grounds, specifically placed east of the runway to the north of the terminal building. The location of the ARFF facility allows firefighting equipment to access any airfield pavement within the required time established by Federal regulations. The current ARFF and Department of Public Safety (DPS) building is approximately 16,500 square feet and located at 136 Wright Brothers Way.

The Airport's ARFF Index is determined by Title 14 CFR Part 139.315, *Aircraft Rescue and Firefighting: Index Determination*. AVL operates as an ARFF Index B. The requirements for ARFF vehicles to transport a specific quantity and type of firefighting agents are established by Title 14 CFR Part 139.317, *Airport Rescue and Firefighting: Equipment and Agents*. As an ARFF Index B, the Airport can choose to have a minimum of either one or two vehicles.

However, specifications of the vehicles depend upon the total number of vehicles chosen. AVL has currently has three ARFF vehicles and exceed the FAA minimum requirements. The FAA-required equipment for these standards are:

- One vehicle carrying the following extinguishing agents:
  - 500 pounds of sodium-based dry chemical, halon 1211, or clean agent and
  - 1,500 gallons of water and the commensurate quantity of AFFF for foam production
- Two vehicles:
  - One vehicle carrying 500 pounds of sodium-based dry chemical, halon 1211, and clean agent and
  - One vehicle carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons.

2.5.5 Aircraft Fueling

Signature Flight Support is responsible for operating the fuel storage facility and the fuel dispensing area at AVL. These operations include services to all aircraft operated at AVL. The Airport's fuel storage facility is located beyond the North Apron and FBO area, and includes six above-ground fuel tanks:

- Four 20,000-gallon Jet-A tanks
- One 12,000-gallon 100LL AvGas tank
- One 1,000-gallon self-serve tank for light piston aircraft (adjacent to the FBO facility)

Existing expansion plans include adding two new 40,000-gallon Jet-A tanks. Present storage capacity includes less than two days of fuel reserve.

Presently, the existing fuel storage capacity includes less them two days for fuel. Signature Flight Support receives fuel deliveries every day. Fuel is then transported from the dispensing area to aircraft via specialized fuel trucks, as needed.

The types of fuel trucks at the Airport and their carrying capacities are as follows:

- Two 1,000-gallon trucks (Avgas)
- One 5,000-gallon truck (Jet-A)
- Three 7,000-gallon trucks (Jet-A)

The FBO support facilities and fuel dispensers are located south of the fuel facility along Lindbergh Lane. The Airport additionally maintains automotive fuel storage and dispensing at the Maintenance Facility for Airport maintenance vehicles, and at the Consolidated Rental Car Service Center for rental cars.

Figure 2-16 – Fuel Farm

Figure 2-17 – GA Fuel Facilities

Source: CHA, 2021.

2.5.6 Snow and Ice Control

As guided by FAA AC 150/5200-30D, *Airport Winter Safety and Operations,* snow, ice, and slush should be removed as expeditiously as practicable to maintain runways, high-speed turnoffs, and taxiways in a "no worse than wet" (i.e., no contaminant accumulation) condition. To meet these guidelines during the winter months, personnel at AVL are on-call for snow removal to ensure adequate response to weather events. In addition to regularly mandated inspections, airfield conditions are monitored throughout the day, or as often as needed by the on-duty airfield maintenance and airport operations personnel. The inspections are conducted visually and with runway friction measuring equipment. Airfield conditions are transmitted electronically to pilots via Notice to Airmen (NOTAMS). Other sources of information include reports from the National Weather Service (NWS), the Airport's Automated Weather Observation System (AWOS) weather station, and pilot reports (PIREPs). Based on these observations and information, Airport personnel can determine the proper equipment and surface treatment to be used. Approved equipment for contaminant removal includes high-speed rotary plows, snowplows, material spreaders, and runway brooms. Approved chemicals include fluid deicers/anti-icers and solid deicers/anti-icers. Fluid deicers/anti-icers consist of glycol-based fluids, potassium acetate base, and potassium formate-based fluids. Solid deicer/anti-icers consists of sodium formate and sodium acetate.

Most equipment is stored in the airfield maintenance building so that it is protected from weather and to prolong its operational life expectancy. Deicing operations are currently carried out at each individual gate, as the Airport has no dedicated deicing facilities.

2.6 AIRSPACE ENVIRONMENT

The National Airspace System (NAS) is made up of a network of air navigation facilities, Air Traffic Control (ATC) facilities, airports, technology, and appropriate rules and regulations that are needed to operate the system. The FAA created the NAS to protect persons and property on the ground, and to establish a safe and efficient airspace environment for civil, commercial, and military aviation within the United States. Airspace is broken down into two categories: regulatory and non-regulatory. Within the regulatory airspace category, there are two types of airspace, controlled and uncontrolled. Categories and types of airspace are defined based on their complexity or density of aircraft movements, or the nature of the operations conducted within the airspace, which dictates the level of safety required and the level of national and public interest.

The purpose of controlled airspace is to provide adequate separation between aircraft operating under Instrument Flight Rules (IFR) and Visual Flight Rules (VFR). For airlines, IFR services are available and required, within all controlled airspace. Airspace designated as Class A, B, C, D, and E is controlled airspace.

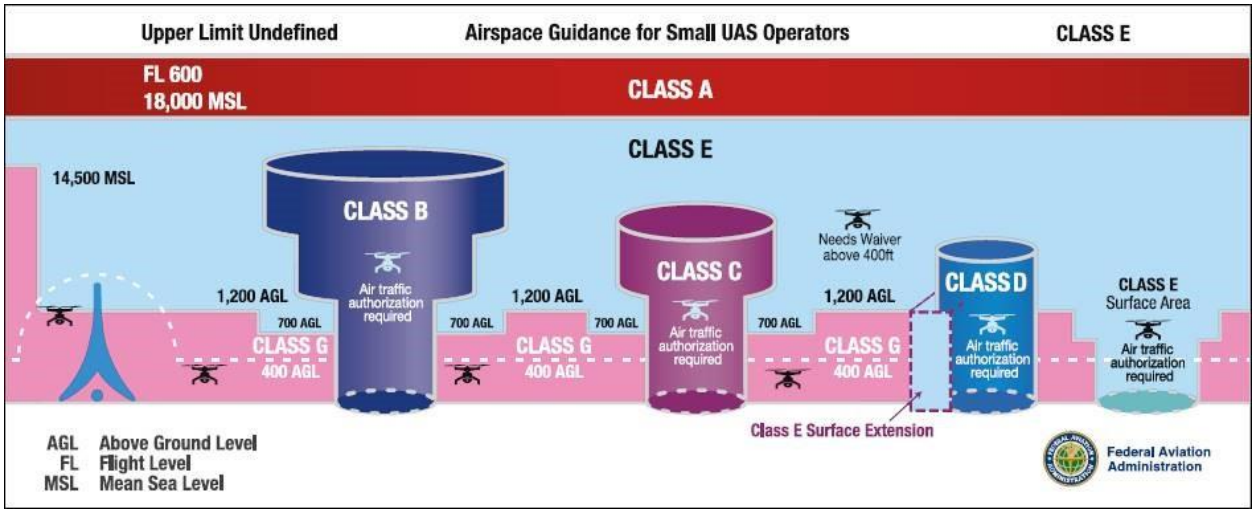
VFR aircraft operating in Class B, C, or D airspace must be in contact with ATC. This gives ATC the authority to manage IFR and VFR traffic in the proximity to airports and ensure proper separation. Controlled airspace designations do not directly affect IFR traffic as all IFR traffic is cleared through controlled airspace by ATC.

Class G airspace is uncontrolled and IFR services may or may not be available.

Large sections of controlled and uncontrolled airspace have been designated as special use airspace. Special use airspace is further defined as prohibited, restricted, warning, military operations, and alert areas. Civil operations within special use airspace may be limited or even prohibited, depending on the area, as operations within these areas is considered hazardous to civil aircraft.

AVL is located within Class C airspace, extending from the runway surface up to 4,000 feet above ground, or to 6,200 feet above mean sea level (MSL) for a 5-nm radius, and from 4,300 feet MSL to 6,200 feet MSL for a 10-nm radius. A graphic of the U.S. Airspace Profile is presented in **Figure 2-18**.

Figure 2-18– U.S. Airspace Profile

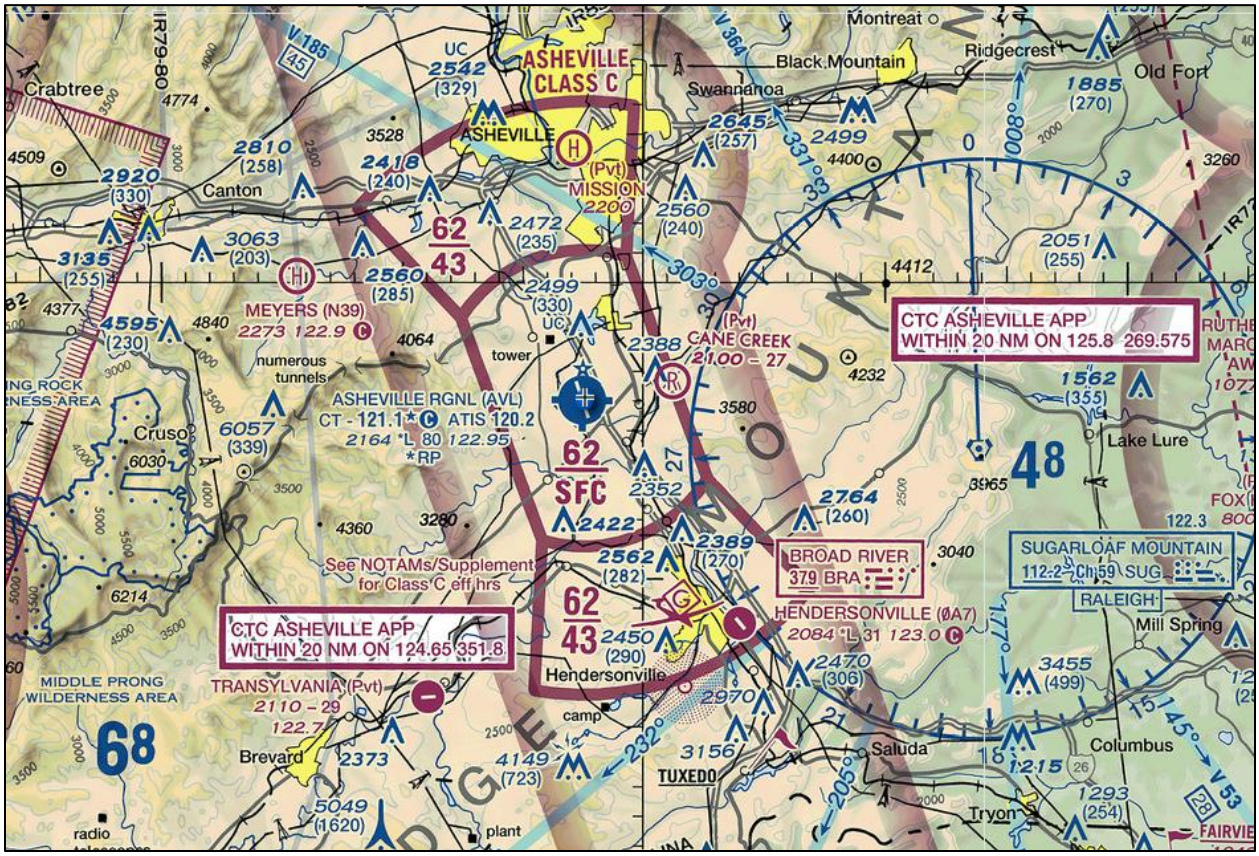


Source: Federal Aviation Administration.

The National Aeronautical Charting Office (NACO) of the FAA publishes special aeronautical charts used by pilots to navigate through the National Airspace System. These charts are called sectional charts, or sectionals. A sectional chart provides detailed information on airspace classes, ground-based NAVAIDS, radio frequencies, longitude and latitude, navigational waypoints, and navigational routes. It also offers topographical features, such as terrain elevations and ground features that are important to aviators, such as landmarks that will be identifiable from a given altitude. Although these charts are used for VFR and IFR navigation, they are a VFR pilot's primary navigation tool.

Figure 2-19 displays a segment of the Atlanta Sectional Chart, centered on AVL. With only a single runway, the Class C airspace has been truncated on the east and west sides of the airport. Beyond the Class C is Class G controlled airspace above 700' or 1,200' AGL depending on the location. The Special Use airspace area, the Snowbird Military Operations Area (MOA) is located approximately 15 miles to the west.

Figure 2-19 – Atlanta Sectional, 103rd Edition [Effective 1 Feb 2018]



Source: aeronav.faa.gov

2.7 METEOROLOGICAL CONDITIONS

Meteorological conditions affect airport operations in many ways. Winds, precipitation, and temperature influence decisions pertaining to NAVAIDs, runway orientation, and required runway length. AVL is equipped with an Automatic Weather Observation System (AWOS), a highly sophisticated weather data sensing, processing, and dissemination system that is designed to support real-time weather activities and aviation operations. While meteorological readings are taken every minute, 24-hours a day, every day of the year, these systems generally report at hourly intervals, but also report special observations if weather conditions change rapidly and cross aviation operation thresholds. Maintained, controlled, and operated by the FAA and the National Weather Service (NWS), the AWOS automatically observes, formats, archives, and transmits observations.

2.7.1 Local Climate

The daily mean annual temperature in Asheville, North Carolina is 57.3 degrees Fahrenheit; The average low is 46.3 degrees Fahrenheit, while the average high is 68.2 degrees Fahrenheit. July is typically the warmest month, with an average high of 85.3 degrees Fahrenheit, and a mean maximum of 90 degrees Fahrenheit. Average monthly precipitation ranges from 3.4 inches to 4.8 inches, with annual precipitation averaging 49.6 inches.

Average monthly snowfall during the months of November through April ranges from a fraction of an inch to four inches, with an annual average of ten inches of snowfall. The local climate requires the Airport to support snow removal and aircraft deicing services. This climate data for Asheville, North Carolina was obtained from the National Oceanic and Atmospheric Administration (NOAA) and the NWS.

2.7.2 Wind Coverage

In addition to climate data, the AWOS (Station 723150 – Asheville Regional Airport) collects wind speed and direction data, which can influence airfield development decisions on runway orientation and length. Local wind conditions at an airport are a key factor in determining runway use. Aircraft operational safety and performance is enhanced when aircraft depart and land into the wind, therefore, runways that are not oriented to take full advantage of the prevailing wind patterns are not utilized as frequently as runways that are appropriately oriented. According to FAA AC 150/5300-13A, *Airport Design*, the desirable wind coverage for an airport is at least 95 percent at all speeds, meaning that the primary runway at an airport has at least 95 percent wind coverage and that the wind at the airport is within certain limits of crosswind conditions. Wind coverage is calculated using the highest crosswind component that is acceptable for the type of aircraft expected to use the runway system. Larger aircraft have a higher tolerance for crosswinds than smaller aircraft due to their size, weight, and operational speed.

Table 2-22 provides the standard crosswind component by aircraft size. **Table 2-23** outlines the weather classification criteria and the number of recorded observations at AVL between 2011 and 2020.

Table 2-22 – Crosswind Components

Runway Design Code (RDC)	Maximum Crosswind Component
A-I and B-I aircraft	10.5 knots
A-II and B-II aircraft	13.0 knots
A-III, B-III, C-I through D-III D-I through D-III	16.0 knots
A-IV, B-IV, C-IV through C-VI, D-IV through D-VI	20.0 knots
E-I through E-VI	20.0 knots

Table 2-23 – Weather Classification Criteria

Weather Class	Recorded Observations at AVL (2011-2020)
All Weather	136,644
VFR Conditions	95,719
IFR Conditions	30,102

Source: NOAA, National Climate Center; Station 723150 (2011-2020)
VFR – Visual Flight Rule
IFR – Instrument Flight Rule

The combination of the crosswind and the weather classification allows for the calculation of the wind coverage, which is presented in **Table 2-24** for AVL. Wind coverage is the percent of time crosswind components are below an acceptable velocity. The 95 percent wind coverage is computed on the basis of crosswinds not exceeding 10.5 knots for ARC A-I and B-I; 13 knots for ARC A-II and B-II; 16 knots for ARC A-III, B-III, and C-I through D-III, and 20 knots for ARC A-IV through D-VI. The calculated wind coverage for AVL facilities shows that observations exceed the 95 percent wind coverage threshold in all modeled weather conditions (all weather, VFR-only, and IFR-only). As a result, crosswind coverage is not an issue at the Airport.

Table 2-24 – AVL Wind Coverage

	Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
All Weather	17-35	99.60%	99.89%	99.98%	100%
VFR		99.55%	99.89%	99.89%	100%
IFR		99.74%	99.87%	99.96%	99.99%

Source: NOAA, National Climate Center; Station 723150 (2011-2020)

Weather observations are presented in a format that is specifically designed by the FAA to be useful for evaluating weather conditions at an airport. Wind direction is grouped according to a 16-point compass rose (N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW and NNW).

Wind speed is organized into groups of 0-3, 4-6, 7-10, 11-16, 17-21, 22-27, 28-33, 34-40, and 41 knots per hour or greater. This data is displayed on a wind rose for each weather classification and included on the formal Airport Layout Plan (ALP).