GREENVILLE-SPARTANBURG INTERNATIONAL AIRPORT

2040 WINGSPAN

A VISION FOR THE FUTURE

DECEMBER 2019

AIRPORT MASTER PLAN UPDATE

CHAPTER 2: INVENTORY

McFarland Johnson

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2. Inventory

The development of a master plan update for the Greenville-Spartanburg International Airport (GSP or Airport) requires the collection and evaluation of baseline information relating to the Airport's property, facilities, services, and tenants, as well as Airport access, utilities and information on its immediate environs. The information presented herein will be referenced in subsequent sections of the master plan when developing aviation activity forecast, exploring demand/capacity relationships, and analyzing future facility requirements. The information covered in this chapter was obtained through a variety of sources including: site visits, interviews with Airport staff, tenants and users, and through detailed review of Airport records, prior planning initiatives, and public documents. The inventory information presented in this chapter is organized as follows:

- Airport Location
- Airfield Facilities
- Airspace Procedures and Air Traffic Control
- Landside Facilities
- Airport Tenants
- Airport Land Use Patterns
- Airport Community Surveys

2.1. AIRPORT LOCATION

GSP is located approximately three miles south of the City of Greer, SC, 10 miles east of the City of Greenville, SC and 15 miles west of the City of Spartanburg, SC. The Airport resides in both Greenville and Spartanburg Counties, which are located in the northwest corner of the State, also known as South Carolina's upstate region. The Airport covers approximately 3,600 acres and major cities near GSP include Columbia, SC (79 miles southeast via automobile); Charlotte, NC (93 miles northeast via automobile); and Atlanta, Georgia (156 miles southwest via automobile). **Figure 2-1** and **Figure 2-2** provide an airport location and vicinity map, respectively.

2.1.1. Airport Service Area

An airport's user base is often most strongly influenced by the connectivity of the airport to surrounding communities. The airport service area is an area where there is a potential market for airport services. Access to general aviation (GA) airports, commercial air service, and transportation networks all have bearing on the size and limits of the airport service area, as well the quality of aviation facilities, distance and other subjective criteria.

For the purpose of this study, the airport service area is based on vicinities within a 30- and 60-minute drive time to GSP.

- 30 minutes or less: Greenville, SC, Spartanburg, SC
- 60 minutes or less: Clemson, SC, Anderson, SC, Hendersonville, NC

Figure 2-1: Airport Location Map

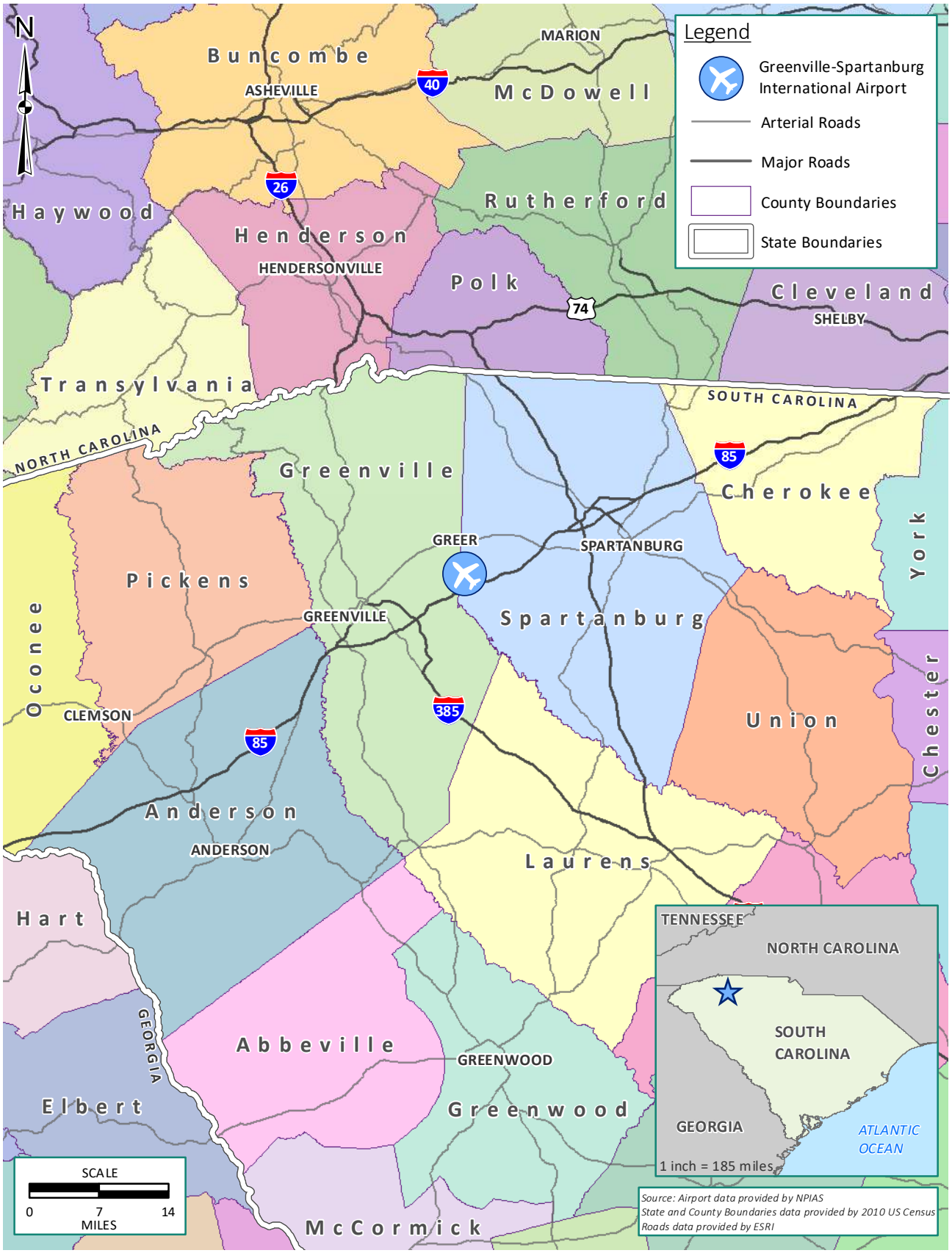

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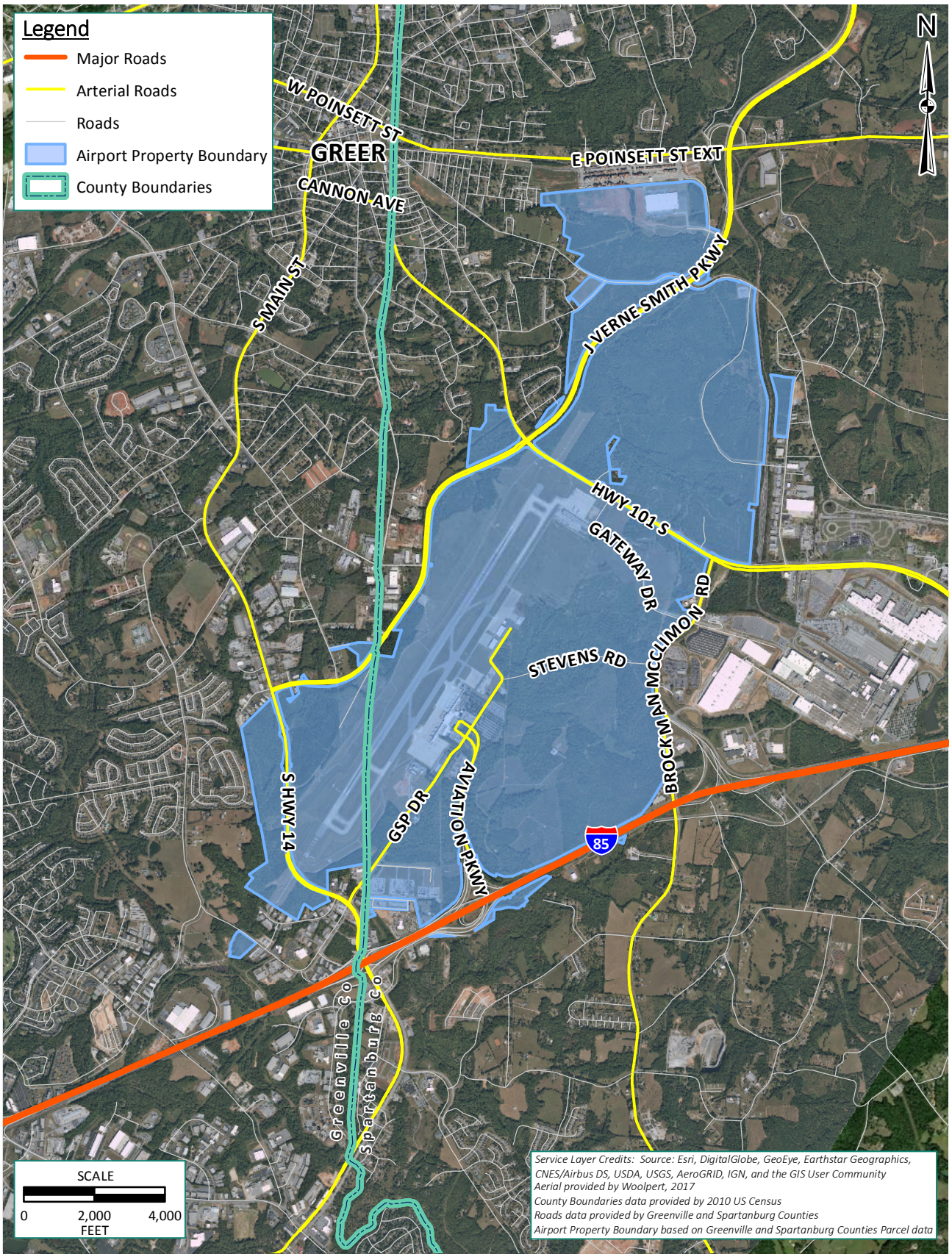
Figure 2-2: Airport Vicinity Map



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The Airport is the only commercial airport within a 60-minute drive time radius. Other commercial airports, such as Columbia Metropolitan Airport, Charlotte Douglas International Airport, Asheville Regional Airport and Concord Regional Airport are over an hour away. The only airports that fall within a 60-minute drive time are classified as private and public reliever airports. A reliever airport is a type of general aviation airport that relieves the congestion of commercial service airports and provides an alternative for landing corporate and general aviation aircraft. **Figure 2-3** depicts GSP's airport service area drive time map.

Commercial Service Airports in Vicinity

Although none fall within the defined airport service area, other commercial service airports in the region include locations in North and South Carolina as shown in **Table 2-1**.

Table 2-1: Commercial Service Airports Near GSP

Name	Runways	FY 2015 Based Aircraft	FY 2015 Annual Operations	FY 2015 Enplanements	Drive Time from GSP (Mins.)
Asheville Regional (AVL)	17/35: 7,001 x 100	132	62,878	396,218	61-90
Charlotte/Douglas Int. (CLT)	18C/36C: 10,000 x 150; 18R/36L: 9,000 x 150; 18L/36R: 8,677 x 150; 5/23: 7,502 x 150	72	545,602	21,766,399	61-90
Hartsfield – Jackson Atlanta Int. Airport (ATL)	9L/27R: 12,390 x 150; 8R/26L: 9,999 x 150; 8L/26R: 9,000 x 150; 10/28: 9,000 x 150	3	882,497	44,141,814	150+

Notes: FY = Fiscal Year, Int.= International

Source: FAA Form 5010, Airport Master Record and 2017 FAA Terminal Area Forecast

General Aviation Airports in Vicinity

Several GA airports are located within a 60-minute drive of GSP and are shown in **Figure 2-3** with additional general aviation airports also listed in **Table 2-2**.

Figure 2-3: Airport Service Area Drive Time Map

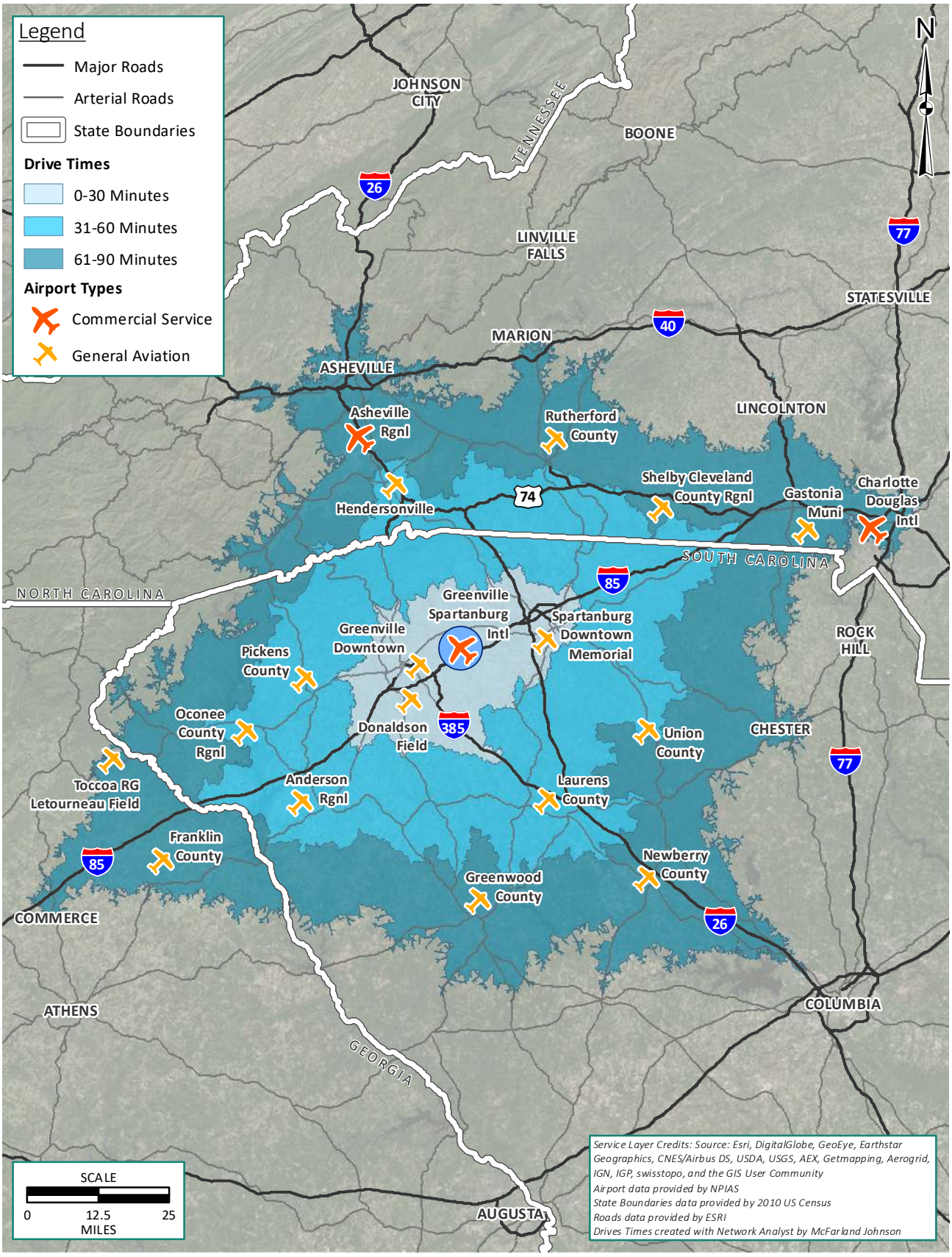

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Table 2-2: General Aviation Airports Near GSP

Name	Runways	FY 2015 Based Aircraft	FY 2015 Annual Operations	Distance (NM)
Anderson Regional	5/23: 6,002' x 149'; 17/35: 4,996' x 149'	73	29,800	34
Donaldson Field	5/23: 8,000' x 150'	45	28,091	11
Franklin County	08/26: 5,000' x 75'	22	6,000	56
Gastonia Municipal	03/21: 3,770' x 100'	27	9,910	55
Greenville Downtown	11/29: 5,393' x 100'; 10/28: 4,000' x 80'	164	49,616	7
Greenwood County	9/27: 5,001' x 100'; 5/23: 3,600' x 60'	56	40,000	39
Hendersonville	15/33: 3,075 x 40'	45	24,550	26
Laurens County	8/26: 4,051' x 75'	18	5,500	27
Newberry County	4/22: 4,001' x 75'	11	12,100	45
Oconee County Regional	7/25: 5,000' x 100'	63	36,000	35
Pickens County	5/23: 5,002' x 100'	37	23,177	24
Rutherford County/Marchman Field	1/19: 5,000' x 100'	38	33,500	34
Shelby-Cleveland County Regional	5/23: 5,001' x 100'	38	18,200	36
Spartanburg Downtown Memorial	5/23: 5,202' x 10'0'	120	53,000	13
Toccoa RG Letourneau Field	03/21: 5,008' x 100'	52	20,000	56
Union County, Troy Shelton Field	5/23: 3,508 X 60	9	6,500	31

Notes: FY = Fiscal Year, Int.= International, NM = Nautical Miles

Source: FAA Form 5010, Airport Master Record and 2017 FAA Terminal Area Forecast

2.1.2. Meteorological Conditions and Climate

The Greenville-Spartanburg area, like much of the Piedmont region of the southeastern United States, has a humid subtropical climate with four distinct seasons; the region is part of USDA Hardiness zone 7b/8a. The area enjoys hot summers and no dry season with temperatures varying from 31°F to 89°F over the course of the year, and is rarely below 22°F or above 96°F. The hot season is generally experienced from late May through mid-September, while the cool season typically occurs from late November through late February.

Precipitation is distributed relatively evenly throughout the year with higher than average rain chances in the late summer months, and amounts of approximately 50 inches annually. The number of days with any measurable precipitation is 77 and there are 220 sunny days per year. Monthly rainfall is between 3.1 and 4.2 inches with an average of three inches of snow during the winter. Cloud cover is most prevalent in the winter months.

Wind Coverage

Runway wind coverage at an airport refers to the percentage of time that crosswinds are within an acceptable velocity. Per the FAA Advisor Circular (AC) 150/5300-13A, *Airport Design*, the minimum wind coverage permitted on a runway, considering all observations, is 95 percent. The wind coverage is analyzed based on the maximum crosswind component of the critical aircraft for

a specific runway under all weather conditions. The Airport's wind data combined with the Runway configuration yielded the wind coverage results that are contained in **Table 2-3**. A breakdown of wind coverage by runway end is also provided in **Table 2-4**.

Table 2-3: Wind Data for Runway 4-22

Condition	Wind Coverage by Crosswind Speed				Number of Observations	Percentage of Ops
	10.5kts	13kts	16kts	20kts		
All-Weather	98.15%	99.18%	99.78%	99.95%	133,566	100%
Instrument Flight Rules (IFR)	98.55%	99.29%	99.78%	99.93%	20,245	15.16%
Visual Flight Rules (VFR)	98.08%	99.16%	99.78%	99.96%	101,329	75.86%
Poor Visibility Conditions (PVC)	99.43%	99.67%	99.79%	99.88%	11,992	8.98%

Source: ASOS 723120 10-year Wind History of Hourly Observations 2017-2016 as provided by National Climatic Data Center, September 2017; McFarland Johnson, 2017

Table 2-4: Wind Coverage by Runway End

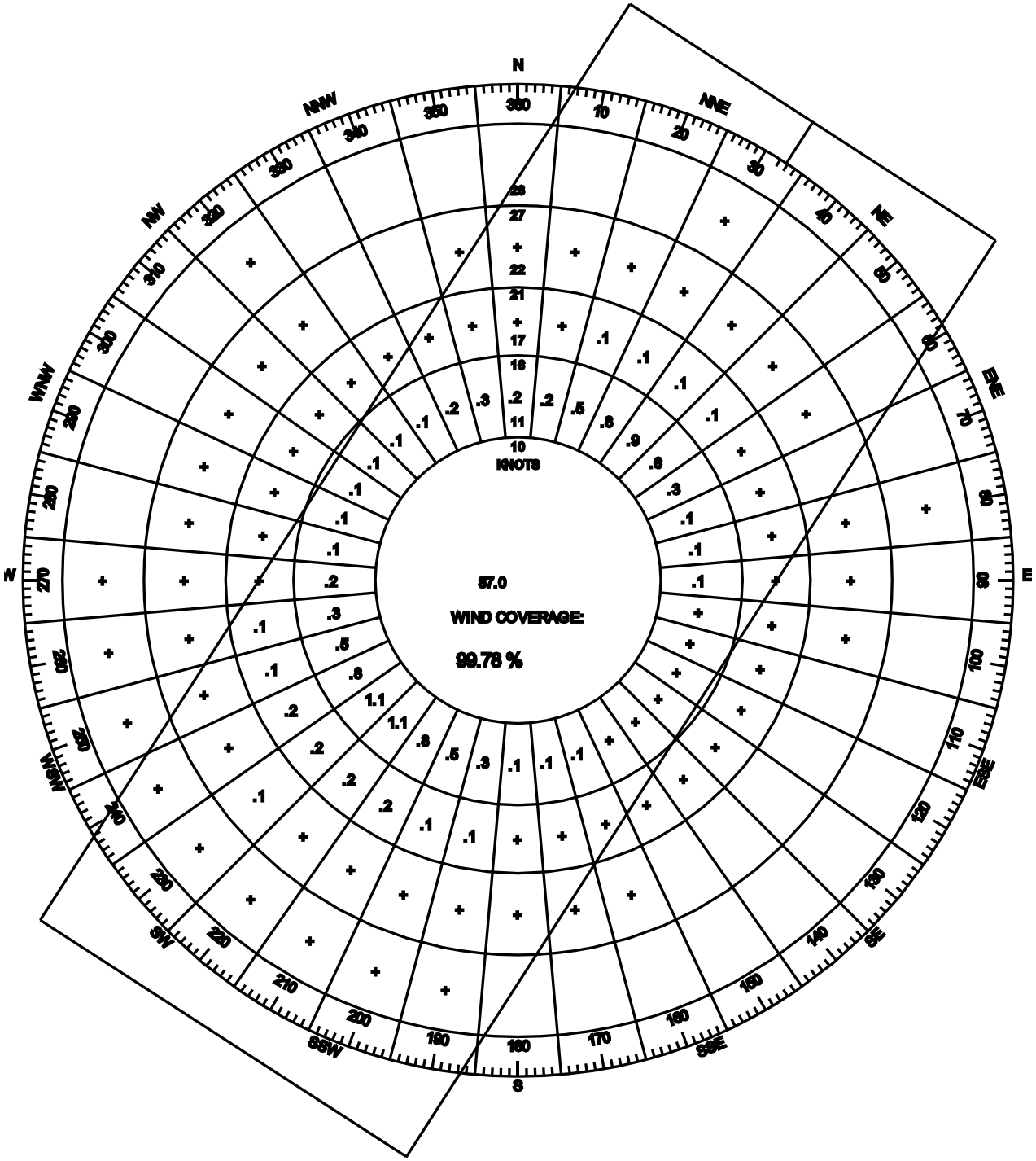
Condition	Runway	Wind Coverage by Crosswind Speed			
		10.5kts	13kts	16kts	20kts
All Weather	4	58.42%	58.84%	59.08%	59.13%
	22	61.47%	62.35%	62.71%	62.84%
IFR	4	57.57%	58.02%	58.27%	58.32%
	22	63.04%	63.67%	64.04%	64.16%
VFR	4	65.13%	65.36%	65.54%	65.59%
	22	49.39%	49.89%	50.20%	50.31%
PVC	4	63.80%	63.83%	63.87%	63.87%
	22	70.75%	70.96%	71.05%	71.13%

Source: ASOS 723120 10-year Wind History of Hourly Observations 2017-2016 as provided by National Climatic Data Center, September 2017; McFarland Johnson, 2017

During times weather conditions are especially poor aircrew and aircraft with special certification are more likely to execute an approach to Runway 4 at GSP as CAT II and CAT III ILS approaches are available to that runway end. CAT II and CAT III ILS approaches allow for more precise landing and roll-out control than provided by the traditional CAT I ILS available to both the Runway 4 and Runway 22 end at GSP. Such sophisticated approaches are enabled by the Runway 4 approach lighting system with centerline sequenced flashing lights (ALSF-2), in-pavement touchdown zone lighting at the Runway 4 end, and the in-pavement runway centerline lighting system.

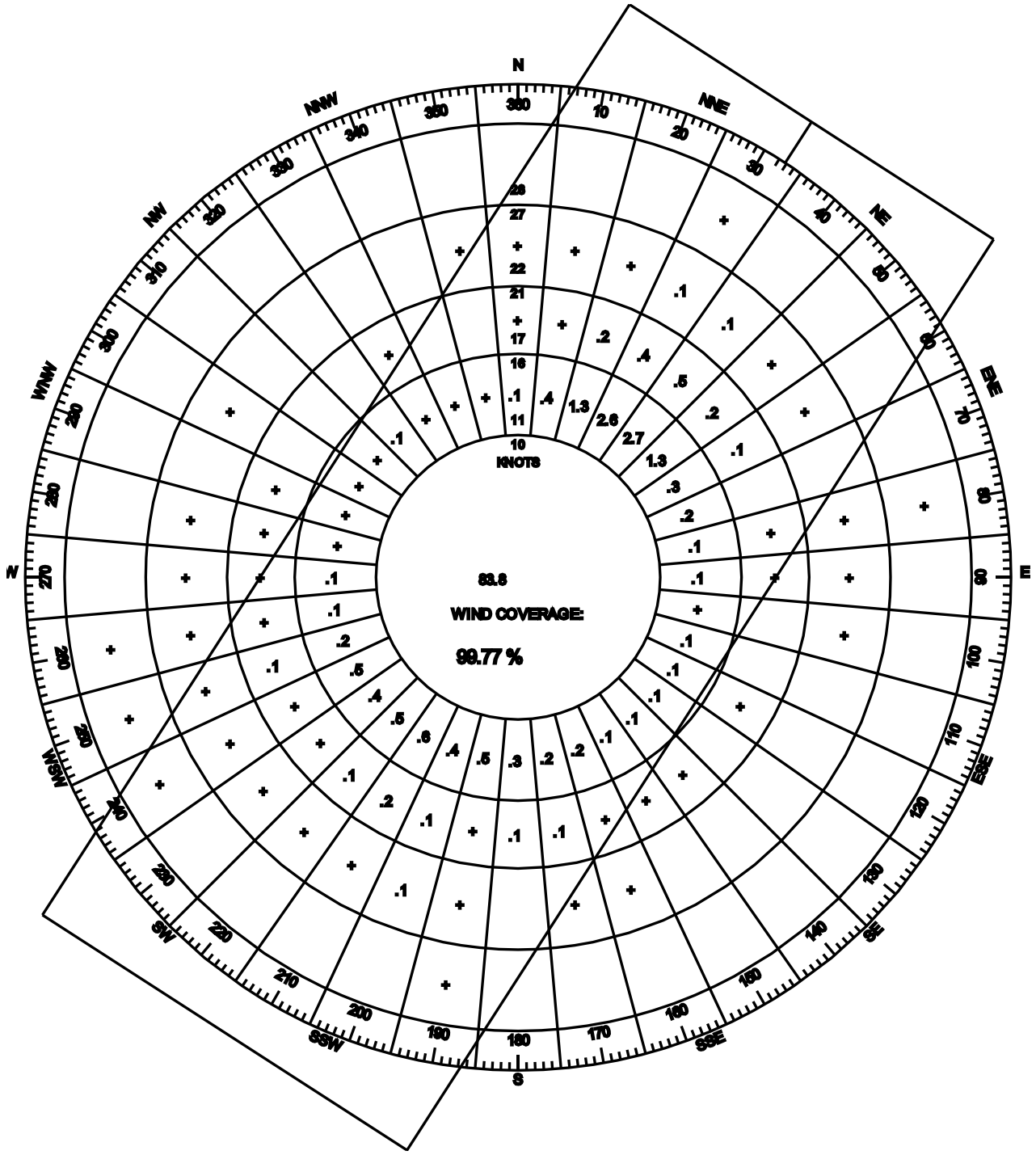
Figure 2-4 and **Figure 2-5** depict the calculated wind roses for the all-weather and instrument flight rules (IFR) conditions, respectively.

Figure 2-4: All Weather Wind Rose



Source: National Climatic Data Center, September 2017

Figure 2-5: IFR Wind Rose



Source: National Climatic Data Center, September 2017

2.2. AIRFIELD FACILITIES

Discussion of airport facilities in this report will be divided into airside and landside sections. Airside facilities are associated with the taxiing, takeoff, and landing of aircraft (i.e., the airfield and its components) and are discussed under the following headings:

- Runways
- Taxiways and Taxilanes
- Apron Areas
- Pavement Management
- Instrumentation, Visual and Navigational Aids

Figure 2-6 depicts existing airfield infrastructure and facilities.

2.2.1. Runways

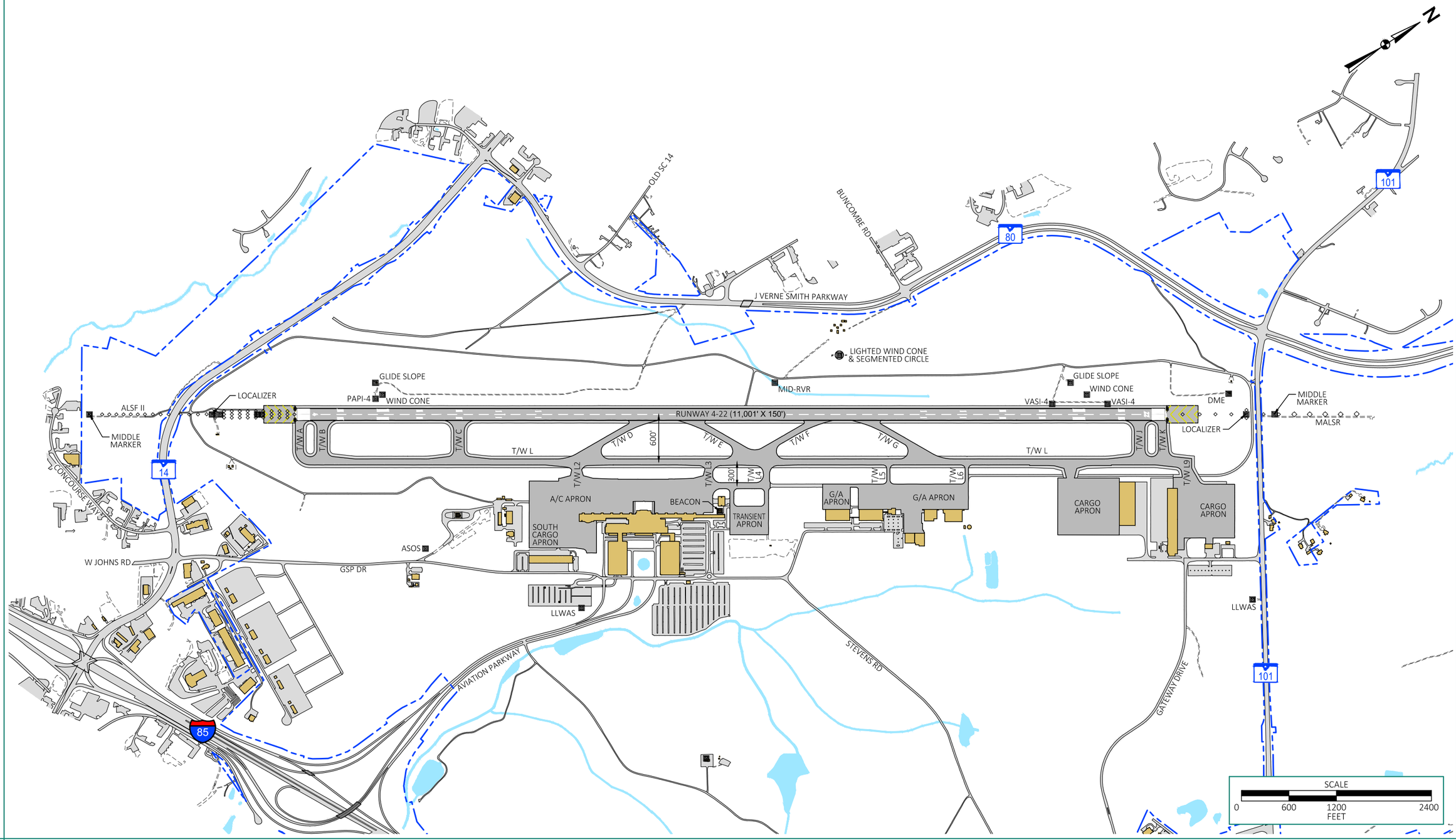
GSP has a single, bi-directional, asphalt-concrete runway. Runway 4-22 meets the criteria for FAA Airport Reference Code (ARC) D-V. An ARC is composed of the Airplane Design Group (ADG), which is the classification of aircraft based on wingspan and tail height, and the Aircraft Approach Speed (AAC). With a D-V classification, Runway 4-22 can accommodate aircraft with wingspans up to but not including 214 feet, a tail height up to but not including 66 feet, and approach speeds up to but not including 166 knots. Based on information obtained from GSP tower personnel Runway 4 supports 45 percent of airfield operations, while Runway 22 supports the remaining 55 percent. Not only do typical wind patterns support the utilization of Runway 4 more than Runway 22, Runway 4 is the preferred runway during calm wind conditions.

Runway 4-22

Runway 4-22 has a northeast to southwest orientation and measures 11,001 feet in length and 150 feet wide with 35-foot paved shoulders on either side. The Runway 4 end elevation is 941 feet and the Runway 22 end elevation is 963.7 feet to yield a 0.2 percent gradient across the Runway's length. Each end of the Runway is supplemented with 220-foot wide and 400-foot long paved blast pads.

Runway 4-22 is equipped with high intensity runway edge lighting (HIRL) and has in-pavement centerline lights spaced at 50-foot intervals. These lights are white except for the last 3,000 feet of each runway end, where they alternate white and red for the next 1,969 feet and are consistently red for the last 984 feet. Runway 4 is equipped with a 2,400-foot high intensity ALSF-2 and Runway 22 is equipped with a 1,400-foot medium intensity approach lighting system with runway alignment indicator lights (MALSR). The Runway 4 ALSF-2 is available between 0600 and 2345 local time (UTC-5) each day, and operates as a MALSR system during the off hours. For additional visual guidance, both Runway 4 and Runway 22 are equipped with a four-light precision approach path indicators (PAPI) with a standard three-degree glide paths. Both PAPIs are located on the west side of Runway 4-22. Both runways are marked with precision runway markings and the markings are in good condition.

Figure 2-6: Airfield Facilities



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Runway 4 has a Category IIIb precision instrument landing system (ILS) with distance measuring equipment (DME) and Runway 22 is equipped with Category I precision ILS. Additionally, Runway 4-22 is equipped with a forward scatter runway visual range (RVR) system to inform pilots of the exact visibility conditions on the airfield. Utilizing this system, the CAT IIIb ILS approach to Runway 4 permits aircraft to approach GSP in very poor visibility conditions.

To maintain safe and efficient operations at an airport, the FAA requires that certain areas on and near the airport are clear of objects or restricted to objects with a certain function, composition, and/or height as defined in FAA AC 150/5300-13A, *Airport Design*. To comply with these requirements, Runway 4-22 has a standard Runway Safety Area (RSA) width of 500 feet with a length of 1,000 feet beyond the departure ends and a Runway Object Free Area (ROFA) width of 800 feet with a length of 1,000 feet beyond the departure ends. The Runway Object Free Zone (ROFZ) width is 400 feet and extends 200 feet beyond each runway end. All protection areas are standard for Runway 4-22.

2.2.2. Taxiways and Taxilanes

GSP has one full length parallel taxiway with nine connecting taxiways to Runway 4-22, four of which are directionally specific and permit rapid exits from the Runway, and six taxiways providing access to apron areas. The taxiway system includes standard yellow pavement markings and enhanced centerline markings prior to hold short markings leading to runway intersections. The taxiway system is equipped with high intensity taxiway lighting (HITL) across its entirety. Taxiways serving large commercial or cargo aircraft have a Taxiway Safety Area (TSA) width of 214 feet and Taxiway Object Free Area (TOFA) width of 320 feet to satisfy ADG V standards. Taxiways intended for smaller aircraft (Taxiways L5 and L6) have a TSA width of 79 feet and a TOFA of 131 feet to satisfy ADG II requirements.

Taxiway L

Taxiway L is a full-length parallel taxiway that serves as the airfield's main taxiway. Taxiway L is on the east side of Runway 4-22 and maintains a centerline to centerline separation of 600 feet from the runway for its entire length. The taxiway maintains a width of 75 feet along its entire length and is equipped with 35-foot-wide paved shoulders on each side. On the west side of Taxiway L are Taxiways A through K (excluding H and I), each providing access to Runway 4-22. To the east of Taxiway L are Taxiways L2 through L9 (excluding L7 and L8) providing access to the various apron areas available at GSP.

Taxiway A

Taxiway A is the southernmost taxiway servicing Runway 4-22 and provides access to the Runway 4 end from parallel Taxiway L to enable full length use of Runway 4. Taxiway A is 100 feet wide with 35-foot-wide paved shoulders on each side.

Taxiway B

Taxiway B is parallel to and located north of Taxiway A. Centerline to centerline separation between Taxiway B and Taxiway A is 300 feet. Taxiway B is 130 feet wide and equipped with 35-

foot-wide paved shoulders on each side. Taxiway B provides access to Runway 4 approximately 340 feet from the Runway 4 threshold.

Taxiway C

Taxiway C is a mid-field connector taxiway located 2,056 feet from the Runway 4 threshold. Taxiway C is 130 feet wide and equipped with 35-foot-wide paved shoulders on each side.

Taxiway D

Taxiway D is a rapid exit taxiway for aircraft arriving on Runway 22. Located 6,552 feet from the Runway 22 threshold, Taxiway D is 75 feet in width with 30-foot-wide stabilized turf shoulders on either side. Aircraft using Taxiway D can proceed in either direction on Taxiway L or access the commercial apron area by means of Taxiway L2[1].

Taxiway E

Taxiway E is a rapid exit taxiway for aircraft arriving on Runway 4. Located 4,950 feet from the Runway 4 threshold, Taxiway E is 75 feet in width with 30-foot-wide stabilized turf shoulders on either side. Aircraft using Taxiway E can proceed in either direction on Taxiway L.

Taxiway F

Taxiway F is a rapid exit taxiway for aircraft arriving on Runway 22. Located 4,344 feet from the Runway 22 threshold, Taxiway F is 75 feet in width with 30-foot stabilized turf shoulders on each side. Aircraft using Taxiway F can proceed in either direction on Taxiway L.

Taxiway G

Taxiway G is a rapid exit taxiway for aircraft arriving on Runway 4. Located 7,152 feet from the Runway 4 threshold, Taxiway G is 75 feet in width with 30-foot-wide stabilized turf shoulders on each side. Aircraft using Taxiway G can proceed in either direction on Taxiway L to access landside facilities.

Taxiway J

Taxiway J is south of and parallel to Taxiway K. Centerline to centerline separation between Taxiway J and Taxiway K is 300 feet. Taxiway J is 130 feet wide and equipped with 35-foot-wide paved shoulders on each side. Taxiway J provides access to Runway 22 approximately 350 feet from the Runway 22 threshold.

[1] *Heavy aircraft restricted to 90-degree turns or less on asphalt portions of the runway or on Taxiway L,D,E,F,G.*

Taxiway K

Taxiway K is the northernmost taxiway servicing Runway 4-22 and provides access to the Runway 22 end from parallel Taxiway L to enable full length use of Runway 22. Taxiway K is 130 feet wide with 35-foot-wide paved shoulders on each side.

Taxiways L2, L3, L4, L5, L6, and L9

Taxiways L2, L3, L4, L5, L6 and L9 connect Taxiway L to the various apron areas and landside facilities at GSP. These taxiways range in width from 40 feet to over 90 feet based on the type of aircraft each is intended to support. Taxiway L2 and L3 provide access to the commercial terminal apron, L4 provides access to the transit apron area, L5 and L6 to the GA apron areas, and L9 to the north cargo apron area.

2.2.3. Apron Areas

GSP has five independent apron areas categorized in this report based on their specific uses. These aprons include: the commercial terminal/south cargo apron, a transit apron, two general aviation aprons and the north cargo apron. All three aprons are located on the east side of Runway 4-22 and Taxiway L.

Commercial Terminal/South Cargo Apron

The commercial terminal/south cargo apron is constructed of portland cement concrete (PCC) covering an area of approximately 118,000 square yards. An apron rehabilitation project recently replaced portions of pavement adjacent to Gates B1-B4 and Gates A1-A4 and A-6. The remainder of apron pavement is in generally good condition.

The commercial terminal/south cargo apron provides access to air carrier gates and passenger boarding bridges. The apron provides space for 13 air carrier gates connecting users to Concourses A and B and two air carrier hardstands. On the southern portion of this apron, two aircraft hardstand positions are available away from the terminal to support air cargo activity. This area can accommodate one 747-8F or six ADG-III sized aircraft. The Airport's air traffic control tower (ATCT) and Index C aircraft rescue and firefighting (ARFF) building are both located on the far northern portion of this apron.

Transit Apron

The transit apron is constructed of PCC measuring 500 feet long and 350 feet wide, this 19,445 square-yard apron is capable of supporting a wide variety of aircraft weighing less than 60,000 pounds. Presently, the taxilanes providing access to this apron are 50 feet wide and each is accessible from the primary taxilane parallel to Taxiway L. The transit apron sits just north of the commercial terminal apron.

General Aviation Aprons

Two independent but collocated general aviation apron areas exist at GSP north of the commercial terminal apron and the transit apron. The southernmost of these two GA apron areas is

constructed of PCC and provides 10,615 square yards of apron adjacent to a large GA storage hangar. This apron space is connected to the northernmost GA apron via a taxilane parallel to Taxiway L and is associated with one storage hanger. This northernmost GA apron, also constructed of PCC, provides over 53,000 square yards of additional GA apron space. This apron is contiguous with three GA storage hangars, the District owned Fixed Base Operator and GA terminal, and will support two additional bulk hangars presently under construction. Approximately 1,500 square yards of apron is used for the parking of aircraft fuel trucks.

North Cargo Area

The main cargo apron area is northernmost of the five apron areas at the Airport. This apron is constructed of PCC and offers over 50,000 square yards of pavement capable of supporting regular use by some of the heaviest freight aircraft in use today. Presently this apron supports cargo activities from the adjacent 120,000 square-foot cargo sorting facility and 5,000 square-foot cargo operations building, as well as U.S. Customs and Boarder Protection which operates from a building located on the apron's northeast corner. Airport staff has expressed the desire to relocate the U.S. Customs and Boarder Protection (CBP) facility to the GA apron in the future to better service the growing international GA traffic. Adjacent to this facility is the UPS cargo building, completed in 2017, which provide 5,000 square feet of tenant space. The north cargo apron has five hardstand positions, two of which provide direct access to the cargo sorting facility.

2.2.4. Pavement Management

As part of this update to the GSP Airport Master Plan an evaluation of airfield pavement condition was conducted to provide insight into not only the current pavement condition and types of damage present, but also to aid in capital improvement decision making. A full Pavement Management Plan report can be found in Appendix A which details the specific findings of the study.

2.2.5. Instrumentation, Visual and Navigational Aids

Navigational aids (NAVAIDs) are any electronic or visual devices, airborne or on the ground, which provide point-to-point guidance information or position data to aircraft in flight. All local traffic is controlled by the FAA ATCT which is operational between 0600 to 2345 local time. GSP has several electronic and visual NAVAIDs that pilots use to locate, navigate to, and land at the airport. A summary of instrument approach minima is shown in Table 2-5.

Table 2-5: GSP Instrument Procedures Approach Minima

Procedure Name	Minimum Visibility	Minimum Descent Altitude (MSL)
RWY 22 ILS or LOC	ILS All Aircraft Categories: ½ mile, LOC Aircraft Categories A and B: ½ mile LOC Aircraft Categories C and D: 5/8 mile	ILS: 200 feet LOC: 400 feet
RWY 4 ILS or LOC/DME	ILS All Aircraft Categories: ½ mile LOC Aircraft Categories A and B: ½ mile LOC Aircraft Categories C and D: 1 mile	ILS: 200 feet LOC: 500 feet
RWY 4 ILS	All Categories of Aircraft: 252 feet	14 feet
RWY 4 ILS (CAT II & III)	All Categories of Aircraft: 136 feet	12 feet
RWY 4 RNAV (GPS)	All Aircraft Categories: 1¼ mile	500 feet
RWY 22 RNAV (GPS)	All Aircraft Categories: ¾ mile	403 feet

Notes: ILS = Instrument Landing System, LOC = Localizer, RWY = Runway, DME = Distance Measuring Equipment, RNAV = Area Navigation, GPS = Global Positioning System, MSL = Mean Sea Level

Source: FAA Southeast Terminal Procedures, Date 22 June 2017 to 22 July 2017

Instrument Landing System

An instrument landing system (ILS) provides horizontal and vertical guidance to a runway end, which allows pilots to land aircraft when visual navigation is limited. The ILS is used in poor weather with low visibility conditions. The ILS procedures for Runways 4 and 22 are included in Figure 2-7 through Figure 2-10.

The electronic components that comprise the ILS are the localizer, glide slope, outer marker, and middle marker. The localizer (LOC) signal is used to establish and maintain the aircraft's horizontal position until visual contact confirms the runway alignment and location. The glide slope is an electronic transmitter that emits signals used to establish and maintain the aircraft's descent rate until a pilot can visually confirm the runway alignment and location. The outer marker radiates a signal that marks the point at which glide slope altitude is verified or at which descent without glide slope is initiated. The middle marker radiates a signal that marks the decision point of the ILS approach.

Approach lighting systems are used in conjunction with an ILS to assist pilots transitioning from instrument to visual conditions.

Figure 2-7: Runway 22 ILS or LOC

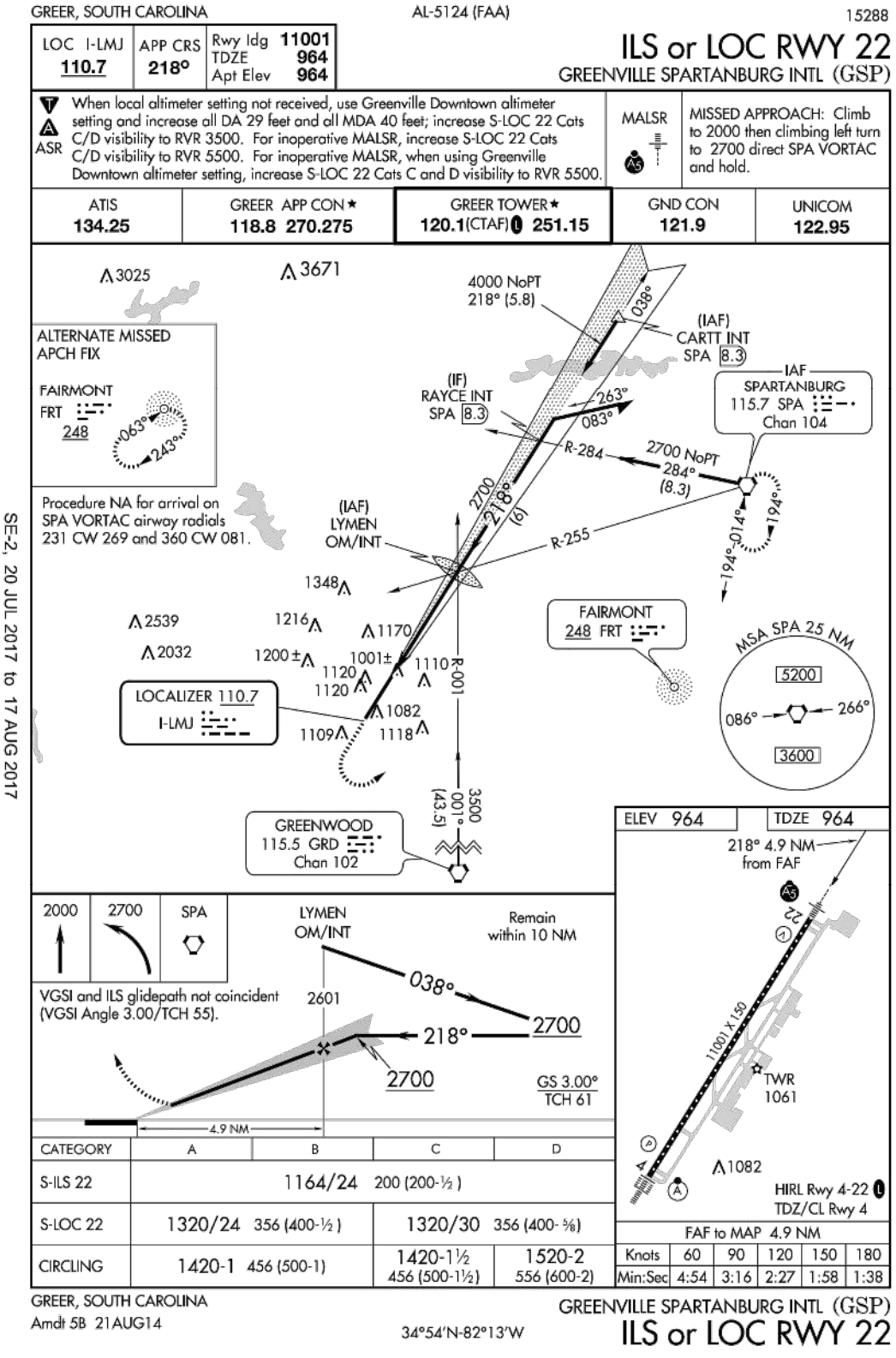

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Figure 2-8: Runway 4 ILS or LOC-DME

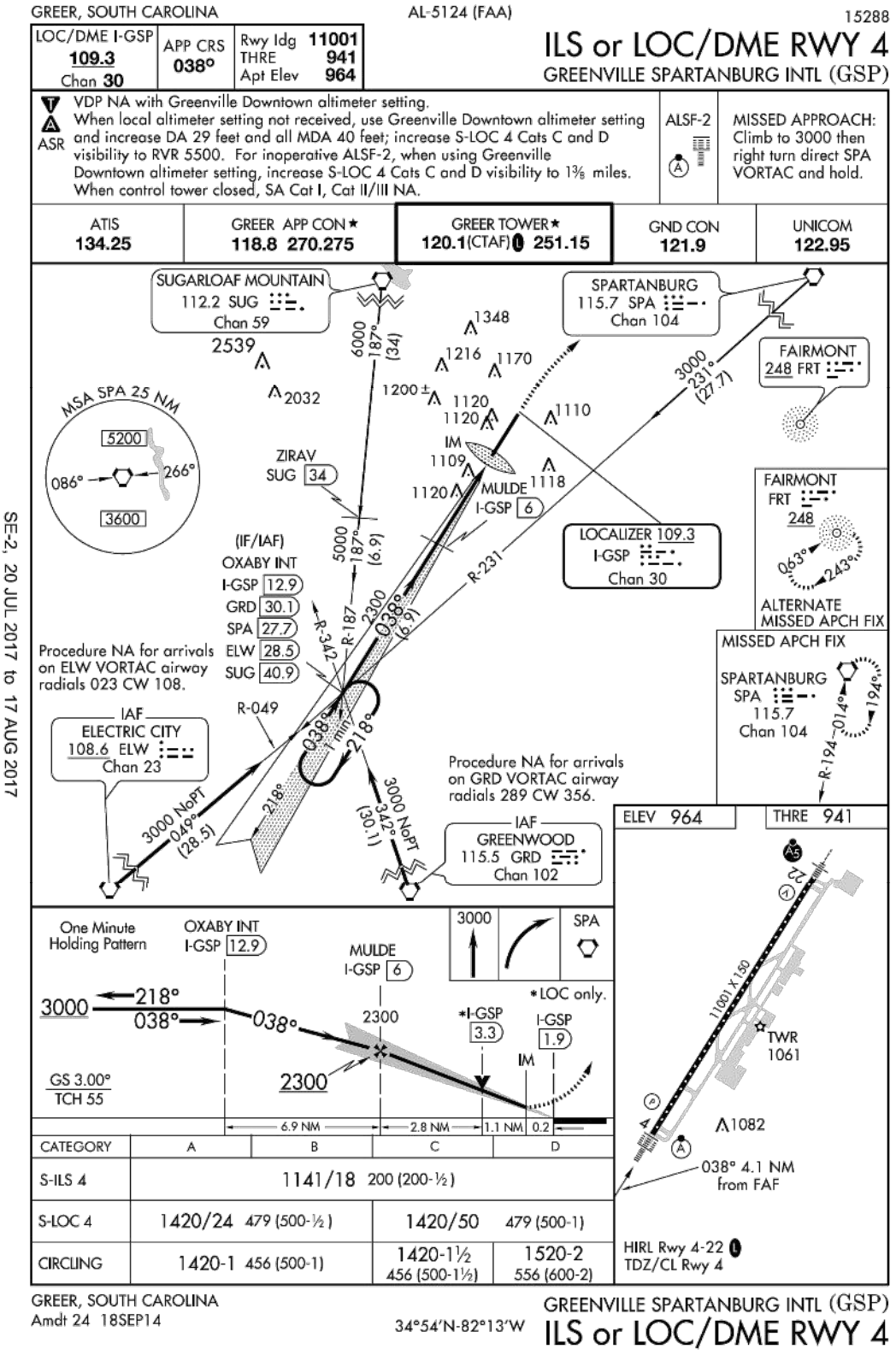


Figure 2-9: Runway 4 ILS

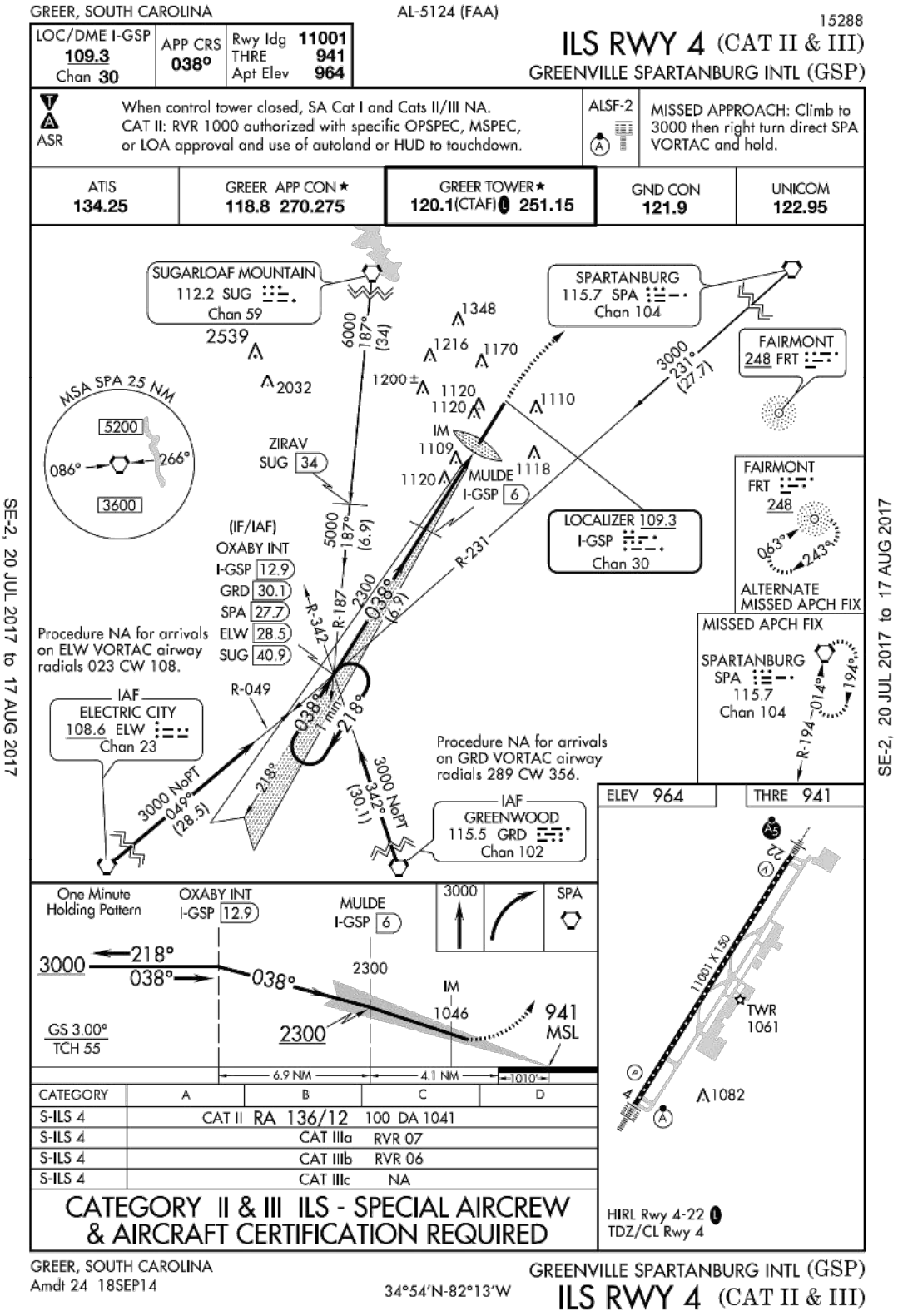
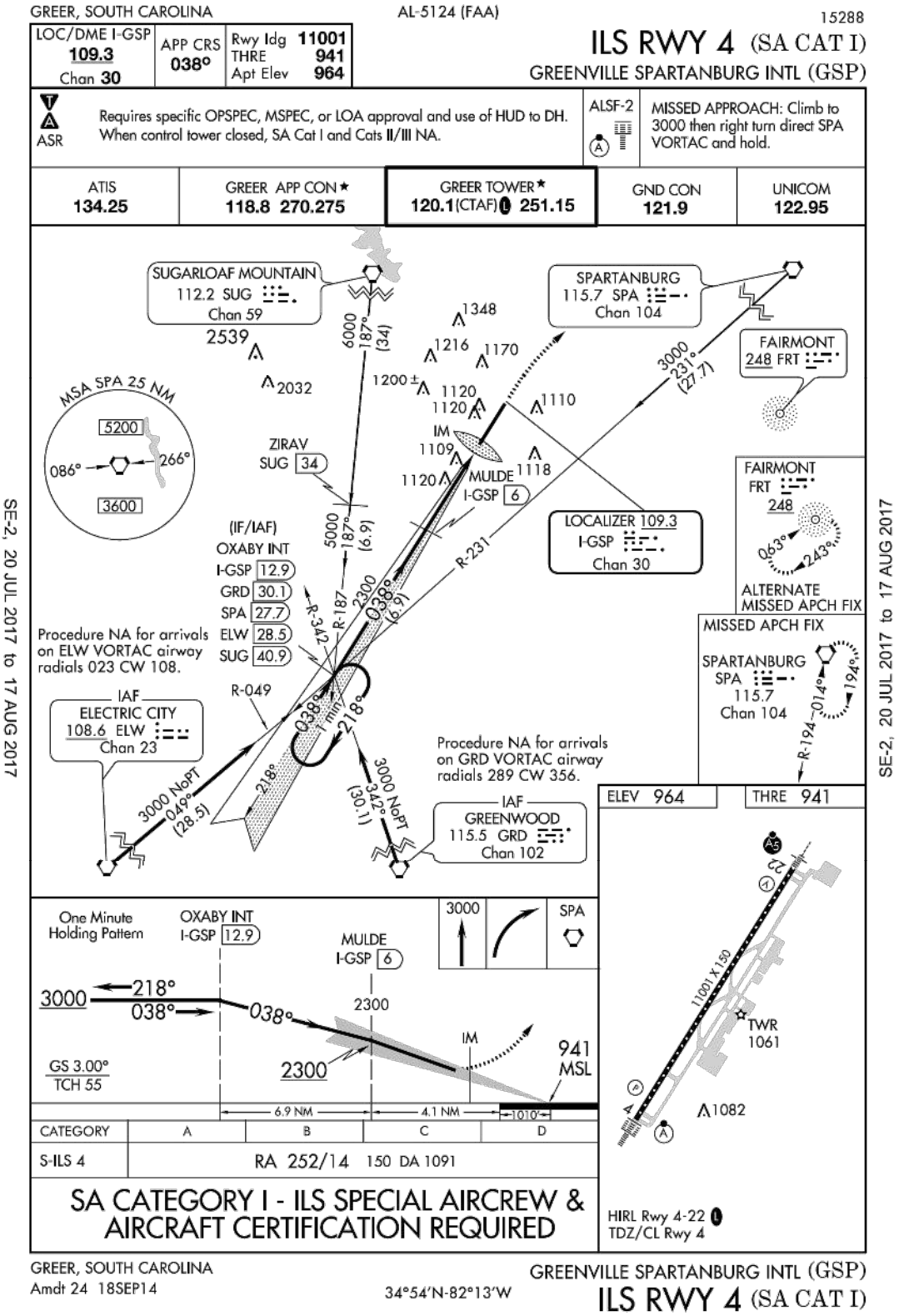


Figure 2-10: Runway 4 ILS (CAT II & III)



Distance Measuring Equipment

Distance measuring equipment (DME) is often used as an aid to the ILS and is therefore often collocated with the ILS. DME provides pilots with a slant range measurement of distance to the runway in nautical miles. In many installations, the DME augments or replaces the markers within the ILS system. Runway 4 has DME in coordination with the localizer to support the ILS.

RNAV/GPS Approaches

Properly equipped aircraft can use global positioning systems (GPS) provided by satellites for approach procedures to the Airport. The area navigation (RNAV) GPS procedures for Runway 4 and Runway 22 are included in **Figure 2-11** and **Figure 2-12**.

Visual Approach Aids

For visual guidance, Runway 4 is equipped with a four-light PAPI to left of the runway with a standard three-degree glide path and Runway 22 has a four-light PAPI to the right of the runway with a standard three-degree glide path.

Automated Surface Observing System

Weather reporting equipment at GSP consists of an automated surface observing system (ASOS) that provides continuous minute-by-minute observations and performs basic observation functions necessary to generate an aviation routine weather report (METAR) and other aviation weather information. An ASOS has the capability to report altimeter, wind, temperature/dew point, density altitude, visibility, clouds/ceiling, precipitation, and remarks. The ASOS is located south of the commercial service/south cargo apron and operated by the National Weather Service (NWS).

Low Level Wind Shear Alert System

There is a low level wind shear alert system (LLWAS) to the southwest of Runway 4 end. This is a ground-based system used to identify weather conditions involving wind shear and microbursts cause by storm activity (gusts and downdrafts), temperature inversions, and surface obstructions around an airport and near runways. Wind shear is defined by the FAA as a change in wind speed and/or direction over a short distance. This change can take place over vertical and horizontal distances and can pose a great threat to safety during landing and departing operations at an airfield. The LLWAS at GSP aids in maintaining the safety and awareness of pilots using the airport through a series of sensor stations located around the Airport and near the Runway along the approach and departure paths.

Figure 2-11: Runway 4 RNAV (GPS)

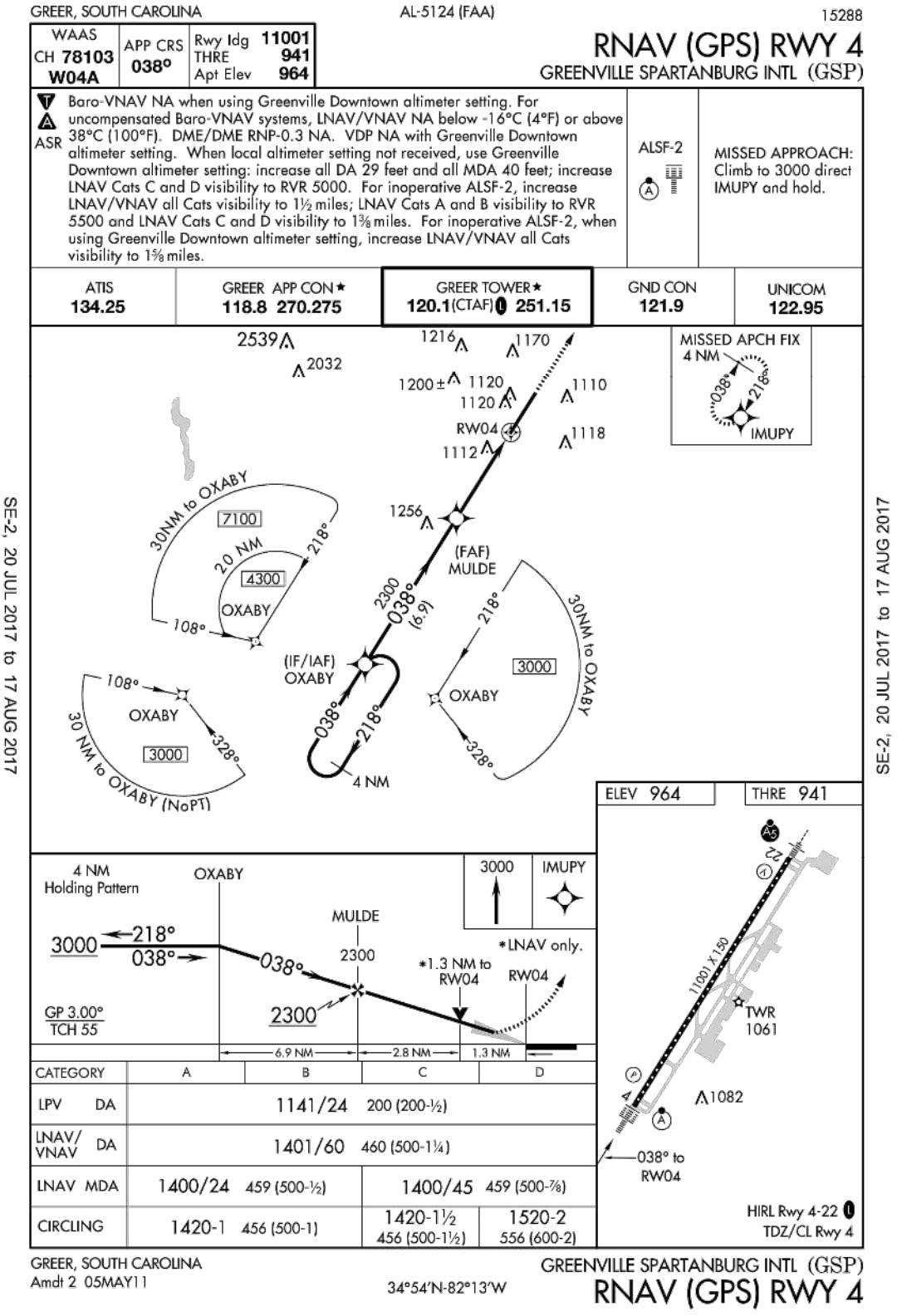
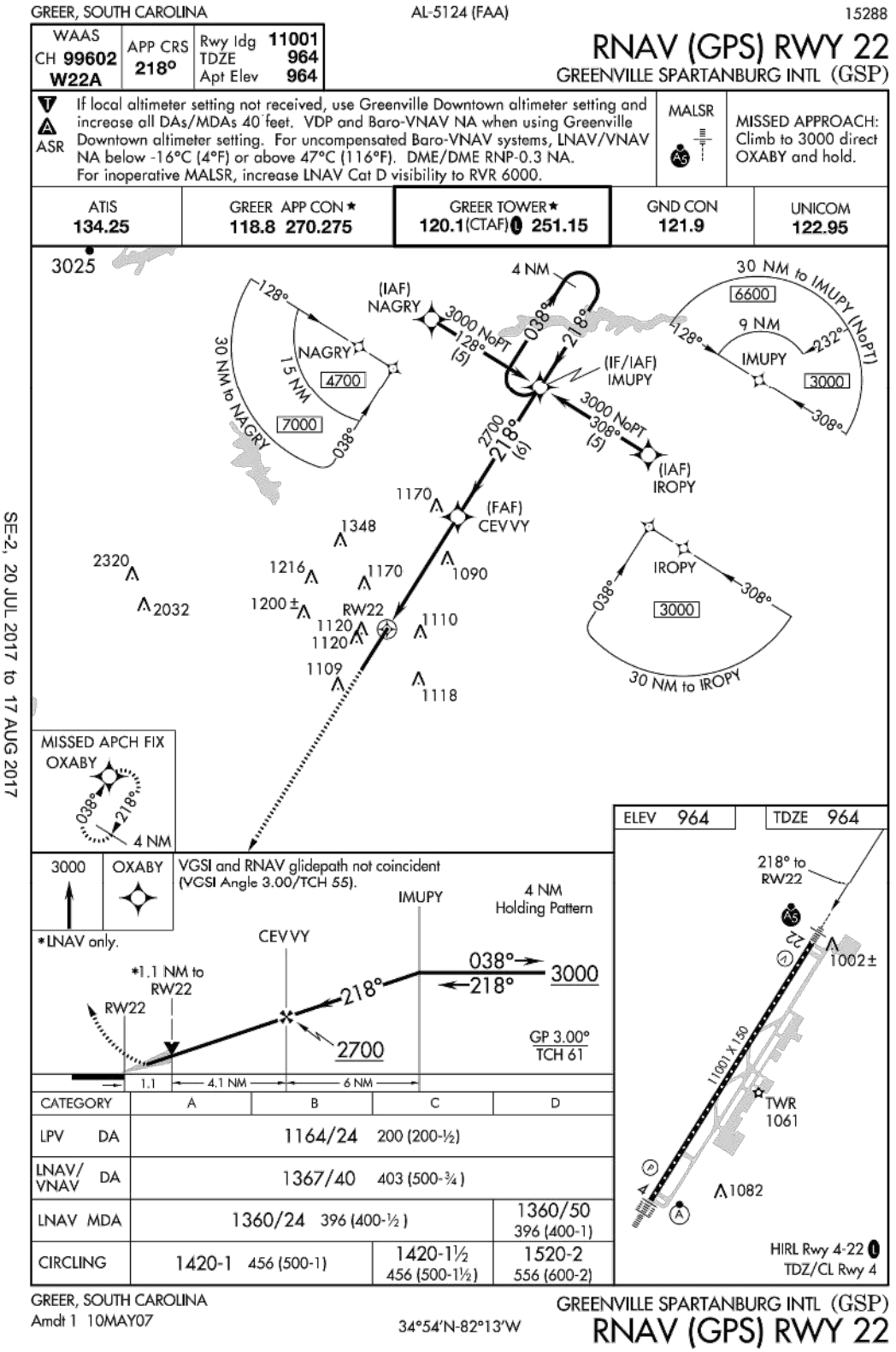


Figure 2-12: Runway 22 RNAV (GPS)



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Wind Cones

The primary wind cone located on the airfield is lighted and located within a segmented circle on the northwest side of the Runway. A segmented circle performs two functions; it aids the pilot in locating airports and it provides a centralized location for indicators and signal devices that may be required on an airport. Segmented circles are required at airports receiving FAA funds and are particularly helpful to pilots at non-towered airports. Two supplemental wind cones are installed on the airfield, one on each end of Runway 4-22.

Airfield Lighting

In 2006, GSP updated its airfield lighting system by replacing runway and taxiway edge-lighting and the supporting electrical wiring system. A computer control system was also installed to monitor and alert airport maintenance when a failure in the lighting system occurs. As part of this upgrade, the current regulators and emergency back-up generator for the airfield were replaced. Currently, airfield lighting for runways, taxiways, lighted directional signs and other signage is powered from the airfield electrical vault and provided with backup power by a collocated emergency generator.

Runway Approach Lighting

As previously discussed, the ALSF-2 is a robust, 2,400-foot, approach lighting system which provides visual information on runway alignment, height perception, roll guidance, and horizontal references to specifically support up to Category II/III instrument approaches. The 2,400-foot long MALSR system supplements approaches to Runway 22 by providing runway alignment and height perception information to pilots to support CAT I approaches. Each approach lighting system is equipped with an emergency back-up generator and are owned and operated by the FAA.

Runway In-Pavement Lighting

Centerline Lighting

Runway centerline lighting system (RCLS) are installed on some precision runways to better facilitate runway identification and alignment recognition by pilots of approaching aircraft. When viewed from the landing threshold, the runway centerline lights are white until the last 3,000 feet of the runway. The white lights begin to alternative with red for the next 2,000 feet and for the last 1,000 feet of useable runway the lights are all red. The RCLS at GSP is bi-directional and as such supplement approaches to both Runway 4 and Runway 22.

Touchdown Zone Lighting

Touchdown zone lights (TDZL) are installed on some precision approach runways to indicate the touchdown zone when landing under adverse visibility conditions. They consist of two rows of transverse light bars located symmetrically about the runway centerline. The system consists of steady-burning white lights which start 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. At GSP, TDZL are installed on Runway 4 only as required to support the CAT II/III approaches to that runway end.

Taxiway Centerline Lead-Off Lights

Taxiway centerline lead-off lights provide visual guidance to persons exiting the runway. They are color-coded to warn pilots and vehicle drivers that they are within the runway environment. Taxiway centerline lead-off lights are installed on all rapid-exit taxiways at GSP.

Taxiway Lighting

All taxiways at GSP are equipped with high intensity taxiway lighting (HITL) along the edge of pavement. No in-pavement taxiway lighting exists other than the taxiway centerline lead-off lights installed on rapid-exit taxiways, Taxiways D, E, F and G. Additionally, all taxiways which access Runway 4-22, with exception to Taxiway F and Taxiway G, have in-pavement stop bar lights installed. These red, unidirectional lights are installed across the entire taxiway at the runway hold position markings.

Airport Beacon

The Airport's rotating beacon is located on top of the Air Traffic Control Tower (ATCT) and provides a visual navigation aid for aircraft. The beacon is equipped with an optical rotating system that projects two beams of light; one green and one white or clear, 180 degrees apart, in accordance with FAA criteria. These colors indicate that the Airport is a civil airport. The GSP rotating beacon is operational when the airport is open and turned off when the Airport is closed to traffic.

2.3. AIRSPACE PROCEDURES AND AIR TRAFFIC CONTROL

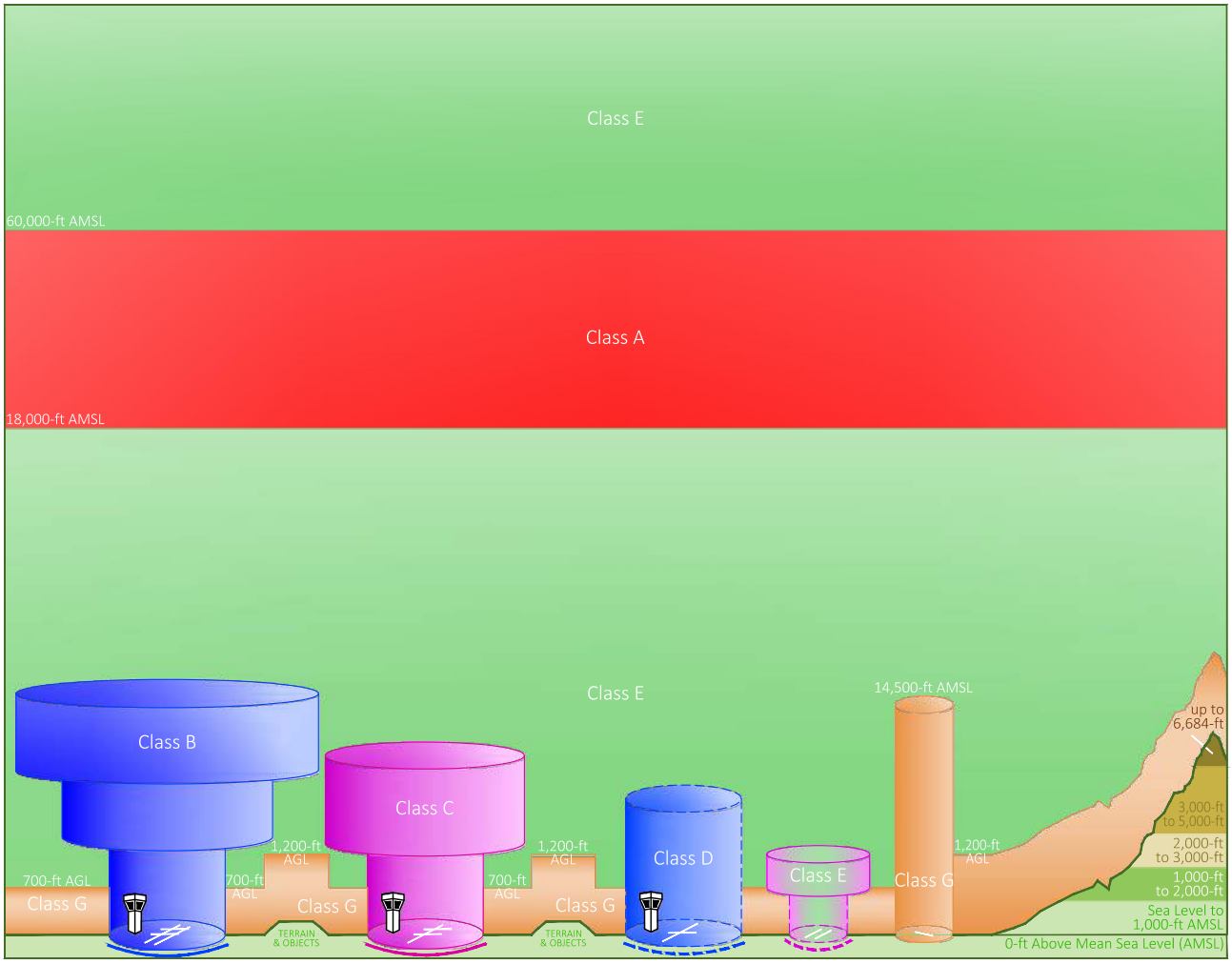
Airspace in the United States is designated with the letters A through G (not including F). A summary of each of these types of airspace is depicted in **Figure 2-13** and the airspace surrounding GSP is shown in **Figure 2-14**. GSP operates under Class C airspace when the control tower is operating and under Class E for all other hours.

- **Class A:** All airspace between 18,000 feet MSL and 60,000 feet AGL. Class A airspace contains all high-altitude airways (jet routes).

- **Class B:** Airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports in terms of IFR operations or passenger enplanements. Each Class B airspace is uniquely tailored to the airport and its vicinity. Class B airspace can resemble an upside-down wedding cake having different tiers with different elevations. ATC clearance is required for aircraft to enter Class B airspace. Charlotte Douglas International Airport (CLT) and Hartsfield-Jackson Atlanta International Airport (ATL) are the closest airports to GSP surrounded by Class B airspace.

- **Class C:** Airspace from the surface up to 4,000 feet above the airport elevation surrounding airports that have an operational control tower, are serviced by a radar approach control, and that have a certain number of IFR operations or passenger enplanements. Class C airspace is individually tailored, but generally the airspace consists of a 5 nautical mile (NM) tier from the surface to 4,000 feet AGL and a 10 NM shelf that extends from 1,200 feet up to 4,000 feet AGL. GSP is currently operating under Class C Airspace. GSP's Class C airspace has a 5 NM tier from the surface to 5,000 feet and a 10 NM tier with a northwestern appendage extending from 3,100 feet to 5,000 feet and a southeaster section extending from 2,200 feet to 5,000 feet.

Figure 2-13: Generalized Airspace Schematic



Communication Requirements and Weather Minimums

	Class A	Class B	Class C	Class D	Class E	Class G
Minimum Pilot Qualification	Instrument Rating	Student *	Student *	Student *	Student *	Student *
Entry Requirements	IFR: ATC Clearance VFR: Operations Prohibited	ATC Clearance	IFR: ATC Clearance VFR: Two-Way Communication w/ ATC	IFR: ATC Clearance VFR: Two-Way Communication w/ ATC	IFR: ATC Clearance VFR: None	None
VFR Visibility Below 10,000 AMSL **	N/A	3 Statute Miles	3 Statute Miles	3 Statute Miles	3 Statute Miles	Day: 1 Statute Mile Night: 3 Statute Miles
VFR Cloud Clearance Below 10,000 AMSL	N/A	Clear of Clouds	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal ***
VFR Visibility 10,000 AMSL and Above **	N/A	3 Statute Miles	3 Statute Miles	3 Statute Miles	5 Statute Miles	5 Statute Miles
VFR Cloud Clearance 10,000 AMSL and Above	N/A	Clear of Clouds	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 2,000 Horizontal	500 Below 1,000 Above 1 Statute Mile Horizontal	1,000 Below 1,000 Above 1 Statute Mile Horizontal
Airport Application	N/A	• Radar • Instrument Approaches • Weather • Control Tower • High Density	• Radar • Instrument Approaches • Weather • Control Tower	• Instrument Approaches • Weather • Control Tower	• Instrument Approaches • Weather	
Special VFR Permitted?	No	Yes	Yes	Yes	Yes	N/A

* Prior to operating within Class B, C, or D airspace (or Class E airspace with an operating control tower), student, sport, and recreational pilots must meet the applicable FAR Part 61 training and endorsement requirements. Solo student, sport, and recreational pilot operations are prohibited at those airports listed in FAR Part 91, Appendix D, Section 4.
** Student pilot operations require at least 3 statute miles visibility during the day and 5 statute miles visibility at night.
*** Class G VFR cloud clearance at 1,200 AGL and below (day): clear of clouds.

Figure 2-14: Surrounding Airspace

Source: Atlanta Sectional Aeronautical Chart

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- **Class D:** The terminal area airspace surrounding non-hub commercial airports with a radius of five statute miles. Generally, Class D extends from the surface to 2,500 feet.

- **Class E:** General and en-route airspace that includes most of the remaining airspace not designated as A through D. This airspace contains low altitude airways often called Victor Airways. In the GSP region, the Class E airspace begins at the surface to the southeast from the Spartanburg Downtown Memorial Airport (SPA) and extends to the floor of the Class C airspace. The remainder of Class E airspace surrounding GSP begins at 700 feet AGL and extends to the floor of the Class C.

- **Class G:** Uncontrolled airspace that exists between the ground and 700 feet AGL, within and beyond the limits of the GSP Class C area, except within the airspace surrounding SPA.

- **Special Use Airspace:** There are three special use areas adjacent to GSP. The Snowbird Military Operations Area (MOA) is approximately 44 NM to the northwest and the Gamecock MOA is approximately 74 NM to the southeast. There is also Alert Area A-685, which is over 80 NM to the west of GSP.

- **En-Route Airspace:** Aircraft flying inbound to or outbound from GSP typically follow designated routes between ground based NAVAIDs. The primary en-route NAVAID in this region is the Spartanburg VOR.

There is other controlled airspace near GSP including Class E airspace for Greenville Downtown Airport, Spartanburg Downtown Memorial Airport, Donaldson Center Airport, Laurens County Airport, and Class C airspace for Asheville Regional Airport.

2.3.1. Air Traffic Control Facilities

The Greer Air Traffic Control Tower (GSP ATCT) is located on the north end of the terminal building on the commercial terminal apron. The tower is open from 0600 to 2345 local time and provides air traffic and ground control services throughout its availability. The approach control is between Charlotte Approach and Atlanta Approach, with Asheville Approach to the north and Columbia and Augusta Approach to the south. Air Traffic Control has eight center sectors that are either adjacent to or overlay the airspace. GSP ATCT issues approach control services for 10 airports in the region, including Greenville Downtown and Donaldson Center. Terminal Radar Approach Control (TRACON) is provided during hours of operation. Atlanta Air Route Traffic Control Center (ARTCC) provides approach and departure procedures when the tower is closed. During ATCT hours of operation, aircraft require two-way radio communications and a Mode C transponder before entering the airspace.

GSP has an airport surveillance radar (ASR) located east of the commercial service terminal area. An ASR is a radar system that detects and displays aircraft in the airspace around the airport at which it is located. The ASR at GSP detects aircraft in an approximately 60-mile radius. When the ATCT is closed, a common traffic advisory frequency (CTAF) is used to keep the airport open for air traffic.

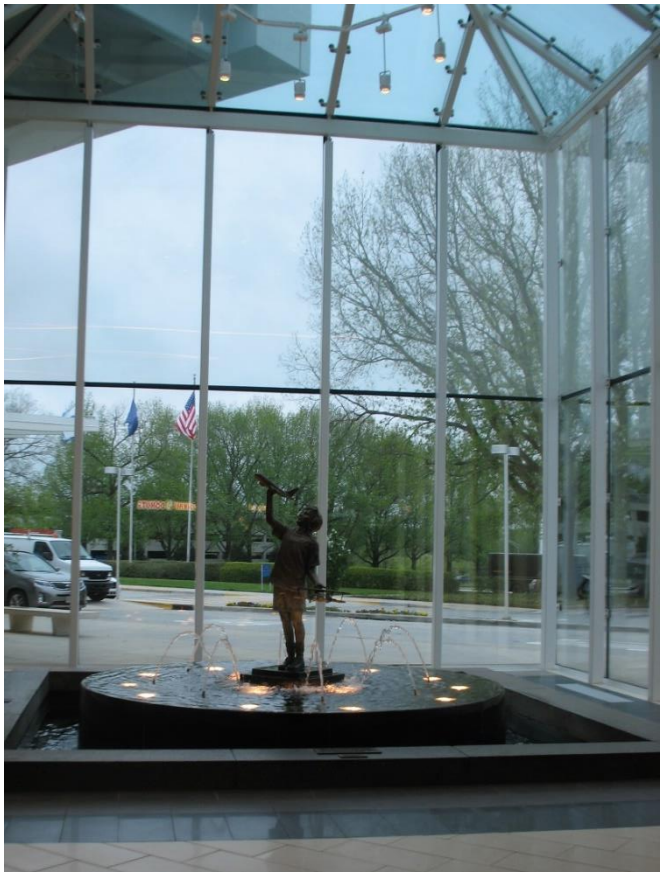
2.4. LANDSIDE FACILITIES

The existing landside facilities at GSP include the general location of buildings, hangars, and other airports and tenant facilities. Landside facilities are discussed under the following headings:

- Passenger Terminal Facilities
- General Aviation Facilities
- Cargo Facilities
- Airport Support Facilities
- Utility Infrastructure
- Regional Access, Airport Parking and Ground Transportation

The existing landside facilities are depicted in **Figure 2-15.**

2.4.1. Passenger Terminal Facilities



The passenger terminal complex at GSP recently underwent a major renovation and revitalization effort focused on increasing capacity, improving efficiency and elevating the aesthetics of the terminal building and its surroundings. The passenger terminal complex consists of the Main Terminal and two concourses, designated as Concourse A (south) and Concourse B (north). Together, these facilities total approximately 322,446 square feet and serve major and commuter airlines across 13 gates. The Main Terminal has three floors and a basement. The first floor is designated as the Ticketing Level and is unsecure. The Grand Hall is to the floor above, a two-story area with amenities at the Apron Level and Concourse Level that requires passage through security prior to entry. Two transportation cores containing stairs, escalators, and elevators transport passengers between the Ticketing Level and the levels located in the Grand Hall. The terminal facilities are currently utilized by commercial airlines including Allegiant Air (Allegiant), American Airlines (American), Delta Air Lines (Delta), Southwest Airlines (Southwest), and United Airlines (United) as well as multiple concessionaires.

For clarity throughout this section, the passenger terminal complex has been sub-divided by function. In the discussion and drawings that follow, these functional areas have been color-coded:

- Airline Areas (Dark Blue) – the area dedicated to airline functions include; check-in (counters and kiosks), check-in queue, airline offices, holdrooms, inbound baggage input area, baggage claim retrieval area, baggage services offices, and baggage make-up area.
- Concessions and Amenities (Green) – The concessions and amenities terminal utilization areas include; food/beverage areas, kitchen facilities, retail spaces, rental car areas, office/storage areas, and other revenue areas.
- Security/Federal Inspection Stations (Light Blue) – the security/federal inspection stations utilization areas include all areas within the terminal that staff and administer security services for the Main Terminal, Concourse A or Concourse B.
- Public and Circulation (Yellow) – the public and circulation terminal utilization areas include; unenclosed areas and public areas, secure or non-secure.
- Non-Public Areas (Magenta) – the non-public terminal utilization areas include; airport administration and mechanical/electrical/building system.

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Figure 2-15: Landside Facilities

1	AIR CARRIER CONCOURSE	14	PARKING GARAGE B
2	EQUIPMENT BUILDING	15	FEDERAL INSPECTION FACILITY
3	AIR CARGO	16	NWS FORECAST OFFICE
4	RENTAL CAR MAINTENANCE	17	FEDEX CARGO
5	PARKING GARAGE A	18	FUEL FARM
6	ARFF & ELECTRICAL VAULT	19	DEICE & UNLEADED/DIESEL FUEL FARM
7	ATCT	20	MAINTENANCE OFFICE
8	AIRCRAFT HANGAR	21	ANTENNA FARM
9	AIRCRAFT HANGAR	22	AIR CARGO - UNDER CONSTRUCTION
10	AIRCRAFT HANGAR	23	UPS BUILDING
11	AIRCRAFT HANGAR	24	AIRCRAFT HANGAR
12	FBO TERMINAL	25	AIRCRAFT HANGAR
13	ASR		

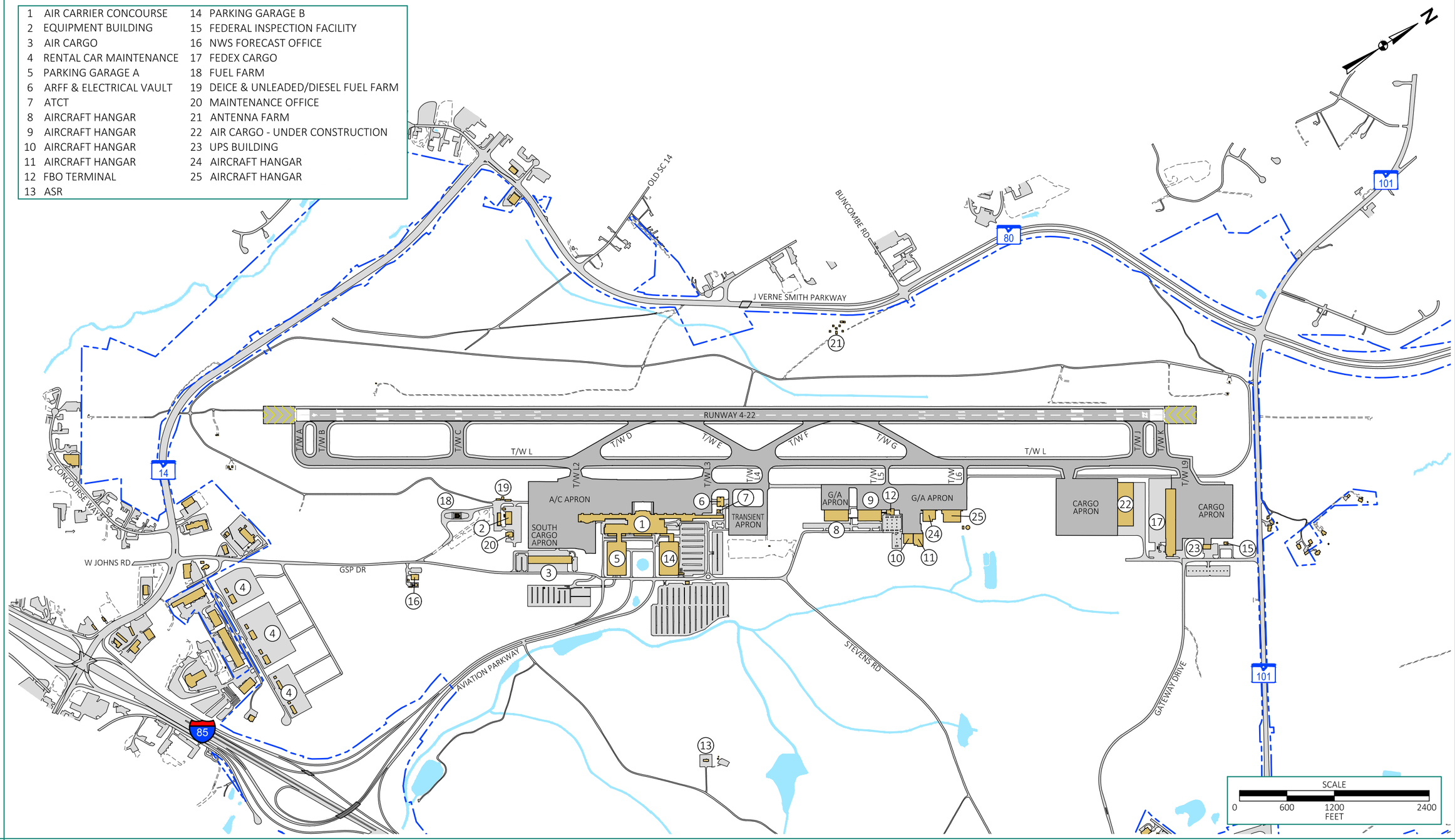

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Figure 2-16 through Figure 2-18 depict each level of the passenger terminal complex.

Airline Areas

The air carriers at GSP have space designations for various functions on each floor. The Ticketing Level houses 46 check-in desks in the check-in hall as well as 46 bag wells. There are no baggage-drop locations other than those located at baggage wells. Airlines' space allocation within the terminal building is based upon current lease agreements and includes ticketing counters, operations/office space, and baggage/storage areas. Each individual check-in desk measures three feet-four inches. Each baggage well measures two feet-four inches.

Several of the check-in desks serve as kiosks, with the following distribution across the airlines:

- American Airlines: four kiosks at five check-in desks
- Delta Airlines: six kiosks at seven check-in desks
- Southwest Airlines: four kiosks at five check-in desks
- United Airlines: five kiosks at five check-in desks
- Common-use desks: no kiosks at 17 check-in desks
- GSP District shared/per-turn-use: no kiosks at seven check-in desks

There is approximately 10 feet between the back edge of the check-in desk to the back wall. Within this area is located the take-away baggage belt, which occupies about five feet of the space. The remaining five feet of area is where check-in agents work to total approximately 2,000 square feet. The area in front of the check-in desks available for queueing measures approximately 200 feet in width. A designated area is set aside for direct flow from the curb to the baggage take-away belt. This allows for approximately 4,400 square feet for the queueing of passengers.

The airlines also have designated space on the Apron and Concourse Levels for operations, common and shared use, and the departure lounges each airline uses. The specific space allocation for airlines at GSP is shown in Table 2-6.

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Figure 2-16: Commercial Terminal 1st Floor (“Ticketing Level”)

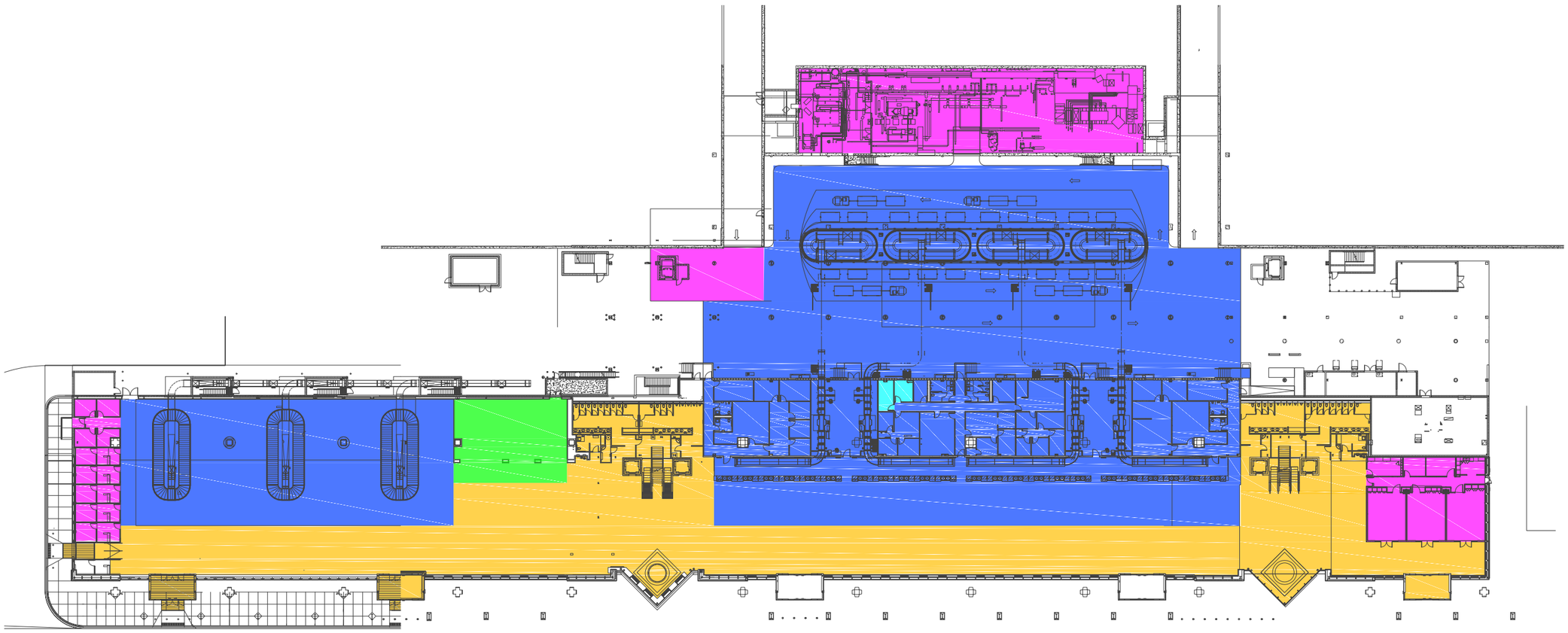

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Figure 2-17: Commercial Terminal 2nd Floor ("Apron Level")

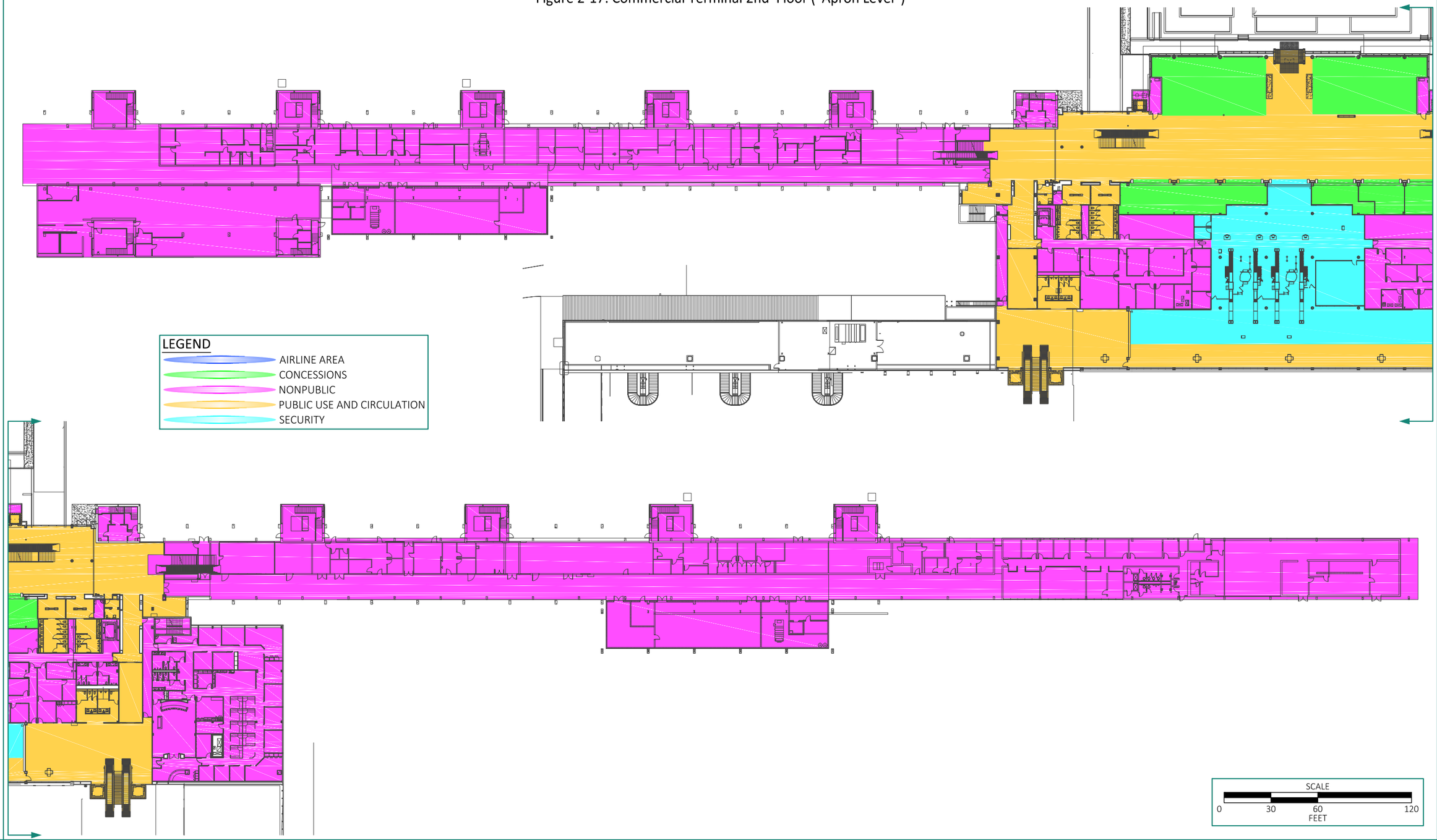

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Figure 2-18: Commercial Terminal 3rd Floor ("Concourse Level")

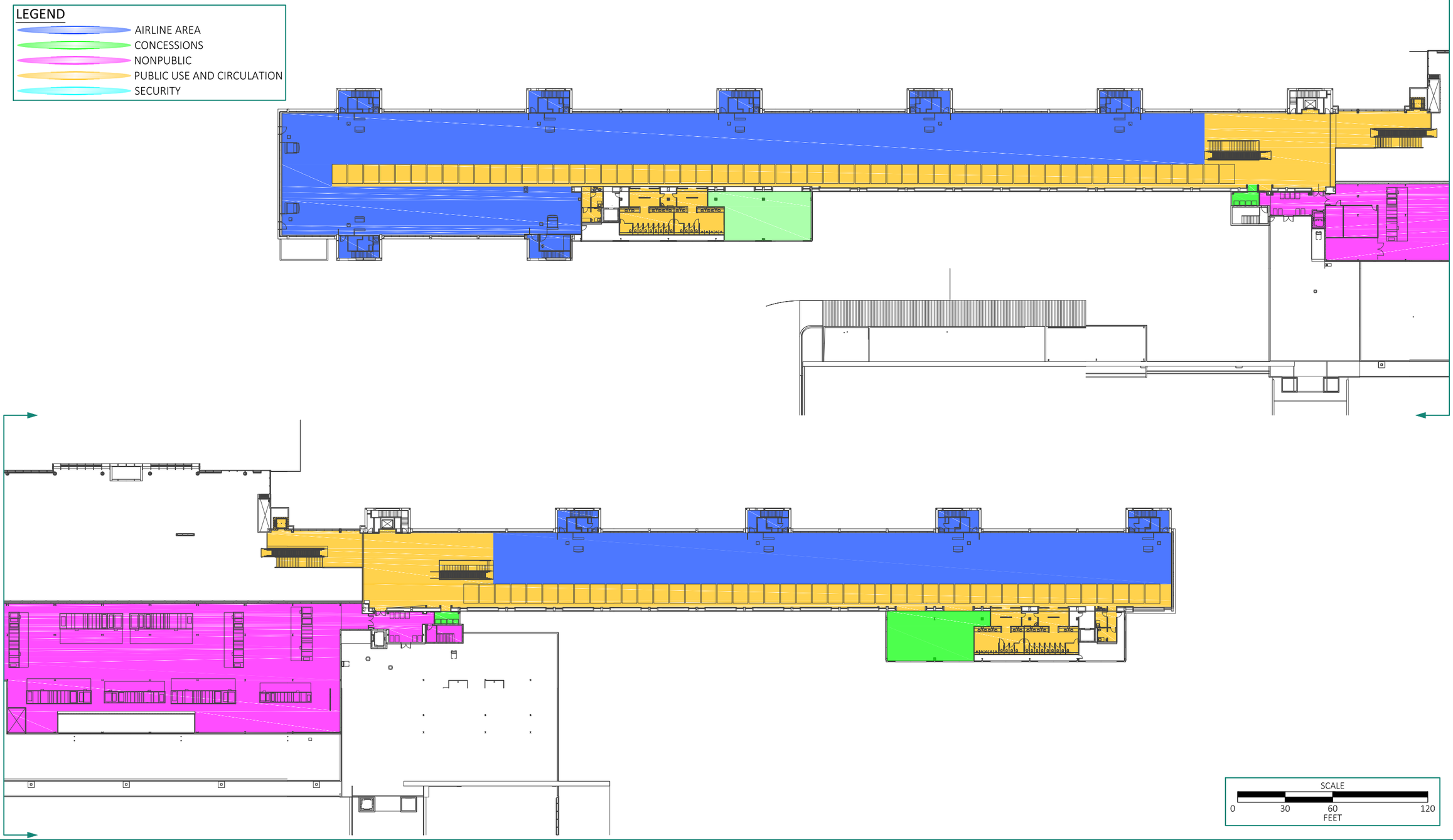

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Table 2-6: Commercial Terminal Airline Space Allocation

Airline Areas	Designated Space (Sq Ft)
Ticketing Level	
Airline Common Use: Baggage Carousels, Tug Drive, and Baggage Conveyors	51,886
Airline Ticket Offices	
Southwest	1,916
United	1,062
American	587
Delta	927
Allegiant	140
Shared Use	1,516
Vacant	2,483
Airline Ticket Counters and Queue (No. of Positions)	
Southwest (5)	1,031
United (5)	997
American (5)	986
Delta (7)	1,788
Delta Curbside Check-in (1)	55
Common Use - Allegiant and Charters (17)	2,887
Airline Baggage Service Offices	
Southwest	242
United	242
American	42
Delta	254
Vacant	436
Sub-Total	**69,477**
Apron Level	
Airline Operations Space	
Southwest	2,763
United	1,749
American	1,749
Delta	2,293
Airline Operations Space – Vacant	678
Airline Common Use	1,374
Airline Shared Use Space - Security Checkpoint Queue & Storage	11,521
Airline GSE Parking – Vacant	1,190
Sub-Total	**23,317**
Concourse Level	
Airline Departure Lounges and Stairs (gates)	2,977
Southwest (1)	5,780

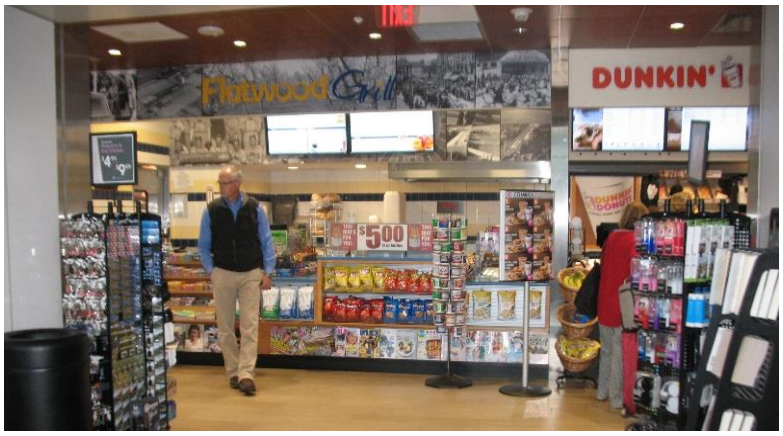
United (2)	8,933
American (4)	9,095
Delta (4)	12,535
Shared/Per Turn Use (4)	2,977
Sub-Total	42,297
Total Airline Use Space	**135,091**

Source: Greenville-Spartanburg International Airport District

Concessions and Amenities

Concessions and amenity areas include food and beverage services and retail shops. Restaurants and amenities are available on each level of the Main Terminal.

There are four concessionaires on the Ticketing Level of the terminal. The first, Atchison Transport, is a shuttle service located in the baggage claim area of the terminal. Food and beverages are available at Flatwood Grill and Dunkin Donuts and newspapers, magazines, and sundries are available at Hudson. Together the four concessions occupy approximately 3,406 square feet of area.



Once through security, passengers are given the opportunity to choose from multiple concessionaires located on each level of the Grand Hall. On the Apron Level of the Grand Hall, Upstate Market, Hudson, and Tech-on-the-Go provide news, gifts and travel sundries for passengers. Food and beverage is also available with options for Chick-Fil-A, Palmetto Distillery, Baskin-Robbins, Dunkin Donuts, and The Kitchen by Wolfgang Puck. The Apron Level also provides access to the Airport's Airside Garden.

The Concourse Level of the Grand Hall offers multiple concessions as well with Hudson located in each concourse. Food and beverage services are provided by Thomas Creek Hill in Concourse A and RJ Rocker's Flight Room in Concourse B. A Benefits Cosmetic kiosk located in Concourse A offers beauty products for purchase and Best Buy kiosks are located in both concourses. Each concourse also has designated space for passenger access to charging tables, circulation chairs, drinking fountain and water refill stations, massage chairs, and nursing rooms. Departure lounge space, public and circulation areas are discussed in subsequent sections of this report.

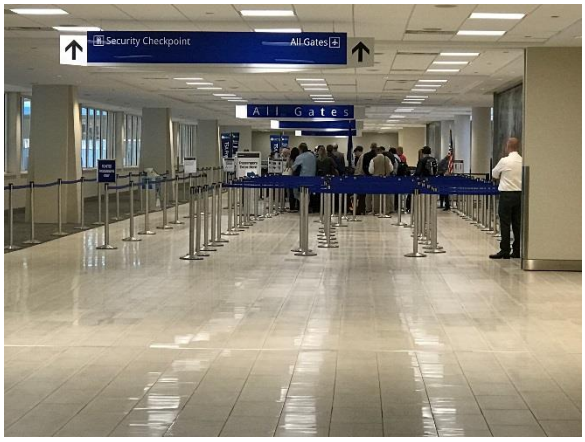
The specific space designated for concessionaires in the terminal is shown in Table 2-7.

Table 2-7: Commercial Terminal Concessionaire Space

Concessionaires	Designated Space (Sq Ft)
Ticketing Level	
Hudson, Flatwood Grill, and Dunkin' Donuts	2,844
Hudson Freezer	260
Atchison Transport	302
Sub-Total	**3,406**
Apron Level	
Chick-fil-A & DC-3	2,998
The Kitchen by Wolfgang Puck	2,999
Hudson	560
Upstate Market, Dunkin' Donuts, Baskin Robbins, Tech-on-the-Go, and Palmetto Distillery	3,419
Hudson Storage	818
Shared Use Storage	6,154
Sub-Total	**16,948**
Concourse Level	
Hudson – A Concourse	680
Hudson – B Concourse	600
Thomas Creek Grill – A Concourse	1,106
RJ Rockers Flight Room – B Concourse	2,327
Benefit Cosmetics – Concourse A	75
Best Buy – Concourses A & B	150
Sub-Total	**4,938**
Total Concession Use Space	**25,292**

Source: Greenville-Spartanburg International Airport District

Security and Baggage Screening, and Federal Inspection Stations



Passage through the Transportation Security Administration (TSA) screening area is required to enter the Grand Hall on the second floor of the Main Terminal. Passengers are queued on the non-secure side of the checkpoint in two lines, each coming from the escalators and elevators available on each side of the terminal. Each of the two queueing areas have approximately 5,600 square feet of area, of which only about 720 square feet on each side have queueing stanchions. Two podiums split passengers into four lanes available for passenger carry-on baggage screening. Of the four lines, two are equipped with magnetometers and two are equipped with full-body scanners. TSA offices are located on the secured side of the passenger screening area.

Checked baggage screening takes place behind the check-in counters in two separate rooms. The southern room measures approximately 34 feet by 40 feet for a total square foot area of 1,419 square feet. The northern room measures approximately 35 feet by 40 feet for a total square foot area of 1,435 square feet. Each room contains two baggage screening devices.

Additionally, CBP operates two federal inspection stations (FIS) at GSP. These facilities are responsible for inspecting all international passengers, baggage and air cargo. FIS inspections cover customs, immigration and agricultural and plant health concerns. Located beneath the south concourse (Concourse A), the first FIS facility is designed to accommodate 250 international travelers per hour when operating at full capacity. The second FIS is located on the northern cargo ramp area and accommodates cargo and corporate aircraft requiring international clearance. This facility consists of approximately 1,500 square feet and 18 vehicle parking stalls. The facility is in good condition and can be accessed by the public from Gateway Drive via Route 101. The establishment of these two facilities granted the airport its international status.

Public and Circulation Areas

Public and circulation areas within the GSP terminal include restrooms, conference rooms, waiting and seating areas not leased by airlines, and circulation corridors. Space is also designated for passenger circulation including the entrances/exits and the lobby. The area provided for each of these functions is accounted for in Table 2-8.

Table 2-8: Commercial Terminal Public Areas

Public and Circulation Areas	Designated Space (Sq Ft)
Ticketing Level	
Public Space	28,605
Apron Level	
Public Space	34,197
Concourse Level	
Public Space	34,221
Total Public Use Space	**97,023**

Source: Greenville-Spartanburg International Airport District

Non-Public Areas

Non-public areas within the GSP terminal include the administrative and government agency office suites and those areas reserved for mechanical/electrical/building systems. Together, these spaces occupy 128,729 square feet of the terminal building as shown in **Table 2-9**.

Table 2-9: Commercial Terminal Non-Public Areas

Non-Public Areas	Designated Space (Sq Ft)
Ticketing Level	
GSP District Counters – Shared/Per-Turn-Use	1,392
Government Agencies - Exclusive Use (TSA)	142
Government Agencies - Allocated to Airlines	2,854
Government Agencies - Common Use	398
Tenant/Other Exclusive	111
Shared Use	2,978
Sub-Total	**7,875**
Apron Level	
GSP District – Shared/Per-Turn-Use	435
GSP District Use - Police, Administrative, Operations, Janitor, Storage	22,904
Government Agencies - Exclusive Use (TSA)	5,174
Government Agencies - Common Use (Customs and Border Protection)	6,401
Government Agencies - Allocated to Airlines (Passenger Security Checkpoint)	7,054
Government Agencies – Vacant	936
Tenant/Other Exclusive	971
Tenant/Other Vacant	1,683
Other Leasable – Vacant	4,815
Shared Use Space	29,415
Support Space and Mechanical	12,010
Sub-Total	**91,798**
Concourse Level	

GSP District Use - Mechanical, Stairs, and Storage	1,639
Tenant/Other - Exclusive – Vacant	767
Shared Use	2,089
Support Space and Mechanical	24,561
Sub-Total	29,056
Total Non-Public Use Space	**128,729**

Source: Greenville-Spartanburg International Airport District

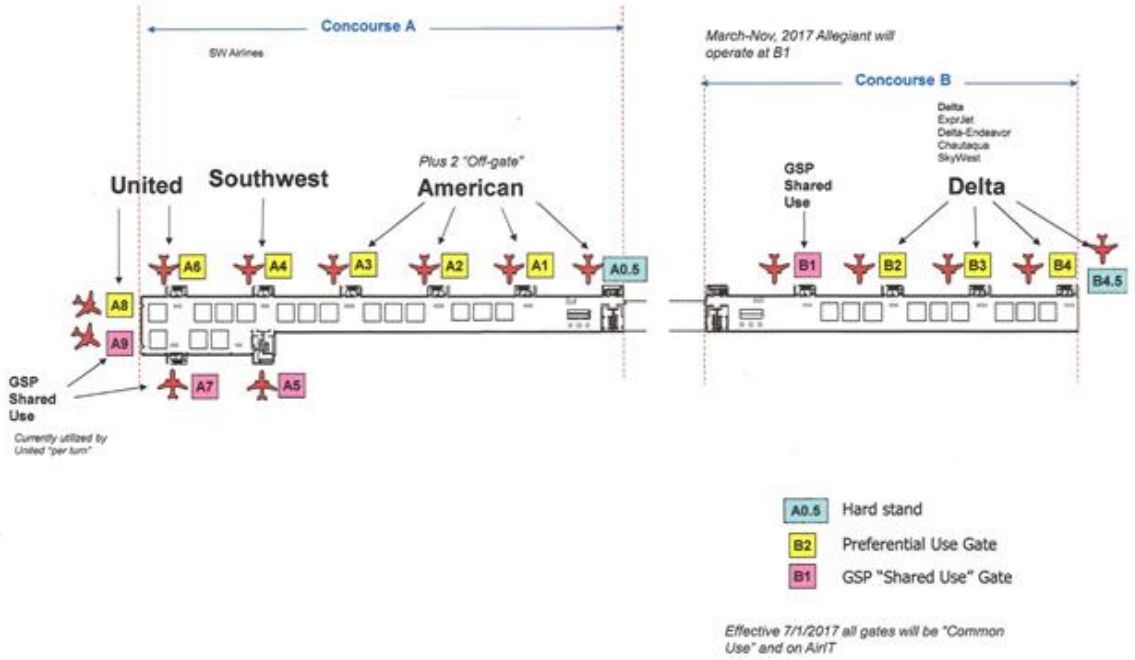
Gates and Boarding Bridges

As previously noted, there are five air carriers based at GSP: Allegiant, American, Delta, Southwest, and United. There are 13 gates providing aircraft access to the terminal and two hardstand parking positions. Each gate (Gates A1 through A9 and B1 through B4) has a passenger boarding bridge (PBB) with the remaining two parking positions (gates A0.5 and B4.5) requiring ground-loading as hardstands. Gates A1 through A9 are in Concourse A on the southwest side of the terminal and Gates B1 through B4 are located in Concourse B on the northeast side. Though many airlines have current gate assignments, all gates are considered common use. The gates are currently distributed between the airlines as follows:

- American: Preferential use of three gates with PBBs and one hardstand
- Delta: Preferential use of three gates with PBBs and one hardstand
- Southwest: Preferential use of one gate with a PBB
- United: Preferential use of two gates and two shared use gates; all with PBBs

A diagram of the gate assignment is shown in **Figure 2-19**.

Figure 2-19: **Concourse and Gate Diagram**



Source: Greenville-Spartanburg International Airport Commission

2.4.2. General Aviation Facilities

General aviation (GA) facilities support both based and itinerant GA aircraft operations at GSP. Components of GA landside facilities include FBO facilities, aircraft hangars, apron areas, and automobile parking areas.

General aviation activity is made up of all aeronautical activity except for military and commercial service operations. GA users at GSP include individuals flying for business or personal reasons, maintenance, and charter. In 2015, 16 GA aircraft were based at the airport including five single-engine, four multi-engine and seven jet airplanes. Based aircraft are those aircraft that are parked and flown from an airport for the majority of the year. Further, each aircraft must have flown at least one hour during that year. Both based and itinerant GA users have full access to the FBO services provided by Cerulean Aviation. In 2016, GSP experienced a total of 8,708 general aviation operations.

General Aviation Terminal

In January of 2010, GSP opened a new general aviation terminal at the Airport located north of the commercial passenger terminal on the general aviation apron. This facility is approximately 6,700 square feet in size and supported by a 150-stall parking lot. The general aviation terminal is operated by Cerulean Aviation.

The GA terminal project was awarded a LEED-Gold Certificate by the U.S. Green Building Council as the building uses 38 percent less energy overall than similar sized buildings and approximately 75 percent less water because of a rain harvest system, which is used to collect rainwater from the roof for toilet flushing. In addition, a solar water heating system provides hot water and the building employs Variable Refrigerant Flow Technology for highly efficient heating and cooling. Multiple glass panels eliminate the use of electrical lights during daylight hours. During construction, 98 percent of the waste generated was recycled.

General Aviation Hangars

To support the general aviation terminal and the services provided by Cerulean Aviation, the Airport has multiple general aviation hangars. Each hangar has varying storage capacity and parking availability as shown in **Table 2-10**.

Table 2-10: GA Hangars

Designation (Location)	Leasee/Owner (Use)	Total Space (SF)	Parking Stalls
Hangar 1 (2100 GSP Drive)	PSA (Maintenance)	40,500	113
Hangar 2 (2102 GSP Drive)	Cerulean Aviation (Community Storage)	29,700	46
Hangar 3 (2106 GSP Drive)	SAI Flight Services (Storage)	13,200	77 (shared)
Hangar 4 (2108 GSP Drive)	Milliken Aviation (Storage)	16,200	77 (shared)
Hangar 5* (2110 GSP Drive)	Michelin (Storage)	21,200	-
Hangar 6* (2112 GSP Drive)	Venture Air (Storage)	33,790	-

*Note: * = under construction*

Source: Greenville-Spartanburg International Airport, 2017

2.4.3. Cargo Facilities

The Airport has two main cargo facilities, one located on the northern cargo apron and the other connected to the commercial/southern cargo apron as shown in Figure 2-15. The larger cargo center on airport property is on the main cargo apron area on the north side of the airfield and provides 120,000 square feet of indoor space for air cargo processing and logistics. This facility is in good condition, and capable of sorting up to 3,000 packages per hour. Additionally, the shipping center located in this area provides for dangerous goods and international shipping, express, and ground services. There is also a 5,000 square-foot cargo facility north of the large cargo center on the main cargo apron.

The remainder of cargo and freight activity is housed in a 52,250 square-foot building located on the south cargo area and accessed by GSP Drive. The building was recently renovated to include 30 docks. This space is shared by American Airlines Cargo, Delta Cargo, Southwest Cargo, Senator International Freight Forwarding Solutions, and Bradford Airport Logistics.

For cargo operators, equipment is available and able to be relocated to each of the cargo areas including:

- (2) Cargo loaders
- (8) Cargo and baggage tractors
- (96) Cargo dollies
- (3) Wide-body aircraft belt loaders
- (5) 4,000 to 5,000 lb. forklifts
- (2) 10,000 lb. forklifts
- (1) 20,000 lb. forklift
- (1) Ground Power Unit (GPU)
- (1) De-ice truck
- (1) Lavatory service cart
- (2) Wide-body aircraft pushback tractors
- (1) Narrow-body aircraft pushback tractor
- (3) Widebody aircraft stair trucks
- (1) Narrow-body aircraft stair truck
- (1) Aircraft tail stand

- (2) Light carts
- (2) Drive over scales (1 – 10', 1 – 20')

2.4.4. Airport Support Facilities

A variety of supporting infrastructure and equipment is employed at GSP to provide for safe, efficient and reliable aeronautical operations. Utilizing perimeter fencing and sophisticated access control technologies, GSP can protect critical airfield areas. The services provided via the on-site ARFF station and airfield maintenance facility ensure the Airport operates at the highest degree of safety, and the airport fuel-farm and deicing facilities ensure year-round operational reliability. The following sections will further discuss each of these facilities.

Security and Fencing

Airport security is provided by the GSP International Airport Police Department. The Airport Police Department has office space on the Apron Level of the Main Terminal and is staffed by 19 employees, 12 of which are officers.

GSP is fully enclosed by a perimeter fence of approximately 31,000 linear feet with secure entrance gates providing access to authorized personnel and vehicles to the airfield perimeter roads, aprons, taxiways, and runways. The entirety of the perimeter fence stands eight feet above the ground and is topped with three strands of barbed wire on outward tilted outriggers. There are 27 security gates providing vehicle access to airport properties as part of the perimeter fence. Of these, 12 are equipped with electronic access control card readers/cameras while the remainder are secured with lock and chain. Additionally, 10 pedestrian gates permit access through the fence. All pedestrian gates are equipped with electronic access control.

Aircraft Rescue and Fire Fighting (ARFF)

GSP's ARFF is located on the north end of the passenger service apron next to the ATCT where there is immediate access to Runway 4-22. The ARFF facility is operated by the GSP International Airport Fire Department and is considered an Index C facility. Federal Aviation Regulations (FAR) Part 139 regulations determine the ARFF index based upon air carrier aircraft length and number of daily departures. Index C facility and minimum equipment requirements defined in §139.317 require either:

- Three vehicles
    - One vehicle carrying the extinguishing agents:
        - 500 pounds of sodium-based dry chemical, halon 1211, or clean agent; or
        - 450 pounds of potassium-based dry chemical and water with a commensurate quantity of AFFF to total 100 gallons for simultaneous dry chemical and AFFF application
    - Two vehicles carrying an amount of water and the commensurate quantity of AFFF so the total quantity of water for foam production carried by all three vehicles is at least 3,000 gallons.

- Two vehicles:
    - One vehicle carrying the 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.
    - 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 3,000 gallons.

GSP ARFF equipment includes three ARFF trucks, one quick response ARFF truck, one custom pumper, one heavy rescue service truck, and one brush truck. This equipment is stored in the four-bay, 9,000 square-foot ARFF building which also provides for office and crew space for the 19 certified aircraft and rescue fire fighters which comprise the GSP International Airport Fire Department. In addition to ARFF services, the department provides for emergency medical system (EMS) first response, structural firefighting, hazardous material first response, confined space rescue, auto extrication, and fire safety inspections.

Airfield Maintenance

GSP's airfield maintenance facility complex is located southwest of the south cargo apron area. The complex occupies 9.18 acres of land to accommodate four buildings of approximately 12,800, 6,400, 5,040, and 1,080 square feet. The complex provides storage for the following maintenance vehicles and equipment:

- (1) Snow thrower
- (2) Snow pushers
- (12) Snow plows
- (2) Snow blowers
- (2) Oshkosh H Series snow units
- (4) Snow brooms
- (1) 1980 Ford 7000
- (1) 2004 Ford F740 Box Dump
- (1) 2004 Ford F750, 14' Bed Dump
- (1) T-1100 Pro Liquid De-Icer
- (1) 5.9 Yard Granulated Spreader
- (9) Mowers
- (3) Tractors
- (3) Sweepers
- (2) Runway closure markers

The maintenance facility complex also contains a 10,000-gallon diesel and a 10,000-gallon gasoline fuel tank. The complex is accessed from GSP Drive and is connected to the airfield by a single road leading to the south cargo ramp area. Both access roadways are gate controlled.

Fuel Farm

GSP operates a fueling facility through Cerulean Aviation located south of the airport maintenance facility. The farm contains four 30,000-gallon tanks of Jet A fuel and one 12,000-gallon tank of Avgas. All tanks have a 95 percent max capacity level with high level auto switch off controls at 95 percent and high-level alarms at 90 percent. All fuel trucks that refill at the storage facility have three separate high level shut off systems to prevent overfill including a Scully System. A fifth 30,000-gallon Jet-A tank is anticipated to be installed in the near future, bringing total Jet-A capacity to 150,000 gallons.

Deicing Facilities

De-icing and anti-icing services are offered for both general aviation and commercial aircraft operating out of GSP. Airfield maintenance facilities and the airfield's FBO provide the necessary supplies and equipment. Currently, GSP maintenance maintains a 6,100-gallon tank with aircraft deicing fluid. When needed, aircraft are deiced at their gate or hardstand.

2.4.5. Utility Infrastructure

The Airport's utilities infrastructure including electric, natural gas, water, telephone/cable, internet, and sewer were reviewed as part of this Master Plan and the following information was found to be relevant for the Airport. The location and system connections are displayed in **Figure 2-20**.

Electric Power

Normal electric power distribution is provided to GSP by Duke Energy with 24kV of electric services fed by the company's transformers. All current airport facilities feed off circuit #2406 from the Pelham Retail Substation which remains loaded at half capacity. Airport property west of Runway 4-22 is not currently equipped with any electric service.

Natural Gas

Natural gas is provided by the Greer Commission of Public Works (CPW) with gas lines entering airport property from Route 101, Stevens Road, and GSP Drive. Natural gas utility could be extended to currently unserved properties west of Runway 4-22 from locations along State Road 14, J. Verne Smith Parkway (SR-80) and South Buncombe Road.

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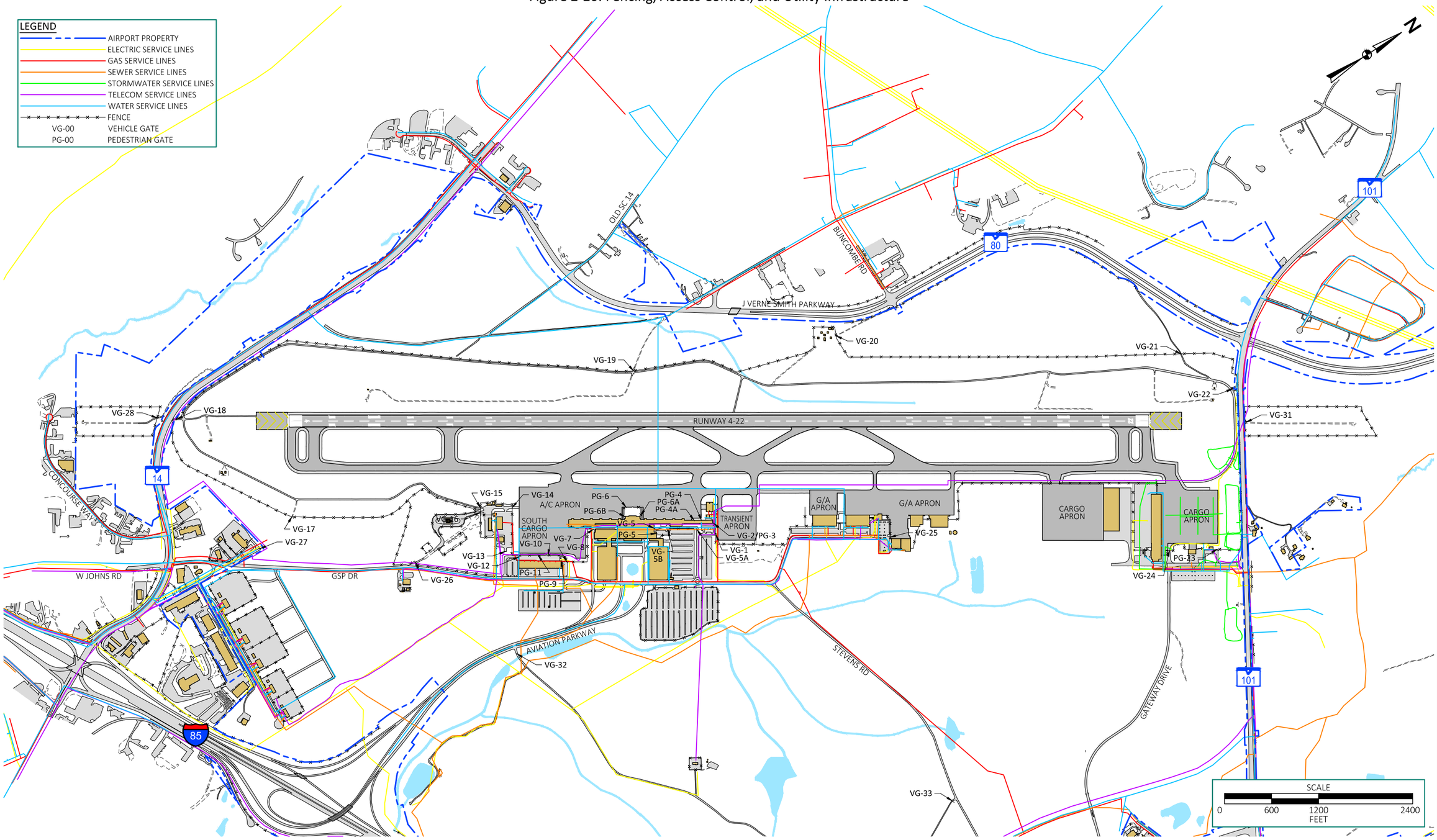
Figure 2-20: Fencing, Access Control, and Utility Infrastructure



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Sanitary Collection System

Sanitary and waste collection is provided by CPW to all structures on airport property. No Airport owned facilities utilize a septic system or leach field. While currently not equipped with sewer lines, properties west of Runway 4-22 could presumably tie in existing sewage lines along SR-14 or SR-80 in the future if needed. Future development of other Airport properties could be served be either CPW or Renewable Water Resources (REWA).

Stormwater Service System

The ability for an airport to quickly and efficiently move stormwater from its hard surfaces and safety areas is of critical importance to ensuring safe aeronautical operations and maximizing the lifespan of airport pavement. At GSP a variety of inlets, pipes and swales help to capture, direct, and disburse stormwater from its impervious services to include the airfield system, aircraft aprons, roadway and parking facilities.

Communication Lines

Airport facilities all have access to telecommunications infrastructure providing both telephone and high-speed internet.

Water System

Water is provided by CPW. Water lines access airport property from a number of locations east of Runway 4-22 along Aviation Parkway, GSP Drive, and Route 101, and from two locations west of Runway 4-22 from service points along Highway 80. One water line is located under Runway 4-22 near its mid-point.

2.4.6. Regional Access, Airport Parking and Ground Transportation

The following summarizes ground access, circulation, and automobile parking within GSP. Airport access, ground transportation and parking facilities are depicted in Figure 2-21.

Roadways

GSP is located immediately northwest of Interstate 85 (I-85). I-85 runs southwest to northeast and is the primary arterial highway connecting Greenville and Spartanburg, and, more broadly, Atlanta and Charlotte. Both north and southbound I-85 traffic is connected to Aviation Parkway via Exit 57 which provides direct access to GSP drive and GSP's commercial terminal.

Aviation Parkway is a two-lane, two-way roadway that leads incoming traffic directly to the passenger terminal area and serves as the primary airport ingress/egress route. After incoming traffic is merged from I-85, Aviation Parkway leads traffic approximately one mile to the airport landside area and circulates counterclockwise through the terminal curbside. From there, Aviation Parkway follows the curbside loop and directs exiting traffic back towards I-85 parallel to its entrance route. As shown in Figure 2-21, GSP Drive intersects Aviation Parkway prior to the terminal curbside area to provide access to parking, offices, the FBO, and major tenant areas of the airport located in the surrounding area of the terminal.

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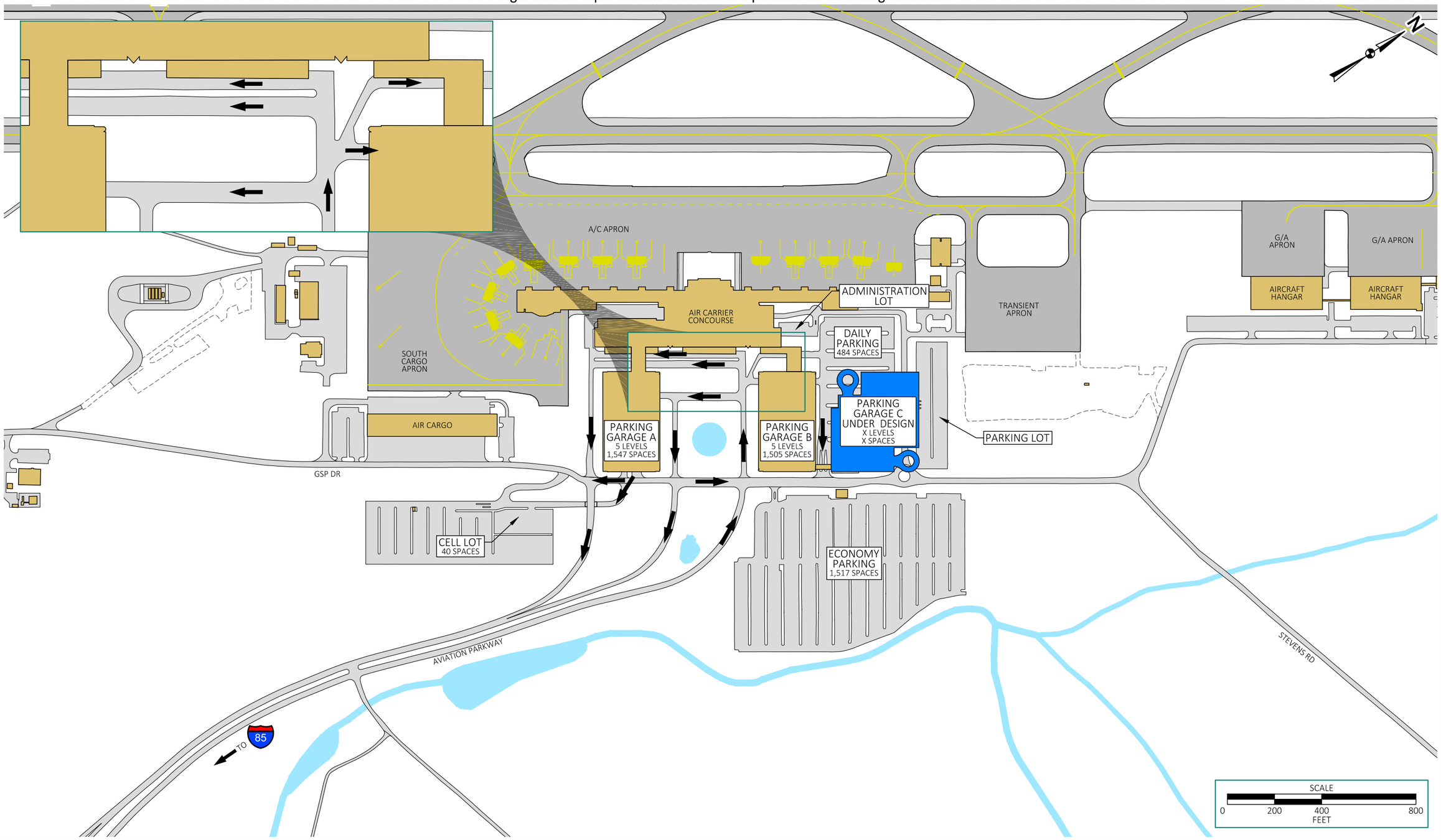
Figure 2-21: Airport Access Ground Transportation and Parking Facilities



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Since Aviation Parkway circulates counterclockwise to provide access back to I-85, there are two intersections of GSP Drive allowing reentrance to the loop if necessary.

In addition to providing access to facilities near the terminal, GSP Drive is the secondary entrance point into GSP and connects inbound traffic from SR-14, located on the west side of the airport running north to south. SR-14 provides a channel from Greer and crosses the SR-80 to the north as well as I-85 to the south of the airport. Tenants on the south side of the airport, including NWS and airline freight facilities, are accessible via this entrance and GSP Drive. Since GSP Drive runs parallel to Runway 4-22, it also provides airport and FAA employees access to the administrative facilities and general aviation users access to the FBO on the north side of the terminal. GSP Drive ends in the general aviation parking lot.

Additional area roadways connect traffic to the remaining airport and tenant facilities. Stevens Road is located towards the north end of GSP Drive and provides private access to tenants and airport personnel located on the northeast end of the airport. Stevens Road provides access from Brockman McClimon Road, which is located to the southeast of the airport connecting I-85 on its southern end and Route 101 to the north. For facilities on the north cargo apron, Gateway Drive provides direct access and leads to the parking areas located there. This one-lane, two-way road also directly connects operations on the northern cargo apron to the BMW manufacturing factory to the east of the airport. Prior to the factory, Gateway Drive intersects the larger New Woodruff Road (Route 101) at its north end and Brockman McClimon to the south; each of which channel traffic to I-85 and SR-80.

Traffic Circulation

Traffic circulation and congestion on the Airport roadways is greatly impacted by the departure and arrival schedules of flights. During times of peak activity, the terminal loop roadway and terminal curbside areas can experience significant demand. At GSP, the terminal loop roadway is defined by the circle created by Aviation Parkway and GSP drive. Aviation Parkway provides access to both parking garages and the Daily parking lot before becoming parallel with the Terminal building and splitting in two to provide both the traditional terminal frontage curb as well as a vehicular island curb. From the vehicular island curb a single pedestrian crosswalk exist to provide access to the terminal building, though it has been observed that pedestrians cross from the vehicular island curb to the terminal at all areas. Vehicles which occupy the portion of Aviation Parkway on the outside of the vehicular island curb have the option to exit to GSP Drive prior to reaching Parking Garage A or proceed the entire length of the terminal building before exiting the terminal area towards GSP Drive beyond Parking Garage A. Those vehicles which occupy the roadway on the inside of the vehicular island curb have only one egress route to GSP drive.

Rental car parking exit and car return entrances are located on the southeast side of Parking Garage A connected to GSP Drive. Departing cars have the option to take GSP Drive to exit the airport area or join circulating traffic on Aviation Parkway towards I-85.

As a major avenue for airport access, the traffic circulation on I-85 has a large impact on that of the airport roadway system. In 2012, the South Carolina Department of Transportation (SCDOT) conducted a Corridor Analysis of I-85 for the area connecting Greenville and Spartanburg counties. This segment of I-85 was identified by the SCDOT as a main priority for congestion relief of state highway systems. Three sections of this corridor provide access to the airport roadway system that result in delays for both departing and arriving traffic during peak times of congestion on I-85. The study forecasts the annual average daily traffic (AADT) volume for these areas to have a 1.8 percent growth rate for the next 10 to 15 years.

A Traffic Count Study was completed at specific locations on the Airport as part of the master planning effort. A full report of this study is included in Appendix B.

Parking

GSP parking facilities include short- and long-term lots, rental lots, a cell phone lot, economy and additional parking for Airport and tenant staff. All revenue producing parking areas are operated by Republic Parking System. A summary of parking lots and spaces is found in Table 2-11.

Parking Garage A and B

Parking Garages A and B are located across from the entrance to the terminal building, Garage A being the southernmost. Both garages provide access to the terminal building via ground level painted and covered crosswalks. The Garage A crosswalk crosses the terminal drop off road and the Garage B crosswalk crosses the access road to the daily parking lot.

Access to Parking Garage A is located on the southeast side of the terminal across from the arrival curb. Garage A provides 742 covered spaces and 324 Sky Lot spaces. Of those, 386 spaces on the first floor of Garage A are reserved for rental car ready/return activities. A total of 31 handicap spots are available in Garage A. The average occupancy rate of Garage A is 89 percent.

Access to Parking Garage B is located on the southwest side of the structure via Aviation Parkway. Parking Garage A has a rental car return entrance on its southeast side via GSP Drive. Garage B provides 1,182 covered spaces and 323 Sky Lot spaces. Garage B provides 34 designated handicap spaces. The average occupancy rate of Garage B is 83 percent.

The exit to the parking garages is controlled by a gate equipped with a payment booth. Parking garage rates are as follows: $1.00 for the first 30 minutes, and $1.00 for each additional hour with a $14.00 daily and a $98.00 weekly maximum. The Sky Lot parking rates are as follows: $1.00 for the first 30 minutes, and $1.00 for each additional hour with a $7.00 daily and a $49.00 weekly maximum.

Daily Parking

The Daily parking lot is located adjacent to and north of Parking Garage B. Daily parking has 484 spaces including 10 handicap spaces. This lot also has 117 spaces designated for valet parking only. Lot users enter via an access road connected to Aviation Parkway on the terminal side of the lot. Daily parking rates are as follows: $1.00 for the first 30 minutes, and $1.00 for each additional hour with a $9.00 daily and a $63.00 weekly maximum.

Economy Parking

Economy parking is located to the southeast of Parking Garage B and Daily Parking across GSP Drive. This lot has 1,522 spaces including 26 handicap spaces. Traffic enters the lot via GSP Drive on the lot's northeast. The parking rates are as follows: $0.00 hourly charge with a $5.00 daily and a $35.00 weekly maximum.

Overflow Parking

The development of an overflow parking lot adjacent to the existing cell phone lot is currently being designed and is programed for implementation in the near future. This lot will provide approximately 500 additional parking spaces during period of peak parking demand. This lot will be equipped with two bus shelters to support regular bus service between this lot and the terminal curb.

Cell Phone Lot

A cell phone lot is available for traffic waiting on passenger arrivals since curb-side parking/waiting in front of the terminal building is prohibited. The cell phone lot is located to the southeast of Parking Garage A across GSP Drive. The cell phone lot has 40 spaces and users enter via an access road connected to GSP Drive on the southeast side. This lot is open and freely available.

Employee Parking

On the north end of the terminal is a private lot for airport and tenant employees with 214 spots. The entrance to the lot is via an access road connected to GSP Drive. This lot is programed for a

small expansion in the near future. Parking lots are also available for FBO employees and users as well as airline freight tenants. Each of these lots is accessed through GSP Drive.

Table 2-11: Airport Parking Summary

Parking Area Location	Total Spaces	Designated Handicap Spaces
Parking Garage A	1,457	31
Parking Garage B	1,505	34
Daily Parking	484	10
Economy Parking	1,517	26
Cell Phone Lot	40	-
Employee Parking	214	-

Source: Greenville Spartanburg International Airport District, 2017

Rental Cars

Five rental car agencies provide services to passengers at GSP including Alamo/National, Avis, Budget, Enterprise, and Hertz. Each rental agency has business counters located in Parking Garage A. Alamo/National, Avis, and Enterprise are located on the first floor of Garage A and Budget and Hertz are on the second floor. An off-site rental agency, Thrifty/Dollar Car Rental, provides pickup services from their shared location to the south of the airport on SR-14.

Rental car agencies operating from GSP do so from rental car counters and admin space within the terminal baggage claim lobby, 386 ready/return spaces of Garage A, and independent but co-located quick turn-around (QTA) facilities south of the terminal complex off Service Center Road accessible via GSP Drive. Each of the five rental car companies also has a separate Quick-Turn-Around (QTA) facility located on Airport property at the juncture of GSP Drive, Airport Road, and Industrial Park Road. A QTA is a facility where the rental car company can re-fuel the vehicle, vacuum it, and wash it prior to entering the vehicle back into service. QTA facilities are also used for light maintenance on the vehicle, such as oil changes and tire changes. The area is also used for longer-term storage of vehicles before and after local events when greater demand for rental vehicles is anticipated. Altogether, approximately 16 acres have been constructed for the use of rental car QTA's. In addition, there is approximately 13 unpaved acres available for additional vehicle storage or future QTA expansion.

2.5. AIRPORT TENANTS

2.5.1. Cerulean Aviation

Cerulean provides FBO services at the Airport and is wholly owned by the GSP Airport District. Cerulean is focused on providing exceptional general aviation and commercial aviation services to Airport users. In addition to operating the general aviation terminal, Cerulean has six hangars which it leases as previously discussed.

Cerulean GA

Located on the general aviation apron, Cerulean GA provides a premier concierge experience to GA travelers. Cerulean operates a full-service FBO from the GA terminal building. The services available to general aviation users include:

- Jet A and 100LL fueling services
- Ground handling
- Deicing and anti-icing Types I and IV
- Freight handling services
- Aircraft on Ground (AOG) services, by third party
- Rental cars on-site

Cerulean Commercial

Cerulean Aviation's commercial division operates from 4:00AM to 11:00pm local time to provide passenger, cargo, and ramp services including:

- Jet-A refueling
- Deicing and anti-icing Types I and IV
- Ramp enplanement/deplanement for private charters
- Rental car delivery and return
- Ground Security Coordinator (GSC) services
- U.S. Customs and Immigration clearance
- Build and break cargo services
- Palletized and non-palletized load handling
- Truck loading, unloading and docks
- Container freight station (CFS) warehousing and storage
- Aircraft parking and cleaning
- Ground power access
- Air start service

2.5.2. Federal Aviation Administration

The FAA leases 1,098 square feet of office space adjacent to Gate B2 on the Apron Level of the terminal. This office provides facilities for the FAA Regional Administrator's field representatives and local coordinators.

2.5.3. National Weather Service – National Oceanic and Atmospheric Administration (NOAA)

A NWS-NOAA weather forecast office (WFO) is located on the southwest side of GSP property on GSP Drive. The facility consists of an office building of a little over 6,000 square feet, six utility buildings, and approximately 30 vehicle parking stalls. The buildings are in good condition. The facility is equipped with a Next Generation Radar (NEXRAD), a high-resolution S-band Doppler weather radar, to provide information and updates on local weather, forecasts, and warnings for airport users.

2.5.4. Cargo and Freight

Multiple facilities at the Airport provide opportunity for consolidation, shipment and forwarding for cargo and freight tenants. GSP cargo tenants include FedEx, American Airlines Cargo, Delta Cargo, Southwest Cargo, Senator International Freight Forwarding, and UPS.

FedEx operates out of the largest cargo center on airport property, located on the main cargo apron area on the north side of the airfield. UPS operates out of the newly constructed north cargo building. The southern cargo building is shared by American Airlines Cargo, Delta Cargo, Southwest Cargo, Senator International Freight Forwarding Solutions, and Bradford Airport Logistics.

Multiple local and international freight forwarding organizations support the cargo tenants at GSP. Forward Air Solutions and Benore Logistics Systems provide supply chain management resources to carriers at the facility. For cargo entering the terminal building, Bradford Airport Logistics offers security as well as command and control services for those goods entering the terminal complex.

2.5.5. Industrial Park Road Complex

GSP currently owns and leases out facilities located on Industrial Park Road in three buildings. Building A is located between Airport Road and Runion Road as shown in **Figure 2-22**. It has approximately 42,500 square feet and three tenants:

- RPM Transportation, leasing 20,000 square feet, is a local trucking company providing warehousing and logistic services.
- S&D Coffee, leasing 7,500 square feet, is a national supplier of coffee, iced tea, and extracts.
- Courier Express is leasing 15,000 square feet

Building B is situated between Industrial Park Road and Runion Road. It has approximately 20,000 square feet and is leased to Forward Air Inc.

Building C is situated between Industrial Park Road and Runion Road. It has approximately 39,500 square feet and six tenants:

- Jim Whitehead Tire: An automotive service and tire installation provider for commercial vehicles, currently leasing 10,000 square feet
- Expeditors: A global logistics company, leasing 5,000 square feet
- Jim Turf and Irrigation: Offers products for gold course maintenance, landscaping and lighting, leasing 7,500 square feet
- Color Channel: Provides sample kits and color channels for the mortar industry, leasing 1,154 square feet
- H&H Electrical: An electrical maintenance and service provider for commercial clients, leasing 1,346 square feet
- Runion Asset Management: A asset management provider, leasing 2,500 square feet.

Figure 2-22: Industrial Park Road Buildings

Source: Google Earth

2.6. AIRPORT LAND USE PATTERNS

GSP is sponsored by both Greenville and Spartanburg Counties in South Carolina. The land use area on and surrounding the airport, called the Airport Environs Area, was created for the protection and security of airport users and the surrounding community. A land use map is depicted in Figure 2-23.

2.6.1. Airport Area Land Use

The area surrounding GSP is mostly residential to the north- and southwest with some intermittent industrial and institutional land use to the direct west and the southeast. A small amount of commercial land is located to the southeast as well.

2.6.2. Airport Area Zoning

GSP zoning is under the authority of the Greenville-Spartanburg Airport Environs Commission (Commission) as granted by South Carolina Code Annotated § 55-11-230 (1995). This Commission has identified the airport zone as a unique Airport Environs Area as defined by this code:

- Airport Environs Area: "All property consisting of the area described in the Air Installation Compatible Use Zone pursuant to DODINST 4165.57 established by the United States Air Force applicable to runways 4L-22R (11,000 feet) and the proposed parallel runways 4R-22L (8,500 feet) including the CLEAR ZONES, ACCIDENT POTENTIAL ZONE I, and the ACCIDENT POTENTIAL ZONE II. Specifically, the environs includes all property 1,000 feet to each side of the runway centerlines and in a corridor 3,000 feet (1,500 feet either side of the runway centerlines) wide, extending from the runway thresholds along the extended runway centerlines for a distance of 15,000 feet, and shall include the property located between the two corridors; provided, however, that the southwestern boundary of the environs area shall be the middle of Rocky Creek."

As shown in Figure 2-24, the majority of GSP lies in Spartanburg County with a large portion of development to the north of the airfield in the City of Greer. The areas outside of the Airport Environs Area within Spartanburg County include the following district groupings:

Downtown Urban Districts (D-T4, D-T5, D-T6): These zoning districts are intended for high concentrations of commercial and business uses targeting travelling customers.

Industrial District (I-1, I-2): These districts are intended for light and heavy manufacturing, assembly facilities, and warehouses.

Residential District (R-6, R-8, R-12, R-15): These districts are intended for general and single-family dwellings and related recreational and support facilities.

Figure 2-23: Land Use Map

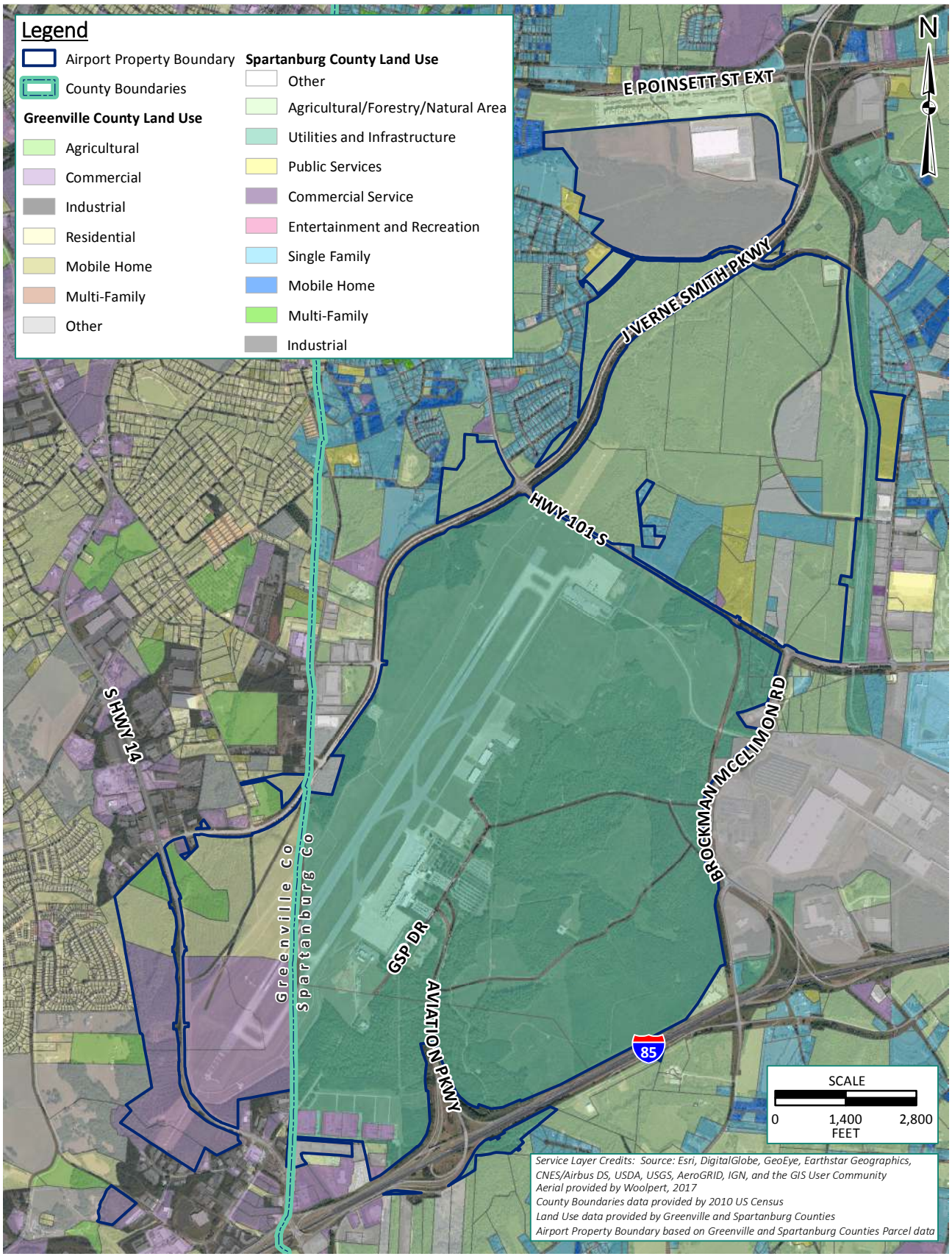

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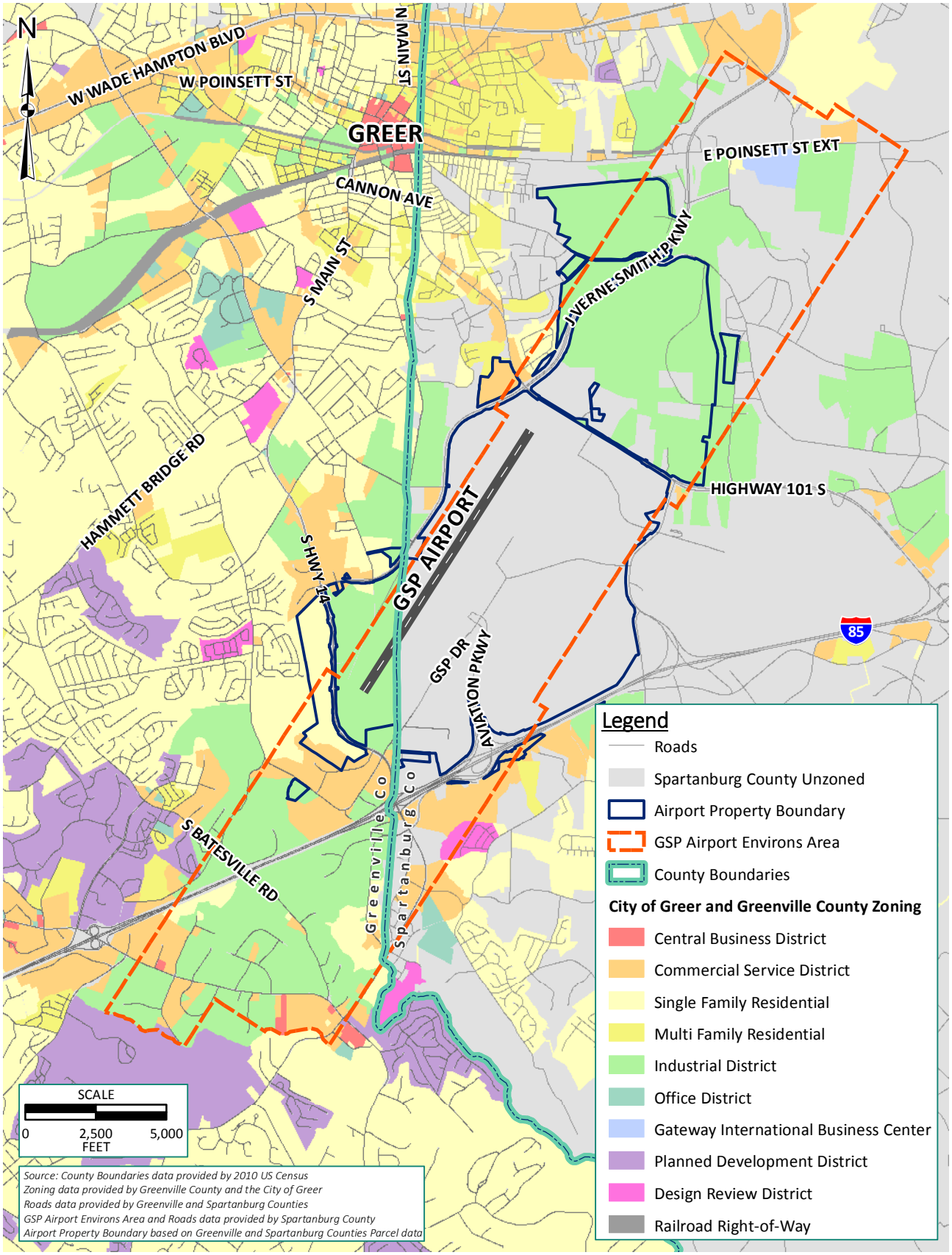
Figure 2-24: Zoning Map



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The remaining western portion of the airport lies in Greenville County. The Airport Environs Area zoning designation is maintained in this county by the Greenville-Spartanburg Airport Environs Commission as well. The surrounding areas outside this area within Greenville County include the following zoning districts:

Central District (C-1): This zoning district is intended for areas of high business concentration and commercial uses located in the downtown area.

Commercial District (C-2, C-3, NC, S-1): This zoning district is intended for the development of commercial land uses and transitional areas to industrial districts.

Industrial District (I-1, PD-1): This district is intended for manufacturing, assembly facilities, and warehouses.

Residential District (R-5 to R-20A, R-S, DRD): These districts are intended for single family dwellings and related recreational and support facilities.

Multi-Family Residential District (R-M, TO R-M20, R-MA, R-MHP): This zoning district is intended for areas of medium to high population density for two- and multi-family dwellings as well as the recreational and support facilities related to them.

Planned Development District (PD-R): This district is established to encourage innovative and creative design of residential and/or commercial developments, to permit a greater amount of flexibility by removing some of the restrictions of conventional zoning.

Office District (O-D, POD): This zoning district is intended for research and office facilities for local use.

2.6.3. Airport Master Land Use and Development Plan

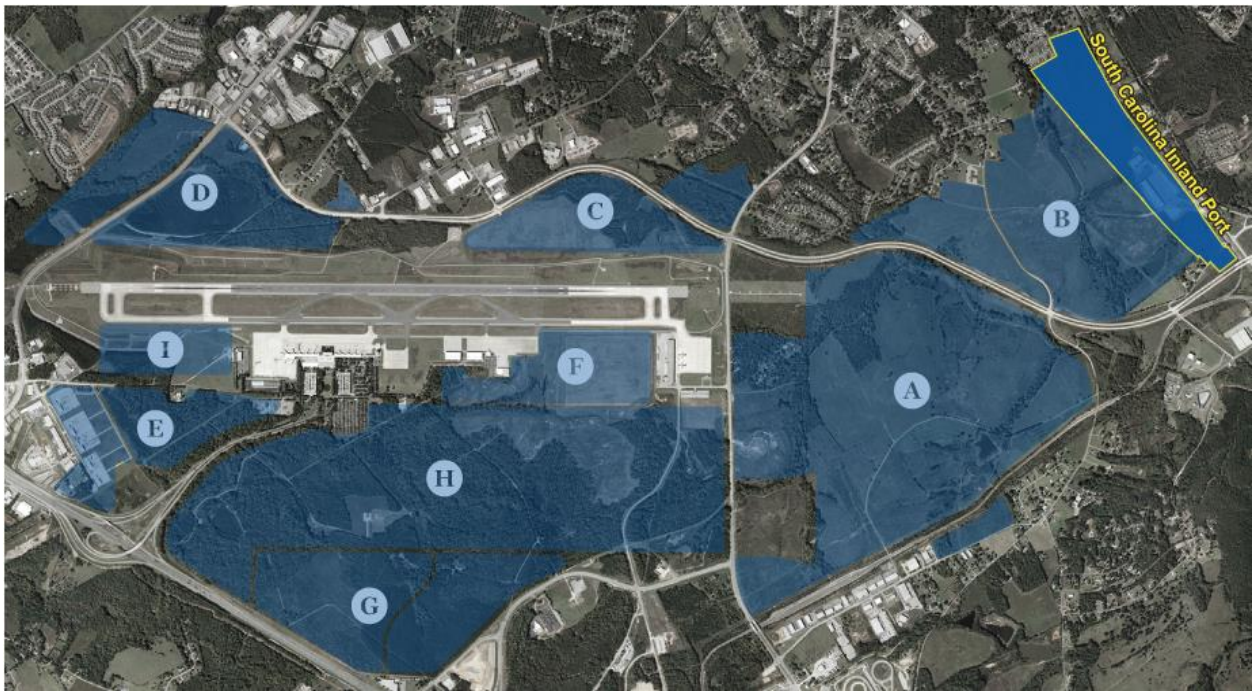
As discussed in Section 1.3.4 of this report, the Airport's master land use and development plan has been used since 2013 to encourage airport compatible development in and around Airport property in a way consistent with the District's strategic development initiatives. This plan, called GSP 360, identifies a total of nine tracts (Tracts A through I), the highest and best use for those tracts, anticipated phasing for future utilization and for some tracts detailed resource documents for potential investors. Table 2-12 details each of these development tracts and Figure 2-25 displays them graphically.

Table 2-12: Airport Master Land Use and Development Plan Tracts

Tract	Acres	Highest and Best Use
A	746	Industrial This would most likely consist of a mixture of larger footprint warehousing, distribution and manufacturing uses.
B	315	Logistics and Distribution This could include a mix of smaller service users fronting J. Verne Smith Parkway and larger footprint warehousing, distribution and manufacturing to the rear of the tract.
C	112	Aviation and Aviation Support Additionally, future light industrial and service uses are feasible along the roadway as topography and access allow.
D	229	Industrial and Service Additional potential for Retail, Office, Flex/R&D and Aviation components as well.
E	156	Flex/Research and Development Excellent potential for Office, Hospitality, Aviation-related, Industrial and Service components
F	82	Aviation and Aviation Support Tract F offers airside access and is well suited for future aviation expansion, including air cargo facilities.
G	250	Industrial, Flex/R&D, Retail and Hospitality Tract G's frontage along Brockman-McClimon Road is exceptionally well-suited to meet the needs of most users.
H	619	Recreational/Public and Industrial The land between Stevens Road and Route 101 has varied topography and strong physical characteristics that allow for a wide variety of development options.
I	69	Aviation and Aviation Support Offers airside access and the ability to accommodate future aviation expansion as demand warrants.

Source: GSP Master Land Use and Development Plan, 2013; GSP360beyondtherunway.com, 2017.

Figure 2-25: Airport Master Land Use and Development Plan Tracts



Source: GSP360beyondtherunway.com,2017.

As part of the airport master plan land use analysis, any potential impacts to development within the study area were evaluated. The South Carolina Inland Port (SCIP) was identified as a significant factor affecting off-airport development. Located on the north side of the Airport adjacent the GSP International Logistics Park, the port acts as an extension of the Port of Charleston to connect companies to the Southeast and South Carolina's Upstate region. The port operates shipping services via train and provides space for private trucking. In 2016, SCIP handled approximately two million twenty-foot equivalent units (TEUs). With a well-connected logistic system and high capacity, this port is considered a major asset for facilitating and developing land use areas in the airport logistics park and other non-aeronautical properties.

2.7. AIRPORT COMMUNITY SURVEYS

Digital surveys were developed and distributed to Airport users, tenants, and stakeholders as a means to inform this master plan and initiate a dialog with airport stakeholders. Appendix C provides a summary overview and individual responses for each of these surveys.

Some of the resulting recommendations and comments from the surveys/interviews were as follows:

- Tenant space allocation and location is satisfactory but updates within the facilities is desired by multiple tenant groups.
- Long range fuel contracts may be an opportunity for economic growth at the Airport.
- Airport community stakeholder groups value the Airport as an engine of local economic growth, credibility, and quality of life.
- Opportunities exist to expand hangar space offerings and other GA facilities.

2.8. CONCLUSION

The above descriptions do not provide an exhaustive account for every specific detail and facet of the Greenville-Spartanburg International Airport. The purpose of this inventory is to provide general facility data for subsequent analyses pertinent to this study effort. The following chapters of this report will seek to project future aeronautical demand which will then be compared to existing facility data for the purpose of analyzing future facility requirements and provide context for future facility improvement decision making.