

4 FACILITY REQUIREMENTS

4.1 Runway Capacity Analysis

An important component of determining the required airside facilities to accommodate future demand is the analysis of airfield capacity, defined as the theoretical maximum number of aircraft operations that may be accommodated on an airfield over a given period. This capacity is often determined by evaluating key operating components of the airport, including runways, associated taxiways, ramp areas, and gate areas. Typically, the initial and most critical factor of an airfield's capacity is the runway environment. As such, the FAA has provided models for estimating the operating capacity of runways for master planning purposes. In this section, the operating capacity of Runway 8-26 at JNU is estimated. As this runway primarily accommodates fixed-wing aircraft with landing gear designed for runway pavement or ground (as opposed to aircraft with floats that are designed for landing on water), the following analysis does not consider the overall airport's capacity to accommodate seaplanes or rotorcraft.

Two methods to estimate runway capacity were used in the following analysis.

1. The application of the method described in FAA Advisory Circular AC 150/5060-5, *Airport Capacity and Delay*. This Advisory Circular was published in 1983, providing a rather coarse but accepted method for estimating runway capacity.
2. The application of the tools provided in National Academies' Airport Cooperative Research Program Report 79, *Evaluating Airfield Capacity*. This report provides a more detailed method for estimating runway capacity and provides a spreadsheet tool for applying the method to particular airport environments.

In each of these models, estimates of runway capacity are provided in terms of:


- **Hourly Capacity:** Hourly capacity is an estimate of the number of operations that may be accommodated on the runway during one hour. This estimate takes into account the runway configuration and use, the operations mix (i.e., percent arrivals, percent departures, and percent touch-and-go's), the fleet mix, the presence of entrance, exit, and parallel taxiways, any airspace limitations, and the presence of runway instrumentation for instrument approaches. Hourly capacity is estimated for operations under Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) and an overall weighted average based on the airport's percentage of time operating under VFR vs. IFR. As noted in Table 2-8 in Chapter 2, VFR operations are estimated to occur 81.29 percent of the time, and IFR operations occur 19.69 percent of the time at JNU. These values are used in each model.
- **Annual Service Volume (ASV):** ASV is an estimate of the total annual capacity of the runway environment, given the estimate of hourly capacity, percentage of time under VFR vs. IFR, as well as ratios of demand during peak months and hours to overall annual demand. It should be noted that ASV is a function of both the physical capacity of the runway environment and the variable seasonal and daily demand that the airport serves.

4.1.1 Model 1: Advisory Circular 150/5060-5

The fundamental application of FAA AC 150/5060-5 includes the use of airport capacity approximation charts, which are based on an airport’s runway configuration and what’s known as its Mix Index. The Mix Index is calculated based on the baseline number of operations by aircraft type described in Chapter 3.

The runway configuration applied for JNU represents a single runway, as noted in **Figure 4-1** below.

Figure 4-1: Single-Runway Airport Capacity Approximation Chart

Runway Configuration	Mix Index, % (C + 3D)	Hourly Capacity, Operations per Hour		Annual Service Volume, Operations per Year
		VFR	IFR	
A 	0–20	98	59	230,000
	21–50	74	57	195,000
	51–80	63	56	205,000
	81–120	55	53	210,000
	121–180	51	50	240,000

Source: FAA AC 150/5060-5 Airport Capacity and Delay, as reproduced in Horonjeff, et al, Planning and Design of Airports.

Each aircraft type is categorized based on its maximum gross takeoff weight (MGTOW), as well as its number of engines. The categories and Mix Index for JNU for this model are illustrated in **Table 4-1** below.

Category	Definition	Percent of JNU Operations
A	Single engine aircraft with MGTOW < 12,500 lbs.	46.2%
B	Multi engine aircraft with MGTOW < 12,500 lbs.	0.2%
C	Aircraft with MGTOW between 12,500 and 300,000 lbs.	53.5%
D	Aircraft with MGTOW greater than 300,000 lbs.	0.02%

Source: FAA AC 150/5060-5, Airport Capacity and Delay

The Mix Index is calculated by the formula: $MI = C + 3D$. For JNU, the Mix Index is 53.56.

By applying the runway configuration and Mix Index to **Figure 4-1** and calculating the estimated hourly capacity under VFR and IFR, the overall average hourly capacity at JNU is 62 operations per hour, as reflected in **Table 4-2**.

Table 4-2: JNU VFR, IFR, and Overall Average Hourly Capacity at JNU

Weather Conditions	Percent of Time	Hourly Capacity (ops/hour)
VFR	81.29%	63
IFR	19.69%	56
Overall Average		62

Source: APG, 2025

Under some circumstances, these baseline hourly capacity estimates are modified based on the presence of significant touch-and-go operations and the number of available exit taxiways at the airport. Considering that touch-and-go operations at JNU are found to be essentially 0 percent, and that there are at least four exit taxiways on Runway 8-26, the base hourly estimates found in Table 4-2 above do not require any modifications to the calculations.

In addition, the hourly capacity estimate provides supplementary approximation charts for modifying runway capacity based on the relative percentage of arrivals vs. departures in a given hour. Fundamentally, as the percentage of arrivals increases, the overall runway capacity decreases. This can be attributed to the prioritization of arrivals to runways and the decreasing amount of spacing that would be available for departures. It is important to note that spacing has been an issue with the narrow corridor and the fact that helicopters take off in groups that are counted as ‘one operation’ by ATC, even when spacing is required to accommodate up to six helicopter flights within a single group. For this analysis, the runway capacity is based on 40 percent arrivals and 60 percent departures in a given hour.

The approximation table in **Figure 4-1** also provides an estimate for Annual Service Volume (ASV) capacity. In this case, with a given Mix Index of 53.56, the ASV capacity for JNU is estimated to be 205,000 operations per year. It should be noted that this value is a very rough estimate that is provided independently of any atypical seasonal or daily peaking characteristics at the airport. In the case of JNU, where seasonal and hourly peaking is more significant than in most environments, the ASV may be less than the above estimate. This will be highlighted in the application of the ACRP 79 spreadsheet model.

4.1.2 Model 2: ACRP Report 79 Spreadsheet Model

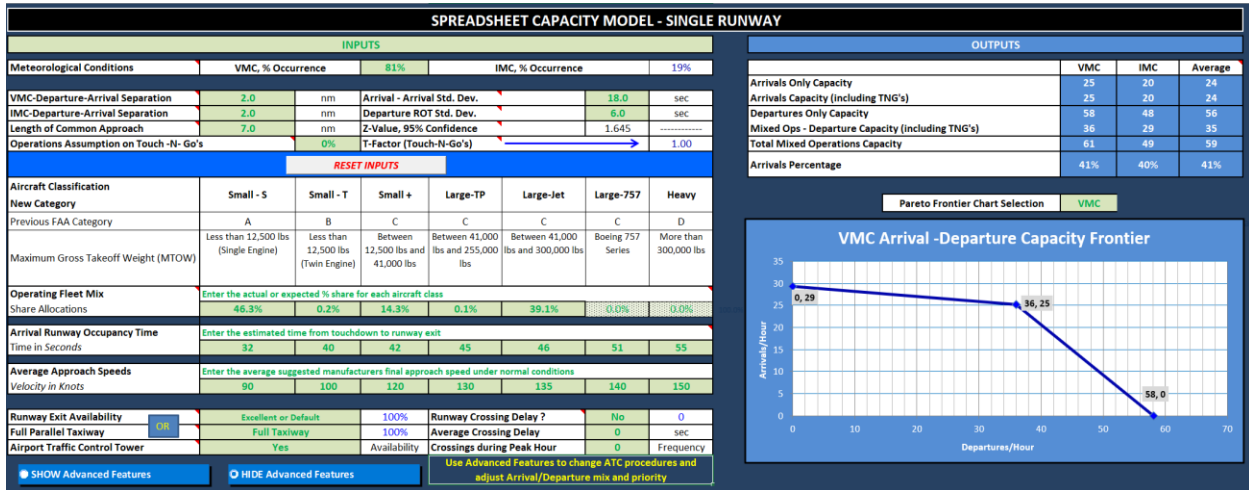
ACRP Report 79, *Evaluating Airfield Capacity*, was published by the National Academies’ Airport Cooperative Research Board in 2013 to provide enhanced tools and guidance for airports to estimate runway capacity. As part of the report, a spreadsheet-based airport capacity model was developed as a tool for more robustly estimating runway capacity than the approximation charts and formulas provided in AC 150/5060-5 without the need to invest in more expensive and time-consuming simulation models. The ACRP Report 79 spreadsheet model is considered an acceptable method of estimating runway capacity for airports with runway configurations and operational fleet mixes such as JNU.

The spreadsheet model accepts inputs on its end-user worksheet. These inputs include the VFR vs. IFR percentage, an enhanced categorization of fleet mix, and proportional estimates of peak monthly and hourly demand. The output of the model includes hourly and ASV

capacity estimates, along with diagrams that reflect how capacity varies with different percentages of arrivals vs. departures over a given hour.

A screenshot of the end-user worksheet for the model's single runway environment is illustrated in **Figure 4-2**.

Figure 4-2: Single Runway Airport Capacity Spreadsheet



Source: ACRP Report 79 Spreadsheet Model

The spreadsheet is pre-populated with standard properties of aircraft and air traffic control performance, including typical separations between arrival-departure pairs, runway occupancy times, and approach speeds, along with randomness features that consider the variability that occurs with each of these parameters among operations. In this analysis, nearly all of the standard parameters were maintained.

The model's inputs include a fleet mix broken down into seven categories. The categories and percentages for JNU used for this model are illustrated in **Table 4-3**.

Table 4-3: Fleet Mix Value Input for JNU Capacity Model

Category	Definition	Percent of JNU Operations
Small - S	Single-engine aircraft with MGTOW < 12,500 lbs.	46.2%
Small - T	Multi-engine aircraft with MGTOW < 12,500 lbs.	0.2%
Small +	Aircraft with MGTOW between 12,500 and 41,000 lbs.	14.3%
Large - TP	Turbo prop aircraft with MGTOW between 41,000 and 255,000 lbs.	0.1%
Large - Jet	Turbo prop aircraft with MGTOW between 41,000 and 300,000 lbs.	39.1%
Large - 757	Boeing 757 series aircraft	0.0%
Heavy	Aircraft with MGTOW greater than 300,000 lbs.	0.01%

Source: ACRP Report 79 Spreadsheet Model User Guide

The outputs to the spreadsheet include hourly capacities under VFR and IFR, as well as in terms of “arrivals only,” “departures only,” and “mixed use.” **Table 4-4** provides the results for JNU.

Table 4-4: JNU Hourly Capacity Output				
Weather Conditions	Percent of Time	Hourly Capacities		
		Arrivals Only	Departures Only	Mixed Operations*
VFR	81.29%	29	58	61
IFR	19.69%	22	48	49
Overall Average		24	56	59

Source: APG, 2025

*Note: Mixed-operations capacity is optimized by adding a 20-second separation buffer between arrivals to allow for more departures between subsequent arrivals. This is common practice in many towered air traffic environments.

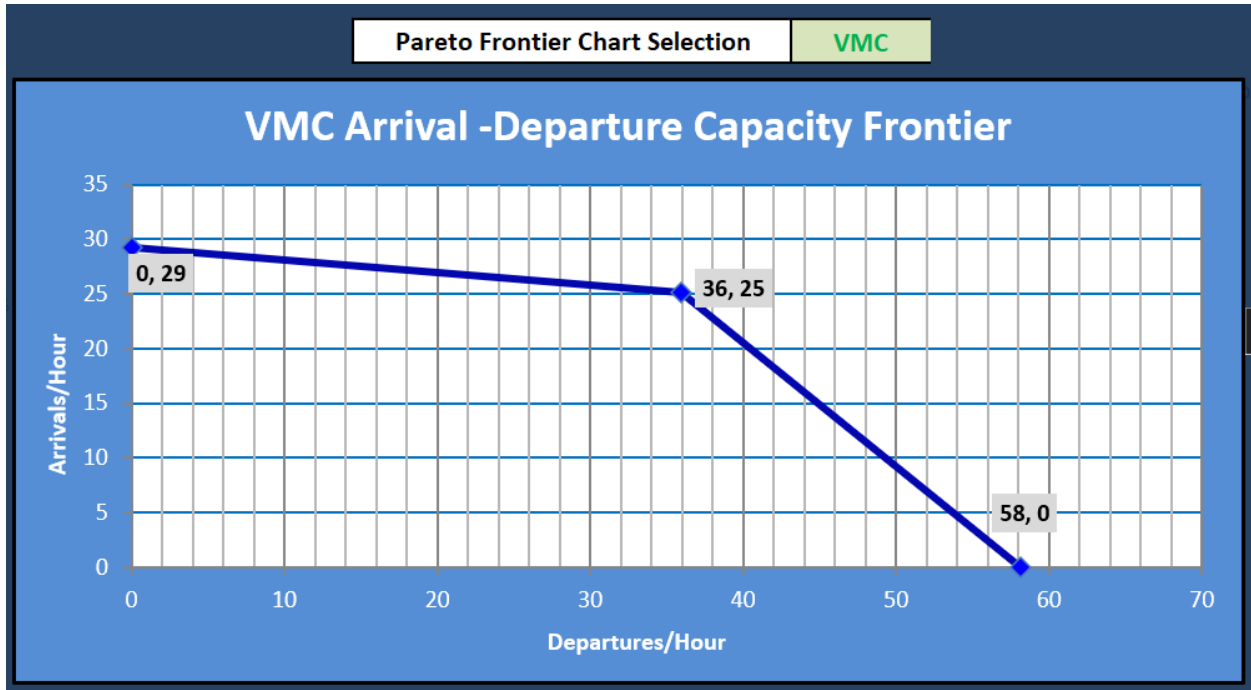
In addition to this summary data, the spreadsheet provides “Pareto” diagrams illustrating the operational capacity of the runway for given percentages of arrivals vs. departures.

Figure 4-3 is the capacity Pareto diagram for operations under visual meteorological conditions (VMC). As illustrated, the maximum number of arrivals per hour—without any necessary separation buffers to allow for departures—is 29 operations per hour. The maximum number of departures per hour without arrivals is 58 arrivals per hour. The optimal capacity occurs at 36 departures and 25 arrivals per hour (approximately 41 percent arrivals), **totaling 61 operations per hour.**

Figure 4-4 is the capacity Pareto diagram for operations under instrument meteorological conditions (IMC). As illustrated, the maximum number of arrivals per hour—without any necessary separation buffers to allow for departures—is 22 operations per hour. The maximum number of departures per hour without arrivals is 48 arrivals per hour. The optimal capacity occurs at 29 departures and 20 arrivals per hour (approximately 41 percent arrivals), **totaling 49 operations per hour.**

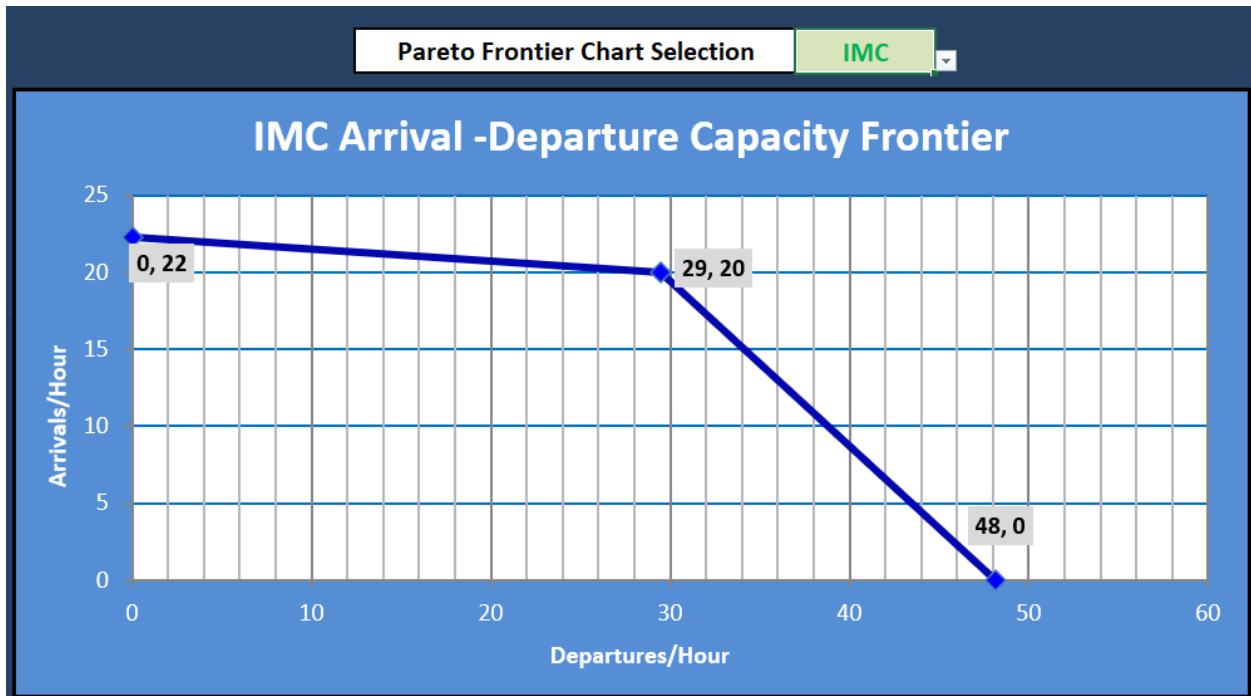
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Figure 4-3: Capacity Pareto Diagram Under VMC



Source: ACRP Report 79 Spreadsheet Model

Figure 4-4: Capacity Pareto Diagram Under IMC



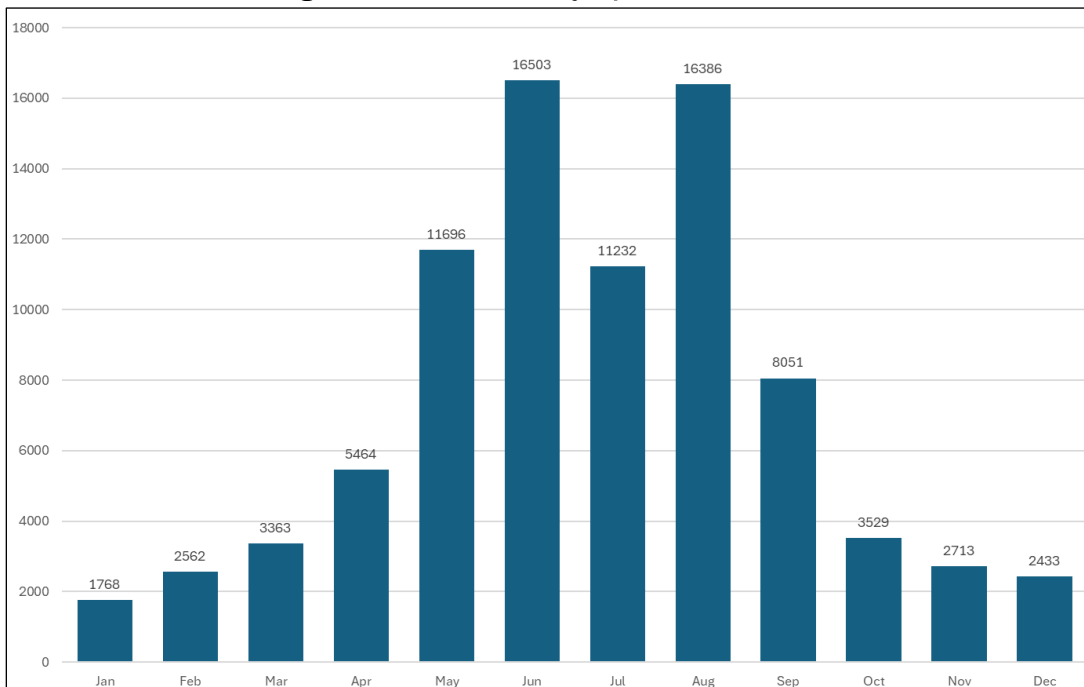
Source: ACRP Report 79 Spreadsheet Model

The spreadsheet model also estimates ASV for the airport, applying the hourly optimal mixed-use capacities under VFR and IFR, the percentage of VFR and IFR conditions over time, and the following demand factors:

4.1.2.1 Ratio of annual demand to the average peak month daily demand (ADPM)

The average peak month daily demand (ADPM), also known as the “D factor,” provides the model with an estimate of how the peaking of demand affects overall annual service volumes. As an example, if there was no significant peaking, demand would be spread out, and hence ASV would be relatively large. However, if there is significant peaking, demand throughout the year causes the model to reduce ASV since available capacity during off-peak times is not realized. In the case of Juneau, the summer months have significantly higher levels of operations than the winter, as illustrated in **Figure 4-5**.

Figure 4-5: JNU Monthly Operations, 2024



Source: FAA OpsNet, 2024.

In the case of JNU, the 2024 annual operations totaled 85,700 operations. The peak month in 2024 was June, with 16,503 operations. The average number of daily operations in June 2024 was 550 (Source: FAA OpsNet). As a result, the ADPM value entered into the spreadsheet model is **157.8**.

As stated in section 4.1.1 the helicopter operations reported by FAA are lower than the actual helicopter operations. This is due to the fact that helicopters take off in groups and are counted as ‘one operation’ by ATC, even when spacing is required to accommodate up to six helicopter flights within a single group.

4.1.2.2 Ratio of Average Peak Month Daily Demand to Average Peak Hour Demand (AHPM)

The AHPM, also known as the “H-factor,” provides the model with an estimate of the hourly peaking of demand during the peak month. The typical AHPM value used in the model is 9, which represents approximately 11 percent of the daily operations occurring during the peak hour. In the case of JNU, we are estimating that the peak is more distributed throughout the day, considering the greater number of daylight hours in the region than the typical airports. As such, in the absence of any more specific counts, we assume an AHPM value of 11, which represents approximately 9 percent of the daily operations occurring during the peak hour.

Using these inputs in the model, the **ASV is estimated to be approximately 104,600 operations per year**. This is a significantly lower value than estimated in Model 1, precisely due to the significant seasonal peaking characteristics around the airport.

4.1.3 Comparison of Models

Table 4-5 provides a summary of capacity estimates of the two models. In addition, the table provides an integrated capacity estimate, that represents the average values between the two models.

In the case of ASV, the integrated estimate is justified by considering that the annual peaking of demand over the year will likely become more distributed, with additional demand being accommodated in the shoulder months of the summer, particularly May and September, as well as additional demand in July.

Weather Conditions	Model 1	Model 2	Integrated Estimate
VFR (operations/hour)	63	61	62
IFR (operations/hour)	56	49	53
Overall Average (operations/hour)	62	59	61
ASV (operations/year)	205,000	104,600	155,000

Source: APG, 2025

The integrated ASV estimate as compared to the forecast level of activity determined in Chapter 3 is illustrated in **Table 4-6**.

	2023	2028	2033	2038	2043
Master Plan Estimate of Demand	123,583	125,697	128,527	131,667	135,949
Percent of ASV: Integrated Estimate	79.7%	81.1%	82.9%	84.9%	87.7%

Source: APG, 2025

As a result of this analysis, it is reasonable to conclude that JNU’s airfield capacity is sufficient to accommodate current and future demand out to 2043.

4.2 Airfield Facility Requirements

This section presents the analysis of requirements for airside facilities necessary to meet FAA standards and the anticipated aviation demand at JNU. Runways, taxiways, and aircraft parking areas are the primary elements of an airport, and in order to protect these assets, the FAA has designated parameters to ensure the operations at the airport are conducted with an understood level of safety provided by an airport.

4.2.1 Runway Orientation

FAA AC 150/5300-13B offers guidance for determining the ideal runway orientation by evaluating wind coverage. Typically, a decade of wind data is utilized to conduct a wind coverage analysis for an airport. In the case of JNU, the available weather data goes back a full decade to 2014. **Table 4-7** lays out the wind coverage.

Table 4-7: Runway 8-26 Wind Coverage					
Meteorological Condition	Runway Designation	Wind Coverage Percentage (%) Allowable Crosswind Component (Knots)			
		10.5	13	16	20
All Weather	8-26	99.62	99.92	99.99	100
Visual	8-26	99.56	99.91	99.99	100
Instrument	8-26	99.91	99.98	100	100

Source: NOAA's Integrated Surface Database (ISD) Weather Station: 703810 Juneau International Airport. Record Period: 2014-2023. Percentages may not add up due to calm or inoperative Surface Observation monitoring conditions.

The wind analysis shows that the wind coverage percentage for 10.5, 13, 16, and 20 knots allowable crosswind components at JNU exceeds FAA standard of greater than 95 percent. Given that the existing runway exceeds the FAA threshold, there is no need for a crosswind component.

4.2.2 Runway Design Standards

Runway design standards are established by the FAA with the purpose of providing a safe area for runway operations. These standards include the determination of runway length, width, pavement strength, and protection areas.

4.2.3 Runway Length

4.2.3.1 FAA Runway Length Planning Guidance

Runway length requirements for JNU were evaluated in accordance with FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*. This AC provides guidelines for airport designers and planners to determine recommended runway lengths for new runways or extensions to existing runways. The FAA’s mandatory use of this AC and its standards and

guidelines are recommended strictly for use in the design of civil airport runway improvement projects receiving federal funding.

When planning for the required physical geometric design and layout of airfield pavements (i.e., runways and taxiways), aircraft operational aspects such as aircraft approach speeds and wingspan widths are considered. For runway length considerations, however, aircraft operational weights are used as part of the FAA's recommendations regarding runway lengths that would be required to fully accommodate the safe operation of aircraft during takeoff and landing operations.

Following the five-step process outlined in the AC, this master plan update revalidates the runway length requirements for JNU.

Step 1: Identify the list of critical design airplanes that will make regular use of the runway:

An analysis of the current and future critical aircraft was prepared as part of the Forecasts of Aviation Activity contained in Chapter 3. It was established that the Boeing 737-900 aircraft would represent the existing and future Critical Design Aircraft for JNU.

Step 2: Identify the airplanes that will require the longest runway lengths at maximum certificated takeoff weight (MTOW):

The existing and future critical aircraft at JNU is the Boeing 737-900 aircraft with an MTOW of 174,200 pounds.

Step 3: Determine the method that will be used for establishing the recommended runway length:

Using Table 1-1 from AC 150/5325-4B: the Boeing 737-900 aircraft has an MTOW of over 60,000 pounds. Therefore, the individual large airplane approach is required to evaluate the runway length requirements. For this effort, the Boeing 737-900 Airplane Characteristics for Airport Planning Manual was used.

Steps 4 and 5: Determine Recommended Runway Length and apply any necessary adjustments:

Within Chapter 4 of the AC, Runway Lengths for Regional Jets and those Airplanes with a Maximum Certificated Takeoff Weight of More than 60,000 Pounds, the FAA recommends runway lengths based upon the following:

- Critical design airplane's Airport Planning Manual (APM),
- The maximum certificated takeoff weight or takeoff operating weight for short-haul routes,
- Maximum certificated landing weight,
- Airport elevation above mean sea level,
- Effective runway gradient,
- and the mean daily maximum temperature of the hottest month at the airport.

Taking the FAA’s “design approach,” recommended runway lengths for this weight category of airplanes are based on performance curves developed by United States Federal Aviation Regulations (FAR) and Certification Specifications (CS).

The requirements identified in this section are based on JNU’s mean daily maximum temperature of 57.0 degrees Fahrenheit (°F) during the hottest month and above mean sea level elevation of 25.3 feet, and the Federal Aviation Administration Takeoff Runway Length Requirements for the Boeing 737-900 (Critical Aircraft).

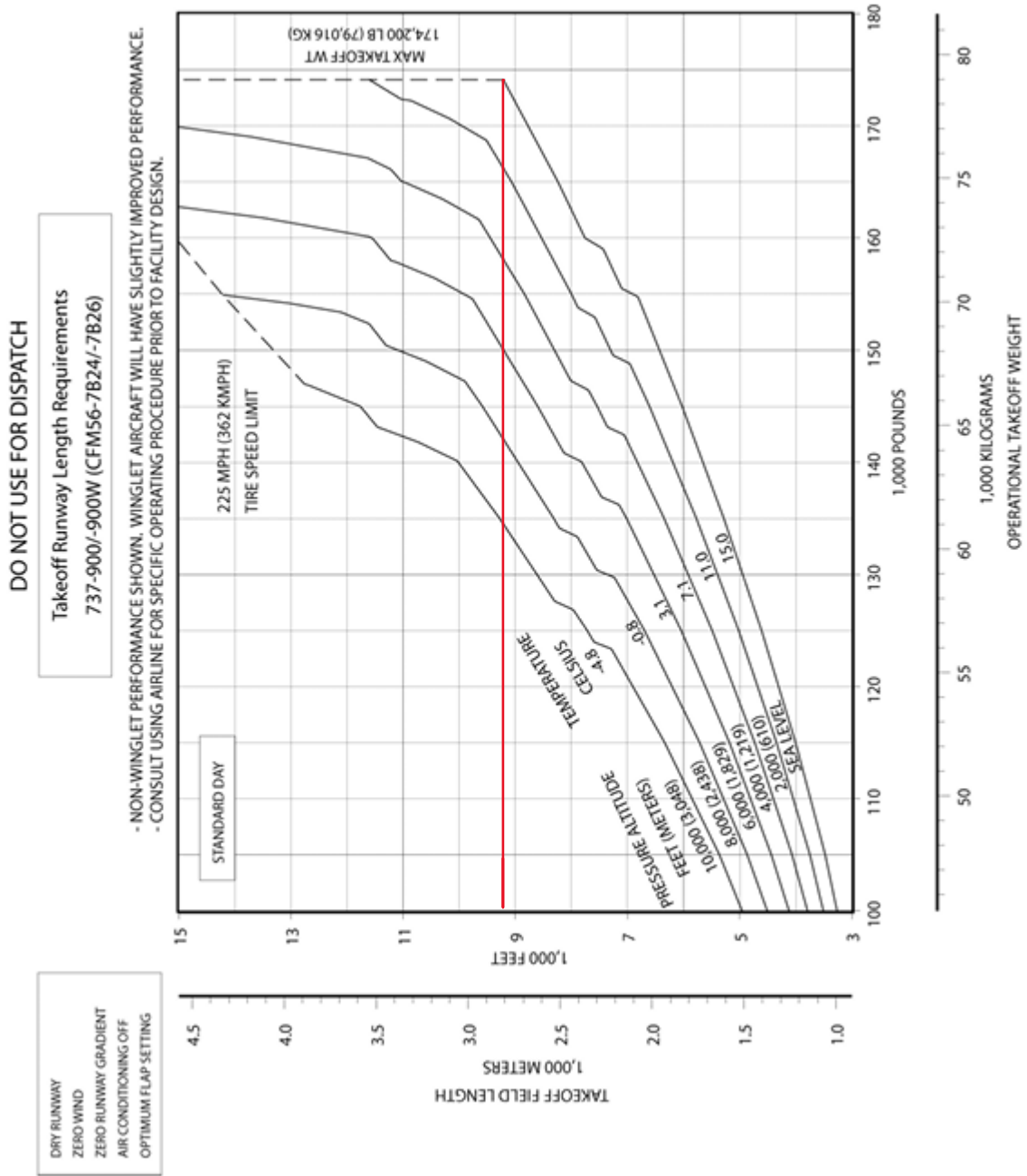
In addition, for federally funded projects, “the airport designer must consider the length of haul (range) that is flown by airplanes on a substantial use basis. The length of haul range will determine the operating takeoff weight for the design airplanes under evaluation”. Considering that JNU is a commercial airport, for this analysis 100 percent useful load factors were evaluated as depicted in **Figure 4-6**, **Figure 4-7**, and **Table 4-8**.

Table 4-8: Runway Length Requirements – Boeing 737-900	
Aircraft	737-900 (CFM56-7B24/-7B26 Engines)
Mean Daily Maximum Temperature of Hottest Month	57.0 °F
Airport Elevation	25.3 FT MSL
Maximum Design Landing Weight	147,300 LBS
Maximum Design Takeoff Weight	174,200 LBS
Difference Runway Centerline Elevations	1.6 FT
Takeoff Length for Elevation (dry pavement) (STD)	9,200 FT
Takeoff Length Requirement	9,200 FT
Landing Runway Length Requirements Flaps 30 Wet Runway	6,800 FT
Landing Length Requirement	6,800 FT
Runway Length Requirement	9,200 FT

Source: Michael Baker international Calculations based on Boeing - 737 Airplane Characteristics for Airport Planning - D6-58325-6, September 2020

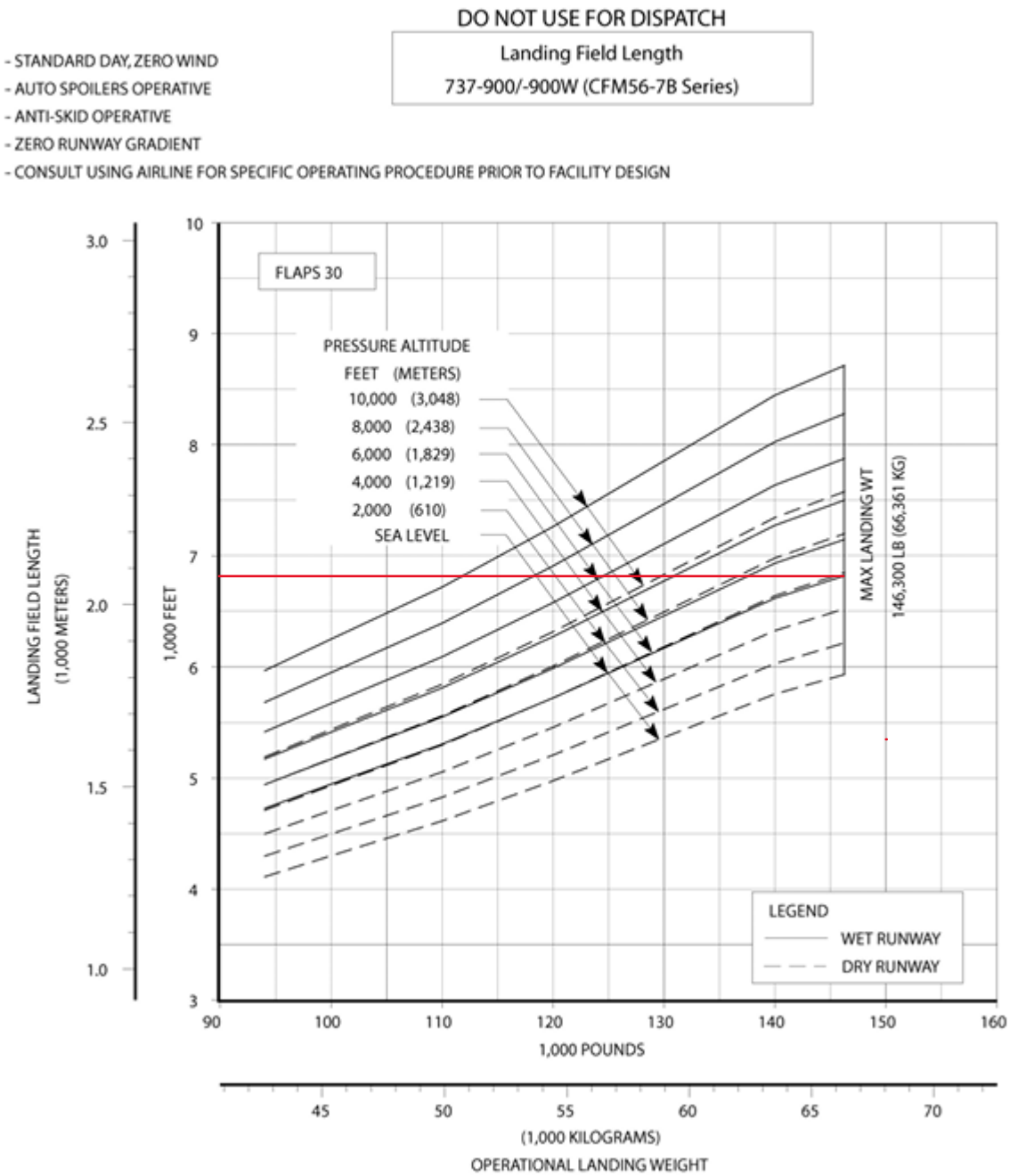
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Figure 4-6: F.A.R Takeoff Runway Length Requirements – Standard Day, Dry Runway: Model 737-900/-900W (CFM56-7B24/-7B26 Engines at 24,000 LB SLST)



Source: Boeing 737 Airplane Characteristics for Airport Planning, September 2020

Figure 4-7: F.A.R Landing Runway Length Requirements – Flaps 30: Model 737-900



Source: Boeing 737 Airplane Characteristics for Airport Planning, September 2020

4.2.4 Runway Width

According to FAA AC 150/5300-13B guidelines, Runway Design Code (RDC) D-III requirement is a width of 100 feet (**Table 4-9**). Runway 8-26 exceeds standards with a width of 150 feet. Though downsizing the width of Runway 8-26 to 100 feet will reduce the expenditure of future funds required for pavement maintenance, additional expenses such as lighting relocation will increase. Future uses and needs of the airport must also be considered before downgrading any existing pavement areas. Runway 8W-26W has a width of 150 feet, while the standard RDC A-II width is listed at 75 feet. Considering Runway 8W-26W is a waterway, there are no pavement expenses to account for. As such, it is recommended that both runways maintain their current widths.

	Runway 8-26 Width	Runway 8W-26W Width
Existing (feet)	150	150
Required (feet)	100	75

Source: FAA Advisory Circular 150/5300-13B, Airport Design.

4.2.5 Runway Pavement Design Strength

Runway 8-26's surface is made of grooved asphalt and is reported to possess the necessary pavement strength to support aircraft with single-wheel main gear and gross weights of up to 120,000 pounds, double-wheel main gear and gross weights of 250,000 pounds, and double-tandem main gear and gross weights of 550,000 pounds. Runway 8-26 has adequate pavement strength to accommodate the aircraft that regularly utilize the airport. However, ongoing pavement maintenance is necessary and mandated to ensure the runway's continued safe and efficient operation.

4.2.6 Runway Design Standards

The FAA sets standards for runway protection surfaces to ensure the safety of runway operations. **Table 4-10** provides a summary of these standards and other key aspects related to airfield geometry. These designated areas are visually represented in **Figure 4-8** for reference.

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Table 4-10: Runway Protection Standards				
Runway Protection Surfaces	Runway 8-26 (D-III/ ≥ 1 Mile Visibility)		Runway 8W-26W (A-II Small/Visual Visibility)	
	Existing	Required	Existing	Required
Runway Safety Area (RSA)				
Length Beyond Departure End (feet)	600	1,000	300	300
Length Prior to Threshold (feet)	600	600	300	300
Width (feet)	500	500	150	150
Runway Object Free Area (ROFA)				
Length Beyond Runway End (feet)	1,000	1,000	300	300
Length Prior to Threshold (feet)	600	600	300	300
Width (feet)	800	800	500	500
Runway Obstacle Free Zone (ROFZ)				
Length Beyond Runway End (feet)	200	200	200	200
Width (feet)	400	400	250	250
Approach Runway Protection Zone (RPZ)				
Length (feet)	1,700	1,700	1,000	1,000
Inner Width (feet)	500	500	250	250
Outer Width (feet)	1,010	1,010	450	450
Departure Runway Protection Zone (RPZ)				
Length (feet)	1,700	1,700	1,000	1,000
Inner Width (feet)	500	500	250	250
Outer Width (feet)	1,010	1,010	450	450

Source: FAA Advisory Circular 150/5300-13B, Airport Design.

4.2.7 Runway Safety Area (RSA)

A Runway Safety Area (RSA) is a specifically designated and graded area surrounding a runway. In the event of an aircraft departing from the runway, this area must have the capability, under typical (dry) conditions, to support the aircraft without causing structural damage or harm to its occupants. Runway 8-26 meets most of the RSA standards outside of the length beyond departure end. The standard for RDC D-III with a visibility minimum not lower than 1 mile is 1,000 feet beyond the departure end, while Runway 8-26 only has 600-foot RSA beyond the departure end. This is due to bodies of water on both ends preventing the establishment of a longer RSA. As such, declared distances are used to meet the standard. Runway 8W-26W meets all RSA standards for RDC A-II Small.

4.2.8 Runway Object Free Area (ROFA) & Runway Obstacle Free Zone (ROFZ)

Runway Object Free Areas (ROFA) and Runway Obstacle Free Zones (ROFZ) are crucial in enhancing aircraft safety by providing essential clearance around runways and ensuring adequate airspace. The ROFA is centered on the runway centerline at ground level. It is imperative that objects not essential for air navigation or aircraft ground maneuvering, including parked aircraft, are not placed within the ROFA and ROFZ. Outside of bodies of water, both runways at JNU meet their respective ROFA and ROFZ runway protection standards.

4.2.9 Runway Protection Zone (RPZ)

The FAA has established specific land use standards for Runway Protection Zones (RPZ), which are areas on the ground located before the threshold or beyond the end of a runway. These zones are designed to enhance the safety of people and property on the ground in the vicinity of the runway. According to FAA Advisory Circular 150/5300-13B, *Airport Design*, it is considered highly desirable to clear the entire RPZ of all above-ground objects. In cases where complete clearance is impractical, airport owners are urged, at a minimum, to ensure that the RPZ remains free of any facilities supporting incompatible activities. Examples of incompatible uses encompass buildings, recreational areas, roads and parking, fuel and hazardous material storage, and above-ground utilities. Both runways at JNU meet their respective Approach and Departure RPZ runway protection standards.

4.2.10 Taxiway Requirements

Taxiways, which are designated paths established for the movement of aircraft from one area of the airport to another (runway to apron), and taxilanes, which provide access from taxiways to hangars and parking areas, form a network of surfaces at JNU. These surfaces are vital for facilitating the safe and efficient movement of aircraft from hangars and tie-down areas to the runways.

As mentioned in the previous chapter, the JNU taxiway system meets or exceeds the TDG-2 or TDG-3 design standard (Tables 2-10 and 2-11). Additionally, the taxiway pavement condition is reported to be acceptable. However, JNU has some design concept issues that do not meet the recommendations provided in AC 150/5300-13B. The nonstandard elements and recommended solutions are provided in **Table 4-11**.

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Table 4-11: Non-Standard Taxiway Conditions		
Non-Standard Condition	Identified Taxiways	Recommendation
Taxiway widths wider than the standard of TDG-3 (50 feet)	Taxiways B (100 feet), C (260 feet), and G (242 feet)	Maintain taxiway widths to continue providing improved aircraft maneuverability and separation between large and small aircraft.
Direct runway access from the apron	Taxiway C	Maintain current configuration to continue providing improved aircraft maneuverability and separation between large and small aircraft.
Runway crossings in the middle third of the runway	Taxiways D and E	Maintain Taxiways D and E within the center portion of the runway, enabling smaller aircraft to quickly exit the runway to help relieve congestion.

Source: FAA AC 150/5300-13B, Airport Design.

Taxiways B, C, and G's widths far exceed the TDG-3 standard of 50 feet. Widths wider than the standard lead to signs being located further from the centerline, which reduces the pilot's visibility. However, during the RIM study, multiple users and airport/ATC representatives weighed in about changing the current widths and layout of Taxiways C and G. To date, there have been no runway incursions due to taxiway width/configuration and these taxiways help support the current flow of aircraft movements. There is currently a letter from ATC on file in support of not changing the width/configuration of these taxiways for operational purposes/need.

Taxiway C directly connects the apron to Runway 8-26. According to the FAA, taxiways that run directly from the apron to a runway can lead to confusion by creating a wrongful expectation of a parallel taxiway before the runway. As such, a pilot may unintentionally enter a runway, leading to an incursion. The previous master plan and ALP recommend a reconfiguration of this area. However, during interviews for this study, ATC personnel stated that the width and configuration of Taxiway C allow for improved aircraft maneuverability, enabling larger air carrier aircraft to taxi to the gate area without impacting taxi movements of smaller aircraft. After several conversations with the ATC and airport staff, the reconfiguration of Taxiway C is not desired and will not be considered during the planning period. It is recommended that the direct-access taxiways be further evaluated in the event of future changes in the aircraft fleet.

Taxiways D and E cross Runway 8-26 in the middle third, which is considered a high-energy area. Keeping the high-energy area clear allows a pilot to maneuver to avoid a potential collision. While Taxiways D and E are located within the center portion of the runway, these taxiways enable smaller aircraft to exit the runway sooner, reducing the runway occupancy time and congestion.

4.2.11 Airfield Lighting

JNU has multiple lighting systems that help ensure safe operations under various conditions and times of day.

4.2.12 Runway Edge Lighting

Runway 8-26 is equipped with a high-intensity runway lights (HIRL) system that is currently functioning properly. Maintenance and refurbishment should be carried out as needed to ensure the system remains operational and up to date.

There is currently no specific design standard mandating the upgrade of incandescent runway edge lights to LED. The FAA encourages the use of energy-efficient and longer-lasting LED fixtures. Airports have been adopting LED lighting as it may offer lower energy consumption, longer operational lifespan, reduced maintenance costs, and certain environmental benefits.

4.2.13 Taxiway Edge Lighting

All major taxiways at JNU are equipped with Medium-Intensity Taxiway Lights (MITL) that are in good working condition. The airport should continue to maintain the taxiway lighting system.

4.2.14 Airfield Signage

The airfield is fully equipped with illuminated airfield informational and directional guidance, as well as mandatory instructional signs. It is recommended that the airport continue to maintain the airfield signage.

4.2.15 Apron Lighting

The apron and ramp areas at JNU are lighted for safety and security. The apron lighting system should be updated to increase efficiency and functionality.

4.2.16 Electronic, Visual, and Satellite Aids to Navigation

The airport is operational around the clock, and therefore, it must have suitable lighting capabilities to ensure safe aircraft operations during nighttime hours. Along the paved surfaces, such as runways and taxiways, lighting installations are essential to providing pilots with visibility and guidance. These lights illuminate the path of usable pavement in front of aircraft, helping pilots navigate and land safely in low-light conditions. Proper runway and taxiway lighting and signage are critical for takeoffs, landings, and taxiing.

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4.2.18 Visual Glide Slope Indicators (VGSI)

As presented in the previous chapter, JNU has two different VGSI systems. Runway 8 has a 2-box Visual Approach Slope Indicators (VASI) and Runway 26 has a 4-box Precision

Approach Path Indicators (PAPI). The Runway 8 VASI is unusable beyond 6 feet of the runway centerline. Additionally, the VASI is aligned 13 degrees to the right of the centerline and is not visible on the centerline. The Runway 26 PAPI is considered to be unusable beyond 2 NM due to terrain. The VGSI at JNU are in good working condition.

The Runway 8 VASI was initially installed in 1970, and its last major upgrade occurred in 2014. Runway 26 PAPI was installed in 2013 with a major upgrade in 2021.

FAA Order 6850.2B – *Visual Guidance Lighting Systems* states that VASI systems are no longer installed at new facilities and are considered legacy systems. All new or replacement installations should use PAPI.

Existing VASIs can remain in service, but when major rehabilitation or replacement is needed (e.g., due to age, failure, or inability to meet standards), the FAA recommends converting to PAPI.

4.2.19 Airport Rotating Beacon

The rotating beacon at JNU is a green and white rotating light, positioned above the Air Traffic Control Tower (ATCT). Per FAA AC 150/5300-13B, a beacon should be mounted high enough above the surface so that the beam sweep, aimed 2 degrees or more above the horizon, is not blocked by any natural or manmade object. The airport rotating beacon is unobstructed and reported to be in good operating condition.

4.2.20 Segmented Circle

A segmented circle provides visual indication of current airport operations such as active landing direction and traffic patterns. The segmented circle at JNU is located approximately 600 feet northwest of the approach end of Runway 8. The segmented circle meets all requirements listed in FAA AC 150/5340-5D.

4.2.21 Wind Cones

A wind cone visually indicates wind conditions at a specific location at an airport. JNU has four wind cones that are placed to best serve operations at the airport. The wind cones meet all requirements listed in FAA AC 150/5340-30J.

4.2.22 Distance Measuring Equipment (DME)

A DME provides slant range measurement of the distance to the runway. The DME serving JNU is located offsite 24 nautical miles southwest of the airport. Due to the remote location of the DME, there is no concern for the introduction of electromagnetic interference (EMI) sources through future airport development projects. The DME is reported to be in working condition.

4.2.23 Runway Visual Range (RVR)

RVR supports increased precision takeoff and landing capacity. RVR visibility readings assist ATC when issuing instructions and to avoid ground operations that may interfere with critical areas. JNU has two RVRs located at the Touchdown and Rollout location of each runway. The

RVR stations are in working order and meet the requirements established by FAA Order 6560.10D, *Runway Visual Range (RVR)*.

4.2.24 VORTAC

VORTAC is a short distance navigation system that provides navigational signals to properly equipped civil and military aircraft. The VORTAC serving JNU is located offsite alongside the DME. The VORTAC is in functional condition and meets siting requirements established in FAA Order 6820.10, *VOR, VOR/DME and VORTAC Siting Criteria*.

4.2.25 Runway End Identifier Lights (REIL)

REIL is a set of lights that provide identification of the runway end. JNU has REILs located at the end of Runway 26. The REILs at JNU are in working condition and meet AC 150/5340-30J requirements.

4.2.26 Medium Intensity Approach Lighting System (MALS)

MALS is a navigational aid that enhances recognition of the runway end for non-precision instrument and visual approaches. Runway 8 has a Medium Intensity Approach Lighting System with Sequenced Flashers (MALSF). Runway 26 is equipped with a MALS and is anticipated to be extended to a 2,400-foot full MALSR. Both of the approach lighting systems at JNU are in working condition and meet AC 150/5340-30J, *Design and Installation Details for Airport Visual Aids*, requirements.

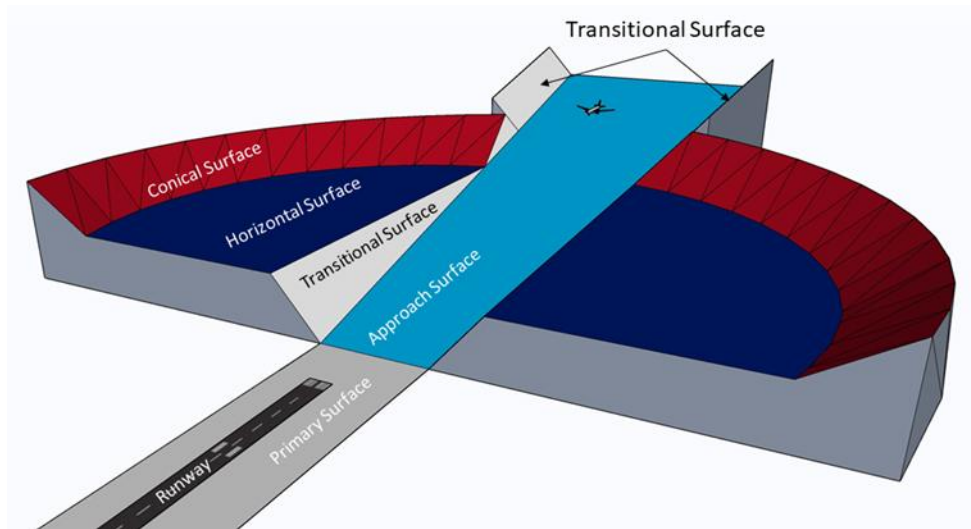
4.2.27 Protection of Navigable Airspace

The regulation of airspace in the vicinity of airports is primarily governed by the Code of Federal Regulations (CFR) Part 77, titled "Objects Affecting Navigable Airspace." Ensuring the presence of protected airspace around an airport is of utmost importance to ensuring the safe operation of arriving and departing aircraft at the facility. Except for a few exceptional cases designated for the National Wildlife Service and other agencies, the Federal Aviation Administration (FAA) oversees all airspace within the United States.

Part 77 outlines the imaginary surfaces that envelop an airport. These surfaces, depicted in **Figure 4-9**, go beyond the regulation of objects and activities on the ground, as they also define and control objects that penetrate the airspace above these designated surfaces.

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Figure 4-9: Part 77-Defined Imaginary Airport Surfaces



Source: APG, 2025

Part 77 dimensions are determined based on the type of approaches to each runway and the weight of aircraft intended to be served by each runway. The FAA classifies this as either "Utility" (for aircraft with a maximum takeoff weight of 12,500 pounds or less) or "Other than Utility" (for aircraft exceeding 12,500 pounds). Runways 8 and 26 are classified as having CFR part 77 Approach Surfaces that serve "Other Than Utility" runways with a Non-precision Instrument approach capability having published minimum visibility minimums of greater than $\frac{3}{4}$ mile. **Table 4-12** provides the dimensions of Part 77 surfaces at the airport based on the current approach configurations.

Table 4-12: Dimensions Requirements for Part 77 Standards at JNU

Surfaces	Runway 8	Runway 26	Runway 8W	Runway 26W
Primary Surface				
Distance From Runway End (feet)	200	200	200	200
Width (feet)	500	500	250	250
Approach Surface				
Inner Edge Width (feet)	500	500	250	250
Outer Edge Width (feet)	3,500	3,500	1,250	1,250
Horizontal Distance (feet)	10,000	10,000	5,000	5,000
Slope Required	34:1	34:1	20:1	20:1
Existing Slope	34:1	34:1	20:1	20:1
Transitional Surface				
Slope	7:1	7:1	7:1	7:1
Horizontal Surface				
Height (feet)	150	150	150	150

Table 4-12: Dimensions Requirements for Part 77 Standards at JNU

Surfaces	Runway 8	Runway 26	Runway 8W	Runway 26W
Arc Radius (feet)	10,000	10,000	5,000	5,000
Conical Surface				
Slope	20:1	20:1	20:1	20:1
Horizontal Distance (feet)	4,000	4,000	4,000	4,000

Source: Code of Federal Regulations (CFR) Title 14: Aeronautics and Space, part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace, §77.19, Civil Airport Imaginary Surfaces.

The Airport Layout Plan (ALP) set of drawings illustrates all surveyed objects, including their relationship to FAR Part 77 surfaces. Also, the FAA has requested that Required Navigation Performance (RNP) procedures for this airport be included in ALP set. Recommendations for managing these objects are outlined in the Airport Layout Plan Set chapter, ensuring compliance with airspace regulations and safety measures.

4.2.28 Emerging Industry Trends

The past decade has seen the development and early introductions of technologies which could have significant impacts on aviation and in turn its supporting airport infrastructure. Many alternatives and methods for implementing these technologies are being proposed for airports across the nation.

4.2.29 Advanced Air Mobility

While not yet brought to market at scale, Advanced Air Mobility (AAM) is a class of aviation operations that is gaining regulatory momentum and manufacturer interest. Urban Air Mobility (UAM), Regional Air Mobility (RAM), and Unmanned Aerial Systems (UAS) all offer unique growth in operations, but all with various infrastructure and safety considerations for airport planning. At present, only interim guidance exists for the development of on-airport vertiport infrastructure and can be found in the FAA’s Engineering Brief (EB) 105A, *Vertiport Design, Supplemental Guidance to Advisory Circular 150/5390-2D, Heliport Design*. It should be noted that many conceptual designs for AAM-class aircraft are planned to, from launch or in future iterations, be powered by electric, hydrogen, or hybrid powertrains, hence the need to develop infrastructure for alternative propulsion at airports. In addition to refueling/recharging infrastructure, some aircraft are being designed for short takeoff and landing (STOL) operations, which would make use of existing runways while others are being designed for vertical takeoff and landing (VTOL) and would require heliport-like facilities that are addressed in FAA EB 105A. Ultimately, supporting infrastructure for AAM may be dependent on operators’ specific needs for supporting infrastructure. Small UAS operations, which fall under 14 CFR Part 107, *Small Unmanned Aircraft Systems*, are also gaining momentum but require different airport considerations from passenger-scaled AAM aircraft. Airport sponsors should closely monitor UAS operations of this type to maintain safety within the airport environment and its associated Part 77 airspace.

4.3 General Aviation Facility Requirements

Below are the requirements necessary to meet both current and projected levels of demand for the 5-, 10-, and 20-year planning horizons.

4.3.1 Design Aircraft/Runway Design Codes

General Aviation (GA) aircraft are typically used for non-commercial, civil aviation purposes other than scheduled airline and military operations. GA encompasses a wide range of aircraft, including small airplanes, helicopters, gliders, and even some business jets. It applies to all civil aircraft operations except those conducted under Title 14 of the Code of Federal Regulations Part 121 (airline operations) and Part 135 (commuter and on-demand operations).

As discussed in Chapter 3, a design aircraft is the most demanding aircraft with at least 500 annual operations on a runway. The design aircraft enables airport planners and engineers to design the airport in such a way as to satisfy the operational requirements of such aircraft and meet national standards for separation and geometric design. For those portions of the airport intended for the exclusive use of GA aircraft (also known as Part 91 aircraft), the GA aircraft meeting the definition of design aircraft are identified in Table 3-18 as single-engine piston aircraft and helicopters.

The design aircraft for the purpose of specifying aircraft parking and storage for the floatplane basin is the DeHavilland DHC-2 Beaver.

4.3.1.1 Floatplane Access Ramps

The two floatplane access ramps on the west end of the water lane meet all tenant-related requirements. The ramps are currently reported to be in fair condition. Fuel is delivered by the FBO, Aero Services, to private general aviation aircraft owners/operators. The companies who operate from the water lane provide their own fuel.

4.3.2 West GA Apron

4.3.2.1 Geometry

The West General Aviation Apron Area (91,770 SF) is located adjacent to the Block “1” Hangars west of the Aero Services FBO and is accessible via Taxiways B-1 and B-2.

Aircraft using the West Apron primarily consist of single-engine piston aircraft. Nearly all are parked in leased spaces. This area is situated near Aero Services, so helicopters and larger aircraft are also known to park in this area. At times aircraft also park near taxiways clear of the Taxiway OFA. When needed, the airport will direct transient aircraft to park near the Snow Removal Equipment Facility (SREF) for overflow purposes. However, this is discouraged and avoided if possible.

4.3.2.2 Tiedowns

Nearly all aircraft are parked on leased lots. This apron also provides aircraft parking for up to 18 GA aircraft. None of the tiedowns have electric plugins. The West GA Apron is typically

used for transient overflow in the summer. This apron is already close to maximum capacity for resident aircraft on the west side of the airport.

The 18 parking positions on this apron accommodate approximately 7 percent of the based aircraft on the airport. Currently, there are no surplus parking spaces. If future demand remains constant at 7 percent of total based aircraft, aircraft parking spaces for approximately 24 aircraft will be required on the West GA Apron by 2043 (7 percent x 332 aircraft). Assuming 590 square yards per aircraft (ADG 1 Large aircraft with ADG I taxilane and TLOFA in front), an additional 3,540 square yards (590 sq yds X 6 aircraft), or a total of 14,160 square yards (590 sq yds X 24 aircraft), of tiedown space will be required on the West GA Apron by 2043.

4.3.2.3 Surface Condition

According to the 2021 JNU Pavement Inspection Report, the pavement is in overall fair condition and should be regularly maintained in accordance with the airport's pavement maintenance program.

4.3.3 East GA Apron

4.3.3.1 Geometry

The East General Aviation Apron Area (278,200 SF) is located along the west side of Taxiway E-1. There are some leased spaces located here, but this apron is primarily used for FBO overflow parking. The airport will direct a variety of aircraft to park here, including large private jet aircraft (i.e., Gulfstream V, Bombardier Challenger, etc.). The East Apron area has also been used to park military aircraft including the Lockheed C-130 and Boeing C-17 aircraft. Future use of the East Apron area is contingent upon potential cargo operations moving to this location. In the event this happens, there will be a need for more transient aircraft parking capacity at JNU.

This apron serves Glacier Aviation (Airlift Northwest), the Army National Guard, Aero Services, and Wings Airways.

4.3.3.2 Tiedowns

There are no tiedowns on this apron. The East GA Apron is used for transient overflow. In the future, this may become limited in the event Alaska Airlines moves their cargo operation to the East Apron.

4.3.3.3 Surface Condition

According to the 2021 JNU Pavement Inspection Report, the pavement is in good condition and should be regularly maintained in accordance with the airport's pavement maintenance program.

4.3.4 Float Pond Slips

Currently there are 60 float pond slips provided at JNU. According to airport staff not all slips are leased and approximately 20 slips are held open for transient aircraft. There is no need to expand the leased slips as there is typically no waiting list for float pond slips. Most

aircraft utilizing the slips consist of small single-engine piston aircraft. There are also DeHavilland Beaver (DHC-2), DeHavilland Otter (DHC-3), and DeHavilland Twin Otter (DHC-6) aircraft that park and operate from the float pond.

There are no issues reported with the water lane depth. Currently, the float pond is 47 feet deep with the shallowest part being 31 feet deep). When depth becomes an issue, the airport makes arrangement to have the float pond dredged.

4.3.5 Lease Lots and Hangars

An estimated **XXX based aircraft** are stored in hangars, including aircraft used for business and recreational purposes. At the time of this report, current lease lots and hangar spaces were reported to be full. According to airport staff, JNU has a memo out offering to allow new hangars to be built. To-date, the airport has not heard from any interested parties. Airport staff has indicated that those on the waiting list would prefer to wait for a leased space to open up than incur the capital expense of building new hangar.

4.3.6 Total Aircraft Parking

Table 4-13 shows a forecast of aircraft parking demand for GA wheeled aircraft, floatplanes, and aircraft in hangars over the 20-year planning horizon.

Year	Based Aircraft	West Apron		East Apron		Floatplanes
		Wheeled Tiedowns	Aircraft on Lease Lots	Wheeled Tiedowns	Aircraft on Lease Lots	
2023	270	18	TBD	0	TBD	60
2043	332	24	TBD	0	TBD	60

Source, APG, 2025

4.3.7 Aircraft Fueling

No unmet demand reported. This is primarily due to other carriers (Alaska Seaplanes and others) having their own fuel supply. The most prominent related issue is fuel storage capacity. The current capacity represents approximately 1 to 2 days of fuel supply. Currently, there is interest by a new fuel supplier, Petro Marine, who would like to build enough fuel capacity to add 100,000 gallons of fuel, roughly a seven-day supply.

4.3.8 Aircraft Wash

There is a 2,500 square-foot airport wash rack located near the Civil Air Patrol hangar on the airports east side; however, it is currently closed. According to airport staff, there is no way to monitor, manage, or charge for use of the wash facility.

4.4 Passenger Terminal Area

4.4.1 Central Apron

The Central Apron is located northeast of the intersection of Taxiways A and C. The apron is divided into two aircraft parking areas supporting passenger service at JNU, one serving Part 121 operators and the second serving Part 135 carriers.

4.4.1.1 Part 121 Apron

The Part 121 Apron area is located on the south side of the passenger terminal and consists of approximately 15,088 square yards of asphalt pavement for the parking and maneuvering of commercial aircraft utilizing the nearby passenger terminal facilities. Aircraft access to this area is by way of Taxiways A, C, and C1.

The apron offers five aircraft parking positions designed to accommodate Boeing 737 (ADG-III) aircraft. Aircraft power-in to their assigned gates and are pushed back. It is important to note that the alignment of the jet bridges has been modified to accommodate B737 Max10 aircraft. Currently, the Part 121 Apron accommodates air carrier operations, projected to grow at an annual rate of 2.30 percent over the 20-year forecast period. The air carriers, Alaska and Delta, are not expecting a change in the aircraft fleet size that operates at JNU during this period. The Part 121 Apron satisfies existing demand and can accommodate forecasted air carrier activity during the planning period. In the event that an additional air carrier enters the JNU market, or the airlines update their operational fleet mix in the future, the expansion of the apron will need to be reevaluated as part of an updated Terminal Area Study.

4.4.1.2 Part 135 Apron

The Part 135 Apron Area is situated between Taxiway C and the northern wing of the passenger terminal and consists of approximately 23,782 square yards of asphalt pavement. This apron area provides four rows of aircraft parking positions associated with Part 135 air carrier, air cargo, and general aviation activities. Each row is capable of accommodating power in/power out movements of four aircraft. The Part 135 Apron satisfies existing demand and can accommodate forecasted air carrier activity during the planning period.

A vehicle service road (VSR) is located near the perimeter of the apron along the building side of the aircraft parking rows. Part 135 passengers are escorted, and baggage is transferred between the terminal and aircraft by air crew or another airline employee.

4.4.1.3 Cargo Apron

The Central Apron area to the west of the Passenger Terminal serves the needs of the air cargo carriers including Alaska Airlines and Alaska Seaplanes. Alaska Airlines maintains a cargo facility consisting of two buildings from which the airline processes freight. Alaska uses a designated aircraft parking position for all-cargo aircraft processing on the central terminal apron; however, the position is available for others when not in use. Belly freight on Alaska Airlines aircraft is loaded and unloaded at the terminal gates.

The regional cargo carrier operations (FedEx and Alaska Central) also take place on the northern portion of the Central Apron area.

4.4.2 Passenger Terminal Building

The airport is served by a passenger terminal facility encompassing approximately 94,200 square feet of space. This facility is composed of a two-story north wing that primarily accommodates Part 135 air carrier operations (Alaska Seaplanes) and a two-story east wing that accommodates facilities for Part 121 air carriers (Alaska and Delta). The terminal is equipped with all the amenities required of a commercial service terminal, including an integrated Airport Traffic Control Tower (ATCT).

Following an airport site visit and meetings with the airport and air carrier representatives, a general capacity assessment of the terminal building facilities was conducted. The main findings were based on the current operations, needs of the air carriers, and potential requirements to serve future demand.

The terminal building serves the passengers transported by the commercial service airlines: Alaska and Delta which have historically operated Boeing 737 aircraft at JNU. As of 2023, aircraft configurations operating at JNU range from 124 to 178 seats with the potential for increased flights by aircraft with seating capacities in the upper portion of that range in the future. The forecasts of aviation activity contained in Chapter 3 indicate that in 2023 JNU moved 465,378 enplaned passengers and expect that number to grow by 2.30 percent annually during the forecast period reaching 732,306 enplaned passengers in 2043.

An operations peak hour analysis was evaluated; however, a detailed commercial passenger peak hour analysis was not developed for this master plan update. According to the aviation activity forecast, approximately 14 percent of operations at JNU correspond to scheduled CFR Part 121 air carrier activity.

To evaluate the terminal building requirements, it is assumed that from the total airport operations, the Part 121 commercial apron will serve 3 to 4 commercial aircraft operations simultaneously by the critical aircraft during the design peak hour.

Ticketing: Each airline (Alaska and Delta) has an assigned number of counters required for to process enplaning passengers and checked baggage. The queue area is sufficient to accommodate the peak hour demand of departing passengers as the adoption of new technologies allows some passengers to proceed directly to the security screening process.

Outbound Baggage Screening: This area is used for processing bags that are checked in at the Ticketing area. Alaska Airlines operates a separate induction belt to transport baggage to the secure TSA screening and sorting areas. Delta Air Lines transfers baggage via carts to manually deliver the bags to the TSA screening area. Although the existing screening equipment and configuration is sufficient to support current screening operations, the existing outbound baggage screening area is constrained, and the expansion of this area is recommended as part of any future terminal and gate expansion. Further analysis and preliminary design activities associated with this area are recommended and are beyond the scope of this master plan.

Security: JNU has a single security screening checkpoint located at the second level of the Passenger Terminal Building. The checkpoint is supported by three queues and passenger

check-in kiosks, two of which are automated and one of which is staffed. Two baggage screening lanes are provided with one passenger walk-through scanner located between the lanes. These lanes accommodate current passenger levels; however, the queuing area becomes congested during peak-hour operations and extends into the central hall towards the escalators. It is recommended that the passenger queuing area be reconfigured/expanded to improve the overall throughput of the security screening checkpoint in the future.

Holdroom: The terminal currently offers 378 seats in an open holdroom area that is designed to serve each of the five gate areas (Gates 2-6). Following the level of service recommendations prescribed in the International Air Transport Association's (IATA) Airport Development Reference Manual (ADRM), it was determined that the holdroom should provide seating to accommodate between 50 to 70 percent of the aircraft seats provided by the design aircraft each gate serves during the peak hour. As mentioned before, the average capacity of an aircraft operating at the terminal is between 124 and 178 seats. In 2023, Alaska Airlines and Delta Air Lines reported average load factors of 64.36 percent and 50.30 percent, respectively. Considering the national average passenger load factor of 83.7 percent, for an aircraft with 178 seats (Boeing 737-900), a range of 74 to 104 seats per gate area should be offered to provide an optimal level of service, resulting in a total of 370 to 520 seats in the event all five gates are in use. As mentioned previously, it is assumed that JNU currently serves three simultaneous flights during the peak hour. However, there are times when all five gates are occupied due to weather or mechanical delays. Under such conditions when five gates are occupied, the existing holdroom area is insufficient to accommodate peak hour demand conditions with the requirements for an optimal level of service.

It is important to note that the previous JNU Terminal Plan recommended that this area of the terminal be expanded in the future to provide for additional gates and associated passenger services. Currently, the airport has discussed the option of expanding into the existing Food/Bar Concession (Tailwinds) area. This plan would result in an additional 150 seats in support of the existing gate configuration. This improvement is recommended to accommodate future passenger demand during the 20-year planning period.

In the event that an additional air carrier enters the JNU market, or the airlines update their operational fleet mix in the future, the expansion of the holdroom gates will need to be reevaluated as part of an updated Terminal Area Study. Holdroom capacity requirements should be assessed every five years to support future terminal expansion and improvements. Terminal Building requirements are summarized in **Table 4-13**. Additional terminal expansion proposed in previous planning studies will be validated as part of the airport development alternatives phase of this master plan update.

Table 4-14: Terminal Building Requirements	
Category	Requirements
Ticketing	No improvements recommended/adequate for the current number of airlines.
Baggage Screening	Alaska Airlines operates an induction belt to transport the bags to the TSA screening and sorting areas. Delta transfers baggage manually to the screening area. Existing outbound baggage screening area is constrained, and the expansion of this area is recommended as part of any future the terminal and gate expansion.
Security Screening	Queuing becomes congested during peak hours. Reconfiguring/expanding the queuing area is recommended.
Holdroom	Expanding the hold room into the existing Food/Bar Concession (Tailwinds) area is recommended to provide an additional 150 seats in support of the existing gate configuration. Holdroom capacity requirements should be assessed every five years to incorporate additional air carriers or potential changes in airline equipment.
Other Services and Amenities	No Improvements recommended.

Source: Michael Baker International, Inc., 2025

Furthermore, it is advised that a detailed terminal planning analysis be conducted between five to ten years to validate changes in airline business models, load factors, and new services required by the passengers.

4.4.3 Automobile Access and Parking

4.4.3.1 Roadways and Curb Frontage

The terminal curb front experiences congestion during peak periods. This condition is impacted by the following conditions:

- existing configuration which requires a 90-degree turn at the main entrance to the terminal area,
- current mix of private automobiles, taxi/van services, and buses that are loading, unloading, waiting for passengers, or freight deliveries (products), and
- the lack of consistent enforcement of the airport’s no waiting/parking policies.

An additional area for shuttles and busses is provided via an additional curbside located adjacent to the short-term parking lot. It is important to note that all parking facilities associated with new development proposed in this Airport Master Plan Update must meet applicable local code requirements.

A Cell Phone Waiting Lot is also provided next to Honda (formerly Alaska Industrial Hardware) and Shell Simmons Drive as a convenience for people waiting for arriving passengers.

4.4.3.2 Public Parking

The main parking lot located in front of the passenger terminal provides short-, and long-term public parking to accommodate the vehicular parking needs of passengers and visitors as determined by the frequency and nature of the scheduled airline and passenger charter operations. Parking facilities are operated by Republic Parking Systems and all parking lots are accessible via Shell Simmons Drive.

The short-term parking lot has a current capacity of 60 short-term parking spaces and represents approximately 24 percent of total public parking demand. Demand for short-term parking had been reported to exceed the available short-term spaces during peak periods. Parking in this area is also available for the first 15 minutes free of charge. The long-term parking lot has an existing parking capacity of 236 spaces and represents approximately 80 percent of total public parking demand. Within the airport industry, typically 70 to 80 percent of public parking spaces are occupied by long-term parkers because the spaces they occupy turnover infrequently.

The number of passenger and public parking spaces varies greatly depending on the policies of each airport operator. While there is variation based on local conditions, passenger demand has been demonstrated to be related to the number of originating passengers. According to planning guidance contained in ACRP Report 25, *Airport Passenger Terminal Planning and Design*, a general rule of thumb range of 900 to 1,400 public parking spaces is typically required for each million annual enplanements depending upon the type and use of the airport. In addition, it is customary to provide an additional 10 percent more space to account for circulation.

Current passenger enplanements at JNU have surpassed forecasts from the 2017 master plan, therefore, public parking requirements shown in this study have significantly increased by comparison. It is also important to note that the previous study only considered Part 121 passenger enplanements when determining public parking needs. For the purpose of this study, it is assumed that airport public parking facilities are used by Part 121 and Alaska Seaplanes passengers (helicopters not included), and approximately 30 percent of those enplaned passengers are using alternate forms of transportation, such as ride-share and public transportation. To more accurately project public parking requirements, it is recommended that the airport conduct regular passenger surveys to assist in identifying the mode of transportation used by arriving passengers. In the future, it is recommended that public parking needs identified in **Table 4-15** be further evaluated as part of the airport alternatives analysis.

The public parking facilities were recently reconstructed in 2023, and the pavement is in good condition. In the future, these facilities should be regularly maintained in accordance with the airport's pavement maintenance program.

4.4.3.3 Employee Parking

Employee parking associated with the passenger terminal operation is provided northeast of the terminal and adjacent to the long-term parking lot offering approximately 118 parking spaces. The number of employee parking facilities is sufficient. Improvements related to the parking lot location and access control will be evaluated during the analysis of airport alternatives.

Pavement is in good condition and should be regularly maintained in accordance with the airport’s pavement maintenance program.

4.4.3.4 Rental Car Parking

Currently, rental car services are available on airport. Rental car ready/return lots are collocated next to the terminal with ample access to the rental car counters located at the east end of the facility next to the baggage claim area. According to FAA AC 150/5360-13A, *Airport Terminal Planning*, a minimum of 10 ready/return spaces for each rental car agency is recommended. The existing car ready lot/return lot has a capacity of 128 spaces (32 spaces for each of the four rental car companies). However, the 2017 Master Plan applied an industry rule of thumb of approximately one rental car space per 2,000 arriving passengers. For consistency, this ratio was applied to future passenger projections to determine the future need for rental car space as shown in **Table 4-15**. In the future, terminal expansion is slated for this location. Improvements needed to address rental car parking needs, and the potential relocation of rental car parking facilities will be evaluated during the analysis of airport alternatives.

Year	Passenger Enplanements (Not Including Helicopters)	Passenger Enplanements (Requiring Public Parking*)	Short-Term Public	Long-Term Public	Total Public	RAC Ready/Return	Employee
2023	465,378	325,765	60	236	296	128	118
2028	521,209	364,846	73	292	365	261	118
2033	583,753	408,627	82	327	409	292	118
2038	653,817	457,672	92	366	458	327	118
2043	732,306	512,614	103	410	513	366	118

Sources: FAA AC 150/5360-13A, *Airport Terminal Planning*; ACRP Report 25, *Airport Passenger Terminal Planning and Design*.

Note: * For purposes of this analysis, it is assumed that approximately 30 percent of enplaned passengers arrive by other modes of transportation.

4.5 Airport Support Facilities

The following outlines the airport facilities necessary to support the airfield, terminal/fixed base operator area, air cargo area, and GA areas and their related activity, including aircraft fueling, airport maintenance, ground access, and vehicular parking.

4.5.1 FAA Facilities

The Airport Traffic Control Tower (ATCT) / Flight Service Station (FSS) facility is located in airport owned space within the terminal complex. According to FSS staff, it is located in an older portion of the complex and has problems with the HVAC and drinking water supply. The age of this portion of the terminal facility has not been determined but referencing Table 1.1 and the previous airport master plan, prior to the terminal reconstruction project that

occurred in 2020-2023, the existing ATCT/FSS space may date to a terminal reconstruction project in 1984.

The current ATCT location at the “elbow” of the terminal is not considered to be the optimal long-term location. As the airport continues to develop the terminal, the location and height of the tower will continue to be a factor limiting development options. The tower may need to be relocated to facilitate operational safety and long-term development opportunities. The previous (2019) airport master plan recommended encouraging FAA to relocate the ATCT to a site along Shell Simmons Road, east of the terminal building.

4.5.2 Federal Inspection Services (FIS) Facilities

At present, the U.S. Customs and Immigration Service operates from facilities located in the north section of the terminal building. From these, they are available to process general aviation international flights at the airport. The FIS was most recently expanded as part of a terminal reconstruction project in 2020.

4.5.3 Fuel

There are no known needs or deficiencies regarding the fueling facilities on the Part 135, Part 121, or Part 95 (GA) aprons.

4.5.4 Airport Rescue and Fire Fighting

ARFF Index C requires that the JNU ARFF facility have a minimum of three vehicles that combined can carry 3,000 gallons of water and the commensurate quantity of Aqueous Film Forming Foam agent (AFFF) for foam production. In addition, at least one of the abovementioned vehicles must contain either 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.

4.5.5 Airport Maintenance Facilities

The anticipated but currently unfunded expansion of an existing heavy maintenance equipment building will result in the need to replace approximately 14,000 square feet of office space for airport maintenance staff. An additional 14,000 square feet of storage space is also needed for the storage of existing light duty equipment.

4.5.6 Snow Removal Equipment Facilities

The airport currently has and maintains snow removal equipment in accordance with 14 CFR 139.313, *Snow and Ice Control*. A new SREF was erected in 2016 and new equipment purchased in 2017. A new Sand and Chemical Storage Building was constructed nearby in 2018. No further unmet equipment or storage needs have been identified.

The construction of a potential new cargo facility is anticipated to eliminate a 300,000 square-foot area currently used for snow storage. In designing a new snow storage area, an additional allowance should be made for snow that is currently being trucked from the

aprons on the north side of Runway 8-26 across the airfield to the southwest end of the floatplane basin for storage.

4.5.7 Ground Access

A project to improve landside access was implemented in 2022. No further needs have been identified beyond monitoring the pavement condition index for landside access infrastructure.

4.5.8 Vehicle Parking

Leaseholders on the Part 91 aprons should be required to provide adequate vehicle parking on their lease lots for activity generated by their operations.

4.5.9 Fencing and Wildlife Control

The airport fencing south of the float pond has gaps. The large gaps in the fence are both a security issue and a wildlife issue, as bear and deer have utilized the woodlands south of the float pond. The vicinity of the woodlands to the aircraft movement areas makes it easy for deer and bear to come onto the movement areas. Completion of the security fence on the southern border will connect the fence from Gate A on the southwest corner of the airfield to Gate V on the east end of the float pond. Completely encompassing the woodlands south of the float pond will reduce accessibility for deer and bear to the airfield.

Fencing is also needed along the Jordan Creek Greenbelt area located along the north boundary of the airport property (Yandukin). However, this area is preserved under a 1980s Corps of Engineers Permit associated with the extension of the taxiway and Crest Avenue (access for ARFF). Due to current local code, airport staff has experienced difficulty maintaining the area to reduce homeless encampments, crime and other illegal/unauthorized use. This represents a constant cleanup and strain on airport crew resources. Potential solutions to address this situation will be further evaluated in the airport alternatives phase of this study.

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4.6 Summary of Facility Requirements

Table 4-16 summarizes recommendations to satisfy JNU’s facility requirements.

Table 4-16: Summary of Facility Requirements	
Category	Requirements
Airfield Capacity and Configuration	No improvements recommended.
Design Aircraft and Airport Reference Code (ARC)	Existing/Future - B737-900 (D-III)
Runway Orientation and Wind Coverage	No improvements recommended.
Runway Length	Lengthen Runway 8-26 to 9,200 ft
Runway Strength	No improvements recommended.
Protection of Navigable Airspace	Required Navigation Performance (RNP) procedures should be included in ALP set as requested by the FAA.
Instrument Approaches and Runway End Siting	IAPs - To be determined in alternatives analysis.
Runway Design Standards	No improvements recommended.
Runway Protection Standards	No improvements recommended.
Taxiway/Taxilane Design Standards	Maintain width/configuration of Taxiways B, C, and G. Maintain Taxiways D and E to enable smaller aircraft to exit the runway sooner to help relieve congestion.
Airfield Lighting	Replace Incandescent Runway Edge Lights with LED
Airfield Markings	No improvements recommended.
Airfield Signage	No improvements recommended.
Visual Navigational Aids	No improvements recommended.
Apron	Apron expansion in the East and West GA Areas to be determined in alternatives analysis.
Terminal Apron	Additional RON parking to be determined in alternatives analysis.
Terminal Building	Baggage Handling Improvements and expansion of queuing area to the Security Screening Check Point is recommended. Evaluate Holdroom expansion/improvements every 5 years.
Based Aircraft Storage	Additional aircraft storage (GA tiedowns) recommended.
Fueling Facilities	There are no known needs or deficiencies regarding the fueling facilities on the Part 135, Part 121, or Part 95 (GA) aprons.
Automobile Access	Regularly maintain pavement and markings and provide technology enhancements.

Table 4-16: Summary of Facility Requirements	
Category	Requirements
Automobile Parking	Public and Rental Car parking improvements are recommended. Leaseholders on the Part 91 aprons should provide adequate vehicle parking on their lease lots for activity generated by their operations.
Airport Maintenance	Expansion of an existing heavy maintenance equipment building will result in the need to replace approximately 14,000 square feet of office space for airport maintenance staff. An additional 14,000 square feet of storage space is also needed for the storage of existing light duty equipment.
Snow Storage	In anticipation of the construction of a potential new cargo facility on the airport's east side, the 300,000 square foot area being used for snow storage should be placed in another location. Allowance should be made for snow that is currently being trucked from the aprons on the north side of Runway 8-26 across the airfield to the southwest end of the floatplane basin for storage.
Wildlife Fencing	Recommend completion of the security fence on the southern border to connect the fence from Gate A on the southwest corner of the airfield to Gate V on the east end of the float pond. Recommend fencing improvements to reduce homeless encampments, crime and other illegal/unauthorized use in the Jordan Creek Greenbelt area.

Source: Michael Baker International, Inc., 2025

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5 AIRPORT ALTERNATIVES

This section includes the development of graphical alternatives which depict methods to either resolve deficiencies or to construct new facilities as necessary to meet future demand expectations at Juneau International Airport (JNU). The alternatives include potential improvements to both airside and landside facilities and also include a review of surrounding land use compatibility.

This chapter introduces the preliminary alternatives for the Juneau International Airport, which are intended for discussion purposes between the various stakeholders including City and Borough of Juneau (CBJ), the Technical Advisory Committee (TAC) for this project, and the public. The individual components of each preliminary alternative were evaluated to aid in the selection of a preferred airport development alternative that represents the desired development plan for the 20-year planning period. For that reason, the preliminary alternatives should be viewed as flexible development plans that may be refined or combined to best satisfy the needs of the airport's stakeholders. The main intent of the preliminary alternatives is to evaluate realistic airfield development options that would satisfy the facility requirements identified in the previous chapter and to analyze the aviation and non-aviation development and redevelopment possibilities of airport property. The preferred airport development alternative, as presented in Chapter 6, will also illustrate the recommended layout of all landside developments, such as the passenger terminal, air cargo facilities, hangars, aprons, and support facilities. The preliminary alternatives should subsequently be viewed as a broad examination of the relationships between required and desired airside and landside developments in order to provide a clear understanding of the airport's possibilities and limitations.

As this section presents development options for

The following elements are covered within this chapter:

- Development Considerations
- Land Use Analysis
- Airfield Analysis
- Airspace Considerations
- Terminal Area
- Northeast Development Area
- Northwest Development Area

5.1 Alternatives Analysis Process

The alternatives analysis process is based on guidance provided in the Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*. The development and analysis of alternatives incorporates input from JNU, stakeholders, and the general public. An organized approach to identifying and evaluating a variety of alternatives is essential to effective planning. This includes identifying a standard set of evaluation criteria based on the goals and objectives of the master plan and existing constraints which will impact the development of alternatives.

In AC 150/5070-6B, the FAA recommends a standard set of criteria to evaluate development alternatives according to an airport’s unique situation. The evaluation process should feature “generally accepted planning principles, be replicable, consistently applied, and documented.” As a result, a set of evaluation criteria were established for use in this alternatives analysis. The criteria are strategic, qualitative, and quantitative to ensure that the evaluation process remained at a master planning level of detail. The selected criteria shown in **Table 5-1** Evaluation Criteria include:

Table 5-1: Evaluation Criteria	
Criteria	Definition
Achievement of Objective	This criterion is based on achieving the specific need identified in the Facility Requirements chapter. Alternatives are assessed based on the degree to which they satisfy the objective.
Airport Design Standards	The proposed development should satisfy applicable airport design standards and maintain or improve the safety and efficiency of the airport.
Flexibility	The alternative should support a reasonable level of flexibility to accommodate changes in demand and include the ability to expand in the future.
Collateral Impacts	This criterion evaluates the extent to which an alternative requires changes or improvements to existing airport facilities which otherwise would not require changes or improvements (e.g., Relocation of a road that is impacted by a general aviation alternative is considered a collateral impact).
Probable Cost	The preferred alternative should be cost effective, within the means of JNU to secure funding, and minimize the long-term financial commitment by JNU or its tenants.
Efficiency of Construction Phasing	Construction of the proposed improvements should be implemented without undue interference to existing operations. As future development options are considered, JNU must consider the ability to stage materials and construction equipment on or near the airport as the airport is space constrained.
Environmental Compatibility	The preferred alternative should be consistent with environmental regulations and minimize impacts to the environmental impact categories identified in FAA Orders 1050.1F, Environmental Impacts: Policies and Procedures Desk Reference, and 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions. Future development should support growth while minimizing impacts to the environment.

Source: AC 150/5070-6B; Michael Baker International, 2025

5.2 Development Considerations

Land uses on and near the airport property consists of airport-related infrastructure, commercial and industrial developments. There are a few uses of land surrounding JNU that would be incompatible with the continued expansion of the airport's airfield and landside facilities (e.g., residential development, wildlife/fish habitat and recreational areas).

As the current runway configuration is adequate, further expansion is being considered to meet future needs. There are also vehicle and utility access limitations to some portions of the airport property that would need to be addressed in order to maximize the development potential of the property. As shown in **Figure 5-1**, there are several wetlands, streams, and protected lands within the project area.

Key considerations during the airport alternatives development process include:

- Mendenhall Wetlands State Game Refuge
- Mendenhall Refuge Trail
- Wetlands and Anadromous Streams

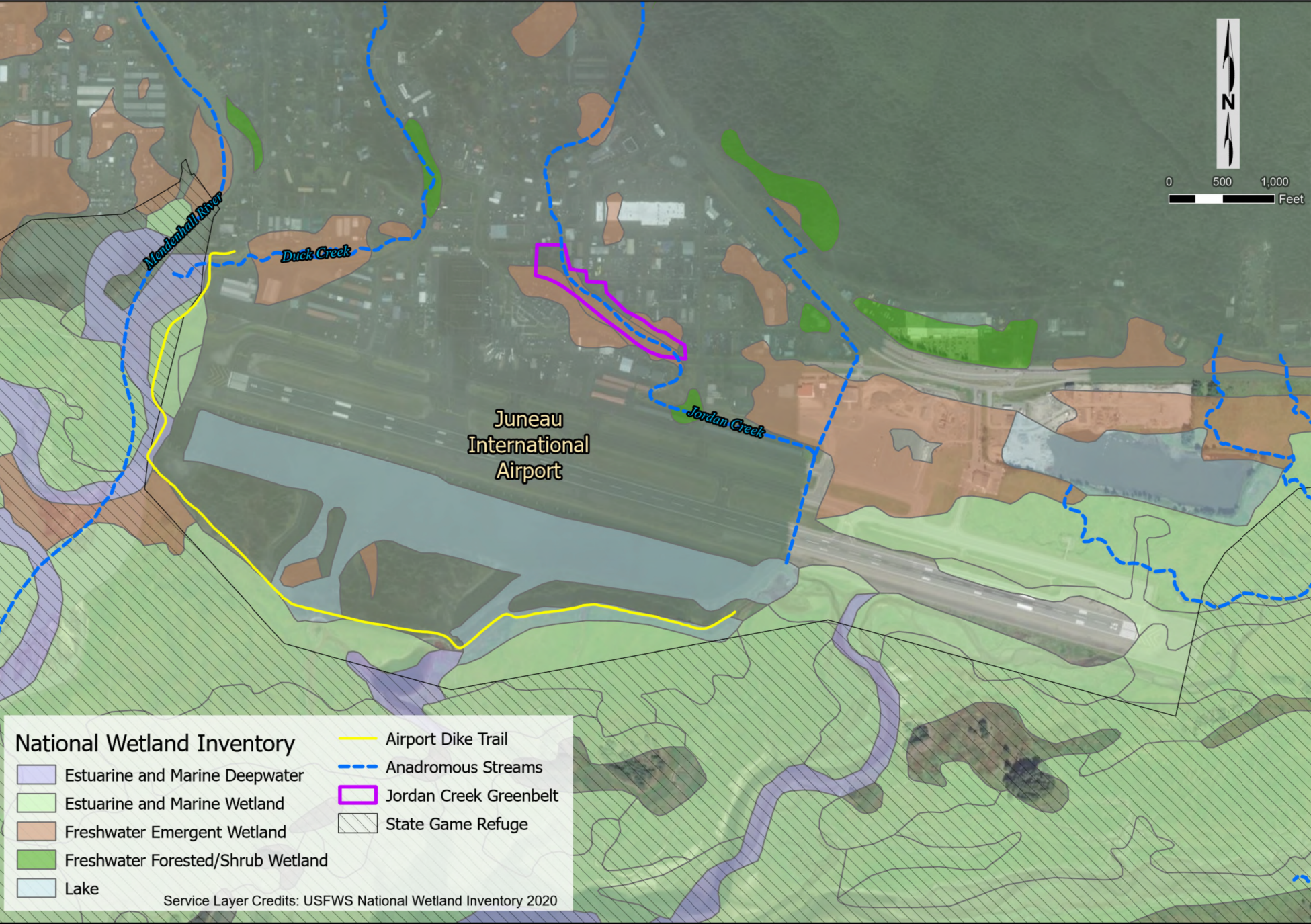
Potential environmental concerns are more fully discussed in Appendix A, Environmental Overview. If possible, new development should be avoided within these areas. Specific development areas identified in this analysis are more fully addressed in Chapter 6, Refinement of Alternatives. In addition, there is the potential for threatened and endangered species to be present in these areas.

5.3 Airfield Analysis

The JNU airfield system includes two parallel runways (paved and water), one main parallel taxiway, apron areas, and other facilities. According to FAA design standards, Runway 8-26 and Taxiway A meet the infrastructure requirements associated with Runway Design Code (RDC) D-III. The RDC has two components, D which indicates the aircraft approach category (AAC), and III, which indicates the airplane design group (ADG). The AAC is based on the aircraft approach speed, which in this case, the approach speed is less than 166 knots. The ADG is determined by the aircraft wingspan and tail height. For ADG III, the tail height is less than 45 feet, and the wingspan is less than 118 feet. The most common aircraft types in this category currently operating at JNU include the Boeing 737-700/800/900 series aircraft, among others. The RDC is used for planning and design purposes only and does not limit the aircraft that may operate safely at the airport.

This Master Plan Update revisited the previous runway length analyses and revalidated the requirements to accommodate the current critical aircraft (Boeing 737-900) and to fulfill JNU's current aviation role. After this review, it was determined that an extension of Runway 8-26 would be needed to accommodate critical aircraft operations at JNU.

In the following sections, this Master Plan Update evaluates alternatives to extend Runway 8-26 and to improve the operational efficiency of the airfield based on the FAA-approved operations forecast and airport needs detailed in the previous chapters.



5.3.1 Runway 8-26

Following the revision and update of the runway length analyses, the results determined that an extension of Runway 8-26 from 8,857 feet to 9,200 feet is recommended. Due to physical constraints to the west of Runway 8 (i.e., Mendenhall River, topography, etc.), the future shift/extension of the runway to the east must be considered. As previously indicated, JNU does not meet the required Runway Safety Area (RSA) length of 1,000 feet beyond the departure ends of the runway.

As a result, this development option addresses these issues by shifting the Runway 8 threshold 400 feet to the east, to correct the RSA deficiency, and shifting the Runway 26 threshold 743 feet to the east to achieve a future runway length of 9,200 feet. The RSA would also extend 1,000 feet beyond the Runway 26 threshold. The resulting approach end of Runway 26 would be 23.16 feet MSL using extrapolation of the existing longitudinal slope. The proposed development results in an additional land platform measuring 2,343 feet in length (approximately 40 acres) with varying widths. It is also estimated that approximately 100 feet of embankment around the proposed development is provided for stabilization and erosion protection.

The Runway 26 MALSR, anticipated to be fully in place around 2026, will need to be relocated with the future extension. The runway extension will include 220-foot by 140-foot blast pads to comply with RDC D-III design standards. As a result of the proposed actions, runway markings and lighting will need to be removed and relocated.

Runway 8-26 will continue to be categorized as RDC D-III with non-precision instrument approach capability due to the challenging local airspace environment. As a result, the required runway to taxiway separations and associated critical areas are being preserved in the proposed airfield development option.

Highlights of the proposed airfield development are summarized in **Figure 5-2** and **Table 5-2**.

5.3.2 Taxiways

Taxiway B will be relocated 400 feet to the east to align with the relocated threshold of Runway 8. This action will also warrant the future relocation of Taxiway B1 to avoid direct access between the Northwest Development Area (NWDA) and the runway environment. Parallel Taxiway A will be extended by 743 feet to the east and Taxiway G will be relocated to serve the relocated end of Runway 26. The proposed taxiway improvements serving Runway 8-26 will improve the movement of aircraft, creating the ability for arriving and departing aircraft to operate without traffic interruption.



LEGEND	
ITEM	DESCRIPTION
	PROPERTY LINE
	RUNWAY SAFETY AREA (C-III)
	RUNWAY OBJECT FREE AREA (C-III)
	RUNWAY PROTECTION ZONE
	FUTURE PAPI-4
	PAVEMENT TO BE DEMOLISHED
	FUTURE AIRFIELD PAVEMENT
	FUTURE AIRFIELD SHOULDER

Table 5-2: Airfield Analysis Highlights

Option	Highlights	
	Advantages	Disadvantages
Extend Runway 8-26 to the East	<ul style="list-style-type: none"> • Achieves 9,200-foot runway length requirement • Full length 1,000-foot RSAs are provided to resolve non-standard conditions. • The closest Juneau Douglas North Crossing (Sunny Point Alternatives) does not impact the proposed airfield development 	<ul style="list-style-type: none"> • Impacts to local environs (rerouting of streams) • Requires additional land acquisition • Requires relocation of MALSR and MALSF • Requires the relocation of Taxiway B, Taxiway B1, and Taxiway G • Runway markings, lighting, and visual aids to navigation will need to be removed and relocated. • Increased cost associated with additional earthwork and pavement required.

Source: Michael Baker International, Inc., March 2025

5.4 Airspace Considerations

One of the key planning needs to be addressed in this Master Plan Update is to provide CBJ with the capability to respond to other area-wide planning considerations or actions that may potentially impose adverse impacts to the preservation of JNU. One such plan includes the Alaska Department of Transportation and Public Facilities’ (DOT&PF) Juneau Douglas North Crossing Planning and Environmental Linkages (PEL) Study. DOT&PF is currently considering six crossing alignments as part of the PEL Study. The closest proposed alignment of the Juneau Douglas North Crossing (Sunny Point Alternatives) was evaluated to determine potential impacts due to the proposed airfield development considered in this study.

For the purpose of this airspace analysis, commercial aircraft operations departing Runway 8 to the east routinely fly over an area currently being considered for one of the Juneau Douglas North Crossing alignments. The Sunny Point Alternatives are the closest alignment to JNU, located approximately 2,650 feet from the proposed end of Runway 26.

Federal Aviation Regulation (FAR) Part 25 requires a two-engine Transport Category Aircraft to be able to climb at a slope of 62.5:1 with one engine inoperative in order to receive its operating certificate from the FAA. Being a minimum aircraft certification performance standard, the surface has nothing to do with clearing obstacles. However, the FAA also uses a 62.5:1 slope as an Obstacle Identification Surface. The 62.5:1 slope helps airlines plan safe takeoff weights and routes to avoid these obstacles.

At times, a 62.5:1 Departure Zoning Surface with a 15-degree splay is used by some international airports throughout the US to identify obstacles that could pose a risk during an emergency takeoff scenario where an aircraft loses one engine.

This study offers a (non-FAA) planning-based analysis regarding the need to identify and protect existing and future navigable airspace to and from Runway 8 with respect to the potential development of other roadway/bridge structures in proximity of JNU.

For this analysis, it is assumed that the proposed causeway bridge is approximately 17 feet MSL high with a 17-foot vertical adjustment of the traverseway to accommodate the passage of vehicles (34 feet MSL total). Based upon the proposed Runway 26 end elevation of 23.16 feet MSL, the elevation of the 62.5:1 surface at the closest point of intersection with the crossing is determined to be 61.31 feet MSL. This results in a vertical clearance distance of 27.31 feet between the roadway and the 62.5:1 surface.

5.5 Terminal Area

In addition to the facility needs identified in Chapter 4, recommendations from the 2017 master planning effort were also revalidated and considered. The following key elements were considered in the development of the terminal area alternatives:

- Providing for future terminal expansion
- Expansion of the baggage induction belt to support outbound baggage screening
- Increasing the TSA Security Checkpoint queue area
- Expansion of the passenger hold room
- Improving automobile parking capacity to support the Terminal Area
- Future Airport Traffic Control Tower siting
- Maximizing the use of existing terminal area facilities

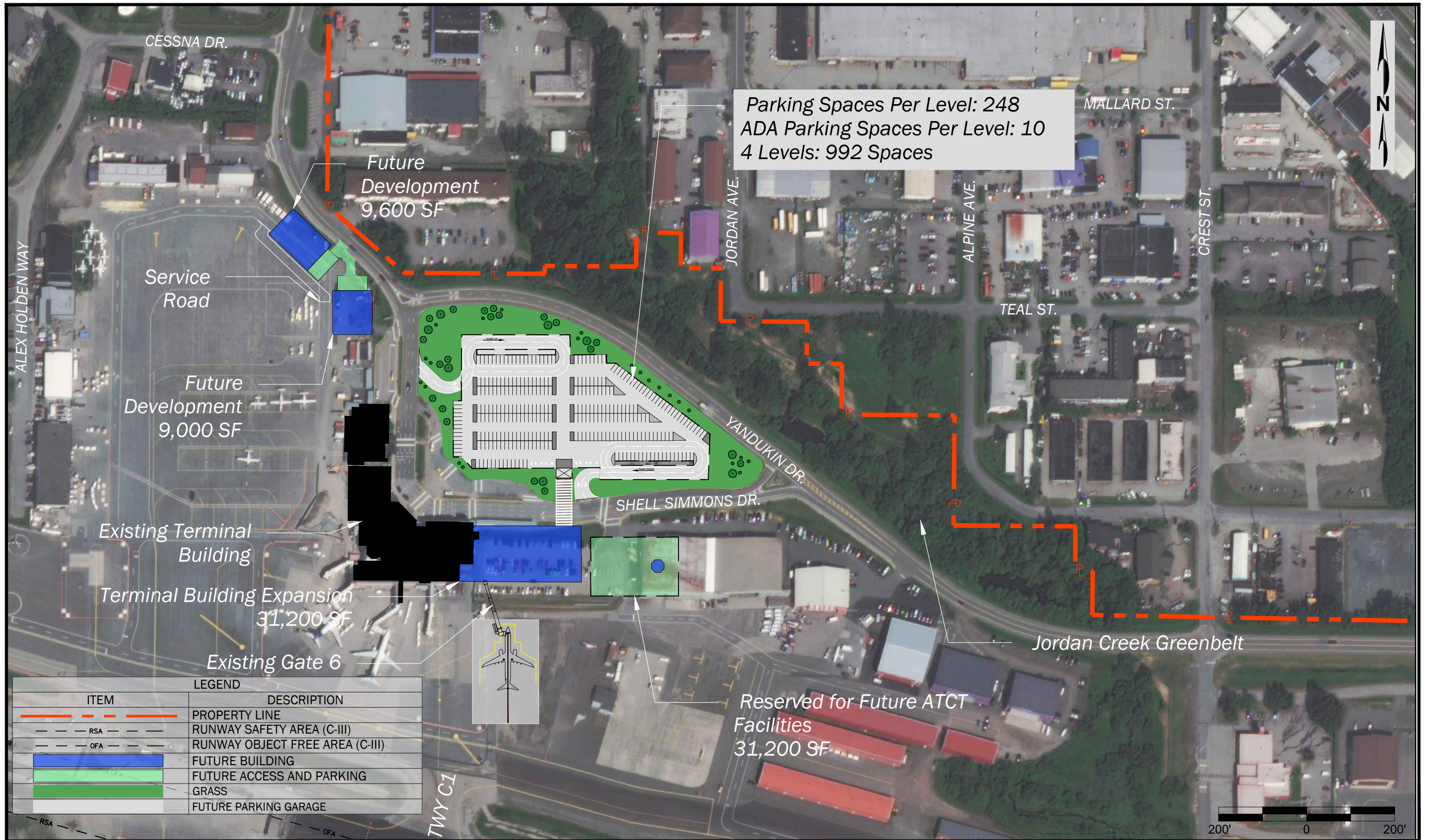
Highlights of the proposed Terminal Area development are depicted in **Figures 5-3, 5-4, and 5-5** and summarized in **Table 5-3**.

5.5.1 Passenger Terminal

Previous planning efforts at JNU, the 2004 Terminal Feasibility Study, and the 2017 Master Plan Update, have recommended the expansion of the passenger terminal (two levels) to the east over the area currently occupied by the Rental Car Parking Lot.

This proposed development and associated recommendations were analyzed and revalidated as part of this Master Plan Update. It was determined that the area east of the existing terminal (shown in **Figure 5-3**) would best serve the airport's long-term terminal development and aircraft parking needs. Therefore, the existing rental car parking facilities will need to be relocated to another nearby on-airport location.

Expansion of the terminal would satisfy the long-term needs associated with the passenger hold room and gate area, security screening, ticketing, baggage make-up and screening, baggage claim, concessions, and support facilities. Since it has been over 20 years since the last focused study of the passenger terminal, it is recommended that the airport conduct a Terminal Area Planning Study within the next five years to better determine the development triggers and phasing associated with the future expansion of the passenger terminal.



5.5.1.1 Outbound Baggage Screening

This area is used for processing bags that are checked in at the Ticketing area. Alaska Airlines operates a separate induction belt to transport baggage to the secure TSA screening and sorting areas. Delta Air Lines transfers baggage via carts to manually deliver the bags to the TSA screening area.

In an effort to enhance baggage security and streamline the processing of baggage, it is recommended that the existing baggage induction belt be expanded to support the Delta Air Lines ticketing area as shown in **Figure 5-4**. In order to accomplish this improvement a hallway is provided to gain access to the Alaska and Delta offices. Reconfiguration of the airline offices would be necessary to accommodate the hallway improvement.

5.5.1.2 Security Checkpoint

JNU has a single security screening checkpoint located at the second level of the Passenger Terminal Building. The checkpoint is supported by three queues and travel document check kiosks. As noted in Chapter 4, Facility Requirements, the queuing area becomes congested during peak-hour operations and extends into the central hall towards the escalators.

As a result, the passenger queuing area shown in **Figure 5-5** and **Figure 5-6** are reconfigured and expanded to improve the overall efficiency of the security screening checkpoint in the future.

5.5.1.3 Passenger Hold Room Expansion

The terminal currently offers 378 seats in an open holdroom area that is designed to serve each of the five gate areas (Gates 2-6). As mentioned in Chapter 4, it is assumed that JNU currently serves three simultaneous flights during the peak hour. However, there may be times when all five gates could be occupied due to weather or mechanical delays. Under such conditions when five gates could be occupied, the existing holdroom area is insufficient to accommodate peak hour demand conditions with the requirements for an optimal level of service.

It is important to note that the 2004 JNU Terminal Plan recommended that this area of the terminal be expanded in the future to provide for additional gates and associated passenger services. Currently, the airport has discussed the option of expanding into the existing Food/Bar Concession (Tailwinds) area. This plan would result in an additional 150 seats (528 seats total) in support of the existing gate configuration, as shown in **Figure 5-6**. This improvement is recommended to accommodate future passenger demand during the 20-year planning period.

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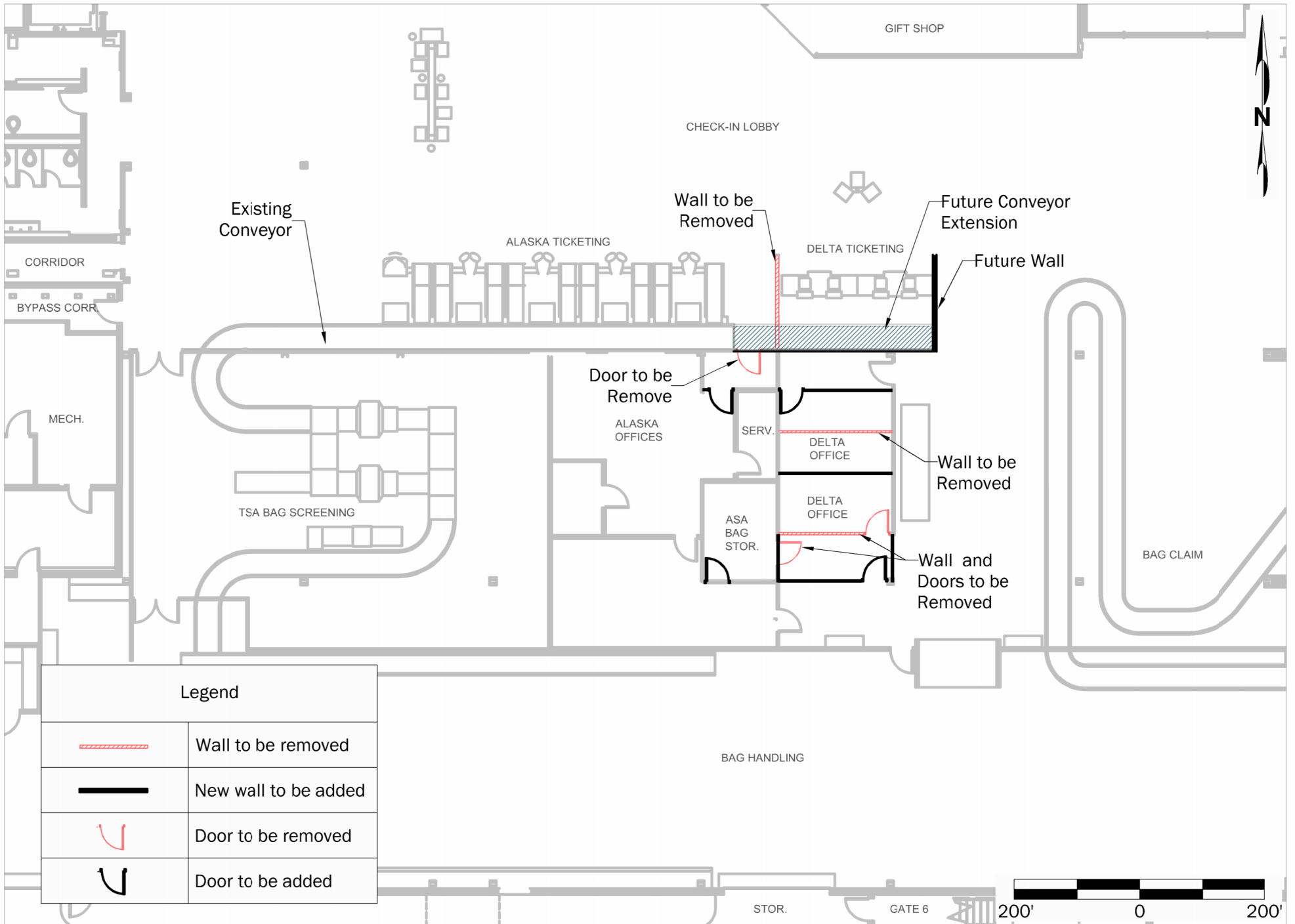
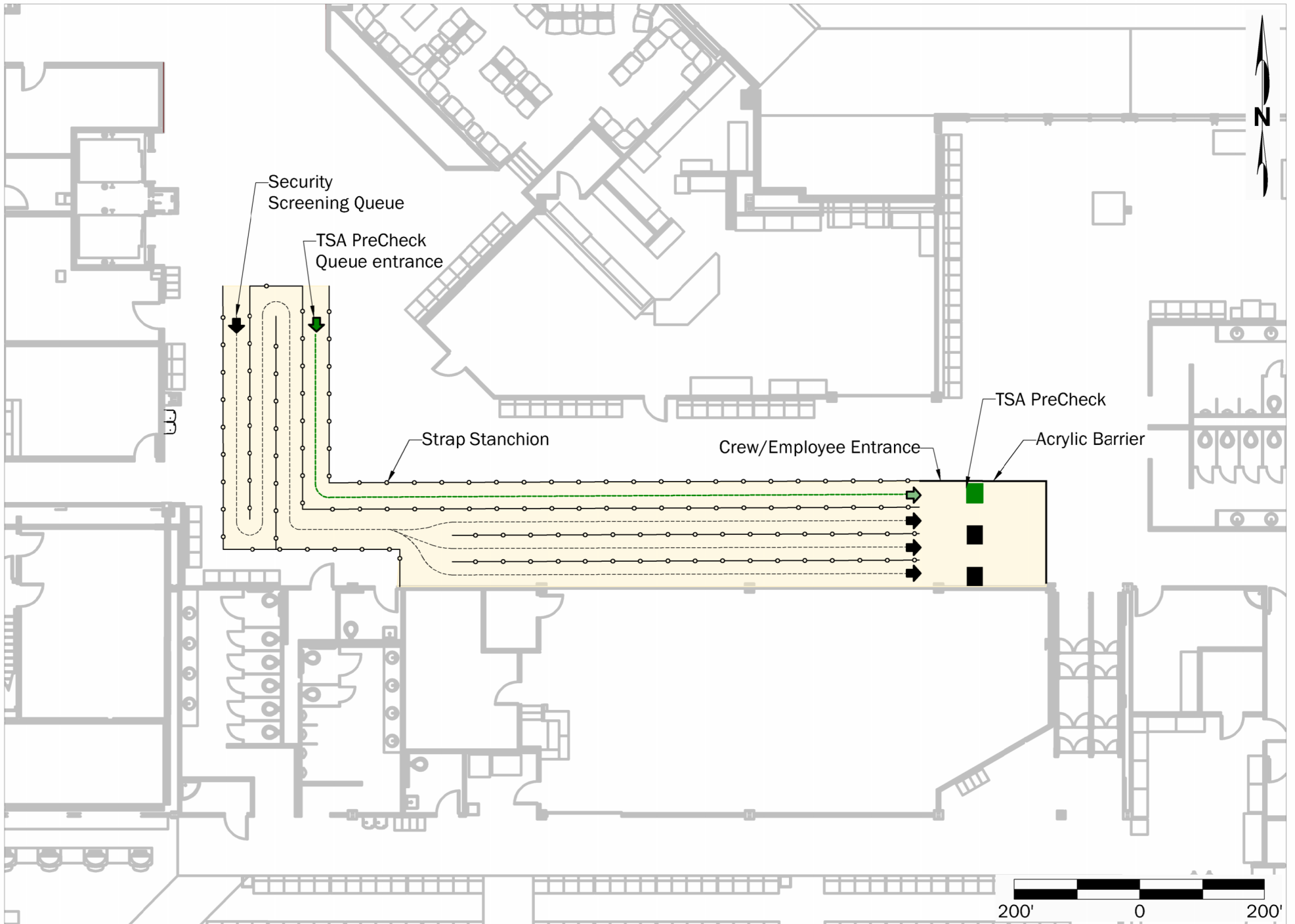
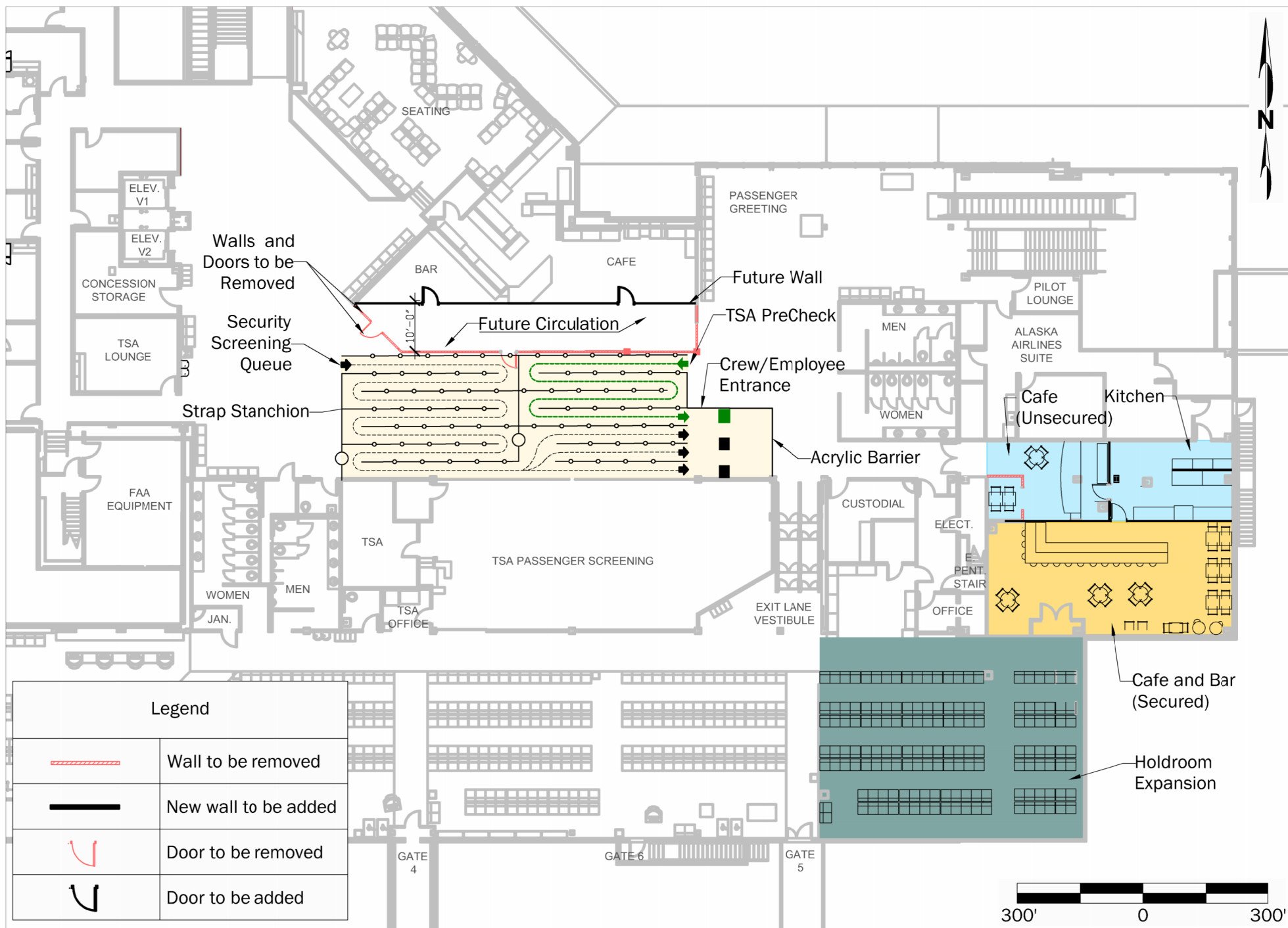


Figure 5-4: Passenger Terminal Development – Level 1

Figure 5-4





5.5.2 Aircraft Parking

In the future, the Part 121 Apron will continue to accommodate movement and parking for a total of five ADG D-III passenger aircraft (i.e., up to the Boeing 737 MAX 10). Since completion of the 2017 Master Plan, the fifth aircraft parking position (Gate 6) was established east of Gate 5 and is incorporated into this update. Gate 6 is currently a ground-boarded aircraft parking position. In the future, a passenger boarding bridge will be provided in conjunction with the future expansion of the passenger terminal.

In the 2017 study, this area was originally slated to accommodate two remain overnight (RON) aircraft parking positions capable of accommodating the critical design aircraft (Boeing 737-900). With the establishment of Gate 6, other areas of the airport are being considered to address the need for RON commercial aircraft parking positions.

After evaluating the apron capacity in contrast to the forecast demand and the fleet mix, it was established that the existing Part 121 apron is capable of accommodating forecast demand throughout the 20-year planning horizon of the Master Plan Update. However, as the passenger boarding bridges (PBBs) achieve their useful life, the airport should incorporate PBB replacement into their Capital Improvement Program.

5.5.3 Vehicle Parking

As identified in the previous chapter, the expansion of vehicle parking facilities is required to meet JNU's future public, employee, and rental car parking needs. The current area used for public and employee parking is not sufficient to accommodate the airport's long-term parking needs. Therefore, construction of a multi-level parking structure is proposed over the existing public parking lot to accommodate future public, employee, and rental car parking requirements. The proposed four-level parking garage facility shown in **Figure 5-3** is capable of providing parking for a total of approximately 992 parking spaces (248 spaces/level), maximizing the use of available property to meet JNU's future parking needs. The first level would support rental car operations, and the remaining levels would be used for public and employee parking. Ingress and egress access to the parking facility would be provided via Shell Simmons Drive. Employee access would be available from Yandukin Drive. It is important to note that the parking structure will need to be constructed prior to the future expansion of the passenger terminal to support staging of materials and phasing of the project. It is expected that the parking garage would have a height of approximately 48-50 feet, not impacting any Part 77 imaginary surface.

5.5.4 Airport Traffic Control Tower

The current age of the Airport Traffic Control Tower (ATCT) makes it a candidate for replacement by the FAA. According to the 2017 Airport Master Plan Update, the existing location at the "elbow" of the passenger terminal was not determined to be the optimal long-term location as it may limit some of the airport's future development options.

As part of this Airport Master Plan Update, the northern ATCT location (31,200 square-foot site) was reaffirmed as shown in **Figure 5-3**, pending validation by the FAA. Considering the development options proposed in this study, this site continues to meet line of sight criteria, supports good aircraft recognition, and meets the requirements associated with airspace, utilities, and access considerations.

The current FAA Equipment Area located in the second level of the Terminal building will be relocated to the proposed ATCT site. At that time, the existing equipment area would be repurposed.

5.5.5 North Terminal Area Development

Two aviation-related facilities are proposed immediately north of the passenger terminal and west of Shell Simmons Drive to demonstrate the development potential of this area. The first facility provides 9,000 square feet while the second one offers 9,600 square feet. Associated parking and access via Shell Simmons Drive are provided for both facilities.

Table 5-3: Terminal Area Development		
Option	Highlights	
	Advantages	Disadvantages
Passenger Terminal Expansion	<ul style="list-style-type: none"> • Provides for future long-term passenger terminal needs • An additional ADG-III parking position with a future PBB connection 	<ul style="list-style-type: none"> • Requires the relocation of the rental car parking area • Future apron expansion has the potential to impact nearby helicopter operations.
Baggage Makeup and Screening	<ul style="list-style-type: none"> • Provides improved baggage induction belt access to inbound baggage screening area • Eliminated the need to manually transfer baggage via carts to screening area • Enhances baggage security through reduced manual handling of baggage 	<ul style="list-style-type: none"> • Requires reconfiguration/relocation of airline offices
Security Checkpoint Queuing	<ul style="list-style-type: none"> • Increases the queuing capacity to improve the overall efficiency of the security screening checkpoint 	<ul style="list-style-type: none"> • Reduces the circulation area of the adjoining corridor. • Requires the relocation of the Food/Bar Concession (Tailwinds) area
Automobile Parking Garage	<ul style="list-style-type: none"> • Consolidated parking and added passenger convenience • Minimizes snow removal operations within parking area • Expands available rental car parking spaces 	<ul style="list-style-type: none"> • Cost associated with vertical development
Passenger Hold Room	<ul style="list-style-type: none"> • Increases the seating capacity by 150 seats to meet future needs 	<ul style="list-style-type: none"> • Requires the relocation of the Food/Bar Concession (Tailwinds) area
North Terminal Area	<ul style="list-style-type: none"> • Maximizes development of available terminal apron area • Provides approximately 8,200 square feet of additional aviation-related development potential 	<ul style="list-style-type: none"> • Access to the area is available but limited

Source: Michael Baker International, Inc., March 2025

5.6 Northeast Development

The Northeast Development Area (NEDA) is currently home to a variety of tenants and two aircraft parking aprons that are used to accommodate transient aircraft parking for small and large general aviation aircraft. In the 2017 Master Plan Update, the NEDA was identified for the future development of general aviation hangar and apron facilities. Since that time, the airport has entered into discussions with Alaska Airlines to move the air carrier's cargo activities from the Terminal Area to the NEDA in the 2025/2026 period. As shown in **Figure 5-7**, various options are being considered for this area to support the development of cargo facilities, maintenance hangars, and aircraft parking (i.e., RON, itinerant, and large aircraft parking facilities). Approximately 150,000 square feet of apron area is available to support the movement and parking of aircraft.

5.6.1 Cargo Facilities

As shown in **Figure 5-7**, within the leasehold area proposed for the cargo operation, there is room to accommodate a 75,000 square-foot Air Cargo Terminal (ACT) with associated automobile and truck parking and access to Livingston Way. Adjacent to the ACT, 105,270 square feet of apron area is associated with this development to accommodate up to three Boeing 737-900 aircraft parking positions with adjacent areas suitable for the storage of cargo containers and ground support equipment. Water, sewer, and power service are available to the proposed site.

5.6.2 Apron and Hangar Development

An apron taxiway capable of accommodating the movement of ADG III aircraft is provided off of Taxiway E1. South of the proposed taxiway shown in **Figure 5-7**, approximately 152,390 square feet apron area is provided to accommodate needed RON itinerant parking for commercial aircraft (i.e., Boeing 737-900). This area is located in the vicinity of the easternmost option previously considered in the 2017 Master Plan Update. On the eastern edge of the apron, a 42,000 square-foot aircraft maintenance, repair, and overhaul (MRO) hangar facility is provided. This facility is capable of accommodating a variety of jet aircraft (up to the Boeing 737-900). Parking and access is provided via Maplesden Way. As part of the redevelopment of this apron area, a taxiway connector capable of accommodating ADG D-III aircraft is proposed between Taxiway H1 and Taxiway F1 to improve the movement of aircraft.

West of Taxiway E1, approximately 45,000 square feet of apron area is available to accommodate itinerant aircraft parking (e.g., can accommodate up to three Gulfstream G-500 aircraft).



5.6.3 Geothermal Loop Field

The geothermal loop field, shown in **Figure 5-7**, was installed in anticipation of the construction of the snow removal equipment facility that has since been constructed on the airport's Northwest Development Area (NWDA). This loop field encompasses an area of approximately 213,130 square feet. This vertical closed loop system was designed for a peak load of 2,600 MBH (kBtu per hour) and is entirely compatible with commercial hangars and other aviation related support activities. Approximately 189,500 square feet of building/hangar area can be heated using heat pumps coupled to the existing loop field. The geothermal field, which has never been put into service, is available for future use as part of a future tenant lease agreement within the NEDA.

5.7 Northwest Development

The NWDA of the airport consists primarily of general aviation facilities. The airport's FBO, Aero Services, is situated within the area and apron availability is limited during peak periods. Airport support facilities (i.e., SREF, Sand Chemical storage and maintenance) are located on the westernmost side of the area.

As a result of the development envisioned for the NEDA, portions of the NWDA will be reconfigured to accommodate future general aviation and support facility needs, as shown in **Figure 5-8**.

5.7.1 Apron and Hangar Development

Several existing hangars located in the northeast corner of this area are nearing the end of their useful service life. As a result, three 3,600 square-foot box hangars (10,800 square feet) and four T-hangars (15,600 square feet) are proposed to replace the aging hangars as warranted. A new taxiway capable of accommodating TDG 1/ADG I aircraft is provided in support of this development. Reconstruction of the existing taxiway leading to this area is also recommended due to poor pavement conditions.

Since the 2017 Master Plan Update, portions of the NWDA have been reconfigured to accommodate the Snow Removal Equipment and Sand Chemical Storage facilities and the realignment of the Vehicle Service Road (VSR). As a result, the area just east of the VSR will be reconfigured to accommodate additional hangars and taxiway improvements. A more efficient layout of three 3,600 square-foot box hangars (60 feet x 60 feet) is proposed in place of the Civil Air Patrol hangar which is also nearing the end of its useful service life. Two additional 3,600 square-foot box hangars are proposed along Taxiway J, and five T-hangar units (18,000 square feet) are proposed along Taxiway K.

Just south of the SREF, approximately 84,000 square-feet of existing apron area will continue to be used for general aviation itinerant parking during peak periods. Other apron areas within the NWDA will continue to support leased aircraft tie-downs and the parking of aircraft serviced by the FBO.

5.7.2 Airport Maintenance

Consistent with the airport's plans to consolidate airport maintenance facilities, a future 20,000 square-foot expansion of the SREF is proposed.

