



Airport Development Plan

for Grand Junction Regional Airport

Final Narrative Report

August 2023



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1 Introduction

This chapter of the airport development plan (ADP) provides the guiding principles that governed the planning process.

An airport plays an important role in the community. As a result, stakeholder engagement is a critical part of maintaining and fostering this relationship with the community and is essential for delivering a successful master plan. It is a way to gather data and ideas, solicit feedback, improve communications, enhance solutions, and augment sustainable decision making.

One technical advisory committee was created for the airport development plan, comprising a broad cross-section of airport and community representatives. This stakeholder group was engaged and briefed at key stages during the airport development planning process. The feedback received during these sessions was used to guide decisions and influence the planning of alternatives and phasing. Stakeholders were largely supportive of the planning process and the future proposed developments for the airport and community.

Additionally, the Authority presented an update on the development plan at an annual joint agency meeting, which was open to the public and featured on the local news. Finally, an executive summary was prepared and made available to stakeholders and the public, featuring highlights from the airport development plan. A complete listing of the tenant stakeholder engagement presentations and other material presented to the public can be found in Appendix A.

1.1 Guiding Principles

The Grand Junction Regional Airport's mission is: To promote economic growth in the western Colorado and Eastern Utah region, through the provision of safe, reliable, and sustainable aviation facilities.

To ensure the planning would further the Authority towards the realization of the mission, the following guiding principles were employed to inform the planning process:

- Safe, secure, well-maintained, and financially self-sustaining
- Airport of choice for airline travelers, whether they are traveling for business or leisure
- A hub for governmental aviation activities, such as the Bureau of Land Management and NOAA facilities
- A regional air cargo hub
- Home to a well-planned, private aircraft operator community
- An equal opportunity employer which strives to attract and retain professionals committed to serving the Authority with distinction
- A responsible community partner and catalyst for economic development

1.2 ADP Objectives

The objectives of the ADP include:

- To assess, refine, and prioritize the Authority's plans, in light of the pandemic, industry changes, and local circumstances
- To provide a foundation for decision-making to accommodate demand in a fiscally responsible manner
- To inform the Authority's efforts to enhance the airport enterprise, including:
 - Maintaining high and stable levels of economic growth
 - Protecting the environment; and
 - Social progress that recognizes stakeholders' needs

2 Strategic Assessment

The strategic assessment presents the existing facility conditions at the Grand Junction Regional Airport. It includes a brief history of the Airport and a description of existing airside and landside facilities and their conditions. Information for this assessment was obtained and collected through on-site visits, interviews, and from previous reports and documents published by the Authority and other stakeholders.

2.1 Overview and Role of Grand Junction Regional Airport

Grand Junction Regional Airport serves the City of Grand Junction, Mesa County, Colorado with a county-wide population of over 155,000 in 2021, as well as surrounding areas, such as eastern Utah. The Airport is located approximately five miles northeast of the downtown district of Grand Junction, and it occupies approximately 2,360 acres of land at an elevation of 4,861 feet above mean sea level. The Airport is owned and operated by the Grand Junction Regional Airport Authority.

In the calendar year 2019, prior to the COVID-19 pandemic, the Airport served over 550,000 passengers with nearly 48,000 flight operations. In calendar year 2020, the Airport served just under 295,000 passengers with almost 52,000 flight operations. An increase in general aviation operations in 2020 offset the number of operations removed by the commercial air carriers. For the calendar year 2021, passengers have returned to nearly 97% of pre-pandemic levels – nearly a full recovery after the dramatic reductions due to the pandemic.

2.1.1 Airport History

During the 1920s, aviation enthusiasts began using a dirt and gravel airstrip on a site located north of the downtown district of Grand Junction. In 1929 the Grand Junction City Council approved plans to improve the runway strip and construct the first hangar and fuel facilities. The airport officially opened in 1930 as the Grand Junction Municipal Airport on 700 acres of land and was later renamed in 1942 to Walter Walker Field after a former publisher of the *The Daily Sentinel* newspaper and avid supporter of the development of the airport. During World War II the field was used to train Army and Navy cadets, and in 1946, the first commercial airliner landed at Walker Field arriving from Los Angeles and departing for Denver. In 1950, a terminal building was constructed to accommodate expanding air service. An air traffic control tower followed in 1962. The 1950s era terminal building was replaced in 1982. The airport was later renamed again as the Grand Junction Regional Airport in 2007.

2.1.2 Airport Role

In order for a publicly owned airport to be eligible for Airport Improvement Program (AIP) funding from the Federal Aviation Administration (FAA), it must be a part of the National Plan of Integrated Airport System (NPIAS). The current 2023-2027 NPIAS identifies more than 3,300 existing and proposed public-use airports, the roles they currently serve, and the amounts and types of airport development eligible for federal funding. According to the 2023-2027 NPIAS, GJT is a public, commercial service—primary, nonhub airport. The NPIAS criteria for primary commercial service nonhub airports are those that receive less than 0.05 percent but more than 10,000 of the annual U.S. commercial enplanements. There are ten primary commercial service airports in the state of Colorado, including Grand Junction Regional Airport, the majority of which are classified as nonhubs.

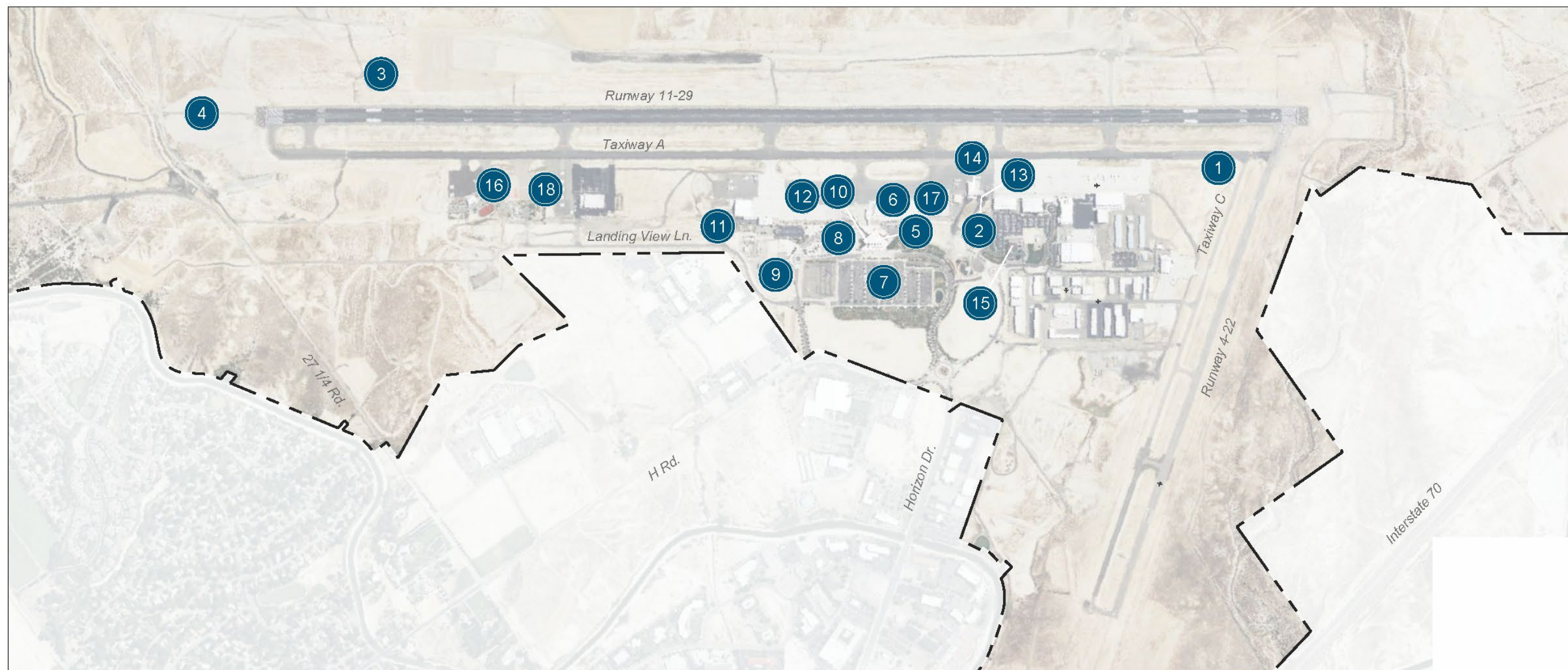
The Colorado Department of Transportation (CDOT) Division of Aeronautics classified GJT as one of 14 commercial service airports within their system of 76 public-use airports.

2.1.3 Facilities Overview and Airport Land Use

The overall land use pattern at the Airport can be subdivided into the following areas:

- The passenger terminal building is located south of Runway 11-29, near the midpoint of the runway.
- Ground access and automobile parking areas are located between the terminal curbside road and H Road, bounded by Walker Field Drive and Falcon Way.
- General aviation facilities are primarily located south and east of the terminal, near the intersection of Runway 11-29 and Runway 4-22. These facilities provide hangar storage, maintenance, aircraft parking, and tie-down options. Additional general aviation facilities are located north and west of the terminal, along the south side of Runway 11-29.
- The primary runway is north of the terminal complex with a southeast-northwest orientation (Runway 11-29), and the secondary runway is east and south of the terminal and general aviation complex with a southwest-northeast orientation (Runway 4-22).
- Cargo aircraft parking and facilities are primarily located just south and east of the commercial aircraft apron, with a secondary location in the northwest area of the airport, near the Bureau of Land Management (BLM) Western Slope Fire Base. Both cargo parking areas provide aircraft access to Taxiway A.
- The Aircraft Rescue and Fire Fighting (ARFF) facility is located on the south side of Runway 11-29, just east of the commercial and primary air cargo ramps.
- The BLM Western Slope Fire Base facilities are located on the south side of Taxiway A, north and west of the terminal complex.
- The Airport Traffic Control Tower (ATCT) is located south of Runway 11-29, adjacent to the ARFF facility and a National Weather Service weather station.
- The main fuel tanks are located near the western end of the commercial aircraft apron.

An overview of the Airport land use is shown in **Figure 2-1**.



Navigational Aids (NAVAIDs)

- ① Segmented circle with wind cone
- ② Rotating beacon
- ③ Automated Service Observation Station
- ④ Approach Lighting System (MALSR)

Terminal Area Facilities

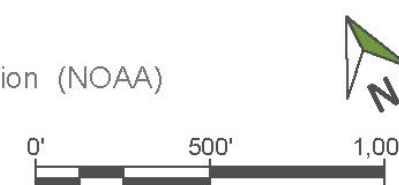
- ⑤ Terminal building
- ⑥ Commercial apron
- ⑦ Automobile parking
- ⑧ Rental car ready/return lot
- ⑨ Rental car facilities
- ⑩ Airport administrative office

Support Facilities

- ⑪ Fuel storage
- ⑫ Deicing facility
- ⑬ Airport Traffic Control Tower (ATCT)
- ⑭ Aircraft Rescue and Firefighting (ARFF)
- ⑮ National Oceanic and Atmospheric Administration (NOAA)
- ⑯ Bureau of Land Management

Air Cargo Tenants

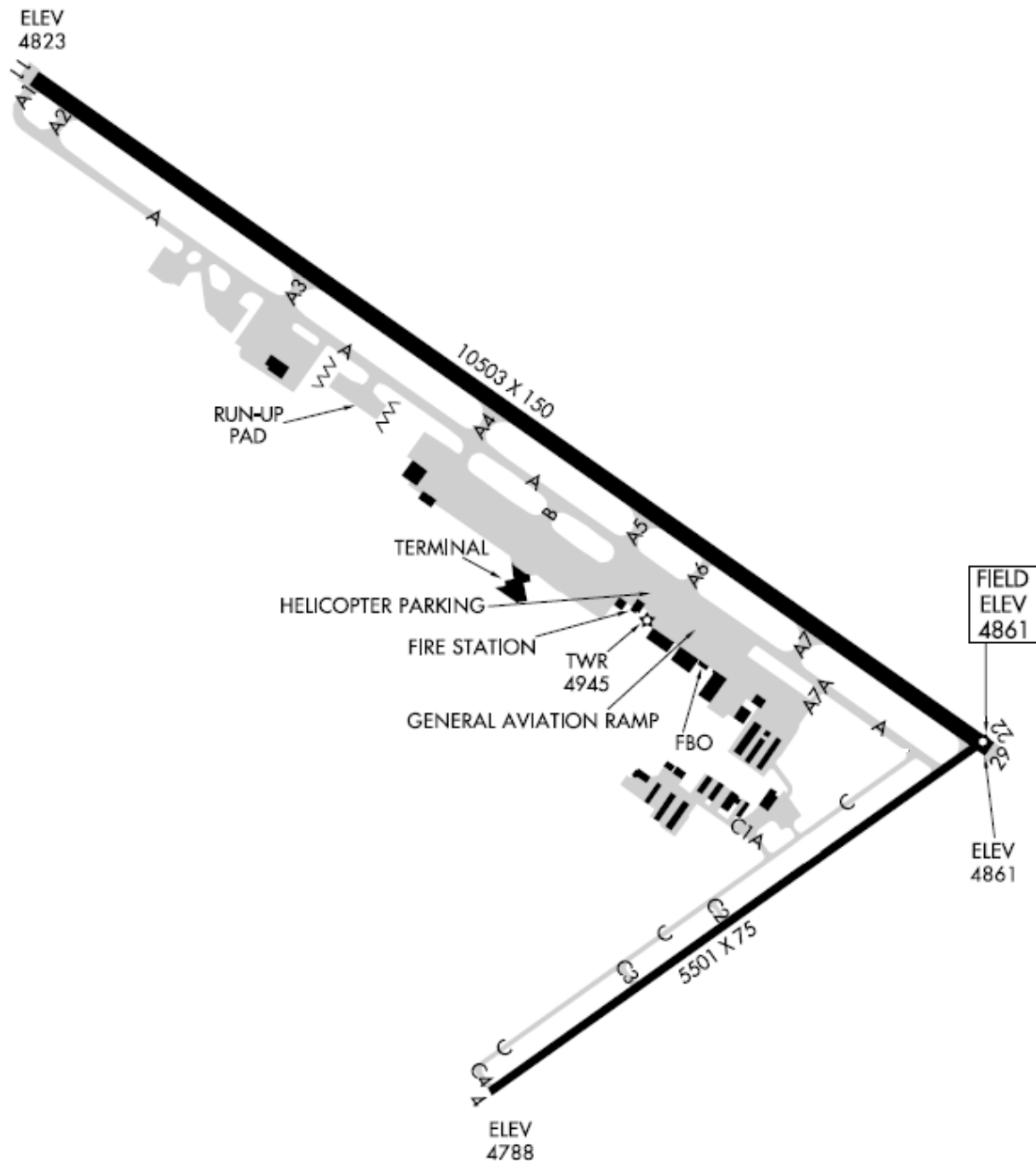
- ⑰ FedEx facilities
- ⑱ Key Lime Air facilities



2.2 Airfield

This section summarizes airfield facilities at GJT. The airfield consists of runways, taxiways, and aircraft parking aprons. Additionally, this section also outlines the navigational aids offered at GJT and current pavement conditions. **Figure 2-2** shows a graphical representation of the airfield in the form of the FAA Airport Diagram for GJT.

Figure 2-2 Airfield Overview



Source: FAA Airport Diagram, 2022

2.2.1 Runway System

The GJT airfield has two runways with Runway 11-29 serving as the primary runway. This runway provides the only instrument approach capabilities on the airfield. Runway 4-22 is a secondary runway that primarily serves smaller general aviation aircraft operations. The available takeoff and landing length for Runway 4-22 is roughly half the available runway length as compared to the primary runway. Runway characteristics are summarized in **Table 2-1**.

Table 2-1. Runway Characteristics

Characteristic	Runway 11	Runway 29	Runway 4	Runway 22
Length (ft.)	10,503'	10,503'	5,501'	5,501'
Width (ft.)	150'	150'	75'	75'
Approach Category (AAC)	C ⁽¹⁾	C	B ⁽²⁾	B
Airplane Design Group (ADG)	IV ⁽³⁾	IV	II ⁽⁴⁾	II
Lowest visibility minimum (statue miles)	½ sm	1 / 1 ¼ sm ⁽⁵⁾	3 sm	3 sm
Surface type	Asphalt - Grooved		Asphalt - Grooved	
Markings	Precision	Precision	Visual	Visual
Lighting (Intensity)	High	High	Medium	Medium
True/Magnetic Bearing	125°/112°	305°/292°	54°/41°	234°/221°
TORA/TODA/ASDA/LDA	10,503'	10,503'	5,501'	5,501'

Notes:

- 1) Aircraft with an approach speed less than 141 knots
- 2) Aircraft with an approach speed less than 121 knots
- 3) Aircraft with a wingspan less than or equal to 171 feet and/or a tail height less than or equal to 45 feet.
- 4) Aircraft with a wingspan less than or equal to 79 feet and/or tail height less than or equal to 30 feet.
- 5) Visibility minimum for aircraft with an approach category A or B is 1 sm. Aircraft with an approach category C or D lowest visibility minimum is 1 ¼ sm.

Source: FAA Airport 5010 Master Record, 2022.

2.2.2 Taxiway and Taxilane System

The taxiway system at the Airport consists of three major taxiways: A, B, and C that provide access from the runway environment to aircraft parking aprons. Taxiway A is a full-length parallel taxiway to Runway 11-29. There are seven taxiway connectors which connect Taxiway A to Runway 11-29 and are numbered A1 through A7 starting at the Runway 11 threshold. Taxiway connector A7A provides access to a general aviation parking apron. Taxiway B connects the commercial aircraft parking apron with Taxiway A. Taxiway C is a full-length parallel taxiway to Runway 4-22. There are four taxiway connectors between Taxiway C and Runway 4-22, numbered C1 through C4, with C4 located at the Runway 4 threshold. In recent years, Taxiway C1 was decommissioned due to line-of-sight deficiencies from the Airport Traffic Control Tower (ATCT). Taxilane C1A provides access into the primary general aviation area. The inventory of the existing taxiways is summarized in **Table 2-2**.

Table 2-2. Taxiway Characteristics

Taxiway	Purpose	Width (ft.)	Surface
A	Full length parallel to Runway 11-29	75'	Asphalt
B	Connects Taxiway A to the commercial aircraft apron	90'	Asphalt
C	Full length parallel to Runway 4-22	35'	Asphalt

Source: Airport Data Collection, Prepared by InterVISTAS, 2022.

2.2.3 Apron Areas

Aprons and hangars allow operators the option to park and/or store their aircraft. The Airport has approximately 1.9 million square feet of apron space used to park aircraft. The terminal area apron serves both the passenger terminal facility and air cargo operations located in the midfield, south of Taxiway A. Together, BLM, Twin Otter International, and West Star leases comprise roughly 1.4 million square feet of the available apron space for their operations. Apron areas and their characteristics are summarized in **Table 2-3**.

Table 2-3. Apron Area Characteristics

Apron Area	Primary Function	Area (Square Feet)	Connecting Taxiways
Main apron	Commercial aircraft and cargo	412,000	A, B
Bureau of Land Management	General aviation	218,000	A
Twin Otter International	General aviation	298,000	A
West Star – West	General aviation	254,000	A
Deicing apron	Deicing	95,000	A
West Star – East (Maintenance/Paint)	General aviation	538,000	A
West Star – South (Completions Hangar)	General aviation	107,000	C

Source: Airport Data Collection, Prepared by InterVISTAS, 2022.

2.2.4 Navigation Aids

This subsection summarizes the navigational aids (NAVAID) at GJT. Navigational aids are categorized in three types as described in the following narrative: visual, electronic, and metrological.

Visual Aids

Visual aids help to facilitate navigation and enhance safety during periods of inclement weather and/or darkness. Visual aids at the Airport include: the runway edge lighting; rotating beacon; precision approach path indicators for Runways 4, 11 and 22; a visual approach path indicator (VASI) for Runway 29; approach lighting systems; segmented circle with lighted wind cone; and supplementary wind cones near each runway end.

Electronic Aids

Electronic aids consist of systems used to support navigation for instrument procedures. Runway 11 has an Instrument Landing System (ILS) that uses ground-based technology to provide information to pilots regarding their horizontal and vertical position in relation to the runway end. Additionally, Runway 11 has an Area Navigation (RNAV) Required Navigation Performance (RNP) and a Global Positioning System (GPS) approach. Both the RNP and GPS approaches triangulate the position of an aircraft using satellites. RNAV RNP provides vertical and horizontal guidance while the RNAV GPS approach only provides horizontal guidance to the runway.

Metrological Aids

Meteorological aids provide pilots with real time and/or delayed weather information. The airport has an Automated System Observation Station (ASOS) that provides barometric pressure, wind speed and direction, visibility, density altitude and cloud ceiling information. In addition, CDOT has installed weather observation cameras that provide regular views of the airfield and surrounding vicinity at the Airport. Cameras are available to the public via the CDOT website.

Table 2-4 provides a summary of the existing navigation aids at Grand Junction Regional Airport.

Table 2-4. Navigational Aids

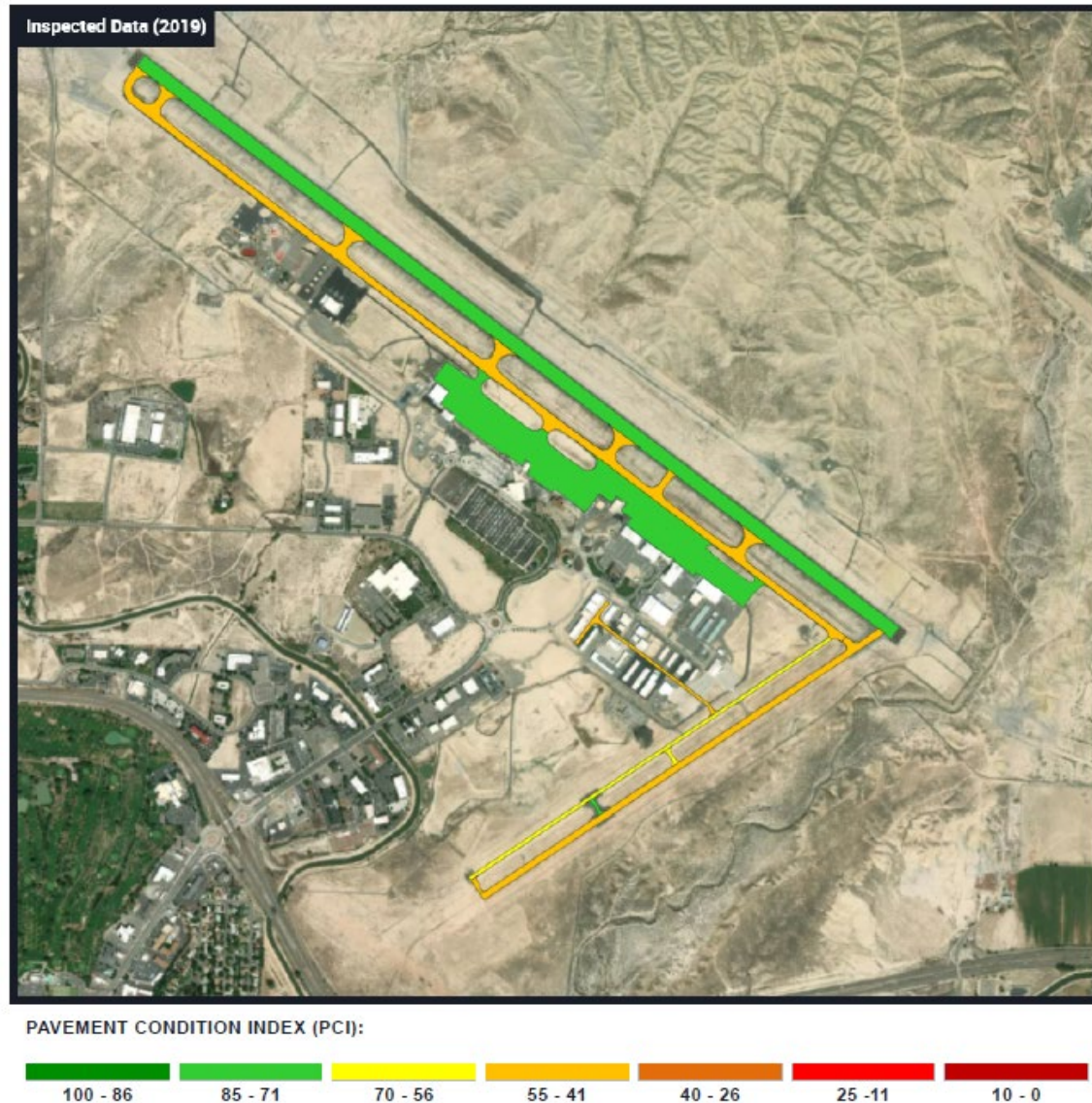
NAVAID	Primary Runway		Secondary Runway		Airport Facility
	Runway 11	Runway 29	Runway 4	Runway 22	
Visual Aids					
Edge light system	HIRL	HIRL	MIRL	MIRL	-
Approach lighting	MALSR	REIL	-	-	-
Visual slope indicator	PAPI	VASI	PAPI	PAPI	-
Segmented Circle	-	-	-	-	Yes
Supplementary wind cone	Yes	Yes	Yes	Yes	-
Rotating beacon	-	-	-	-	Yes
Electronic Aids					
RNAV (GPS)	Yes	Yes	-	-	-
RNAV (RNP)	Yes	-	-	-	-
ILS	Yes	-	-	-	-
Localizer Type Directional Aid (LDA)	-	Yes	-	-	-
Metrological Aids					
Automated Surface Observing System (ASOS)	-	-	-	-	Yes

Source: FAA Airport 5010 Master Record, 2022

2.2.5 Airfield Pavement

The Airport's airfield is comprised of approximately 4,965,000 square feet of paved airfield surfaces made up of Asphalt Concrete (AC) and Portland Cement Concrete (PCC). In 2019, the Colorado Department of Transportation (CDOT) Division of Aeronautics performed a pavement condition index survey for all airfield surfaces. The purpose of the PCI survey is to determine the structural integrity of a pavement section by looking for distresses, such as cracking, depressions or raveling. The results from the PCI survey are shown in **Figure 2-3**.

Figure 2-3. Airfield Pavement Condition



Source: Colorado Department of Transportation (CDOT), 2019

Runway 11-29 and most of the aprons are in satisfactory condition as shown in light green. Taxiway C was found to be in fair condition as shown in yellow. Finally, Runway 4-22, Taxiway A, and the taxiway connected to Taxiway C are in poor condition as shown in orange. Notably, the rehabilitation of Runway 4-22 is scheduled to be completed during the 2023 construction season.

2.3 Airspace and Air Traffic Control Overview

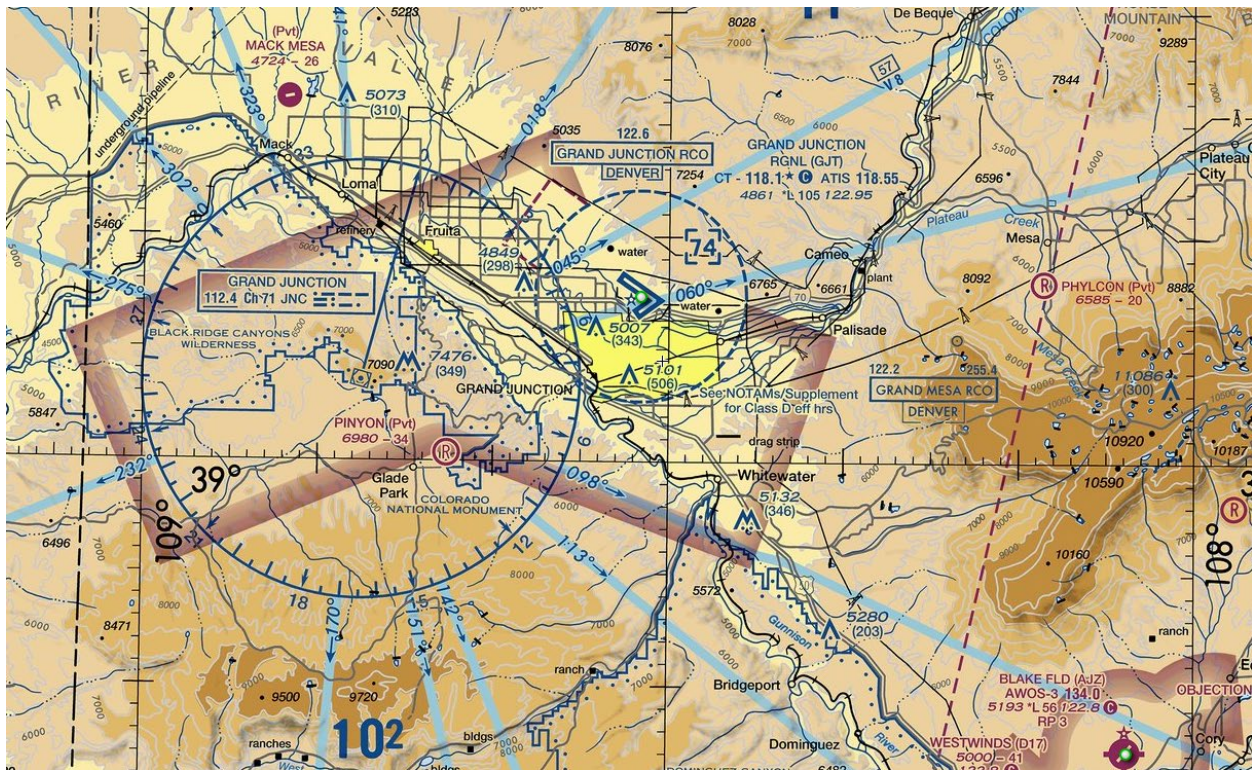
Generally, airspace is categorized as either controlled or uncontrolled airspace. Controlled airspace includes space for which air traffic control (ATC) services are provided to the pilot for sequencing arrivals, departures and to maintain separation between aircraft. For uncontrolled airspace, pilots communicate with one another on a common traffic advisory frequency (CTAF) to alert others in the area of their intentions. The airspace over GJT is designated as a Class D controlled airspace. Class D airspace is defined by a five-mile radius centered on the airport starting from the surface of the earth to 2,500 feet above ground level (AGL). The Airport has a part time Airport Traffic Control Tower (ATCT). When the ATCT is closed between 10:00 pm and 6:00 am local time the airspace changes to Class E airspace.

When the ATCT is closed, pilots on an instrument flight rule (IFR) flight plan will obtain departure clearance from Denver TRACON. Additionally, operations on Runway 4-22 are suspended when ATCT is closed due to the inability to see Runway 11-29 at certain points along the runway. Notably, this limitation will likely be eliminated with the future Runway 12-30 which will not intersect Runway 4-22, as it relates to the requirement for a clear runway visibility zone (RVZ). The airport's RVZ is currently obstructed by aircraft hangars located southwest of the runway intersection.

Figure 2-4 shows a visual flight rule (VFR) sectional chart centered on GJT and the surrounding airports, airspace, terrain, and obstructions. In the immediate ten-mile radius of GJT there are no other public airports; the closest public airport is Blake Field (AJZ), located approximately 30 miles southeast of GJT. There are no special use airspaces or alert areas nearby the airport.

Several obstructions are noted on the sectional chart, some in the City of Grand Junction as highlighted in yellow and a few northwest of the airport. Finally, terrain plays a critical role in determining arrival and departure corridors. Significant terrain features surround the airport to the north, south, and east, leaving airspace to the west of the airport as the primary corridor for arrivals and departures. When winds favor a departure towards a direction where there are known terrain challenges, aircraft will depart and then loop back towards the Airport to gain sufficient altitude to then clear the terrain. Likewise for an arrival, aircraft may maneuver to the west to avoid the terrain and then circle to land on the appropriate runway.

Figure 2-4. GJT VFR Sectional Chart



Source: SkyVector VFR Sectional Aeronautical Chart, 2022

2.4 Passenger Terminal Complex

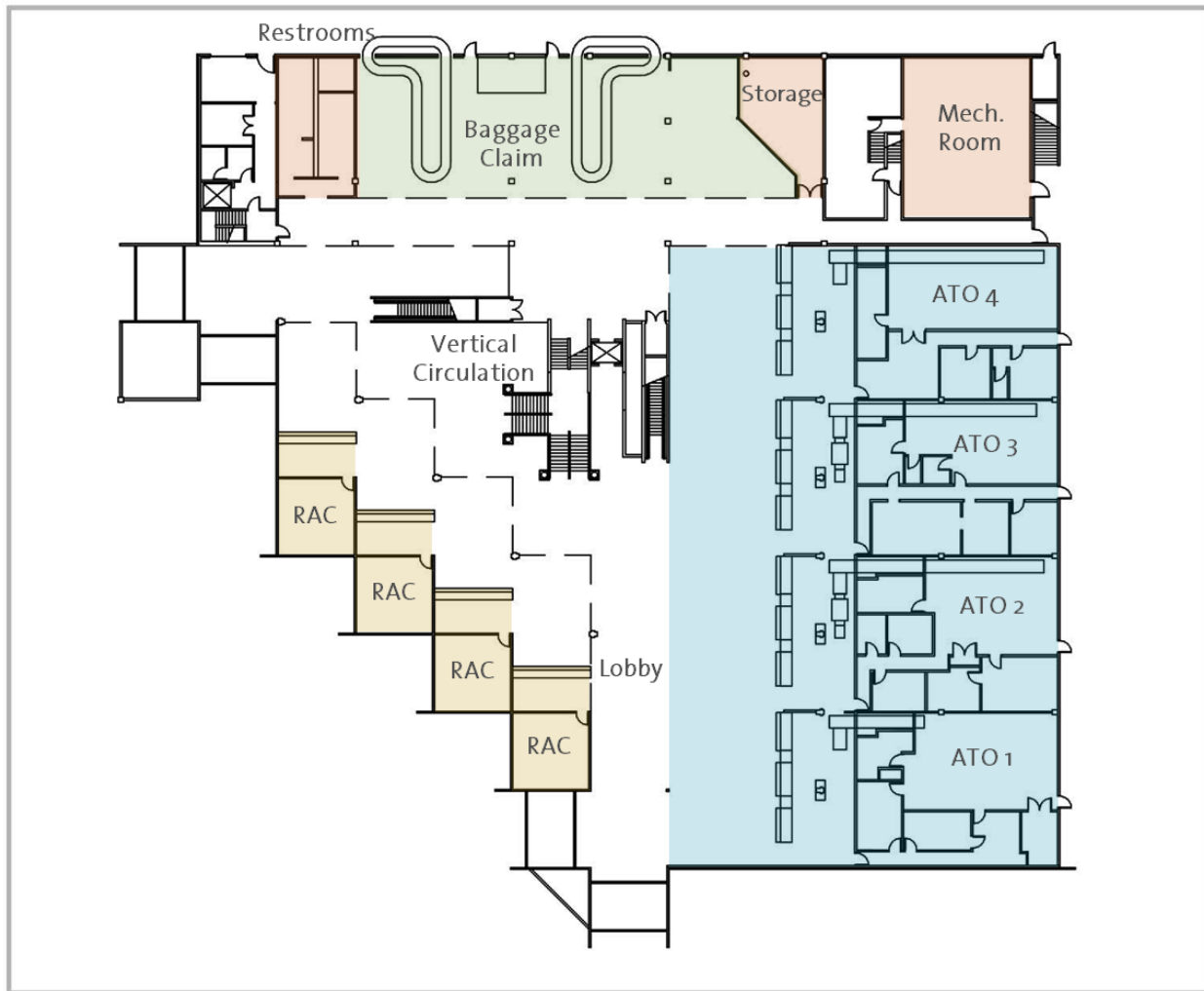
The passenger terminal complex consists of the commercial service aircraft parking apron and the passenger terminal building.

The three-level passenger terminal was originally constructed in 1982 and expanded in 2004. With the expansion, the terminal area encompasses approximately 77,500 square feet. The first floor contains the check-in lobby, the checked baggage screening and makeup areas, the baggage claim, as well as rental car and ground transportation service provider counters. A floor plan of the first level is provided in **Figure 2-5**.

The second floor contains the security screening checkpoint, providing access to the concourse, and offices for TSA. The second floor of the terminal is at grade with the aircraft parking apron. The passenger terminal concourse area, post the security screening checkpoint, has two primary holdroom areas serving six gates. The lower holdroom contains Gates 1 and 6 as well as two concessions providing food/drink and news/gifts. The upper holdroom contains Gates 2/3 and 4/5 as well as a bar concession area. Gates 2 and 5 provide redundant ground load access adjacent to Gates 3 and 4, respectively. As of 2022, Gates 1 and 3 are primarily used by American Airlines. Gates 4 and 6 are primarily used by United Airlines, and Delta Air Lines primarily used Gate 6 (Delta Air Lines discontinued service to GJT in January 2022). On days where Allegiant Airlines operates at the Airport, they primarily use Gate 3 and Gate 1, respectively. A floor plan of the second level is provided in **Figure 2-6**.

The third floor contains airport administration offices and TSA support offices shown in **Figure 2-7**.

Figure 2-5. Passenger Terminal Level 1



Legend

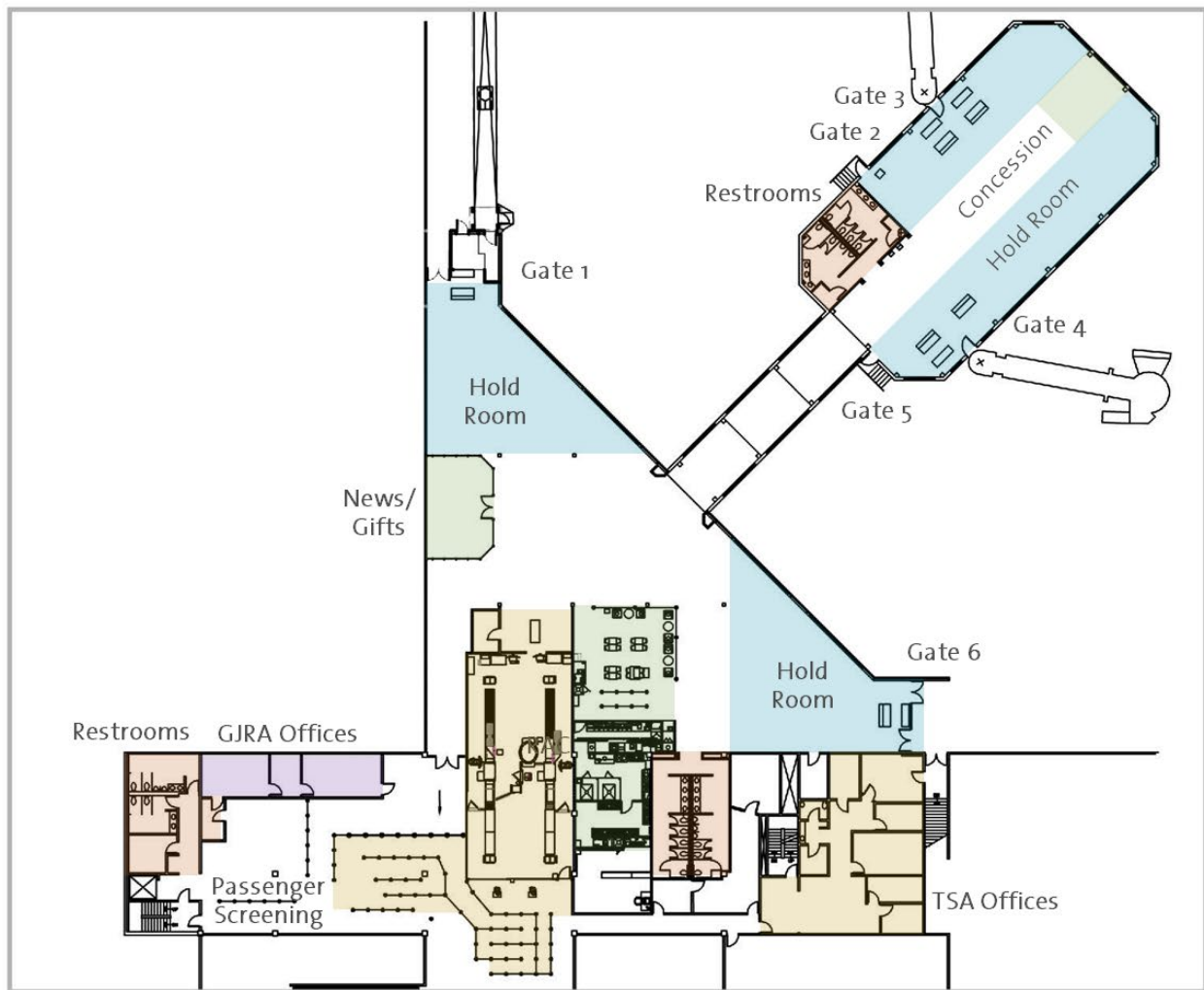
- Airline Ticketing Office (ATO)
- Baggage Claim
- Mechanical Room / Storage / Restroom
- Rental Car Counters

Key Map



Prepared by: InterVISTAS, 2022

Figure 2-6. Passenger Terminal Level 2



Legend

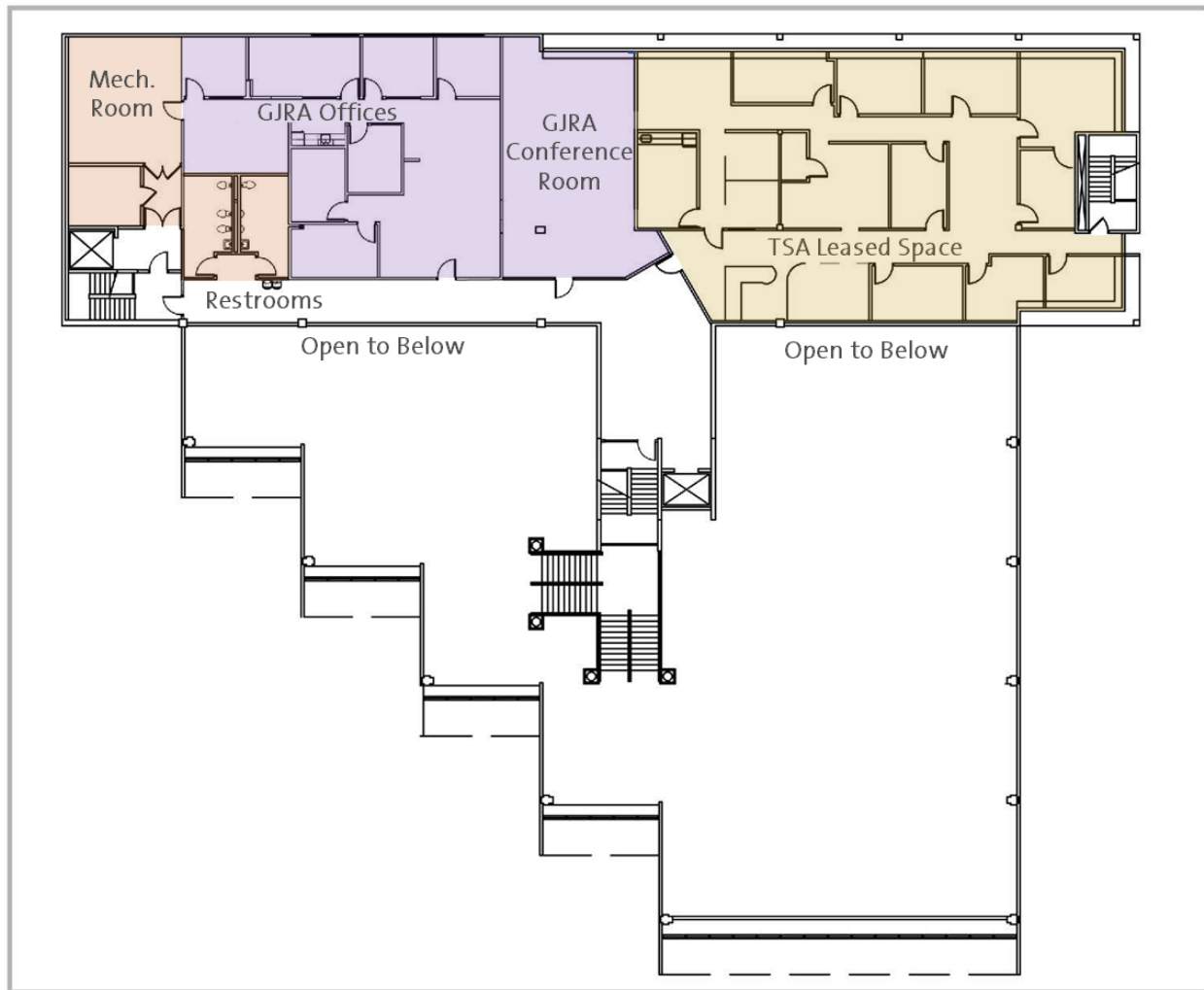
- Gate Hold Room
- Concessions
- Mechanical Room / Storage / Restroom
- TSA Screening / TSA Leased Space
- Airport Administration / Security

Key Map



Prepared by: InterVISTAS, 2022

Figure 2-7. Passenger Terminal Level 3



Legend

- Mechanical Room / Storage / Restroom
- TSA Screening / TSA Leased Space
- Airport Administration / Security

Key Map



Prepared by: InterVISTAS, 2022

Eight aircraft parking positions are available around the terminal building. Three of the positions can be loaded via passenger boarding bridge (PBB) while the remaining five require ground loading. Each bridge-enabled position can accommodate a Boeing 737-800 or Airbus 320 aircraft, while position 1 can accommodate aircraft as large as the Boeing 757-200 or Airbus 321. Positions A, B, and C, which are primarily utilized as remain overnight (RON) positions are accessed from Gate 6 within the terminal building. Positions D and E, also primarily utilized as RON positions, are accessed from Gate 1. Aircraft parking position restrictions and dependencies are provided in **Table 2-5**.

Table 2-5. Aircraft Parking Position Restrictions and Dependencies

Position	Maximum Aircraft	Dependencies	Boarding Type	Relationship to Gate
1	B757-200/A321	None	PBB	
3	B737-800/A320	None	PBB	Also served by Gate 2 doorway for ground loading at Position 3
4	B737-800	None	PBB	Also served by Gate 5 doorway for ground loading at Position 4
A	B737-800/A320	None	Ground	Served by Gate 6 doorway
B	EMB-190	None	Ground	Served by Gate 6 doorway
C	EMB-190	None	Ground	Served by Gate 6 doorway
D	EMB-190	None	Ground	Served by Gate 1 doorway
E	EMB-190	None	Ground	Served by Gate 1 doorway

Source: InterVISTAS, September 2021

2.5 Ground Transportation Facilities

This section describes the terminal area airport access and circulation roadways, terminal curbsides, parking facilities, and other associated ground access facilities. Information on these roadways and associated ground access facilities was obtained through site visits, aerial imagery, and desktop research of previously published materials.

2.5.1 Terminal Area Access and Circulation Roadways

Grand Junction Regional Airport is located north of Interstate 70. Primary access to the Airport is provided from Horizon Drive, which provides a freeway connection to Interstate 70. Secondary access is provided from the west on H Road. At the roundabout where Horizon Drive and H Road meet, Walker Field Drive provides one-way counterclockwise vehicle flow through the terminal area. A map of the key access roadways is provided in **Figure 2-8**.

Figure 2-8. Key Airport Access Roadways



Source: Stamen Maps, September 2021

2.5.2 Curbside Facilities

The terminal curbside roadway network consists of a single-level one-way loop accessible from the roundabout at Horizon Drive, H Road, and Eagle Drive. Walker Field Drive, which exits the roundabout as a one-way loop roadway, consists of two-lanes of traffic and provides access to the surface parking lot prior to reaching the terminal curbside. Additional access to the primary general aviation facilities is provided from Aviators Way, just prior to the public parking entrance. Just prior to the terminal, a third vehicle lane is provided to facilitate passenger drop-off and pick up. Three evenly spaced crosswalks cross the curbside lanes to provide access between the terminal and surface parking lot. Approximately 390 linear feet is provided for public curbside.

Between the last crosswalk and the end of the terminal building, roughly 90 feet of curbside is reserved for commercial vehicles and taxicabs. Just beyond the end of the terminal building is a projected turnout containing a bus stop and shelter serving Grand Valley Transit (GVT) as well as other shuttle services. Transportation Network Companies (TNCs) operating at the Airport include both Uber and Lyft. TNCs are allowed to drop-off and pick-up on the curbside.

The terminal curbside as well as other ground transportation facilities are shown in **Figure 2-9**.

2.5.3 Automobile Parking Facilities

Public automobile parking is located in a surface lot immediately southwest of the terminal building, across from the curbside. The lot contains approximately 668 spaces with some spaces closest to the terminal building reserved for short-term parkers. Spaces for handicap, motorcycles, and oversized vehicles (e.g., vehicles with trailers, recreational vehicles) are provided. Approximately 230 spaces are provided in an adjoining parking lot to the west. These spaces are primarily reserved for employees but also serve to accommodate public parking holiday and overflow. As of June 2022, the Authority is designing improvements to the overflow parking lot, such that it will accommodate peak period demand with a parking experience equivalent to that of the main parking lot, which is expected to be constructed during the construction season of 2023.

The number of parking spaces provided within each of the parking lots is shown in **Table 2-6**.

Table 2-6. Parking Facilities Inventory

Lot	Number of Spaces	Notes
Public Parking	668	Up to 20 minutes — Free Each additional 20 minutes — \$2.00 Daily Maximum — \$12.00
Employee / Overflow	230	
Rental Car Ready / Return	260	146 Ready/Return 114 Storage and other uses
Total parking	1,158	

Source: Grand Junction Regional Airport Authority, InterVISTAS, November 2022

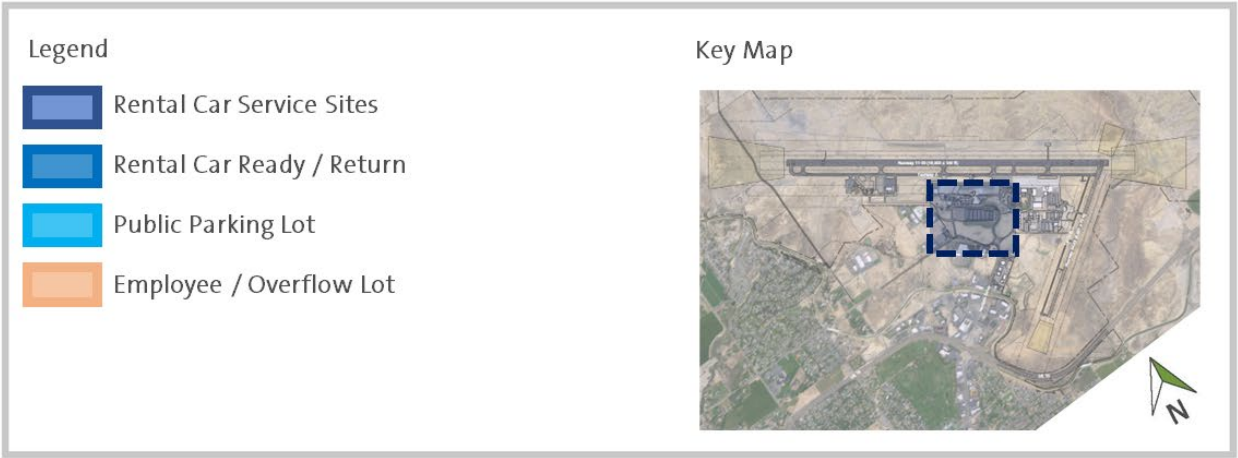
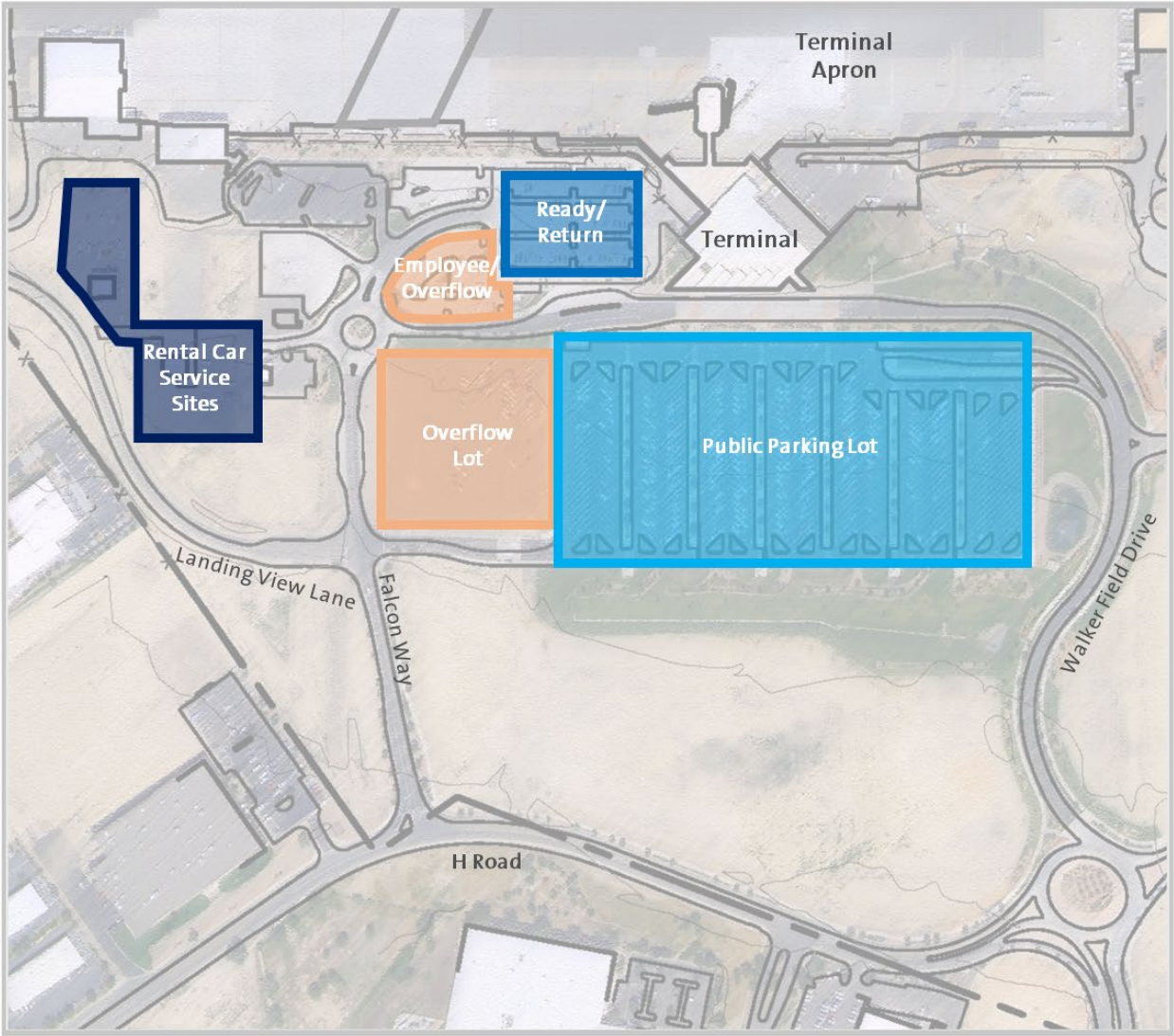
2.5.4 Rental Car Facilities

Four rental cars companies operate six brands on Airport. The rental car ready/return lot has 146 spaces that are allocated among the companies. For renting customers, the lot is accessible from the west exit of the baggage claim. By vehicle, the rental car lot is accessible via a roundabout either from Walker Field Drive after passing the terminal curbside or from Falcon Way. Three rental car service sites can also be accessed from this roundabout, reducing the travel distance of rental car employees servicing the vehicles and limiting their interaction with the traveling public.

2.5.5 Transit Operations

The GVT Authority provides hourly and sometimes half-hourly service between the Airport and downtown. The route operates between 05:15 and 20:05 on weekdays and between 07:15 and 22:05 on Saturdays. Additionally, CDOT's Bustang Outrider interregional express bus service provides daily serve on a dedicated route with multiple stops between the Airport and Durango/Bayfield.

Figure 2-9. Terminal area landside facilities



Source: InterVISTAS, May 2022

2.6 Airline/Airport Support Facilities

This section summarizes the support facilities at the Airport which include fuel storage, deicing, ATCT, ARFF, airport administration, and maintenance, along with the weather station.

2.6.1 Fuel Storage and Distribution

Aviation fuel is stored at one primary location at the Airport, near the western end of the commercial aircraft apron behind the former Mesa Airlines Maintenance Hangar, which is currently leased by West Star Aviation. The above ground storage tanks have capacity for 68,000 gallons of Jet A fuel and 32,000 gallons of 100LL AVGAS. West Star Aviation provides all aircraft fueling with delivery via fuel trucks. There is also a self-serve fuel system providing 100LL AVGAS located near the southeast corner of the general aviation apron, adjacent to the T-hangars. The Authority also has two above ground fuel storage tank sites for ground vehicle fueling. One is located adjacent to the fuel farm and the other is on the rental car services site.

2.6.2 Deicing Facilities

During period of inclement weather, airplane operators may require the use of a deicing agent to be applied to the aircraft before departing. Deicing occurs on the passenger terminal apron west of the commercial terminal apron.

2.6.3 Airport Traffic Control Tower

The ATCT was built in 1962 and is located on the south side of Runway 11-29, immediately east of the ARFF. The tower operates from 6:00 am to 10:00 pm local time. The height and current location of the ATCT does create some line-of-sight deficiencies, particularly relating to Taxiways C1A and portions of Taxiway C. The eye level height of the current control tower is 71 feet above ground level (AGL). The Airport Layout Plan (ALP) on file with the FAA does show a new ATCT location located north of the future Runway 12-30 to address these deficiencies.

2.6.4 Aircraft Rescue and Firefighting Facility

The ARFF facility provides aircraft rescue and firefighting services at the Airport. The current facility was built in 2000, and it is located immediately east of the commercial aircraft apron. The facility, which complies with ARFF Index B, can be accessed through a secure gate along Eagle Drive. The ARFF facility is constructed of three pull-through bays. Two of the bays house two response vehicles, a 2013 Oshkosh Striker and an older 2003 Oshkosh Striker 1500. Both have a capacity of 1,500 gallons of water. The third bay accommodates seasonal equipment, either snow removal equipment in the winter or mowers in summer.

2.6.5 Airport Administrative Facilities

Primary airport administration offices are located on the third floor of the terminal building. This space includes offices for the executive airport leadership as well as the boardroom. Additional airport offices and security facilities are located on the second floor of the terminal building.

2.6.6 National Weather Service

The National Weather Service (NWS) operates a forecast office which is located just south of the ATCT. This office, which opened in its current location on airport property in 1995, provides weather warning and forecast responsibilities for 22 counties in western Colorado and eastern Utah.

2.7 Air Cargo

The Airport has two major air cargo tenants, FedEx and Key Lime Air. FedEx is the largest air cargo operator in terms of market share, transporting approximately 85 percent of all cargo tonnage at the Airport. Currently, FedEx operates scheduled cargo service primarily on a triangle route with arrivals directly from Memphis and departures to Memphis via Colorado Springs. FedEx primarily operates a fleet of Boeing 757-200 aircraft at GJT. Aircraft will park at one of the two positions located east of the passenger terminal apron. The FedEx air cargo building is located adjacent to the apron at the end of Blue Angel Lane. A FedEx shipping center facility is located just west of the Airport, off Justice Drive.

Key Lime Air provides cargo operations, on behalf of UPS. Key Lime aircraft primarily park on the apron just southeast of the BLM Western Slope Fire Base facility. Key Lime primarily operates a fleet of Fairchild Swearingen Metroliners at GJT.

2.8 General Aviation

General aviation has a significant presence at the Airport. The general aviation facilities are spread out among multiple locations, including just northwest and southeast of the passenger terminal, with the majority of the facilities contained in the northeast quadrant near the intersection of Taxiway A and C. West Star Aviation, the sole Fixed Base Operator (FBO) at the Airport, primarily operates from hangars and offices located off Aviators Way east of the passenger terminal. Hangars located on the east side of the airport are depicted in **Figure 2-10**. A detailed list of each hangar by operator and the number of based aircraft is provided in **Table 2-7**.

2.8.1 Bureau of Land Management

The BLM Western Slope Fire Base facilities operates on a site known as the Grand Junction Air Center (GJAC). GJAC is located west of the terminal area and south of Taxiway A, near Taxiway Connector A3. The facilities at the site include multiple buildings which support the wildland fire fighting operations, the tanker base apron, and the jumper base apron. In addition to the buildings, three above-ground fire retardant storage tanks are also located on the site.

Table 2-7. Hangar space and based aircraft

Owner/Operator	Hangar Number(s)	Based Aircraft	Owner/Operator	Hangar Number(s)	Based Aircraft
West Star	206,207, 208, 209, 210, 211, 213, 220	-	Gurrie Aviation, LLC	315	1
Andrew Hatfield	322	1	Hangar One Bldg. 1	302A-E	2
RPM Investments	317C	2	Hangar One Bldg. 2	301A-C	-
Charlie One Alpha	307A-J	16	Kempton Air Service	311	7
Civil Air Patrol	218	2	Ladd Klingleman	317A	-
Clear Blue Sky, LLC	316A-G	9	Park D Trust	317B	1
Colorado Division of Wildlife	214	1	Petal LP	321	1
CMU/WCCC	314	4	Plane Storage	305	-
Corporate Hangars	306A-E	5	GJT Aircraft Sales	323	2
McClymond Aviation	219	1	Rocky Mountain Hangar	309A-D	3
Flying Lizzie, LLC	304	9	Rocky Mountain Hangar (CAF)	313	1
GMF Investments, Inc	308	-	Twin Otter International	104, 320	29
Gordon Autry	303A-D	6	Wild Blue, LLC	312A-G	2
Grand Junction Regional Airport	310	-	AERO GJT T-Hangars	215-217	18
Junction Property Management	300	-			
Tie Downs/Ramp		22	Unknown		12
Total Based Aircraft					157

Source: Grand Junction Regional Airport Authority, 2019

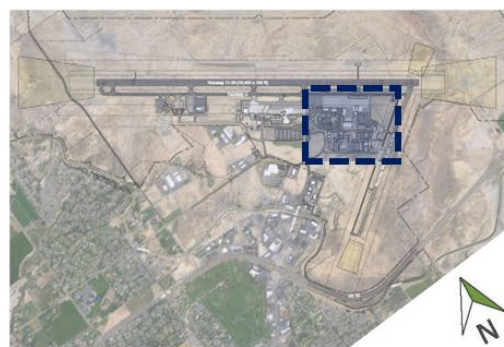
Figure 2-10. General Aviation Hangars (East)



Legend

- T-Hangar / Shade Hangar
- Small Box Hangar
- Large Box Hangar
- Small Corporate Hangar
- Large Corporate Hangar
- West Star Facility/Hangar

Key Map



Source: InterVISTAS, May 2022

2.9 Airport Environs

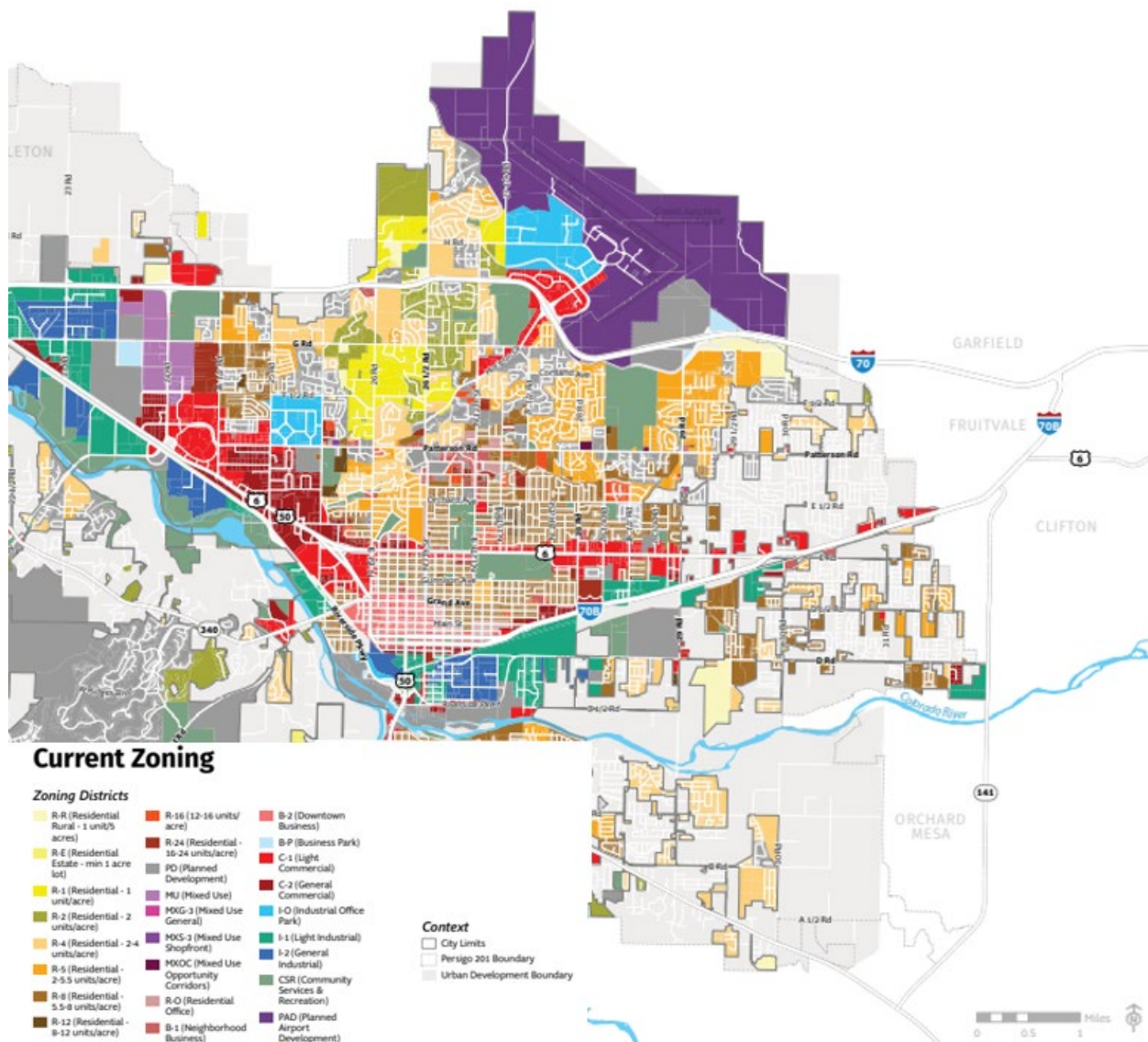
The following section describes existing land use and zoning ordinances at GJT and the surrounding region. This includes a summary of the Grand Junction Comprehensive Plan and the established airport overlay district.

2.9.1 Grand Junction Comprehensive Plan

In 2020, the City of Grand Junction completed the One Grand Junction Comprehensive Plan. This plan serves as a blueprint for development and growth of the city over the next 10 to 20 years. The Airport plays an important role in this plan as a mover of both people and goods and must be protected to allow for continued growth.

Airport property is currently zoned as Public Airport District (PAD) as shown in **Figure 2-11**. The Zoning and Development Code, found in Title 21 of the City's Municipal Code, is a regulatory document establishing the standards for the review of all proposed development within the city. The Code also contains requirements for setbacks, building and structure heights, lot areas and street frontages within a given zone.

Figure 2-11. Current Zoning Districts



Source: City of Grand Junction, April 2022

2.9.2 Airport Environs Overlay Zoning District

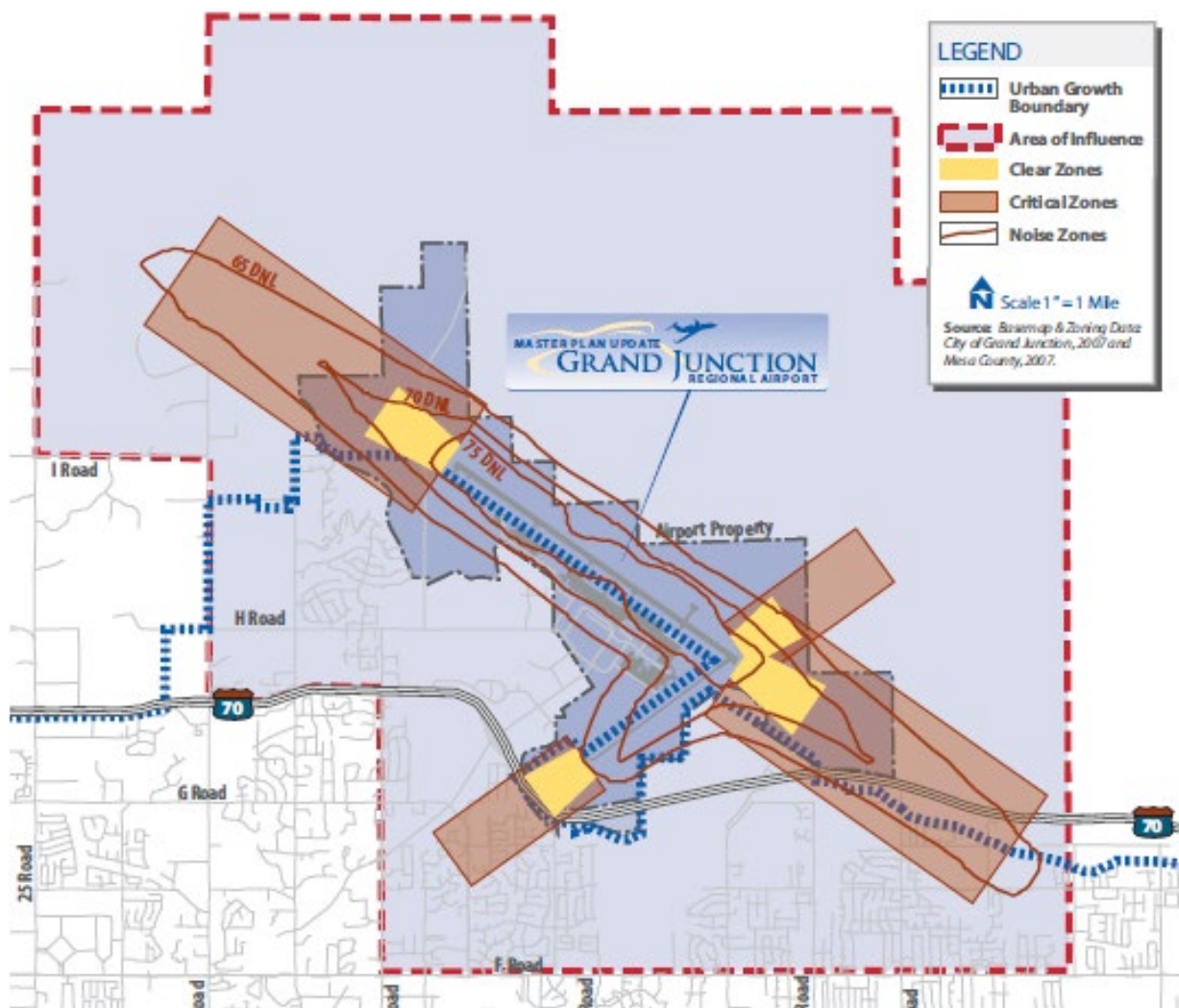
Title 21, Chapter 7 of the Grand Junction Development Regulations (21.07.030) describes the establishment of an Airport Environs Overlay Zoning District (AE).¹ The district was created to protect the public health, safety and welfare by regulating development and land use within noise sensitive areas and airport hazard areas; ensure compatibility between the airport and surrounding land uses; and protect the airport from incompatible encroachment as depicted in **Figure 2-12**.

The AE is comprised of four subdistricts based on a determination by the FAA of differing levels of expected noise impact and hazard from aircraft overflight. The subdistricts are as follows:

¹ <https://www.codepublishing.com/CO/GrandJunction/#!/html2/GrandJunction21/GrandJunction2107.html>

- Area of Influence (Subdistrict A): area surrounding the airport impacted or influenced by proximity of the airport, either by aircraft overflight, noise and/or vibrations.
- Noise Zone (Subdistrict B): the area within the 65 Ldn to 70 Ldn noise-exposure area as shown in the 2009 Airport Master Plan.
- Critical Zone (Subdistrict C): a rectangular-shaped zone, called the Critical Zone, located directly off the end of a runway's primary surface, beginning 200 feet from the end of the pavement, which is critical to aircraft operations.
- Clear Zone (Subdistrict D): a triangular-shaped zone, called the Clear Zone, located directly off the end of a runway's primary surface, beginning 200 feet from the end of the pavement, which is clear of all above-ground obstruction or construction. The Clear Zone dimensions are consistent with the RPZ dimensions as shown on the Airport Layout Plan.

Figure 2-12. Airport Environs Overlay Zoning District



Source: Grand Junction Airport, 2015

2.10 Environmental Conditions

Considering environmental conditions helps to ensure development concepts are feasible and provide information to inform subsequent environmental studies. To document existing environmental conditions at GJT the environmental resources categories contained in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* and the 1050.1F *Desk Reference* were used as a guide. Environmental conditions categorized in the Environmental Assessment completed in 2015 for the relocation of Runway 11-29 were used as a baseline for documenting existing conditions. The following subsections provides an overview of the environmental conditions at the airport.

2.10.1 Air Quality

Grand Junction Regional Airport, located in Mesa County, is within an attainment area for all National Ambient Air Quality Standards (NAAQS) and is not within any pollutant maintenance areas.²

2.10.2 Biological Resources

There are 76 federal- and state-threatened and -endangered species and 20 migratory bird species that could potentially be in the vicinity of the airport.^{3,4} The U.S. Fish and Wildlife Service (USFWS) shows no known critical habitats at the Airport. Additionally, 79 noxious weeds are potentially located at the airport according to the Colorado Department of Agriculture.⁵ Finally, there are no fish species in Mesa County currently protected under the Magnuson-Stevens Fishery Conservation and Management Act.⁶

2.10.3 Climate

Services and functions requiring fuel or power are the primary sources of greenhouse gases (GHGs) at the airport. Generally, aircraft and public vehicles will generate more GHG emissions than airport-controlled sources and facilities, such as Authority operations vehicles.

2.10.4 Coastal Resources

The closest coastal resource to Grand Junction Regional Airport is located approximately 800 driving miles from Grand Junction; thus, there are no Coastal Barrier Resource System (CBRS) segments within Airport property.⁷

2.10.5 Department of Transportation Act, Section 4(f)

BLM managed land proposed for transfer to Grand Junction Airport Authority is the only known Section 4(f) property.

² U.S. Environmental Protection Agency, Air Quality Green Book, Colorado, Accessed May 2022

[Colorado Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants | Green Book | US EPA](#)

³ Colorado Parks and Wildlife, Threatened, and Endangered Lists. Accessed May 2022

[Colorado Parks & Wildlife - Threatened and Endangered List \(state.co.us\)](#)

⁴ U.S. Fish and Wildlife Service, Information for Planning and Conservation (IPaC), Grand Junction Municipal Airport, Accessed May 2022

⁵ Colorado Department of Agriculture, Noxious Weed Species, Accessed May 2022

[Noxious Weed Species ID | Department of Agriculture \(colorado.gov\)](#)

⁶ National Marine Fisheries Service, Essential Fish Habitat Mapper, Accessed May 2022

[EFH Mapper \(noaa.gov\)](#)

⁷ U.S. Fish and Wildlife Service, Coastal Barrier Resources System Mapper, Accessed May 2022

[CBRS Mapper \(usgs.gov\)](#)

2.10.6 Farmlands

The Natural Resource Conservation Service (NRCS) has categorized soils on and in the vicinity of existing airport property to be made of different properties. The two most abundant soils located within airport property are Killpack-Badlands-Persayo complex and Uffens fine sandy loam.⁸ Neither of these soil types are designated as prime or unique farmland. However, there is a small segment of designated prime farmland, if irrigated, in pockets of land surrounded by non-prime farmland soils on the south side of Runway 11-29. These pockets are contained within airport property and located within the Urban Growth Boundary; therefore, is designated as non-prime farmland.

2.10.7 Hazardous Materials, Solid Waste and Pollution Prevention

According to the U.S. Environmental Protection Agency (EPA), there are a small number of sites located near the airport permitted as small generators of hazardous waste. Any solid waste generated at the Airport is disposed of at the Mesa County Landfill, located approximately seven miles southwest of the City of Grand Junction.

2.10.8 Historical, Architectural, Archaeological and Cultural Resources

Three historic sites and nine isolated finds (one prehistoric and eight historic) are found around the airport.⁹ Two of the three historic sites include a homestead (5ME1776) and a dam (5ME17686) which are not eligible for inclusion in the NRHP under Criteria A-D. The other historic site is a segment of the historic Little Book Cliff Railway (5ME768.4). This site is eligible under Criterion A for inclusion in the NRHP. The isolated finds (5ME17677-5ME17685) include eight historic trash scatters or minimal historic artifact distributions and one prehistoric artifact. They are not eligible under Criteria A-D for inclusion in the NRHP.

2.10.9 Land Use

The Airport is located in the City of Grand Junction. The area surrounding the Airport on all sides is commercial, commercial / industrial, residential mostly medium and medium low densities, rural agricultural, parks and community facilities.

2.10.10 Natural Resources and Energy Supply

The Airport has an existing 36-inch steel water line supplied by the Ute Water Conservancy District that runs southeast to the northwest across Runway 4-22. The line is then reduced to a 30-inch steel pipeline south of the roundabout at Walker Field Drive and Eagle Drive and continues northwest past the end of Landing View Lane. The sewer system consists of an 8-inch and a 12-inch pipeline that exit airport property to the southwest of the roundabout at Walker Field Drive and Horizon Drive.

Fuel is currently stored in above-ground storage tanks located west of the former Mesa Airlines Maintenance Hangar. The tanks have a combined capacity of 100,000-gallons, 68,000 gallons of Jet-A fuel and 32,000 gallons of 100LL AVGAS. Additional fuel is stored at the rental car service area site. Existing gas and electrical is required for the operation of Airport-related facilities and fuel for aircraft, aircraft support vehicles/equipment, and maintenance vehicles/equipment.

⁸ Natural Resource Conservation Service, Web Soil Survey, Accessed: May 2022
[Web Soil Survey \(usda.gov\)](https://websoilsurvey.sc.egov.usda.gov/)

⁹ Environmental Assessment, December 2015

2.10.11 Noise and Noise-Compatible Land Use

The 65 DNL contour extends off airport property, as shown in Airport Environs Overlay Zoning map. This includes a portion of BLM managed land to the north, industrial development to the south and a portion of Interstate 70. Additionally, there is a portion of the existing 65 DNL that extends over non-compatible residential land south of the interstate.¹⁰

2.10.12 Socioeconomics, Environmental Justice, Children's Health, and Safety Risk

The City of Grand Junction where the Airport resides has about a ten percent minority population, with about 14 percent of the population at the federal poverty level, and five percent of the area's houses are vacant.¹¹ The closest educational institution to the Airport is IntelliTec College in Grand Junction, about a quarter mile from the airport. The school serves students learning trades and skills in the automotive, information technology, beauty, healthcare, and mechanical building system industries.

The closest neighborhood is located south of airport property adjacent to 27 ¼ Road (approximately 0.5 mile). The closest park is Paradise Hill Park, also located south of airport property and west of 27 ½ Road. The closest grade school to the Airport is Holy Family Elementary School, located southwest of the Airport (approximately 1.5 miles). The neighbourhood, park and school are located outside of the 65 DNL airport noise contour.

2.10.13 Visual Effects

Airports produce light to promote the safe and secure movement of aircraft, people, and vehicles. These light features include runways, taxiways, buildings, access roadways, automobile parking areas, and the apron area. Structures at the Airport include, but are not limited to, the fixed base operator terminal building, hangars, and maintenance buildings. This lighting is required for safety purposes and is consistent with that of an airport.

The closest residence is over 3,000 feet south of the Airport. The residences do have a direct line of sight to the Airport; however, the lighting associated with the Airport is consistent with that of any airport.

2.10.14 Water Resources

The National Wetlands Inventory shows wetlands on airport property. In the northeast corner of the airport property off the Runway 29 end, the inventory map has categorized 2.16 acres as a Freshwater Pond habitat.¹² According to the current Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the Airport, there are no floodplains within the airport property. The airport does not contain any wild and scenic rivers; however, the soil has hydrological connections to the Colorado River Basin as noted in the 2015 Environmental Assessment.

¹⁰ Environmental Assessment, December 2015

¹¹ U.S. Census, City of Grand Junction, Accessed May 2022
[U.S. Census Bureau QuickFacts: Grand Junction city, Colorado](#)

¹² U.S. National Wetland Inventory Mapper, Accessed May 2022
[National Wetlands Inventory \(usgs.gov\)](#)

3 Aviation Demand Forecast

GJT is among the primary airports serving western-central Colorado, namely the city of Grand Junction and surrounding areas, including eastern Utah. The Airport served approximately 268,000 total enplaned passengers in calendar year 2019, just prior to the COVID-19 pandemic and related industry downturn. As of the latest historical calendar year 2021, passenger traffic has nearly returned to this pre-COVID level, reaching over 259,000 total enplanements. According to the 2021-2025 National Plan of Integrated Airport Systems (NPIAS), the Federal Aviation Administration (FAA) classifies GJT as a nonhub primary airport. A nonhub airport is defined as an airport that receives less than 0.05% but more than 10,000 of the annual U.S. commercial passenger enplanements.¹³ GJT is operated by the Grand Junction Regional Airport Authority (GJRAA).

This report summarizes the forecasts of enplaned passengers and aircraft operations at GJT through 2041. The forecast is provided for the following years:

Pre-pandemic Base Year	2019
Pandemic Base Year	2020
Pandemic Recovery Base Year	2021
Base Year +5	2026
Base Year +10	2031
Base Year +15	2036
Base Year +20	2041

In developing the aviation demand forecasts, multiple base years were assessed to understand the changing conditions and subsequent recovery related to the impact of the COVID-19 pandemic in recent history: (1) 2019 as the last full calendar year with pre-pandemic traffic results; (2) 2020, the year in which the pandemic occurred and the full-scale of the pandemic-related downturn was realized; and (3) 2021, the most recent full calendar year and the latest indication of the extent and nature of recovery in air traffic from the pandemic.

This report provides an overview of the historical aviation activity at the Airport along with relevant demographics and economic background related to the Airport's air trade area. The methodology for developing the forecasts for enplaned passengers and aircraft operations is also described. Finally, the forecasts are compared to the most recent FAA Terminal Area Forecast (TAF) issued in March 2022.

Aviation activity data are presented in terms of calendar years, unless otherwise noted.

¹³ https://www.faa.gov/airports/planning_capacity/categories/

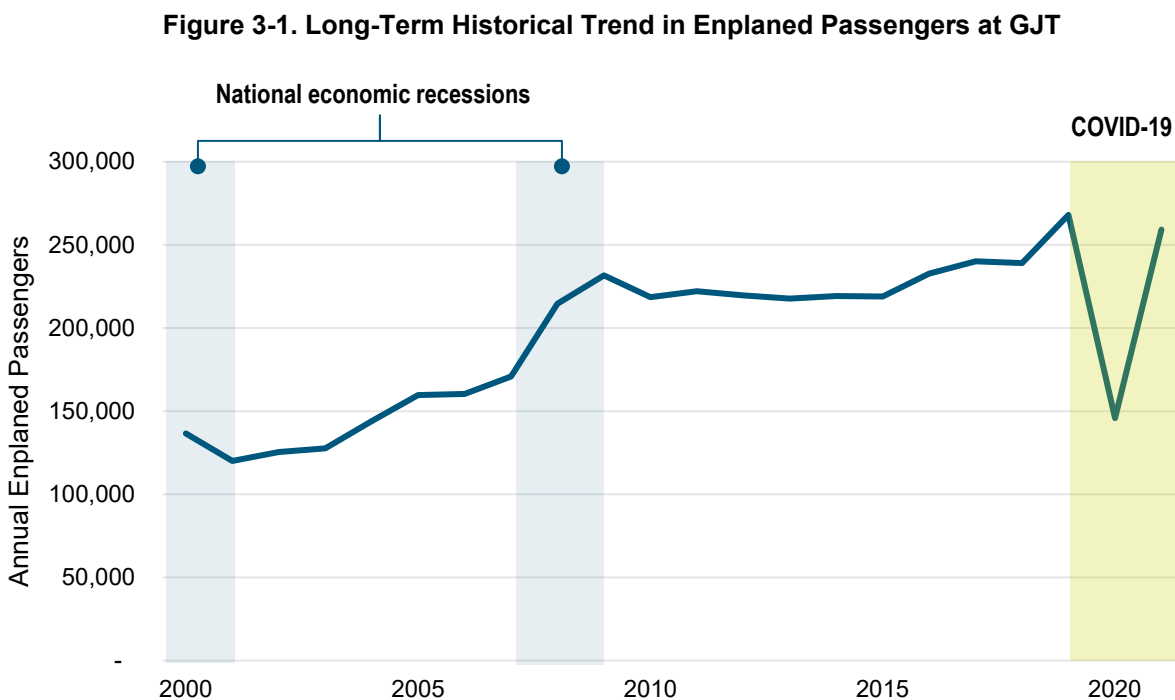
3.1 Historical Aviation Activity

Historical aviation activity at the Airport is described in this section including passenger activity, major markets, and airline market share. Data for air cargo and aircraft operations are also presented.

3.1.1 Passenger Activity

Figure 3-1 summarizes historical passenger traffic at GJT. Total passengers generally grew each year throughout the early 2000s, amounting to a compound annual growth rate (CAGR) of 4.8% per annum between 2000 and 2010. Growth during these years reflected expanded airline service, with the largest increases in passengers occurring throughout 2008 and 2009 after the introduction of service to DFW by American Airlines as well as the start of service by low-cost carriers. After the global financial crisis, annual traffic remained relatively flat, hovering around 219,000 enplaned passengers from 2010 through 2015. After 2015, traffic began to grow again reaching a historical peak of 268,000 enplaned passengers in 2019. In 2020, the pandemic drove a 46% year-over-year decline in enplaned passengers relative to the Airport's record-setting 2019, consistent with the declines at other airports nationwide. However, annual enplanements largely rebounded in 2021, reaching over 259,000 enplaned passengers or nearly 97% of pre-pandemic traffic in 2019.

Table 3-1 shows annual enplaned passengers from 2010 to 2021.



Source: GJRAA records, April 2022.

Table 3-1. GJT Historical Enplaned Passengers, 2010-2021

Year	Enplaned passengers	Year- over-year change
2010	218,519	--%
2011	222,096	1.6%
2012	219,643	(1.1%)
2013	217,684	(0.9%)
2014	219,252	0.7%
2015	218,948	(0.1%)
2016	232,672	6.3%
2017	240,132	3.2%
2018	239,063	(0.4%)
2019	268,029	12.1%
2020	145,841	(45.6%)
2021	259,193	77.7%
Compound annual growth rates		
2010 – 2019		2.3%
2019 – 2021		1.6%
Source: GJRAA records, April 2022. Note: GJRAA records both scheduled and nonscheduled enplaned passengers. This can result in differences when compared to U.S. DOT databases.		

3.1.2 Major Origin and Destination Markets

Table 3-2 summarizes the largest origin and destination markets for passengers traveling to or from GJT, sorted based on the latest calendar year 2021. The largest markets are distributed across major metropolitan areas as well as a few sunspot destinations nationwide, with the single largest markets in Phoenix and Los Angeles followed by Las Vegas, Denver, and Dallas. The Airport has nonstop flights to each of these top 5 markets, served by regional carriers operating mainline service as well as seasonal service by low-cost airlines. Collectively, the top 5 markets accounted for about 30% of the total passenger market in 2021.

Table 3-2. Shares of Top 10 Domestic Origin and Destination Passenger Markets

Rank	Market	2010	2019	2021
1	Phoenix ^a	5%	11%	8%
2	Los Angeles ^b	11%	6%	8%
3	Las Vegas ^c	8%	7%	5%
4	Denver ^d	4%	4%	5%
5	Dallas ^e	3%	5%	5%
6	Seattle ^f	2%	3%	3%
7	Houston ^g	4%	2%	2%
8	New York ^h	2%	2%	2%
9	Orlando ⁱ	1%	1%	2%
10	Washington ^j	3%	2%	2%
	<i>Other</i>	55%	57%	59%
	Total	100%	100%	100%

a Includes Sky Harbor and Mesa Gateway airports

b Includes Los Angeles, Ontario, John Wayne, Hollywood Burbank, and Long Beach airports

c Includes Harry Reid airport

d Includes Denver airport

e Includes Dallas/Ft. Worth airport (no traffic to Love Field for the years shown)

f Includes Seattle-Tacoma airport

g Includes George Bush and Hobby airports

h Includes John F. Kennedy, LaGuardia, Newark Liberty, and Stewart airports

i Includes Orlando airport

j Includes Ronald Reagan National, Washington Dulles, and Baltimore-Washington airports

Source: U.S. DOT Origin and Passenger Destination Survey via Diio Mi, April 2022.

Note: Figures may not sum to 100% due to rounding.

3.1.3 Airline Service and Market Shares

The Airport has predominantly been served with scheduled service by four main airlines (and their regional affiliates): American Airlines, United Airlines, Delta Air Lines, and Allegiant Air. Local carrier Key Lime Air, doing business as Denver Air Connection, previously also offered in-state service out of GJT but discontinued those flights in March 2020.

The major network airlines – American, United, and Delta – and their regional affiliates have historically carried most of the passenger traffic at GJT, accounting for 87% of total enplaned passengers in 2021. As a result, most of the airline service at GJT connects into nearby hubs of the network carriers, primarily DEN, DFW, PHX, and SLC, while low-cost carrier Allegiant has introduced some point-to-point service directed at sunspot destinations. Delta discontinued service at GJT in January 2022, but this does not change the general assessment that major airlines provide connections to their route networks.

In 2021, new seasonal service was introduced by low-cost carriers Frontier Airlines and Avelo Airlines. Avelo discontinued its service in 2021, with no service scheduled for 2022. Frontier maintained seasonal service in the first half of 2022, but does not currently offer service at the airport.

Generally, it is expected that there will continue to be changes in the airline service decisions of individual airlines, but also that the GJT market will continue to support growth in service and passenger demand as indicated by historical trends and forward-looking economic indicators.

Table 3-3 summarizes the historical market shares for revenue enplanements by airline.

Table 3-3. Enplaned Passenger Market Share by Airline

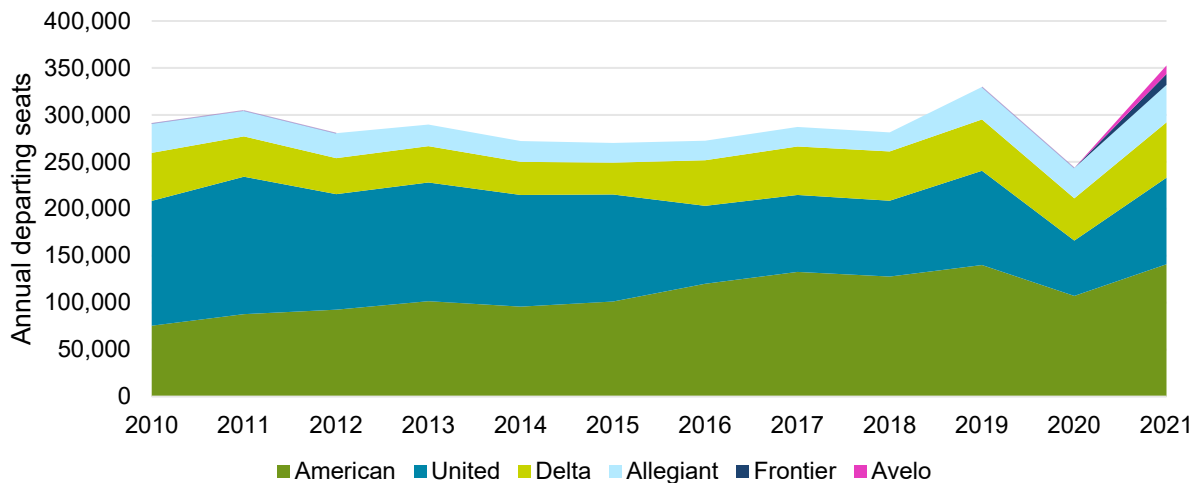
Airline ^a	Code(s)	2011	2019	2020	2021
American Airlines	AA	30%	41%	47%	42%
United Airlines	UA	42%	30%	25%	29%
Delta Airlines	DL	14%	16%	16%	16%
Allegiant Air	G4	12%	9%	10%	8%
Others ^b		2%	3%	1%	4%

a Includes regional affiliates
b Includes Frontier Airlines, Avelo Airlines, Denver Air Connection, Southwest Charter, and SwiftAir Charters
Source: GJRAA Records, April 2022.
Note: Numbers may not add to 100% due to rounding.

In 2020, the pandemic drove a downturn in traffic resulting in reduced overall airline activity nationwide, amounting to an overall reduction of 26% fewer scheduled departing seats out of GJT specifically. The majority of passenger traffic remained concentrated within the three main network airlines that operate most of the capacity at GJT, with each of them generally retaining their pre-pandemic market shares of passenger traffic throughout 2020 and into 2021.

Figure 3-2 illustrates the annual trend in departing seats by airline from 2010 to 2021.

Figure 3-2. Annual Scheduled Departing Seats by Airline



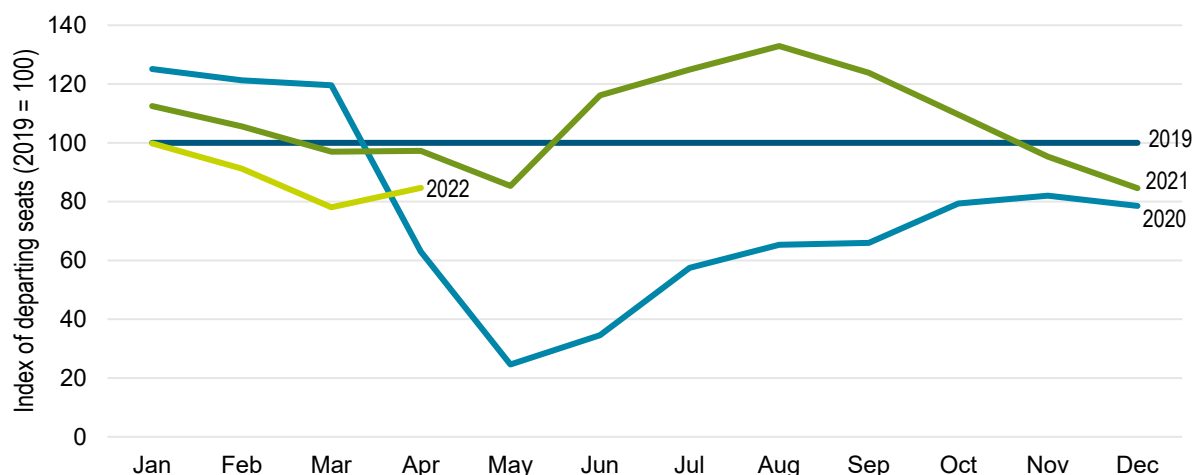
Source: Innovata schedules, April 2022.

Note: Denver Air Connection (Key Lime Air) does not file schedule data in Innovata, and therefore is not shown here.

Figure 3-3 shows an index of 2020-2022 monthly departing seats compared against the level of departing seats provided in the same month in 2019 (the last full calendar year pre-pandemic). For each month in 2019, the number of scheduled departing seats is expressed as an index value of 100. This is to present 2019 service as a baseline against which to compare the 2020, 2021, and latest 2022 results. For the months of 2020-2022, the number of scheduled departing seats is compared to that 2019 index value of 100 to indicate the increase or decrease (in percentage terms) against the service levels provided in 2019. The onset of the pandemic, for instance, can be seen with the drop in scheduled departing seats through April and May 2020, reaching a low of about 25% of the 2019 baseline level in May 2020 before gradually recovering to as much as 80% of 2019 levels toward the end of 2020.

The trend in 2021 indicates that seasonal capacity at GJT during its busier summer months has already rebounded from the pandemic and grown beyond pre-pandemic levels. Monthly scheduled seats between June through September 2021 averaged 24% higher than pre-pandemic 2019 levels. While this included new service by Frontier and Avelo – some of which may not return for Summer 2022 – approximately half of this growth was attributed to added capacity by its major network airline incumbents. It is acknowledged that Delta has discontinued service at GJT as of January 2022. However, other airlines can provide network connections to serve passenger demand.

Figure 3-3. Index of Monthly Scheduled Departing Seats – January 2019 to April 2022



Source: Innovata schedules, April 2022.

3.1.4 Air Cargo

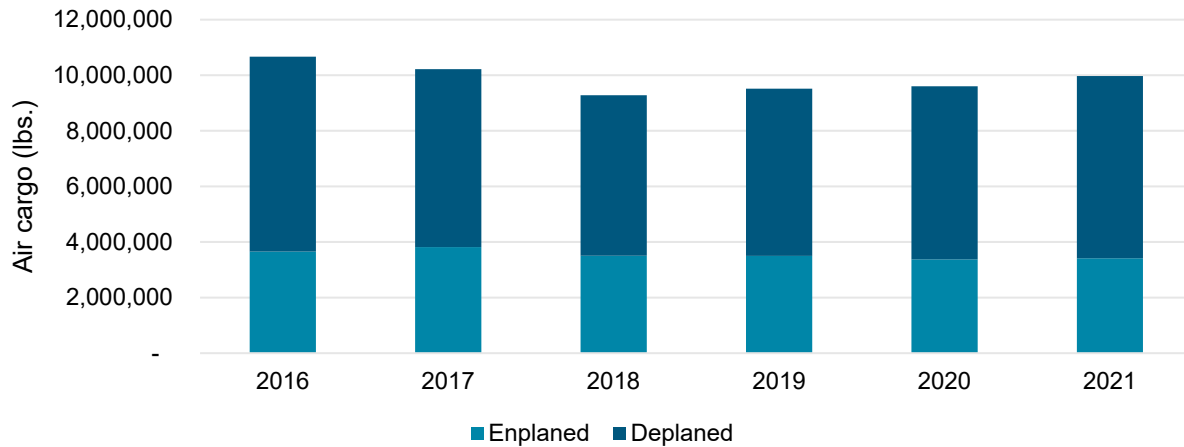
Air cargo volume is reported at GJT in pounds, and includes both freight and mail, carried by both passenger airlines and all-cargo airlines. Air cargo activity typically exhibits very different patterns as compared to passenger activity. For example, trucking networks combine with air networks. In addition, there can be a significant difference in the balance between inbound and outbound (deplaned and enplaned) cargo, based on manufacturing and shipping trends, to include regional imports and exports.

Total cargo volume at GJT (enplaned and deplaned) has declined from the historically high levels realized in the 2011 to 2013 time period. It is important to note that local air cargo activity is affected by a variety of factors beyond just local demand, including competition with trucking alternatives and the regional network decisions of airlines and other participants such as freight forwarders. Air cargo has been increasing steadily since 2018.

Figure 3-4 shows the recent trend in air cargo activity at GJT and highlights the increase in activity since 2018. The recent increase in air cargo activity nationally and locally is attributed significantly to pandemic-related increases in e-commerce.

It is also important to note the difference in the shares of enplaned and deplaned cargo. All-cargo aircraft are more fully loaded with inbound (deplaned) cargo than with outbound (enplaned) cargo. Thus, the volume of deplaned cargo will be the determining factor in airline decisions regarding aircraft capacity.

Figure 3-4. Recent Historical Enplaned and Deplaned Cargo (pounds)



Source: GJRAA records, April 2022.

Table 3-4 shows the share of total cargo by airline in 2021. As shown, virtually all cargo at GJT is carried by all-cargo airlines, with the largest being FedEx, and the second largest Key Lime. The relatively small market share of passenger airlines is typical of markets in which belly cargo is limited primarily to regional jets with little capacity for more than baggage and mail.

Table 3-4. Air Cargo Market Shares

Airline	2021
All-Cargo Airlines	99.7%
FedEx	86.4%
Key Lime	13.3%
Passenger Airlines	0.3%

Source: GJRAA records, April 2022.

The U.S. Mountain West region is considered to include Colorado, Arizona, Utah, and Nevada. There are a few large hub airports accounting for the majority of the air cargo in the region: the airports in Phoenix, Denver, and Salt Lake City. The smaller airports in the region, including GJT, are primarily origin-destination markets with most of the service provided by FedEx and UPS, and affiliated feeder carriers.

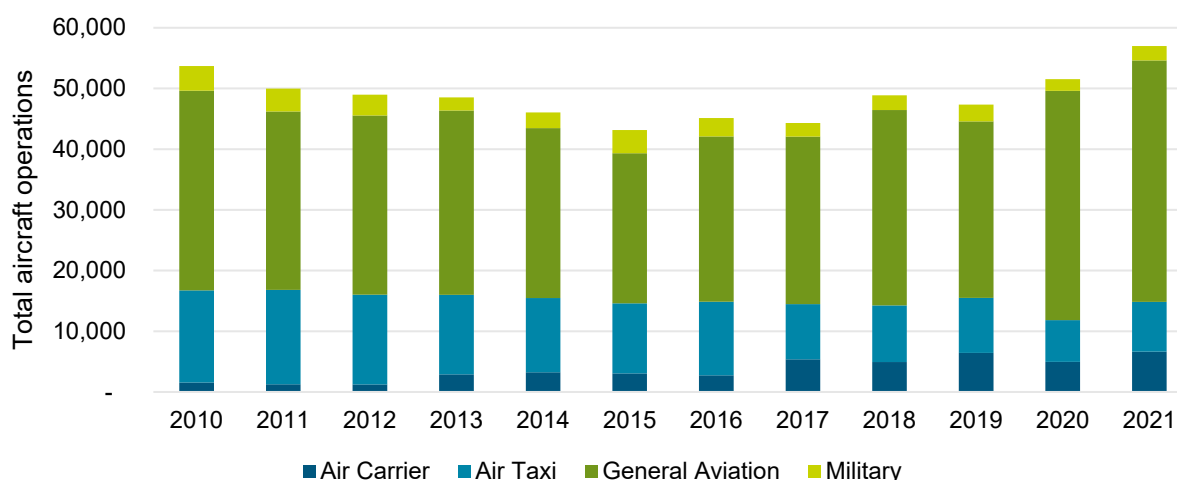
3.1.5 Historical Aircraft Operations

Aircraft operations represent the total number of aircraft landings and takeoffs at GJT and are recorded and reported by FAA control tower staff. The FAA categories for aircraft operations are air carrier, commuter/air taxi, general aviation (GA), and military. It is important to note that some previous studies at GJT have included an upward adjustment of aircraft operations, due to the fact that the FAA control tower is closed from 10pm to 6am every night, and therefore it is possible that there is underreporting of total aircraft operations in the FAA statistics. For purposes of this report, we did not have any independent information regarding the potential higher level of aircraft operations in comparison to the FAA data. Therefore, we have relied on the FAA data, but at the same time we note that there may be some additional overnight aircraft operations not represented in the official FAA data.

For the recent historical period, from 2011 to the pre-pandemic 2019, total aircraft operations at GJT have fluctuated between 40,000 and 50,000 each year, with some variations in the category of activity. The

share of aircraft operations from commercial airlines has fluctuated in historical years, based on airline service decisions. The largest category of aircraft operations historically is general aviation. From 2011 to 2017, there was a decline in general aviation activity, consistent with a broader trend of less private and recreational flying observed across North America.¹⁴ Total operations achieved positive growth from 2017 to 2021, growing from 44,000 operations in 2017 to nearly 57,000 in 2021. Notably, the pandemic did not result in a decrease in total operations at GJT in 2020; while commercial service via air carrier and air taxi operations showed a modest decline in 2020, this was more than offset by an increase in general aviation operations. **Figure** summarizes the total annual aircraft operations at GJT between 2010 to 2021.

Figure 3-5: Historical Aircraft Operations



Sources: 2010-2016 data from FAA Opsnet; 2017-2021 data from GJRAA annual data reports.
Note: Figures in chart do not include overnight operations.

3.2 Demographic and Economic Background

This section provides an overview of the historical and projected demographic and economic trends that impact the Airport. This background includes GJT's air trade area as well as the region's population, employment, and gross regional product.

3.2.1 Air Trade Area

The Airport's air trade area is defined as the area surrounding the Airport, whose population and economic activity generate a majority of the Airport's passenger traffic. In general, an airport's air trade area is limited by distance from the airport as well as the time it takes to travel to the airport.

An airport's air trade area is further defined by the availability and quality of air service at surrounding airports. The extent of the Airport's demand is influenced by the proximity to these other airports. There are three commercial service airports located within two hours' drive time from GJT, summarized further in **Table 3-5** and mapped in **Figure 3-6**. Along with GJT, the broader central-western Colorado region is served by Aspen-Pitkin County Airport (ASE), Eagle County Regional Airport (EGE), and Montrose Regional Airport (MTJ), each of which offer feeder flights into DEN as well as a selection of other non-

¹⁴ Federal Aviation Administration, *FAA Aerospace Forecast Fiscal Years 2021-2041*. See Tables 28-30.

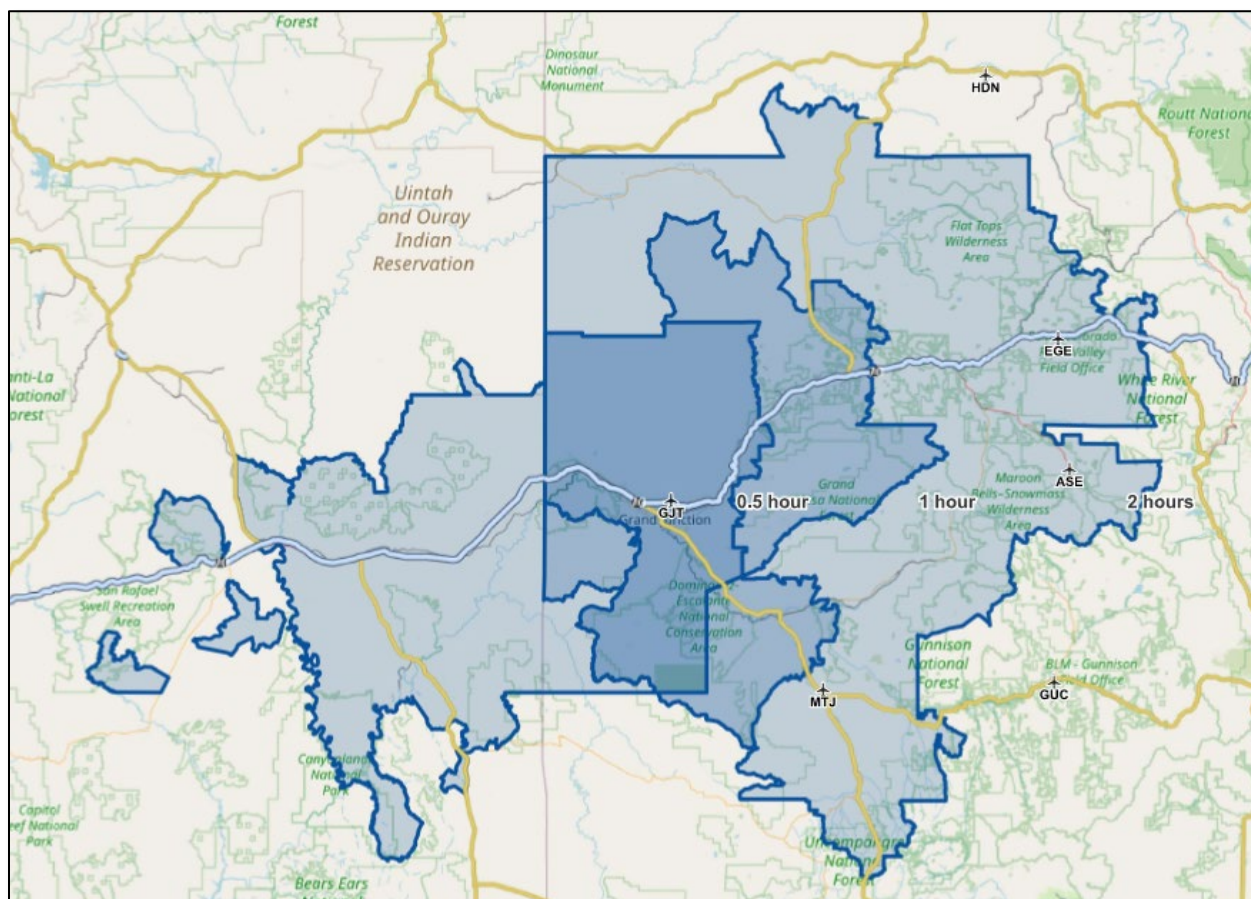
stop destinations. As shown with 2021 data in **Figure 3-7**, GJT accounts for roughly 29% of this regional scheduled passenger market share.

Table 3-5. Commercial Service Airports in Proximity to GJT

Airport	Road Distance (miles)	2021 Average Daily Departures	2021 Annual Enplanements
Grand Junction Regional Airport	--	14	259,193
Aspen/Pitkin County Airport	124	16	224,533
Eagle County Regional Airport	114	8	183,201
Montrose Regional Airport	65	9	159,676

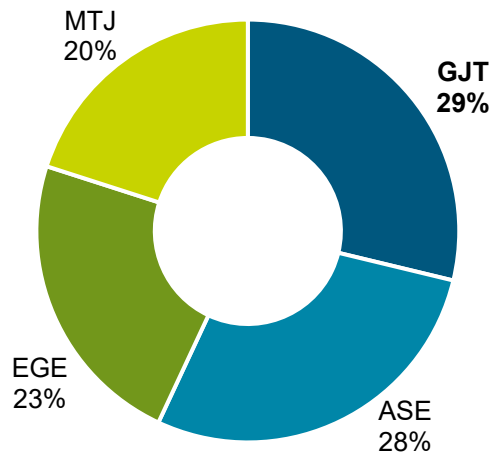
Source: Road distance: Google Maps, April 2022.
Average Daily Departures: 2021 Diio Mi Schedules, April 2022.
2021 Enplanements: GJT from GJRAA records. Other airports from FAA.

Figure 3-6. Commercial Service Airports Within 2 Hours' Drivetime From GJT



Source: Diio Mi catchment mapper, April 2022.

Figure 3-7 Share of Regional Enplaned Passengers

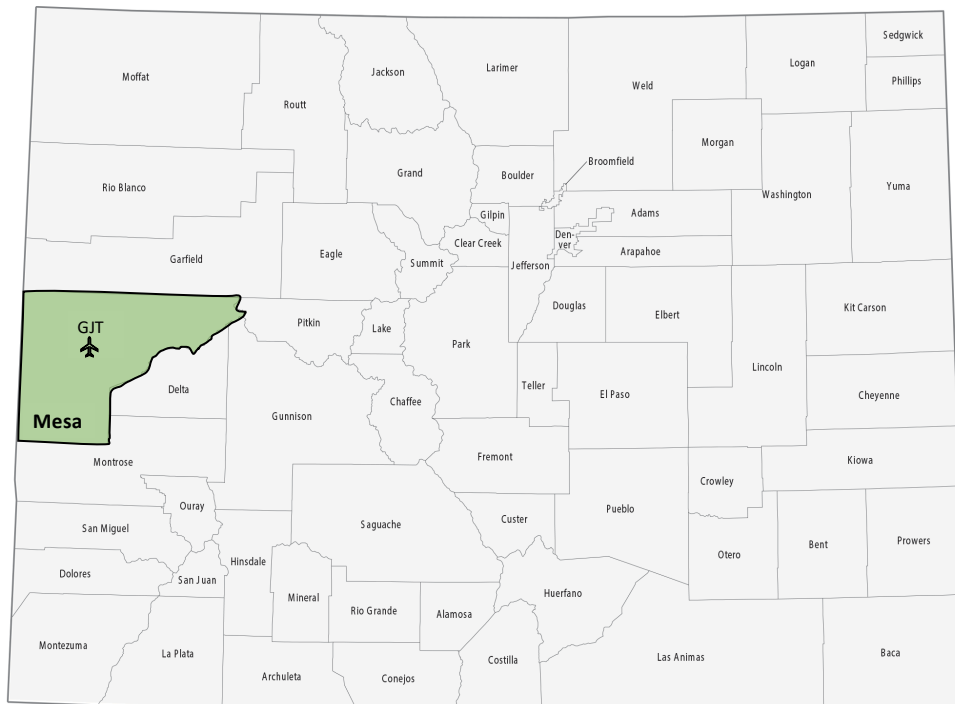


Source: GJRAA records for GJT, FAA data for other airports, April 2022.

3.2.2 Population, Employment, and Economic Activity

The Grand Junction Metropolitan Statistical Area (MSA) is comprised of one county in Colorado, Mesa County, as shown in **Figure** . It is the only metropolitan area located in the western half of the state and includes the main cities of Grand Junction and Fruita. This area accounts for the majority of the region's population and is believed to generate most of the local demand for air travel out of GJT. As such, data for this MSA is described in this section as a representation of the Airport's air trade area for purposes of understanding relevant trends on local population, employment, and economic growth.

Figure 3-8. Colorado Map showing Grand Junction (Mesa County) Metropolitan Statistical Area



Source: U.S. Census Bureau, 2020 Core Based Statistical Areas and Counties in Colorado.

It is important to note that some economic trends and data, nationally and locally, may have changed due to the COVID-19 pandemic beginning in early 2020. The analyses rely on the most recent sources and estimates available as of the date of this forecast, which incorporate information and estimated impacts of the pandemic and subsequent recovery. The economic data release by Woods & Poole (the latest available at the time of this analysis) is presented in this section and incorporates the estimated impact of the pandemic. Although COVID-19 had a significant and disruptive short-term impact in 2020 and 2021, the projections by Woods & Poole do not show a significant long-term effect from the pandemic on economic growth beyond 2022.

This section focuses on the long-term demographic and economic trends which typically drive long-term trends in aviation demand.

As shown in **Table 3-6**, the population of the Grand Junction MSA grew at a compound annual rate of 1.7% per annum from 1990 to 2020, at a similar pace as the statewide average growth rate and nearly double that of the nationwide average. The projected growth in population from 2020 to 2040 is expected to average around 0.9% per annum, compared to the statewide average of 1.1% and the national average of 0.7% per annum.

Table 3-6. Historical and Projected Population – Grand Junction MSA, Colorado, and United States

Year	Grand Junction MSA ^a	Colorado ^a	United States ^a
1990	94	3,308	249,623
2000	118	4,327	282,162
2010	146	5,047	309,322
2020	154	5,759	328,241
CAGR 1990 - 2020	1.7%	1.9%	0.9%
Projected population			
2040	185	7,097	374,697
CAGR 2020 - 2040	0.9%	1.1%	0.7%
^a Population in thousands Source: Woods & Poole, 2021			

Table 3-7 summarizes historical and projected employment (jobs) trends. Employment growth in the Grand Junction MSA averaged 2.1% per annum between 1990 and 2020, roughly in line with the statewide average growth rate of 2.2% per annum and exceeding the national average of 1.3% per annum over the same historical period.

Over the projected timeframe through 2040, the MSA's annual employment growth is expected to trend closer toward the national average rate, averaging 1.3% per annum from 2020 to 2040.

Table 3-7. Historical and Projected Employment – Grand Junction MSA, Colorado, and United States

Year	Grand Junction MSA ^a	Colorado ^a	United States ^a
1990	49	2,040	138,331
2000	70	2,918	165,371
2010	83	3,144	172,902
2020	92	3,950	203,810
CAGR 1990 - 2020	2.1%	2.2%	1.3%
Projected employment			
2040	120	5,327	260,220
CAGR 2020 - 2040	1.3%	1.5%	1.2%
a Employment in thousands of jobs Source: Woods & Poole, 2021			

Table 3-8 summarizes the historical and projected gross regional product (GRP) for the Grand Junction MSA and Colorado, along with the gross domestic product (GDP) for the United States. GRP/GDP are broad indicators of economic activity occurring within the geography of interest. The dollar figures for each year below are expressed in real terms so that changes over time indicate true growth in the economy rather than inflation.

Similar to population and employment growth, economic activity in the Grand Junction MSA has historically grown at a similar pace to the statewide average and above the national average rate of growth. Between 1990 and 2020, the MSA's GRP grew at a compound rate of 3.3% per annum. This is expected to slow to 2.4% per annum through the next two decades to 2040, or roughly in line with the projected growth rates for both Colorado and the United States overall.

Table 3-8. Historical and Projected GRP/GDP – Grand Junction MSA, Colorado, and United States

Year	Grand Junction MSA ^a	Colorado ^a	United States ^a
1990	\$2,363	\$122,606	\$9,167,257
2000	\$3,968	\$230,962	\$13,020,311
2010	\$5,638	\$267,134	\$15,556,285
2020	\$6,302	\$347,636	\$18,728,983
CAGR 1990 - 2020	3.3%	3.5%	2.4%
Projected GRP and GDP			
2040	\$10,196	\$568,172	\$29,096,747
CAGR 2020 - 2040	2.4%	2.5%	2.2%
a GRP and GDP in millions of 2012 dollars Source: Woods & Poole, 2021			

3.3 COVID-19 Pandemic Downturn and Recovery Outlook

This section discusses the pandemic downturn over the past two years, as well as the outlook for the recovery of the aviation industry.

3.3.1 COVID-19 Pandemic Downturn

The global spread of COVID-19 in 2020 resulted in significant declines in economic activity and airline traffic. Airports in the United States suffered declines of 24% to 89% in 2020, compared to passenger levels in 2019. In 2021, nationwide enplanements began to recover, reaching 69% of pre-pandemic levels from 2019. As mentioned in earlier sections, GJT and similar domestic service-driven airports have fared well relative to other airports. Enplaned passengers at GJT decreased 46% in 2020 compared to 2019 but largely rebounded in 2021, with 2021 traffic reaching nearly 97% of 2019 levels as shown in **Table 3-9**.

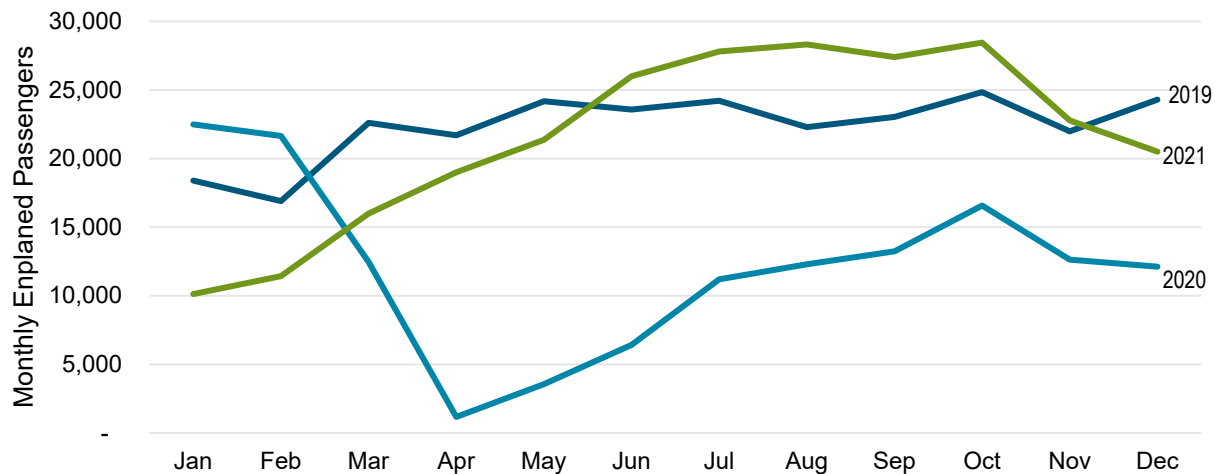
Table 3-9. COVID-19 Passenger Traffic at GJT and Nationwide

Region	2019	2020	2021	Enplaned Passengers		
				2019 (% of 2019)	2020 (% of 2019)	2021 (% of 2019)
GJT	268,029	145,841	259,193	100%	54%	97%
United States	942,737,511	371,569,269	648,361,366	100%	39%	69%

Source: GJT from GJRAA records; United States directional onboards from US DOT T-100 via Diio Mi, April 2022.
Note: at the time of writing, T-100 international data was only available through October 2021. The 2021 U.S. figure shown will therefore slightly underrepresent total onboards for the year.

Figure 3-9 provides further detail on the lifecycle of the pandemic-driven downturn and initial recovery for passenger enplanements at GJT, by comparing monthly traffic for 2019 through 2021. Like most airports in North America, monthly traffic at GJT began to decline in March 2020 and hit its low in April 2020 as most commercial operations were halted with the onset of the pandemic. Since then, passenger enplanements have largely continued to grow closer to pre-pandemic levels with each passing month. In 2021, monthly traffic already surpassed pre-pandemic 2019 levels throughout the months from June to November.

Figure 3-9. Monthly Enplaned Passengers at GJT, January 2019 to December 2021



Source: GJRAA records, April 2022.

3.3.2 Industry Outlook

The COVID-19 downturn has introduced considerable uncertainty regarding near-term economic growth and airline activity. While many airports including GJT have shown substantial and rapid recoveries thus far, ongoing developments related to emerging COVID-19 variants, broader economic conditions, and the future of airline operations such as staffing levels and network plans, could continue to impact the recovery and growth of air traffic in the coming years. During the first half of 2022, most industry sources have estimated that travel will return to pre-pandemic levels within three to five years, with domestic travel leading in the recovery ahead of international travel. In March 2022, IATA released its latest regional recovery projections and indicated that North America passenger travel was expected to achieve a full recovery in 2023.¹⁵ As of May 2022, IATA indicated that global passenger traffic may also recover by 2023, a full year earlier than its previous global forecasts and an indication that air traffic recovery has, on average, continued to accelerate despite ongoing impacts from the war in Ukraine and continued travel restrictions in certain large markets like China.¹⁶ This may further allude to an accelerated recovery for domestic-focused markets like GJT which are less directly impacted by these other global factors. Other industry sources for forecasts (including ACI, ICAO, bond rating agencies) have also been reviewed during the development of the recovery projections for traffic at GJT.

The most recent FAA TAF for GJT and nearby airports (ASE, EGE, MTJ) have also been reviewed. These forecasts generally indicate traffic recovery to pre-pandemic levels within 2-5 years.

For purposes of this analysis, the long-term activity demand forecast is based on historical data through 2021 and a recovery to 2019 levels by 2022.

¹⁵ <https://www.iata.org/en/pressroom/2022-releases/2022-03-01-01/>

¹⁶ <https://www.reuters.com/business/aerospace-defense/iata-boss-says-high-fuel-prices-not-likely-impact-travel-demand-now-2022-05-09/>

3.4 Aviation Demand Forecast Methodology and Results

This section describes the methodology and forecast results for enplaned passengers and aircraft operations at GJT. The forecasts are prepared for calendar years.

It was assumed that airline service at the Airport will not be constrained by the availability of aviation fuel, limitations in airline fleet and/or staffing, limitations in the capacity of the air traffic control system or the Airport, charges for the use of aviation facilities, or government actions that could restrict growth.

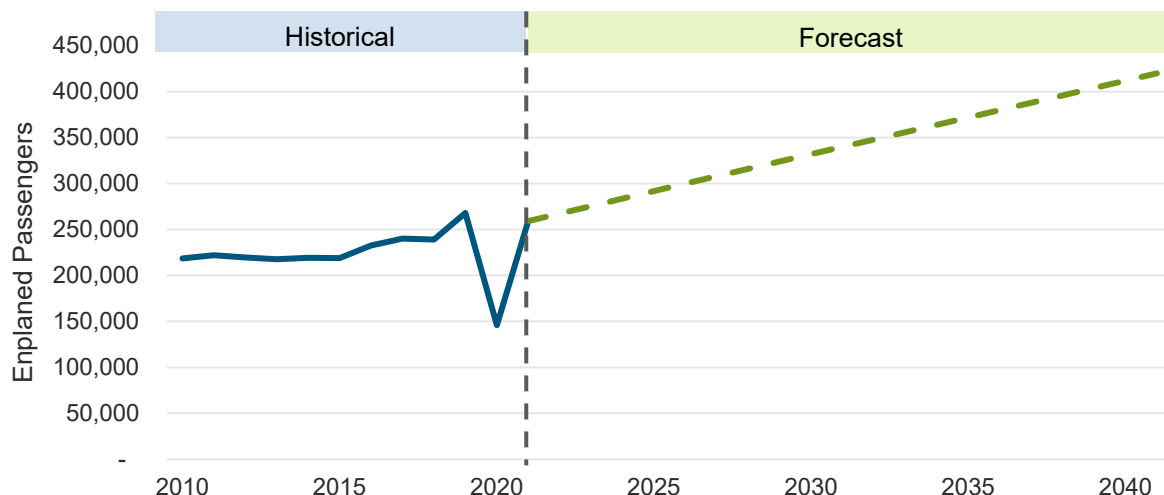
3.4.1 Enplaned Passengers

The enplaned passenger forecast was developed in accordance with industry standards and FAA guidance. Trend analysis coupled with professional judgment were used to develop the baseline forecast. Assumptions related to traffic recovery and the Airport's market share of regional passengers forms the basis for the forecast of enplaned passengers:

- With the significant recovery in 2021 already, enplanements are expected to recover to 2019 levels by 2022-23, generally consistent with the FAA TAF for GJT and broader industry expectations for U.S. domestic traffic recovery.
- GJT is expected to continue to account for approximately 30% of regional passenger activity (the combined total of GJT, ASE, EGE, MTJ) over the long-term period to 2041, and considering the most recent FAA TAF for the region's airports.

Using this methodology, the resulting forecast for enplaned passengers is shown in **Figure 3-10**. Through 2041, enplanements are expected to grow at a compound annual rate of 2.4%, from the baseline of 259,193 enplaned passengers in 2021 to around 420,000 in 2041.

Figure 3-10. Enplaned Passenger Forecast



Sources: Historical: GJRAA records, April 2022. Forecast: InterVISTAS, May 2022.

Table 3-10 summarizes the enplaned passenger traffic by year. Enplanements are expected to grow by an annual average of 3.0% from 2021 to 2026, 2.5% from 2026 to 2031, 2.2% from 2031 to 2036, and 2.0% from 2036 to 2041.

Table 3-10. GJT Historical and Projected Enplaned Passengers

Historical			Forecast		
Year	Enplanements	Year-over-year increase	Year	Enplanements	Year-over-year increase
2010	218,519	--%	2022	267,400	3.1%
2011	222,096	1.6%	2023	275,500	3.1%
2012	219,643	(1.1%)	2024	283,700	3.0%
2013	217,684	(0.9%)	2025	291,800	2.9%
2014	219,252	0.7%	2026	300,000	2.8%
2015	218,948	(0.1%)	2027	308,000	2.7%
2016	232,672	6.3%	2028	316,000	2.6%
2017	240,132	3.2%	2029	324,000	2.5%
2018	239,063	(0.4%)	2030	332,000	2.5%
2019	268,029	12.1%	2031	340,000	2.4%
2020	145,841	(45.6%)	2032	348,000	2.4%
2021	259,193	77.7%	2033	356,000	2.3%
			2034	364,000	2.2%
			2035	372,000	2.2%
			2036	380,000	2.2%
			2037	388,000	2.1%
			2038	396,000	2.1%
			2039	404,000	2.0%
			2040	412,000	2.0%
			2041	420,000	1.9%
Compound annual growth rates					
	2010 – 2021			1.6%	
	2021 – 2026			3.0%	
	2026 – 2031			2.5%	
	2031 – 2036			2.2%	
	2036 – 2041			2.0%	
	2021 – 2041			2.4%	

Sources: Historical: GJRAA records, April 2022. Forecast: InterVISTAS, May 2022.

3.4.2 Aircraft Operations

Aircraft operations were forecast for commercial passenger, air cargo, general aviation, and military aircraft. The subsections below describe the methodology and results of the aircraft operations forecast. As noted above, the aircraft operations numbers do not include any allowance for nighttime operations that are not recorded in the FAA statistics.

3.4.2.1 Passenger Airline Aircraft Operations

Passenger airline aircraft operations were derived from the enplaned passenger forecast, based on assumptions regarding average seats per departure, load factors, and the resulting passengers per departure. The average number of seats per departure increased from about 55 in 2017 to about 66 in 2021. This is related to the general trend to use of larger regional jet aircraft, as well as new service introduced by low cost carriers that utilize narrowbody aircraft.

Steady growth is expected for average aircraft size and load factors throughout the forecast period, reaching 75 average seats per aircraft and a load factor of approximately 80% by 2041. Prior to the

pandemic, the average load factor at GJT was approximately 80%. **Table 3-11** outlines these passenger-per-departure assumptions.

Table 3-11. Assumptions for Commercial Passenger Airline Operations Forecast

Year	Seats per Aircraft	Load Factor
2021	66	74%
2026	68	76%
2031	70	78%
2036	72	79%
2041	75	80%

Source: InterVISTAS, May 2022.

Table 3-12 summarizes the commercial passenger airline operations by each year. These operations are expected to grow by an annual average rate of 1.9% from 2021 to 2026, 1.4% from 2026 to 2036, and 0.9% from 2036 to 2041.

Table 3-12. GJT Historical and Projected Commercial Passenger Airline Operations

Historical			Forecast		
Year	Operations	Year-over-year increase	Year	Operations	Year-over-year increase
2017	10,892	--%	2022	10,800	2.0%
2018	10,872	(0.2%)	2023	11,000	2.0%
2019	11,740	8.0%	2024	11,200	1.9%
2020	7,536	(35.8%)	2025	11,400	1.9%
2021	10,554	40.0%	2026	11,600	1.9%
			2027	11,800	1.5%
			2028	11,900	1.4%
			2029	12,100	1.4%
			2030	12,300	1.4%
			2031	12,500	1.4%
			2032	12,600	1.5%
			2033	12,800	1.4%
			2034	13,000	1.4%
			2035	13,200	1.4%
			2036	13,400	1.4%
			2037	13,500	1.0%
			2038	13,600	0.9%
			2039	13,700	0.9%
			2040	13,900	0.9%
			2041	14,000	0.9%
Compound annual growth rates					
	2021 – 2026			1.9%	
	2026 – 2031			1.4%	
	2031 – 2036			1.4%	
	2036 – 2041			0.9%	
	2021 – 2041			1.4%	

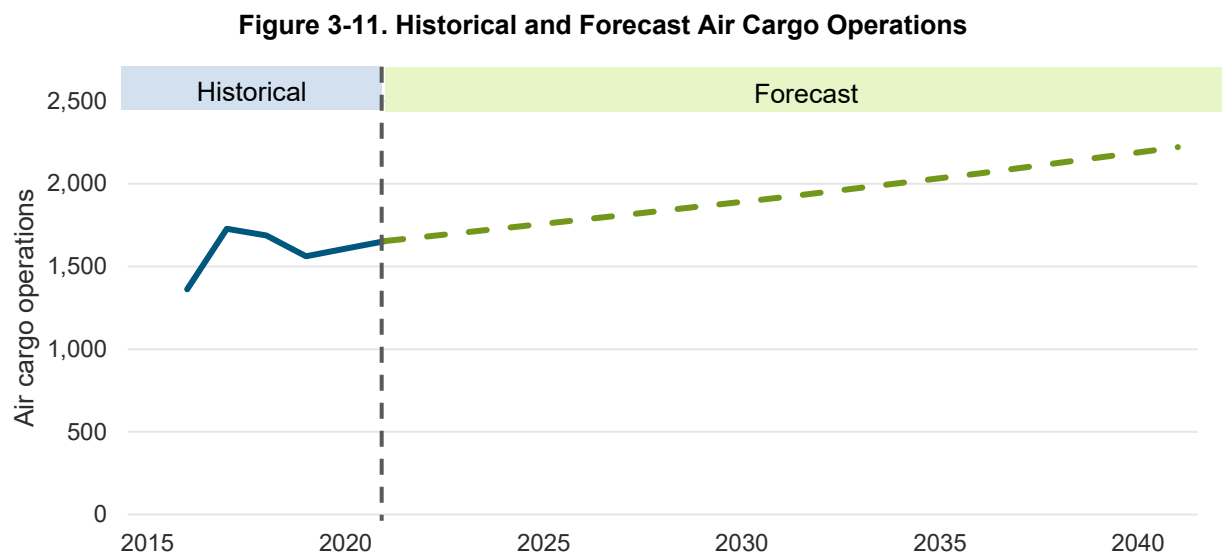
Sources: Historical: InterVISTAS analysis based on GJRAA landings records and US DOT T-100, April 2022. Forecast: InterVISTAS, May 2022.

Note: Historical GJRAA data by operation type provided back to 2017 only.

3.4.2.2 Cargo Airline Aircraft Operations

The recent level of historical air cargo aircraft operations fluctuated between 1,500 and 1,700 annual operations. While most of the air cargo volume is carried by FedEx (86% in 2021), the larger share of cargo airline aircraft operations was represented by Key Lime because of Key Lime's smaller aircraft size. In 2021, for example, FedEx accounted for 33% of total cargo airline aircraft operations, and Key Lime the balance of 67%.

Based on professional opinion regarding ongoing activity by current operators at GJT, and assuming a modest growth rate in cargo tonnage consistent with industry forecasts for U.S. domestic markets, air cargo aircraft operations are expected to grow at a modest pace through 2041. This comes with the caveat that, given the relatively small scale of shipments at GJT, even minor adjustments by incumbent carriers or entry by a new operator (e.g., an Amazon-contracted carrier) could substantially affect this base case outlook for air cargo at GJT. The resulting all-cargo aircraft operations forecast is shown in **Figure 3-11**.

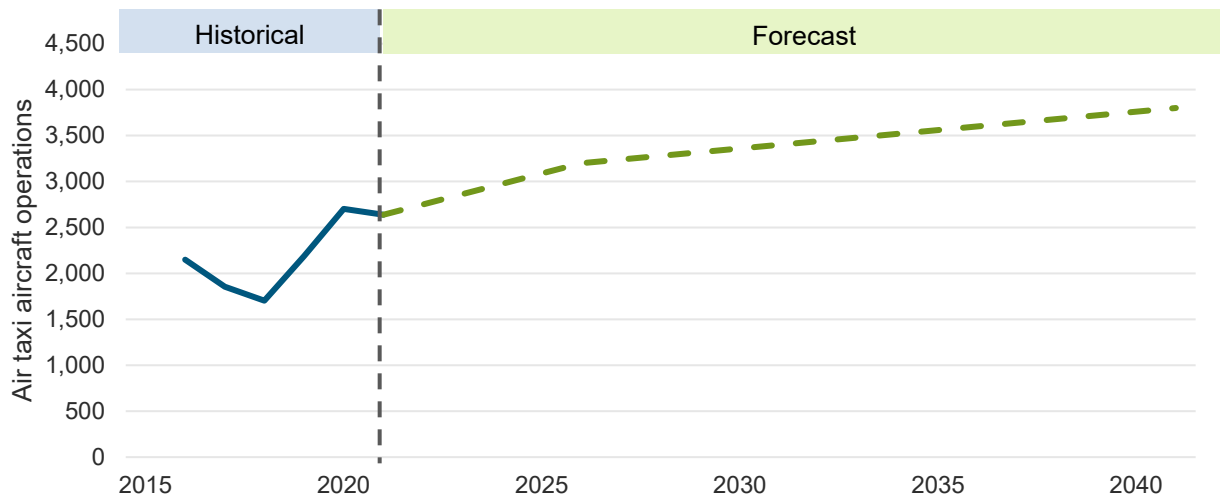


Sources: Historical: GJRAA records, April 2022. Forecast: InterVISTAS, May 2022.

3.4.2.3 Air Taxi Aircraft Operations

Over the last 5 years, air taxi operations represented on average around 4% of all aircraft operations at GJT. For this forecast, air taxi operations were assessed “net of” all commercial airline aircraft operations, and therefore they do not include any commercial airline air carrier or commuter operations, instead referring only to non-scheduled operations. With this in mind, it is anticipated that the level of air taxi operations will increase to around 3,800 annual aircraft operations by 2041. **Figure 3-12** shows the historical and forecast air taxi aircraft operations.

Figure 3-12. Historical and Forecast Air Taxi Aircraft Operations

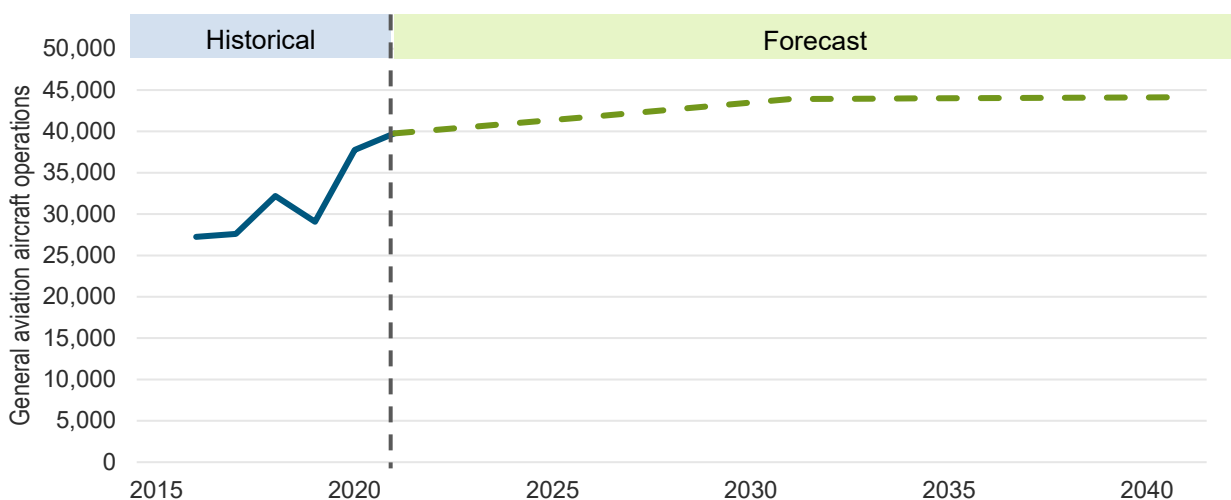


Sources: Historical: GJRAA records, April 2022. Forecast: InterVISTAS, May 2022.

3.4.2.4 General Aviation Aircraft Operations

General aviation operations have grown dramatically in recent years, from 27,251 operations in 2016 to 39,760 as of 2021. According to the latest FAA TAF for the Airport, general aviation operations are expected to stabilize throughout the forecast years, which is the same assessment adopted by the forecast team. As a result, general aviation aircraft operations were forecast to increase at a growth rate of 0.5% per year through the end of the planning horizon – generally consistent with the TAF growth projection of 0.4% per year. **Figure 3-13** shows the total historical and forecast general aviation aircraft operations.

Figure 3-13. Historical and Forecast General Aviation Aircraft Operations

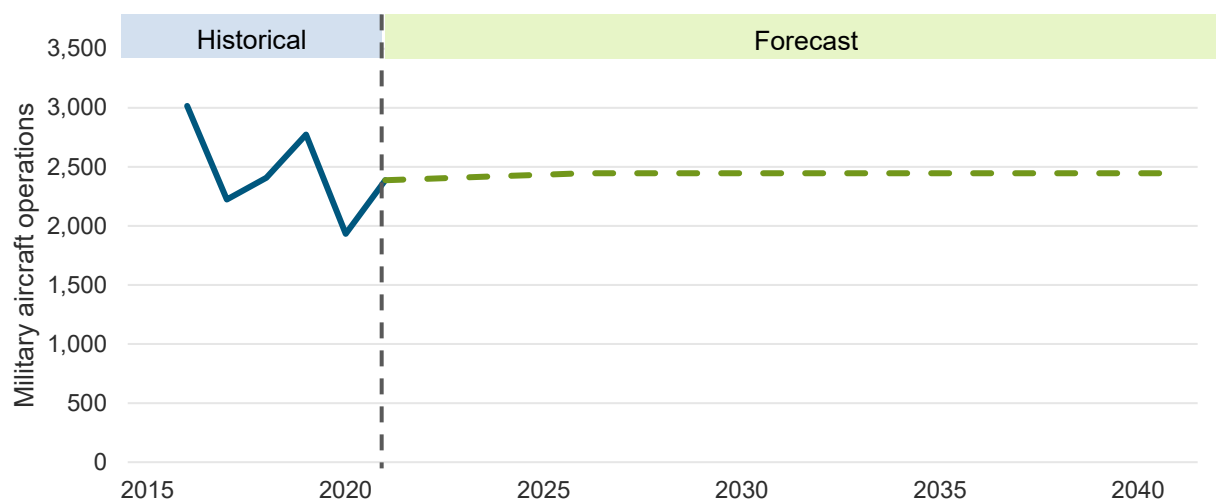


Sources: Historical: GJRAA records, April 2022. Forecast: InterVISTAS, May 2022.

3.4.2.5 Military Aircraft Operations

Military aircraft operations have fluctuated historically, and for purposes of this report we assumed the same forecasted operations per the FAA TAF, amounting to approximately 2,400 operations each year. **Figure 3-14** shows the historical and forecast military aircraft operations.

Figure 3-14. Historical and Forecast Military Aircraft Operations



Sources: Historical: GJRAA records, April 2022. Forecast: InterVISTAS, May 2022.

3.4.2.6 Total Aircraft Operations

Table 3-13 and **Table 3-14** summarize total aircraft operations for GJT. Total operations are expected to grow throughout the forecast period, from nearly 57,000 in 2021 to approximately 66,600 in 2041, amounting to a compound annual growth rate of 0.8%. By 5-year increments, total aircraft operations are expected to grow by an annual average rate of 1.3% from 2021 to 2026, 1.1% from 2026 to 2031, 0.4% from 2031 to 2036, and 0.3% from 2036 to 2041.

Table 3-13. Summary of Historical and Forecast Operations, by Type

	Historical				Forecast		
	2019	2020	2021	2026	2031	2036	2041
Passenger Airlines	11,740	7,536	10,554	11,600	12,500	13,400	14,000
Cargo Airlines	1,562	1,608	1,654	1,800	1,900	2,100	2,200
Air Taxi	2,188	2,702	2,638	3,200	3,400	3,600	3,800
General Aviation	29,076	37,760	39,760	41,800	43,900	44,000	44,100
Military	2,773	1,933	2,387	2,400	2,400	2,400	2,400
Total Aircraft Operations	47,339	51,539	56,993	60,800	64,100	65,500	66,500

Sources: Historical: GJRAA records, April 2022. Forecast: InterVISTAS, May 2022.

Note: Forecast figures may not sum to totals due to rounding.

Table 3-14. GJT Historical and Projected Total Aircraft Operations

Year	Historical Operations	Year-over- year increase	Year	Forecast Operations	Year-over- year increase
2017	44,306	--%	2022	57,700	1.4%
2018	48,860	10.3%	2023	58,500	1.4%
2019	47,339	(3.1%)	2024	59,300	1.3%
2020	51,539	8.9%	2025	60,000	1.3%
2021	56,993	10.6%	2026	60,800	1.3%
			2027	61,500	1.1%
			2028	62,200	1.1%
			2029	62,800	1.1%
			2030	63,500	1.1%
			2031	64,100	1.0%
			2032	64,400	0.4%
			2033	64,700	0.4%
			2034	65,000	0.4%
			2035	65,200	0.4%
			2036	65,500	0.4%
			2037	65,700	0.3%
			2038	65,900	0.3%
			2039	66,100	0.3%
			2040	66,300	0.3%
			2041	66,500	0.3%
Compound annual growth rates					
	2021 – 2026			1.3%	
	2026 – 2031			1.1%	
	2031 – 2036			0.4%	
	2036 – 2041			0.3%	
	2021 – 2041			0.8%	

Sources: Historical: GJRAA records, April 2022. Forecast: InterVISTAS, May 2022.

3.4.3 Fleet Mix

This section presents the fleet mix for the primary segments of aircraft operations at the Airport.

3.4.3.1 Passenger Airlines

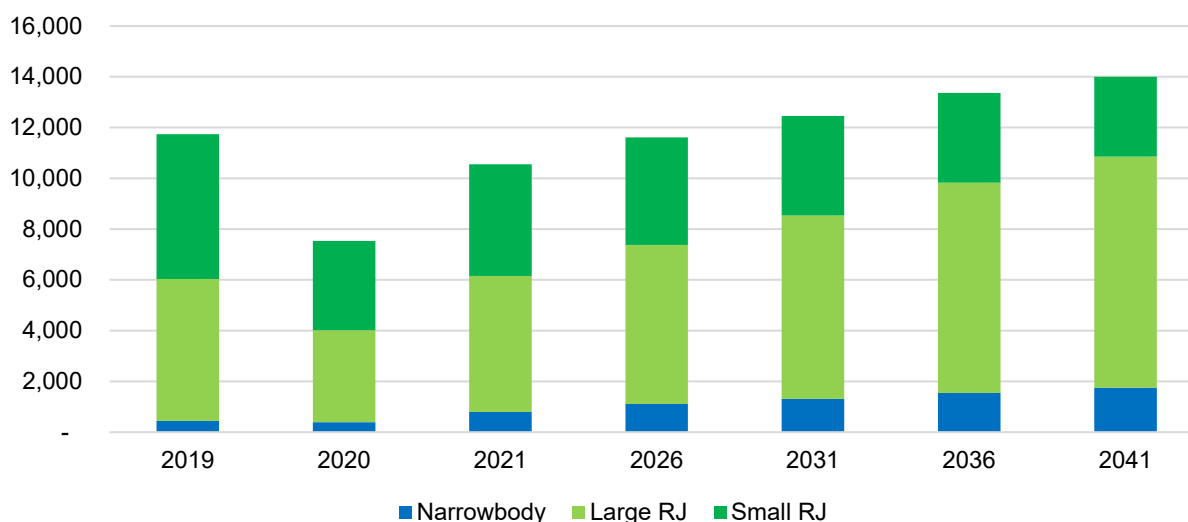
Historically, the majority of passenger airline aircraft operations have been operated with regional jet aircraft of various size from 50 seats to 80 seats, and in particular the Canadair and Embraer families of jets.

Narrowbody aircraft have historically been a relatively small share of the annual passenger airline aircraft operations at GJT (between about 2% and 5% of annual operations from 2016 to 2020). More recently, there is evidence, based on actual activity and airline service filings, of increased use of narrowbody aircraft at GJT, including Allegiant with the A319/A320, Frontier with the A320, and United with the A319. In 2021 the share of narrowbody aircraft operations increased to 7.5%.

In addition to the share of aircraft operations, it is important to understand the share of passengers. The share of passengers carried on narrowbody aircraft at GJT is about twice the share of aircraft operations, due to the larger size of narrowbody aircraft compared to regional jets.

Figure 3-15 presents the historical and forecast fleet mix shares for passenger airline aircraft operations at GJT.

Figure 3-15. Historical and Forecast Fleet Mix for Passenger Airline Aircraft Operations



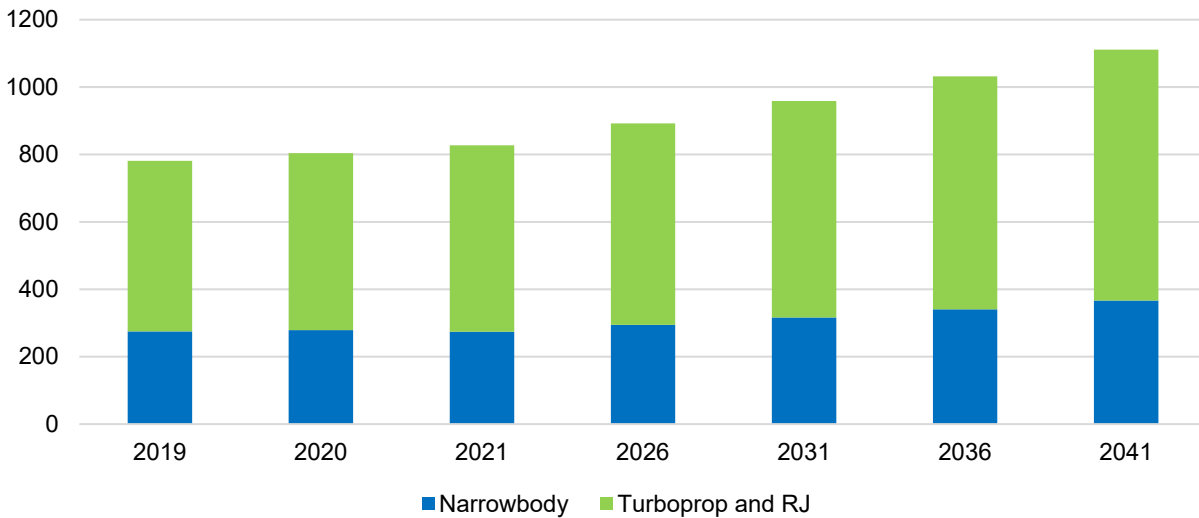
Sources: Innovata schedule data and GJRAA data for historical; InterVISTAS analysis for forecast.

It is assumed that there will be a gradual increase in the use of narrowbodies and larger regional jets, and a decrease in the use of smaller regional jets.

3.4.3.2 Cargo Airlines

As discussed earlier, the two all-cargo airlines at GJT are FedEx and Key Lime. FedEx operates narrowbody (B-757) aircraft, and Key Lime operates smaller turbo-prop aircraft. **Figure 3-16** presents the forecast of cargo airline fleet mix.

Figure 3-16. Historical and Forecast Fleet Mix for Passenger Airline Aircraft Operations



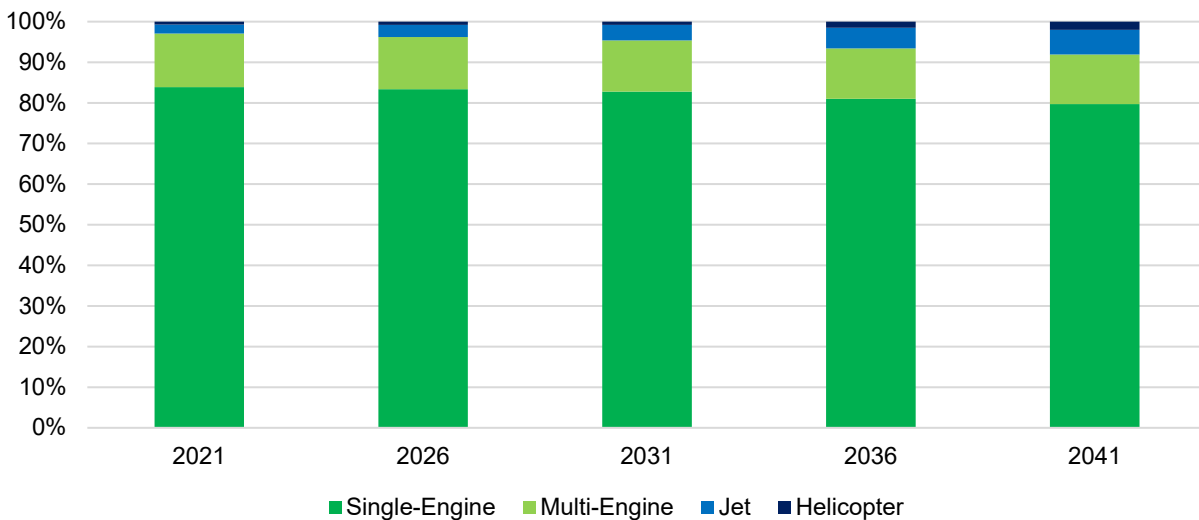
Sources: GJRAA data for historical; InterVISTAS analysis for forecast.

3.4.3.3 General Aviation Operations

General aviation activity at GJT is conducted primarily by single-engine and multi-engine piston and turboprop aircraft. Data sources used for the fleet mix analysis included based aircraft surveys, and review of itinerant activity.

Figure 3-17 presents the forecast fleet mix for general aviation aircraft operations. It is assumed that the current fleet mix shares will characterize the future years, with some increase in the use of jet aircraft, from 2% share in 2021 to 6% share in 2041.

Figure 3-17. Historical and Forecast Fleet Mix for General Aviation Aircraft Operations



Sources: GJRAA data for historical; InterVISTAS analysis for forecast.

3.4.4 Determination of Future Critical Aircraft at Grand Junction Airport

The critical aircraft is the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of the airport. The existing critical aircraft is based on current aeronautical use (a minimum of 500 annual takeoffs and landings, excluding touch-and-go operations). The future critical aircraft is an aircraft that is “highly likely” to regularly use the airport in the future. The characteristics of the future critical aircraft are used as a planning tool to evaluate facility needs and compatibility with FAA design standards. Defining the existing and future critical aircraft for each runway helps to ensure a balanced airfield and the ability to construct future facilities in a cost effective manner.

According to available FAA Aviation System Performance Metrics (ASPM) data, the Boeing 757-200 is the existing critical aircraft for Runway 11-29. The Boeing 757-200 is Aircraft Approach Category C, Airplane Design Group IV, and Taxiway Design Group 4. For Runway 4-22, the existing critical aircraft is a composite aircraft made up of the Cessna Conquest II, Pilatus PC-12 and the King Air 350. The composite aircraft is Aircraft Approach Category B, Airplane Design Group II, and Taxiway Design Group 2.

FedEx is the primary operator of the Boeing 757-200 at GJT. Nationally, FedEx has been phasing out older aircraft in favor of the performance of the Boeing 767-300. As previously shown in **Figure 3-16**, air cargo operations are expected to grow in the future. With FedEx’s national trend to increase their use of the Boeing 767-300 coupled with the expected growth in air cargo it is “highly likely” the Boeing 767-300 will be the future critical aircraft for Runway 11-29. The Boeing 767-300 is Aircraft Approach Category D, Airplane Design Group IV, and Taxiway Design Group 5.

There is no anticipated change in the existing critical aircraft for Runway 4-22 in the future. It should be noted that the existing and future critical aircraft determinations in this planning study are in line with the previous Airport Layout Plan completed in 2018.

3.4.5 Peak Period

Historical monthly activity records and airline scheduled activity were reviewed to determine the peak month and the average day peak month at the Airport. Historical data through 1999 were used to develop the daily operation and peak hour forecast, because the pandemic influence on monthly trends in 2020 and 2021 is not representative. It was assumed that the peak hour share of the year would remain approximately equal to the historical averages. **Table 3-15** shows the average day peak month forecast while **Table 3-16** summarizes the peak hour passenger forecast.

Table 3-15. Historical Average Day Peak Month Enplanements and Aircraft Operations

Historical average ¹	
Total Aircraft operations	9.8%
Enplaned passengers	9.5%

Note. Historical average is for period 2016 to 2019.

Source: Historical: GJRAA records, FAA Air Traffic Activity System, and Innovata schedules via Diio Mi, Forecast: InterVISTAS, May 2022.

Table 3-16. Historical and Forecast Peak Hour Passengers

Peak Hour Passengers	Arrivals	Departures
2021 Peak hour passengers	193	193
2026 Peak hour passengers	245	245
2031 Peak hour passengers	280	280
2036 Peak hour passengers	310	310
2041 Peak hour passengers	345	345

Source: Historical: GJRAA records and Innovata schedules via Diio Mi, Forecast: InterV/STAS, May 2022.

3.5 Comparison to the FAA Terminal Area Forecast

Table 3-17 provides a comparison of the aviation demand forecasts presented in this report as part of the GJT Airport Development Plan (ADP) against the FAA's 2022 TAF published in March 2022. The results are presented for the historical years 2019 to 2021, and the forecast years equal to base-year 2021 plus-5, -10, -15, and -20 years (2026, 2031, 2036, and 2041). **Table 3-18** presents a summary sheet of the ADP forecast enplanements, aircraft operations, and operational factors for each forecast year, along with the average forecasted compound annual growth rates by 5-year and full-forecast increments.

The key findings of the comparison with the FAA 2022 TAF include:

- The ADP forecast of enplaned passengers varies by 9.1% and 11.4% from the TAF at the 5- and 10-year planning horizons, respectively.
- The ADP forecast of total aircraft operations varies by 5.0% and 7.2% from the TAF at the 5- and 10-year planning horizons, respectively.

Development plan forecasts of enplanements and operations are considered consistent with the TAF if they differ by less than 10% in the 5-year forecast period, and 15% in the 10-year forecast period. Accordingly, the ADP is consistent with the 2022 TAF with respect to both enplanements and total aircraft operations.

Several reasons account for the differences between the ADP forecast and the 2022 TAF some of which include:

- The ADP forecast is prepared based on the calendar year (CY), whereas the TAF is based on the federal fiscal year (FFY, October 1 through September 30).
- The ADP forecast is prepared using recent historical airport results for the calendar year 2021, whereas the 2022 TAF is prepared in early to mid-2021 (before actual results are available).
- The TAF for the Airport is prepared as part of a dynamic model for over 200 airports, which allocates demand throughout the system; whereas the ADP forecast is prepared using a custom analysis of the local demographics and airline service at the airport.

Table 3-17. GJT FAA TAF Forecast Comparison

	ADP forecast	2022 TAF	ADP vs. 2022 TAF (% variance)
Passenger enplanements			
2019	268,029	241,610	10.9%
2020	145,841	166,389	(12.3%)
2021	259,193	229,129	13.1%
2026	300,000	275,047	9.1%
2031	340,000	305,287	11.4%
2036	380,000	335,932	13.1%
2041	420,000	364,763	15.1%
Total aircraft operations			
2019	47,339	47,407	(0.1%)
2020	51,539	48,885	5.4%
2021	56,993	57,150	(0.3%)
2026	60,800	57,908	5.0%
2031	64,100	59,795	7.2%
2036	65,500	61,470	6.6%
2041	66,500	63,094	5.6%

Source: Base Year – GJRAA Records, April 2022, ADP forecast prepared by InterVISTAS, May 2022, 2022 TAF

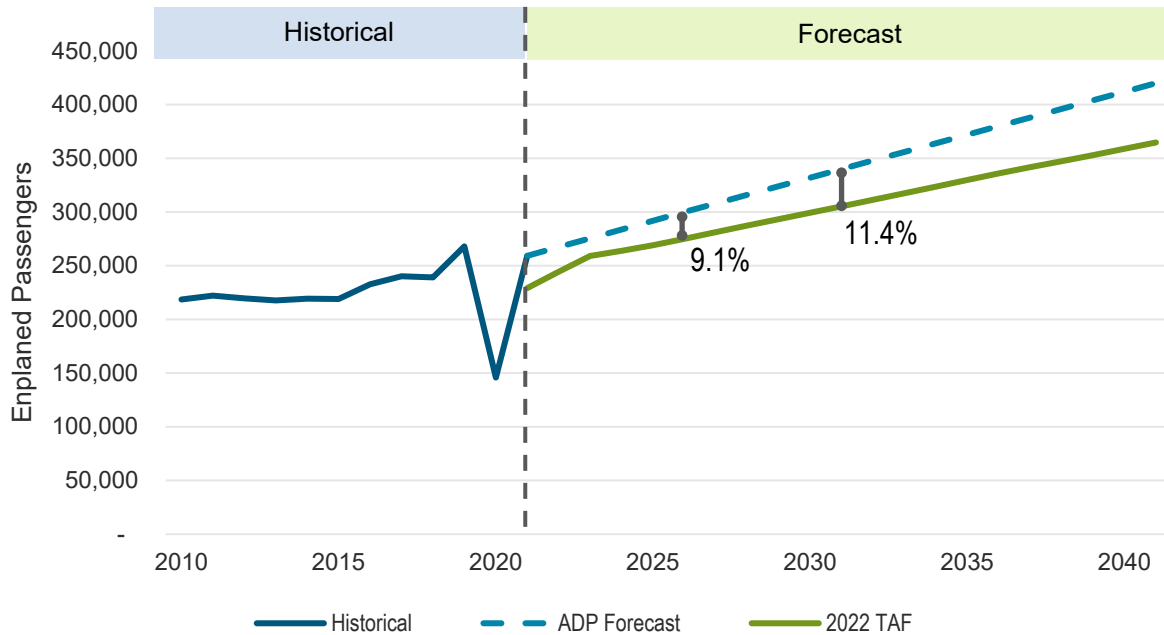
Table 3-18. GJT Airport Development Plan Forecast Summary Sheet

	Historical			Forecast				Compound annual growth rates				
	2019	2020	2021	2026	2031	2036	2041	2021-26	2026-31	2031-36	2036-41	2021-41
Passenger enplanements												
Total	268,029	145,841	259,193	300,000	340,000	380,000	420,000	3.0%	2.5%	2.2%	2.0%	2.4%
Aircraft operations												
Passenger airlines	11,740	7,536	10,554	11,600	12,500	13,400	14,000	1.9%	1.4%	1.4%	0.9%	1.4%
Cargo airlines	1,562	1,608	1,654	1,800	1,900	2,100	2,200	1.5%	1.5%	1.5%	1.5%	1.5%
Total airlines	13,302	9,144	12,208	13,400	14,400	15,500	16,200	1.9%	1.4%	1.4%	1.0%	1.4%
Air taxi	2,188	2,702	2,638	3,200	3,400	3,600	3,800	3.9%	1.2%	1.1%	1.1%	1.8%
General aviation	29,076	37,760	39,760	41,800	43,900	44,000	44,100	1.0%	1.0%	0.0%	0.0%	0.5%
Military	2,773	1,933	2,387	2,400	2,400	2,400	2,400	0.5%	0.0%	0.0%	0.0%	0.1%
Total operations	47,339	51,539	56,993	60,800	64,100	65,500	66,500	1.3%	1.1%	0.4%	0.3%	0.8%
Based Aircraft												
Single Engine (Nonjet)			114	120	124	128	133	0.9%	0.8%	0.6%	0.6%	0.7%
Multi Engine (Nonjet)			18	18	19	20	20	0.0%	1.1%	1.0%	0.0%	0.5%
Jet Engine			3	4	6	8	10	5.9%	8.4%	5.9%	4.6%	6.2%
Helicopter			1	1	1	2	3	0.0%	0.0%	14.9%	8.4%	5.6%
Other			0	0	0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%
Total based aircraft	126	126	136	143	150	158	166	1.0%	1.0%	1.0%	1.0%	1.0%
Operational factors												
Average aircraft size (seats)												
Passenger airlines	59	64	66	68	70	72	75					
Average enplaning load factor												
Passenger airlines	77%	60%	74%	76%	78%	79%	80%					

Note: Forecasted operations may not sum to totals due to rounding. Total based aircraft by type not available for 2019 and 2020

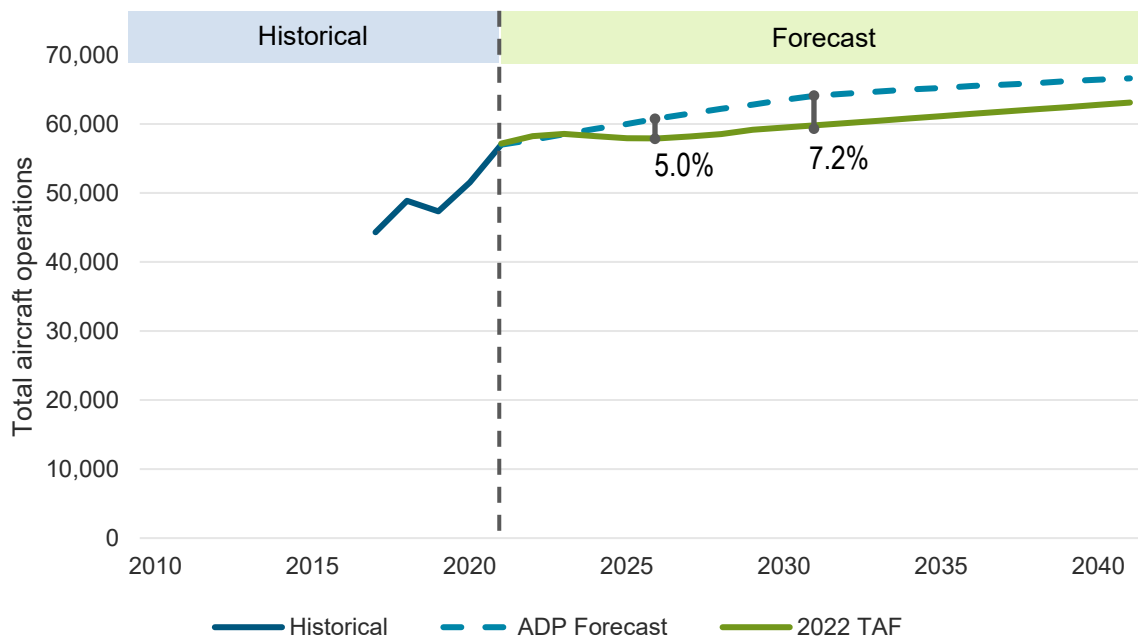
Figure 3-18 shows the comparison of the ADP forecast and the FAA TAF for enplanements, while **Figure 3-19** shows the comparison of the ADP forecast and the FAA TAF for total aircraft operations.

Figure 3-18. Enplanements Forecast Comparison



Source: Historical: GJRAA records, ADP Forecast: InterVISTAS, May 2022.

Figure 3-19. Total Aircraft Operations Forecast Comparison



Source: Historical: GJRAA records, ADP Forecast: InterVISTAS, May 2022.

4 Facility Requirements

This chapter summarizes the assumptions, methodology, and results associated with the facility requirements analysis. Requirements are dependent upon the projected demand identified in the aviation demand forecasts, discussed in Chapter 3, Aviation Demand Forecasts. Additionally, requirements are also based on complying with the latest guidance provided by FAA. Facility requirements were developed for the airfield, the passenger terminal complex, ground access, air cargo, general aviation, and aviation support facilities.

4.1 Methodology for Determining Requirements

The following subsections describe the methodology used for preparing the facility requirement analysis including the assumptions used to develop derivative forecasts from the annual aviation demand forecast.

4.1.1 Planning Activity Levels

There is a level of uncertainty associated with long-range demand forecasting and associated planning of airport facilities, especially at small and non-hub airports. In light of the variability and to avoid pegging development to a particular year, planning activity levels (PALs) are used to inform the future levels of activity at which a facility's capacity needs to be increased. PALs help to disassociate projects from specific years as realized activity levels may occur earlier or later than the forecast predicts, and it allows airport management to accelerate/decelerate capital projects based on how demand occurs.

Determining a facility's future capacity need is driven by levels of aircraft operations, passengers, and/or based aircraft. For example, the need to expand the terminal complex is triggered by the growth in passenger demand. Additionally, the need to expand the fuel farm facility is triggered by the growth in aircraft operations.

The 20-year aviation demand forecast projects 420,000 enplanements, 66,500 aircraft operations, and 166 based aircraft in 2041. Given the forecast trajectory, four future PALs were identified to trigger facility improvements to meet demand levels. The PALs and the associated levels of activity are defined in **Table 4-1**. PAL 4 is well beyond the baseline forecast planning horizon but provides an ultimate build condition to help inform earlier PALs.

Table 4-1. Planning activity levels

Activity	Planning Activity Level				
	PAL 0	PAL 1	PAL 2	PAL 3	PAL 4
Aircraft operations	58,500	60,800	66,000	67,000	68,000
Enplaned passengers	275,000	300,000	400,000	500,000	600,000
Based aircraft	141	143	160	165	170

Source: InterVISTAS Analysis, 2021

4.1.2 Defining Average Day Peak Month Activity

The annual demand forecast is traditionally converted into average day peak month (ADPM) demand to generate facility requirements, especially as they relate to the terminal. Small markets like Grand Junction are unique in that changes to individual flights can have a sizeable impact on the peak hour. Recent trends in the peak hour share at GJT are described below and the resulting assumptions used to estimate ADPM activity are provided in **Table 4-2**.

- During periods of the year with the highest number of daily seats, the peak hour share of the day accounts for between 20% and 25% of seats.
- Despite the pandemic, the overall peak period relationship at GJT has not changed significantly, but the high/low range has increased some, reflecting more dynamic airline behaviors.

Table 4-2. Peak period activity assumptions

Parameter	Assumption	Justification
ADPM enplanement percent of annual	Remains constant, though slightly higher than 2017-2019 historical	Reflects more peaked days resulting from airlines operating non-daily schedules (Allegiant, Frontier, other new entrants)
Passenger per operation (seats per operation)	Increase from about 60 passengers (68 seats) in 2019 to 74 passengers (84 seats) by 600,000 enplanements	Growth is consistent with (1) pre-pandemic trends at GJT and (2) business model changes by US airlines, leading to shift from regional jets toward larger narrowbody aircraft
Peak hour departure percent of ADPM	Remains constant (~25%)	Peak flattening has historically occurred at GJT as airlines added service during off-peak periods (e.g., more frequency as opposed to more destinations); holding this share constant provides a conservative approach to account for new entrants or other structural changes to airline networks

Source: InterVISTAS Analysis, 2021

Using the three key assumptions identified in **Table 4-2**, ADPM and peak hour enplaning and deplaning passengers were derived for each planning activity level along with corresponding operations. A summary of the ADPM and peak hour passenger and operations activity is provided in **Table 4-3**.

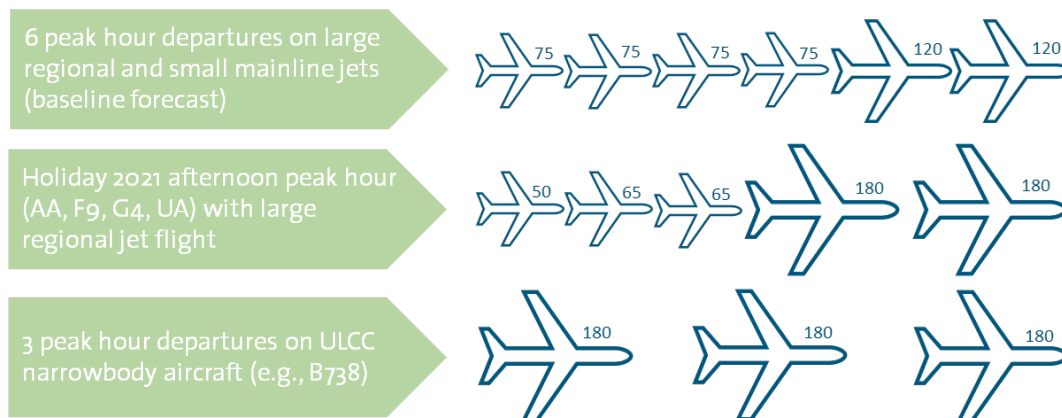
Table 4-3. ADPM passenger and operations activity

Annual Enplaned Passengers	PAL 0 275,000	PAL 1 300,000	350,000	PAL 2 400,000	450,000	PAL 3 500,000	550,000	PAL 4 600,000
Passenger Activity								
ADPM Enplaned Passengers	965	1,050	1,225	1,400	1,575	1,750	1,925	2,100
Departing Peak Hour Passengers	250	270	315	360	405	450	495	540
ADPM Deplaned Passengers	965	1,050	1,225	1,400	1,575	1,750	1,925	2,100
Arriving Peak Hour Passengers	245	270	315	360	405	450	495	540
Operations Activity								
ADPM 2-way Operations	32	32	36	40	46	48	52	56
Peak Hour 2-Way Operations	3	3	4	4	4	5	5	6
Departing Peak Hour Operations	3	3	4	4	5	5	5	6
Arriving Peak Hour Operations	3	3	3	3	4	4	4	4

Source: InterVISTAS Analysis, 2021

The peak period forecast can be used to represent additional scenarios beyond the baseline growth assumptions provided in **Table 4-3**. This scenario planning is important in accounting for small market variability, where small changes to demand can have an outsized impact on the peak period. As part of the development of facility requirements for the terminal and apron, a number of different scenarios were evaluated. An example of three scenarios that might occur at PAL 4 are depicted in **Figure 4-1**.

Figure 4-1. Peak period scenario planning



Source: InterVISTAS, December 2021

The baseline scenario assumes six peak hour departures on a mix of large regional jets and small mainline jets. However, to account for recent activity patterns, especially around the holidays when the airport experiences larger jets, a second scenario with fewer but larger airplanes was identified. Finally, a scenario focused on ULCC growth was also evaluated, which results in fewer operations but on significantly larger airplanes.

4.1.3 Critical Aircraft

According to the FAA, the identification of a critical aircraft is necessary for proper airport planning. A critical aircraft is defined as the most demanding aircraft or group of aircraft that frequently use the airport and has 500 total annual operations excluding touch-and-go landings. It is crucial to determine the critical aircraft for each runway as it informs which FAA design standards are necessary for the airfield.

As mentioned in Chapter 3, Aviation Demand Forecasts, the existing critical aircraft for Runway 11-29 was determined to be the Boeing 757-200 and the future critical aircraft was determined to be the Boeing 767-300. On the other hand, the existing and future critical aircraft for Runway 4-22 is a composite aircraft made up of the most demanding characteristics of the Cessna Conquest II, Pilatus PC-12 and the King Air 350.

FAA categorizes aircraft based on three characteristics: (1) the speed of the aircraft which is represented by the Aircraft Approach Category (AAC), (2) the tail height and wingspan of the aircraft which is represented by the Airplane Design Group (ADG), and (3) the length of the cockpit wheel to the main gear and the width between the main gear wheels which is represented by the Taxiway Design Group (TDG). **Figure 4-2** shows the existing and future critical aircraft characteristics for Runway 11-29 and 4-22. These characteristics will be used in the facility requirements analysis in determining if the airfield meets current FAA design standard.

Figure 4-2. Critical aircraft characteristics



Source: InterVISTAS Consulting, 2022

4.2 Airfield Capacity

The following subsections describe the methodology, assumptions, and results of the airfield capacity analysis in determining if future improvements to the airfield are needed.

4.2.1 Measuring Airfield Capacity

Airport capacity, also known as throughput capacity, refers to the maximum number of aircraft operations that can be accommodated on the runway system. The capacity of an airport is affected by various factors such as airport layout, aircraft mix, ATC operational procedures, navigation equipment, and meteorological conditions. The theoretical capacity of a runway system is reported as both an hourly throughput rate and as an annual service volume (ASV).

This analysis measured the throughput rate using an FAA approved modeling approach. This modeling software utilizes a Monte Carlo simulation combined with a trajectory model, airport and fleet characteristics, and FAA airspace separation rules to produce a more accurate estimate of airfield capacity than previous models. The runwaySimulator model is designed to account for NextGen improvements, complex interactions between multiple runways, and newly established wake class separations, while simulating efficient aircraft sequencing.

The analysis of the Grand Junction Regional Airport airfield capacity in this document is based on the runwaySimulator model and the guidance provided in FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*.

4.2.2 Airport Fleet Mix

The overall airfield capacity of the Airport is significantly affected by the type of aircraft operating at the airport. The fleet mix has a direct impact on the planning and engineering decisions for designing and determining the geometry of the airfield. **Table 4-4** Table 4-4. GJT Aircraft Fleet Mix summarizes the fleet mix at Grand Junction Regional Airport. This fleet mix data is based on the percentage of operations by aircraft type identified in the Aviation Demand Forecast at the end of the planning-horizon.

Table 4-4. GJT Aircraft Fleet Mix

Aircraft Type	Percentage
Commercial Service Aircraft	30%
Single Engine	57%
Twin Engine	8%
GA Jets	5%

Source: InterVISTAS Analysis, 2021

4.2.3 Metrological Conditions

Another factor that can impact an airport's capacity are the methodological conditions, such as wind coverage and visibility. Runway wind coverage analysis was conducted using the FAA's Airports GIS Wind Analysis Tool. Data for this tool is supplied by the National Climate Data Center from the weather reporting station located at Grand Junction Regional Airport, using weather observations from the last 10-years. Out of those observations 4 percent were during instrument meteorological conditions (IMC), which is generally characterized by low visibility due to factors such as clouds, fog, rain, or snow, as well as low ceilings or reduced contrast between the ground and the sky. The remaining 96 percent occurred during periods of visual metrological conditions (VMC).

The airfield's capacity is at its peak during VMC when the visibility is greater than 3 miles and cloud ceilings are above 1,000 feet. During VMC, aircraft are allowed to fly closer together, which enables more aircraft to land within a single hour. However, during IMC aircraft must fly further apart and have more restricted flight operations to ensure safety. Consequently, when aircraft are farther apart, fewer landings can take place within a single hour.

FAA runway design standards recommend an airport's runway system to provide a minimum of 95 percent wind coverage. The 95 percent wind coverage is computed on the basis of the crosswind component not exceeding the set value based on the Runway Design Code (RDC). If a single runway cannot provide this level of coverage, then a crosswind runway is warranted. During all weather conditions Runway 11-29 provides adequate wind coverage as shown in **Table 4-5**. Runway 4-22 does not have a calculated crosswind coverage for instrument metrological conditions because the runway does not accommodate instrument procedures.

Table 4-5. Runway wind coverage

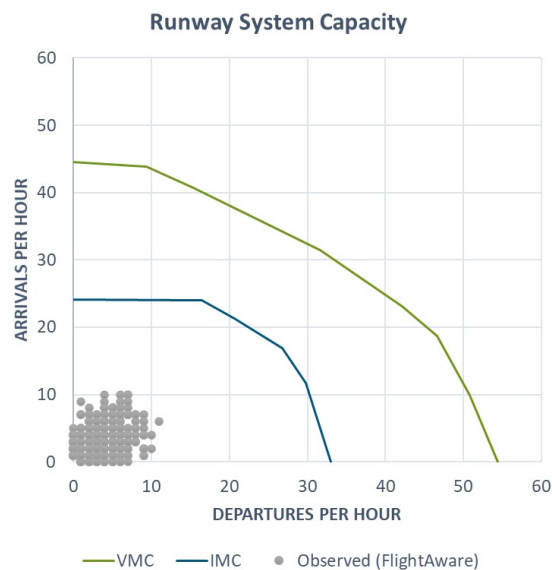
Runway	Crosswind Coverage							
	All Weather				Instrument Metrological Conditions (IMC)			
	10.5 kts	13 kts	16 kts	20 kts	10.5 kts	13 kts	16 kts	20 kts
11	65.33%	66.14%	66.92%	67.42%	50.77%	51.08%	51.45%	51.70%
29	47.14%	47.96%	48.59%	48.87%	75.99%	76.62%	77.04%	77.16%
4	61.30%	64.29%	N/A	N/A	N/A	N/A	N/A	N/A
22	44.10%	46.09%	N/A	N/A	N/A	N/A	N/A	N/A
Combined	98.63%	99.46%	99.85%	99.97%	99.44%	99.89%	99.97%	99.99%

Source: InterVISTAS Analysis, 2021

4.2.4 Hourly Throughput Capacity

Grand Junction Regional Airport has a closed V-shaped runway configuration to where the thresholds of Runway 29 and Runway 22 intersect. It should be noted that intersecting runway thresholds does not meet current FAA standards and limits runway capacity. **Figure 4-3** shows the hourly throughput capacity during both VMC and IMC at GJT. Hourly throughput capacity during VMC is optimized for arrival and departure operations through the use of both runways, achieving 32 arrivals and 32 departures per hour, totaling 64 operations per hour. Operational throughput is reduced during IMC conditions to 22 arrivals and 22 departures per hour, totaling 44 operations per hour. The analysis concluded that the hourly capacity is adequate throughout the planning period; however, the Airport may consider implementing high-speed taxiways to increase operational efficiencies for aircraft operations on Runway 11-29.

Figure 4-3. Runway system capacity



Source: InterVISTAS Analysis, 2021

4.2.5 Annual Service Volume

Annual service volume is the estimated capacity of the runway configuration in terms of annual operations. This is used as a general measure of total throughput for future planning of the airfield.

Table 4-6 compares forecasted aircraft operations to the existing airfield annual service volume, as identified in FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*. The ASV of the Airport is 215,000 .

The ASV ratio, which is obtained by comparing the forecasted operations to the ASV, serves as a tool to identify existing and future capacity limitations. The accepted industry planning standard for additional airfield capacity is when the demand reaches 60 percent of the ASV. In the case of the Airport, the ASV ratio only reaches about 30 percent at PAL 3. As aircraft operations are anticipated to remain below 70,000 annual operations and the total airfield system throughput is estimated to be 215,000 operations per year, the airfield's capacity is expected to remain adequate well beyond the 20-year planning horizon.

Table 4-6. Annual service volume

	Existing	Planning Activity Level			
	2021	PAL 1	PAL 2	PAL 3	PAL 4
Total Aircraft Operations	56,993	60,800	66,000	67,000	68,000
Existing ASV	215,000	215,000	215,000	215,000	215,000
ASV Ratio	26.5%	28.2%	30.6%	31.1%	31.6%

Source: InterVISTAS Analysis, 2021

Though an additional runway is not needed for wind coverage or capacity, the 2018 FAA approved Airport Layout Plan identified a future parallel runway to Runway 11-29. It is recommended that the future parallel runway be carried forward as a future facility to continue to preserve the land for aeronautical use in the future.

4.3 Airfield Design

This section summarizes the evaluation of the runways, taxiways/taxilanes and navigational aids required to meet forecasted demand levels.

4.3.1 Runway Design

The following subsections summarize the existing runway design to meet both current and future demand. Runway criteria examined in this section includes length, width, shoulders, strength, protection zones, and separation standards.

4.3.1.1 Runway Physical Characteristics

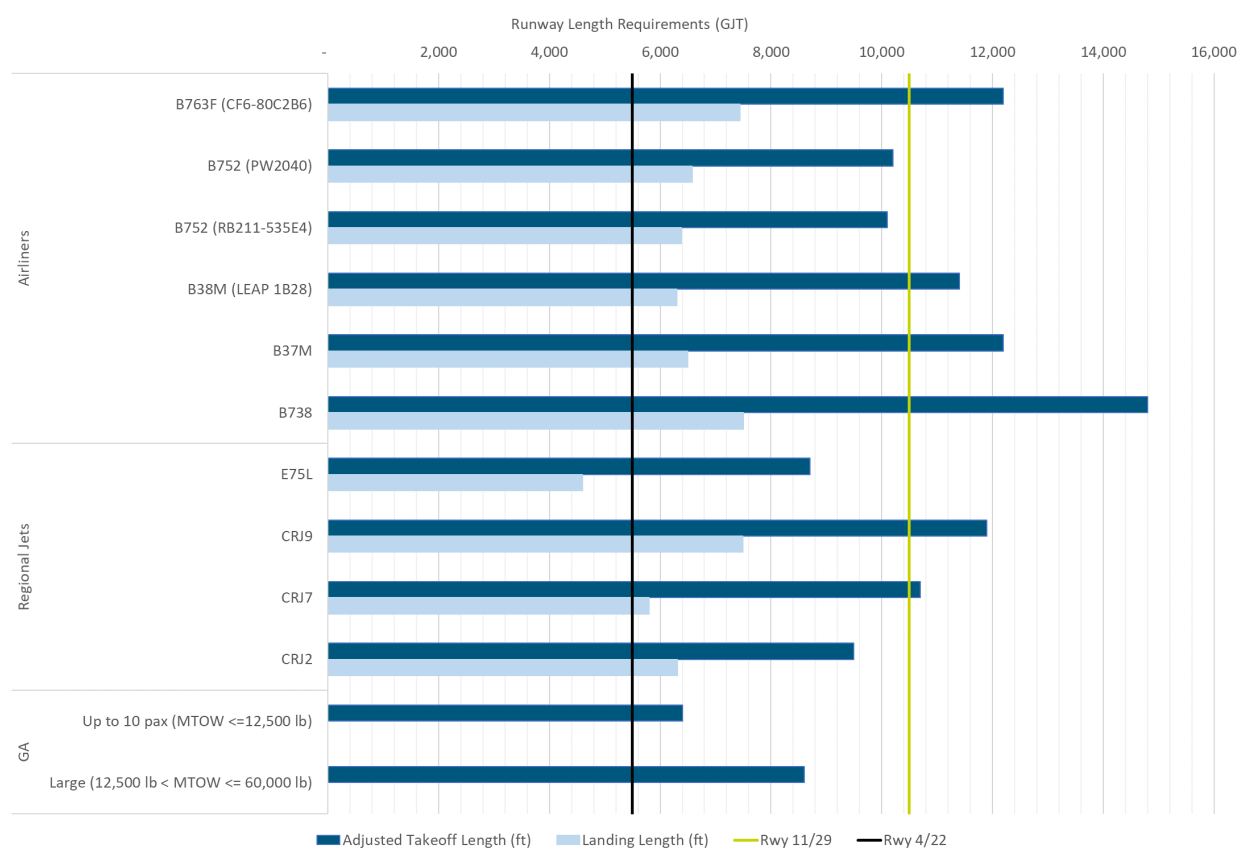
The Airport is equipped with two runways: Runway 11-29 and 4-22. Analysis of the runway's physical characteristics addresses the ability of each runway to accommodate the existing and future critical aircraft by having the proper length, width, shoulders, and strength based on FAA design standards.

To determine the length of the runway, the airport considers the takeoff and landing performance requirements of the existing and future critical aircraft, as well as the airport's elevation and weather

conditions. Runway length requirements are typically driven by the takeoff distance for the critical aircraft as this parameter is generally the most demanding requirement.

A runway length analysis was performed using FAA approved modeling software and aircraft planning manuals. The analysis considers the mean maximum temperature and airport elevation along with the gradient for each runway. GJT is a high-altitude airport and particularly during the summer months the climate can be relatively hot. Both these factors impact aircraft performance compared to airports near sea level and in cooler climates, which results in additional runway length needed. **Figure 4-4** provides the recommended runway length requirements.

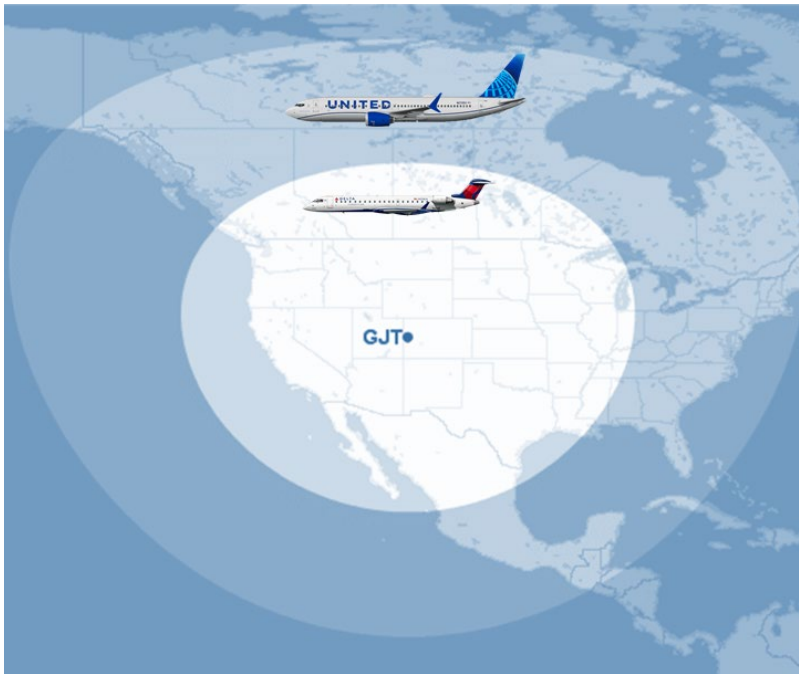
Figure 4-4. Runway length requirement



Source: InterVISTAS analysis, November 2021

General planning guidance suggests that the length for Runway 11-29 should be approximately 12,000 feet to accommodate the future critical aircraft, Boeing 767-300. Upon further investigation, however, it is unlikely that Runway 11-29 needs to be extended to 12,000 feet. First, the analysis assumes aircraft operate at maximum takeoff weight (MTOW). In discussions with the potential aircraft operator, it is unlikely that the aircraft will operate at MTOW, meaning less runway length is required. Additionally, an analysis was performed that concluded that the existing length of Runway 11-29 can serve the forecasted markets identified in the aviation demand forecasts as shown in **Figure 4-5**. For these reasons, Runway 11-29 has sufficient length throughout the planning period. The length of Runway 4-22 is also adequate throughout the planning period.

Figure 4-5. Aircraft range from GJT



Source: InterVISTAS analysis, November 2021

Runway 11-29 is 150 feet wide with 25-foot paved shoulders. For runways serving a critical aircraft that meets C/D-IV standards, the FAA recommends a 150-foot-wide runway with 25-foot-wide paved shoulders. Additionally, Runway 4-22 is 75 feet wide with no shoulders. For runways serving a critical aircraft that meets B-II standards, the FAA recommends a 75-foot-wide runway and does not require shoulders to be paved. The existing design of Runway 11-29 and 4-22 meets FAA designs standards for runway width and shoulders for accommodating both the existing and future critical aircraft.

Finally, the strength of the pavement is a crucial factor in determining the runway's ability to accommodate aircraft. General aviation aircraft can weigh anywhere from 2,000 to 50,000 pounds and often have a single wheel gear (SWG) configuration. Aircraft with a maximum takeoff weight exceeding 20,000 pounds usually have a dual-wheel gear (DWG) configuration. Air carrier turboprop and regional jet aircraft typically weigh between 22,000 to 85,000 pounds, while narrow-body domestic passenger jets, equipped with dual-tandem wheel gear (DTW), can weigh up to 280,000 pounds.

The Boeing 767-300 has a dual tandem wheel configuration, and MTOW of 412,000. As previously stated, it is unlikely that the aircraft will operate at MTOW given the forecasted service market. The composite aircraft for Runway 4-22 has an assumed MTOW of 26,000 pounds. Runway 11-29 has a DTW strength of 260,000 pounds. Runway 4-22 has a dual-wheel gear strength of 26,000 pounds MTOW. Current runway pavement strength at GJT may be adequate throughout the planning horizon.

At the time of the development of this ADP, Authority staff have begun implementing a project to shift Runway 11-29 approximately 700 feet to the northwest in order to provide additional land for aeronautical development. It is recommended that the engineer tasked to design the Runway 11-29 shift perform a detailed study to determine if the runway should be strengthened to accommodate the future critical aircraft.

4.3.1.2 Runway Designation

Runway designations are based on magnetic compass bearings, which shift over time due to the drift of the Earth's magnetic poles. If the drift, or magnetic declination, exceeds the FAA recommended 5-degree tolerance from a runway's current designation then a change may be required.

The magnetic declination at GJT is 9° 32'E, changing annually by 0° 6' W. **Table 4-7** summarizes the existing and anticipated future designations for each runway. Runway 11-29 is anticipated to change to Runway 12-30 during the planning period. Though the designation of Runway 4 exceeds the 5-degree tolerance at the end of the planning period, both runway ends need to exceed the 5-degree tolerance before a change in designation is made. Therefore, Runway 4-22 designation is anticipated to remain the same in the future.

Table 4-7. Runway designation

Existing			Future (2041)		
Designation	True Bearing	Magnetic Bearing	True Bearing	Magnetic Bearing	Designation
Runway 11	125° 05' 53"	115° 33' 53"	125° 05' 53"	117° 27' 53"	Runway 12
Runway 29	305° 07' 01"	295° 35' 01"	305° 07' 01"	297° 29' 01"	Runway 30
Runway 4	52° 26' 55"	42° 54' 55"	52° 26' 55"	44° 48' 55"	Runway 4
Runway 22	234° 27' 31"	224° 55' 31"	234° 27' 31"	226° 49' 31"	Runway 22

Source: InterVISTAS Analysis, 2023

4.3.1.3 Runway Protection and Separation Standards

An analysis was performed comparing the existing runway protection areas and separation distances from taxiways, aircraft parking areas, and facilities to determine deficiencies with accommodating the future critical aircraft. Airports should comply to the fullest extent possible without modifications to standards.

Runway 11-29 was evaluated using D-IV runway design criteria. **Table 4-8** provides a comparison of existing runway protection areas and separation distances for Runway 11-29 against current FAA airport design criteria in FAA Advisory Circular 150/5300-13B, *Airport Design*. The existing Runway 11-29 protection areas and separation standards are adequate throughout the planning period.

Table 4-8. Runway 11-29 design standards

Protection and Separation Standard	ADG D-IV requirements	Runway 11-29	
		Current Condition	Meets future needs (✓)
Protection Areas			
Runway Safety Area (RSA)			
Length beyond departure end	1,000'	1,000'	✓
Length prior to threshold	600'	600'	✓
Width	500'	500'	✓
Runway Object Free Area (ROFA)			
Length beyond departure end	1,000'	1,000'	✓
Length prior to threshold	600'	600'	✓
Width	800'	800'	✓
Runway Obstacle Free Zone (ROFZ)			
Length	200'	200'	✓
Width	400'	400'	✓
Precision Obstacle Free Zone			
Length	200'	200'	✓
Width	800'	800'	✓
Runway Protection Zone			
Dimensions (inner width x length x outer width)	See Note	Rwy 11 (1,000'x2,500'x1,750') Rwy 29 (1,000'x1,700'x1,510')	✓
Separation Standards			
Parallel runway centerline	-	-	✓
Holding position	300'	300'	✓
Parallel taxiway/taxilane centerline	400'	400'	✓
35' Building Restriction Line	745'	745'	✓

Note: For runways serving instrument approaches with a visibility minimum equal or greater than $\frac{3}{4}$ sm the RPZ dimensions are 1,000'x1,700'x1,510'. Runways serving instrument approaches with a visibility minimum less than $\frac{3}{4}$ sm the RPZ dimensions are 1,000'x2,500'x1,750'.

Source: FAA Advisory Circular 150/5300-13B, Airport Design, InterVISTAS Analysis 2023

Table 4-9 shows a comparison of existing runway protection areas and separation distances for Runway 4-22 against current FAA airport design criteria. The existing Runway 4-22 protection areas and separation standards are adequate throughout the planning period.

Table 4-9. Runway 4-22 design standards

Protection and Separation Standard	ADG B-II requirements	Runway 4-22	
		Current Condition	Meets future needs (✓)
Protection Areas			
Runway Safety Area (RSA)			
Length beyond departure end	300'	300'	✓
Length prior to threshold	300'	300'	✓
Width	150'	150'	✓
Runway Object Free Area (ROFA)			
Length beyond departure end	300'	300'	✓
Length prior to threshold	300'	300'	✓
Width	500'	500'	✓
Runway Obstacle Free Zone (ROFZ)			
Length	200'	200'	✓
Width	400'	400'	✓
Runway Protection Zone			
Dimensions (inner width x length x outer width)	500'x1,000'x700'	500'x1,000'x700'	✓
Separation Standards			
Parallel runway centerline	--	--	✓
Holding position	200'	200'	✓
Parallel taxiway/taxilane centerline	240'	240'	✓
35' Building Restriction Line	495'	495'	✓

Source: FAA Advisory Circular 150/5300-13B, Airport Design, InterVISTAS Analysis 2023

The previous Airport Layout Plan showed both Runway 4 and 22 to be upgraded from visual to non-precision runways in the future. This upgrade would necessitate an increase in the dimensions of the runway protection zone (RPZ) beyond its current size. Currently, each RPZ meets FAA standards by being owned in fee. The RPZ for Runway 4, if upgraded to a non-precision runway, would extend beyond the airport's existing boundary and over a portion of Interstate 70, which would create a nonstandard condition.

To validate if an upgrade to a non-precision approach is feasible, an airspace analysis was performed. Given the terrain at both ends of the runway it makes it highly unlikely for a non-precision approach

procedure to be designed and published, even with known and upcoming instrument approach technologies. Even if one were to be designed, it is very unlikely that the approach procedure would have the required visibility minimums to trigger the need to increase the size of the RPZ. For this reason, the existing RPZ dimensions were determined to be adequate throughout the planning period.

4.3.2 Taxiway/Taxilane Design

This subsection focuses on comparing the existing taxiways and taxilanes against current FAA design standards and assessing the capacity of the existing system to handle both current and future demands. The taxiways/taxilanes must meet FAA design standards, provide smooth circulation, and have adequate strength to safely accommodate the critical aircraft. In addition, a network of taxiways/taxilanes are required to support circulation to runways and connecting them to the parking and hangar areas for aircraft. Taxiways are generally classified as follows:

- **Apron taxiway or connector** – connects the aircraft parking apron to another taxiway or in some rare cases to the runway.
- **Crossover or traverse taxiway** – a perpendicular taxiway that connects two parallel runways or taxiways.
- **Entrance or exit (connector) taxiway** – provides a means to enter the runway and allows aircraft to exit after they land or for an aborted takeoff.
- **Parallel taxiway** – runs parallel to a runway and provides a path for aircraft to taxi to and from the runway.

The design standards and dimensional criteria for a taxiway/taxilane at an airport is determined by the type of aircraft its designed to accommodate. The width of the taxiway pavement is based on the turning radius of the critical aircraft. Additionally, the separation standards between taxiways and other airport features are determined by the wingspan or other size characteristics of the critical aircraft.

Different portions of an airfield may be designed to accommodate a specific aircraft type. The design of may vary depending on the demand for aircraft types. This is because each facility on the airport plays a specific role, and the design of an airfield must be tailored to meet the requirements of that specific aircraft. Tailoring sections of the airfield helps to avoid overdesigning or under-designing and ensures the airport operates efficiently and effectively. For Runway 11-29, the critical aircraft requires facilities designed to ADG IV/TDG 5 standards. On the other hand, the critical aircraft for Runway 4-22 requires facilities designed to ADG II/TDG2B standards. **Table 4-10** identifies each taxiway/taxilane at the airport and compares the existing design to current FAA standards. Components with a ✓ meet current FAA standards, while an X means that the existing taxiway/taxilane does not meet current standards.

Table 4-10. Taxiway/Taxilane design standards

Taxiway / Taxilane Designation	Type	Width	Shoulder Width	Safety Area Width	Object Free Area Width	Centerline to Parallel Taxiway	Centerline to Fixed or Moveable Object	Fillet Design
Runway 11-29 req. (ADG IV/TDG 5)		75'	30'	171'	243'(Twy) 224' (Txl)	207'(Twy) 198' (Txl)	121.5'(Twy) 112' (Txl)	Note (1)
A	Parallel	✓	X	✓	✓	✓	✓	X
A1	Connector	✓	X	✓	✓	✓	✓	X
A2	Connector	✓	X	✓	✓	✓	✓	X
A2A	Taxilane	✓	X	✓	✓	✓	✓	X
A2B	Taxilane	✓	X	✓	✓	✓	✓	X
A2C	Taxilane	✓	X	✓	✓	✓	✓	X
A3	Connector	✓	X	✓	✓	✓	✓	X
A3A	Taxilane	✓	X	✓	✓	✓	✓	X
A4	Connector	✓	X	✓	✓	✓	✓	X
A5	Connector	✓	X	✓	✓	✓	✓	X
A6	Connector	✓	X	✓	✓	✓	✓	X
A7	Connector	✓	X	✓	✓	✓	✓	X
A7A	Connector	X	X	✓	✓	✓	✓	X
B	Connector	✓	X	✓	✓	✓	✓	X
Runway 4-22 req. (ADG II/TDG 2)		35'	15'⁽²⁾	79'	124'(Twy) 110' (Txl)	102'(Twy) 94' (Txl)	62'(Twy) 55' (Txl)	Note (1)
C	Parallel	✓	✓	✓	✓	✓	✓	X
C1	Connector	✓	✓	✓	✓	✓	✓	X
C1A	Taxilane	✓	✓	✓	✓	✓	✓	X
C2	Connector	✓	✓	✓	✓	✓	✓	X
C3	Connector	✓	✓	✓	✓	✓	✓	X
C4	Connector	✓	✓	✓	✓	✓	✓	X

Notes:

(1) See section 4.7 in FAA Advisory Circular 150/5300-13B for fillet design dimensions.

(2) It is required that one the following conditions are met, turf shoulders or stabilizing soil treatments as outlined in FAA Advisory Circular 150/5370-10. Shoulders are not required to be paved.

Source: FAA Advisory Circular 150/5300-13B, Airport Design and InterVISTAS Analysis, 2023

Taxilane A7A is currently 30-feet wide and does not meet current airfield design standards. FAA design standards require taxiways serving ADG IV aircraft to have paved shoulders at a width of 30 feet.

Taxiway A and the support connectors currently do not have paved shoulders. Additionally, the fillet design for all taxiways is currently deficient as shown in **Table 4-10**.

In 2015, the FAA established the Runway Incursion Mitigation (RIM) Program. The goal of the program is to identify locations where there is a known challenge with airfield geometry that may be a contributing factor for runway incursions. In order for a particular area of the airfield to be added to the RIM Location Inventory, there must be at least one runway incursion per year during the study period (2007-2021) or three or more runway incursions in a single calendar year. Though the Airport does not have any RIM locations, some of the taxiway geometry does not currently meet FAA design standards for promoting situational awareness for pilots. Taxiways A3, A4, A5 and A6 were identified to have direct apron to runway access which does not meet taxiway geometry standards.

These geometric design issues will need to be addressed over time. It is recommended that the Authority correct these airfield nonstandard conditions during the rehabilitation and reconstruction of each taxiway to minimize disruptions in airport operations.

4.3.3 Navigational Aids and Lighting

The equipment that helps pilots find the airport, commonly known as Navigational Aids and Lighting or NAVAIDS, includes various tools and devices. NAVAIDS provide pilots with crucial information such as the aircraft's position on the airfield, horizontal alignment, height above the ground, and location of airport facilities.

4.3.3.1 Visual Aids

Visual aids help to facilitate navigation and enhance safety during periods of inclement weather and/or darkness. These types of aids include runway specific and those that service the entire airport.

Table 4-11 shows a summary of visual aids at GJT. Fields that are highlighted in red denote the existing NAVAID will be deficient in meeting future demand. The analysis found that the approach lighting system for Runway 29 will be inadequate in the future. It is recommended that a vendor be selected to install a Medium Intensity Approach Light System with Runway Alignment Intimidator Lights (MALSR) to have the ability to improve the instrument approach capabilities for Runway 29. Additionally, the Runway 29 VASI system is recommended to be replaced with a PAPI system.

Table 4-11. Visual NAVAIDS

NAVAID	Primary Runway		Secondary Runway		Airport Facility
	Runway 11	Runway 29	Runway 4	Runway 22	
Visual Aids					
Edge light system	HIRL	HIRL	MIRL	MIRL	--
Approach lighting	MALSR	REIL	--	--	--
Visual slope indicator	PAPI	VASI	PAPI	PAPI	--
Segmented Circle with wind cone	--	--	--	--	Yes
Supplementary wind cone	Yes	Yes	Yes	Yes	--
Rotating beacon	--	--	--	--	Yes

Source: InterVISTAS Analysis, 2023

4.3.3.2 Electronic Aids

Electronic aids consist of systems used to support navigation for instrument procedures. **Table 4-12** shows a summary of the electronic aids associated with each runway. Since Runway 4-22 is a visual runway and will remain a visual runway throughout the planning period, there are no electronic aids associated with the runway. The analysis on the electronic aids found that the instrument approach procedures for Runway 29 are inadequate and should be modified. It is recommended that GJT install a traditional instrument landing system (ILS) with a glideslope antenna for Runway 29. This system will provide an added level of safety by allowing aircraft operators to land at lower visibility minimums. Additionally, an RNAV (RNP) approach procedure is recommended for Runway 29 to provide redundancy for aircraft operators. The airport should work with FAA to submit a request for the development of an RNAV (RNP) approach procedure for Runway 29.

Table 4-12. Electronic NAVAIDS

NAVAID	Primary Runway		Secondary Runway		Airport Facility
	Runway 11	Runway 29	Runway 4	Runway 22	
Electronic Aids					
RNAV (GPS)	Yes	Yes	--	--	--
RNAV (RNP)	Yes	No	--	--	--
ILS	Yes	No	--	--	--
Localizer Type Directional Aid (LDA)	--	Yes	--	--	--

Source: InterVISTAS Analysis, 2023

4.3.3.3 Metrological Aids

Metrological aids provide pilots with real time and/or delayed weather information. The airport has an Automated System Observation Station (ASOS) that provides barometric pressure, wind speed and direction, visibility, density altitude and cloud ceiling information. The existing metrological aids were determined to be adequate through the planning period.

4.4 Passenger Terminal Complex

This section summarizes the evaluation of the passenger terminal complex to meet forecasted demand levels.

4.4.1 Terminal Requirements Methodology

The method and assumptions used for determining future requirements were based on industry guidance. This included Airport Cooperative Research Program (ACRP), Report 25, *Airport Passenger Terminal Planning and Design*, and the International Air Transport Association (IATA) Airport Development Reference Manual (ADRM), 11th Edition. Additionally, recommended practices were incorporated from the Transportation Security Administration (TSA) concerning checkpoint and checked baggage. For planning purposes, the ease of flows and delays for specific components of the terminal are measured in accordance with IATA's Level of Service (LoS) standards. "Optimum" LoS corresponds to overall good levels of service, where flows are stable, delays are acceptable, and a good level of comfort is provided.

Previous versions of IATA's ADRM refer to optimum level of service as being most similar to LoS C. LoS space and waiting time criteria for each functional area is provided in **Figure 4-6**.

Figure 4-6. IATA Level of Service standards by functional area

Functional Area \ Level of Service Standard		SPACE STANDARDS FOR WAITING AREAS (ft ² /pax)					WAITING TIME STANDARDS FOR PROCESSING FACILITIES (minutes)					PROPORTION OF SEATED OCCUPANTS (%)				
		A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
		Over design	Optimum	Suboptimum	Over design	Optimum	Suboptimum	Over design	Optimum	Suboptimum	Over design	Optimum	Suboptimum	Over design	Optimum	Suboptimum
Check-in	Self-Service Kiosk	> 19.4	14.0 - 19.4	< 14.0				< 1	1 - 2	> 2						
	Bag Drop Desk															
	All Classes	> 19.4	14.0 - 19.4	< 14.0												
	Economy Class							< 1	1 - 5	> 5						
	Business Class							< 1	1 - 3	> 3						
	Check-in Desk															
	All Classes	> 19.4	14.0 - 19.4	< 14.0												
	Economy Class							< 10	10 - 20	> 20						
	Business Class							< 3	3 - 5	> 5						
	First Class							< 1	1 - 3	> 3						
Security Checkpoint	All Lanes	> 12.9	10.8 - 12.9	< 10.8												
	Regular Lane							< 5	5 - 10	> 10						
	Expedited Lane							< 1	1 - 3	> 3						
Boarding Gate Lounge	Seated Passengers	> 23.7	19.4 - 23.7	< 19.4								> 70%	50% - 70%	< 50%		
	Standing Passengers	> 16.1	12.9 - 16.1	< 12.9												
Baggage Claim Area	Narrow Body	> 18.3	16.1 - 18.3	< 16.1				< 1	1 - 15	> 15						
	Wide Body	> 18.3	16.1 - 18.3	< 16.1				< 1	1 - 25	> 25						

Source: Adapted from Airport Terminal Reference Manual (ADRM), 11th Edition, International Air Transport Association, Aug. 2019

ADPM provides the demand basis for the terminal facility requirements to ensure that the facility is sized to meet a sufficiently busy demand period.

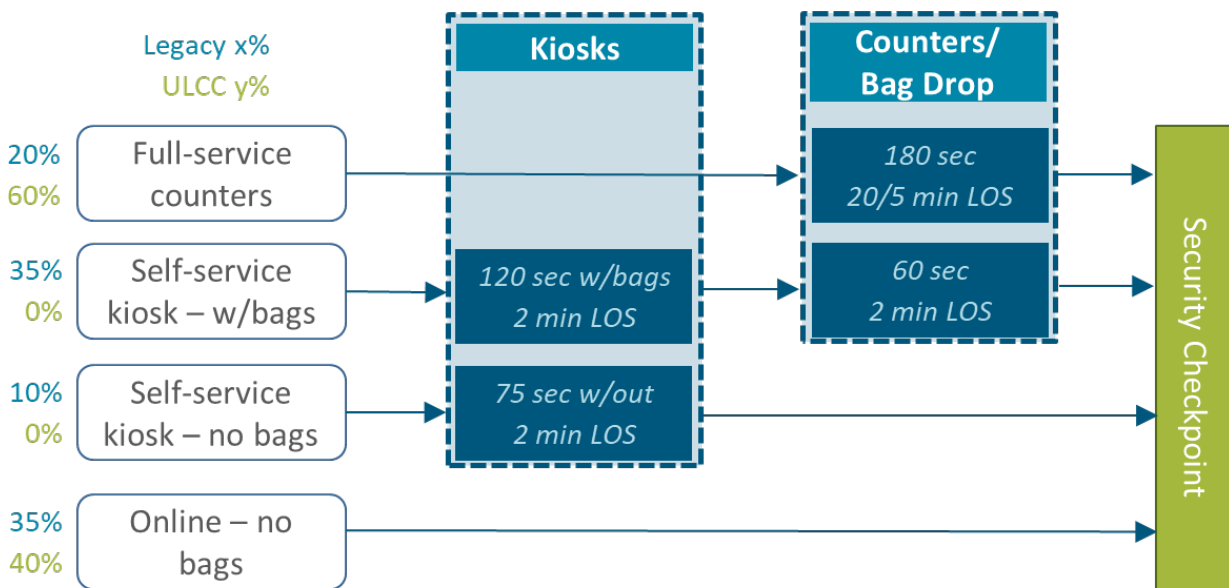
Additionally, for each primary functional area, certain assumptions are varied to help inform capacity triggers. For example, a lower security checkpoint throughput is analyzed to understand the sensitivity of the assumptions in triggering an additional lane. These sensitivities are helpful in providing context into the primary drivers of the facility requirements, as assumptions like transaction times or aircraft fleet mix are likely to vary.

4.4.2 Check-in Lobby

There are four kiosks and 24 counter positions in the existing check-in lobby along with approximately 3,180 square feet of space for passenger queueing and processing. The key assumptions for the check-in hall analysis are shown in **Figure 4-7**. These assumptions include the proportion of passengers using the various check-in methods and the corresponding processing times. Given the diverse mix of airlines at the Airport, unique check-in assumptions for legacy airlines, such as United Airlines and Delta Air Lines (not currently serving GJT), and ultra-low cost carriers (ULCC) such as Allegiant and Frontier (not currently serving GJT) were developed. The analysis takes into account that a ULCC passenger will use the kiosk less than a legacy airline passenger. The economy class passenger share is assumed to be 85 percent, with 15 percent of passengers subject to a shorter wait time at the counter either due to airline status or traveling in the business class cabin. Maximum wait times of two minutes for kiosks and 20 minutes for full-service counters (5 minutes for business class/elite passengers), consistent with IATA optimum LoS, is assumed. Queueing passengers occupy 17 square feet, which is also consistent with IATA optimum LoS.

Additionally, exclusive counter use by individual airlines is assumed and no earliness arrival distribution is applied. These two assumptions provide for a more conservative counter requirement to account for future uncertainties in individual airline makeup or share serving the Airport.

Figure 4-7. Check-in channel distribution



Source: InterVISTAS, December 2021, based on experience at other airports with a similar flight mix

The current supply of check-in counters is sufficient to meet demand beyond PAL 3, as shown in **Table 4-13**. The total number of kiosks is sufficient through PAL 2 for the airlines that currently have them deployed, though individual airlines may choose to add kiosks as needed. By the end of PAL 4 it is anticipated at least one additional kiosk will be needed to maintain an optimal level of service.

An additional sensitivity analysis was performed that reduced the maximum wait time at a full-service economy class counter from 20 minutes to 5 minutes. This increases the counter requirements for each PAL, but not beyond the number of counters currently provided.

Table 4-13. Check-in lobby requirements

	Supply	275k 2019	300k PAL 1	350k	400k PAL 2	450k	500k PAL 3	550k	600k PAL 4
Kiosks	4	3	4	4	5	5	6	6	7
Counters	24	12	12	14	15	16	18	21	22
Counters (5 min wait)	24	13	13	15	17	19	21	23	24

Source: Analysis by InterVISTAS, December 2021

It is anticipated that flexibility for new entrants can be provided in the existing check-in lobby, especially since the counter requirement assumes exclusive use. Additionally, any future shifts toward more technologically dependent solutions across all airlines will work to reduce demand in the check-in lobby.

4.4.3 Outbound Baggage Screening and Makeup

There are two standalone CT-80 explosive detection screening (EDS) machines located immediately behind the check-in counters. Behind these EDS machines is 3,040 square feet of ATO and baggage makeup space.

The facility requirements analysis assumed the processing rate of a CT-80 is 180 bags per hour (BPH). A makeup belt length factor of 2.5 linear feet is assumed, consistent with *ACRP Report 25* and ten minutes of bags accruing on the makeup belt. Between 50 and 60 bags can be accommodated on a baggage cart and each cart requires approximately 600 square feet of area for staging and loading.

Since checked baggage ratios may change over time as the airline makeup at the Airport evolves, a higher share of passengers checking bags was evaluated to understand the highest demand levels.

The number of EDS units and makeup length required is provided in **Table 4-14**. Two EDS units with a throughput similar to that of a CT-80 are sufficient through the planning period, but a third EDS may be required near PAL 3 if checked bag shares increase. The baggage makeup area for tugs remains less than the ATO area currently provided, but it is important to note that the current setup is inefficient and limits other ATO functions.

Table 4-14. Outbound baggage screening and makeup requirements

	Supply	275k 2019	300k PAL 1	350k	400k PAL 2	450k	500k PAL 3	550k	600k PAL 4
Peak hour bags (a)	n/a	132	144	168	192	216	240	264	288
EDS Units	2	2	2	2	2	2	2	2	3
EDS Units – 60% checked bags	2	2	2	2	2	2	2	3	3
Makeup length (ft)	n/a	55	60	70	80	90	100	110	120
Makeup area (sf)	3,040	1,800	1,800	2,400	2,400	3,000	3,000	3,000	3,600

(a) traditional mini inline system threshold is 1,600 daily bags or 400 peak hour bags

Source: Analysis by InterVISTAS, December 2021

It is recommended to plan the outbound baggage area to accommodate a third EDS, 120 linear feet of makeup length, and circulation for six baggage carts.

4.4.4 Security Screening Checkpoint

The existing security screening checkpoint provides two standard screening lanes with blended TSA PreCheck, such that PreCheck does not have exclusive use of a screening lane. CT screening of carry-on bags was added to the checkpoint in 2022. There is 400 square feet of permanent queue which is expandable to 1,300 square feet during peak periods.

Peak hour departing passengers drive the requirement for the number of security screening lanes. Based on standard industry metrics and prior studies conducted at the Airport, the throughput capacity is assumed to be 160 passengers per hour per lane for standard passengers and 200 passengers per hour per lane for PreCheck passengers. A standard maximum wait time of 10 minutes for standard passengers and 5 minutes for PreCheck passengers was applied which is consistent with TSA processing goals. A future PreCheck share goal of 35% is assumed. Finally, it is assumed queuing passengers each occupy 12 square feet.

Maintaining the use of blended screening lanes is assumed as the baseline condition. Two sensitivities were evaluated and compared against the baseline. One sensitivity assumes that only 80% of the throughput capacity could be achieved in a blended configuration and the other sensitivity assumes that PreCheck passengers require a separate dedicated lane. Results from these three scenarios are provided in **Table 4-15**.

Table 4-15. Security screening checkpoint requirements

	Supply	275k 2019	300k PAL 1	350k	400k PAL 2	450k	500k PAL 3	550k	600k PAL 4
Lanes – blended	2	2	2	2	2	2	2	3	3
Lanes – blended (80% throughput)	2	2	2	2	2	2	3	3	3
Lanes – separate	2	2	2	2	3	3	3	3	3

Source: Analysis by InterVISTAS, December 2021

If the current method of processing passengers is used throughout the planning period, then a third security screening lane is required at 550,000 enplanements. At a 20 percent lower throughput rate, the need for a third lane is accelerated to PAL 3, or about 500,000 enplanements. If a dedicated PreCheck lane is introduced, then the third lane is required in PAL 2, or at around 400,000 enplanements.

It is recommended to plan and protect for three security screening lanes by the end of the planning period as well as provide 1,000 square feet of queue.

4.4.5 Holdrooms

The existing holdrooms provide roughly 6,100 square feet of space, split across a lower- and upper-level concourse.

Aircraft fleet mix and the number of peak hour departures drive the holdroom requirement. Large regional jets comprise the majority of operations at the Airport, so 70 passengers per departure is assumed. This is consistent with a 92 percent load factor on an ERJ-175 regional jet. 20 percent of passengers are assumed to utilize an adjoining concession or retail outlet and are not in the holdroom. Of the remaining passengers, 80 percent are assumed to be seated. Seated passengers occupy approximately 21 square feet and standing passengers occupy 14 square feet, which are both around the midpoint of the IATA optimum LoS range. The share of seated passengers is higher than IATA's optimum LoS, which assumes 50 to 70 percent, but a higher level of service is desired given the local market conditions. A 10 percent buffer on the number of seats is added to account for passenger belongings occupying adjacent seats. An allowance is also provided for gate podium, queuing, and egress.

Since the Airport also accommodates ULCC operations and some aircraft upgauging is anticipated during the planning horizon, a sensitivity on a higher number of passengers per departure is necessary to analyze. 130 passengers per departure is assumed to represent these larger aircraft.

The peak hour holdroom requirements for each aircraft size is provided in **Table 4-16**. At the 70 passenger per departure level, additional holdroom is required prior to PAL 2. Over 2,000 square feet of additional holdroom is required to accommodate PAL 3 demand. At the 130 passenger per departure level, the existing holdrooms are already deficient to accommodate the peak departures today. The

holdroom requires more than doubling in size by PAL 3. Given the evolving fleet mix, it is anticipated that the holdroom requirement is likely to fall somewhere in between these individual requirements.

Table 4-16. Holdroom requirements

	Supply	275k 2019	300k PAL 1	350k	400k PAL 2	450k	500k PAL 3	550k	600k PAL 4
Peak Hour Holdroom (sf) – 70 seats	6,100	4,980	4,980	6,640	6,640	8,300	8,300	8,300	9,960
Peak Hour Holdroom (sf) – 130 seats	6,100	8,070	8,070	10,760	10,760	13,450	13,450	13,450	16,140

Source: Analysis by InterVISTAS, December 2021

It is recommended to provide 2,500 square feet of additional holdroom by PAL 2 to account for growth in both large regional jets and ULCC narrowbody aircraft. An additional 2,500 square feet is required to bridge the gap between PAL 2 and PAL 3.

4.4.6 Baggage Claim

The existing baggage claim is equipped with two L-shaped flat-plate claim devices that provide a total of 160 linear feet of claim frontage for passengers. Each device travels through the wall to the secured side of the terminal, where baggage is offloaded from carts. There is also one rollup door and ramp for oversized baggage located between the claim devices.

Given the short walking distance for passengers from the plane to baggage claim, it is assumed that passengers arrive prior to their checked bags. As a result, passenger demand will drive the claim frontage requirement. Fifty percent of passengers are assumed to check bags, which is calculated from the January to August 2021 checked baggage to passenger ratios provided by Airport staff. The average traveling party size is 1.5, based on industry experience with a mix of business and leisure passengers at other similar sized airports. An allowance of 25 percent is added to represent additional passengers who are at the claim device, as a single member of a travelling party may not claim all bags. Each person is assumed to occupy two linear feet of claim frontage, which is consistent with IATA LoS optimum.

As with baggage screening and makeup, since checked baggage ratios may change as the airline makeup at the airport evolves, a higher share of passengers checking bags is evaluated as a sensitivity.

At the baseline checked baggage ratio, as shown in **Table 4-17**, the existing claim frontage is sufficient up through PAL 1. Lengthening the existing devices by roughly 55 feet or adding a third claim device is required to accommodate PAL 2. A third device of similar size to the existing devices provides sufficient capacity through PAL 3. If the checked baggage ratio increases into the future, then additional frontage is required in the near term.

Table 4-17. Baggage claim requirements

	Supply	275k 2019	300k PAL 1	350k	400k PAL 2	450k	500k PAL 3	550k	600k PAL 4
Frontage (lf)	160	145	160	190	215	245	270	295	325
Frontage (60% checked) (lf)	160	175	195	230	260	290	325	360	390

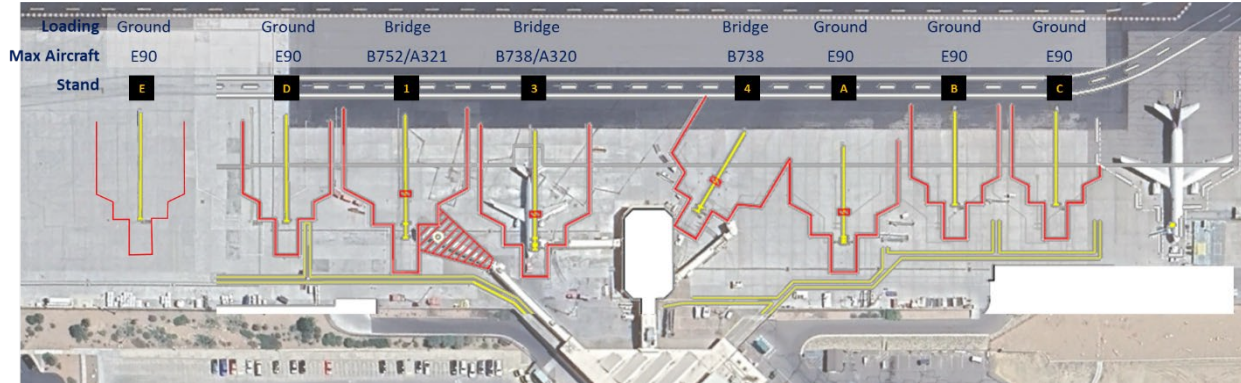
Source: Analysis by InterVISTAS, December 2021

It is recommended that additional claim frontage be added between PAL 1 and PAL 2, either by lengthening the existing devices or adding a new claim device. The decision whether to add a new claim device before PAL 2 or PAL 3 is dependent on peak period arrivals and operational considerations. If there is a desire to separate peak period arriving flights onto different claim devices, providing a third device sooner may be more advantageous. The baggage offload rate per flight is likely quicker, which allows for multiple flights to occupy a single claim device, given the aircraft fleet mix at the airport.

4.4.7 Passenger Aircraft Parking Positions

There are seven aircraft parking positions for passenger airlines located on the apron abutting the passenger terminal, as depicting in **Figure 4-8** . Three parking positions are equipped with passenger boarding bridges and the remaining four positions are ground loaded. The three bridge-enabled gates are each capable of accommodating narrowbody aircraft.

Figure 4-8. Existing aircraft parking positions



Source: Grand Junction Regional Airport, March 2022

Aircraft parking position requirements are dependent on the fleet mix, number of operations and the estimated aircraft ground time at the airport. Since GJT is a spoke market with most flights operating from/to hubs (large international airports), the assumed dwell time for an aircraft is 55 minutes. This is consistent with historical flight schedule analysis of flights that do not remain overnight. It is also assumed that all peak hour departures will be accommodated at boarding bridge-enabled positions. The fleet mix is assumed to comprise primarily large regional jets with some narrowbodies resulting from upgauging and from ULCCs.

GJT commonly accommodates diversions from other Mountain West airports, so as a sensitivity, an additional factor was applied to the gate requirement. This factor also serves to account for possible changes to the morning departure bank, which is traditionally the busiest part of the day at the Airport.

Parking position requirements are expressed two ways in **Table 4-18**: the number of positions required to accommodate the peak hour (at a boarding bridge) and the number of positions required to accommodate remain overnight (RON) aircraft. The number of boarding bridge-enabled gates is sufficient through PAL 1. One additional bridge-enabled gate is required just beyond PAL 1, with a second bridge-enabled gate required just beyond PAL 2. A total of six boarding bridge-enabled gates are not required until beyond the end of the planning period at PAL 4. The existing number of overall aircraft parking positions is sufficient to accommodate the remain overnight demand through the end of the planning period. Some of these positions, such as the ground loaded ones accessible via Gate 6 may need to increase in size to accommodate a larger future fleet mix.

Table 4-18. Aircraft parking position requirements

	Supply	275k 2019	300k PAL 1	350k	400k PAL 2	450k	500k PAL 3	550k	600k PAL 4
Positions – Peak Hour Departures	3	3	3	4	4	5	5	5	6
Positions – RON	7	5	5	5	5	6	6	6	7

Source: Analysis by InterVISTAS, December 2021

It is recommended to plan for one additional bridge-enabled gate by PAL 1 and another by PAL 2 to ensure that there are five bridge-enabled gates by PAL 2. To account for diversions and provide additional flexibility, additional remote/RON parking positions should be provided by PAL 3.

4.5 Ground Transportation Facilities

This section describes the requirements for ground transportation facilities to meet the forecasted demand. Facilities evaluated include terminal area airport access and circulation roadways, terminal curb, parking facilities, and rental car facilities.

4.5.1 Terminal Area Access and Circulation Roadways

The access and circulation roadways to and from the terminal area is expected to be adequate throughout the planning period. The current volume/capacity (v/c) of the two-lane inbound roadway, Horizon Drive and Walker Field Drive, was determined to meet the current and future demand levels. Though the capacity of Horizon Drive and Walker Field Drive is adequate, it is important to monitor traffic volume and capacity over time to ensure that the roadway continues to meet the needs of airport users.

4.5.2 Terminal Curb

The curbside configuration in front of the terminal is expected to be adequate throughout the planning period. However, Authority staff has indicated the lack of curbside enforcement contributes to congestion on the curbside. Authority staff should consider implementing a program that discourages excessive dwell times to alleviate congestion, especially during peak periods.

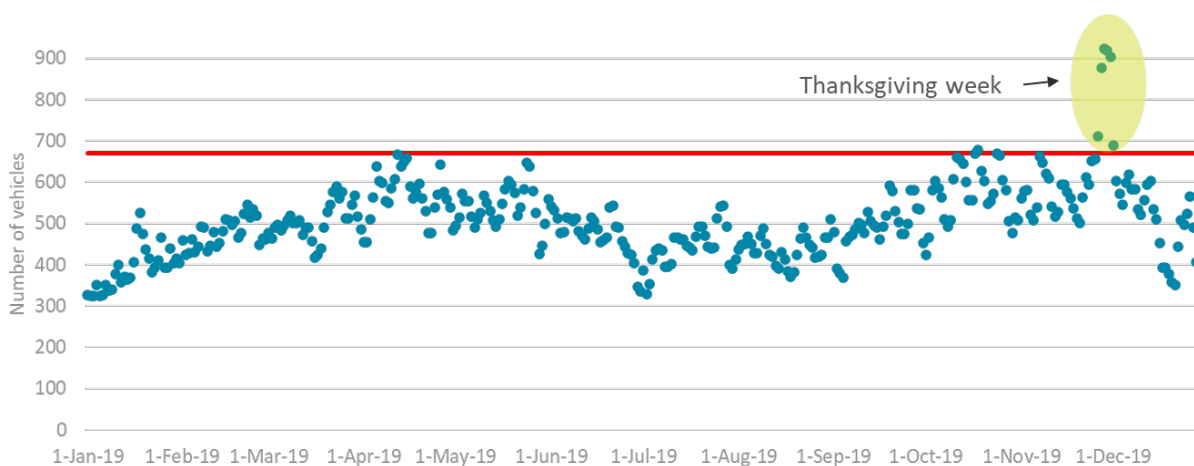
4.5.3 Automobile Parking Facilities

There are 668 parking spaces in the current airport parking facilities as depicted in **Figure 4-9**. In 2019, parking demand at the airport peaked during Thanksgiving week, with a few days showing significantly

higher demand compared to the rest of the year. April and October were also identified as busy non-holiday periods.

Pickup/drop-off activity in short-term parking required approximately 40 spaces and long-term parking required approximately 630 spaces in 2019. Based on this data, it is recommended that permanent parking facilities be sized to meet the spring and fall busy periods, which required 670 parking spaces in 2019. To ensure adequate capacity year-round, it is recommended that overflow/holiday parking facilities be sized to meet the demand during Thanksgiving week. This would ensure that there is sufficient capacity to handle any unexpected increases in demand, while also providing a positive parking experience for airport users.

Figure 4-9. Peak public parking accumulations in 2019



Source: Analysis by InterVISTAS, December 2021

The mode choice of passengers traveling to and from an airport can have a significant impact on the demand for parking facilities, specifically Transportation Network Companies (TNCs) and the introduction of autonomous vehicles.

Determining future parking requirements factored in the mode of transportation, specifically TNCs and the introduction of autonomous vehicles. Potential changes reflect TNC maturation in the near-term and introduction of autonomous vehicles in the long-term. By PAL 4, the following changes in mode share are expected:

- TNC mode share (approximately 7% 2019) could increase to between 8% and 23%.
- Short-duration parking (pickup/drop-off) mode share (14% in 2019) could decrease to between 5% and 13%.
- Long-duration parking mode share (8% in 2019) could decrease to between 5% and 7%.

Table 4-19 shows the estimated public parking requirements for each PAL, based on two different scenarios. Future requirements (non-holiday) are expected to be between 960 (high parking/low TNC usage scenario) and 1,460 spaces (low parking/high TNC usage scenario). Additionally, up to 550 spaces could be required for holiday overflow.

Table 4-19. Public parking requirements

	Supply	275k 2019	300k PAL 1	350k	400k PAL 2	450k	500k PAL 3	550k	600k PAL 4
High Parking/Low TNC scenario requirements									
Public Parking	668	690	750	870	1,000	1,120	1,230	1,350	1,460
Holiday Overflow	230	260	290	330	370	410	460	500	550
Total Parking	898	950	1,040	1,200	1,370	1,530	1,690	1,850	2,010
Surplus/Deficit(-)	-	-52	-142	-302	-472	-632	-792	-952	-1,112
Low Parking/High TNC scenario requirements									
Public Parking	668	690	730	800	860	910	940	960	960
Holiday Overflow	230	260	280	310	330	350	360	360	370
Total Parking	898	950	1,010	1,110	1,190	1,260	1,300	1,320	1,330
Surplus/Deficit(-)	-	-52	-112	-212	-292	-362	-402	-422	-432

Note: Space requirements (non-holiday) include a 10% circulation factor through the end of the planning period.

Source: Analysis by InterVISTAS, December 2021

It is recommended the Airport design and construct a parking lot large enough to meet PAL 1 demand. Additionally construct parking facilities incrementally to meet the forecasted demand in PALs 2, 3 and 4.

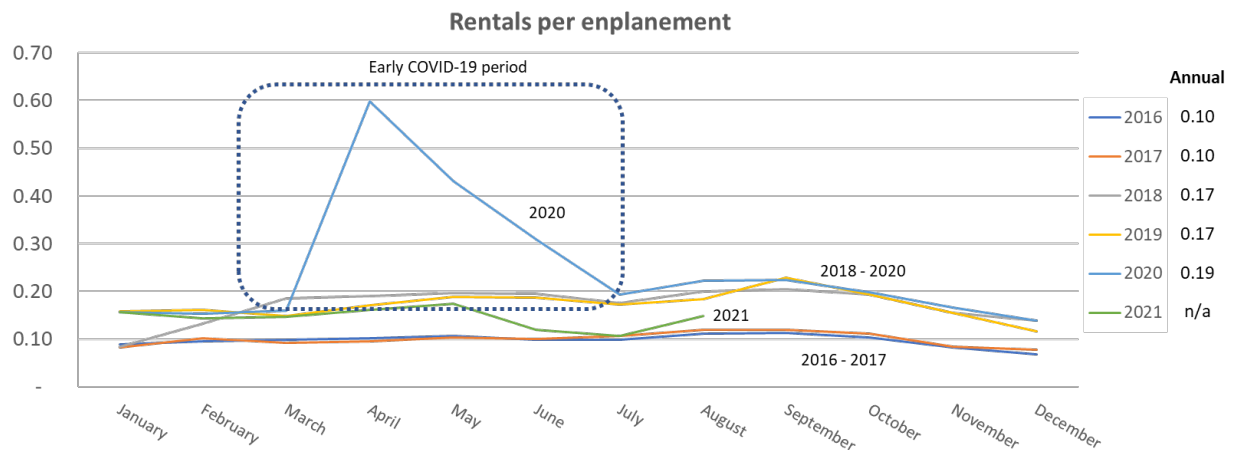
4.5.4 Cell Phone Lot

During the public parking and terminal curb evaluation process, it was observed that individuals were utilizing the public parking lot or dwelling along the terminal curb while they waited for arriving passengers. This not only creates additional traffic congestion along the terminal curb, but also creates a safety hazard as it makes it difficult for other vehicles to maneuver. As passenger traffic increases, congestion along the terminal curb will increase as well. For these reasons it was determined that a cell phone lot is needed within the planning horizon.

4.5.5 Rental Car Facilities

Rental car facilities at the airport have shown consistent growth in rental car transactions-per-enplanement, with no significant impact from TNCs. In early 2018, activity increased and remained elevated through the start of the pandemic. Early in the pandemic, activity increased significantly before returning to 2018-2020 pre-pandemic levels. Based on current trends shown in **Figure 4-10**, the rental car ready/return area appears to be adequate through PAL 2.

Figure 4-10. Historical rentals per enplanement



Source: Analysis by InterVISTAS, December 2021

To meet future demands, ready/return areas can be expanded within the existing paved area to provide approximately 240 spaces. However, discussions with existing operators may be needed to refine ready/return requirements and establish service center needs. Other additional considerations include the extent to which operators use airport facilities to serve non-airport activity, the need for covered spaces, service center capacity and quality, potential for developing a consolidated service center, and the ability to incorporate new entrants.

Emerging peer-to-peer car rental options, such as Turo and Avail, may also impact rental car facility requirements. Upcoming rental car agreements should be reviewed and incorporated into the planning process as necessary. Overall, the rental car facilities at GJT appear to be in good shape, but continued monitoring of demand and industry trends is recommended to ensure that adequate facilities are available for passengers.

4.5.6 Employee Parking Lot

The primary employee parking lot is collocated with the public overflow lot. Additional spaces for the Authority are provided in the western portion of the rental car ready/return lot. As the need for public parking and rental ready/return spaces increases there will be a need to relocate parking spaces for employees. In discussions with Authority staff, it was determined that a future site would need to accommodate 230 spaces.

4.6 Support Facilities

Support facilities play a vital role in ensuring an airport can fulfill its primary function and mission safely and efficiently. The following subsections detail the various support facilities and their ability to meet the forecasted demand and comply with current FAA guidance.

4.6.1 Aircraft Rescue and Fire Fighting

Airports that accommodate both scheduled and unscheduled air carrier operations are obligated to furnish firefighting facilities and equipment. For FAR Part 139 airports, the ARFF equipment prerequisites are determined by an index rating, which takes into account factors such as the size of aircraft, the type and number of emergency vehicles, and the number of daily aircraft departures.

The largest scheduled passenger aircraft operating at the Airport is the Boeing 737-800. Per CFR Title 14 Part 139.315, this aircraft falls into Index C requirements; however, because it operates less than an average of five times per day, only Index B requirements are currently required. As published by the FAA, Grand Junction Regional Airport is FAR Part 139 Class I, with an ARFF Index B. This is anticipated to be adequate throughout the planning period.

4.6.2 Aircraft Fuel Storage

Fuel storage requirements at the Airport depend on the level of aircraft traffic, fleet mix, and fuel delivery schedules. Changes in aircraft fleet mix, for example piston twins being replaced by turboprops, will likely increase demand for Jet A fuel. **Table 4-20** outlines fuel storage requirements for the planning period for both Jet A fuel and 100LL Avgas with an assumed five-day fuel delivery schedule.

Table 4-20. Aircraft fuel storage

	2021	Planning Activity Level			
		PAL 1	PAL 2	PAL 3	PAL 4
Peak Month Average Day Operations	186	198	215	218	222
100LL					
PMAD Operations	120	128	140	142	144
5-Day Fuel Need (Gallons)	2,160	2,304	2,520	2,556	2,592
Available Storage	32,000	32,000	32,000	32,000	32,000
Total Storage for 5-Day Need: Surplus/Deficit (-)	+29,840	+29,660	+29,480	+29,444	+29,408
Jet A					
PMAD Operations	66	70	75	76	78
5-Day Fuel Need (Gallons)	46,860	49,700	53,250	53,960	55,380
Available Storage	68,000	68,000	68,000	68,000	68,000
Total Storage for 5 Day-Need: Surplus/Deficit (-)	+21,140	+18,300	+14,750	+14,040	+12,620

Source: InterVISTAS Analysis, 2023

Though the existing fuel storage capacity, managed by West Star, is adequate throughout the planning period, it is recommended that space be preserved to accommodate an additional 10,000-gallon tank in the event the fuel delivery schedule is altered and/or demand levels change.

4.6.3 Deicing

Deicing operations are generally broken out into two major categories: (1) agents used to treat the airfield, (2) and agents that treat aircraft. Generally, the storage capacity for both anti-icing and deicing agents used for treating the airfield relates to the total Priority 1 surface area as defined in the Airport's Snow and Ice Control Plan. The storage requirements were determined to be adequate, as the facility requirements analysis does not propose major changes to the overall airfield layout over the planning

period. Airport staff may consider expanding the existing maintenance and snow removal building for additional circulation area.

For treating aircraft, totes for storing both Type I and Type IV deicing and anti-icing agents are located adjacent to the deice pad and are managed by the airlines and West Star.

Currently, the airport only has two positions to deice aircraft. As the peak departure bank increases over time there may be a need to add an additional deicing position to minimize delays for aircraft operators.

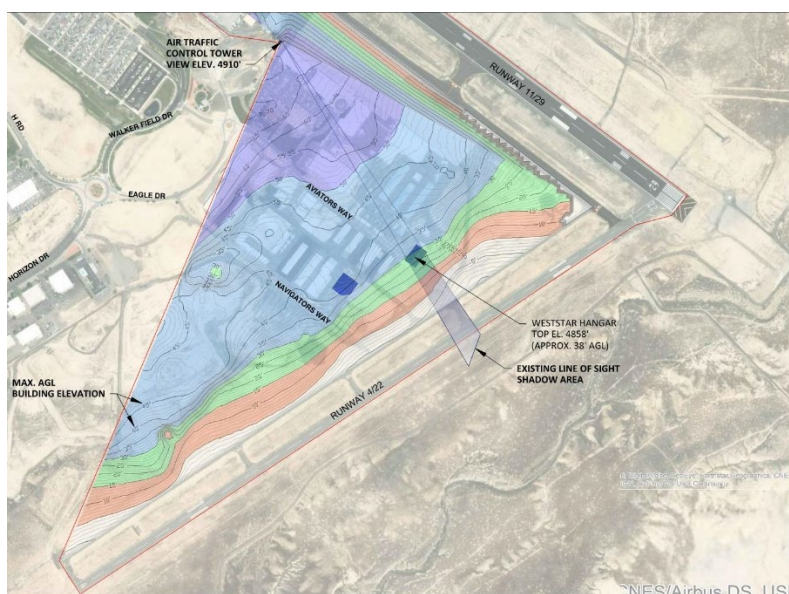
4.6.4 Airport Maintenance, Snow Removal Equipment and Storage

Airport maintenance and snow removal equipment are mostly stored in the SRE/ARFF facility; however, the Authority also utilizes a few hangars for storage. In discussions with Authority staff, the existing facility is deficient and needs to be improved to not only increase the overall storage capacity but also to be more efficient for staff to accomplish their daily duties to maintain the airport in a safe and efficient manner. In these discussions, Authority staff suggested that there is a storage deficit of approximately 15,000 square feet that would need to be implemented by the end of the 20-year planning period.

4.6.5 Airport Traffic Control Tower

The ATCT is located near the ARFF building. The over 40-year-old tower has several challenges that impact airport operations. The height and location of the ATCT creates some line-of-sight deficiencies, particularly at Taxiways C1A, portions of Taxiway C and Runway 4-22. The challenges with the line of sight not only impact operations today, but also limits development opportunities for new facilities if they were to be constructed on the green field site south of Taxilane C1A as shown in **Figure 4-11**.

Figure 4-11. ATCT Line-of-Sight Analysis



Source: LOS Shadow Analysis – Technical Memorandum, Mead & Hunt, 2018

The prior airport master plan study recommended that the ATCT be relocated north of Runway 11-29, near the threshold of Runway 29. This site may still be suitable to accommodate the ATCT in the future; however, prior to designing the future ATCT it is recommended a feasibility and siting analysis be performed using the latest FAA guidance. The feasibility and siting analysis should also evaluate the

airspace system to determine the separation distance needed for a future parallel Runway 11-29 and identify potential impacts to the proposed ATCT.

4.7 Air Cargo

The Airport is currently served by two air cargo providers: FedEx and Key Lime Air. FedEx's operations occur adjacent to the terminal building on an apron that can accommodate up to two Boeing 757-200. Key Lime Air provides cargo operations on behalf of UPS. Key Lime Air's operations occur between the Bureau of Land Management Western Slope Fire Based Facility and a facility leased by Twin Otter. The apron Key Lime Air leases can accommodate approximately three Fairchild Swearingen Metroliners.

A detailed air cargo forecast and market study were conducted to determine the growth potential during the planning horizon. The forecast concluded that air cargo would increase from 9,970,039 pounds in 2021 to a forecasted 17,473,982 pounds in 2048. For these two carriers to accommodate the forecasted demand levels, it is anticipated that the operational frequency would need to increase and/or aircraft would need to be upgauged, specifically the Boeing 757-200 changing to the Boeing 767-300 in the future. The additional cargo demand could also be handled by a new provider, such as Amazon, to reflect growth in the e-commerce sector. The full air cargo and market study can be found in **Appendix C**.

To accommodate the forecasted cargo tonnage demand levels, facility improvements are needed to maintain an adequate level of service. In discussions with the integrators and Authority staff it was determined that a sortation facility of approximately 50,000 square feet is needed along with approximately five aircraft positions. Additionally, it is recommended that cargo operations be consolidated to one location on the Airport as to provide operational efficiencies and flexibility for each cargo operator.

4.8 General Aviation

The following subsections describe the methodology and requirements for accommodating the forecasted demand levels for general aviation activity. Areas evaluated include aircraft hangars, tie-downs, and apron space.

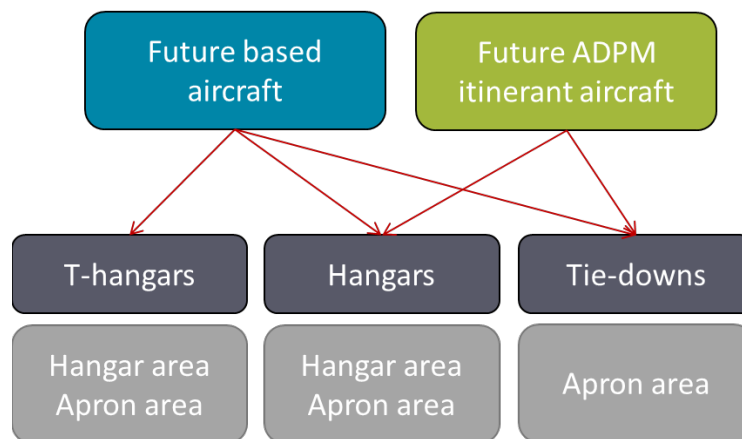
4.8.1 General Aviation Requirements Methodology

General aviation facility requirements are comprised of both based aircraft and itinerant aircraft needs, as shown in **Figure 4-12**. The methodology for calculating general aviation requirements can be summarized into six steps described below:

1. Forecast future based aircraft, informed by historical trends at the airport along with national general aviation trends.
2. Allocate future based aircraft by type using FAA Aerospace Forecast, adjusted for local conditions.
3. Define the storage requirement for the based aircraft (e.g., T-hangars, hangars, tie-downs).
4. Calculate future itinerant aircraft ADPM operations and assign a defined share to hangars and ramp parking.
5. Calculate total hangar demand for based and itinerant (hangar area + associated apron) by aircraft type.

6. Calculate apron area required to accommodate based and itinerant tie-downs.

Figure 4-12. General aviation requirements methodology



Source: InterVISTAS, 2022

4.8.2 Based Aircraft Storage Requirements

Aircraft storage is categorized as either being a t-hangar, individual box or corporate hangar, or a tie-down. T-hangars are small hangars that are typically arranged so small aircraft are “nested” to one another. Box or corporate hangars are standalone structures that often have a leasable apron for aircraft to be parked or staged. Tie-downs allow an aircraft operator to park their aircraft on the apron typically using chains to secure the aircraft from moving. **Table 4-21** summarizes the distribution of based aircraft broken out by aircraft storage type.

Table 4-21. Future storage share of based aircraft

	T-hangars	Hangars	Tie-downs
Single engine	15%	70%	15%
Multi engine	0%	95%	5%
Jet	0%	100%	0%
Helicopter	0%	100%	0%

Source: InterVISTAS Analysis, 2021

Results from **Table 4-21** were then applied to the based aircraft forecast presented in Chapter 2, Aviation Demand Forecasts, to determine based aircraft storage requirements for each PAL. Requirements for based aircraft storage by type are summarized in **Table 4-22**.

While this analysis determines specific requirements based on hangar type, its primary use is to determine the total amount of land necessary to meet future demand. Actual hangar development is largely determined by financial considerations. Therefore, it is crucial to create land reservations to ensure that sufficient space is available for future hangars. For instance, a developer might find it more economical to construct a large hangar to accommodate multiple aircraft rather than building several individual T-hangars in a row. Hence, future land reservations must remain flexible, and conceptual layouts should be designed to allow for on-demand construction of any of the various types of hangars.

Table 4-22. Based Aircraft Storage Requirement by Type

Year	2021 (Actual)	PAL 1	PAL 2	PAL 3	PAL 4
T-hangars					
Count	21	18	18	19	20
Square Footage	21,000	18,000	18,000	19,000	20,000
Surplus/Deficit (-)	--	+3,000	+3,000	+2,000	+1,000
Individual Hangars					
Count	91	106	112	119	125
Square Footage	637,000	715,200	752,400	793,600	828,400
Surplus/Deficit (-)	--	-78,200	-115,400	-156,600	-191,400
Total Hangars					
Count	136	143	250	158	166
Square Footage	658,000	733,200	770,400	812,600	848,400
Surplus/Deficit (-)	--	-75,200	-112,400	-154,600	-190,400

Source: InterVISTAS Analysis, 2021

It is recommended that the Authority preserve sufficient land to construct individual box and corporate hangars by the beginning of PAL 1. Construction of the actual facility should be contingent upon forecasted demand materializing.

4.8.3 Itinerant Aircraft Storage Requirements

The summer months are traditionally the busiest months at GJT for itinerant general aviation operations. Over the last five years (2017-2021), average day operations during the peak month has ranged between roughly 80 and 97, as shown in **Table 4-23**. The peak in 2020 can be partially attributed to firefighting operations related to wildfires in the western half of the country. In 2021, there were about 83 average day peak month operations.

Table 4-23. Average day peak month itinerant general aviation operations

	2017	2018	2019	2020	2021
ADPM GA itinerant operations	80.4	92.6	64.0	97.5	83.2

Source: GJT monthly operations data, 2017-2021

Itinerant general aviation growth in the 2022 TAF is projected at about 0.4% per annum, significantly lower than the annual growth rate between 2015 and 2020 of about 3.5%. To reflect the upside growth of itinerant general aviation, a 2% annual growth in ADPM itinerant operations is assumed.

Some itinerant aircraft can be expected to occupy hangar space at the Airport. 10% of itinerant aircraft across all types are assumed to be stored in hangars. Additionally, it is assumed that 40% of the non-based aircraft are on the ramp simultaneously. This can be considered an optimistic assumption, but it provides planning flexibility for peak demand surges, which can occur.

Applying the assumed ADPM itinerant operations growth rate and the share of aircraft stored in hangars and on the ramp, an additional 4 hangared itinerant aircraft are projected by the end of PAL 4, as shown in **Table 4-24**.

Table 4-24. Itinerant aircraft storage

	2021 (Actual)	PAL 1	PAL 2	PAL 3	PAL 4
ADPM Itinerant operations	83	92	101	112	123
Itinerant hangared aircraft	8	9	10	11	12

Source: InterVISTAS Analysis, 2021

4.8.4 Aircraft Tie-Down Requirements

Aircraft tie-down requirements are comprised of a share of based aircraft and itinerant aircraft. The apron area requirements for these two categories varies, with itinerant ramped aircraft allocated a larger area. *FAA AC 150/5300-13B Airport Design* suggests 300 square yards of apron for based aircraft and 360 square yards for itinerant aircraft, plus ten percent expansion. Based on this guidance, 3,000 square feet for based aircraft and 3,600 square feet for itinerant aircraft is assumed. There are 74 existing tie-down positions across over 260,000 square feet of apron. Tie-down requirements for based and itinerant aircraft for each PAL is summarized in **Table 4-25**. The existing number of tie-down positions and apron area is sufficient to meet the demands at the end of the planning period.

Table 4-25. Aircraft tie-down requirements

	2021 (Actual)	PAL 1	PAL 2	PAL 3	PAL 4
Based Tie-downs	-	19	20	20	21
Itinerant ramped	-	37	40	45	49
Total aircraft	74	56	60	65	70
Apron required (sf)	260,000	190,200	204,000	222,000	239,400

Source: InterVISTAS Analysis, 2021

4.9 Facility Requirements Summary

Below is a list of airport facility needs and improvements to either meet current FAA design standards or to meet the forecasted demand. Needs and future considerations are broken out by major facilities. Identified deficiencies as identified by a  will be further refined in **Chapter 5, Identification of Alternatives**.



Airfield Design

Runway system – Existing runway thresholds should be decoupled to meet FAA standards.

Runway 11-29 pavement strength – Evaluate if the allowable weight needs to be increased to 412,000 pounds.

Runway 11-29 designation – Change the designation of Runway 11-29 to Runway 12-30.

Taxiway fillet design – Design and modify existing taxiway geometry to meet current FAA standards.

Taxiway A and support taxiway shoulders – Taxiways serving ADG IV aircraft are recommended to be paved at a width of 30 feet.

Direct apron to runway access – Modify the location of Taxiways A3, A4, A5 and A6 to avoid direct apron to runway access.

Approach lighting system for Runway 29 – Replace the existing runway end lights with a MALSR.

Path indicator lights for Runway 29 – Replace the existing VASI system with a PAPI.

Runway 29 instrument approach procedures – Coordinate with FAA to design and publish an RNAV (RNP) approach procedure. Additionally, design and construct an ILS system.



Passenger Terminal Complex

Outbound baggage area – Accommodate a third EDS, 120 linear feet of makeup length, and sufficient circulation for six baggage carts.



Security screening lanes – Plan and protect for three security screening lanes by the end of the planning period and provide 1,000 square feet of additional queuing.



Holdrooms – Provide an additional 2,500 square feet by PAL 2 and another 2,500 square feet between PAL 2 and PAL 3.



Baggage claims – Add additional claim frontage between PAL 1 and PAL 2, either by lengthening the existing devices or adding a new claim device. A new claim device should be added before PAL 2 or PAL 3 dependent on peak period conditions.



Passenger boarding bridges – Provide one additional boarding bridge-enabled gate by PAL 1 and another by PAL 2.



Ground Transportation Facilities



Terminal curb – Implement a program to reduce dwell times especially during peak periods.



Public parking – Construct a parking lot large enough to meet PAL 1 demand and expand incrementally to meet the forecasted demand in PALs 2, 3 and 4.



Rental car – Expand facilities at PAL 2 to meet demand levels.



Support Facilities, Air Cargo and General Aviation

Aircraft fuel storage – Preserve land for an additional 10,000-gallon tank.

Aircraft deicing – Construct a secondary deicing pad in the future.



Airport Maintenance, Snow Removal Equipment and Storage – Increase the existing footprint of the snow removal equipment building by appropriately 15,000 square feet.

Airport Traffic Control Tower – Perform a feasibility and siting study for relocating the ATCT to the location recommended in the prior Airport Layout Plan.



Air cargo – Construct a consolidated facility with a 50,000 square foot sortation building and apron which can accommodate five aircraft parking positions.



Aircraft hangars – Preserve sufficient land to construct individual box and corporate hangars by the beginning of PAL 1. By the end of PAL 4, the Airport will need to preserve approximately 190,000 square feet for future hangars.

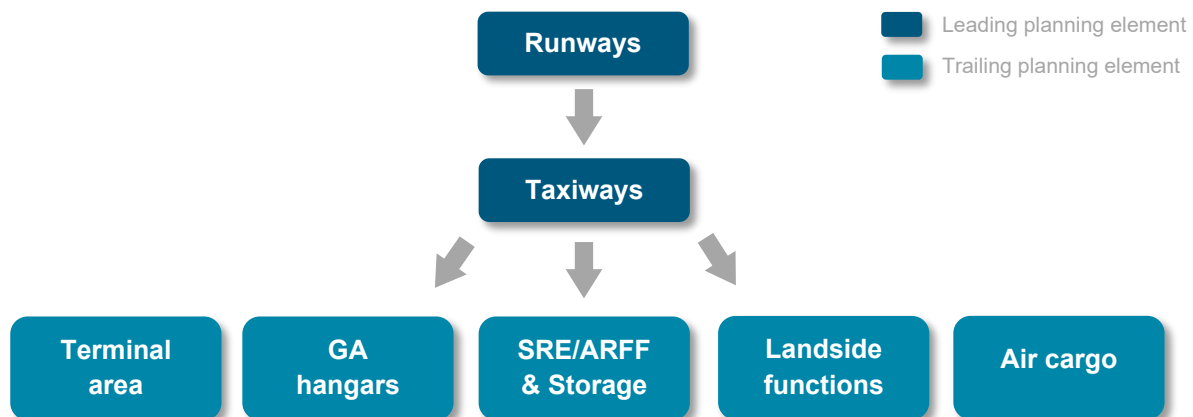
Itinerant aircraft storage – Accommodate four additional hangered internet aircraft by the end of PAL 4.

5 Alternatives

This chapter examines and assesses different options for developing facilities at the Grand Junction Regional Airport, considering the requirements outlined in **Chapter 4, Facility Requirements**. The purpose of exploring and evaluating various development possibilities is to ensure that the Airport's facilities can accommodate the expected levels of activity, optimize the use of available land, meets FAA standards, and generates a suitable return on investment. The development options presented in this chapter have undergone comprehensive analysis, refinement, and scrutiny with the involvement of key stakeholders, resulting in plans that reflect the values, preferences, and unique operational characteristics of GJT within the community it serves.

The alternatives development process first begins by establishing leading and trailing planning elements. Leading elements include critical infrastructure, such as the runways and taxiways comprising the airfield, that guides the development of trailing elements. These trailing elements, such as the terminal area, air cargo, general aviation hangars, support facilities, and landside functions are facilities whose location and layout are influenced by the leading elements. **Figure 5-1** illustrates the interrelationship between leading and trailing planning elements.

Figure 5-1. Leading and trailing planning elements



Source: InterVISTAS Analysis, 2023

5.1 Airfield Design

The airfield is the foremost leading element due to its strong correlation with terrain, predominant wind patterns, and the aircraft fleet it serves. Additionally, airfield design adheres to defined FAA standards, guidance, and best practices, reinforcing its role as the primary leading planning element. The Airport's runways are designed to accommodate the unique range of aircraft that utilize them and serve as the primary factor driving the design of supporting taxiways. The following sections will provide a brief overview of key considerations for the airfield system, present a conceptual solution to meet current and future requirements based on FAA design standards and industry best practices, and evaluate each option using established criteria.

5.1.1 Airfield Facility Requirements

The facility requirements analysis identified deficiencies with the airfield in meeting current FAA standards. **Table 5-1** summarizes the airfield deficiencies previously identified in Chapter 4, Facility Requirements.

Table 5-1. Airfield facility requirements

Airfield component	Deficiency
Runway 11-29 pavement strength	May need to be increased to meet the future critical aircraft.
Runway 11-29 designation	The magnetic declination at the Airport will require the runway designation to change to 12-30 in the future.
Taxiway fillet design	Each taxiway does not meet the current design for a fillet in FAA Advisory Circular 150/5300-13B, <i>Airport Design</i>
Taxiway A and supporting taxiway shoulders	Currently there are no paved shoulders. Based on the dimensions of the critical aircraft, a paved 30-foot shoulder width is required.
Taxiways A3, A4, A5 and A6	Have direct apron to runway access, which does not meet recommended airfield geometry practices in FAA Advisory Circular 150/5300-13B, <i>Airport Design</i> .
Approach lighting for Runway 29	The existing system needs to be replaced with a MALSR.
Path indicator lights for Runway 29	The existing VASI system is antiquated and needs to be replaced with a PAPI system.
Runway 29 instrument approach procedures	An approach procedure equivalent to Runway 11 ILS procedure is needed for redundancy and resiliency for inclement weather events.

Source: InterVISTAS Analysis, 2022

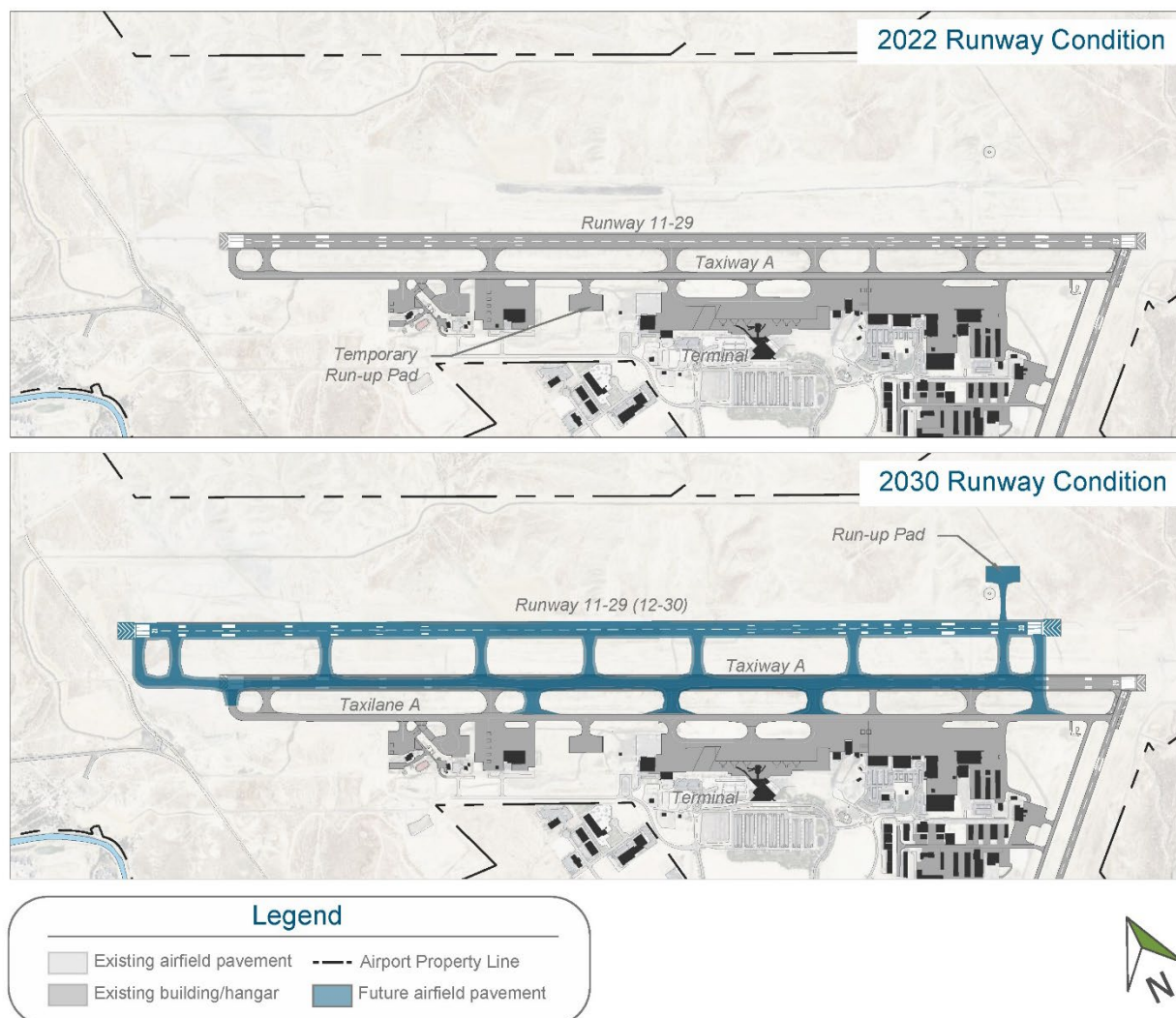
5.1.2 Runway 11-29 Relocation

At the time of the ADP development, the Airport is carrying out a project to relocate Runway 11-29 600 feet towards the northwest. The primary objective behind this relocation is to improve safety by decoupling the ends of Runway 22 and Runway 29. Such separation will enhance pilots' situational awareness by providing clear signage to help them determine their location, thereby eliminating the chances of runway incursions or incorrect surface events in this part of the airfield. Decoupling the runway thresholds will provide a permanent solution to address the Airport's lone hot spot location. Finally, the project will allow for further aeronautical development along Taxiway A.

The implementation of this project can be broken down into three primary phases. The initial phase will involve earthwork and preparing the site for the new Runway 11-29. The second phase will focus on constructing the new runway, which is expected to be completed by 2027. This will include the runway, navigational aids and constructing a run-up pad north of the runway. The third and final phase will convert existing Runway 11-29 to new Taxiway A, followed by the conversion of existing Taxiway A into a taxilane. This phase is anticipated to be completed by 2030. **Figure 5-2** provides a visual comparison of

the current airfield layout to what it will look like after completion of the runway relocation project. It should be noted that the 2030 runway condition may change as the project is still in progress.

Figure 5-2. Airfield design changes



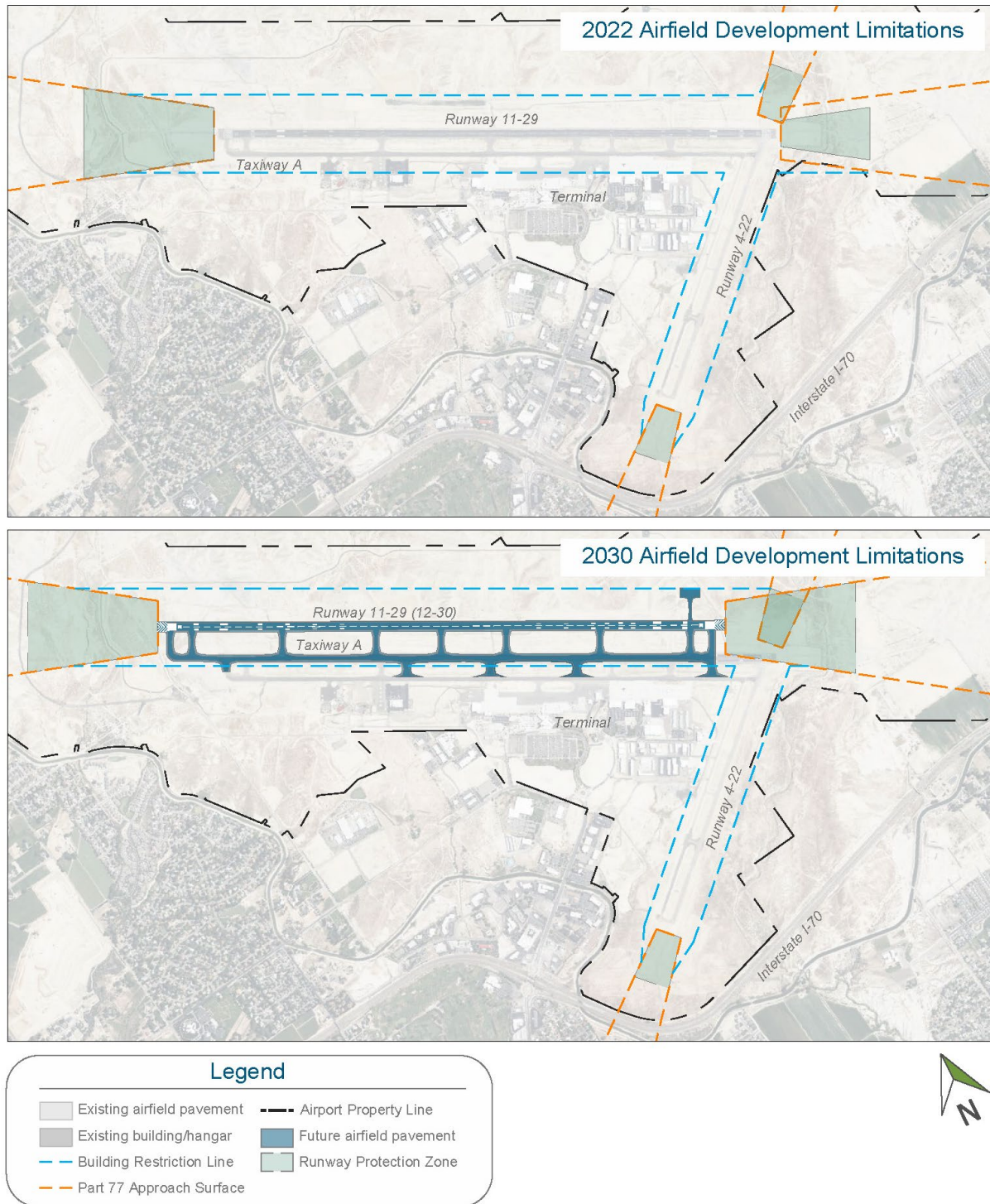
Source: InterVISTAS Analysis, 2022

The Runway 11-29 relocation project is expected to address the airfield facility requirements mentioned in Section 5.2.1 except for the approach lighting and instrument approach procedures for Runway 29, as per the current design plan. To address this facility requirement, it is recommended that the Authority collaborate with the design engineer and the FAA to procure a MALSR approach lighting system and initiate the process of submitting a request for an RNAV (RNP) approach instrument flight procedure for Runway 29.

Since the runway will be relocated over the course of the planning period, there will be a change in the available land to accommodate the forecasted demand. When considering the trailing planning elements, both the existing and future Runway 11-29 limitations were taken into account. This was done in relation to the airspace surfaces defined under FAR Part 77 and the separation requirements set forth in FAA AC 150/5300-13B, *Airport Design*. It is essential to distinguish between the existing and future limitations, as

some development concepts may be able to be implemented today, while others may depend on the completion of the Runway 11-29 relocation project. The constraints for both the present and future airfield system are shown in **Figure 5-3** by identifying the Building Restriction Line (BRL), approach surfaces and Runway Protection Zones (RPZ).

Figure 5-3. Airfield development limitations



Source: InterVISTAS Analysis, 2022

5.2 Passenger Terminal Complex Alternatives

The requirements presented in Chapter 4 indicate that the terminal will become deficient first in holdroom space and then in aircraft parking positions. These elements require that the footprint of the terminal be expanded during the planning horizon. This section describes the initial terminal concepts that were identified, the refined shortlist concepts, and the evaluation criteria utilized to identify the preferred alternative.

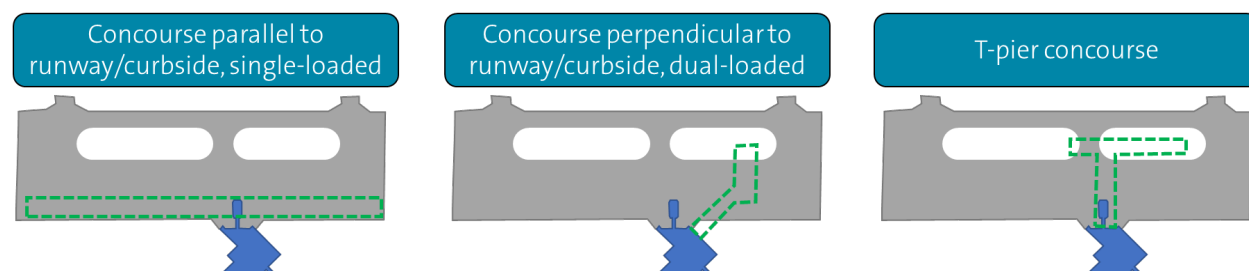
5.2.1 Initial Terminal Concepts

The approach for developing terminal expansion concepts was predicated on defining the most optimal configuration within the area available for terminal development. This area is defined by airfield safety areas such as the future Taxiway A OFA to the north as well as the existing airside-landside limit to the south. The terminal area envelope was also bounded by the fuel farm on the west and the ATCT and ARFF to the east.

Ultimate development plans, accommodating capacity well beyond the end of the planning period, were undertaken to determine the efficiency of alternative terminal layouts. From these ultimate plans, a feasible initial development phase was considered to address the near-term demands. Preferred alternative families were shortlisted for additional development and refinement.

Given the terminal envelope available for development, three alternative families were defined: (1) concourse parallel to runway, (2) concourse perpendicular to runway, and (3) T-pier concourse. These three families are diagrammatically depicted in **Figure 5-4**.

Figure 5-4. Terminal alternative groupings



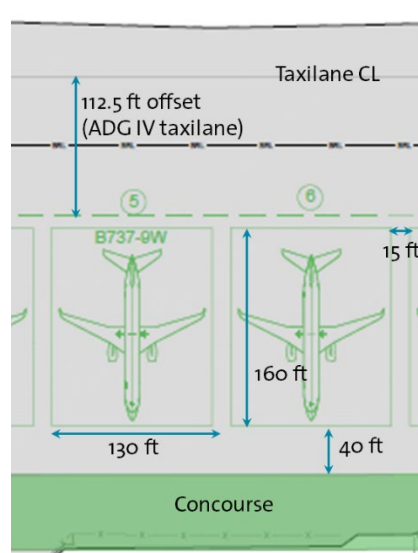
Source: InterVISTAS Analysis, 2022

Consistent geometric planning guidelines were identified prior to developing these three families into detailed alternatives. All aircraft parking positions, as shown in **Figure 5-5**, are sized at 130 feet wide by 160 feet deep to provide Boeing 737-900W aircraft capability with the ability to also serve Boeing 757-200 and widebody aircraft for diversions. At least one parking position on the existing apron can accommodate these larger aircraft, so this capability should be preserved in a future terminal. 20 feet is also preserved immediately behind the aircraft parking positions for a vehicle service road (VSR).

40 feet of separation is preserved between the face of the terminal and the front of the aircraft parking positions to allow for push-back tugs, passenger boarding bridges, and GSE. A 15-foot buffer between parking positions is provided to allow for fuel truck and GSE circulation.

The entire aircraft apron is offset from the taxilane such that the taxilane meets OFA minima for ADG IV aircraft. Additionally, the concourse is sized with a minimum depth of 60 feet for single-loaded and 90 feet for dual-loaded capability.

Figure 5-5. Terminal area geometric planning standards



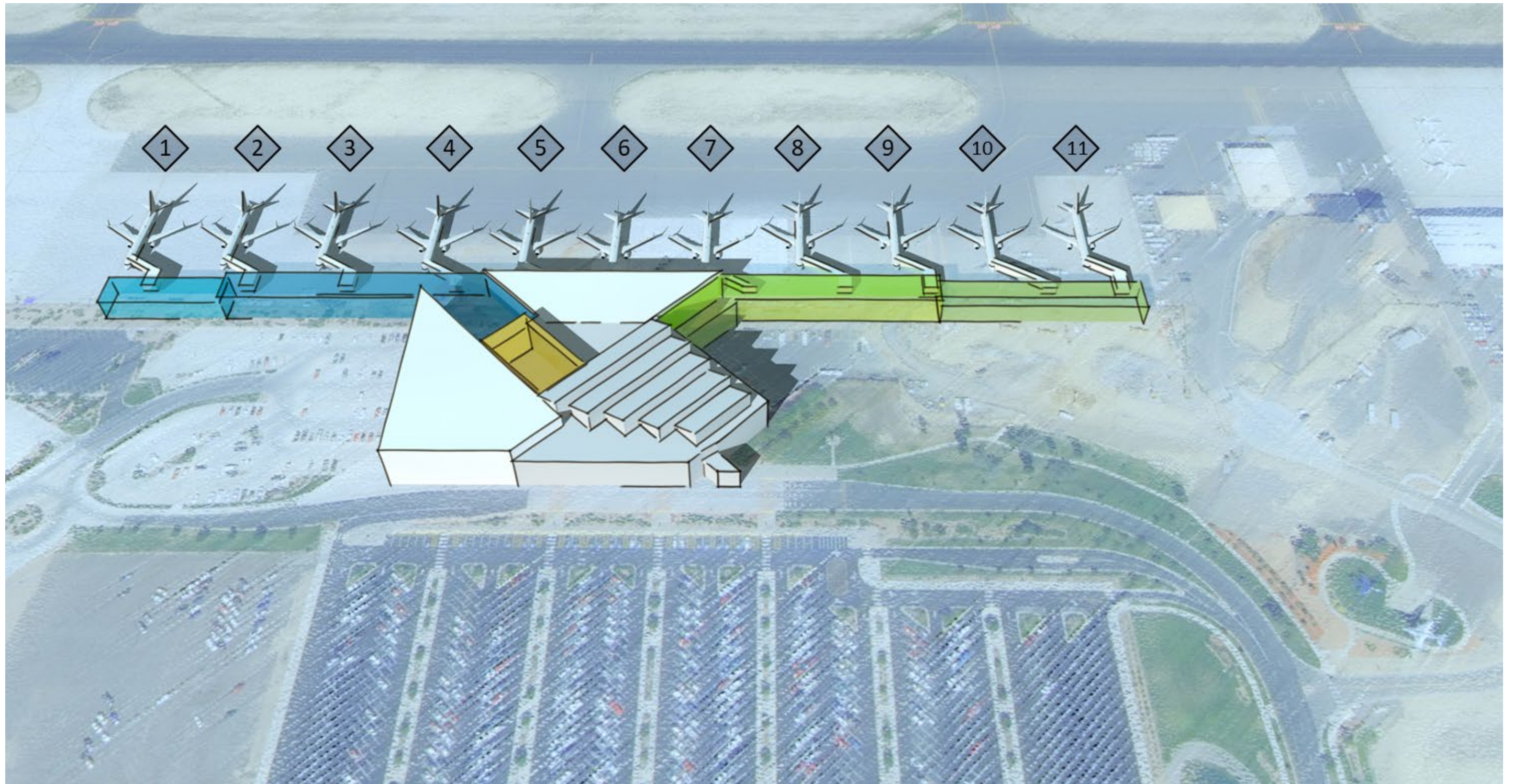
Source: InterVISTAS Analysis, 2022

The concourse parallel to runway alternative, as shown in **Figure 5-6**, presents a linear single-loaded concourse that runs parallel to the runway and existing curbside infrastructure. This alternative provides for an ultimate capability of 11 narrowbody gates and expands to the eastern limits of the terminal envelope, requiring the relocation of air cargo facilities. This concourse configuration allows for unrestricted push-back of aircraft and does not interfere with future aircraft flow once the runway is relocated. Headhouse expansion can be achieved through expansion of the building to the west, onto the site of the current rental car ready/return lot. This expanded headhouse would serve as the centroid to the linear concourse.

The concourse perpendicular to runway alternative, as shown in **Figure 5-7**, explores the dual-loading of the course to increase the efficiency of limited apron depth and reduce walking distances for passengers. This alternative provides for an ultimate capability of 15 narrowbody gates. As with the concourse parallel to the runway alternative, the easternmost expansion would require relocation of air cargo facilities. The westernmost expansion would require removal of both hangars. Additionally, the taxiway islands between the existing apron and Taxiway A would be paved in to create an expanded and more capable apron. A new larger headhouse can be constructed immediately to the west of the existing headhouse in a more centralized location to the ultimate buildout.

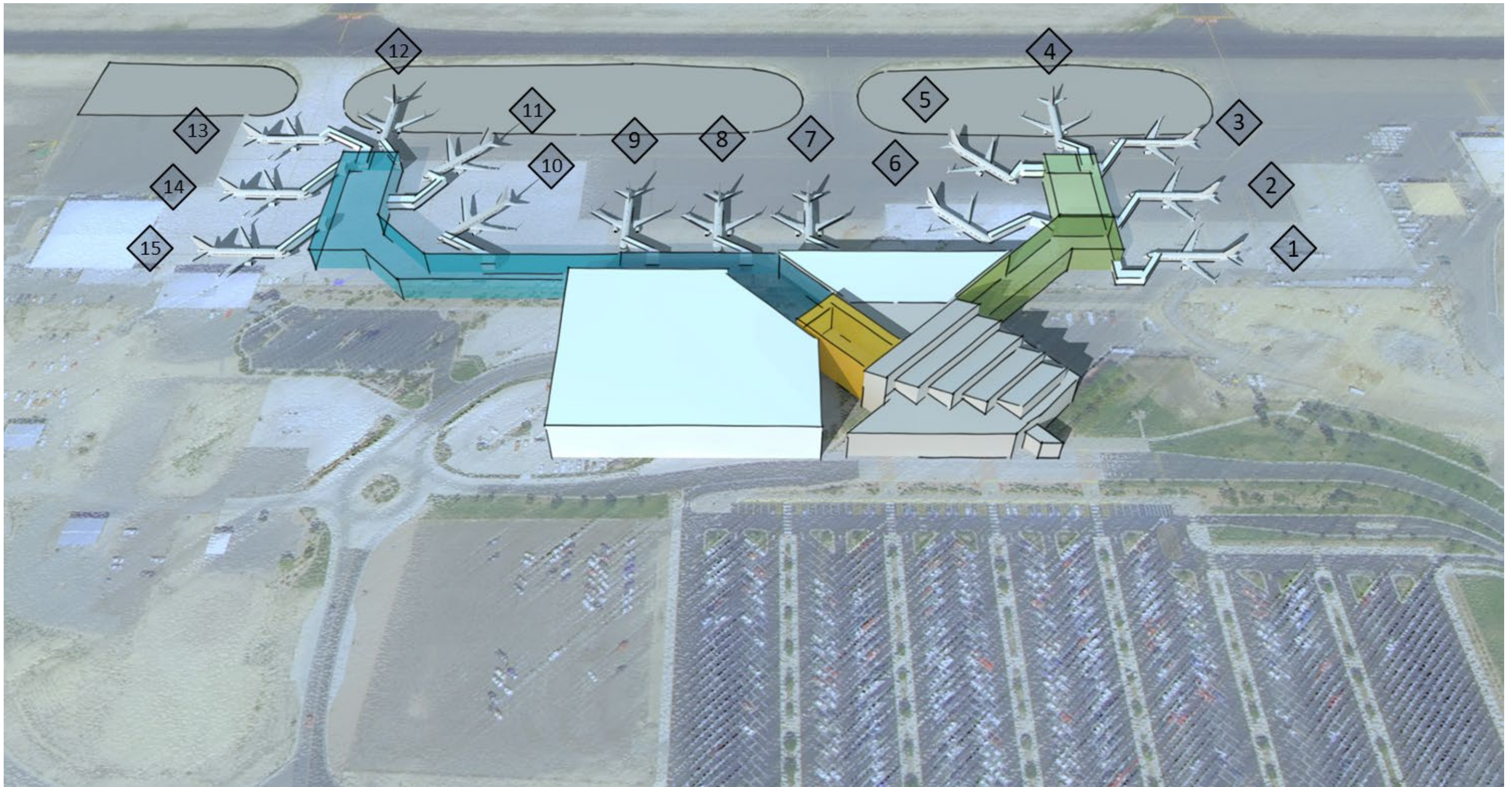
There are two T-pier alternatives: single-loaded and dual-loaded. The single-loaded alternative, which provides for an ultimate capacity of 9 narrowbody gates and fits within the current apron envelope, is depicted in **Figure 5-8**, and the dual-loaded alternative, which provides for an ultimate capacity of 12 narrowbody gates is depicted in **Figure 5-9**. In order to provide dual-loading capability, the T-pier has to be shifted northward such that aircraft parked on the north side of the concourse would be located adjacent to existing Taxiway A. This alternative also requires paving the taxiway islands. Additionally, the first phase of the T-pier development would significantly impact existing operations and requires large construction investment to open the first new gate. Given these challenges, and compared to the other expansion families, the T-pier family can be eliminated from further evaluation.

Figure 5-6. Concourse parallel to runway ultimate build



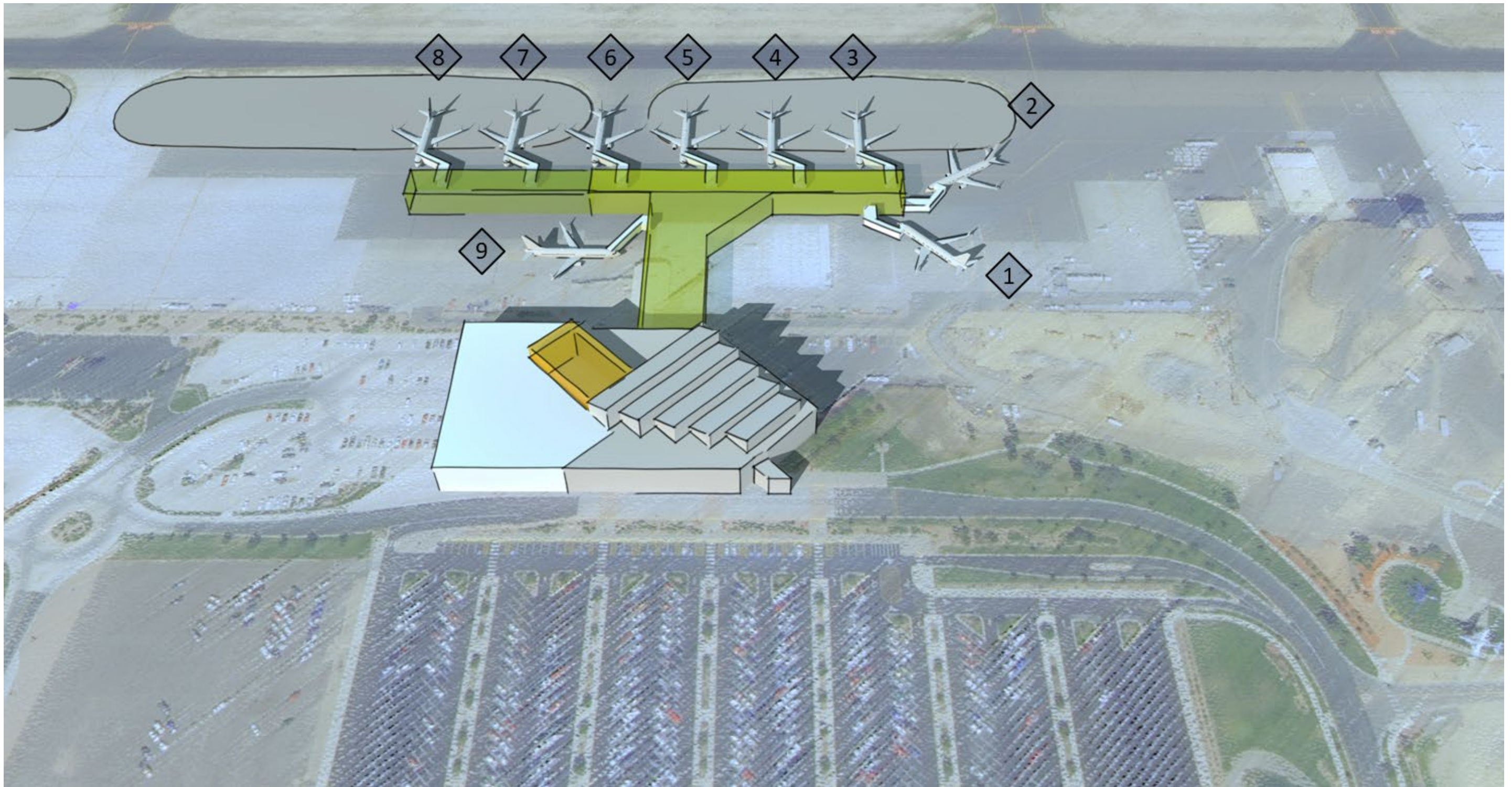
Source: InterVISTAS Analysis, 2022

Figure 5-7. Concourse perpendicular to runway ultimate build



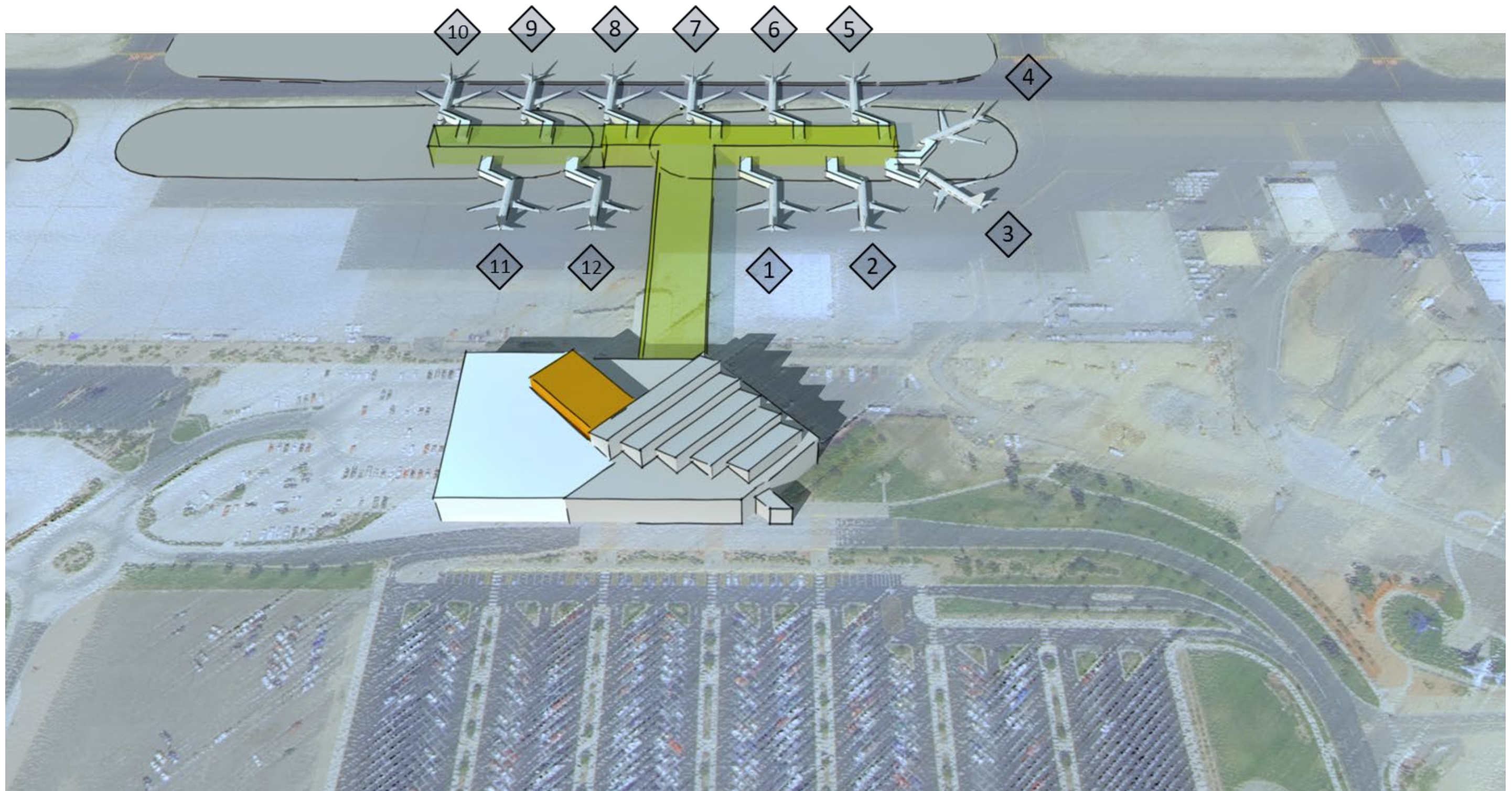
Source: InterVISTAS Analysis, 2022

Figure 5-8. T-pier concourse single-loaded ultimate build



Source: InterVISTAS Analysis, 2022

Figure 5-9. T-pier concourse dual-loaded ultimate build



Source: InterVISTAS Analysis, 2022

5.2.2 Shortlist Concepts

Given the phasing and operational challenges described above with the T-pier concepts, the linear and perpendicular concourse alternatives were brought forward as the shortlist concepts for further phasing refinement. Four construction phases were developed for each concept centered around the PALs, as shown in **Table 5-2**.

Table 5-2. Terminal construction phases

Phase	Provision	Approximate timeframe
Phase 0	Provides enabling capacity in the lower level holdroom to allow for future flexibility	By PAL 1
Phase 1	5 PBB-enabled gates with associated holdroom	PAL 2
Phase 2	7 PBB-enabled gates with associated holdroom	PAL 3, meets 20-year program
Phase 3	9 PBB-enabled gates and still maintains the “lollipop”	PAL 4

Source: InterVISTAS Analysis, 2022

Phase 0, as depicted in **Figure 5-10**, is consistent among all terminal alternative families to allow for this enabling project to proceed regardless of the terminal concept selected. This phase would provide expanded capacity in the lower level holdroom adjacent to Gate 1 and would enable a larger security checkpoint to be constructed in the future along with concessions and holdrooms. The first floor would provide expanded space for terminal support and baggage claim functions while a third floor would provide additional administration space.

Figure 5-10. Phase 0 terminal expansion



Source: InterVISTAS Analysis, 2022

Parallel to Runway Alternative

There are two phasing options for the concourse parallel to runway alternative, one that first expands to the left (“linear left”) and one that first expands to the right (“linear right”). In the linear left option, Phase 1 constructs new holdroom and gates to the west of existing Gate 1, immediately adjacent to the Phase 0 addition. Two new PBB-enabled parking positions are added, and existing Gate 1 is repositioned to be served from the new concourse. Ground loading remains off the east end of the terminal as it does in existing operations. Phase 2 constructs new holdroom and gates to the east, replacing the ground load positions. Two of these positions would be converted to PBB-enabled and connected to the concourse expansion. Phase 3 continues expansion to the east with the lengthening of the concourse and addition of two gates.

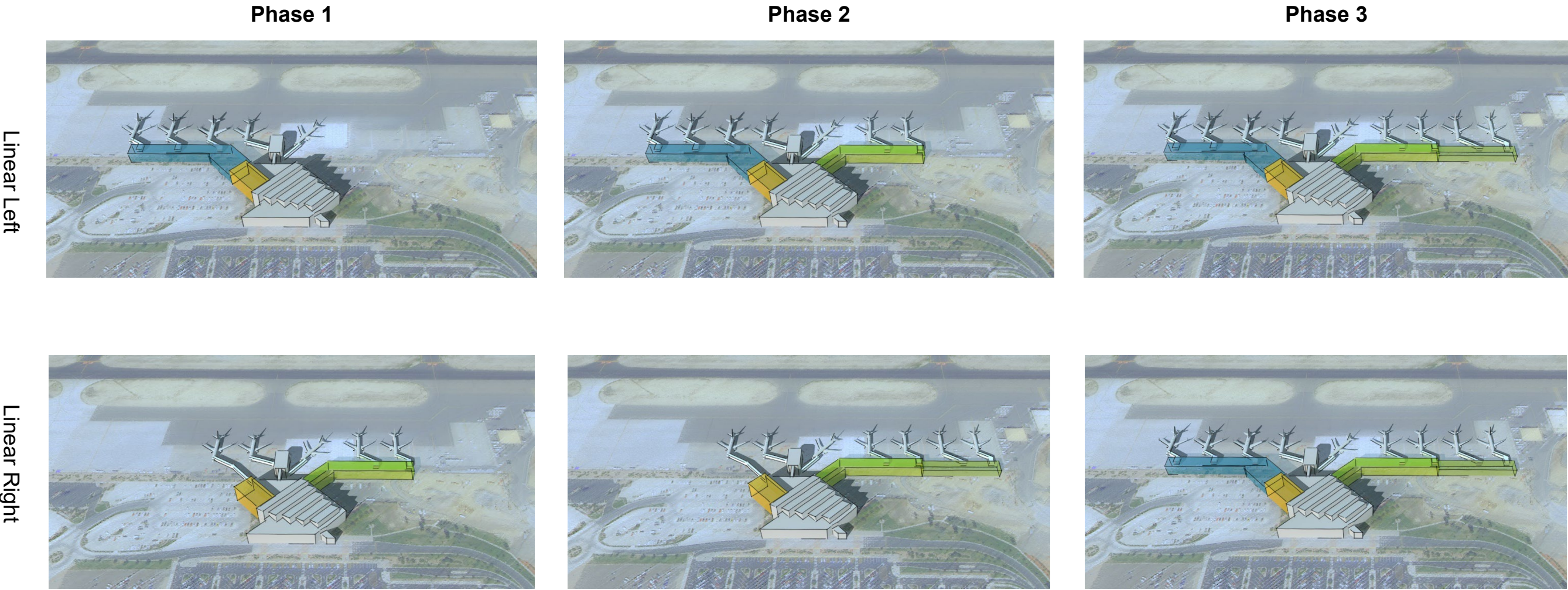
In the linear right option, Phase 1 and Phase 2 from the linear left phasing are effectively swapped. New holdroom and gates are first constructed to the east, on the site of the three ground loaded positions, while Phase 2 constructs new holdroom and gates to the west of existing Gate 1. Phase 3 is the same in the linear right option as it is in the linear left option. Phasing for both linear options is depicted in **Figure 5-11**.

Perpendicular to Runway Alternative

There are also two phasing options for the concourse perpendicular to runway alternative, one that first expands to the left (“perpendicular left”) and one that first expands to the right (“perpendicular right”). In the perpendicular left option, Phase 1 constructs new holdroom and gates to the west of existing Gate 1, immediately adjacent to the Phase 0 addition. One new PBB-enabled parking position is added, and existing Gate 1 is repositioned to be served from the new concourse. Ground loading remains off the east end of the terminal as it does in existing operations. Phase 2 constructs new holdroom and gates to the east, replacing the ground load positions. Three of these positions would provide new boarding bridge enabled access while one would accommodate a relocation to provide a larger holdroom and ability to accommodate larger aircraft. Phase 3 continues expansion on the east side with the lengthening of the perpendicular concourse and addition of two gates, bringing the total to 9.

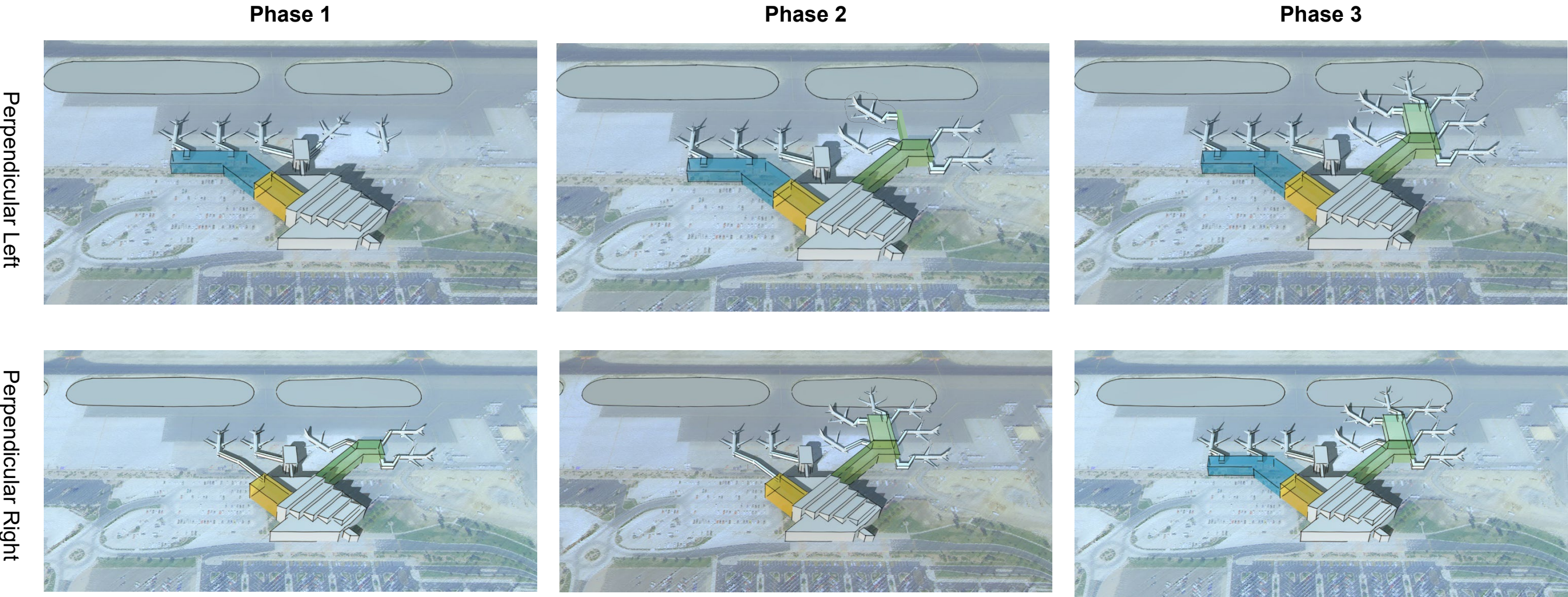
In the perpendicular right option, Phase 1 and Phase 2 from the perpendicular left phasing are swapped. New holdroom and two new PBB enabled gates are first constructed to the east, on the site of the three ground loaded positions, while Phase 2 constructs new holdroom and gates to the west of existing Gate 1. Phase 3 is the same in the linear perpendicular option as it is in the perpendicular left option. Phasing for both perpendicular options is depicted in **Figure 5-12**.

Figure 5-11. Concourse parallel to runway – linear left and linear right phasing



Source: InterVISTAS Analysis, 2022

Figure 5-12. Concourse perpendicular to runway – perpendicular left and perpendicular right phasing



Source: InterVISTAS Analysis, 2022

5.2.3 Evaluation Criteria

Airport sustainability, as articulated by Airports Council International – North America (ACI-NA) is “a holistic approach to managing an airport so as to ensure the integrity of the economic viability, operational efficiency, natural resource conservation and social responsibility (EONS) of the airport.” It is a framework designed to recognize the need to incorporate operational efficiency along with the traditional social, economic, and environmental “triple bottom line” adopted by global businesses. This framework was used to evaluate the four shortlisted terminal concepts. Examples of criteria as they relate to the sustainability framework are shown in **Figure 5-13**.

Figure 5-13. EONS evaluation criteria



Six relevant criteria were identified from the EONS framework to evaluate the shortlisted alternatives. These criteria included ease of expansion, impact to existing operations, walking distances/passenger flow, customer experience, reuse of existing facilities, and compatibility with other airfield and landside development.

Early in the evaluation process it was determined that the “right” developments in both alternatives created early phasing challenges. These alternative concepts require the three ground load positions to be impacted immediately, thus reducing the number of usable gates during construction. The “left” developments, however, only impact the ground loaded positions once additional capacity is provided to the west. Due to the impact to existing operations and associated phasing challenges, the linear right and perpendicular right concepts were removed from further consideration.

The main differentiators between linear left and perpendicular left lie in the walking distances, the capital costs, and the ultimate capacity provided. Since the linear concourse concept only serves aircraft on a single side, the walking distances between the headhouse and the gates is longer than in a dual-loaded concourse configuration. More building is also required for the linear concept, thus increasing capital costs. The dual loaded concourse also provides for a higher capacity ultimate build than the linear concourse. As a result, the perpendicular left concept was selected as the preferred alternative for terminal expansion.

5.3 Terminal Interior Facilities

While the focus of the alternatives development is on the footprint of new and expanded facilities to ensure space is protected for the future, improvements inside the terminal building were also evaluated based on facility requirement needs. Through consultation with the Authority, baggage screening and makeup was identified as one area requiring a more refined evaluation.

5.3.1 Baggage Screening and Makeup Alternatives

Presently, checked bags are manually carried to two EDS machines located directly behind the ticket counters (one in front of ATO 2 and the other in front of ATO 3). Once bags are screened they are fed through one of four ATOs where they are loaded onto carts and transported to the aircraft. This is a highly manual process for several of the airlines not immediately adjacent to the two lobby EDS machines. Additionally, separate EDS create a load balancing challenge as demand from the carriers varies throughout the day. The ATO spaces also contain lockers, offices, and storage for other equipment.

There is a desire to centrally locate the EDS machines to back of house space to improve employee safety and increase overall efficiency. On the back end, there is also a desire to separate the baggage makeup from the office space and reconfigure the ATO to increase utilization of the space.

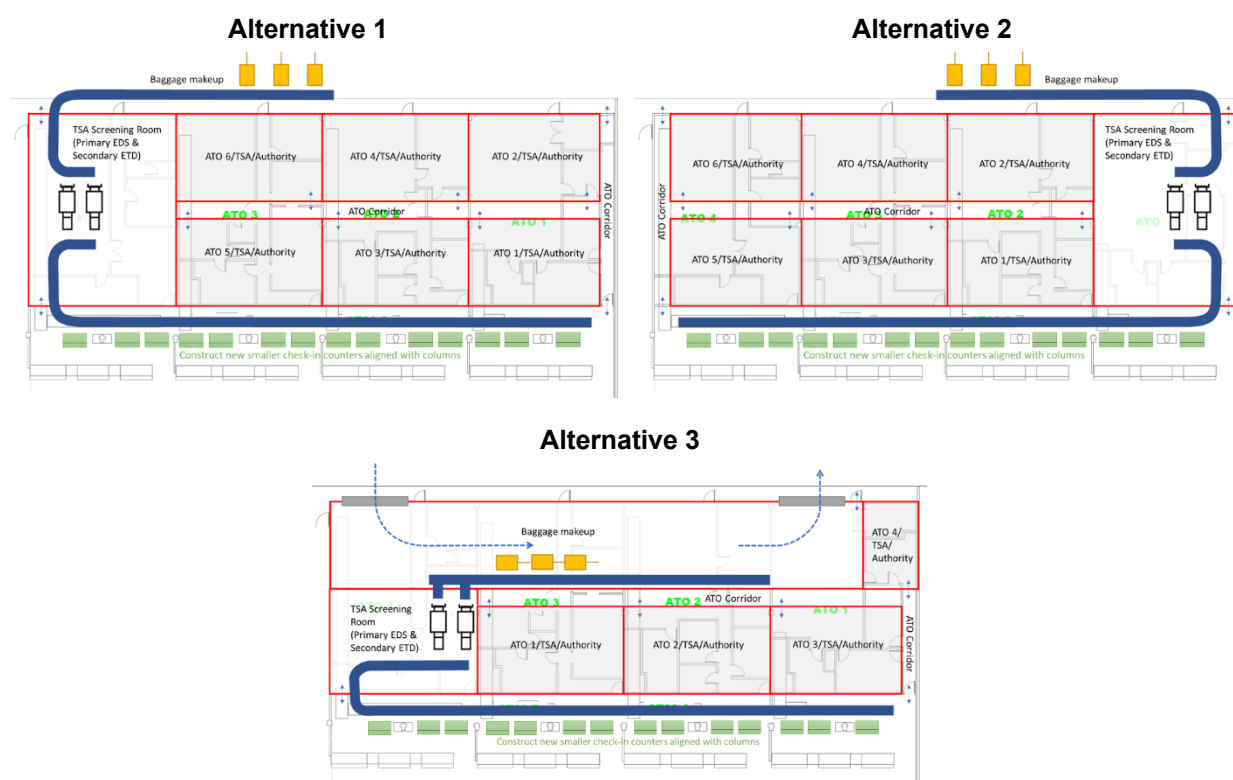
Three alternatives were developed to address EDS centralization, consolidated baggage makeup, and optimized ATO space. In all three alternatives a single feed belt transports bags from the ticket counters into the baggage screening room. After screening, a single belt transports bags to the makeup area. By relocating the EDS machines, the ticket counters are proposed to shift toward the ATOs to align with the building columns and create more queuing space in the ticketing lobby. The alternatives, as depicted in **Figure 5-14**, focus on different orientations to implement this preferred operation.

In alternative 1, TSA baggage screening is relocated to ATO 4 (closest to the baggage claim). ATOs 1, 2, and 3 are redeveloped into offices which would be accessed through a corridor along the curbside end of the lobby. Baggage makeup would occur outside existing ATOs 3 and 4. One challenge with this orientation, however, is that the baggage carts would be located within close proximity to the ramp which connects up to the apron. This would negatively impact the turning radius of vehicles, such as deice trucks and other airport service vehicles that park behind the ATOs.

In alternative 2, the layout is flipped and TSA baggage screening is relocated to ATO 1 (closest to the curbside). The remaining ATOs are redeveloped into offices which would be accessed through a corridor down by existing ATO 4. The primary advantage of this layout is that baggage makeup can occur away from the ramp without interfering with operations. Also from a phasing perspective, ATO 1 is currently not servicing any airlines, which makes it easier to develop first.

Alternative 3 was developed to explore moving baggage makeup into covered and conditioned space. In this alternative, the back half of the ATO space is converted into a drive aisle to allow baggage tugs to load bags in a drive-thru configuration. Roll-up doors would be added to the entrance and exit to provide weather protection. As a consequence of this configuration, less ATO and office space can be provided and there are reduced opportunities for flexibility for future growth.

Figure 5-14. Baggage screening and makeup alternatives



Source: InterVISTAS Analysis, 2022

Evaluation criteria were developed to determine the preferred baggage screening and makeup alternative. These criteria, as depicted in **Figure 5-15**, include ramp accessibility, weather protection, future flexibility to phase to an inline screening system, and relative cost to construct. Given the ramp accessibility concerns of alternative 1 and the restricted flexibility of alternative 3, alternative 2 was selected as the preferred baggage screening and makeup option.

Figure 5-15. Baggage screening and makeup evaluation summary

Evaluation Criteria	Alternative 1	Alternative 2	Alternative 3
Ramp accessibility	Concept performs poorly	Concept performs well	Concept performs well
Weather protection	Concept performs poorly	Concept performs well	Concept performs well
Phaseable to inline BHS	Concept performs well	Concept performs well	Concept performs poorly
Relative cost for development	Concept performs well	Concept performs well	Concept performs poorly

■ Concept performs well
 ■ Concept performs fair
 ■ Concept performs poorly

Source: InterVISTAS Analysis, 2022

5.4 Ground Transportation Facilities

This section describes the terminal area airport access and circulation roadways, terminal curbsides, parking facilities, and other associated ground access facilities. Information on these roadways and associated ground access facilities was obtained through site visits, aerial imagery, and desktop research of previously published materials.

5.4.1 Public Parking Alternatives

Future requirements (non-holiday) beyond the 20-year planning horizon are expected to reach up to 1,460 spaces. Additionally, up to 550 spaces could be required for holiday overflow. Parking alternatives have been developed to meet the requirements at the Airport. The parking alternatives were developed to meet the requirements of the third phase of the airport development plan, PAL 3, which corresponds to a capacity of 500,000 annual enplanements (EPAX). Additionally, the plan has identified additional expansion areas to meet the requirements of 600,000 annual enplanements.

One of the key considerations in developing the parking alternatives is the stall width. The existing stall width of the parking lot is 10 feet; however, the expansion alternatives consider both 9 feet and 10 feet stall widths. Another consideration is the stall angle, with a 45-degree angled option considered alongside a 90-degree perpendicular option. The existing lot is currently composed of 45-degree stalls and includes landscaping areas between the aisles. As a result, the current configuration requires more area per space than it would were the stalls angled at 90 degrees and if landscaping areas were reduced.

The existing landside area allocated for parking is more than adequate to accommodate the demand at the end of PAL 3 even with using a 45-degree stall option. If the Authority wanted to further optimize the area and accommodate additional nonaeronautical functions, a 90-degree configuration and/or reductions in landscaping areas would reduce the area-per-space. Another consideration is the need for employee parking. Potential locations for dedicated employee lots have been identified.

Reserved green spaces have been considered for landscaping, drainage, or other uses. Pedestrian connections between the parking lots and terminal are also considered in order to provide convenient access to the parking expansion areas and to maintain the overall airport experience for passengers.

As described in **Table 5-3**, the following surface level parking alternatives were identified along with key considerations. The alternatives that consider 90-degree stalls and reduced landscaping areas were developed to test the potential efficiency of the parking areas in the event the Airport wished to consider alternative land uses for the future parking expansion areas.

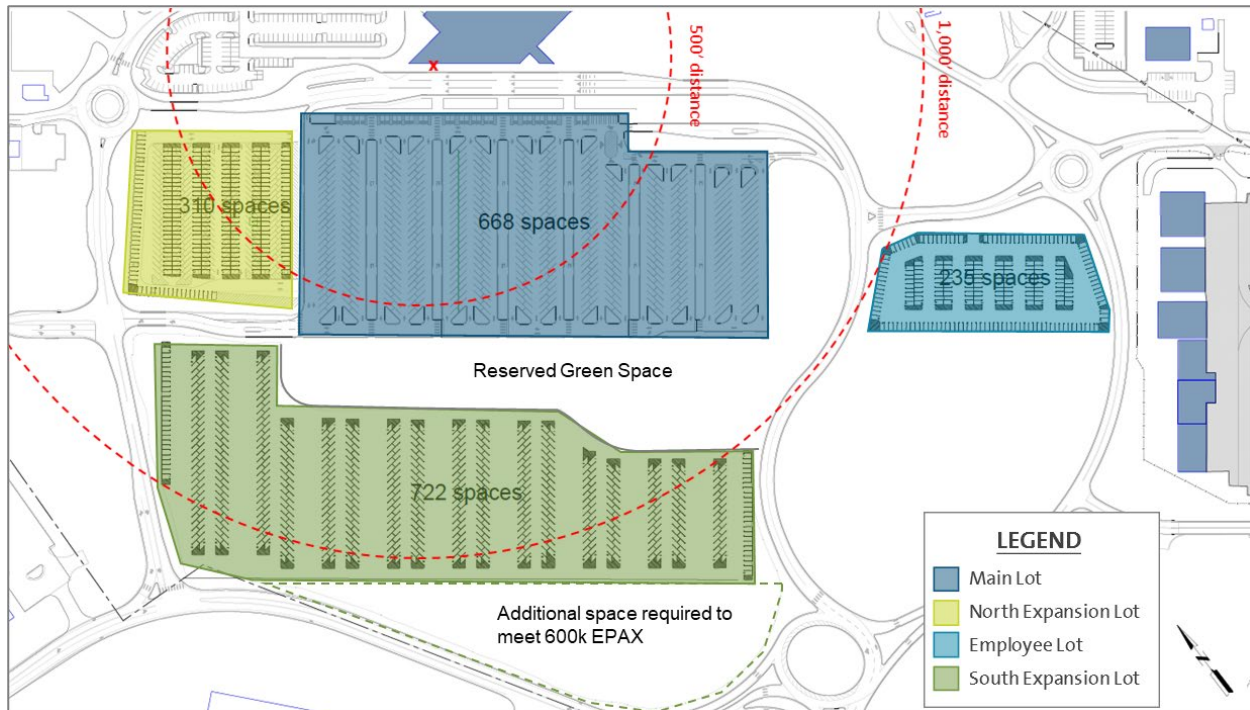
Table 5-3. Surface parking lot alternatives

Alternative	Stall width	Stall angle	Space optimization	Employees
1a (Figure 5-16)	10 feet	45 degrees	Maintain existing space allocation	Relocated to a new lot in the east parcel
1b (Figure 5-17)	10 feet	45 degrees	Maintain existing space allocation	Relocated to a new lot in the east parcel
2 (Figure 5-18)	10 feet	90 degrees	Greater use of allocated space	Relocated to a new lot in the east parcel
3a (Figure 5-19)	9 feet	90 degrees	Greater use of allocated space	Relocated to a new lot in the east parcel
3b (Figure 5-20)	9 feet	90 degrees	Greater use of allocated space	Relocated to the south expansion parcel

Source: InterVISTAS Analysis, 2022

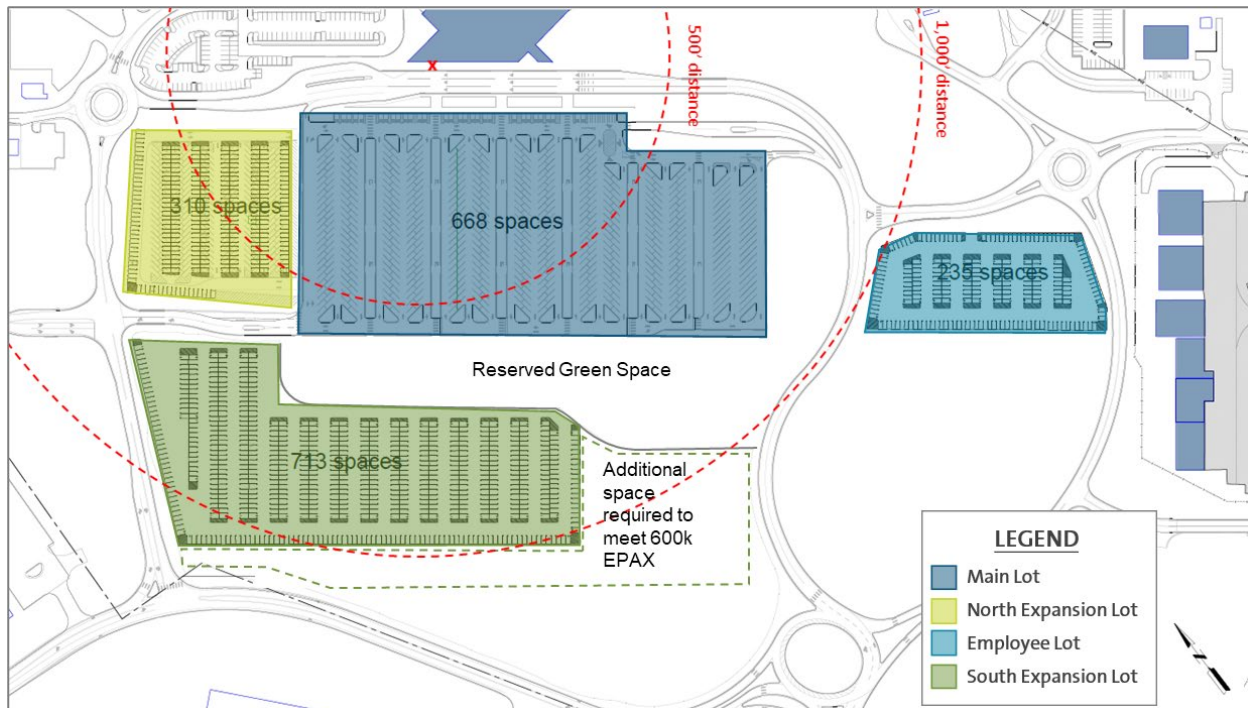
In addition to the surface parking lot alternatives, Alternative 4 was developed to explore the impacts of transitioning to a parking structure. **Figure 5-21** depicts the area for a two-level parking structure for public parking, providing approximately 615 spaces per level. The parking structure would exclude overflow spaces which would be located on an adjoining surface parking lot. The parking structure could also be expanded to include rental car ready/return spaces. Employees could use the current overflow site or a new surface parking lot.

Figure 5-16. Parking alternative 1a



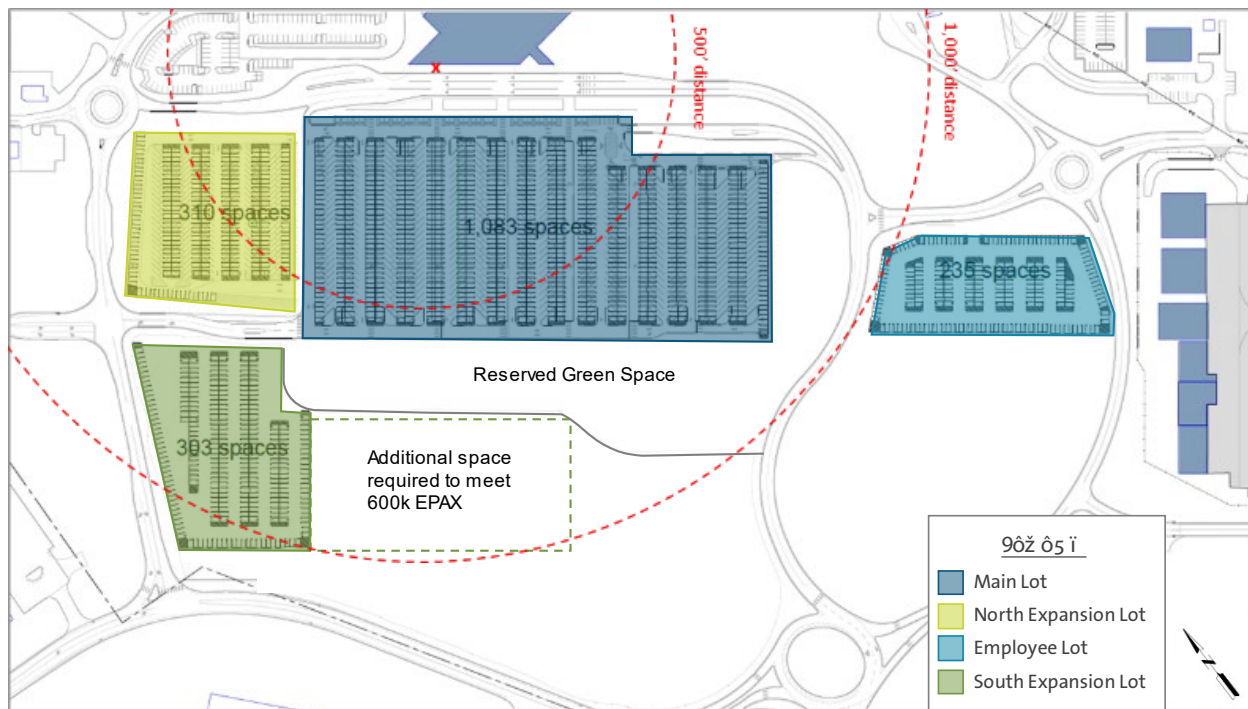
Source: InterVISTAS Analysis, 2022

Figure 5-17. Parking alternative 1b



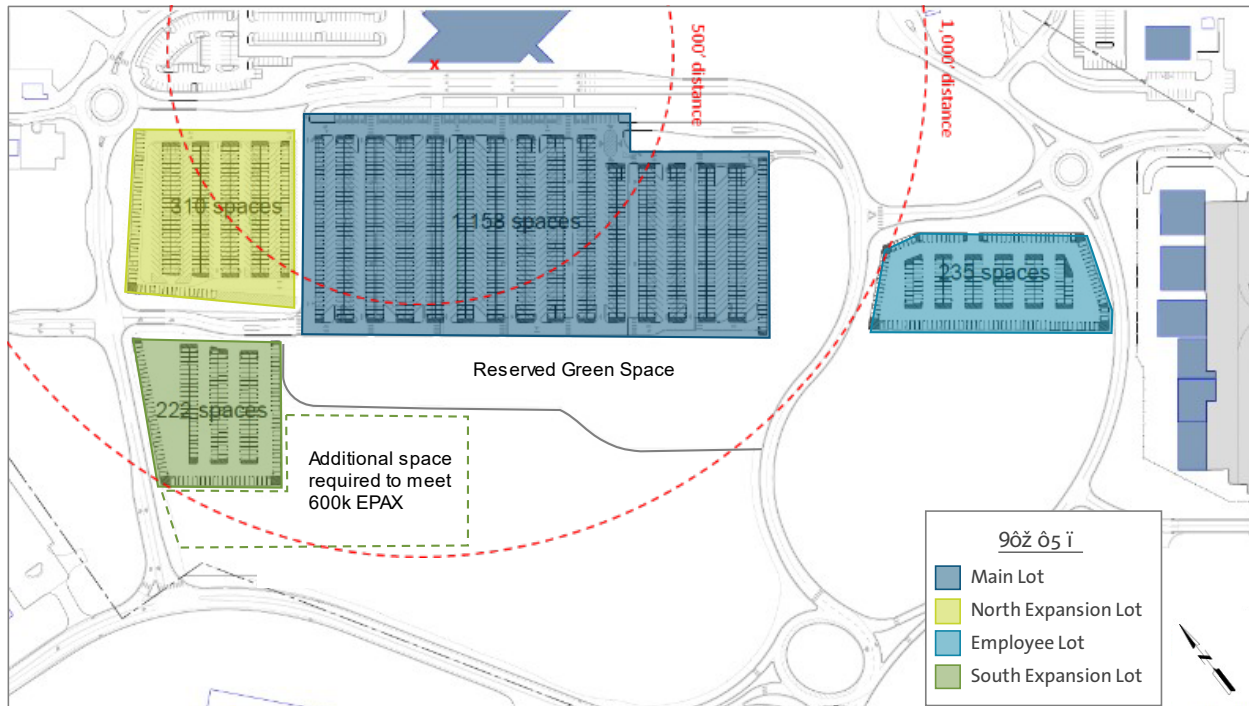
Source: InterVISTAS Analysis, 2022

Figure 5-18. Parking alternative 2



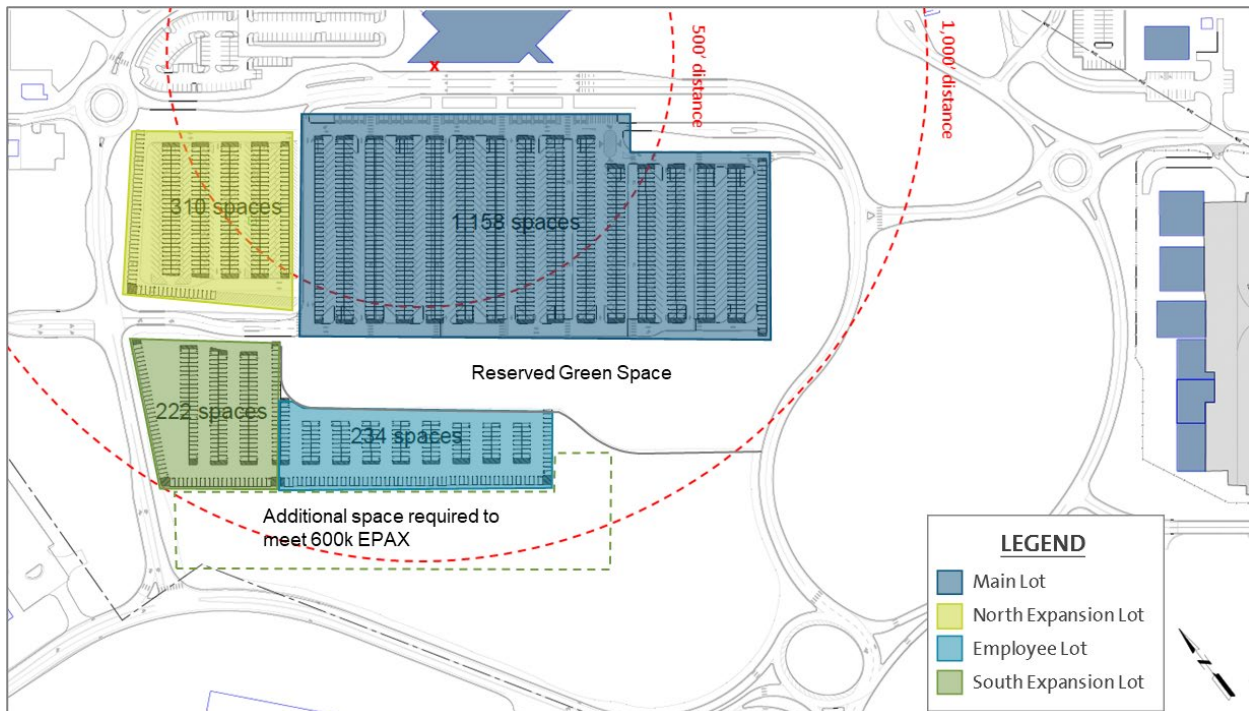
Source: InterVISTAS Analysis, 2022

Figure 5-19. Parking alternative 3a



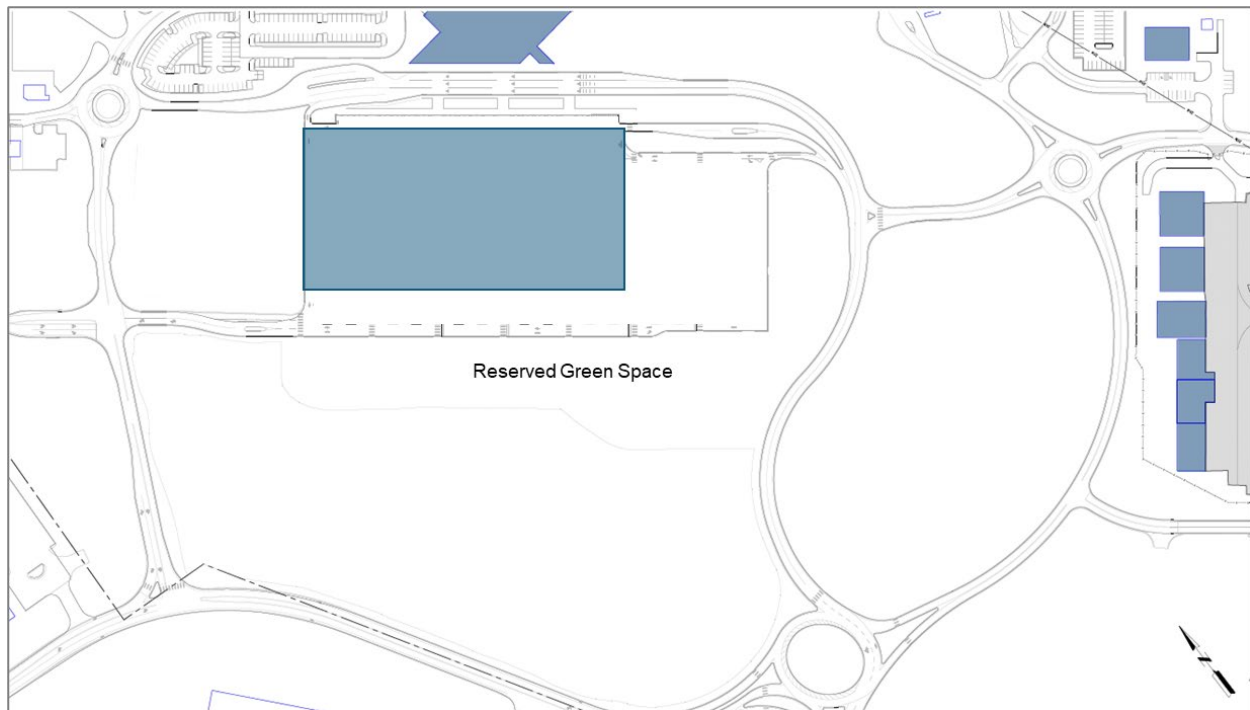
Source: InterVISTAS Analysis, 2022

Figure 5-20. Parking alternative 3b



Source: InterVISTAS Analysis, 2022

Figure 5-21. Parking alternative 4



Source: InterVISTAS Analysis, 2022

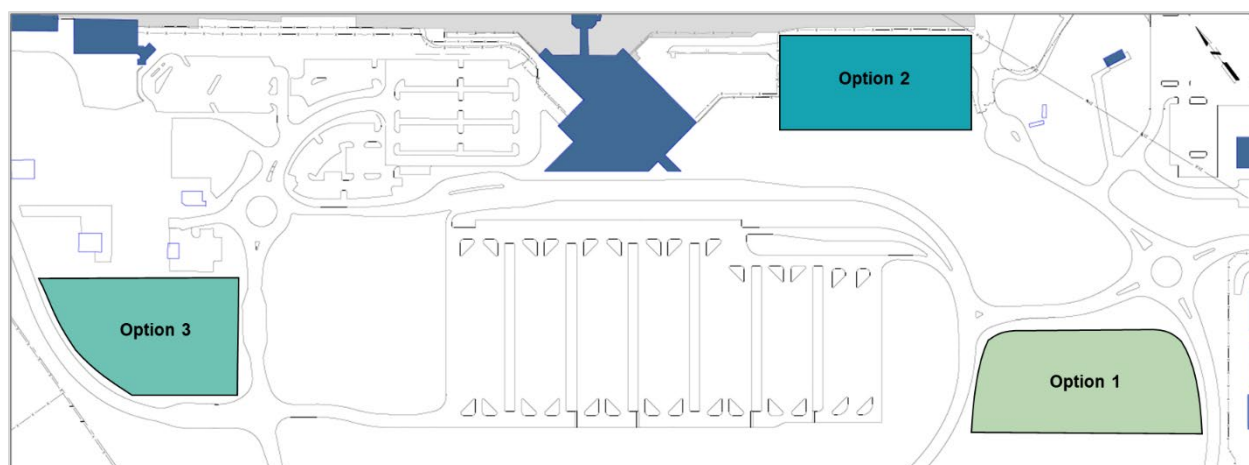
5.4.2 Employee Parking Alternatives

Employee parking is an important consideration for any airport planning process, as it directly affects the employee experience and can impact airport operations. Some key considerations for employee parking include:

1. Proximity to work areas: Employee parking facilities should be located as close as possible to work areas to minimize travel time.
2. Parking capacity: The number of parking spaces required should be based on the number of employees expected to use the facility and should also consider the potential for growth in employees.
3. Access control: Access to employee parking facilities should be restricted to authorized personnel only. Airports should use a secure method of access control such as key cards or biometric systems to ensure that only employees are able to park in the designated areas.

Three locations, shown in **Figure 5-22**, were identified to meet employee parking demands. Option 1 is located on an empty parcel east of Walker Field Drive and south of Aviators Way. Sidewalk infrastructure from this site to the terminal building already exists. Option 2 is located on a graded site just east of the terminal building that was previously planned to house other airport infrastructure. Option 3 is located south of the rental car QTA facilities and north of Landing View Lane.

Figure 5-22. Employee parking lot site alternatives



Source: InterVISTAS Analysis, 2022

5.4.3 Rental Car Alternatives

The existing rental car ready / return area (146 spaces) appears adequate beyond 350,000 enplanements (between PAL 1 and PAL 2). To meet future demands, ready/return areas can be expanded within the existing paved area, as shown in **Figure 5-23**, to provide approximately 240 spaces. However, discussions with the existing rental car operators may be needed to refine ready/return requirements and establish service center needs. Other additional considerations include the extent to which these operators use airport facilities to serve non-airport activity, the need for covered spaces, service center capacity and quality, potential for developing a consolidated service center, and the ability to incorporate new entrants.

Figure 5-23. Rental car expansion site alternative



Source: InterVISTAS Analysis, 2022

5.4.4 Cell Phone Lot Alternatives

The placement of a cell phone lot at an airport involves several key considerations, including:

1. Proximity to terminals: The cell phone lot should be located in a convenient location near the airport terminals to allow drivers to easily park their vehicles and wait for passengers. However, placement of the cell phone lot should not be located too close to the terminal as this may encourage unauthorized activity such as employee parking or passenger/public parking.
2. Size: The cell phone lot should be large enough to accommodate the anticipated volume of vehicles during peak periods. The size of the lot should be based on the expected demand for parking and the number of flights arriving at the airport during the peak period.
3. Signage: Clear and visible signage should be installed to direct drivers to the cell phone lot.
4. Accessibility: The cell phone lot should be easily accessible from the main airport entrance, the terminal area, and nearby highways or major roads to minimize traffic congestion.
5. Other uses: The cell phone lot can also be used as a potential staging area for taxicabs or transportation network company vehicles. Additionally, the cell phone lot can be combined with other uses such as a gas station or convenience store, in order to provide revenue enhancement opportunities.

Figure 5-24 identifies three alternatives for a cell phone lot and the potential access points. Site A is located on the southern section of a future commercial development area. Site B is located on an empty parcel with the northern section of the parcel identified as a potential employee lot location. Site C is located on a potential support facility site.

Figure 5-24. Cell phone lot site alternatives



Source: InterVISTAS Analysis, 2022

5.5 Aviation Support Facility Alternatives

Aviation support facilities are influenced by the layout of the airfield and the passenger terminal complex. Therefore, the placement of support facilities such as air cargo, general aviation hangars, and airport maintenance facilities are determined by the preferred location of leading elements.

Before exploring alternative concepts, an assessment was conducted to identify potential locations that could accommodate the growing demand for air cargo, general aviation hangars, and airport maintenance facilities. **Figure 5-25** illustrates the five selected sites that were evaluated.

Site C was found to be unsuitable due to limitations with the line-of-sight for the ATCT, which would significantly restrict the height of any structures and make development impractical. In contrast, although Site E is a viable option, it would require a significant investment to prepare the site for development compared to the other sites, and therefore was not considered for further evaluation.

The following subsections identify alternative concepts for corporate general aviation hangars, small/leisure general aviation hangars, air cargo and airport maintenance.

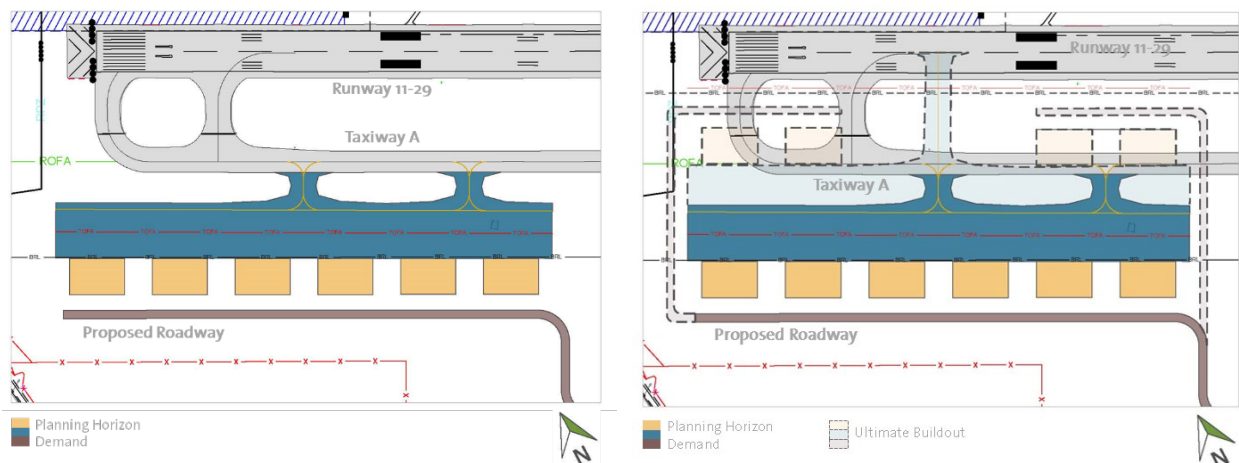
Site A was determined to be the preferred location to accommodate the forecasted demand in corporate general aviation hangars. To ensure the alternative options satisfy the forecasted demand, align with airport objectives, and meet FAA design standards a set of planning parameters were established. The planning parameters used to develop each concept included the following:

- ## Alternatives

- Accommodate corporate hangars sized 150 feet wide by 100 feet deep.
- Provide, at minimum, a single taxilane for aircraft circulation around the site.
- Provide sufficient apron depth to maintain independent operations and meet industry best practices in ACRP Report 113, *General Aviation Facility Planning*
- Provide a right-of-way for a vehicle roadway to gain access to the hangars on the site.

Alternative Concept 1 as shown in **Figure 5-26**, proposes six corporate hangars parallel to Taxiway A that could be constructed prior to the relocation of Runway 11-29. The development concept depicts two apron connectors and an extension of Landing View Lane running parallel to the hangars. After the relocation of Runway 11-29 in the future, the site could be expanded to accommodate up to ten corporate hangars. The apron connector would be modified to a single taxilane to support all ten hangars. Access roadways from Landing View Lane would be provided to wrap around the northern most hangars located just south of future Taxiway A (Existing Runway 11-29). While locating the hangars to the north on existing impervious surfaces may provide a perceived cost savings, providing these access roadways as shown in the development concept could limit the site's capabilities. Furthermore, a single taxilane could result in aircraft delays when entering and exiting the site.

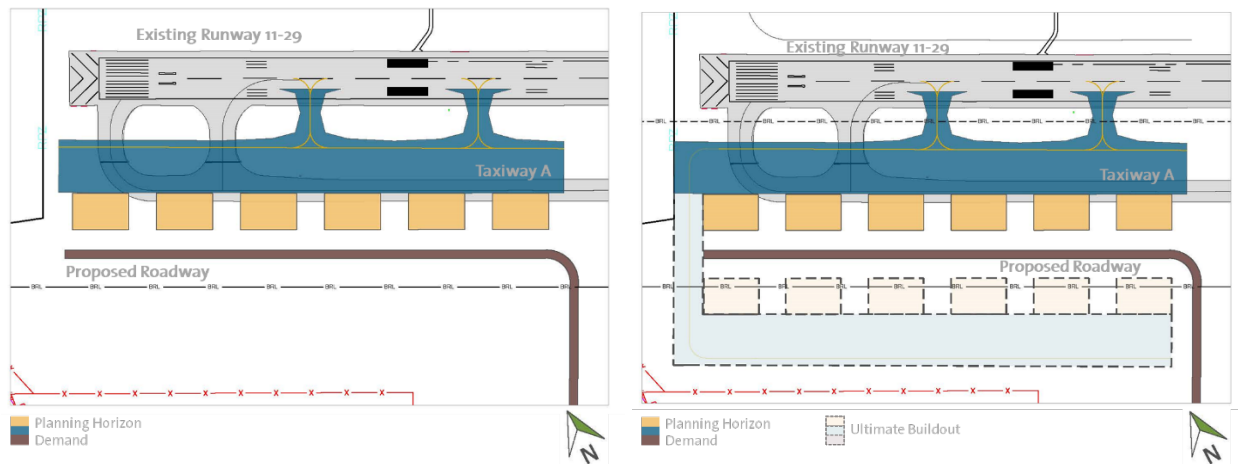
Figure 5-26. Corporate general aviation hangar alternative concept 1



Source: InterVISTAS Analysis, 2022

Alternative Concept 2, as shown in **Figure 5-27**, suggests a layout that is similar to Alternative Concept 1 but with the initial buildout located on top of the existing Taxiway A. This would result in lower site preparation costs. However, the initial six hangars can only be constructed after Runway 11-29 is shifted. Therefore, if the demand for hangars materializes before the runway is shifted, then the six hangars shown as "ultimate buildout" could be built first. The area for the proposed ultimate buildout hangars may require significant site grading, leading to a substantial increase in project cost. In addition, the concept presents a challenge in the ultimate buildout phase as Landing View Lane is extended and ends at a taxilane. This dead-end roadway could create circulation issues and limit the ability to connect to major roadways such as 27 ¼ Road in the future.

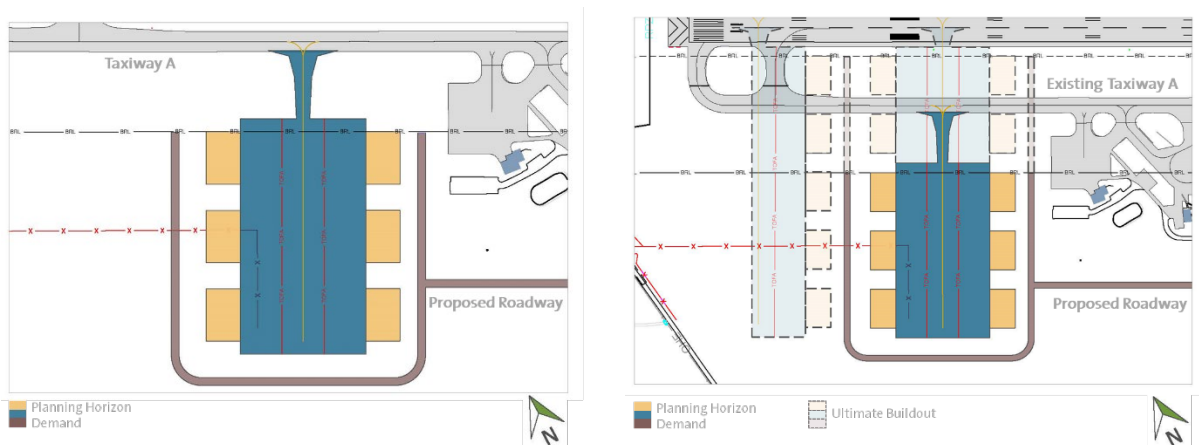
Figure 5-27. Corporate general aviation hangar alternative concept 2



Source: InterVISTAS Analysis, 2022

Alternative Concept 3, as shown in **Figure 5-28**, proposes an east-west orientation for hangars, perpendicular to Taxiway A. The initial buildout would accommodate the forecasted demand with up to six hangars and could be expanded to accommodate up to 15 corporate hangars after the relocation of Runway 11-29. However, a significant amount of earthwork would be required to fill portions of the site up to grade with Taxiway A. Additionally, with a single taxilane for ten aircraft operators, there could be operational challenges. Aircraft operating near the throat of the apron connector could potentially block aircraft operating in and out of the site. An advantage of this orientation, however, is that hangars facing in an east-west orientation are preferred over a north-facing orientation in regions with significant snowfall.

Figure 5-28. Corporate general aviation hangar alternative concept 3

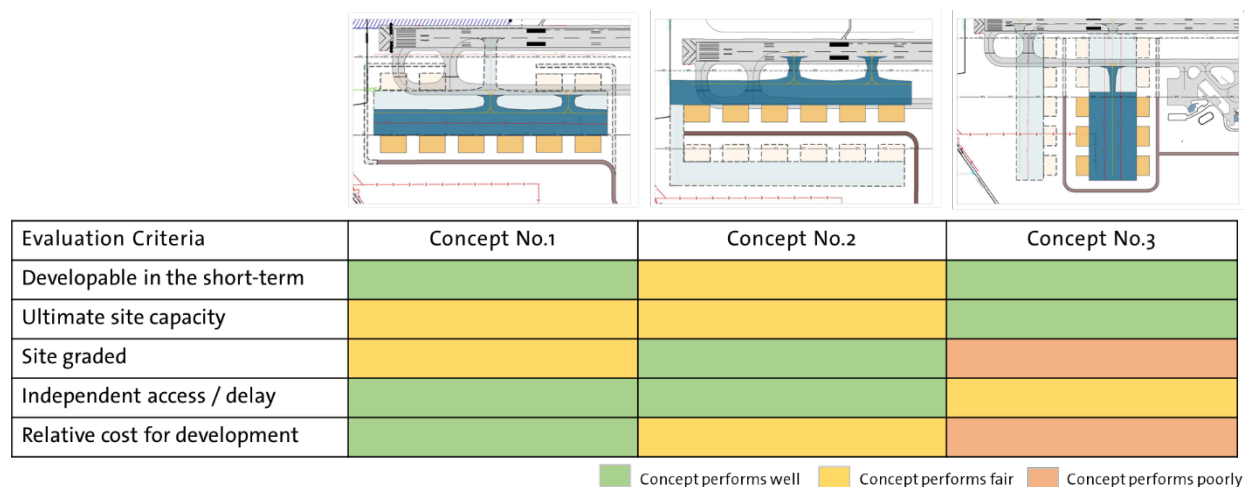


Source: InterVISTAS Analysis, 2022

A set of evaluation criteria was created and used to assess the performance of each alternative concept. **Figure 5-29** summarizes how each alternative concept performed compared to the set of evaluation criteria. It was determined that Concept 1 was the preferred concept and would be carried forward in the

preferred development plan. While site grading challenges exist, Concept 1 provided the best aircraft access and easiest path toward short-term development.

Figure 5-29. Corporate general aviation hangar alternatives summary



Source: InterVISTAS Analysis, 2022

5.5.2 Recreational General Aviation Alternatives

Site D was determined to be the preferred location to accommodate the forecasted demand for leisure and recreational general aviation hangars. The following planning parameters were established for developing the site.

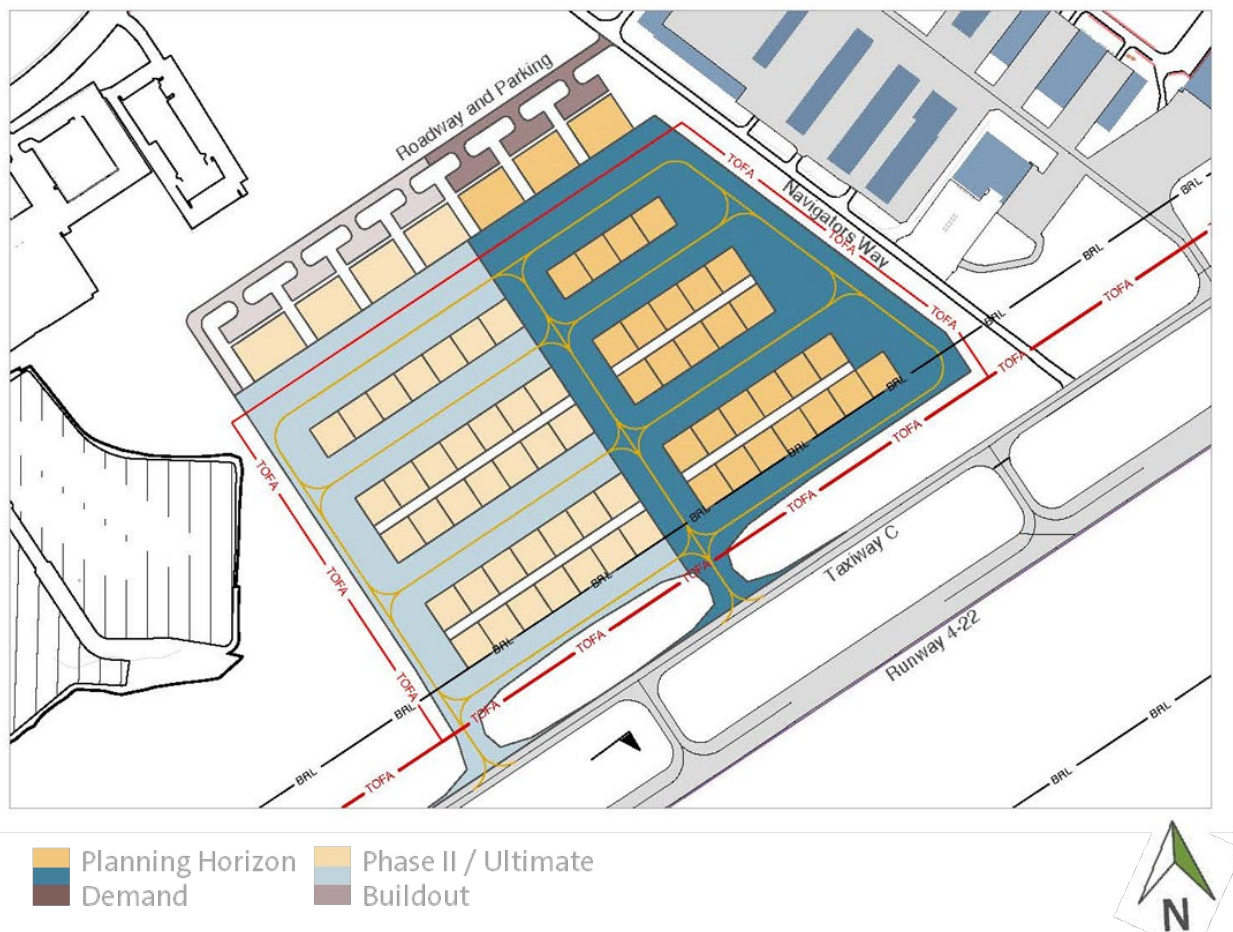
- Accommodate a mix of large box hangars (80 feet by 80 feet) and corporate hangars (100 feet by 100 feet).
- Do not impact the line-of-sight for the ATCT in its existing location.
- Ensure that there are no dead end taxilanes.
- Provide shared apron space for tenants that would occupy a box hangar.
- Provide sufficient apron depth to maintain independent operations and meet industry best practices in ACRP Report 113, *General Aviation Facility Planning*
- Provide a right-of-way for a vehicle roadway to gain access to the hangars on the site.

A single concept was developed to depict how the entire site could be developed to not only accommodate the demand in the planning horizon but also demand well beyond the planning period. As shown in **Figure 5-30**, the site can accommodate approximately 62 box hangars and seven small corporate hangars. The concept includes two apron connectors to provide access to and from the site. The development features three taxilanes oriented in an east-west configuration, with one positioned in the middle of the site and two outboard of the box hangars. This arrangement not only eliminates dead-end taxilanes but also enhances aircraft circulation within the area, allowing for seamless movement with minimum delay. The site is relatively flat, such that little site grading is required.

The purpose of this concept is to show the site's capabilities of accommodating leisure and recreational general aviation hangars. Hangar location, size and apron dimensions can all be modified to

accommodate demand as it materializes. To have a better understanding of what the site could look like in the future, it is recommended the Authority conduct a survey to quantify hangar types and quantities based on detailed input from participants.

Figure 5-30. Leisure and recreational general aviation hangar development concept



Source: InterVISTAS Analysis, 2022

5.5.3 Air Cargo

Site B was determined to be the preferred location to accommodate air cargo and logistics on a consolidated site. Alternative layouts for sortation facilities and corresponding apron on Site B were developed, guided by several planning parameters. Each alternative provides a 30,000 square foot sortation facility to accommodate FedEx relocation and growth. A facility of this size is anticipated to process 3,000 packages per hour and is similar to those at San Antonio International Airport (SAT) and Albuquerque Support (ABQ). A 15,000 square foot e-commerce facility is also included in each alternative. This is similar to facilities that exist at ABQ, Boise (BOI), Des Moines (DSM), Spokane (GEG), and Wichita (ICT). A landside depth of 140 feet is maintained to allow for truck docks and circulation. Finally, the apron is designed to accommodate D-IV aircraft such as the Boeing 767-300, which are common among the integrated air cargo operators.

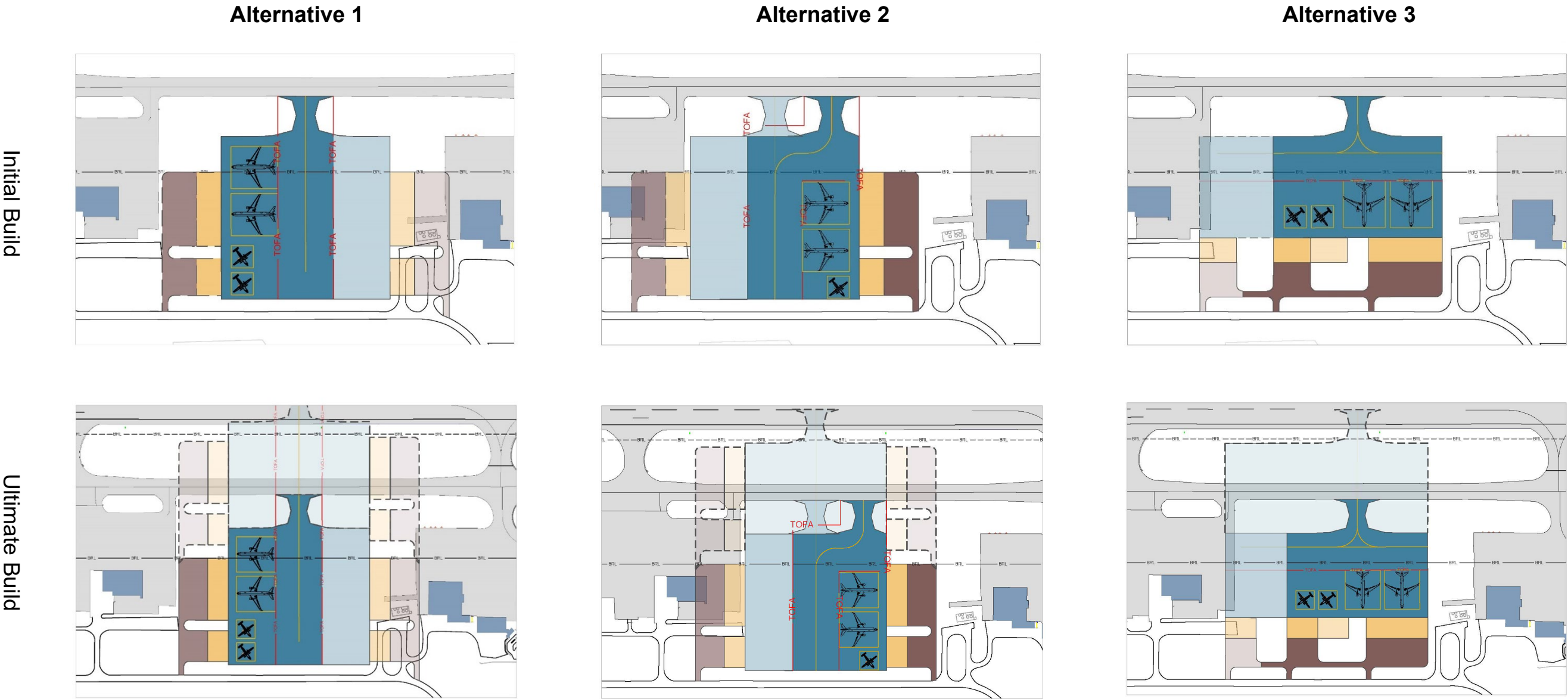
Three alternative layouts were developed for the air cargo site. Each alternative provides for a two-phase initial build as well as an ultimate build and are depicted in **Figure 5-31**. The alternatives are described below along with some benefits and challenges for each. That is followed by an evaluation matrix.

In air cargo alternative 1, the first phase of cargo facilities is constructed on the west side of the apron, closest to Twin Otter, where land is more easily developed in the short-term and site grading is minimal. Access to the apron is provided via the existing temporary runup pad connection to Taxiway A. Landside access is provided through a driveway connecting to Landing View Lane, with multiple tenants utilizing the same driveway given the orientation of the sortation facilities. The second phase provides for mirrored facilities on the east side of the apron. These sortation facilities would first require relocation of the fuel farm. In the ultimate phase, both apron and sortation facilities can be expanded to the north toward the existing location of Runway 11-29. This would provide for up to 180,000 square feet of sortation facilities and 12 aircraft parking facilities. For reference, the ultimate phase would be equivalent to three sortation facilities at Denver International Airport.

In air cargo alternative 2, the access to the apron remains on the site of the existing runup pad, but the apron is expanded to the west to allow for unimpeded construction of sortation facilities on the eastern side. This enables the fuel farm to remain in its existing location. The second phase of development occurs on the west side of the apron and also realigns the apron entrance to improve circulation. Given the shifted location of the apron to avoid the fuel farm, second phase development is likely to impact Twin Otter. Similar to cargo alternative 1, the ultimate phase provides for up to 180,000 square feet of sortation facilities and 12 aircraft parking positions by expanding to the north toward the existing location of Runway 11-29.

In air cargo alternative 3, the sortation facilities are oriented along Landing View Lane with aircraft parking on the apron perpendicular to Taxiway A. Access to the apron continues to be provided via the temporary runup pad. Each sortation facility is equipped with its own landside access to Landing View Lane, eliminating the need for shared driveways. The second phase of development would occur to the west, potentially encroaching on the Twin Otter apron. An additional sortation building can be provided with the westward growth. A benefit of this expansion is that it could provide a second access point to the air cargo apron. One challenge to this orientation, however, is that north facing buildings are less desirable when there is inclement weather. The ultimate phase provides additional apron to the north toward existing Runway 11-29. Unlike alternatives 1 and 2, alternative 3 does not provide for additional sortation facilities in the ultimate build. The ultimate phase still provides for up to 75,000 square feet of sortation facilities, which is equivalent to the facilities provided at BOI. 10 total aircraft parking positions are required, with five directly adjacent to the sortation facilities and five located across the ramp.

Figure 5-31. Air cargo alternatives



Source: InterVISTAS Analysis, 2022

Five evaluation criteria were developed to compare the three air cargo alternatives, as shown in **Table 5-4**. The primary differentiator among the alternatives focused on the impact to facilities/leases and the relative cost for development. With the lease impact on adjacent facilities and a lower relative cost for development, Alternative 3 was identified as the preferred alternative to be depicted on the development plan.

Table 5-4. Air cargo alternatives evaluation

Evaluation Criteria	Alternative 1	Alternative 2	Alternative 3
Site grading required			
Impact to facilities / leases			
Ultimate buildout capacity			
Utilization of available land			
Relative cost for development			

Source: InterVISTAS Analysis, 2022

5.5.4 Airport Maintenance, ARFF, Snow Removal Equipment and Storage

The SRE/ARFF building and a single hangar along Taxilane C1A house ARFF vehicles, snow removal equipment, and maintenance storage. The SRE/ARFF building is currently in good condition and the hangar could potentially be leased out if the Authority had alternative storage options for maintenance items. After consulting with Authority staff, it was determined that additional space was necessary to improve the capabilities of the existing SRE/ARFF building and relocate maintenance items currently housed in the hangar on Taxilane C1A.

The following planning parameters were established to develop each concept.

- Ensure the site can accommodate an ultimate expansion of 80 foot- by 80-foot building.
- Accommodate approximately 10-15 parked vehicles at one time.
- Provide for expansion prior to Runway 11-29 relocation.
- Provide the ability for the site to be secured.

Six initial concepts were identified and developed as shown in **Figure 5-32**. Each concept underwent an evaluation process based on a predetermined set of criteria, which included its ability to be developed before the shift of Runway 11-29, potential for future expansion, connection to existing landside infrastructure, visibility to the public, operational performance, and cost-effectiveness of development.

Figure 5-32. Airport maintenance alternative concepts



Evaluation Criteria	Concept No.1	Concept No.2	Concept No.3	Concept No.4	Concept 5	Concept 6
Developable in the short-term						
Expandability						
Landside connectivity						
Public perception / view						
Operational performance						
Relative cost for development						

■ Concept performs well
 ■ Concept performs fair
 ■ Concept performs poorly

Source: InterVISTAS Analysis, 2022

Working in collaboration with Authority staff, it was determined that Concept 6 was the preferred option. As shown in **Figure 5-33**, Concept 6 proposes to take an existing facility the Authority currently owns and relocate it near the existing ARFF/SRE building. The restructured facility is approximately 55 feet by 165 feet, meeting the future facility requirements. Additionally, the location of the proposed facility off Eagle Drive places airport maintenance staff in close proximity to the terminal building. Finally, by repurposing an existing facility there are perceived cost savings versus constructing a new facility with new materials.

Figure 5-33. Preferred airport maintenance alternative concept

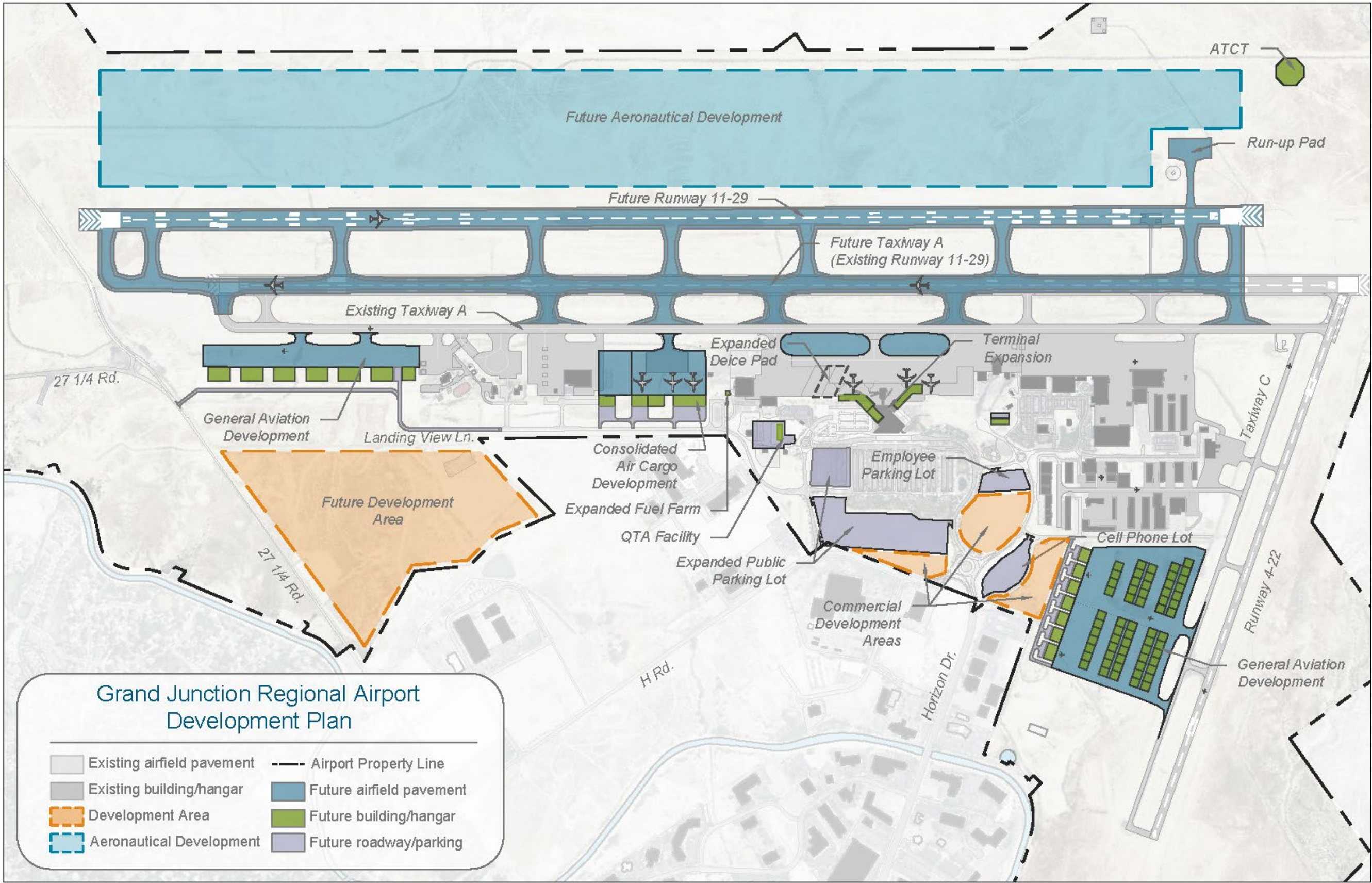


Source: InterVISTAS Analysis, 2022

5.6 Preferred Development Plan

The preferred development plan presents the combination of all preferred facility development concepts over the planning period and beyond. The development plan incorporates the recommended facilities outlined in **Chapter 4, Facility Requirements**. A thorough evaluation of the options was conducted in collaborative workshops with Airport staff and stakeholders, resulting in the selection of the comprehensive preferred development plan depicted in **Figure 5-34. Chapter 6, Financial Feasibility and Implementation Plan** will identify when projects should be implemented, as well as proposed funding sources for each project.

Figure 5-34. Preferred Development Plan



6 Implementation and Financial Plan

The preceding chapters identified the forecasted growth in aviation activity, evaluated existing facilities for meeting FAA standards and accommodating growth and presented alternatives to enhance facilities in the future. With the facility recommendations defined and the preferred development identified, this chapter will:

- Identify the range of potential funding sources for projects
- Provide an overview of the airport's financial performance and outlook
- Provide a phasing plan for the 5-year, 10-year and 20-year planning horizons
- Deliver detailed descriptions, justifications, and triggering demand levels for short-term projects
- Provide rough order-of-magnitude cost estimates for all CIP projects
- Summarize the updated 10-year Capital Improvement Program (CIP)

Building on the preferred development plan, a financially feasible implementation strategy is to update the Airport's CIP. The CIP will serve as a guide for airport development over the next 10 years, with a focus on improving various areas of the airport, including airfield taxiways and apron pavements, the commercial terminal building, landside roads and parking facilities, and other support facilities. Planning-level cost estimates were developed that considered real-world factors such as inflation and "soft costs". The goal is to allocate sufficient funding for each project and assess the feasibility of each within the planning period. Furthermore, sustainability considerations have been integrated into the projects in the CIP, with results from the relevant studies and audits available in appendices attached to this Airport Development Plan report.

The Grand Junction Regional Airport Capital Improvement Program involves various interconnected components that need to be coordinated and implemented in a cohesive manner. This chapter aims to document the required development sequencing at the project level, dividing them into short-, mid-, and long-term phases (5-, 10-, and 20-year periods, respectively). Since funding is a critical factor for any development, this process begins by identifying potential capital project funding sources and establishing realistic future funding expectations based on historic Airport funding trends and FAA funding guidance. With realistic funding expectations in place, the CIP projects can be properly sequenced and assigned rough order-of-magnitude (ROM) costs based on design and construction timing estimates. The objective of this methodology is to provide the Authority with a practical, fundable, and implementable plan that guides project timing and budgeting to meet future development needs.

6.1 Airport Funding Sources

Typically, airport authorities cannot fund capital improvements by strictly using their own internal funding sources. Rather, they combine federal, state, local, and private funding with airport funds and bond proceeds, which are backed by airport revenues and/or municipal support, to generate the necessary funds for capital improvement projects. Federal funding sources, such as Airport Improvement Program (AIP) grants, may also be available, but they are subject to potential modifications by Congress or other entities with jurisdictional control over a particular funding source.

The eligibility criteria for specific projects vary based on the funding source. Therefore, it is essential to scrutinize each project element to determine its eligibility for each funding program. Moreover, it is crucial

to consider the availability of funds for each funding source. The following sections outline the primary funding sources that may be available to fund the preferred development plan.

6.1.1 Federal Funding Sources

Through the Airport Improvement Program, the FAA provides funding to airports for capital improvements, including entitlement grants and discretionary grants. The Authority has received around \$70 million in AIP funding since 2016. Entitlement grants are determined by a formula based on airport enplanements and cargo tonnage which averages approximately \$2 million annually for GJT. Applying for discretionary grants is a competitive process. The FAA has an established priority ranking system to objectively determine which projects will receive funding.

The Runway 11-29 Relocation project is a high priority project and has received a significant funding commitment from FAA. The project is estimated to receive approximately \$10 million annually in FAA funding through 2030. This includes the \$2 million annual entitlement grant and an additional discretionary amount per year. Therefore, it is unlikely that other significant FAA funding will be available for other airport projects until after 2030.

The Federal Government passed the Infrastructure Investment and Jobs Act (IIJA) or otherwise known as the Bipartisan Infrastructure Law (BIL) in 2021. BIL includes significant funds for airport capital projects over a five-year period between FY 2022 and FY 2027. Within BIL, there is the Airport Infrastructure Program (AIG) which is a noncompetitive grant awarded to airports annually and there are two competitive grants within BIL related to terminal and Airport Traffic Control Tower (ATCT) projects. The Authority expects to receive about \$2 million per year as part of the Airport Infrastructure Grant (AIG) program.

6.1.2 Passenger Facility Charges

Airport capital projects can be funded by Passenger Facility Charges (PFC) revenue, which are subject to airline consultation and FAA approval. In the past, the Authority has received approval to use PFC revenue for prior projects, including the debt service for bonds. However, the approved use of PFC revenue for prior projects extends through 2036. Therefore, it is anticipated that PFC revenue will not be available to fund projects in the CIP.

6.1.3 Customer Facility Charges

Customer Facility Charges (CFC) revenue is generated from rental car companies and used to cover rental car facility capital and operating expenses. In the past, CFC revenue was used to pay off a loan for a rental car capital investment, but the loan has now been paid in full. Therefore, CFC revenue is currently available to fund rental car projects within the CIP.

6.1.4 State Grants and Loans

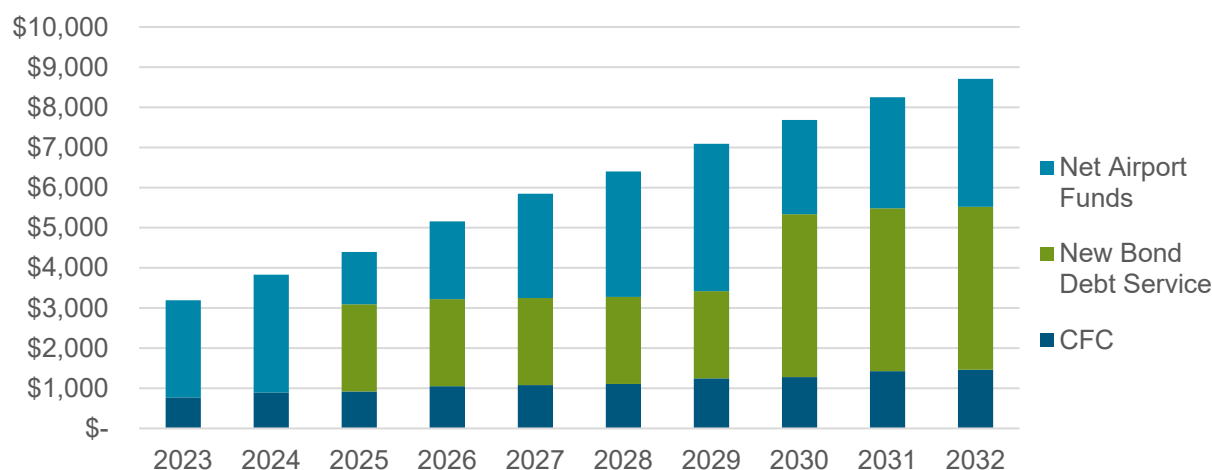
The Colorado Department of Transportation (CDOT) has been supportive of Airport development projects and provided funds in the form of grants and loans. It is expected that the Authority will receive approximately \$4 million approximately every five years to fund airfield-related projects.

6.1.5 Airport Funds

Airport funds can be used as a source of funding for the CIP, but this is limited by the amount of net revenue generated each year. Airport net revenues are needed to pay the annual debt service on any

future bonds issued to finance the CIP. **Figure 6-1** shows the projected availability of airport net revenue to fund the 10-year CIP.

Figure 6-1. Use of Net Revenues for CIP (\$'000)



Source: InterVISTAS Analysis, 2022

6.1.6 Third-Party Funds

Investment from third-party developers and investors is commonly used to finance airport projects that fall outside of the “core areas” funded by airlines. For the proposed general aviation and cargo projects at the airport, it is anticipated that there will be interest from third-party developers and investors to provide funding.

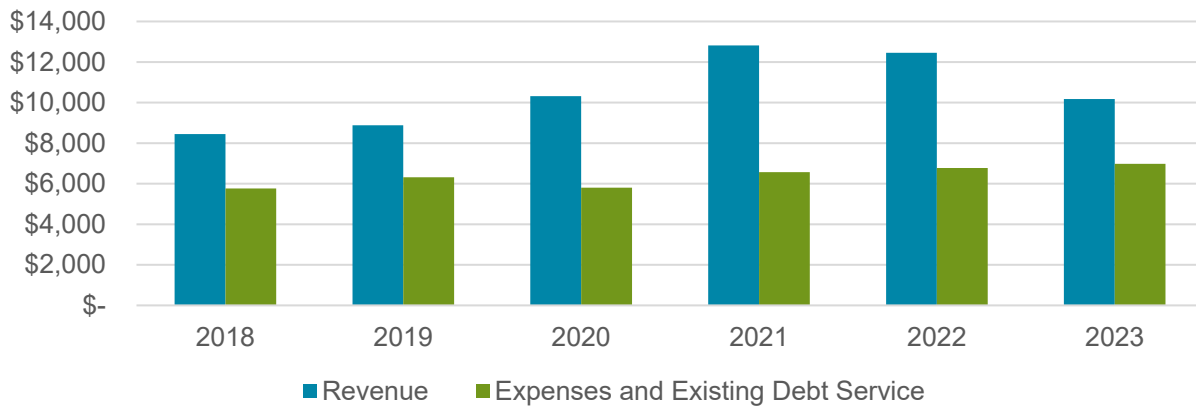
6.2 Financial Overview and Funding Outlook

The Airport is a political subdivision of the State of Colorado and receives operating revenue from aeronautical charges and non-aeronautical sources, and non-operating revenues from other sources. Additionally, the airport also incurs operating expenses for annual operations and maintenance expenses, as well as non-operating expenses for annual debt service on bonds issued to finance airport improvements. The following subsections outline the historical financial performance of the airport and provides an outlook on available funds for future capital projects.

6.2.1 Annual Financial Results

Figure 6-2 shows the recent actual financial results from 2018 to 2022 and a projection for 2023 utilizing the Authority’s published budget. The net revenue result has fluctuated annually due to factors such as the pandemic, federal operating grants, and agreements with tenants, but in general the net positive result is indicative of the Authority’s ability to generate net revenue to support investment in future capital projects, either through cash investments or payment of debt service on future bonds.

Figure 6-2. Historical Revenue and Expenses (\$000)

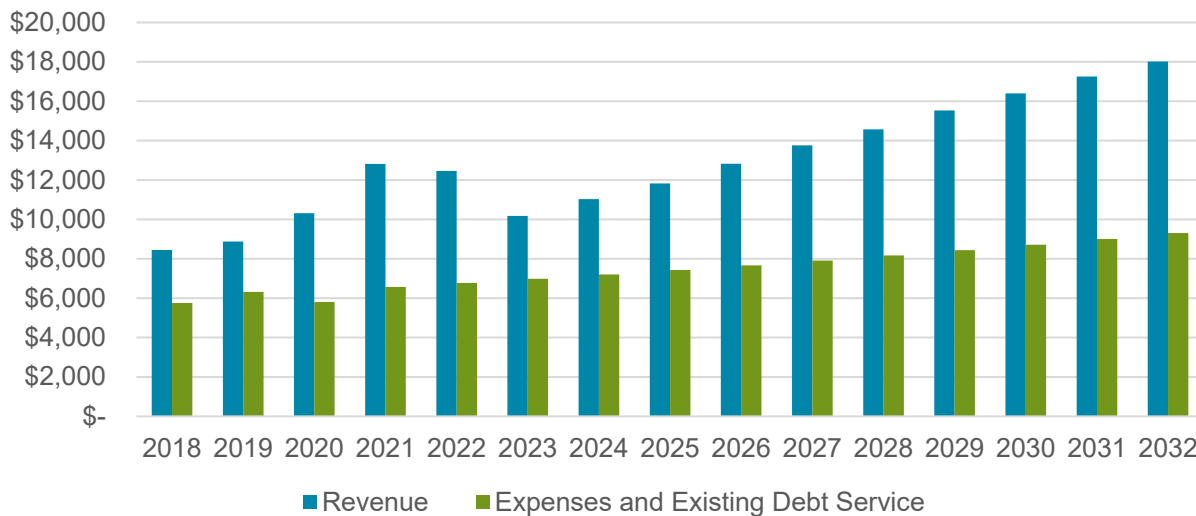


Source: Grand Junction Airport Authority, InterVISTAS Analysis, 2023

Figure 6-3 shows a pro forma projection of total revenue and expenses out to 2032. This pro forma projection was used to evaluate sources of funding for the 10-year CIP. The following subsections provide more detail on the primary sources of revenue and expenses. It was assumed that there would be increases in airline and non-airline revenue to support the 10-year development program.

The pro forma projection of operating expense and debt service does not include any potential new bond debt service in order to show the capacity for future CIP funding.

Figure 6-3. Pro Forma Revenue and Expenses (\$000)



Source: Grand Junction Airport Authority, InterVISTAS Analysis, 2023

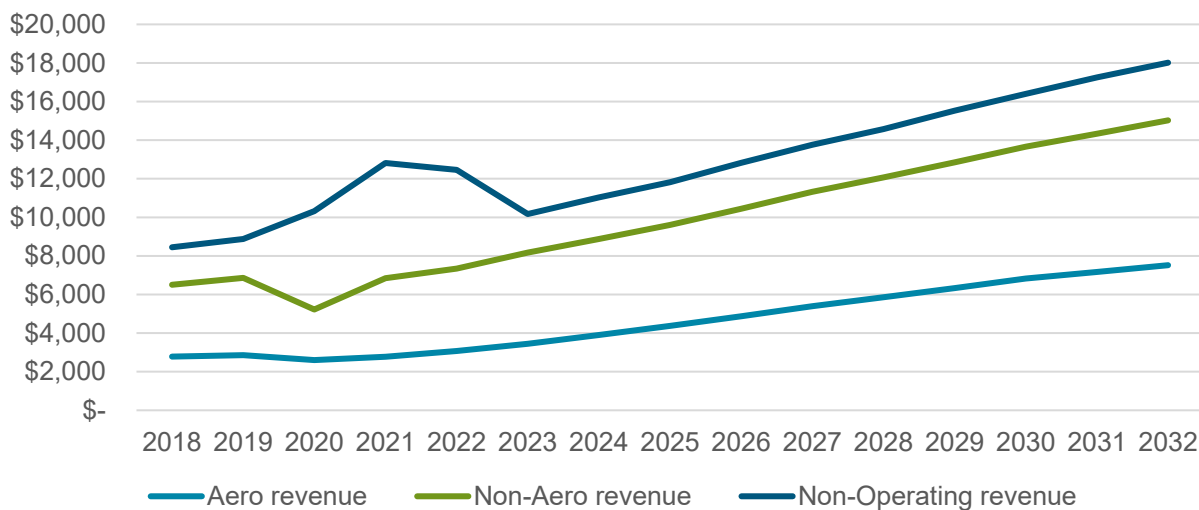
Figure 6-4 shows the historical and projected sources of revenue. Primary sources of revenue and assumptions include:

- **Aeronautical Revenue** – assumed increase in reasonable cost per enplanement to support CIP funding.

- **Non-aeronautical revenue** – evaluation of non-aero revenue agreements and expected trends in revenue per passenger.
- **Non-operating revenue** – a return to pre-pandemic trends after receiving federal operating grants for operating expenses in the 2020-2022 pandemic years.

Each primary source of revenue is discussed in the following subsections.

Figure 6-4. Projected Sources of Revenue (\$000)



Source: Grand Junction Airport Authority, InterVISTAS Analysis, 2023

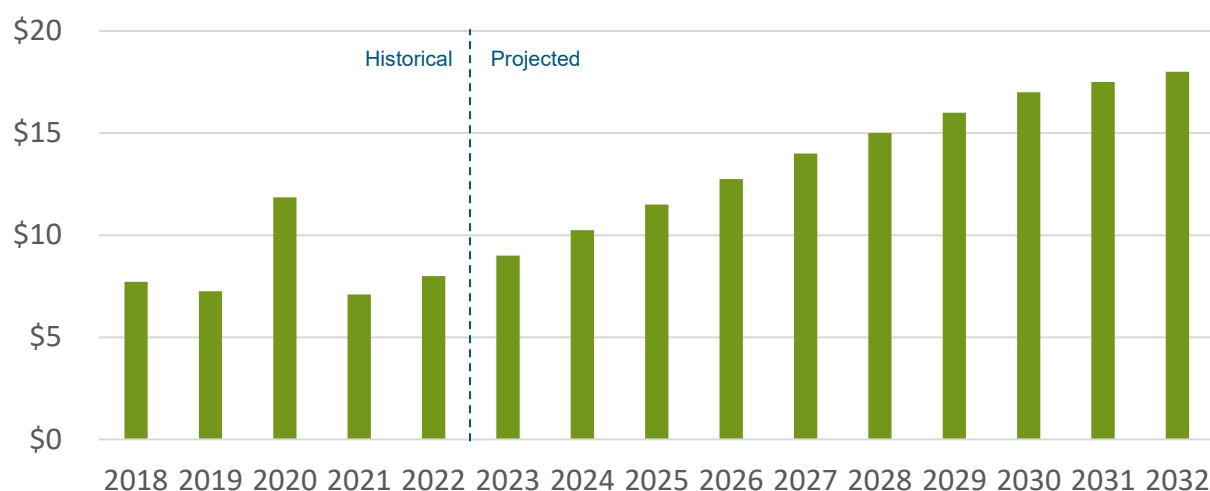
6.2.2 Aeronautical Revenue

Aeronautical revenue is comprised of passenger airline revenue, which includes airline landing fees and terminal rent, and non-passenger airline revenue, primarily consisting of fuel flowage fees and cargo airline landing fees. Aeronautical revenue charges are established each year in relation to the cost of providing facilities and services to the airlines and other aeronautical users at the Airport, and to ensure financial stability.

The passenger airline revenue charges are specified in agreements between the Authority and airlines. The Authority renegotiates airline agreements periodically and expects that the terms regarding generating aeronautical revenue will be largely consistent with historical trends, thereby facilitating the financing of the CIP through increased airline revenue per passenger.

Figure 6-5 shows the historical and forecast trend in airline revenue per enplaned passenger. Over the past few years, airlines have paid around \$8 per enplaned passenger, except for 2020, where there was a significant decrease in passengers. Based on anticipated industry averages, the average airline revenue per enplaned passenger at GJT is expected to reach approximately \$18 by 2032, while remaining reasonably close to industry standards.

Figure 6-5. Airline Revenue per Enplaned Passenger



Source: Grand Junction Airport Authority, InterVISTAS Analysis, 2023

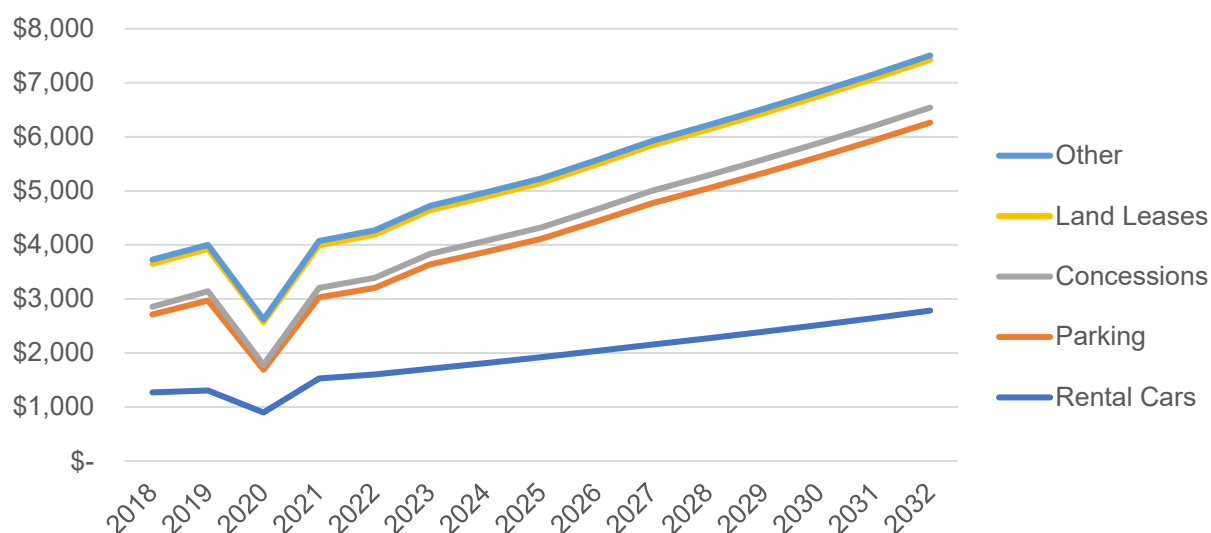
6.2.3 Non-Aeronautical Revenue

The primary sources of non-aeronautical revenue include terminal concessions, parking, rental cars, and land and building leases. The Authority has established agreements with non-aeronautical tenants, stipulating that they must provide revenue to the Airport. During the COVID-19 pandemic, there was some disruption in certain business terms to provide relief to tenants, while federal aid was offered to the Authority to replace tenant revenue. As shown in **Figure 6-6**, in 2020 total non-aeronautical revenue declined because of the pandemic; however, in 2021 non-aeronautical revenue was back up to similar levels to 2019. As traffic volumes continue to recover to pre-pandemic levels, it is anticipated that non-aeronautical business terms will also return to previous norms.

In forecasting non-aeronautical revenue, general trends and assumptions were established to forecast non-aeronautical revenue. This includes the following:

- Rental car revenue will increase with the growth in passengers.
- Parking revenue will increase in relation to both the growth in passengers and the planned increases in parking rates.
- Other revenues are projected to increase on a trend basis.

Figure 6-6. Sources of Non-Aeronautical Revenue (\$000)



Source: Grand Junction Airport Authority, InterVISTAS Analysis, 2023

6.2.4 Non-Operating Revenue

The primary sources of non-operating revenue consist of the PFC and CFC. These sources of revenue are restricted in their usage and will be expounded upon later in this chapter.

Before the pandemic, this revenue stream generated approximately \$2 million annually. However, from 2020 to 2022, the Authority received an additional \$3 million to \$4 million per year in federal relief grants for operations. As of 2023, this source of revenue is expected to revert to its previous historical pattern.

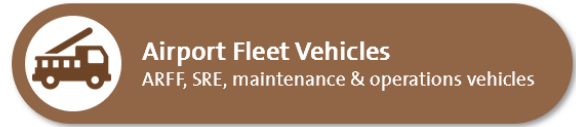
6.2.5 Operating and Non-Operating Expenses

Operating expenses are calculated based on the Authority's yearly budget, along with the resulting expenses incurred for personnel, materials and supplies, and contractual services. A projected increase of approximately 4% per year in operating expenses has been assumed.

The Authority is obligated to pay annual debt service on the bonds used to fund airport enhancements. This obligation is taken into account when reviewing annual airline rates and charges. The current annual debt service obligation is \$1.5 million.

6.3 Airport Development Phasing and Funding Plan

This section presents the four development phases of the Capital Improvement Program outlined in the Airport Development Plan. These phases reflect the short-term (PAL 1), the mid-term (PAL 2), the long-term (PAL 3), and well beyond the planning period (PAL 4). This section will cover specific projects, trigger points, and crucial implementation steps needed to achieve the objectives highlighted in previous chapters. Project descriptions are provided for all phases to provide a better understanding of how future development should be carried out. Projects were grouped into the following programs based on objectives, areas, and functions.



The following subsections summarize the implementation process and defines each project in each of the four periods.

6.3.1 Implementation Process

Normally, several specific steps must be taken to finish each capital improvement project at an airport. In certain instances, preparing for a facility upgrade may commence up to five years ahead of the actual requirement for the facility. This lead-in time is crucial for coordinating funding, environmental documentation and other regulatory compliance requirements, site and facility design, and also for allowing enough time to complete the actual facility construction. The significant steps involved in executing a complex AIP funded airport project are outlined in Table 6-1. Steps to complete complex AIP funded projects **Table 6-1**.

Table 6-1. Steps to complete complex AIP funded projects

Steps to complete four years prior to construction

Identify the project in the approved Airport Layout Plan and consult with the Denver ADO

Submit 5-year CIP

Validate project justification, funding eligibility and identify funding sources

Determine probable level of environmental review

Determine if ALP and/or Exhibit A need updating

Identify required flight procedure modifications and need for aeronautical survey

Coordinate and local officials and airport users on project plans

Steps to complete two years prior to construction

Refine project scope

Solicit professional design services

Prepare preliminary design, site planning and cost estimates

Initiate reimbursable agreements and coordinate any NAVAID requirements with FAA

Complete aeronautical survey and submit requests for new/modified flight procedures with FAA

Submit a request for airspace review of projects under non-rulemaking authority (NRA)

Begin Benefit/Cost Analysis if determined to be necessary

Initiate environmental assessment or categorical exclusion documentation

Coordinate with local officials and airport users on refined project scope and schedule

Steps to complete one year prior to construction

Complete airspace study

Finalize project scope of work

Complete environmental documentation

Complete 90 percent design, plans and specifications after FAA environmental findings are made

Refine and update cost estimates

Execute reimbursable agreements to support NAVAIDs

Prepare and coordinate Construction Safety Phasing Plan

Initiate Safety Management Systems (SMS) process

Secure all necessary local funding

Secure environmental and other necessary permits

Submit Benefits/Cost Analysis

Coordinate Safety Risk Management Panel

Steps to complete the year of construction

- Complete 100 percent design, plans and specifications
- Complete FAA environmental documentation for current fiscal year
- Advertise and secure bids according to ADO schedule
- Submit grant application
- Accept federal grants
- Coordinate with local officials and airport users on the progress and schedule
- Issue notice-to-proceed
- Monitor environmental mitigation requirements during construction
- Provide weekly inspection reports

Steps to complete after construction

- Submit final report and provide final test results
- Close any accepted federal grants (within 90 days of acceptance)
- Monitor environmental mitigation measures
- Submit final As-Built and Exhibit A

Source: FAA – Steps to AIP funding for Your Airport Project: Quick Reference Guide, March 2016

6.3.2 Short-term Development Projects

The capital improvements planned for the short-term comprise the development projects expected to commence within the next five years. To facilitate quick reference, this section includes project summaries for all short-term development projects, which contain descriptions, trigger points, justifications, schedule timelines, budgeted and escalated project costs, as well as maps of project locations. The Airport will need to work closely with the FAA to implement these projects since federal funding and environmental documentation may be necessary.

The following short-term development project list has been strategically assembled according to Authority priorities, required enabling projects, and funding availability. Short-term development projects are designed to address safety and standards, capacity constraints, level of service enhancements and the airport's overall viability.

Relocate Runway 11-29, New Runup Pad and Taxiway A

This is an ongoing project at the Airport and can be broken down into three primary phases. The initial phase will involve earthwork and preparing the site for the new Runway 11-29. The second phase will focus on constructing the new runway, which is expected to be completed by 2027. This will include the runway, navigational aids and constructing a run-up pad north of the runway. The third and final phase will convert existing Runway 11-29 to Taxiway A, followed by the conversion of Taxiway A into a taxilane. This final phase is anticipated to be completed by 2030.

Rehabilitate Runway 4-22 & Taxiway C

This project will rehabilitate portions of Runway 4-22 and Taxiway C. It will mill and fill portions of Runway 4-22 and Taxiway C south of Runway 11-29 with asphalt pavement. The areas that have experienced substantial wear and tear will be reconstructed to prolong the useful lifespan of the runway and taxiway

system. This project will also upgrade edge light and airfield sign fixtures to LED and replace existing regulators for Runway 4-22.

Runway 4-22 & Taxiway C Seal Coat

This project will apply a seal coat to portions of Runway 4-22 and Taxiway C. It entails the cleaning and sealing of cracks, followed by the application of a seal coat to all parts of Runway 4-22 and Taxiway C located south of Runway 11-29. After the completion of crack sealing and seal coating, the runway and taxiway will be restriped to meet the FAA specifications.

Airport Perimeter Gate & Reader Replacement

This project will replace existing perimeter gates, electronic components, and card readers. It will cover ten gates, including the replacement of electrical motors, mechanical equipment, controls, and gates. The project will be coordinated with the Transportation Security Administration (TSA) to ensure the Airport remains a secured facility. Gate replacements will take place outside of the secure area and temporary security fences will be installed. Previous gates and mechanical equipment will be removed and replaced with aluminum gates and new motors and controls. Existing gate dimensions will be used to procure replacement gates of the same size. This project does not include any modifications to utilities or other access control components.

Rehabilitate Taxiway A

This project will rehabilitate portions of Taxiway A. Taxiway A and taxiway connectors up to the hold short markings for Runway 11-29 will be milled and filled with new asphalt. Areas that have experienced significant wear will be reconstructed to prolong the lifespan of the taxiway system. No utility modifications are expected to be part of this project. It should be noted that as previously mentioned in **Chapter 4, Facility Requirements**, Taxiway A lacks the necessary fillet design and pavement shoulders to accommodate the critical aircraft. These deficiencies are set to be addressed in the Authority's ongoing project to relocate Runway 11-29 to the north.

Rehabilitate Taxiway C1A

This project will rehabilitate the entire length of Taxiway C1A up to the nonmovement area boundary line adjacent to Taxiway C. The project will consist of removing existing markings, removing designated existing pavement surfaces, grading and excavating the subgrade, undercut and backfill, and reconstructing subbase material as needed. The project will also clean existing pavement surfaces of all deleterious material, repairing existing cracks and joints by placing a refined coal tar emulsion surface treatment, and applying new airfield pavement markings.

Terminal Asset Management

This project will prepare a comprehensive plan for managing assets within the terminal. The project includes conducting a thorough assessment of all assets, including physical infrastructure, equipment, and technology systems. Once assessed, deficiencies will be identified and prioritized. Finally, the project will implement recommended improvements to ensure the terminal remains at an adequate level of service for the traveling public.

Install New Passenger Boarding Bridges

This project will procure and install two new passenger boarding bridges (PBBs) to replace the existing bridges at Gate 3 and Gate 4, which are beyond their useful life. This will include working with airline representatives to ensure installation plans have minimal impact to their operations.

Renovate ATO & Construct Baggage Makeup

This project will renovate the existing ticketing area, including ATOs and baggage makeup areas, as well as consolidate and relocate the EDS machines to an area behind the ticket counters. This will also enable the ticket counters to be shifted back to align with the columns, which in turn will increase queueing in the ticketing lobby. The existing ATO and baggage makeup areas will be renovated to provide additional flexible office space for airline and airport tenants.

Expand Terminal Building – Phase 0

This project provides expanded capacity in the lower level holdroom and enables a larger security checkpoint to be constructed in the future along with concessions and holdrooms. The first floor provides expanded space for terminal support and baggage claim functions while a third floor provides additional administration space.

Expand Terminal Building – Phase 1

This project constructs new holdroom and gates to the west of the terminal headhouse. One new boarding bridge enabled parking position is added while an existing gate is repositioned to be served from the new concourse, which provides larger holdrooms and concessions opportunities. Ground loading remains off the east end of the terminal to serve smaller aircraft and diversions.

Terminal Area Apron Expansion

This project will provide additional apron capacity for aircraft circulation and remain overnight (RON) parking. It will involve filling in the two grass islands between Taxiway A and the existing air carrier apron with concrete pavement. In addition, the existing utility infrastructure and light fixtures will be adjusted in accordance with FAA design standards. Pavement markings will be applied to ensure proper separations with other aircraft maneuvering in the area. However, this project is contingent upon the completion of relocated Runway 11-29.

Expand Public Parking

This project will expand the existing public parking lot to accommodate the growth in passenger traffic. The project will include site preparation and grading for a parking lot that can accommodate approximately 700 spaces. The parking lot will be expanded with asphalt material and will include landscaping and applicable lighting in accordance with local ordinances.

Construct New Cell Phone Lot

This project will construct a new cell phone lot to accommodate vehicles waiting to pick up passengers from the terminal. The cell phone lot will be designed and constructed with asphalt pavement and be accessible to the public via Navigators Way. The cell phone lot will include landscaping and applicable lighting in accordance with local ordinances.

Rehabilitate Navigators Way

This project will rehabilitate the entire length of Navigators Way. The project includes performing full-depth pavement repairs, repairing deteriorated curbs and driveway aprons where necessary; performing inlet adjustments; adjusting utility castings to grade and resurfacing the entire pavement with asphalt. This also includes applying pavement markings and replacing traffic signal loop detectors, where applicable.

Site Preparation for Consolidated Air Cargo Site

This project will enable the construction of a consolidated air cargo facility located just west of the fuel farm. The project includes earthwork, grading, and enhancing utility infrastructure to accommodate the future development.

Acquire Snow Removal Equipment (SRE)

This project is programmed at five-year intervals and involves acquiring one snow removal multitasking equipment unit with at least a 24 ft. plow and a 22 ft. broom to replace an older unit.

Acquire Airport Operations Vehicle

This project is programmed at three-year intervals and involves acquiring one vehicle to replace an older airport operations vehicle.

Acquire Airport Maintenance Vehicle

This project is programmed at three-year intervals and involves acquiring one vehicle to replace an older piece of maintenance equipment.

Update Pavement Management Maintenance Program (PMMP)

This project is programmed at three-year intervals. The project will update and maintain the Pavement Management Maintenance Program (PMMP) to ensure the Airport complies with FAA requirements that all airports have a pavement maintenance-management program in-place before federal funds will be allocated for pavement improvement projects. This requirement, FAA Grant Assurance Number 11, was introduced through Public Law 103-305, Section 107, amending Title 49, Section 47105 of the United States Code.

Perform Land Survey & Property Title Search

This project will hire a title search and land surveying firm to refine the Exhibit 'A' Airport Property Inventory Map shown in **Chapter 8, Airport Layout Plan**. The title search will involve examining various factors such as the grantee, type of interest, conveyance instrument, recording date, recording information, federal and local agreement numbers, and easements. Furthermore, the project will encompass conducting a survey of the current airport property boundary line, which will entail a title review of the current airport property, field reconnaissance of property corners, evidence of occupations, and scrutiny of local public records.

Develop Airport Rules & Regulations

This project will prepare a document that will serve as a guide for tenants on conducting operations at the Airport. The document will outline specific rules and requirements on safety procedures, access control, security screening, noise management, environmental impact, aircraft operations and other prudent functions. It will also provide information on the consequences of non-compliance. This could include fines, penalties, or even revoking access privileges. It will also provide a mechanism for reporting violations and a process for adjudicating disputes. The development of airport rules & regulations will require a variety of stakeholder coordination and legal review.

6.3.3 Mid-term Development Projects

The mid-term capital improvements comprise the development undertakings that are slated to begin during the second five-year phase of the planning cycle. The projects are presented sequentially, along with a concise description of each. Each project has been allotted a specific year to streamline financial planning and facilitate the implementation of the overall CIP. The mid-term projects have been designed to conform to FAA design standards, airfield maintenance, enhance terminal and landside functions, and conduct planning studies.

Expand Deicing Apron

This project will expand the existing deicing apron to accommodate an additional aircraft position. The existing deicing apron, situated close to the terminal, will be expanded to accommodate one more aircraft deicing position. The apron will be utilized for deicing activities during the winter season and will be configured in such a way that all deicing operations can occur independently from one another. The structural pavement will be reconstructed to match the same concrete pavement section used for the present deicing pad.

Rehabilitate East Commercial Apron

This project will rehabilitate the portion of the commercial apron east of the terminal building. The project will replace deteriorated joint seals and repair concrete pavement on apron east of the terminal that is spalling. Work will be performed in phases to repair the concrete at one aircraft gate at a time to minimize the number of gates that are taken out of service during repairs. Failing joint seals will be replaced with new backer rod and silicon material. Spalled areas will be saw-cut to remove the damaged areas and replaced with DS Brown Del Patch material.

Rehabilitate Taxiway C

This project will rehabilitate portions of Taxiway C. Taxiway C south of Runway 11-29 will be milled and filled with new asphalt. Areas that have seen significant wear will be reconstructed to preserve the useful life of the taxiway system. It is anticipated that this project will not include any utility modifications.

Install Airfield Regulator, Backup Generator & Climate Control System

This project will procure a vendor to install an additional airfield regulator, a backup generator, and a climate control system in the Airport's electrical vault. The project includes purchasing and installing a 15kW constant current regulator (CCR) and a single diesel-powered generator that can effectively power primary airfield surfaces. Moreover, a suitable climate control system will be installed to ensure that individuals working inside the electrical vault are provided with appropriate heating and cooling.

Taxiway C Lighting & Signage Enhancements

This project will install medium intensity (LED) taxiway edge lights along the entire length of Taxiway C. This will include purchasing and installing edge light fixtures, transformers, cabling and conduit. The edge lights will be installed in accordance with FAA Advisory Circular 150/5340-30M, *Design and Installation Details for Airport Visual Aids*. Additionally, existing airfield signage along Taxiway C will be replaced.

Update Access Control System

This project will update the access control mechanisms at all perimeter gates, terminal, and bag doors to allow biometric access control, camera installation and upgrade software that controls access. This includes installing new mechanisms at specific perimeter gates. The access control systems will be

replaced with new systems and duress alarms will be installed. The project also includes fully integrating video surveillance, physical access control, and access credential media into one system.

Enhance Baggage Claim System

This project will either replace and lengthen the existing baggage claim belts or replace and add a third baggage claim belt to meet the forecasted growing passenger demand. This will involve replacing the existing flat plate conveyors with longer units given their age. Additional ground floor space provided by Phase 0 would enable terminal functions to be relocated such that a third claim device could be constructed.

Expand Terminal Building – Phase 2

This project, which meets the 20-year airport development plan program for the terminal, constructs new holdroom and gates to the east of the headhouse, replacing the ground loading positions. Three of these positions would provide new boarding bridge enabled access while one would accommodate a relocation to provide a larger holdroom and ability to accommodate larger aircraft. Seven boarding bridge enabled aircraft parking positions and associated holdroom would be provided.

Construct QTA Facility

This project will expand and improve the quick turnaround (QTA) facility to accommodate the growth in rental car activity. The project will construct consolidated facilities for rental car companies to wash, detail, fuel and store their vehicles in between car rental transactions.

Rehabilitate Aviators Way

This project will rehabilitate the entire length of Aviators Way. The project includes performing full-depth pavement repairs, repairing deteriorated curbs and driveway aprons where necessary; performing inlet adjustments; adjusting utility castings to grade and resurfacing the entire pavement with asphalt. This also includes applying pavement markings and replacing traffic signal loop detectors, where applicable.

Construct Solar Canopies for Public Parking Lot

This project will install solar canopies that will provide both shade for parked vehicles as well as serve as a renewable resource to power the terminal and other Authority owned facilities. The project will involve erecting steel frames and support structures at an appropriate height to allow vehicles to park underneath. Solar panels will then be mounted onto the support structures at an optimal angle for solar collection, without causing glare to pilots and air traffic controllers. Additionally, the existing utilities will be modified to enable the connection of the solar canopy system.

Construct Landside Maintenance Facility

This project will relocate an existing facility to a site near the existing ARFF building. The project will include site preparation to grade and modify existing utility infrastructure.

Expand Aircraft Rescue and Firefighting (ARFF) Facility

This project will increase the capacity of the existing Aircraft Rescue and Firefighting (ARFF) building by expanding it towards the north. The expansion will provide one additional bay for storing equipment and vehicles. The project will involve modifying the existing buildings, including the demolition of the current north wall, and constructing an expansion using materials that are similar to those used in the original construction. It should be noted that this project can only proceed once Runway 11-29 has been shifted.

Environmental & Construction Administration Services for Expanded Fuel Farm

This project will hire a consultant to provide environmental and construction administration services to oversee the expansion of the fuel farm. Construction costs for expanding the fuel farm are anticipated to be incurred by the tenant that manages and maintains the fuel tanks.

Advanced Airspace Feasibility & ATCT Siting Study

This project involves hiring a consultant to conduct an in-depth analysis of the airspace system and perform an ATCT siting study. The first step will be to validate the separation distance of Runway 11-29 after it is shifted and the future parallel runway. Following this, a siting study will be carried out to assess potential sites for a replacement ATCT. The findings from this study will guide the design and construction of the new ATCT.

Construct Replacement ATCT

This project will fund the construction to relocate the over 60-year-old existing ATCT. The Authority confirmed many short comings of the existing contract tower including: (1) poor line-of-sight to critical airfield infrastructure; (2) aeronautical development that is severely height-limited (or in many cases prohibited) to apron-only improvements, preventing buildings like hangars, maintenance, and cargo facilities; and (3) non-compliance with modern building code.

Acquire ARFF Vehicle Replacement

This project will replace an existing ARFF vehicle that has reached the end of its useful life with a new one. The specifications for the replacement vehicle will match what the Authority currently operates today.

Develop GIS Database

This project will hire a consultant to develop a GIS database. The project will take existing AutoCAD and Esri files and compile them into a centralized database. Information will then be scrubbed for accuracy and presented to Authority staff for consideration. An internal and external platform will be developed allowing appropriate users to view critical information about the Airport.

6.3.4 Long-term Development Projects

The long-term capital improvements comprise the development undertakings that are slated within the final ten years of the planning period. The projects are presented sequentially, along with a concise description of each. The long-term projects have been designed to conform to FAA design standards, airfield maintenance, enhance terminal and landside functions, and conduct planning studies.

Expand Terminal Building – Phase 3

This project, which is planned if demand increases faster than forecasted within the 20-year planning horizon, continues concourse expansion to the east with the lengthening of the concourse and addition of two boarding bridge enabled gates, bringing the total to nine.

Conduct Airport Master Plan

This project will hire a consultant to conduct an airport master plan. It is recommended that airport master plans be regularly reviewed and updated, with a minimum frequency of every ten years. The aviation industry and external factors that affect its growth are constantly evolving, and it is essential to reassess

an airport master plan's vision, goals, and capital improvement program in response to these changes. Therefore, a revision of this Master Plan is scheduled in the CIP, ten years after its initial completion.

Employee Parking Lot

This project will construct a dedicated parking lot exclusively for employees. The need for this lot arises from the expansion of both public and rental car facilities, which require a new dedicated lot to be constructed for employees. The new parking lot will accommodate both airport administration and tenant employee parking with a single access control system.

6.3.5 Demand Driven Projects

Certain projects cannot be assigned to a specific year due to their demand-driven nature. The implementation of these projects is contingent upon the emergence of demand and the availability of third-party investments required to construct the necessary facilities to satisfy the demand. **In Chapter 5, Identification of Alternatives**, general concepts were presented on how these demand-driven projects could utilize vacant parcels. However, the specific development considerations will be influenced by the demand when it materializes. Three demand-driven projects have been identified, and their general descriptions have been provided to define the type of activity that would occur. However, the specifics of the projects will be influenced by the actual demand.

Construct Site A General Aviation Development

This project will construct large corporate hangars on development Site A, parallel to Taxiway A. Two apron connectors will be designed and constructed to provide access to and from the site. Landing View Lane would also be extended to provide access to the site.

Construction Site D General Aviation Development

This project will construct an assortment of small individual box hangars and corporate hangars. Two apron connectors will be designed and constructed to provide access to and from the site. Taxilanes will be sited in accordance with FAA Advisory Circular 150-/5300-13B, *Airport Design* to provide adequate circulation and separation. A driveway will be constructed to provide access to the site from Navigators Way.

Construct Consolidated Air Cargo Development

This project proposes the construction of sortation facilities oriented along Landing View Lane, with aircraft parking on a new apron perpendicular to Taxiway A. The temporary run-up pad will be repurposed and expanded to provide adequate circulation and parking for aircraft on the apron. Each sortation facility will be equipped with its own landside access to Landing View Lane, eliminating the need for shared driveways.

6.3.6 Beyond Planning Period Projects

Two projects were identified as being important to the development of the Airport, however, implementation planning does not require them within the 20-year planning period. These projects include: (1) constructing Runway 12L-30R and a parallel taxiway system, and (2) consulting Taxiway D parallel to Runway 4-22. These facilities were added to the Airport Layout Plan to ensure adequate land is preserved into the future.

6.4 Capital Improvement Plan

The Airport's Capital Improvement Plan was developed on the basis of the analysis conducted during the ADP, including demand forecasts, capacity analysis, and alternatives analysis. This section presents a summary of the projects in the CIP, and the following section presents the proposed funding of the CIP.

"Planning-level estimates", as defined for this purpose, is a rough order-of-magnitude (ROM) cost estimate that considers gross areas multiplied by a realistic unit cost factor. In addition, a contingency factor is applied to the construction costs for each project. This contingency factor is added to account for variables in the design of facilities that cannot be predicted at the planning level. Beyond construction costs, the "soft costs" of projects including architectural/engineering design fees and project management fees (typically totaling 20 percent of construction cost), and variety of other potential costs are accounted for, depending on the project magnitude and mobilization requirements. Finally, each project cost is escalated by an annual increase of 2.5 percent to account for projected inflation. This method of financial planning ensures a realistic and effective CIP budget that identifies sufficient funding for each CIP project over the planning period.

Analyzing the potential environmental effects for projects within each development phase will need to be completed in advance of design and construction to allow for project completion in accordance with applicable federal, state, and local rules and regulations. Environmental projects which are not already programmed into the FAA Accepted 5-Year CIP have been strategically grouped into EAs and scheduled into the CIP based upon the timing and magnitude of the projects being assessed. This allows each EA within the CIP to analyze the potential environmental consequences associated with the proposed actions along with any enabling projects prior to the start of construction. The groupings of associated projects for each EA programmed in the CIP will be addressed further within the project narratives later in this chapter. The applicable time for development should be reviewed by Airport management periodically and adjusted as necessary to account for changing circumstances.

Table 6-2 presents a summary of the 10-year CIP. There is approximately \$300 million in project cost to be funded, excluding cargo and general aviation projects which are assumed to be funded with third party sources.

The projects are summarized as follows:

- Airfield projects represent the largest category of project cost, primarily funded with FAA grants.
- Terminal expansion projects are phased over 10 years and assumed to require bond financing.
- Landside and parking projects are anticipated to be largely self-funded, in terms of revenue generated from parking rates and CFC revenue.

Table 6-2. Summary of 10-Year CIP (\$000)

	1-5 Years	6-10 Years	Ten Year Total
Airfield	95,260	78,135	173,396
New runway	88,206	58,911	147,117
Other	7,054	19,224	26,278
Terminal	29,932	47,219	77,151
ATO and bag makeup	6,143	-	6,143
Phase 0 expansion	18,689	-	18,689
Phase 1 expansion	-	27,808	27,808
Phase 2 expansion	-	5,137	5,137
Apron expansion	-	13,423	13,423
Other	5,100	851	5,951
Landside	12,917	21,028	33,945
Parking	11,978	4,600	16,578
Rental cars	-	12,689	12,689
Other	939	3,739	4,678
Facilities	1,220	17,519	18,739
Total before Cargo/GA development	139,329	163,901	303,230
Cargo/GA development	126,278	128,808	255,086
Total CIP	265,607	292,709	558,316

Source: InterVISTAS Analysis, 2022

6.5 CIP Funding

Table 6-3 summarizes the assumed funding of the first five year CIP. Key facts and assumptions include:

- Airfield projects will be funded approximately 90% with FAA grants.
- Terminal expansion will require bond financing, but also receive federal BIL funds.
- Parking improvements will be supported by increased parking rates.

Table 6-3. Assumed Funding of CIP Years 1-5 (\$000)

	FAA+BIL	CDOT	CFC	Bonds	Airport	Total
Airfield						
New runway	80,180	1,250	-	-	6,776	88,206
Other	500	4,000	-	-	161	4,661
Terminal						
ATO and bag makeup	3,000	-	-	3,143	-	6,143
Phase 0 expansion	12,000	-	-	6,689	-	18,689
Other	1,500	-	-	3,600	-	5,100
Landside						
Parking	-	-	-	11,978	-	11,978
Other	-	-	-	939	-	939
Facilities	275	-	-	945	-	1,220
Total CIP	97,455	5,250	-	27,294	6,937	136,936

Source: InterVISTAS Analysis, 2022

Table 6-4 presents the assumed funding for the 6-10 year CIP. Key facts and assumptions include:

- Airfield projects funded approximately 85% with FAA grants, primarily for completion of the new runway project.
- Terminal expansion funded primarily with new airport revenue bonds.
- Rental car improvements funded with CFC revenue.
- Available airport funds spread over multiple projects.

Table 6-4. Assumed Funding of CIP Years 6-10 (\$000)

	FAA+BIL	CDOT	CFC	Bonds	Airport	Total
Airfield						
New runway	53,548	1,250	-	-	114	54,911
Other	14,536	4,000	-	5,000	2,081	25,617
Terminal						
Phase 1 expansion	-	-	-	25,000	2,808	27,808
Phase 2 expansion	-	-	-	4,000	1,137	5,137
Other	7,477	-	-	5,000	1,797	14,274
Landside						
Parking	-	-	-	4,600	-	4,600
Rental cars	-	-	12,689	-	-	12,689
Other	-	-	-	3,217	522	3,739
Facilities	10,674	-	-	-	6,845	17,519
Total CIP	86,235	5,250	12,689	46,817	15,303	166,294

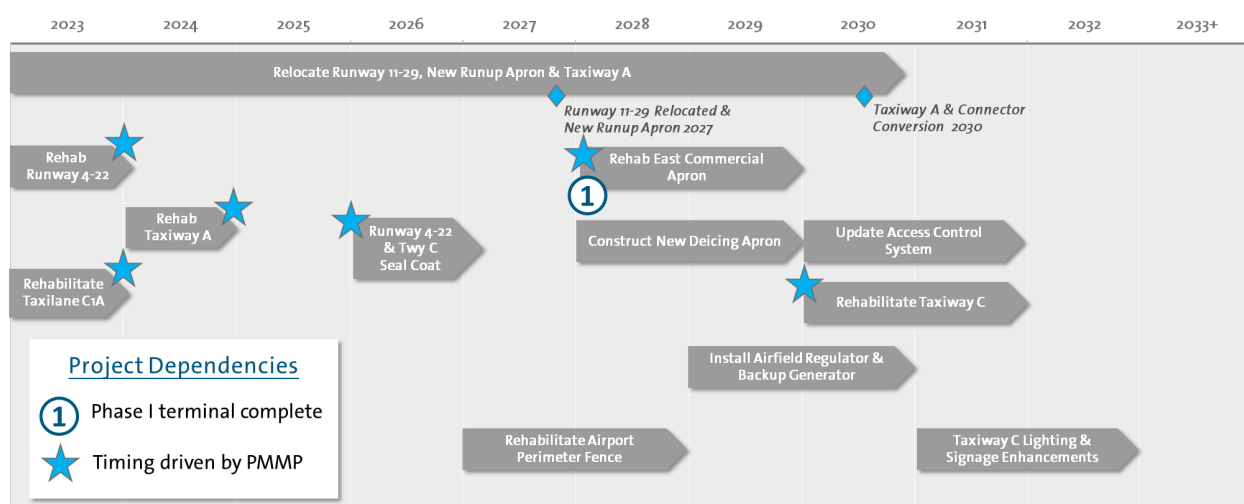
Source: InterVISTAS Analysis, 2022

6.5.1 Project Dependencies

Several factors such as funding, changes in airport priorities, and other objectives can impact the implementation of CIP projects. Such factors can have a ripple effect on the implementation timeline. This subsection aims to summarize the key dependencies for projects identified in the ten-year CIP that rely on each other or influence the next project's implementation.

The successful execution of the airfield infrastructure program hinges on one critical factor: refurbishment of the east commercial apron is subject to the completion of Phase I of the Terminal Building Expansion project. This is intended to reduce operational disruptions by having one side of the terminal area available for airline operations, thereby eliminating the need for temporary staging areas to transport passengers to and from the terminal area **Figure 6-7** offers a broad outline of the airfield infrastructure initiatives, as well as the dependencies and triggering events for project implementation.

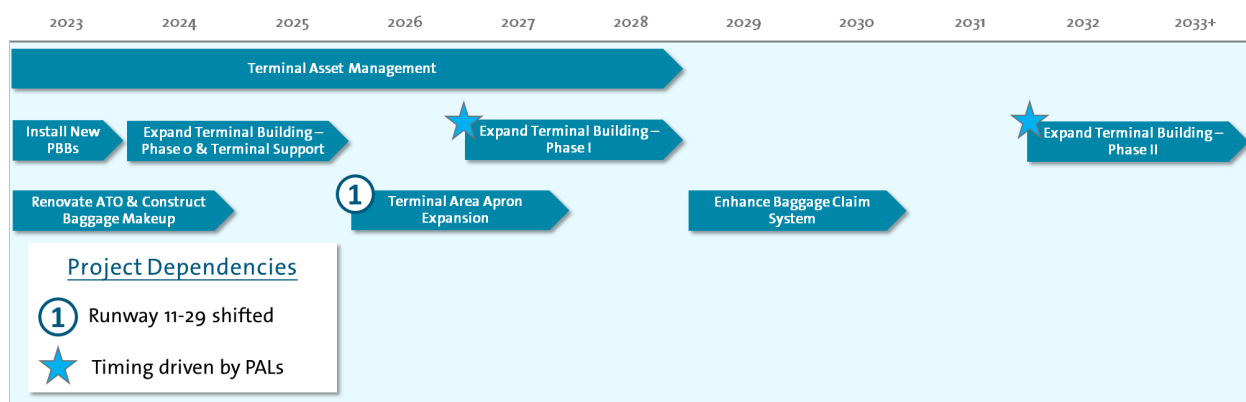
Figure 6-7. Airfield Infrastructure Program - Project Dependencies



Source: InterVISTAS Analysis, 2022

The planning activity levels primarily drive the implementation of the terminal area infrastructure program. One project that is directly contingent upon the relocation of Runway 11-29 is the Terminal Area Apron Expansion project. Failure to relocate the runway before implementing the project would result in parked aircraft encroaching into the building restriction line, causing a nonstandard condition. **Figure 6-8** offers a high-level overview of the terminal area infrastructure projects and the events that trigger their implementation.

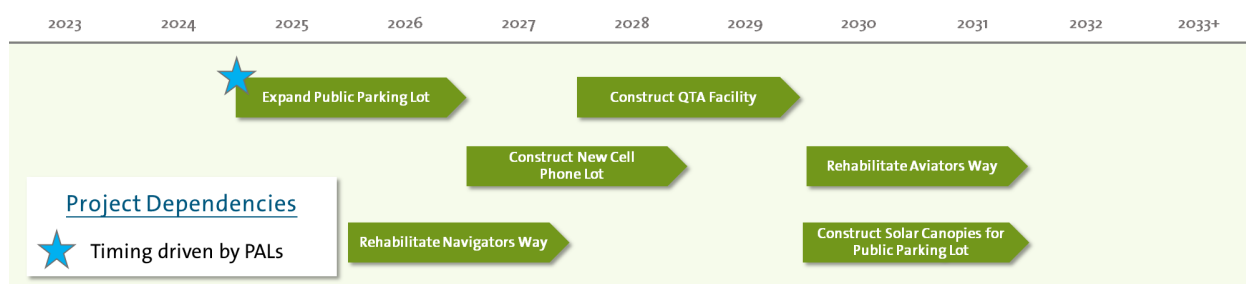
Figure 6-8. Terminal Area Infrastructure Program - Project Dependencies



Source: InterVISTAS Analysis, 2022

Similar to the terminal area infrastructure program, the landside infrastructure program is triggered by the increase in passenger traffic. **Figure 6-9** provides a high-level overview of the landside infrastructure program projects and the triggering events for implementing projects.

Figure 6-9. Landside Infrastructure Program - Project Dependencies

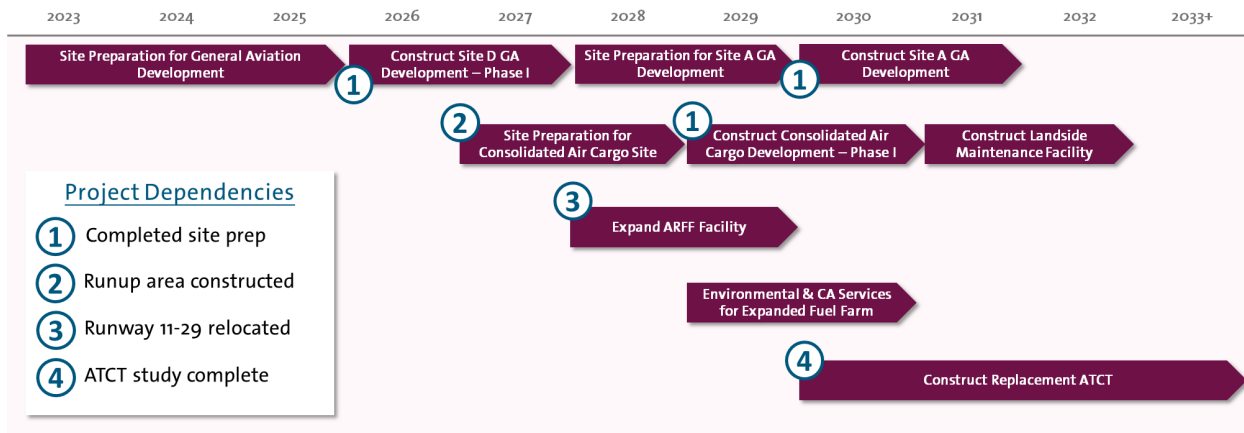


Source: InterVISTAS Analysis, 2022

The implementation of the airport facilities program is triggered by multiple factors. The construction of general aviation facilities and the consolidated air cargo development are projects that rely on theoretical demand, and their implementation is contingent on this demand materializing. While there are scheduled years for these projects, the actual implementation date remains fluid and is determined by "real demand".

The implementation of the consolidated air cargo site cannot begin until the completion of the replacement runup area, which is part of the Runway 11-29 relocation project. Additionally, the expansion of the ARFF facility cannot occur until the relocation of the runway, as building the facility before the relocation could result in a nonstandard condition caused by the building encroaching into the Building Restriction Line. Finally, before designing and constructing a replacement ATCT, a detailed airspace and siting study is necessary. **Figure 6-10** offers a high-level overview of the airport facilities program projects and the events that trigger their implementation.

Figure 6-10. Airport Facilities Program - Project Dependencies



Source: InterVISTAS Analysis, 2022

The implementation of the airport fleet vehicle program and the planning, environmental, and contingency program do not have any know dependencies with other projects identified in the CIP; however, they can influence the completion of other projects.

7 Environmental Overview

This Environmental Overview has been conducted to identify the Airport Development Program projects with potential environmental impacts. An impact's level of significance determines the expected level of FAA review to satisfy requirements under the National Environmental Policy Act (NEPA) of 1969. Any proposed project that either (1) involves securing federal funds or (2) requires agency approval, must be examined for potential impacts to a set of environmental, human health, and socioeconomic categories (referred to as "resource categories") in accordance with the NEPA and Council of Environmental Quality (CEQ) regulations, FAA's 1050.1F Desk Reference, FAA Orders 5050.4B and 1050.1F, and the review checklist required for a new or updated Airport Layout Plan (ALP). As such, these FAA orders, desk references, regulations, and Advisory Circulars (ACs) were consulted during this effort. The ADP projects are assessed for potential impact(s) to the resource categories listed in **Figure 7-1**.

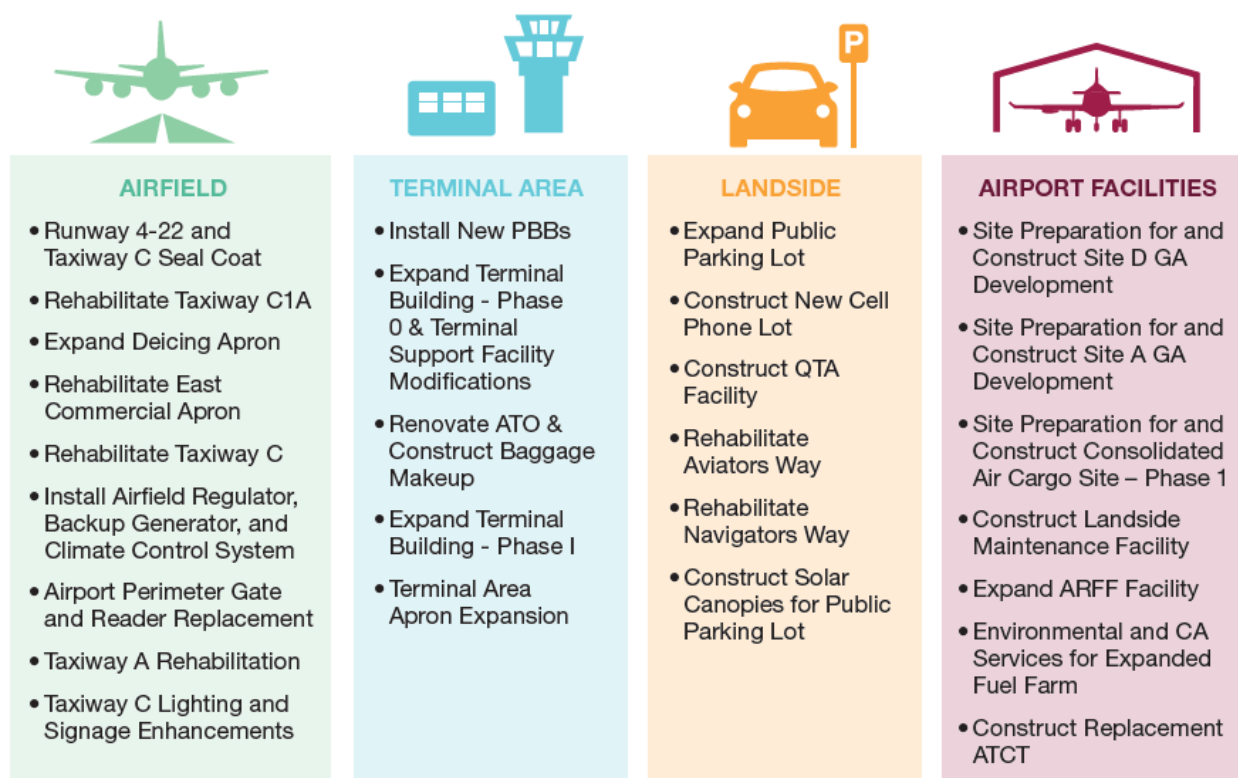
Figure 7-1. Resource Categories Grand Junction Regional Airport

	Air Quality		Historical, Architectural, Archaeological, and Cultural Resources
	Biological Resources		Land Use
	Climate		Natural Resources and Energy Supply
	Coastal Resources		Noise and Noise-Compatible Land Use
	Department of Transportation Act Section 4(f)		Socio-economics, Environmental Justice, and Children's Environmental Health and Safety Risks
	Farmlands		Visual Efforts
	Hazardous Materials, Solid Waste, and Pollution Prevention		Water Resources (Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)

Environmental Science Associates (ESA), 2022

The ADP recommends more than two dozen potential short- and longer-term projects, which are organized into four main categories – airfield, terminal area, landside, and airport facilities. These projects are depicted in **Figure 7-2**.

Figure 7-2. ADP Recommended Projects Grand Junction Regional Airport



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7.1 Levels of Environmental Review

There are three levels of NEPA review for any given project: A Categorical Exclusion (CatEx), an Environmental Assessment (EA), and an Environmental Impact Statement (EIS). Upon review of the necessary preliminary documentation, the FAA determines the required level of NEPA review based on the significance of each proposed action's impact to each of the resource categories. Generally, the determination of the significance of an impact may vary with context and intensity, but significance thresholds have been established by the FAA for certain resource categories, which are used to establish the level of environmental review. When significance thresholds have not been established for resource categories, the FAA will determine whether a project's impact(s) requires a CatEx, EA, or EIS.

7.1.1 Categorical Exclusion

According to 40 CFR 1508.4, a federal project may be categorically excluded from a detailed environmental analysis if the project does not, "individually or cumulatively have a significant effect on the human environment." Chapter 6 of FAA Order 5050.4B and Chapter 3 of FAA Order 1050.1F specify when a CatEx is an appropriate level of review for a given project. If the FAA makes a CatEx determination for a proposed project, it is the Authority's responsibility to prepare and submit the CatEx documentation. The expected timeline of the CatEx review process is generally one to three months.

7.1.2 Environmental Assessment

In the event that the FAA determines that a project cannot be categorically excluded, it may require the preparation of an EA. The EA examines whether or not a project has the potential to cause significant environmental effects. It is, in theory, a concise public document that provides evidence and analysis for determining whether to perform a more robust study of impacts (i.e., an EIS) or if a Finding of No Significance (FONSI) (i.e., the project does not result in significant impacts to the environment) is more appropriate. Chapter 7 of FAA Order 5050.4B and Chapter 4 of FAA Order 1050.1F specify when an EA is an appropriate level of review for a given project. If the FAA decides that an EA is necessary for a project, the Authority would prepare an EA application or proposal for the FAA. Depending on the potential significance of impacts, the expected timeline of the EA review process is generally 6 to 18 months.

7.1.3 Environmental Impact Statement

The FAA prepares an EIS if a proposed federal project is determined to significantly affect the quality of the human environment. The regulatory requirements for an EIS are more detailed and rigorous than the requirements for a CatEx and EA. It is the FAA's responsibility to prepare the EIS and will eventually conclude the process with a Record of Decision (ROD) that explains its decision, alternatives considered, and plans for mitigation and monitoring, if necessary. Chapter 8 of FAA Order 5050.4B and Chapter 5 of FAA Order 1050.1F specify when an EIS is an appropriate level of review for a given project. The expected timeline of the EIS review process is generally 24 to 48 months.

7.2 Methodology

The NEPA resource categories are a comprehensive representation of the environment as it pertains to the preservation of flora, fauna, and human health, culture, and socioeconomic conditions. The ADP's potential impacts to the resource categories are subject to the characteristics of the Grand Junction region and, more specifically, the environment within and surrounding the Airport boundary. **Table 7-1** lists the evaluation criteria used in this Environmental Overview to assess potential impacts and an impact's level of significance.

Table 7-1. Evaluation Criteria for Environmental Overview

Intensity of Impact	
Negligible	Impacts are not expected to be measurable, or are measurable but too small to cause any noticeable changes
Modest	Impacts are slightly measurable, but within the capacity of the affected system to absorb the change
Moderate	Impacts are measurable, but within the capacity of the affected system to absorb the change and the impacts can be avoided, minimized, or mitigated
Significant	Impacts are measurable, but exceed the capacity of the affected system to absorb the change, and without major mitigation, are severe
Duration of Impact	
Temporary	Occurs only during the development of the project
Permanent	Continues beyond construction and into the operational lifetime of the project
Context of Impact	
Local	Occurs within the designated Airport boundary
Regional	Extends outside the designated Airport boundary

Type of Impact	
Beneficial	Results in some level of positive effect on the environment
Negative	Results in an adverse effect on the environment

Environmental Science Associates (ESA), 2022

The approach to this section serves several purposes, which includes (1) identifying the methods and tools used in assessing the impacts of various projects and (2) identifying the resource categories that are not relevant to or impacted by the ADP projects to avoid redundancy for multiple projects with similar scopes, impacts, and/or significance levels as past projects or other ADP projects.

The ADP will be subsequently analyzed for a project's potential impacts during two stages of a project's lifetime—construction and/or demolition (C&D) and operations. Construction requires mobilizing equipment, preparing the site for construction, managing C&D waste, and constructing the project. Construction is typically associated with the addition of a new facility or with the expansion or restoration of a current facility, but may also include the demolition or removal of an old facility. These impacts are usually temporary in nature, whereas impacts from the operation of the ADP projects may be more long-lasting or even permanent. Importantly, some resource categories may not even be relevant to the ADP project and, therefore, can be excluded from any further analysis. To determine the project's potential impact to resource categories listed in the 1050.1F Desk Reference, the following databases were reviewed:

- U.S. Fish and Wildlife Service (USFWS), Information for Planning and Consultation (IPaC)
- USFWS, Critical Habitat Mapper
- USFWS, National Wetlands Inventory (NWI)
- U.S. National Park Service (USNPS), National Register of Historic Places (NRHP)
- Federal Emergency Management Agency (FEMA), Flood Map Service Center, Flood Zones Map
- U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Web Soil Survey
- U.S. Geological Survey (USGS), National Water Information System (NWIS)
- U.S. Environmental Protection Agency (USEPA), Sole Source Aquifers for Drinking Water Interactive maps
- USEPA, NEPAAssist Tool
- USEPA, Superfund NPL Mapper
- Colorado Wetland Information Center (CWIC), Colorado Wetlands Inventory Mapping Tool

After reviewing the databases, the following resource categories have been omitted from further analysis:

- **Biological Resources**—The USFWS IPaC tool identified the possible presence of eight endangered or threatened species in or around the Airport. However, IPaC did not identify any critical or protected habitats located in the designated Airport boundary. The closest critical habitat is for the Federally Threatened Yellow-Billed Cuckoo (*Coccyzus americanus*) and is located approximately five miles south of the Airport boundary along the Colorado/Gunnison River.

- **Coastal Resources**—The Airport is located several hundred miles from the closest coastal resource.
- **Farmlands**—No prime or unique agricultural areas are located in the vicinity of the Airport.
- **Historical, Architectural, Archeological, and Cultural Resources**—NEPAssist and NRHP databases did not identify a historical resource within proximity to the Airport. The closest registered historic site is Cross Land and Fruit Company, which is more than three miles southeast of Airport property. The Little Book Cliff Railway roadbed was documented as part of a prior study.
- **Land Use**—The Authority will not be purchasing additional land to implement the proposed ADP projects and the projects are consistent with the existing use of Airport land.
- **Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety**—USEPA’s EJScreen did not identify any neighborhoods adjacent to the Airport as being populated with communities of children, minority, or low-income populations.
- **Water Resources (Groundwaters)**—The USGS NWIS identified no groundwater sources or sole source aquifers within the vicinity of the Airport.
- **Water Resources (Floodplains)**—The FEMA Flood Insurance Maps indicate that the Airport is not located within a flood hazard area.
- **Water Resources (Wild and Scenic Rivers)**—NEPAssist identified no wild and scenic rivers within the vicinity of the Airport.

It is very important to note that, while these resource categories are excluded from further analysis in this report, coordination with the appropriate local, state, and federal regulatory agencies will still be required as part of the future formal environmental review process. These agencies are identified in Section 7.4. The NEPA resource categories that are part of this analysis include the following:

- Air Quality and Climate
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Natural Resources and Energy Supply
- Noise and Noise-Compatible Land Use
- Visual Effects
- Water Resources (Wetlands and Surface Waters)
- Department of Transportation Act, Section 4(f)

It is important to note that the ADP projects are not intended to attract new growth but instead fulfill existing and future forecasted demand. This is important because it affects the approach to analyzing several resource categories, such as noise and air quality, and could ultimately affect the level of review required by the FAA.

7.3 Analysis of Potential Environmental Impacts

7.3.1 Airfield

The purpose of the airfield program is to identify and implement projects that either maintain or enhance the safety of runways, taxiways, aprons, or the airfield. The potential impacts to environmental resources associated with ADP-recommended airfield improvements are described in **Table 7-2**. The Airfield Regulator, Backup Generator, and Climate Control System and Airport Perimeter Gate and Reader Replacement projects are unlikely to result in any environmental impacts; as such, they are not described in Table 2, but a CatEx is the likely level of NEPA review for both projects. All airfield projects listed below will take place on developed land and will not likely result in impacts to previously undisturbed land. Therefore, a CatEx is the expected level of NEPA review for each project. For more information on the individual projects listed in **Table 7-2**, please refer to **Chapter 6**.

Table 7-2. Environmental Review of Proposed Airfield Development Projects

Resource Category	Overview of Potential Impacts
Runway 4-22 and Taxiway C Seal Coat	
Air Quality and Climate	Paving and sealing activities would likely cause modest, but temporary, increases to criteria air pollutant (CAP) and greenhouse gas (GHG) emissions.
Expected Level of NEPA Review	CatEx
Rehabilitate Taxiway C1A	
Air Quality and Climate	Paving and debris removal activities would likely cause modest, but temporary, increases to CAP and GHG emissions.
Solid Waste	Old pavement debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Expected Level of NEPA Review	CatEx
Expand Deicing Apron	
Air Quality and Climate	Construction and paving activities would likely cause modest, but temporary, increases to CAP and GHG emissions.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Water Resources (Surface Waters)	The addition of impervious paved surfaces may permanently disturb or increase existing stormwater flows.
Expected Level of NEPA Review	CatEx
Rehabilitate East Commercial Apron	
Air Quality and Climate	Paving activities and debris removal would likely cause modest, but temporary, increases to CAP and GHG emissions.
Solid Waste	Old pavement debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Expected Level of NEPA Review	CatEx

Rehabilitate Taxiway C	
Air Quality and Climate	Paving activities and debris removal would likely cause modest, but temporary, increases to CAP and GHG emissions.
Solid Waste	Old pavement debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Expected Level of NEPA Review	CatEx
Taxiway A Rehabilitation	
Air Quality and Climate	Paving activities and debris removal would likely cause modest, but temporary, increases to CAP and GHG emissions.
Solid Waste	Old pavement debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Expected Level of NEPA Review	CatEx
Taxiway C Lighting and Signage Enhancements	
Natural Resources and Energy Supply	Additional lighting and signage could result in a modest increase in electricity usage; although, it might be offset through the installation of high efficiency lights.
Expected Level of NEPA Review	CatEx

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7.3.2 Terminal Area

The primary goals of the terminal program are to provide additional aircraft parking positions, or gates, and associated holdroom(s) to accommodate larger aircraft serving the Airport. The terminal program is broken into four phases to align with forecasted growth of passengers and aircraft operations. The potential impacts to environmental resources associated with ADP-recommended terminal improvements are described in **Table 7-3**. Similar to the proposed airside projects, the terminal area projects are anticipated to primarily impact previously developed and/or disturbed land at the Airport. Therefore, a CatEx is the expected level of NEPA review for each project. For more information on the individual projects listed in **Table 7-3**, please refer to **Chapter 6**.

Table 7-3. Environmental Review of Proposed Terminal Area Projects

Resource Category	Overview of Potential Impacts
Install New PBBs	
Natural Resources and Energy Supply	The additional and/or new PBBs may result in a permanent, but modest, increase in electricity use.
Solid Waste	Old PBBs would be removed and possibly sold for scrap, but may be transferred a local landfill.
Expected Level of NEPA Review	CatEx
Expand Terminal Building - Phase 0 and Terminal Support Facility Modifications	
Air Quality and Climate	Construction of new terminal areas would likely require heavy duty vehicles, which could result in modest and temporary increases in CAP and GHG emissions.
Hazardous Waste, Solid Waste	Given their likely presence in the vicinity of the terminal building, hazardous materials may be encountered during the construction process. Old pavement and building debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts. Once complete, the project could result in a

	permanent, but modest, influx of municipal solid waste (MSW) generated by passengers and concessionaires.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Natural Resources and Energy Supply	Expansion of the terminal may result in a permanent, but moderate, increase in electricity and natural gas consumption.
Visual Effects	Expansion of existing terminal facilities would likely involve additional exterior lighting, but would not likely result in impacts in the vicinity of the Airport.
Water Resources (Surface Waters)	The addition of impervious paved surfaces may permanently disturb or increase existing stormwater flows.
Expected Level of NEPA Review	CatEx
Renovate ATO and Construct Baggage Makeup	
Solid Waste	Renovation of baggage areas may result in building and materials waste requiring removal to a local landfill.
Expected Level of NEPA Review	CatEx
Expand Terminal Building - Phase I	
Air Quality and Climate	Construction of new terminal areas would likely require the use of heavy duty vehicles, which could result in modest, but temporary, increases in CAP and GHG emissions.
Hazardous Waste, Solid Waste	Given their likely presence in the vicinity of the terminal building, hazardous materials may be encountered during the construction process. Old pavement and building debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts. Once complete, the project could result in a permanent, but modest, influx of MSW generated by passengers and concessionaires.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Natural Resources and Energy Supply	Expansion of the terminal may result in a permanent, but moderate, increase in electricity and natural gas consumption.
Visual Effects	Expansion of existing terminal facilities would likely involve additional exterior lighting, but would not likely result in impacts in the vicinity of the Airport.
Water Resources (Surface Waters)	The addition of impervious paved surfaces may permanently disturb or increase existing stormwater flows.
Expected Level of NEPA Review	CatEx
Terminal Area Apron Expansion	
Air Quality and Climate	Paving activities and debris removal would likely cause modest, but temporary, increases to CAP and GHG emissions.
Hazardous Waste, Solid Waste	Given their likely presence in the vicinity of the terminal building, hazardous materials may be encountered during the construction process. Old pavement debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Visual Effects	Aircraft apron areas would require overhead lighting, but light would be directed downwards, thereby minimizing any visual impacts in the vicinity of the Airport.
Water Resources (Surface Waters)	The addition of impervious paved surfaces may permanently disturb or increase existing stormwater flows.
Expected Level of NEPA Review	CatEx

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7.3.3 Landside

Landside projects include modifications or planned expansion to parking, roadways, cell phone lot, and rental cars. The potential impacts to environmental resources associated with ADP-recommended landside improvements are described in **Table 7-4**. The landside projects are likely to result in impacts on previously undeveloped land which could result in permanent impacts to wetland and stream resources. As detailed in Section 7.4, it is recommended for the Authority to perform a wetland delineation and coordinate with state and local authorities to acquire the appropriate permits prior to construction, if applicable. For more information on the individual projects listed in **Table 7-4**, please refer to **Chapter 6**.

Table 7-4. Environmental Review of Proposed Landside Development Projects

Resource Category	Overview of Potential Impacts
Expand Public Parking Lot	
Air Quality and Climate	Construction-related activities would likely require the use of heavy-duty vehicles, which could result in modest, but temporary, increases in CAP and GHG emissions. Modest, but temporary, fugitive dust emissions may also occur.
Solid Waste	Old pavement debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Natural Resources and Energy Supply	Additional parking area would likely require additional overhead lighting, thus resulting in a permanent, but modest, increase in electricity usage.
Visual Effects	Parking areas would require overhead lighting, but light would be directed downwards, thereby minimizing any visual impacts in the vicinity of the Airport.
Water Resources (Surface Waters)	The addition of impervious paved surfaces may permanently disturb or increase existing stormwater flows.
Expected Level of NEPA Review	CatEx
Construct New Cell Phone Lot	
Air Quality and Climate	Construction-related activities would likely require the use of heavy-duty vehicles, which could result in modest, but temporary, increases in CAP and GHG emissions. Modest, but temporary, fugitive dust emissions may also occur.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Natural Resources and Energy Supply	Additional parking area would likely require additional overhead lighting, thus resulting in a permanent, but modest, increase in electricity usage.
Visual Effects	Parking areas would require overhead lighting, but light would be directed downwards, thereby minimizing any visual impacts in the vicinity of the Airport.
Water Resources (Surface Waters, Wetlands)	The addition of impervious paved surfaces may permanently disturb or increase existing stormwater flows. The proposed project could permanently impact streams and/or wetland resources located at the site.
Expected Level of NEPA Review	CatEx
Construct QTA Facility	
Air Quality and Climate	Construction-related activities would likely require the use of heavy-duty vehicles, which could result in modest, but temporary, increases in CAP and GHG emissions. Modest, but temporary, fugitive dust emissions may also occur.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Natural Resources and Energy Supply	Additional parking area would likely require additional overhead lighting, thus resulting in a permanent, but modest, increase in electricity usage.

Visual Effects	Parking areas would require overhead lighting, but light would be directed downwards, thereby minimizing any visual impacts in the vicinity of the Airport.
Water Resources (Surface Waters)	The addition of impervious paved surfaces may permanently disturb or increase existing stormwater flows.
Expected Level of NEPA Review	CatEx
Rehabilitate Aviators Way	
Air Quality and Climate	Construction-related activities would likely require the use of heavy-duty vehicles, which could result in modest, but temporary, increases in CAP and GHG emissions.
Solid Waste	Old pavement debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Expected Level of NEPA Review	CatEx
Rehabilitate Navigators Way	
Air Quality and Climate	Construction-related activities would likely require the use of heavy-duty vehicles, which could result in modest, but temporary, increases in CAP and GHG emissions.
Solid Waste	Old pavement debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Expected Level of NEPA Review	CatEx
Construct Solar Canopies for Public Parking Lot	
Air Quality and Climate	Construction-related activities would likely require the use of heavy-duty vehicles, which could result in modest, but temporary, increases in CAP and GHG emissions.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Visual Effects	The addition of solar panels may generate glare, but siting would consider avoiding impacts to ATCT personnel and pilots.
Expected Level of NEPA Review	CatEx

Environmental Science Associates (ESA), 2022

7.3.4 Airport Facilities

Airport facilities include general aviation (GA) hangars, maintenance facilities, fuel farms, aircraft rescue and firefighting facilities (ARFF), and the air traffic control tower (ATCT). The purpose of these projects is to provide air cargo and GA development to serve the Western Slope of Colorado. A list of ADP-recommended Airport facility improvements and potential impacts to environmental resources are described in **Table 5**. The proposed Airport development projects are likely to result in additional facilities on previously undeveloped land. As such, the projects could result in modest, but permanent, impacts to Section 4(f) and/or wetland and stream resources on Airport property. Please see Section 7.4 for a description of the recommended agency consultation and coordination. For more information on the individual projects listed in Table 5, please refer to **Chapter 6**.

Table 7-5. Environmental Review of Proposed Airport Facility Projects

Resource Category	Overview of Potential Impacts
Site Preparation for and Construct Site D GA Development	
Air Quality and Climate	Construction-related activities would likely require the use of heavy-duty vehicles, which could result in modest, but temporary, increases in CAP and GHG emissions. Modest, but temporary, fugitive dust emissions may also occur.
Solid Waste	Building debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours. After construction, tenant activities may result in permanent changes in existing noise exposure to communities adjacent to the Airport.
Natural Resources and Energy Supply	The operation of additional facilities would likely result in a permanent, but modest, increase in electricity and natural gas consumption.
Visual Effects	The addition of aviation-related facilities could require exterior lighting; however, the impact to communities adjacent to the Airport is expected to be nominal.
Water Resources (Surface Waters, Wetlands)	The addition of impervious paved surfaces may permanently disturb or increase existing stormwater flows. The proposed project could permanently impact streams and/or wetland resources located at the site.
Expected Level of NEPA Review	CatEx
Site Preparation for and Construct Site A GA Development	
Air Quality and Climate	Construction-related activities would likely require the use of heavy-duty vehicles, which could result in modest, but temporary, increases in CAP and GHG emissions. Modest, but temporary, fugitive dust emissions may also occur.
Solid Waste	Building debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours. After construction, tenant activities may result in permanent changes in existing noise exposure to communities adjacent to the Airport.
Natural Resources and Energy Supply	The operation of additional facilities would likely result in a permanent, but modest, increase in electricity and natural gas consumption.
Visual Effects	The addition of aviation-related facilities could require exterior lighting; however, the impact to communities adjacent to the Airport is expected to be nominal.
Water Resources (Surface Waters, Wetlands)	The addition of impervious paved surfaces may permanently disturb or increase existing stormwater flows. The proposed project could permanently impact streams and/or wetland resources located at the site.
Expected Level of NEPA Review	CatEx
Site Preparation for and Construct Consolidated Air Cargo Site – Phase 1	
Air Quality and Climate	Construction-related activities would likely require the use of heavy-duty vehicles, which could result in modest, but temporary, increases in CAP and GHG emissions. Modest, but temporary, fugitive dust emissions may also occur.
Solid Waste	Building debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours. After construction, tenant activities may result in permanent changes in existing noise exposure to communities adjacent to the Airport.
Natural Resources and Energy Supply	The operation of additional facilities would likely result in a permanent, but modest, increase in electricity and natural gas consumption.

Visual Effects	The addition of aviation-related facilities could require exterior lighting; however, the impact to communities adjacent to the Airport is expected to be nominal.
Water Resources (Surface Waters, Wetlands)	The addition of impervious paved surfaces may permanently disturb or increase existing stormwater flows. The proposed project could permanently impact streams and/or wetland resources located at the site.
Expected Level of NEPA Review	CatEx
Construct Landside Maintenance Facility	
Air Quality and Climate	Construction-related activities would likely require the use of heavy-duty vehicles, which could result in modest, but temporary, increases in CAP and GHG emissions. Modest, but temporary, fugitive dust emissions may also occur.
Solid Waste	Building debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Natural Resources and Energy Supply	The operation of additional facilities would likely result in a permanent, but modest, increase in electricity and natural gas consumption.
Visual Effects	The addition of aviation-related facilities could require exterior lighting; however, the impact to communities adjacent to the Airport is expected to be nominal.
Water Resources (Surface Waters)	The addition of impervious paved surfaces may permanently disturb or increase existing stormwater flows.
Expected Level of NEPA Review	CatEx
Expand ARFF Facility	
Air Quality and Climate	Construction-related activities would likely require the use of heavy-duty vehicles, which could result in modest, but temporary, increases in CAP and GHG emissions. Modest, but temporary, fugitive dust emissions may also occur.
Solid Waste	Building debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Natural Resources and Energy Supply	The operation of additional facilities would likely result in a permanent, but modest, increase in electricity and natural gas consumption.
Visual Effects	The addition of aviation-related facilities could require exterior lighting; however, the impact to communities adjacent to the Airport is expected to be nominal.
Water Resources (Surface Waters)	The addition of impervious paved surfaces may permanently disturb or increase existing stormwater flows.
Expected Level of NEPA Review	CatEx
Environmental and CA Services for Expanded Fuel Farm	
Air Quality and Climate	Construction-related activities would likely require the use of heavy-duty vehicles, which could result in modest, but temporary, increases in CAP and GHG emissions. Modest, but temporary, fugitive dust emissions may also occur.
Hazardous Waste, Solid Waste	Petroleum products would be stored and managed in accordance with state and federal regulations. Old pavement debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Natural Resources and Energy Supply	The operation of additional facilities would likely result in a permanent, but modest, increase in fuel consumption.
Water Resources (Surface Waters)	The addition of impervious paved surfaces may permanently disturb or increase existing stormwater flows. Minor spills and leaks at the fuel farm could impact nearby streams.
Expected Level of NEPA Review	CatEx

Construct Replacement ATCT	
Air Quality and Climate	Construction-related activities would likely require the use of heavy-duty vehicles, which could result in modest, but temporary, increases in CAP and GHG emissions. Modest, but temporary, fugitive dust emissions may also occur.
Solid Waste	Building debris would likely be generated, but it is anticipated that these materials would be reused on site, thereby minimizing waste impacts.
Noise	Construction vehicles and related activities may generate modest, but temporary, levels of noise on Airport property and on local roads especially during nighttime hours.
Natural Resources and Energy Supply	The operation of additional facilities would likely result in a permanent, but modest, increase in electricity and natural gas consumption.
Visual Effects	The addition of aviation-related facilities could require exterior lighting; however, the impact to communities adjacent to the Airport is expected to be nominal. The ATCT may interrupt with the visual enjoyment of adjacent communities; however, the new ATCT is replacing the existing ATCT, so the impacts are likely to only be modest.
Water Resources (Surface Waters, Wetlands)	The addition of impervious paved surfaces may permanently disturb or increase existing stormwater flows. The proposed project could permanently impact streams and/or wetland resources located at the site.
Section 4(f)	The proposed project could impact publicly owned recreational areas managed by the Bureau of Land Management (BLM).
Expected Level of NEPA Review	Pursuant to Section 3-1.2(b)(6) of FAA Order 1050.1F, the construction or relocation of an ATCT normally requires an EA.

Environmental Science Associates (ESA), 2022

7.4 Anticipated Required Regulatory Agency Coordination

Based on the environmental overview of the potential impacts associated with each project proposed in the ADP, the following agency coordination is recommended immediately upon embarking on the formal NEPA review process.

7.4.1 Biological Resources

Consult with the USFWS and the Colorado Parks & Wildlife to confirm the presence of any federal or state threatened or endangered species and critical habitats on or near Airport property.

7.4.2 Historical, Architectural, Archaeological, and Cultural Resources

Coordinate with the Colorado State Historic Preservation Office to identify and confirm potential historic or cultural sites in the vicinity of the Airport. Although unlikely, the FAA may require the Authority to also coordinate with the Colorado Commission of Indian Affairs.

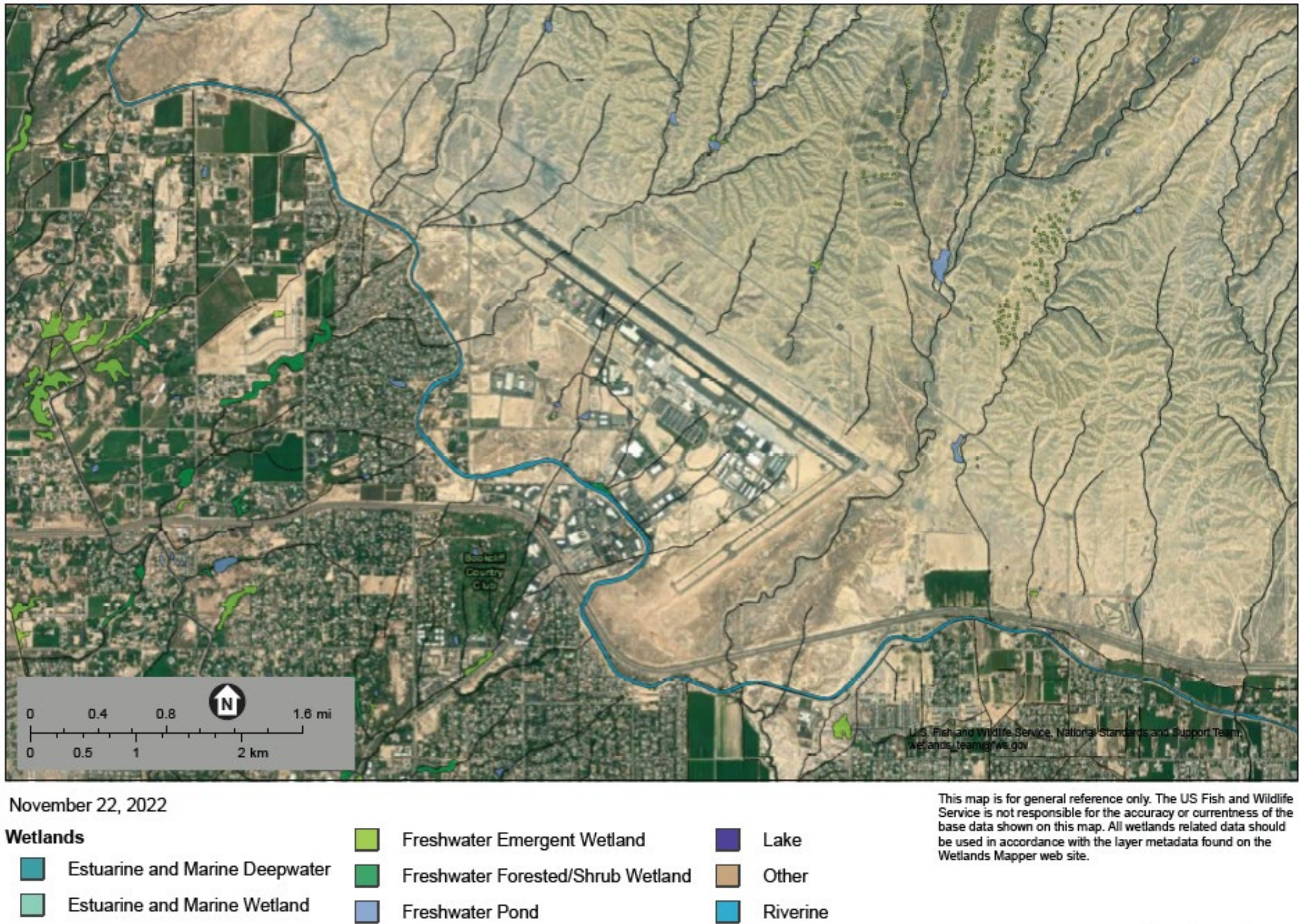
7.4.3 Water Resources (Surface Waters, Wetlands)

According to the USFWS National Wetlands Mapper and CWIC, there are stream and/or wetland resources located within the Airport boundary that could be permanently impacted by the proposed ADP projects. **Figures 3 and 4** depicts the wetland resources identified on the USFWS National Wetlands Mapper and CWIC Colorado Wetlands Inventory Mapping Tool, respectively. The projects with potential to result in wetland impacts are identified in Section 4. It is recommended to perform a wetland delineation in accordance with state and federal regulations to properly identify and quantify the extent of any impacts to wetland and/or stream resources. It is also recommended to coordinate with United States Army Corps of Engineers to confirm the presence and extent of Jurisdictional Waters of the U.S., which might require permits.

7.4.4 Department of Transportation Act, Section 4(f)

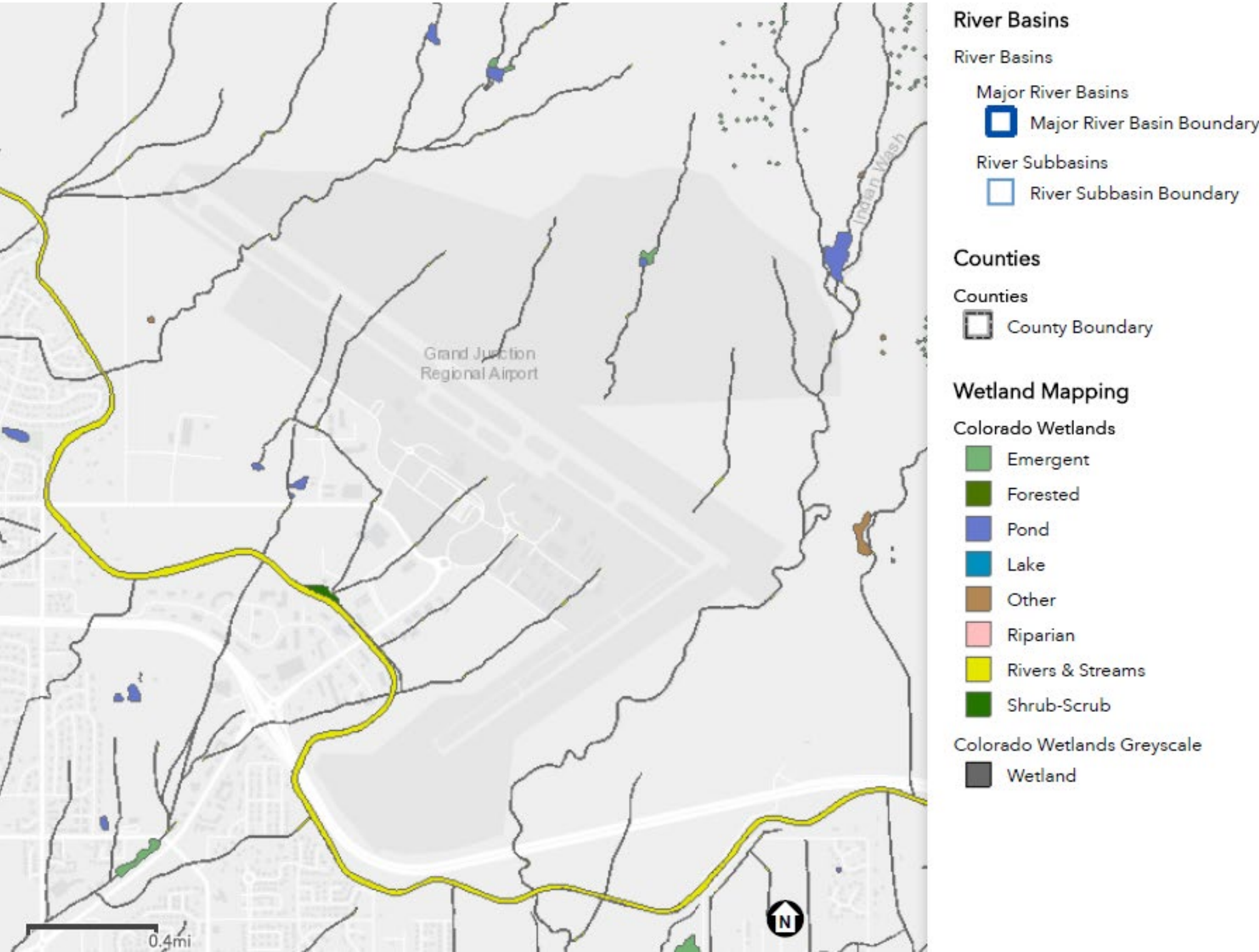
According to the USEPA NEPAassist and the BLM Colorado Interactive Map, the Grand Valley Off-Highway Vehicle Recreation Area is located within the northern portion of the Airport boundary. The projects with potential to result in Section 4(f) impacts are identified in Section 4; as such, it is recommended to coordinate with the BLM Grand Junction Field Office to discuss projects with potential to impact nearby public lands.

Figure 7-3. USFWS National Wetlands Inventory Grand Junction Regional Airport



Source: U.S. Fish and Wildlife, National Wetlands Mapper, November 2022

Figure 7-4. Colorado Wetlands Inventory Grand Junction Regional Airport



Source: U.S. Colorado Wetland Information Center (CWIC), Colorado Wetlands Inventory Mapping Tool, November 2022

8 Airport Layout Plan

This chapter presents and describes the Airport Layout Plan (ALP) drawing set, which was created as part of the Airport Development Plan process. The chapter summarizes various aspects of the ALP, including its purpose, compliance with FAA standards, existing modifications to standards, a description of each ALP sheet and revisions made since the previous ALP. At the end of the chapter a copy of the ALP drawing set is included as a reduced-sized 11x17 insert.

8.1 ALP Purpose

The purpose of an ALP is to provide a detailed graphical representation of the existing and planned airport facilities, infrastructure, and their related operational and safety features. The ALP drawing set serves several needs for the Airport, Grand Junction, Mesa County, Colorado Department of Aeronautics, and the FAA. This critical planning tool provides these key stakeholders with the following information.

- Provides a comprehensive overview of the airport layout, including the location and dimensions of runways, taxiways, apron, terminals, parking areas and other key airport features.
- Ensures compliance with FAA design standards for airport development and grant assurances.
- Facilitates effective planning and decision-making for airport development and management, including capital improvements, maintenance, and operational activities.
- Supports coordination and communication amongst stakeholders.
- Provides a basis for airspace analysis and planning, including approach and departure procedures, airspace restrictions and other related considerations.
- Promotes discussions with FAA for federal funding for future capital projects.

8.2 FAA Design Standards and ALP Compliance

FAA provides airports with standards to ensure facilities are designed safely and efficiently. The primary document airport's reference for ensuring their facilities meet current standards is FAA Advisory Circular (AC) 150/5300-13B, *Airport Design*. Additionally, several FAA guidelines and checklists were used to ensure the ALP set was prepared in accordance with FAA standards. These additional documents included the following.

- FAA ARP SOP 2.00, Standard Procedures for FAA Review and Approval of Airport Layout Plans (ALPs)
- FAA ARP SOP 3.00, Standard Procedures for FAA Review of Exhibit 'A' Airport Property Inventory Maps
- FAA Advisory Circular 150/5070-6B Change 2, Airport Master Plans
- FAA Advisory Circular 150/5190-4B, Airport Land Use Compatibility Planning

- Code of Federal Regulation Title 14 Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace
- FAA Advisory Circular 150/5340-30J, Design and Installation Details for Airport Visual Aids
- FAA Advisory Circular 150/5340-1M, Standards for Airport Markings
- FAA Order 8260.3E, United States Standards for Terminal Instrument Procedures
- FAA Order 8260.19I, Flight Procedures and Airspace
- FAA Order 6850.2B, Visual Guidance Lighting Systems

8.3 Modifications to Standards

The FAA regularly updates and revises the standards for designing and operating airports to ensure safety and efficiency. These changes are often prompted by advances in technology, new aircraft models, or lessons learned from previous accidents. As a result, it is not uncommon for airports to have non-standard conditions or modifications to standards, as they met the standards in effect at the time of their implementation, but those standards have since changed. At GJT, there are currently six modifications to standards and one nonstandard condition. Each condition is documented in **Table 8-1**, along with the proposed corrective action for the facility to meet current FAA standards.

Table 8-1. Modifications to Standards / Nonstandard Conditions

Description	Existing Condition	Proposed Correction
Runway 11-29 Traverse Gradient	Transverse gradient exceeds recommended design standard of 1.5%	When Runway 11-29 is converted to Taxiway A as part of the Runway 11-29 shift project.
Runway 11-29 Longitudinal Gradient	Longitudinal gradient exceeds recommended design standard of 0.8%	When Runway 11-29 is converted to Taxiway A as part of the Runway 11-29 shift project.
Runway 11-29 Connecting Taxiway Longitudinal Gradient	Connecting taxiway longitudinal gradient exceeds recommended design standards of 1.5%	When Runway 11-29 is converted to Taxiway A as part of the Runway 11-29 shift project.
Runway Visibility Zone (RVZ)	Many structures obstruct line of sight. Runway 4-22 is closed when ATCT is closed.	When existing Runway 11-29 is decommissioned and redesignated as a taxiway.
Taxiway B Longitudinal Gradient	Longitudinal gradient exceeds recommended design standards of 1.5%	When the air carrier apron is expanded and reconstructed.
Runway 11-29 Traverse Gradient	Transverse gradient exceeds recommended design standard of 1.5% in the center of the runway.	When Runway 11-29 is converted to Taxiway A as part of the Runway 11-29 shift project.
Taxiway A Shoulders (Nonstandard)	No paved shoulders	When Runway 11-29 is converted to Taxiway A as part of the Runway 11-29 shift project.

Source: GJT Airport Layout Plan, 2018 & InterVISTAS Analysis, 2021

8.4 Airport Layout Plan Drawing Sheet Descriptions

The ALP set graphically illustrates existing conditions and those proposed over the 20-year planning horizon. This section describes each of the sheets that were prepared in the complete ALP set.

1	Cover Sheet	20	Inner Portion of the Approach Surface Drawing Runway 22
2	Airport Data Sheet	21	Departure Surface – Existing Runway 11
3	Airport Data Sheet	22	Departure Surface – Future Runway 12
4	Existing Airport Layout Drawing	23	Departure Surface – Existing Runway 29
5	Interim Airport Layout Drawing	24	Departure Surface – Future Runway 30
6	Future Airport Layout Drawing – North	25	Departure Surface – Future Runway 12L
7	Future Airport Layout Drawing – South	26	Departure Surface – Future Runway 30R
8	Airport Airspace Drawing – Plan View	27	Departure Surface Obstruction Table
9	Airport Airspace Drawing Runway 12 Approach Plan View	28	General Aviation Drawing – NW
10	Airport Airspace Drawing Runway 30 Approach Plan View	29	General Aviation Drawing – SE
11	Airport Airspace Drawing Runway 12R Approach Plan View	30	General Aviation Drawing – NW (EXT)
12	Airport Airspace Drawing Runway 30L Approach Plan View	31	General Aviation Drawing – SE (EXT)
13	Airport Airspace Drawing Runway 12L Profile View	32	Terminal Area Drawing
14	Airport Airspace Drawing Runway 30R Profile View	33	Existing Land Use Drawing
15	Airport Airspace Drawing Runway 4-22 Profile View	34	Existing Land Use Plan Off Airport
16	Inner Portion of the Approach Surface Drawing Runway 11 – Plan	35	Airport Property Inventory Map Exhibit ‘A’
17	Inner Portion of the Approach Surface Drawing Runway 11 – Profile	36	Airport Property Inventory Map Exhibit ‘A’
18	Inner Portion of the Approach Surface Drawing Runway 29	37	Airport Property Inventory Map Property Information
19	Inner Portion of the Approach Surface Drawing Runway 4		

8.4.1 Cover Sheet

Sheet 1 contains information regarding the Airport’s name and an index that lists each sheet included in the ALP set. In addition, it includes a map that displays the Airport’s location and vicinity, as well as a title block to incorporate approval signatures, board members and a history of ALP revisions.

8.4.2 Airport Data Sheets

Sheets 2 and 3 provide comprehensive data tables detailing the current and future conditions of the Airport. These sheets provide crucial information regarding the characteristics of critical airport infrastructure. Major airport components and the information presented in these sheets include:

- **Airport Data Table** – Airport reference code (ARC), highest elevation point at the airport, mean maximum temperature of the hottest month, airport reference point (ARP), critical aircraft, and service level for the NPIAS and the state of Colorado.
- **Runway Data Table** – Runway design code (RDC), pavement strength, gradient, dimensions, end coordination and elevations, separation and safety area dimensions, approach and departure surfaces, navigational and visual aids.
- **Taxiway Data Table** – Dimensions, lighting, and separation standards.
- **Modifications to Standards** – A list of all modifications to standards at the airport including known nonstandard conditions.
- **Declared Distances Table** – Values for Take Off Runway Available (TORA), Take Off Distance Available (TODA), Accelerate Stop Distance (ASDA) and Landing Distance Available (ASDA).
- **Wind Rose Data** – Wind rose and tables that present crosswind coverage as 10.5, 13 and 16 knots for both instrument metrological conditions and all-weather conditions.

8.4.3 Airport Layout Plan Drawings (Existing & Future)

Sheets 4 through 7 serve as a graphical representation of existing and future Airport facilities. One main objective of the Airport Layout Plan Drawing is to depict areas of land that need to be preserved for aeronautical functions, either constructing a facility or providing proper separation to ensure the safe operations of aircraft.

Additionally, Sheets 5 and 6 portray changes to physical characteristics both within and surrounding the Airport that could impact safe navigation of airspace or the airport's operational capabilities. The development depicted on the ALP corresponds to the Airport's 20-year CIP. Specifically, the drawing delineates the Airport's property boundaries, land utilization, and facility configuration in accordance with FAA airfield design and separation standards. It also comprises a plan view of the approach surface under CFR 14 Part 77 for each runway end, as well as the identification of NAVIAD facilities and critical areas. Finally, each sheet shows dimensional data on the runways, taxiways, taxilanes, aprons and associated airspace. There is a space reserved on each sheet designated for FAA approval.

8.4.4 Airport Airspace Drawings – Plan View

Sheets 8 through 10 depict the imaginary surfaces defined in the CFR 14 Part 77, *Safe, Efficient Use, and Preservation of The Navigable Airspace* in plan view. These surfaces define the recommended heights for objects in the vicinity of an airport. A USGS digital map serves as the base for the drawings, which illustrate all of the FAR Part 77, Subpart C, Imaginary Surfaces (Primary, Approach, Transitional, Horizontal, and Conical). These drawings depict the ultimate airspace conditions for the Airport.

The sheets also identify all obstructions to FAR Part 77, Imaginary Surfaces. Each obstruction is identified by a dot with a corresponding number that correlates to an entry in the obstruction data table. The table provides a description, ground elevation, top elevation, which surface the object penetrations and a proposed disposition for mitigation. Obstructions vary from vegetation to human-made objects. Some objects are defined as fixed-by-function, such as NAVAIDS, because of current sitting requirements and the role they play in ensuring the safe navigation of flight.

8.4.5 Airport Airspace Drawings – Profile View

Sheets 11 through 15 depict the imaginary surfaces defined in CFR 14 Part 77, *Safe, Efficient Use, and Preservation of The Navigable Airspace* in profile view. Each sheet depicts the full extents of each runway's ultimate Part 77 Approach Surface. For Runways 12, 30, 12R and 30L, the approach surface extends out to 52,000 feet beyond the runway's threshold. For Runways 4 and 22, the approach surface extends out to 6,000 feet beyond the runway's threshold.

8.4.6 Runway Inner Approach Plan and Profile

Sheets 16 through 20 provide a plan and profile for each runway's existing approach surfaces. These drawings offer a more detailed depiction of the airspace off each runway end. In compliance with FAA ALP development guidance, each sheet shows the extents of the approach surface up to 100 feet above the runway's threshold. Each drawing also depicts the Departure Surface, Threshold Siting Surface, PAPI Obstacle Clearance Surface, and Inner Approach Obstacle Free Zone, when applicable. Obstructions are depicted with a black dot with a corresponding number that correlates to an entry that relates to the entry made in the obstruction table.

Each drawing also depicts critical airfield design components including runways, taxiways, Runway Protection Zones, Runway Safety Areas, Runway Object Free Areas, navigational aids, and roadways.

8.4.7 Departure Surface Drawings

Sheets 21 through 26 depict the Departure Surface defined in FAA Advisory Circular 150/5300-13B, *Airport Design*. Each sheet shows the full extents of each runway's existing and future departure surface in both plan and profile view. Obstructions are depicted with a black dot with a corresponding number that correlates to an entry that relates to the entry made in the obstruction table found on Sheet 26, Departure Surface Obstruction Table.

8.4.8 Departure Surface Obstruction Table

Sheet 27 provides tables showing each obstruction noted in the Departure Surface Drawings. Each table provides a description, ground elevation, top elevation, the clearance or penetration to the Departure and a proposed disposition for mitigation.

8.4.9 Terminal Area and General Aviation Drawings

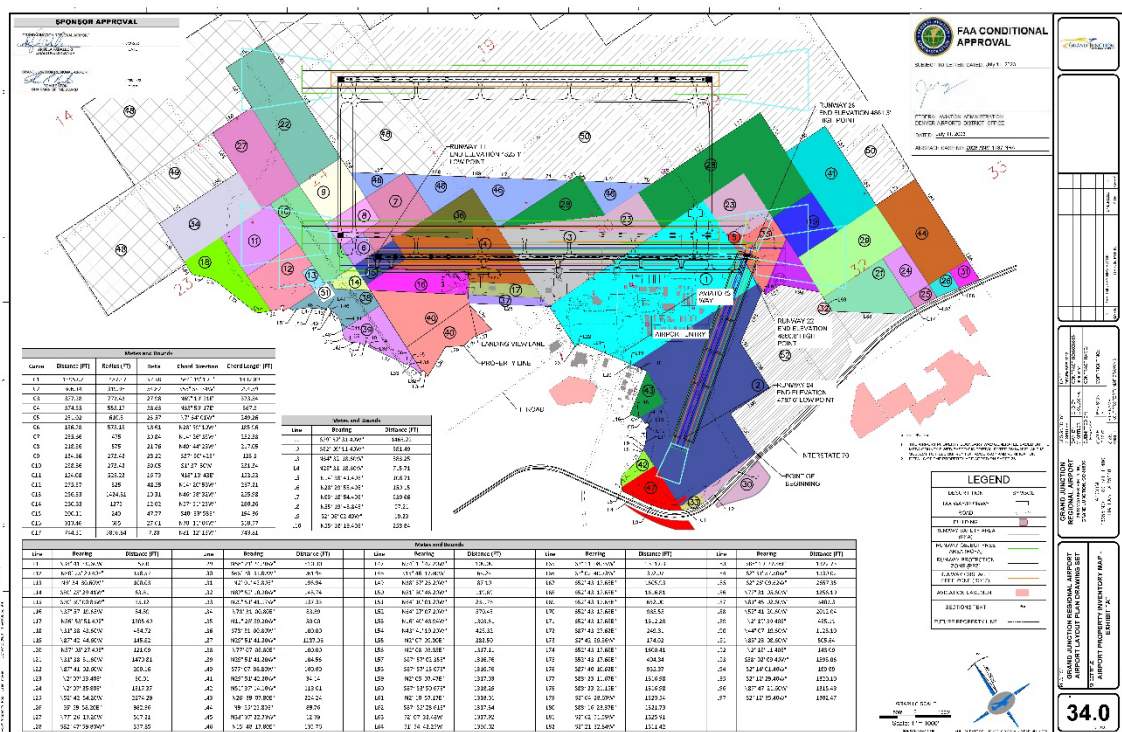
Sheets 28 through 32 show existing and future conditions for significant general aviation areas and the terminal area. These sheets, scaled at one-inch equals 200 feet, provide dimensional criteria involving runways, taxiways and taxilanes, surfaces, and aprons.

8.4.10 On-Airport and Off-Airport Land Use Plan

Sheets 33 and 34 depict the existing land use and zoning on and around the airport. Each land use is graphically represented and identified in a different color shade. The 65 Day-Night Average Sound Level (DNL) is reflective of the one included in the City of Grand Junction's Zoning Code. It is recommended the sheet is revised with updated contours once Runway 11-29 is shifted.

8.4.11 Exhibit 'A' Airport Property Map

Sheets 35 through 37 present the airport property interests that are in alignment with the Airport Layout Plan drawing. Based on information extracted from property deeds that comprise the legal descriptions of the parcels, the Exhibit 'A' drawing records the airport's previous land acquisitions, encompassing both fee-simple and easement tracts, and outlines any acquisitions or disposals that have taken place since the last Airport Layout Plan was implemented. The creation of this sheet adheres to the guidelines established in ARP SOP 3.00 FAA Review of Exhibit 'A' Airport Property Inventory Maps.



8.5 Airport Layout Plan Changes Since Prior Set

The proposed future conditions shown in this ALP set are largely similar to those depicted in the 2018 approved ALP set. There are four major changes to the ALP set listed below that are reflective of the recommendations from the ADP.

- **Future terminal size, orientation, and shape.** This change is the result of current market trends and to accommodate growth in passengers and aircraft as noted in the approved demand

forecast. Additionally, changes reflect the recommendations from an assessment of terminal functional area capacities to ensure an adequate level of service.

- **Runway 4-22 will remain a visual runway.** An airspace analysis to determine the feasibility of publishing a non-precision approach procedure for Runway 4-22. Given the terrain off each runway end it is unlikely a non-precision approach procedure could be constructed. Even if one was plausible, it is unlikely that it will trigger the need to increase the size of the Runway Protection Zone. Therefore, the ALP shows the current conditions of Runway 4-22 being adequate throughout the planning period.
- **Hangar development.** The proposed hangar development along Taxiway A has changed to reflect current market trends and the forecasted based aircraft.
- **Landing View Lane Extension to 27 ¼ Road.** To provide adequate access for tenants, airport users and mutual aid, Landing View Lane is proposed to be extended in the future and connect to 27 ¼ Road. The extension of the roadway does not require any land being acquired as shown on the Future Airport Layout Drawings.

8.6 Airport Layout Plan Set

The Airport Layout Plan drawing set included in this report is a scaled-down 11x17 rendition of the original drawings that undergone scrutiny and validation from the FAA, Colorado Department of Transportation, Aeronautics Division, Airport staff and other key stakeholders

Figure 8-1. Cover Sheet

COUNTY OF MESA

GRAND JUNCTION REGIONAL AIRPORT

ANGELA PADALECKI, AIRPORT DIRECTOR

AIP GRANT NO.:3-08-0027-2021

DRAWING INDEX

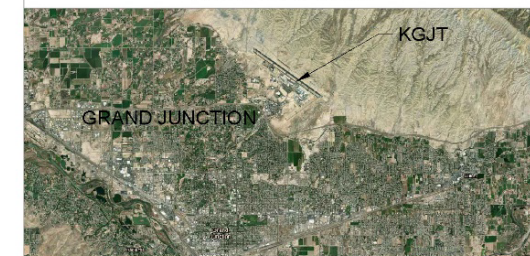
SHEET	TITLE	
1.0	Cover Sheet	APRIL 4, 2023
2.0	Airport Data Sheet	APRIL 4, 2023
3.0	Airport Data Sheet	APRIL 4, 2023
4.0	Existing Airport Layout Drawing	APRIL 4, 2023
5.0	Interim Airport Layout Drawing	APRIL 4, 2023
6.0	Future Airport Layout Drawing - North	APRIL 4, 2023
7.0	Future Airport Layout Drawing - South	APRIL 4, 2023
8.0	Airport Airspace Drawing- Plan View	APRIL 4, 2023
9.0	Airport Airspace Drawing Runway 12 Approach Plan View	APRIL 4, 2023
10.0	Airport Airspace Drawing Runway 30 Approach Plan View	APRIL 4, 2023
11.0	Airport Airspace Drawing Runway 12R Approach Profile View	APRIL 4, 2023
12.0	Airport Airspace Drawing Runway 30L Approach Profile View	APRIL 4, 2023
13.0	Airport Airspace Drawing Runway 12L Profile View	APRIL 4, 2023
14.0	Airport Airspace Drawing Runway 30R Profile View	APRIL 4, 2023
15.0	Airport Airspace Drawing Runway 04-22 Profile View	APRIL 4, 2023
16.0	Inner Portion of the Approach Surface Drawing RWY 11-PLAN	APRIL 4, 2023
17.0	Inner Portion of the Approach Surface Drawing RWY 11-PROFILE	APRIL 4, 2023
18.0	Inner Portion of the Approach Surface Drawing RWY 29	APRIL 4, 2023
19.0	Inner Portion of the Approach Surface Drawing RWY 04	APRIL 4, 2023
20.0	Inner Portion of the Approach Surface Drawing RWY 22	APRIL 4, 2023
21.0	Departure Surface - Existing Runway 11	APRIL 4, 2023
22.0	Departure Surface - Future Runway 12	APRIL 4, 2023
23.0	Departure Surface - Existing Runway 29	APRIL 4, 2023
24.0	Departure Surface - Future Runway 30	APRIL 4, 2023
25.0	Departure Surface - Future Runway 12L	APRIL 4, 2023
26.0	Departure Surface - Future Runway 30R	APRIL 4, 2023
27.0	Departure Surface Obstruction Table	APRIL 4, 2023
28.0	General Aviation Drawing - NW	APRIL 4, 2023
29.0	General Aviation Drawing- SE	APRIL 4, 2023
30.0	General Aviation Drawing - NW (EXT)	APRIL 4, 2023
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33.0	Existing Land Use Drawing	APRIL 4, 2023
34.0	Existing Land Use Plan Off Airport	APRIL 4, 2023
35.0	Airport Property Inventory Map Exhibit "A"	APRIL 4, 2023
36.0	Airport Property Inventory Map Exhibit "A"	APRIL 4, 2023
37.0	Airport Property Inventory Map Property Information	APRIL 4, 2023

AIRPORT AUTHORITY BOARD OF COMMISSIONERS

- TOM BENTON, CHAIR
- CLAY TUFLY, VICE CHAIR
- RICK TAGGART
- LINDE MARSHALL
- THADDEUS SHRADER
- ERLING BRABAEC
- RON VELARDE



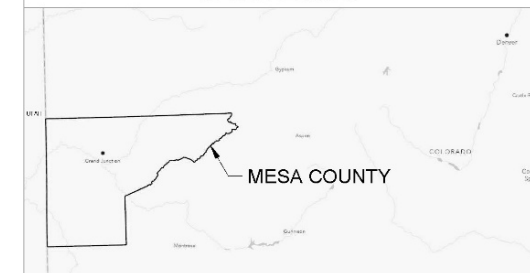
VICINITY MAP



LOCATION MAP



STATE MAP



OWNER AND REPRESENTATIVES

OWNER:

GRAND JUNCTION REGIONAL AIRPORT AUTHORITY
COUNTY OF MESA
2828 WALKER FIELD DR
GRAND JUNCTION, CO 81506

AIRPORT STAFF:

ANGELA PADALECKI, AIRPORT DIRECTOR
2828 WALKER FIELD DR
GRAND JUNCTION, CO 81506
TELEPHONE NO. (970)-244-9100

APPROVALS

 GRAND JUNCTION REGIONAL AIRPORT TOM BENTON CHAIRMAN OF THE BOARD	 GRAND JUNCTION REGIONAL AIRPORT ANGELA PADALECKI EXECUTIVE DIRECTOR
---	--

[illegible]

GRAND JUNCTION REGIONAL AIRPORT 2828 WALKER FIELD DR GRAND JUNCTION, CO 81506		DESIGNED BY: M. S. SIVAKRISHNA DRAWN BY: U. S. SIVAKRISHNA CHECKED BY: S. S. SIVAKRISHNA QUANTITY BY: H. S. SIVAKRISHNA	DATE: APRIL 2023 PROJECT NO.: CONTRACT NAME: COPYRIGHT NO.: REVISION: A SCALE:	SIZE: 11x17 FILE NAME: ANSID: 10
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PROJECT	GRAND JUNCTION REGIONAL AIRPORT AIRPORT LAYOUT PLAN DRAWING SET
SHEET TITLE	COVER SHEET

SHEET
1.0

Figure 8-2. Airport Data Sheet

RUNWAY DATA TABLE										
	RUNWAY 11	RUNWAY 29	RUNWAY 11	RUNWAY 29	RUNWAY 11 (12)	RUNWAY 29 (30)	RUNWAY 12L	RUNWAY 30R	RUNWAY 4	RUNWAY 22
DESCRIPTION	EXISTING	EXISTING	INTERIM	INTERIM	FUTURE	FUTURE	FUTURE	FUTURE	EXISTING (E)/ FUTURE (F)	EXISTING (E)/ FUTURE (F)
RUNWAY IDENTIFICATION	> UTILITY	> UTILITY	SAME	SAME	SAME	SAME	> UTILITY	> UTILITY	> UTILITY	> UTILITY
RUNWAY DESIGN CODE (RDC)	C-IV-2400	C-IV-5000	SAME	SAME	D-IV-2400	D-IV-2400	D-IV-2400	D-IV-2400	B-II-VIS	B-II-VIS
CRITICAL AIRCRAFT	B-757-200	B-757-200	SAME	SAME	B-757-300	B-757-300	B-757-300	B-757-300	COMPOSITE	COMPOSITE
APPROACH REFERENCE CODE (APRC)	D/IV/2400	D/IV/5000	SAME	SAME	SAME	D/IV/2400	D/IV/2400	D/IV/2400	B/II/VIS	B/II/VIS
DEPARTURE REFERENCE CODE (DPRC)	D/IV - D/V	D/IV - D/V	SAME	SAME	SAME	SAME	D/IV - D/V	D/IV - D/V	B/II	B/II
WIND COVERAGE REQUIREMENT (KNOTS)	20	20	SAME	SAME	SAME	SAME	20	20	13	13
PERCENT WIND COVERAGE	99.71%	99.71%	SAME	SAME	SAME	SAME	99.71%	99.71%	99.89%	99.89%
PAVEMENT STRENGTH (LBS):										
SINGLE WHEEL	111,000	111,000	SAME	SAME	SAME	SAME	111,000	111,000	26,000	26,000
DUAL WHEEL	180,000	180,000	SAME	SAME	SAME	SAME	180,000	180,000	26,000	26,000
DUAL TANDUM WHEEL	260,000	260,000	SAME	SAME	SAME	SAME	260,000	260,000	-	-
PAVEMENT SURFACE TYPE	ASPHALT	ASPHALT	SAME	SAME	SAME	SAME	ASPHALT	ASPHALT	ASPHALT	ASPHALT
PAVEMENT SURFACE TREATMENT	GRVD	GRVD	SAME	SAME	SAME	SAME	GRVD	GRVD	GRVD	GRVD
PAVEMENT CLASSIFICATION NUMBER - PCN	57/F/C/X/T	57/F/C/X/T	-	-	-	-	-	-	10/F/C/X/T	10/F/C/X/T
EFFECTIVE GRADIENT (IN %)	0.38%	1.38%	SAME	SAME	0.29%	0.29%	0.29%	0.29%	1.30%	1.30%
MAXIMUM GRADIENT (IN %)	1.13%	2.13%	SAME	SAME	0.29%	0.29%	0.29%	0.29%	1.37%	1.37%
LINE OF SIGHT REQUIREMENT MET	CRITERIA MET	CRITERIA MET	SAME	SAME	SAME	SAME	1.50%	1.50%	CRITERIA MET	CRITERIA MET
RUNWAY LENGTH	10503'	10503'	9343'	9343'	SAME	SAME	10503'	10503'	5501'	5501'
RUNWAY WIDTH	150'	150'	SAME	SAME	SAME	SAME	150'	150'	75'	75'
RUNWAY END ELEVATION	4823.1'	4861.3'	4827.9'	SAME	4825'	4856'	4858.5'	4900.0'	4787.6'	4860.8'
RUNWAY END LATITUDE	39° 08' 5.89" N	39° 07' 6.09" N	39° 07' 59.27" N	SAME	39° 08' 16.82" N	39° 07' 17.03" N	39° 07' 52.04" N	39° 07' 52.21" N	39° 06' 35.65" N	39° 07' 07.25" N
RUNWAY END LONGITUDE	108° 32' 39.63" W	108° 30' 50.73" W	108° 32' 27.82" W	SAME	108° 32' 46.32" W	108° 30' 57.42" W	108° 32' 14.11" W	108° 30' 25.48" W	108° 31' 47.58" W	108° 30' 50.81" W
DISPLACED THRESHOLD LATITUDE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DISPLACED THRESHOLD LONGITUDE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
DISPLACE THRESHOLD ELEVATION	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RUNWAY LIGHTING	HIRL	HIRL	SAME	SAME	SAME	SAME	HIRL	HIRL	MIRL	MIRL
RUNWAY PROTECTION ZONE (RPZ)										
INNER WIDTH (APP. / DEP.)	1000' / 500'	500' / 500'	SAME	SAME	SAME	1000' / 500'	1000' / 500'	1000' / 500'	500'	500'
OUTER WIDTH (APP. / DEP.)	1750' / 1010'	1010' / 1010'	SAME	SAME	SAME	1750' / 1010'	1750' / 1010'	1750' / 1010'	700'	700'
LENGTH (APP. / DEP.)	2500' / 1700'	1700' / 1700'	SAME	SAME	SAME	2500' / 1700'	2500' / 1700'	2500' / 1700'	1000'	1000'
RUNWAY MARKING TYPE	PIR	PIR	SAME	SAME	SAME	SAME	PIR	PIR	VIS	VIS
RUNWAY MARKING CONDITION	FAIR	FAIR	SAME	SAME	N/A	N/A	N/A	N/A	FAIR	FAIR
14 CFR PART 77 APPROACH CATEGORY SLOPE	50:1	34:1	SAME	SAME	SAME	50:1	50:1	50:1	20:1	20:1
APPROACH TYPE	PRECISION	NON-PRECISION	SAME	SAME	SAME	PRECISION	PRECISION	PRECISION	VISUAL	VISUAL
APPROACH VISIBILITY MINIMUMS	½ MILE	1 MILE	SAME	SAME	SAME	½ MILE	½ MILE	½ MILE	VISUAL	VISUAL
AERONAUTICAL SURVEY TYPE	VGS	VGS	SAME	SAME	SAME	SAME	VGS	VGS	NVGS	NVGS
DEPARTURE SURFACE (40:1 SLOPE)	YES	YES	SAME	SAME	SAME	SAME	YES	YES	NO	NO
RUNWAY SAFETY AREA (RSA)										
LENGTH BEYOND RUNWAY END (EXT. / REQ.)	1000'	1000'	SAME	SAME	SAME	SAME	1000'	1000'	300'	300'
WIDTH (EXT. / REQ.)	500'	500'	SAME	SAME	SAME	SAME	500'	500'	150'	150'
RUNWAY OBJECT FREE AREA (ROFA)										
LENGTH BEYOND RUNWAY END (EXT. / REQ.)	1000'	1000'	SAME	SAME	SAME	SAME	1000'	1000'	300'	300'
WIDTH (EXT. / REQ.)	800'	800'	SAME	SAME	SAME	SAME	800'	800'	500'	500'
RUNWAY OBSTACLE FREE ZONE (ROFZ)										
LENGTH BEYOND RUNWAY END (EXT. / REQ.)	200'	200'	SAME	SAME	SAME	SAME	200'	200'	200'	200'
WIDTH (EXT. / REQ.)	400'	400'	SAME	SAME	SAME	SAME	400'	400'	400'	400'
THRESHOLD SITING SURFACE RUNWAY TYPE	5	4	SAME	SAME	SAME	5	5	5	3	3
THRESHOLD SITING SURFACE PENETRATIONS	NO	NO	SAME	SAME	SAME	SAME	NO	NO	YES	YES
VISUAL APPROACH AIDS	PAPI-4L, MALSR, RVR	VASI-4L, REIL, RVR	PAPI-4L, MALSF, RVR	SAME	SAME	PAPI-4L, MALSR	PAPI-4L, MALSR, RVR	PAPI-4L, MALSR, RVR	PAPI-4L, REIL	REIL
INSTRUMENT APPROACH AIDS	ILS/DME	LDA/DME	SAME	SAME	SAME	SAME + ILS/LOC, RNAV(RNP)	ILS/DME	ILS/DME	N/A	N/A
RUNWAY TOUCHDOWN ZONE ELEVATION	4833'	4861.4'	4852' EST.	SAME	4833.9'	4856'	4870.3'	4900.0'	4827.5'	4860.8"
RUNWAY HIGH POINT ELEVATION	4861.4'	4861.4'	SAME	SAME	4856'	4856'	4900.0'	4900.0'	4860.8'	4860.8"
RUNWAY LOW POINT ELEVATION	4822.9'	4822.9'	4827.9'	4827.9'	4825'	4825'	4858.5'	4858.5'	4787.7'	4787.7'
RUNWAY < TO PARALLEL TWY < SEPARATION	400'	400'	SAME	SAME	600'	600'	600'	600'	250'	250'
RUNWAY < TO HOLDLINE SEPARATION (REQ.)	300'	300'	SAME	SAME	300'	300'	300'	300'	200'	200'
DISPLACED THRESHOLD DISTANCE	N/A	N/A	SAME	SAME	N/A	N/A	N/A	N/A	N/A	N/A
RUNWAY SHOULDER WIDTH	25'	25'	SAME	SAME	SAME	SAME	25'	25'	N/A	N/A
TRUE BEARING	125°	305°	SAME	SAME	SAME	SAME	125°	305°	54°	234°
MAGNETIC BEARING	119°	296°	SAME	SAME	SAME	SAME	116°	296°	45°	225°
RUNWAY BLAST PAD DIMENSIONS (LENGTH x WIDTH)	99'x190'	100'x190'	SEE NOTE 11	SAME	200'x200'	200'x200'	200'x200'	200'x200'	N/A	N/A
SHEET NOTES:										
1. REFER TO GENERAL NOTES ON SHEET 3 - AIRPORT DATA SHEET.										
2. EXISTING AND FUTURE AIRPORT REFERENCE POINT (ARP), DETERMINED USING FAA COMPSYS 21 SOFTWARE.										
3. FUTURE AIRPORT ELEVATION BASED ON CURRENT DEVELOPMENT PLANS.										
4. TRUE BEARING DETERMINED USING FAA GEO 83 SOFTWARE.										
5. PAVEMENT STRENGTH AS LISTED BY THE FAA NATIONAL FLIGHT DATA CENTER AND/OR AIRPORT IQ 5010 AIRPORT MASTER RECORDS.										
6. FOR PRECISION INSTRUMENT RUNWAYS (PIRS) THE GLIDEPATH QUALIFICATION SURFACE (GQS), IS APPLIED IN ADDITION TO THE TSS THAT MATCHES THE AIRCRAFT APPROACH CATEGORY, USE, AND MINIMUMS.										
7. RUNWAY CENTERLINE TO PARALLEL TAXIWAY CENTERLINE SEPARATION DISTANCE VARIES PER RUNWAY AND IS SUBJECT TO THE RDC REQUIREMENT FOR EACH RESPECTIVE RUNWAY.										
7. CFR PART 77 SURFACES ARE BASED ON THE EXISTING RUNWAY END LOCATIONS.										
8. FOR RUNWAY 29 THE VISIBILITY IS 1 1/2 AND 1 3/4 SM FOR CAT C AND D AIRCRAFT RESPECTIVELY.										
9. CLOSE IN OBSTRUCTIONS ARE SHOWN ON THE INNER PORTION OF THE APPROACH SURFACE DRAWINGS ON SHEETS 15-19.										
10. THRESHOLD SITING SURFACE PENETRATIONS ARE DOCUMENTED ON SHEET 7.0 AIRPORT AIRSPACE DRAWING PLAN VIEW.										
11. A PORTION OF RUNWAY 11-29 WILL BE CONVERTED TO A TAXIWAY FOR ACCESSING THE THRESHOLD OF RUNWAY 11.										

AIRPORT DATA TABLE					
DESCRIPTION	EXISTING	INTERIM	FUTURE		
AIRPORT REFERENCE POINT (ARP)	39°07'20.69"N	39°07'20.69"N	39°07'49.36"N		
COORDINATES (NAD 83)	108°31'38.75"W	108°31'38.75"W	108°31'32.44"W		
AIRPORT ELEVATION (MSL) (NAV 88)	4861.4'	4861.4'	4900'		
AIRPORT REFERENCE CODE (ARC)	C-IV	C-IV	D-IV		
CRITICAL AIRCRAFT	MAKE AND MODEL	B-757-200	B-757-200	B-757-300	
	WINGSPAN	125'	125'	156'	
	UNDERCARRIAGE WIDTH	24'	24'	36'	
	APPROACH SPEED (Kts.)	137	137	140	
MEAN MAX. TEMP. OF HOTTEST MONTH (JULY)	MAX. TAKEOFF WEIGHT (LBS)	255,000	255,000	412,000	
		96.8°	SAME	SAME	
MAGNETIC VARIATION	9° 30' E ± 0° 22' CHANGING BY 0° 5' W PER YEAR		SAME	SAME	
MISCELLANEOUS FACILITIES	SEGMENTED CIRCLE, LIGHTED WINDCONE, PART-TIME CONTROL TOWER, ASOS		SAME	SAME	
AIRPORT NAVAIDS	BEACON (CLEAR-GREEN), PAPI, VASI, ASR, RVR, ILS, LDA, DME, MALSR, REIL, GPS (FAA OWNED)		SAME	SAME	
NPIAS SERVICE LEVEL	PRIMARY NONHUB		SAME	SAME	
STATE EQUIVALENT SERVICE ROLE	COMM. SERVICE		SAME	SAME	

MODIFICATION OF STANDARDS					
DESCRIPTION	AIRPORT REFERENCE CODE	EXISTING CONDITIONS	FAA APPROVAL DATE	FAA AIRSPACE CASE #	PROPOSED CORRECTION
RUNWAY 11/29 TRAVERSE GRADIENT	C-IV	TRANSVERSE GRADIENT EXCEEDS RECOMMENDED DESIGN STANDARD OF 1.5%	03/22/1995	94-DEN-161-NRA	CONSTRUCT NEW RUNWAY 11/29
RUNWAY 11/29 LONGITUDINAL GRADIENT	C-IV	LONGITUDINAL GRADIENT EXCEEDS RECOMMENDED DESIGN STANDARD OF 0.8%	3/22/1995	94-DEN-161-NRA	CONSTRUCT NEW RUNWAY 11/29
RUNWAY 11/29 CONNECTING TAW LONGITUDINAL GRADIENT	C-IV	CONNECTING TAXIWAY LONGITUDINAL GRADIENT EXCEEDS RECOMMENDED DESIGN STANDARD OF 1.5%	3/22/1995	94-DEN-161-NRA	CONSTRUCT NEW RUNWAY 11/29
RUNWAY 11/29 RUNWAY 4/22 VISIBILITY ZONE	C-IV	MANY STRUCTURES OBSTRUCT LINE OF SIGHT, RUNWAY 4/22 WILL BE CLOSED AFTER AIR CONTROL TOWER HOURS OF OPERATION	03/2002	02-DEN-044-NRA	CONSTRUCT NEW RUNWAY 11/29
TAXIWAY "B" LONGITUDINAL GRADIENT	C-IV	LONGITUDINAL GRADIENT EXCEEDS RECOMMENDED DESIGN STANDARD OF 1.5%	08/5/2005	2005-ANM-318-NRA	EXPAND AND RECONSTRUCT AIR CARRIER APRON INCLUDING TAXIWAY "B"
RUNWAY 11/29 TRAVERSE GRADIENT	C-IV	TRANSVERSE GRADIENT EXCEEDS RECOMMENDED DESIGN STANDARD OF 1.5% IN THE CENTER OF 4,500 FEET	6/23/2008	2008-ANM-289-NRA	CONSTRUCT NEW RUNWAY 11/29
TAXIWAY A SHOULDERS	C-IV	NO PAVED SHOULDERS	-	-	IN CONNECTION WITH CONSTRUCTING NEW RUNWAY 11/29

DECLARED DISTANCES				
	TAKEOFF RUN AVAILABLE (TORA)	TAKEOFF DISTANCE AVAILABLE (TODA)	ACCELERATE-STOP DISTANCE (ASDA)	LANDING DISTANCE AVAILABLE (LDA)
RUNWAY 11-29 (EXISTING)	10503'	10503'	10503'	10503'
RUNWAY 11-29 (INTERIM)	9343'	9343'	9343'	9343'
RUNWAY 12-30 (FUTURE)	10503'	10503'	10503'	10503'
RUNWAY (12L-30R) (FUTURE)	10503'	10503'	10503'	10503'
RUNWAY 04-22 (EXISTING/FUTURE)	5501'	5501'	5501'	5501'

PROJECT
GRAND JUNCTION REGIONAL AIRPORT -
AIRPORT LAYOUT PLAN DRAWING SET

SHEET TITLE
AIRPORT DATA

SHEET
2.0

DESIGNED BY:
V. SPILLER
DATE:
APRIL 2023

CHECKED BY:
J. S. SCHNA
DATE:
06/06/24

DESIGNED BY:
V. SPILLER
DATE:
APRIL 2023

CHECKED BY:
J. S. SCHNA
DATE:
06/06/24

SCALE:
1"=100'

REVISION
A

COPYRIGHT NO.:
-

FILE NAME:
C:\PROJECTS\AIRPORT LAYOUT PLAN\AIRPORT DATA SHEET

SIZE:
11x17

DATE:
APRIL 2023

DESCRIPTION:
-

DATE:
APRIL 2023

DESCRIPTION:
-

NOT ISSUED FOR CONSTRUCTION

Airport Layout Plan
Grand Junction Regional Airport

176

Figure 8-3. Airport Data Sheet

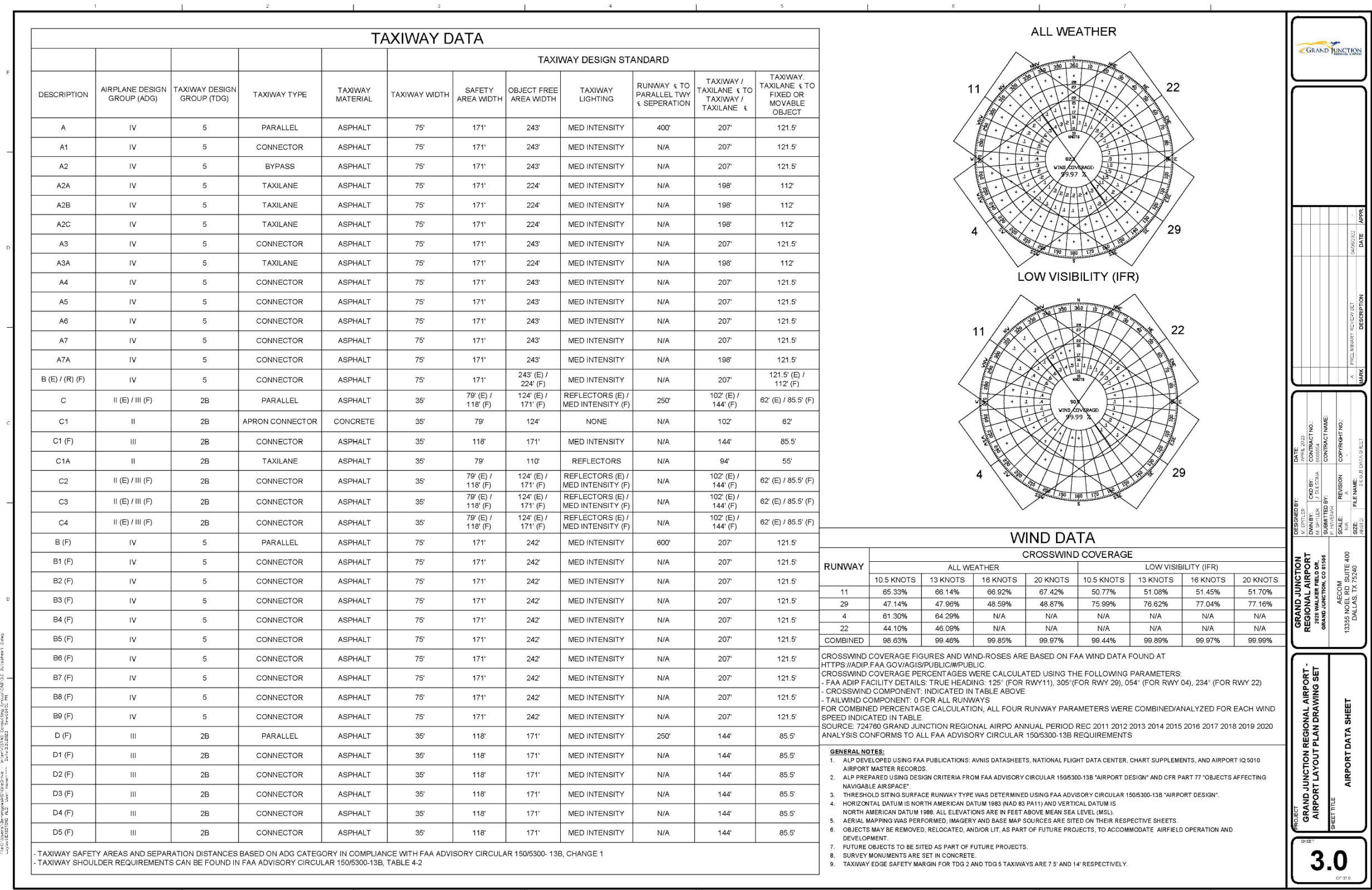


Figure 8-4. Existing Airport Layout Drawing

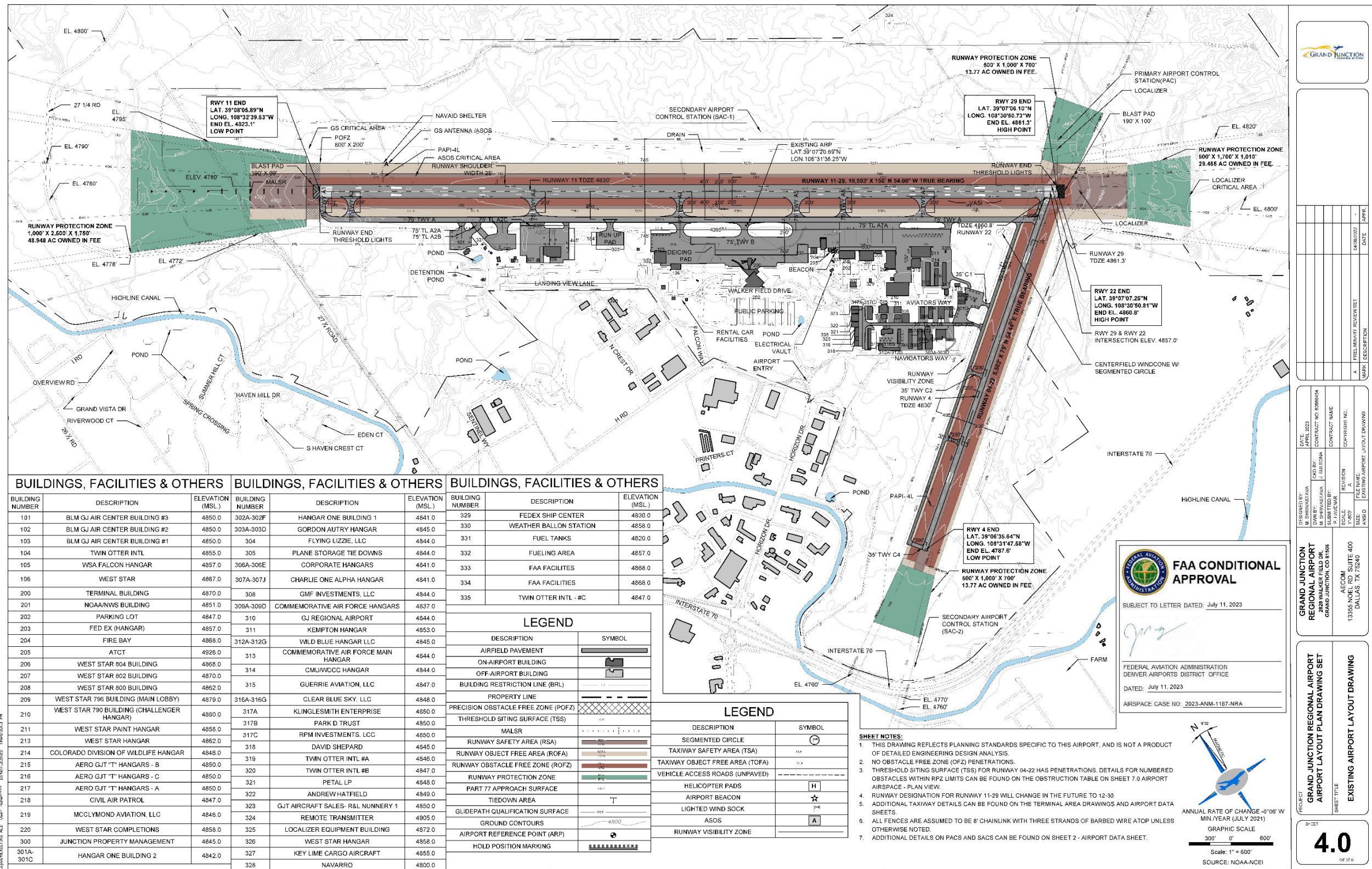


Figure 8-5. Interim Airport Layout Drawing

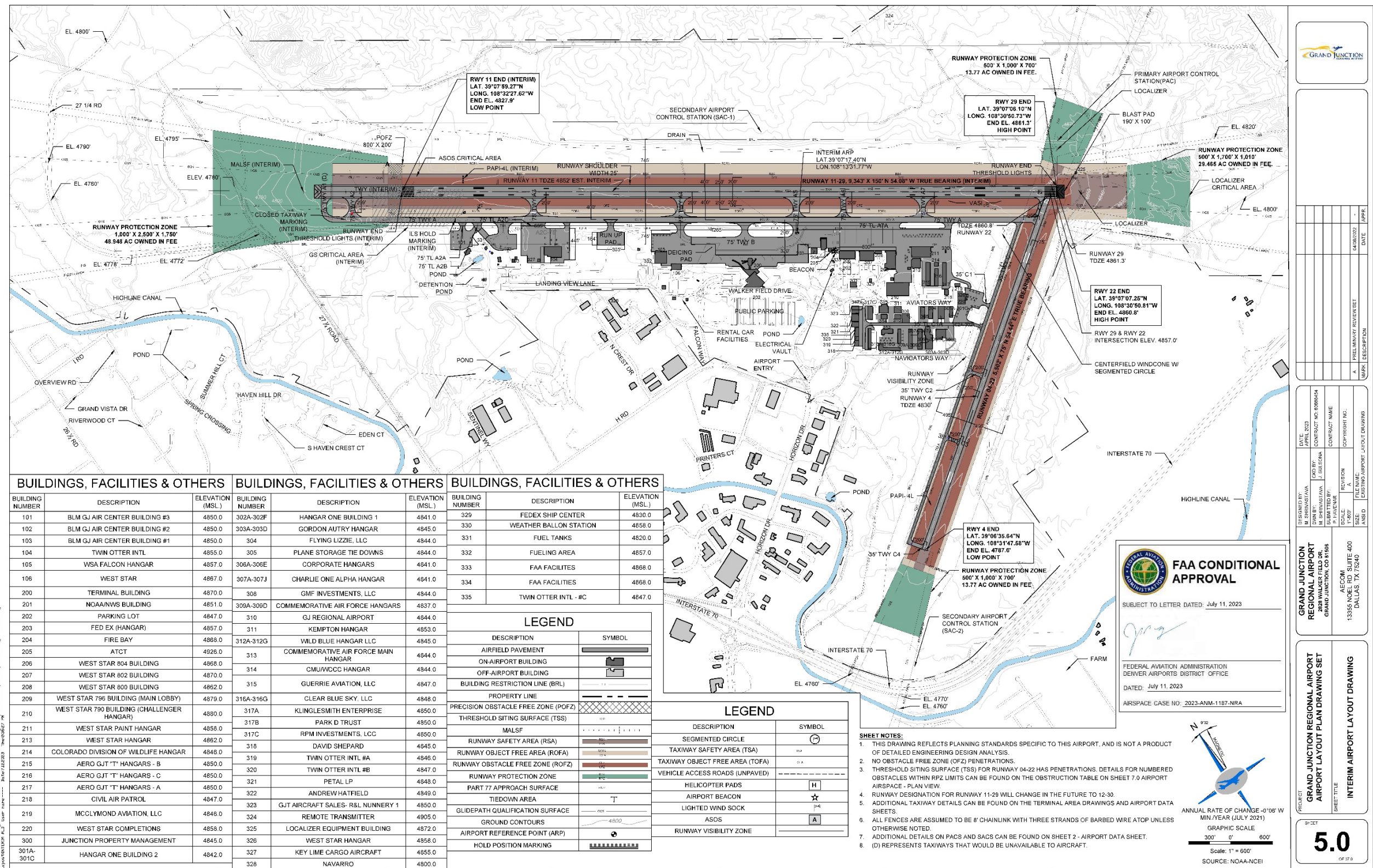


Figure 8-6. Future Airport Layout Drawing – North

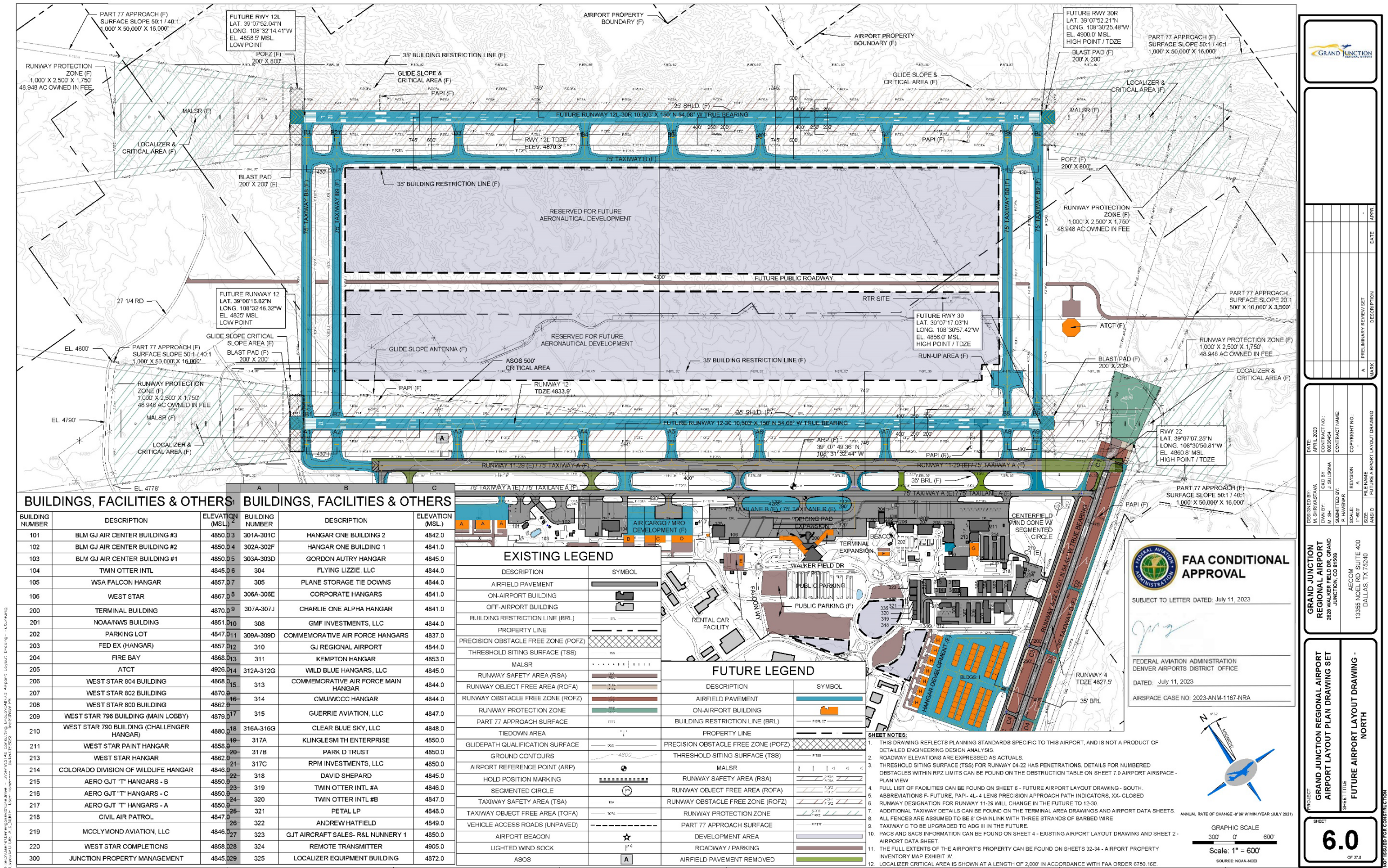


Figure 8-7. Future Airport Layout Drawing – South

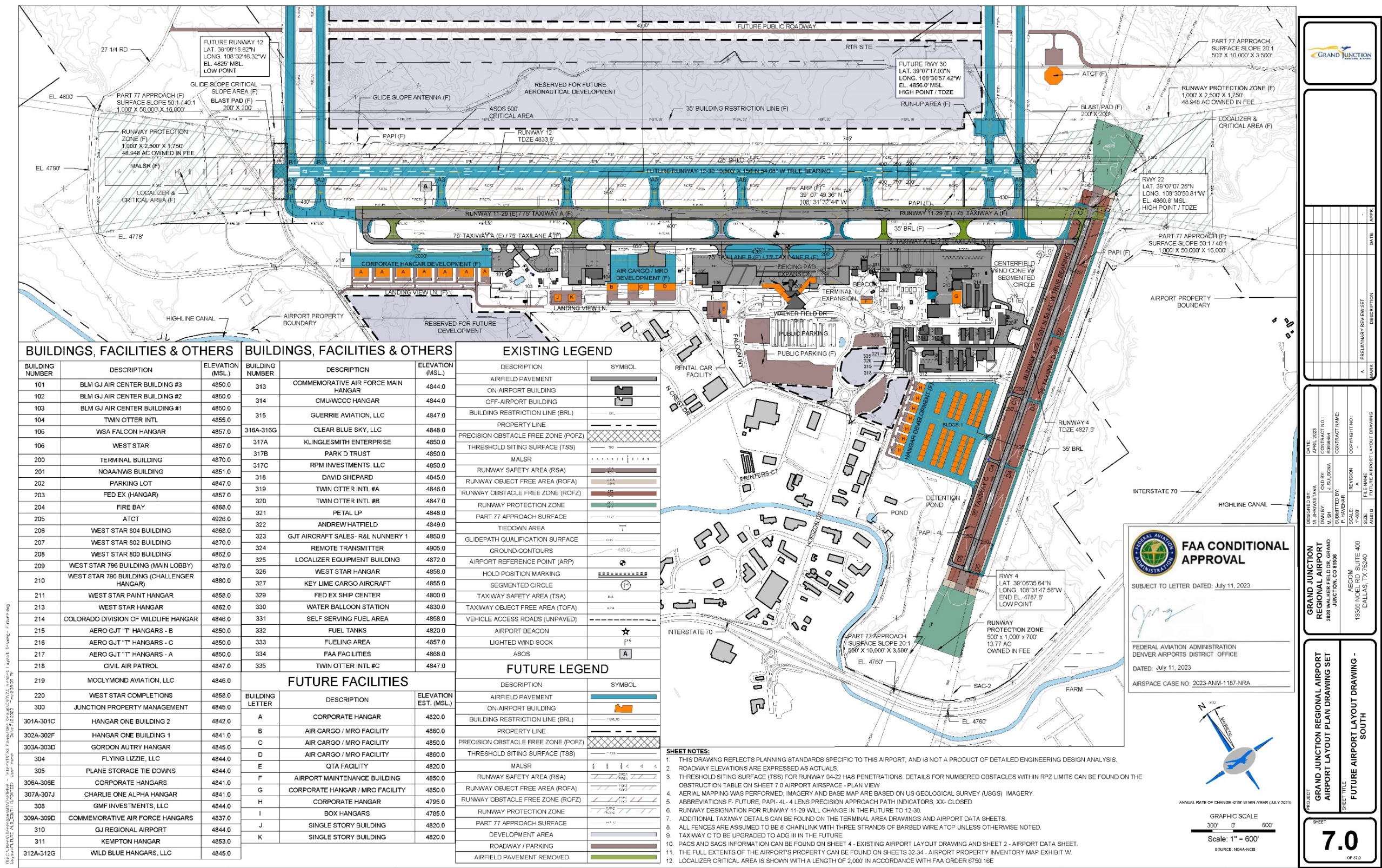


Figure 8-8. Airport Airspace Drawing – Plan View

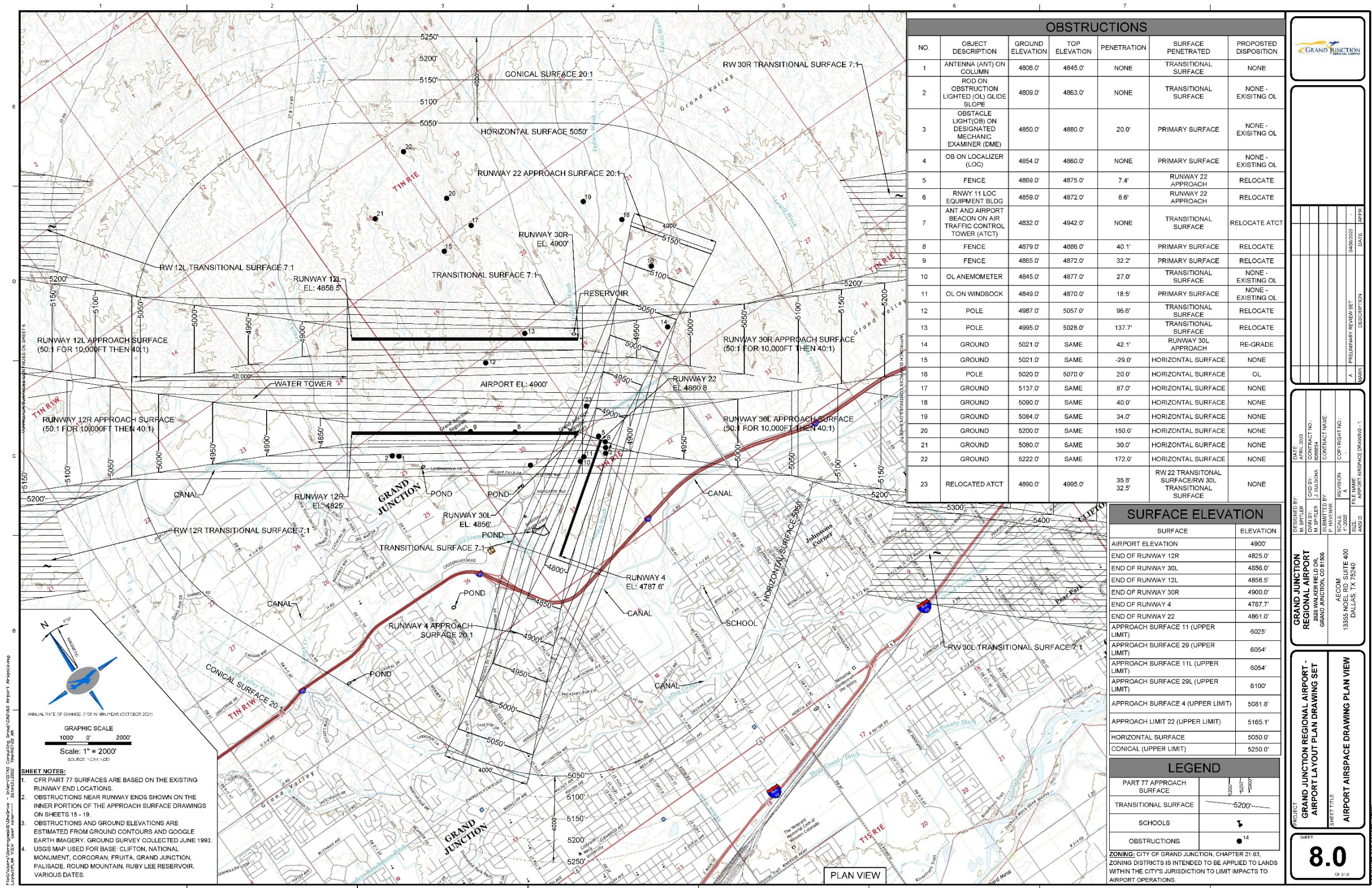


Figure 8-10. Airport Airspace Drawing Runway 30 Approach Plan View

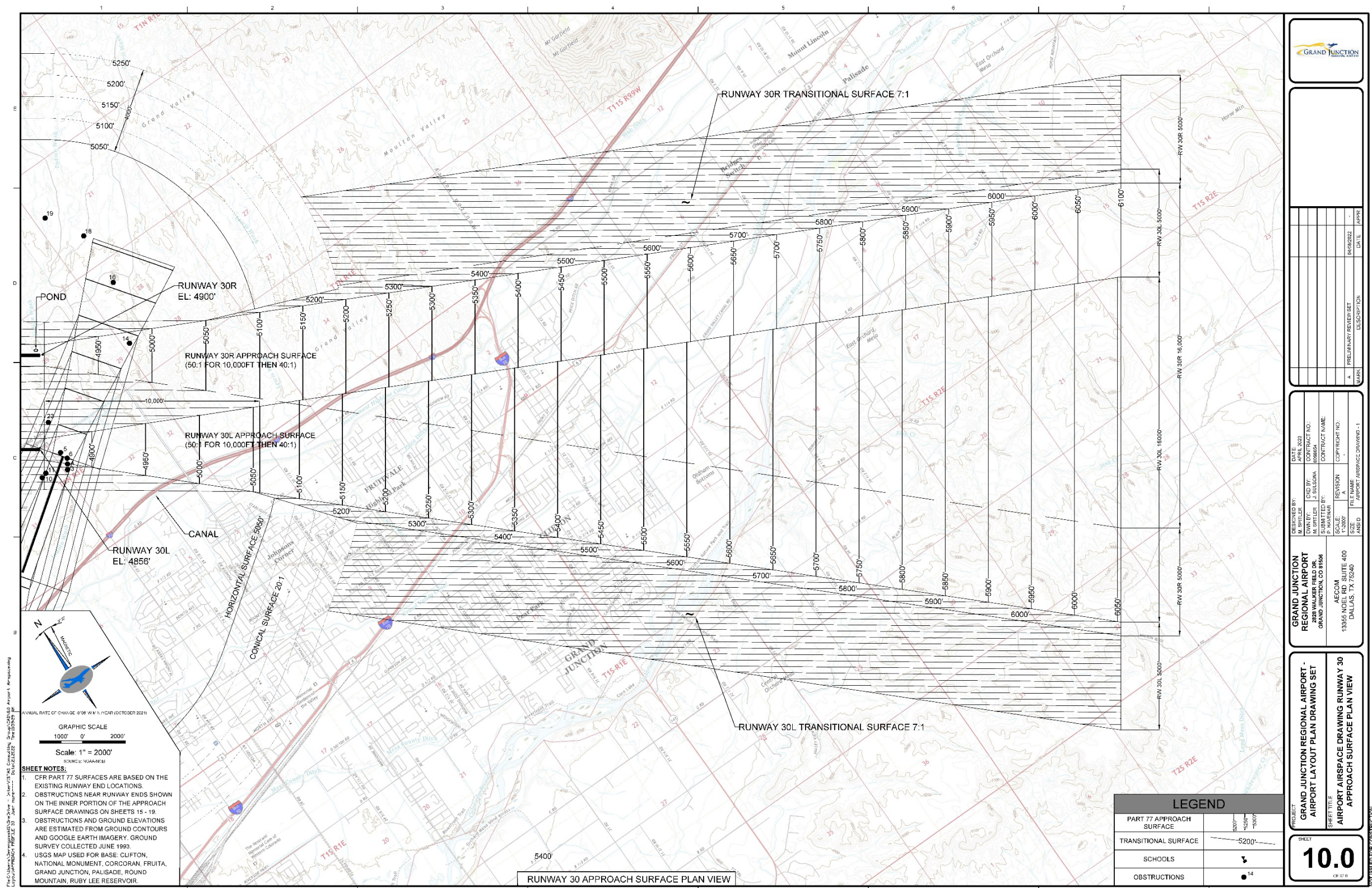


Figure 8-11. Airport Airspace Drawing Runway 12R Approach Plan View

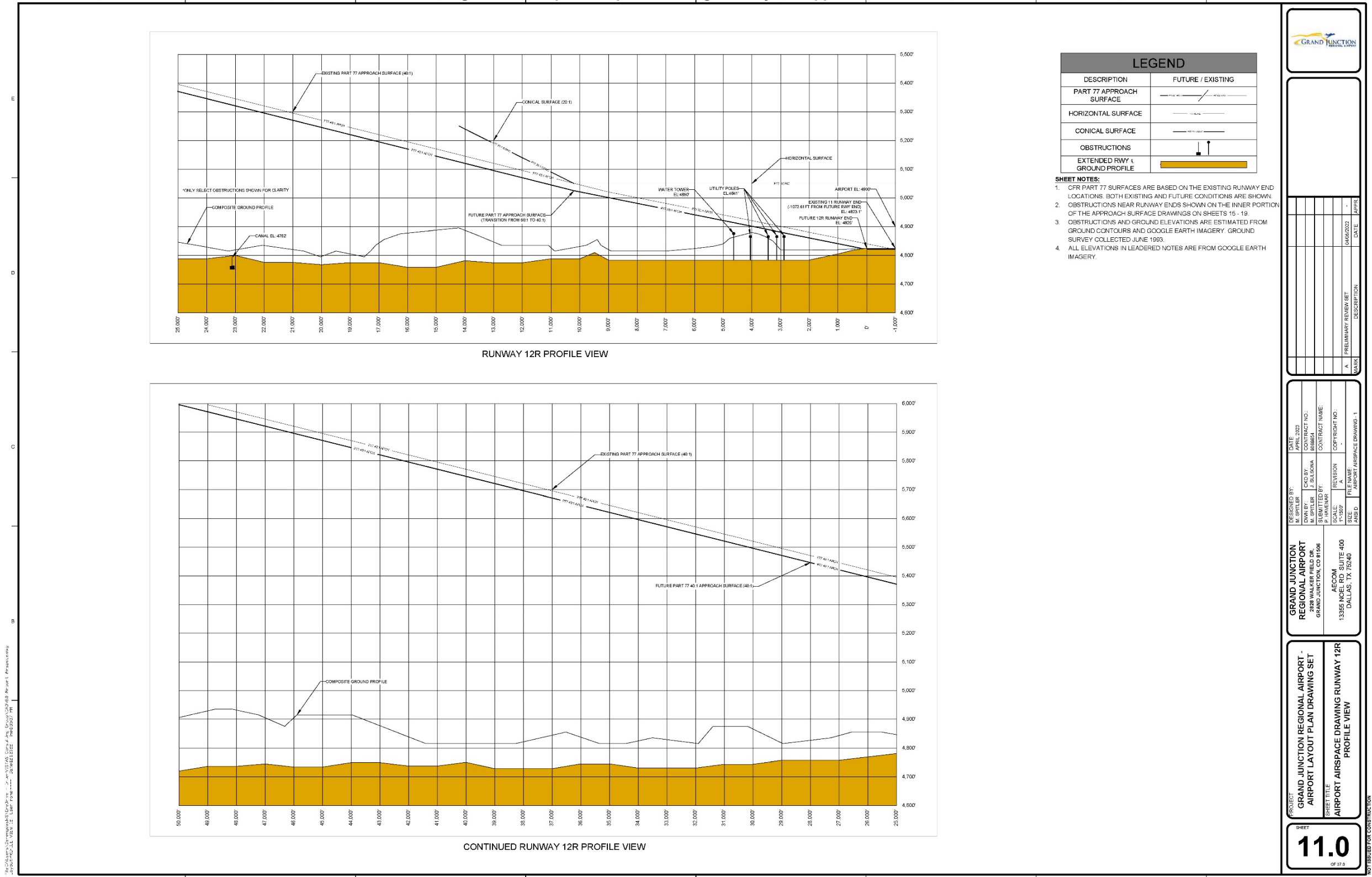


Figure 8-13. Airport Airspace Drawing Runway 12L Profile View

LEGEND

DESCRIPTION	FUTURE / EXISTING
PART 77 APPROACH SURFACE	--- FUTURE --- / --- EXISTING ---
HORIZONTAL SURFACE	---
CONICAL SURFACE	---
OBSTRUCTIONS	--- OBSTRUCTIONS ---
EXTENDED RWY 12L GROUND PROFILE	---

SHEET NOTES:

1. CFR PART 77 SURFACES ARE BASED ON THE EXISTING RUNWAY END LOCATIONS. BOTH EXISTING AND FUTURE CONDITIONS SHOWN.
2. OBSTRUCTIONS NEAR RUNWAY ENDS SHOWN ON THE INNER PORTION OF THE APPROACH SURFACE DRAWINGS ON SHEETS 15 - 18.
3. OBSTRUCTIONS AND GROUND ELEVATIONS ARE ESTIMATED FROM GROUND CONTOURS AND GOOGLE EARTH IMAGERY. GROUND SURVEY COLLECTED JUNE 1993.
4. ALL ELEVATIONS IN LEADERED NOTES ARE FROM GOOGLE EARTH IMAGERY.

RUNWAY 12L PROFILE VIEW

CONTINUED RUNWAY 12L PROFILE VIEW

DESIGNED BY		DATE	DATE
DRAWN BY		DATE	DATE
CHECKED BY		DATE	DATE
SUBMITTED BY		DATE	DATE
P. HAVEMER		DATE	DATE
REVISION		DATE	DATE
FILE NAME		DATE	DATE
SIZE		DATE	DATE
AECOM		DATE	DATE
13955 NOEL RD, SUITE 400		DATE	DATE
DALLAS, TX 75240		DATE	DATE
AIRPORT AIRSPACE DRAWING - 1		DATE	DATE
PROJECT		DATE	DATE
GRAND JUNCTION REGIONAL AIRPORT		DATE	DATE
AIRPORT LAYOUT PLAN DRAWING SET		DATE	DATE
SHEET TITLE		DATE	DATE
AIRPORT AIRSPACE DRAWING RUNWAY 12L		DATE	DATE
PROFILE VIEW		DATE	DATE
SHEET		DATE	DATE
13.0		DATE	DATE
OF 31.0		DATE	DATE

Figure 8-14. Airport Airspace Drawing Runway 30R Profile View

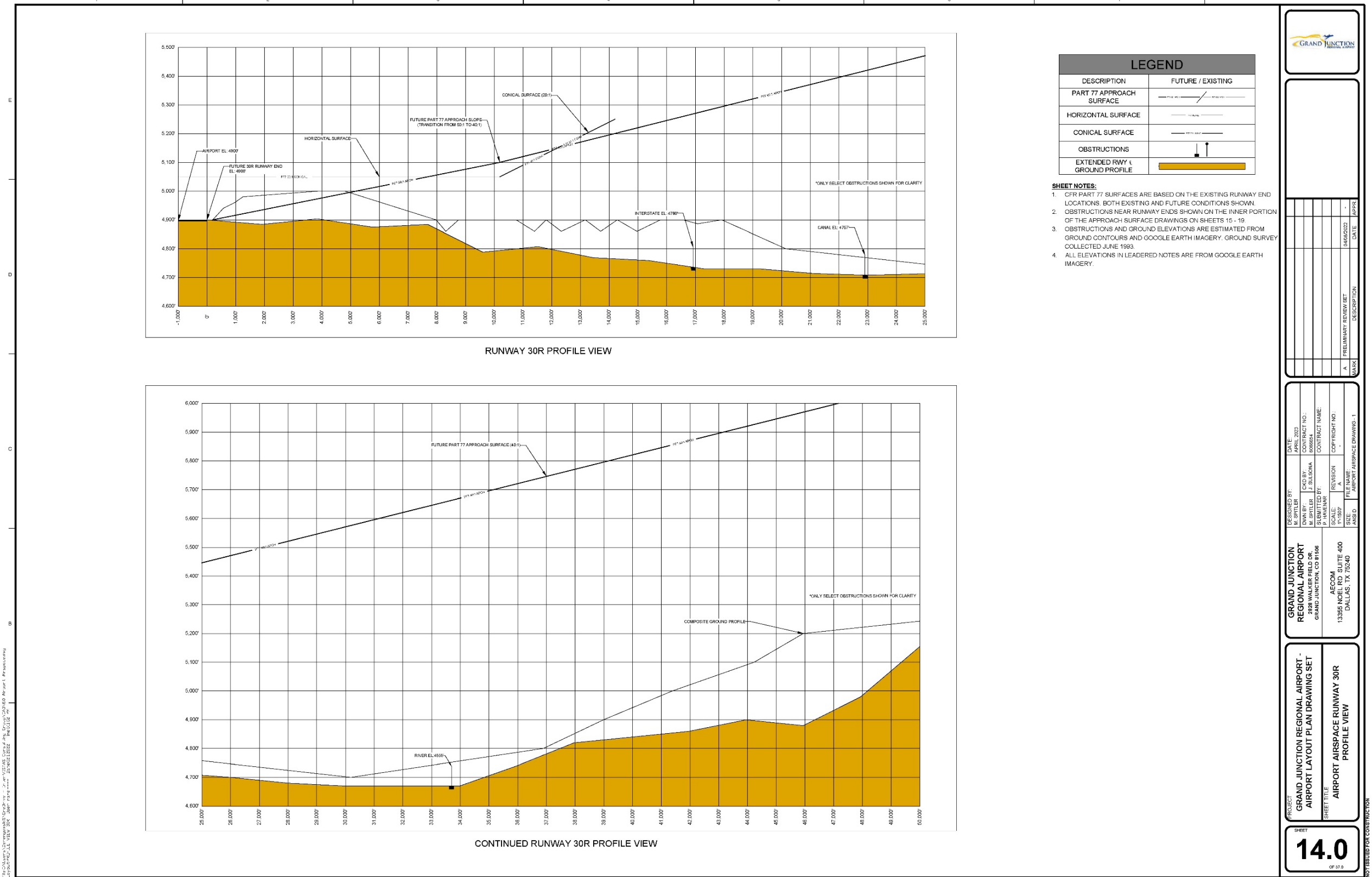


Figure 8-15. Airport Airspace Drawing Runway 4-22 Profile View

LEGEND

DESCRIPTION	FUTURE / EXISTING
PART 77 APPROACH SURFACE	— FUTURE — EXISTING
HORIZONTAL SURFACE	— FUTURE —
CONICAL SURFACE	— FUTURE —
OBSTRUCTIONS	— FUTURE —
EXTENDED RWY & GROUND PROFILE	— FUTURE —

SHEET NOTES:

- CFR PART 77 SURFACES ARE BASED ON THE EXISTING RUNWAY END LOCATIONS, BOTH EXISTING AND FUTURE CONDITIONS SHOWN.
- OBSTRUCTIONS NEAR RUNWAY ENDS SHOWN ON THE INNER PORTION OF THE APPROACH SURFACE DRAWINGS ON SHEETS 15 - 19.
- OBSTRUCTIONS AND GROUND ELEVATIONS ARE ESTIMATED FROM GROUND CONTOURS AND GOOGLE EARTH IMAGERY. GROUND SURVEY COLLECTED JUNE 1993.
- ALL ELEVATIONS IN LEADERED NOTES ARE FROM GOOGLE EARTH IMAGERY.

Runway 4 Profile View

Runway 22 Profile View

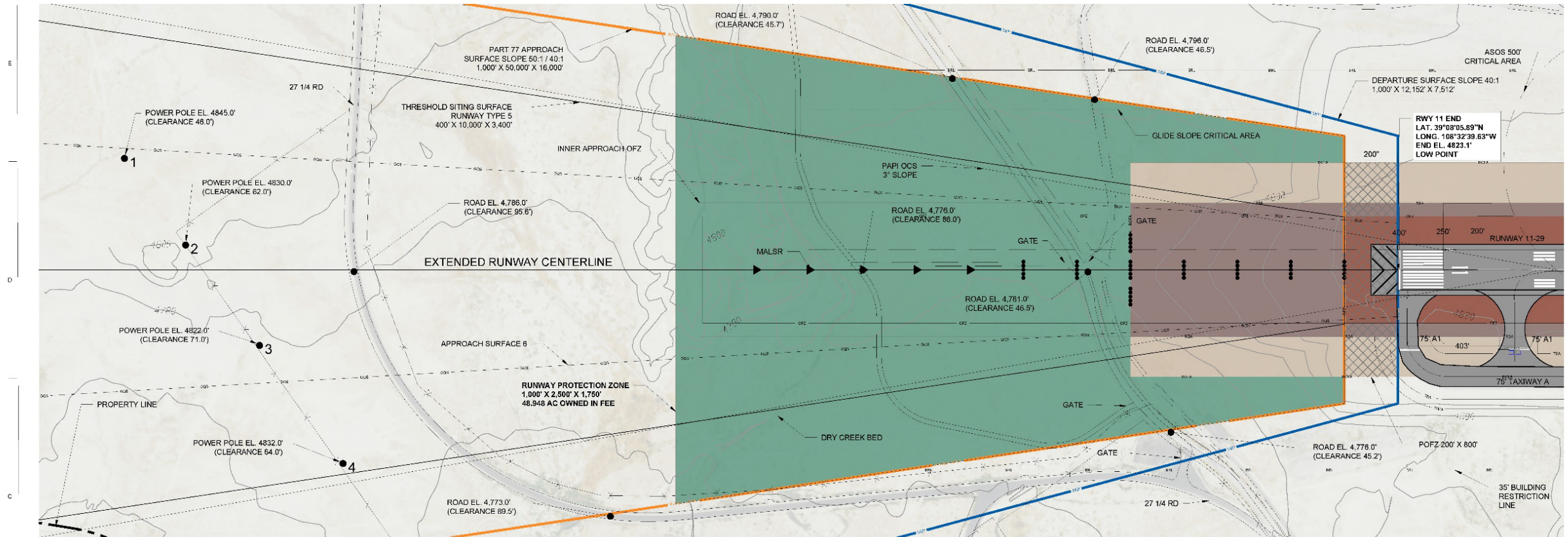
Grand Junction Regional Airport - Airport Layout Plan Drawing Set

Runway 4-22 Profile View

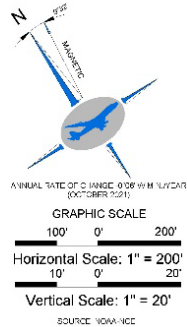
15.0

OF 37.9

Figure 8-16. Inner Portion of the Approach Surface Drawing RWY 11-Plan



EXISTING RUNWAY 11 PLAN VIEW



LEGEND	
DESCRIPTION	EXISTING
AIRFIELD PAVEMENT	
ON-AIRPORT BUILDING	
OFF-AIRPORT BUILDING	
BUILDING RESTRICTION LINE (BRL)	
PROPERTY LINE	
PRECISION OBSTACLE FREE ZONE (POFZ)	
THRESHOLD SITING SURFACE (TSS)	
MALSR	
RUNWAY SAFETY AREA (RSA)	
RUNWAY OBJECT FREE AREA (ROFA)	
RUNWAY OBSTACLE FREE ZONE (ROFZ)	
RUNWAY PROTECTION ZONE	
PART 77 APPROACH SURFACE	
TIEDOWN AREA	
GLIDEPATH QUALIFICATION SURFACE	
GROUND CONTOURS	
HOLD POSITION MARKING	
DEPARTURE SURFACE	
PART 77 APPROACH SURFACE (50:1)	
PAPI OBSTACLE CLEARANCE SURFACE	
GLIDESLOPE CRITICAL AREA	
FENCE	
OBSTACLE	

- SHEET NOTES:**
1. TERRAIN PROFILE REPRESENTS THE HIGHEST POINT ACROSS THE WIDTH AND ALONG THE LENGTH OF THE EXTENDED APPROACH SURFACE.
 2. CONTOUR INTERVALS REPRESENT 10FT ELEVATION CHANGE.
 3. AERIAL MAPPING WAS PERFORMED: IMAGERY AND BASE MAP ARE BASED ON US GEOLOGICAL SURVEY (USGS) IMAGERY.
 4. MALSR LOCATED NEXT TO ROAD AT END OF RUNWAY 11- LIGHTS REPRESENTED ACROSS ROAD FOR CLARITY.
 5. AN ADDITIONAL 15 FEET IS ADDED TO PUBLIC ROADS SURFACE ELEVATIONS TO DETERMINE CLEARANCE.
 6. AN ADDITIONAL 10 FEET IS ADDED TO PRIVATE ROADS SURFACE ELEVATIONS TO DETERMINE CLEARANCE.
 7. REFER TO GENERAL NOTES FOUND ON SHEET 2 - AIRPORT DATA.
 8. CODE OF FEDERAL REGULATIONS (CFR) PART 77 SURFACES ARE BASED ON THE EXISTING RUNWAY END LOCATIONS.
 9. SURFACE ELEVATIONS ARE ESTIMATED USING AN ONLINE SOURCE AND SHOULD BE VERIFIED BY A PROFESSIONAL LAND SURVEYOR (PLS).
 10. THERE ARE NO PUBLISHED OBSTRUCTIONS IN THIS VIEW.

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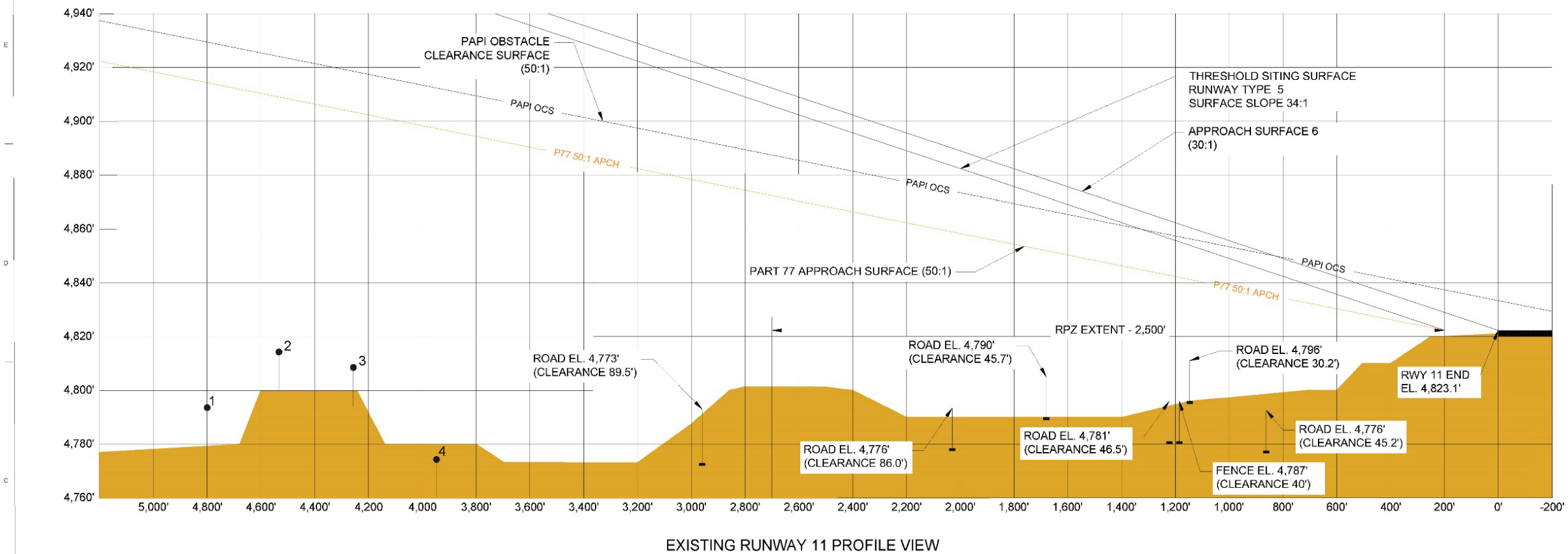
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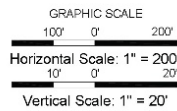
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16.0

Figure 8-17. Inner Portion of the Approach Surface Drawing RWY 11-PROFILE



EXISTING RUNWAY 11 PROFILE VIEW



- SHEET NOTES:**
1. TERRAIN PROFILE REPRESENTS THE HIGHEST POINT ACROSS THE WIDTH AND ALONG THE LENGTH OF THE EXTENDED APPROACH SURFACE.
 2. AERIAL MAPPING WAS PERFORMED (USGS) IMAGERY AND BASE MAP ARE BASED ON US GEOLOGICAL SURVEY (USGS) IMAGERY.
 3. AN ADDITIONAL 15 FEET IS ADDED TO PUBLIC ROADS SURFACE ELEVATIONS TO DETERMINE CLEARANCE.
 4. AN ADDITIONAL 10 FEET IS ADDED TO PRIVATE ROADS SURFACE ELEVATIONS TO DETERMINE CLEARANCE.
 5. REFER TO GENERAL NOTES FOUND ON SHEET 2 - AIRPORT DATA.
 6. CODE OF FEDERAL REGULATIONS (CFR) PART 77 SURFACES ARE BASED ON THE EXISTING RUNWAY END LOCATIONS.
 7. SURFACE ELEVATIONS ARE ESTIMATED USING AN ONLINE SOURCE AND SHOULD BE VERIFIED BY A PROFESSIONAL LAND SURVEYOR (PLS).
 8. THERE ARE NO PUBLISHED OBSTRUCTIONS IN THIS VIEW.
 9. LEGEND CAN BE FOUND ON SHEET 15 - INNER PORTION OF THE APPROACH SURFACE - PLAN VIEW RUNWAY 11.



DESIGNED BY: W. SAUNDERS
DRAWN BY: W. SAUNDERS
CHECKED BY: W. SAUNDERS
DATE: APRIL 2023
CONTRACT NO.: 6086944
CONTRACT NAME: GRAND JUNCTION REGIONAL AIRPORT
REVISION: A
COPYRIGHT NO.:
FILE NAME: 13355 NOEL RD. SUITE 400 DALLAS, TX 75240
SHEET: 17.0 OF 17.0

PROJECT: GRAND JUNCTION REGIONAL AIRPORT - AIRPORT LAYOUT PLAN DRAWING SET

SHEET TITLE: INNER PORTION OF THE APPROACH SURFACE - PROFILE VIEW RUNWAY 11

NOT ISSUED FOR CONSTRUCTION

DATE	DESCRIPTION	MARK
04/26/2023	PRELIMINARY REVIEW SET	A

Figure 8-18. Inner Portion of the Approach Surface Drawing RWY 29

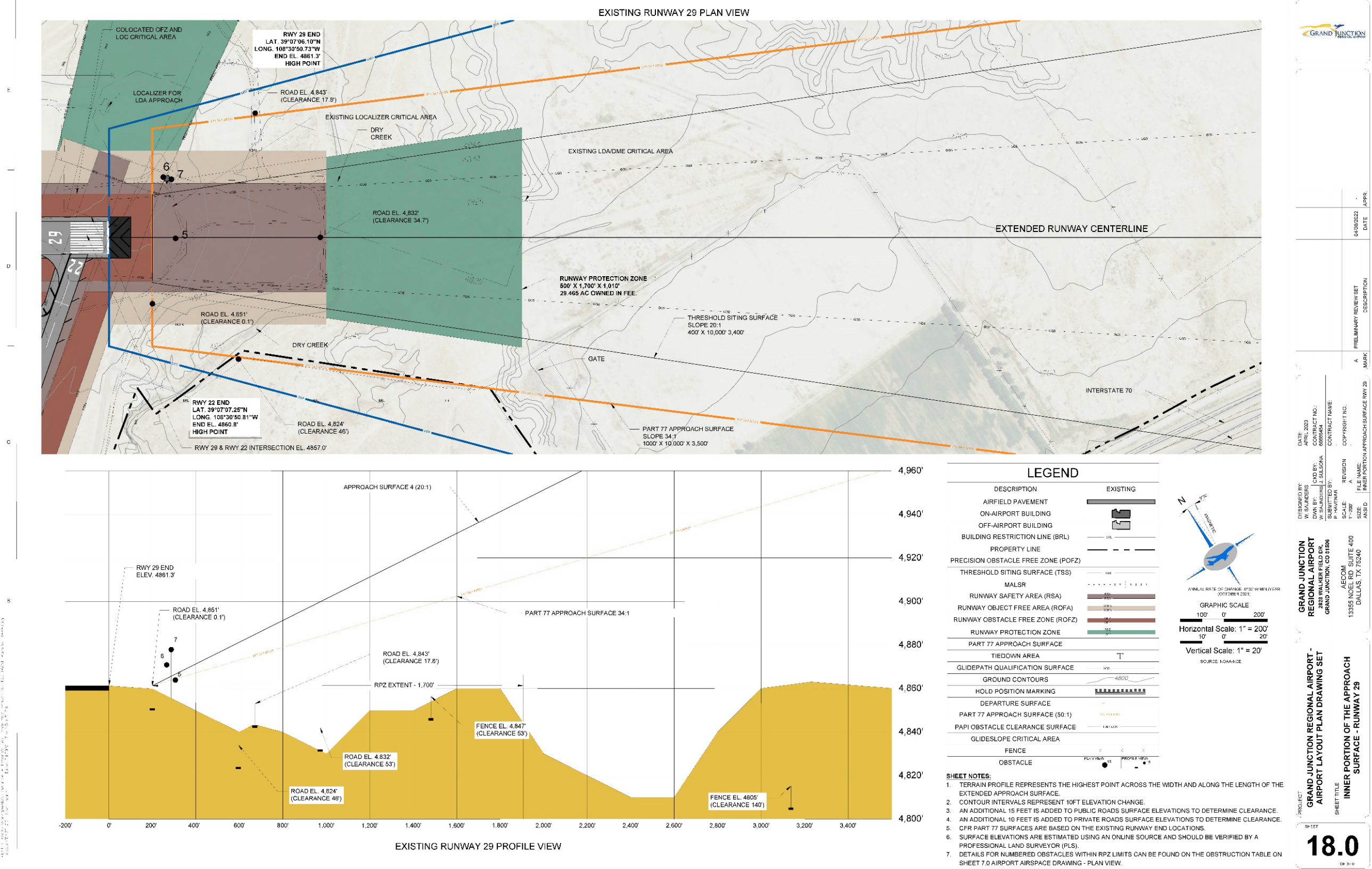


Figure 8-19. Inner Portion of the Approach Surface Drawing RWY 4

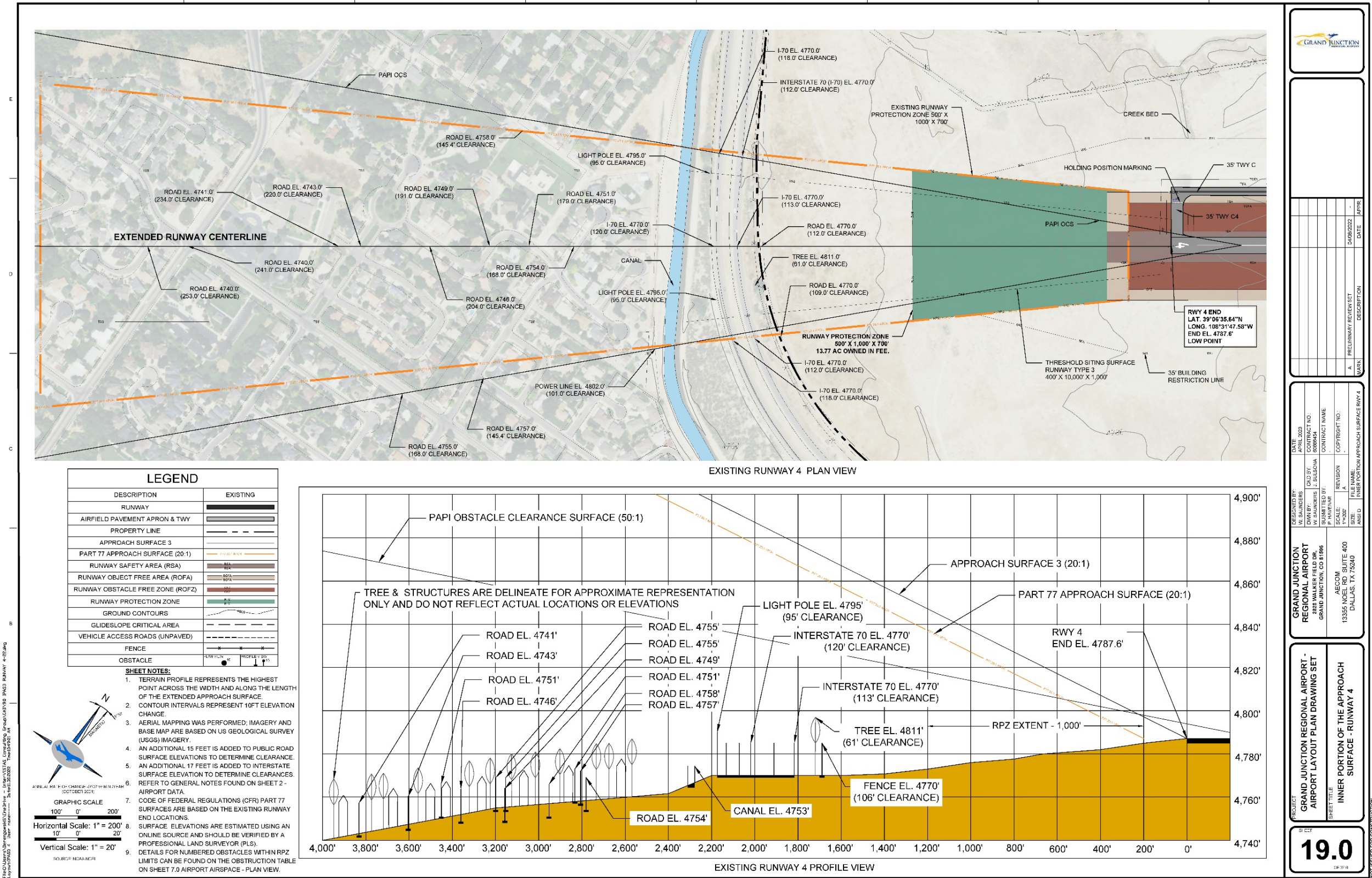


Figure 8-20. Inner Portion of the Approach Surface Drawing RWY 22

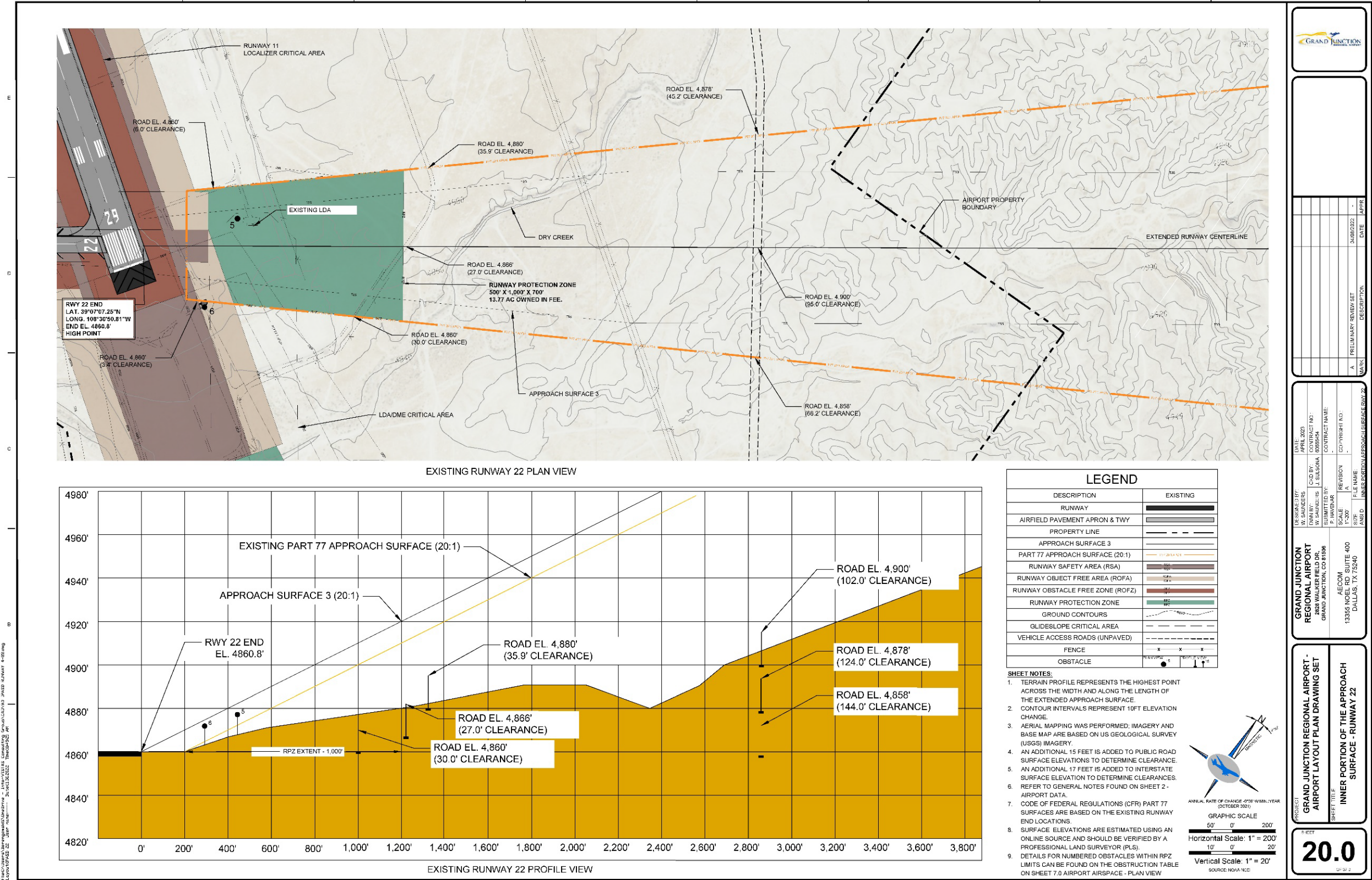


Figure 8-22. Departure Surface – Future Runway 12

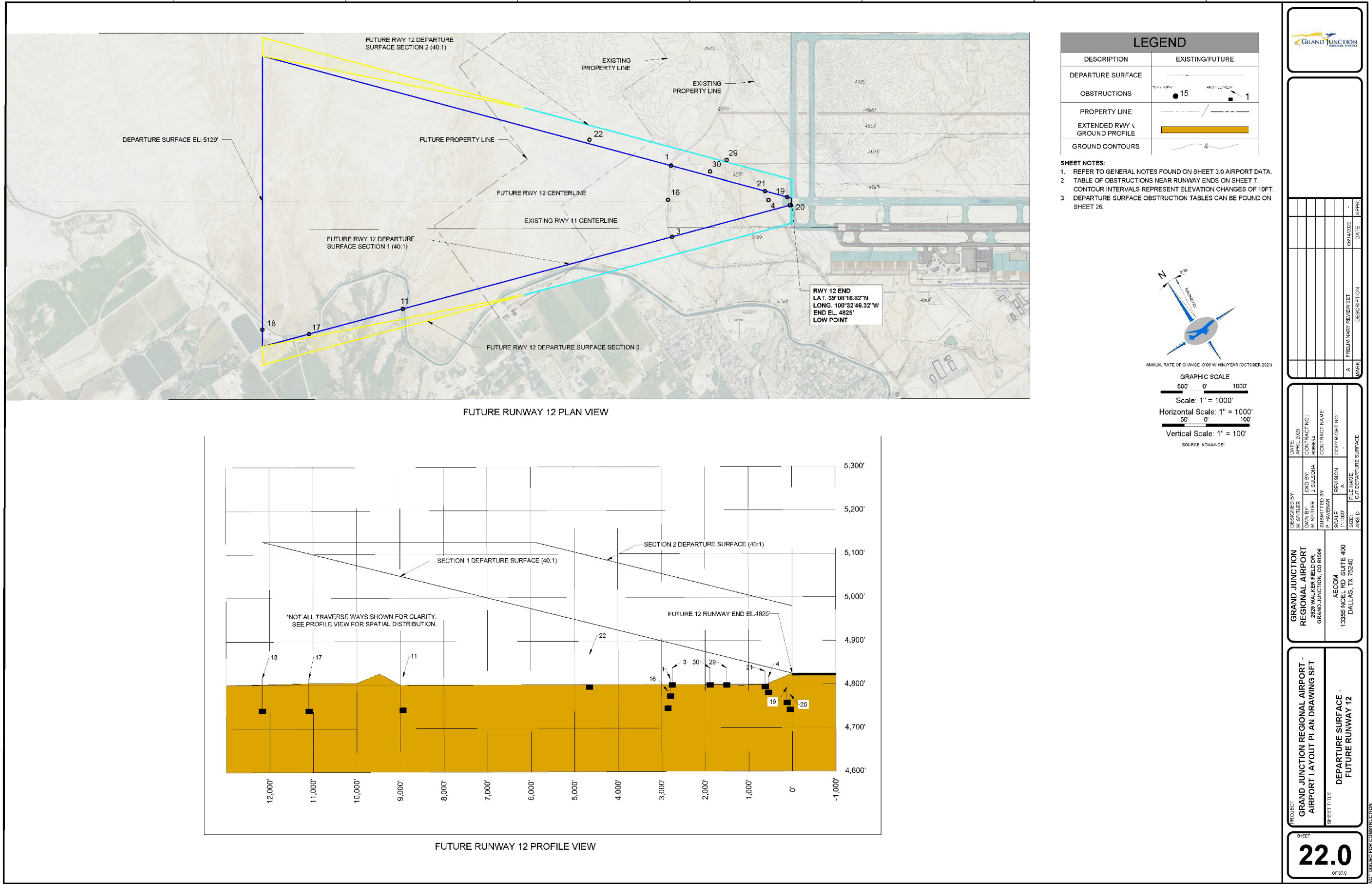
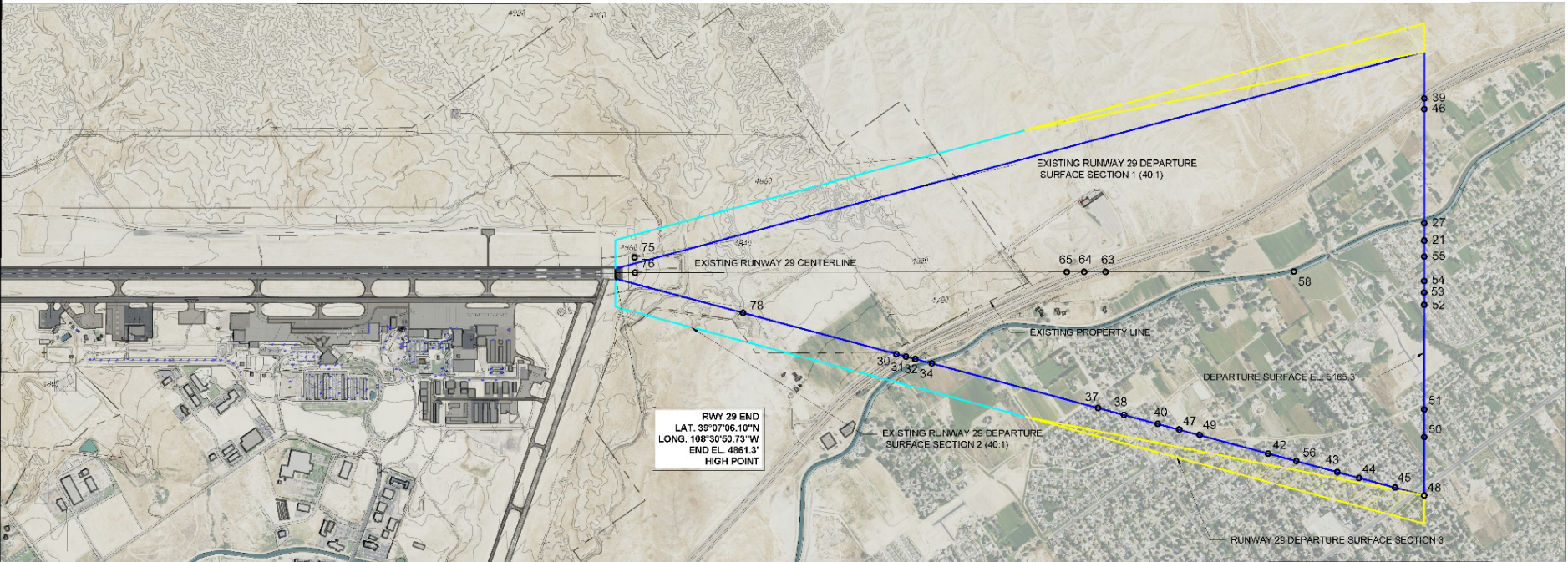
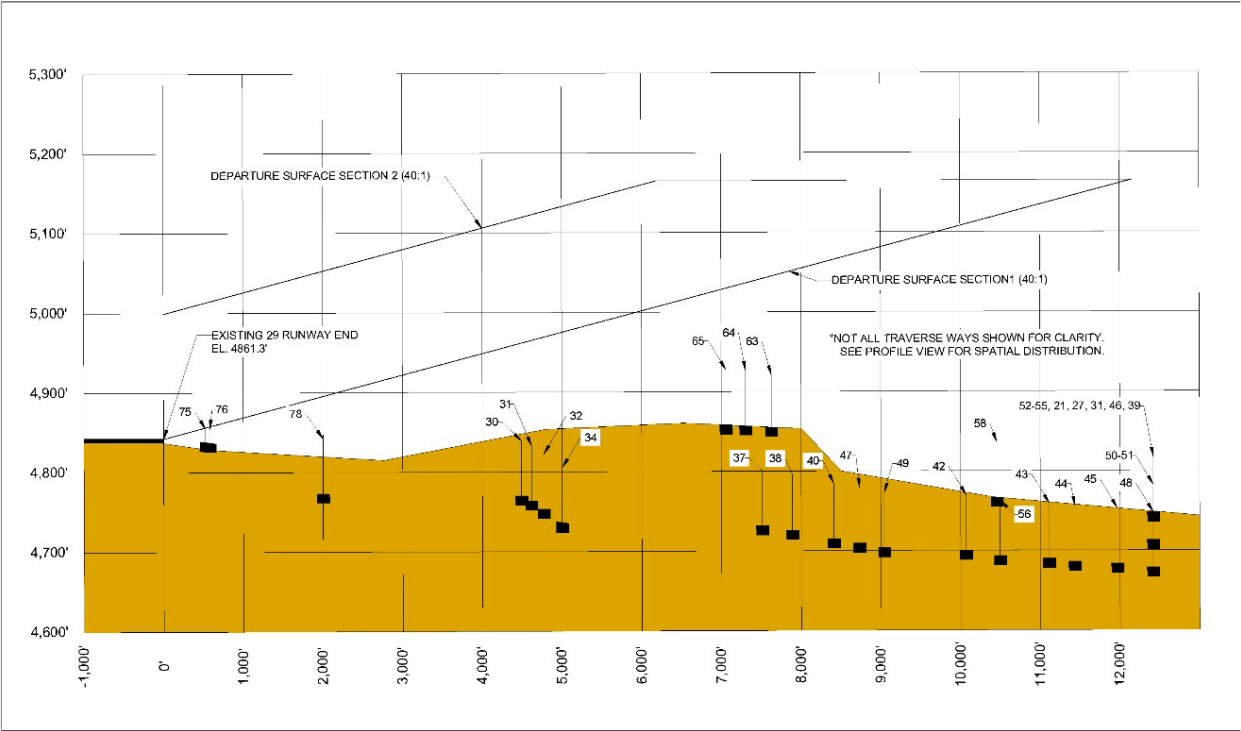


Figure 8-23. Departure Surface – Existing Runway 29



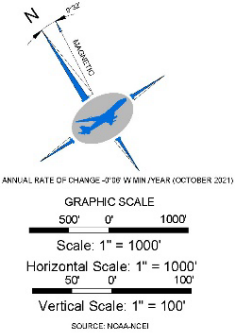
EXISTING RUNWAY 29 PLAN VIEW



EXISTING RUNWAY 29 PROFILE VIEW

LEGEND	
DESCRIPTION	EXISTING/FUTURE
DEPARTURE SURFACE	—
OBSTRUCTIONS	PLAN VIEW: 15, PROFILE VIEW: 1
PROPERTY LINE	---
EXTENDED RWY 6 GROUND PROFILE	—
GROUND CONTOURS	4

- SHEET NOTES:**
1. REFER TO GENERAL NOTES FOUND ON SHEET 2 AIRPORT DATA.
 2. TABLE OF OBSTRUCTIONS NEAR RUNWAY ENDS ON SHEET 7.
 3. DEPARTURE SURFACE OBSTRUCTION TABLES CAN BE FOUND ON SHEET 26.



DATE	DESCRIPTION	MARK
08/14/2023	PRELIMINARY REVIEW SET	A

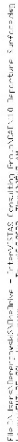
DESIGNED BY		DATE	
M. SPILLER		APRIL 2023	
DRAWN BY		CHECKED BY	
M. SPILLER		J. SULLIVAN	
SUBMITTED BY		CONTRACT NAME	
P. HANSEN			
SCALE		REVISION	
1"=100'		A	
SIZE		FILE NAME	
10" X 14"		LOT DEPARTMENT SURFACE	
AECOM			
13355 NOEL RD. SUITE 400			
DALLAS, TX 75240			

PROJECT: GRAND JUNCTION REGIONAL AIRPORT - AIRPORT LAYOUT PLAN DRAWING SET
SHEET TITLE: DEPARTURE SURFACE - EXISTING RUNWAY 29

SHEET
23.0
OF 37.0

NOT ISSUED FOR CONSTRUCTION

Figure 8-20. Departure Surface – Future Railway 50K



1	2	3	Figure 8-27. Departure Surface Obstruction Table	6	7
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1. REFER TO GENERAL NOTES FOUND ON SHEET 2 - AIRPORT DATA.
2. OBSTRUCTIONS AND GROUND ELEVATIONS ARE ESTIMATED FROM GROUND CONTOURS AND GOOGLE EARTH IMAGERY AND SHOULD BE VERIFIED BY FIELD SURVEY.
3. TABLE OF OBSTRUCTIONS NEAR RUNWAY ENDS ON SHEET 7 - AIRPORT AIRSPACE PLAN VIEW.

Figure 8-28. General Aviation Drawing – NW

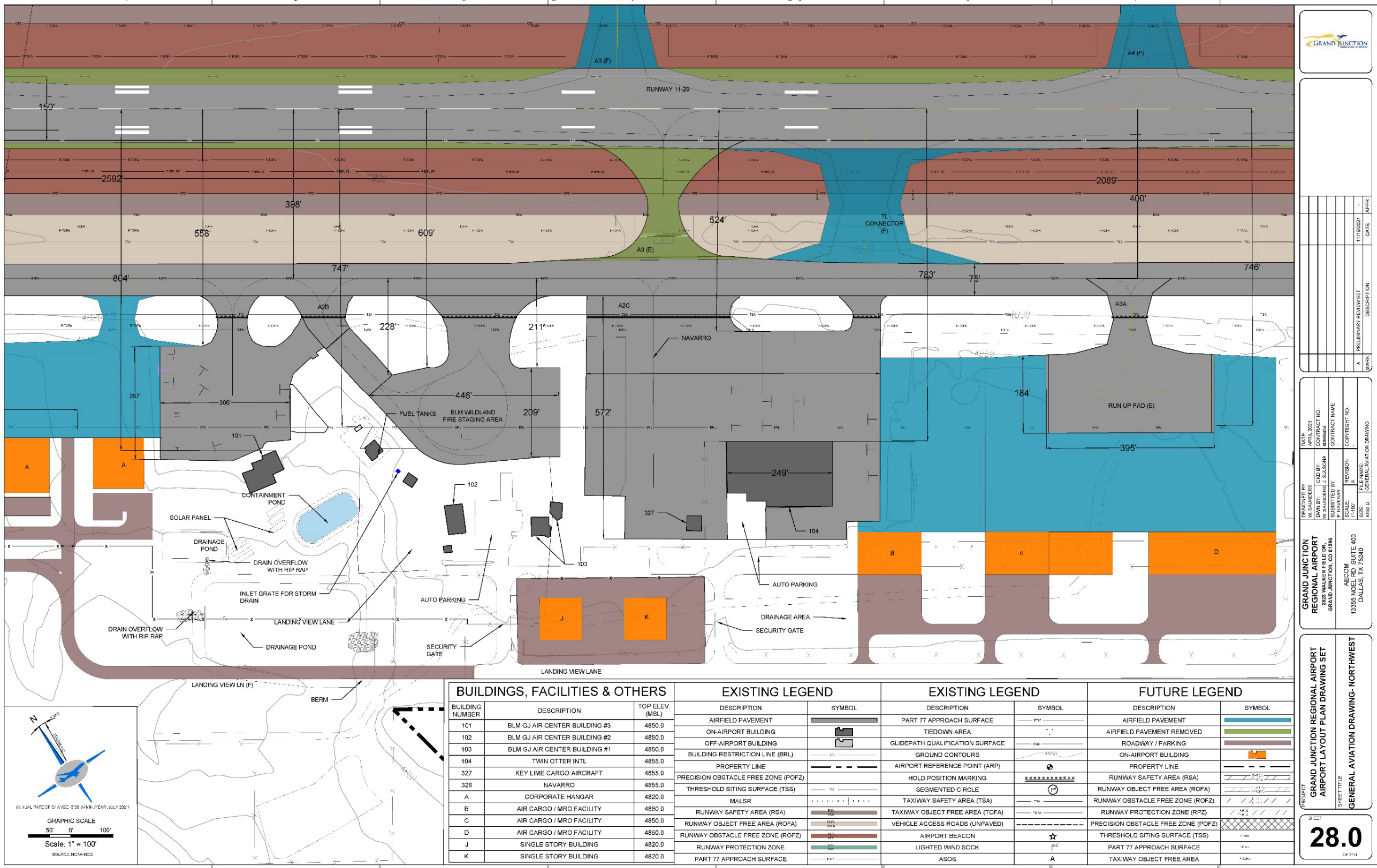


Figure 8-29. General Aviation Drawing – SE



Figure 8-30. General Aviation Drawing – NW (EXT)

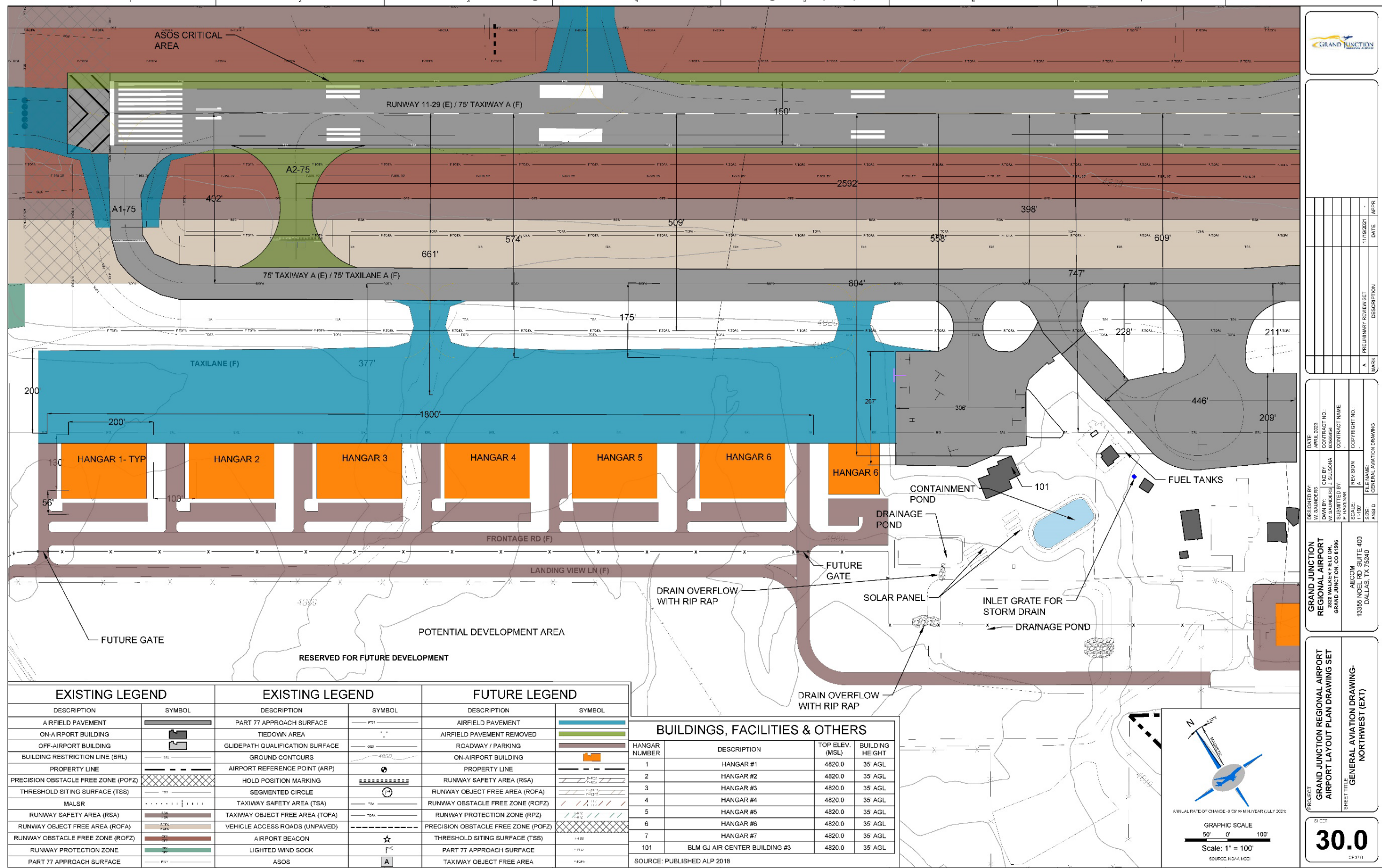


Figure 8-31. General Aviation Drawing – SE (EXT)



Figure 8-32. Terminal Area Drawing

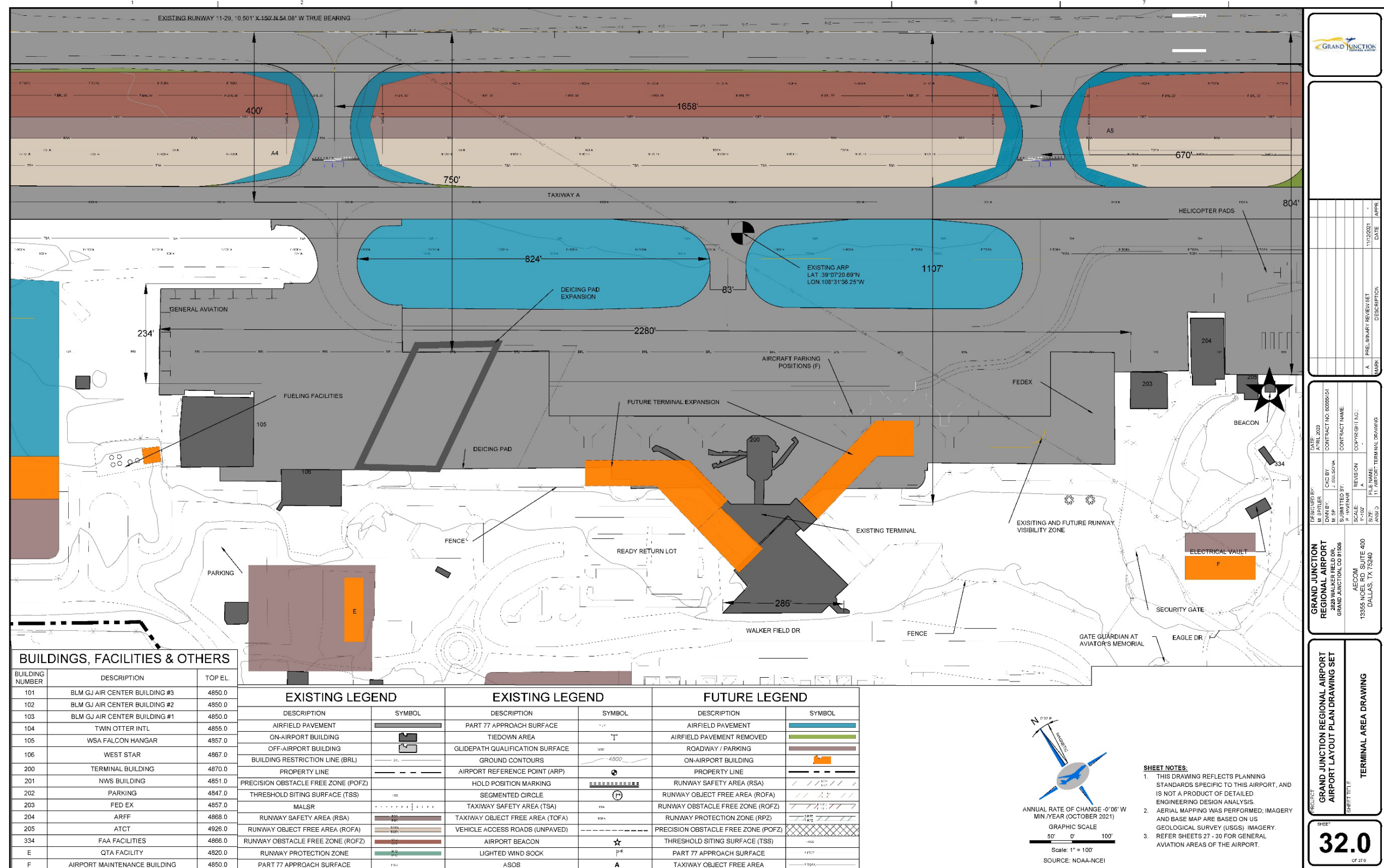


Figure 8-33. Existing Land Use Drawing

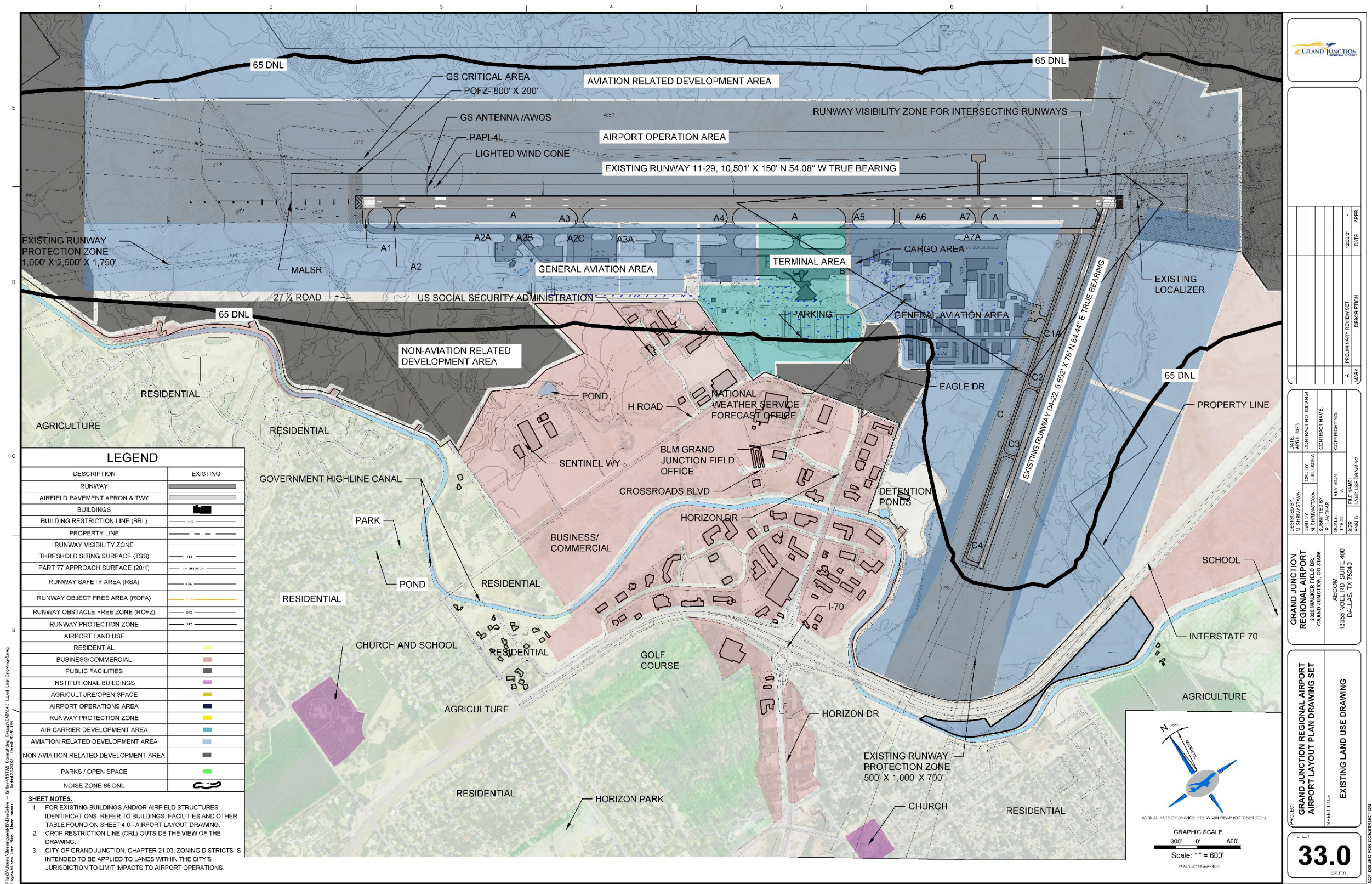
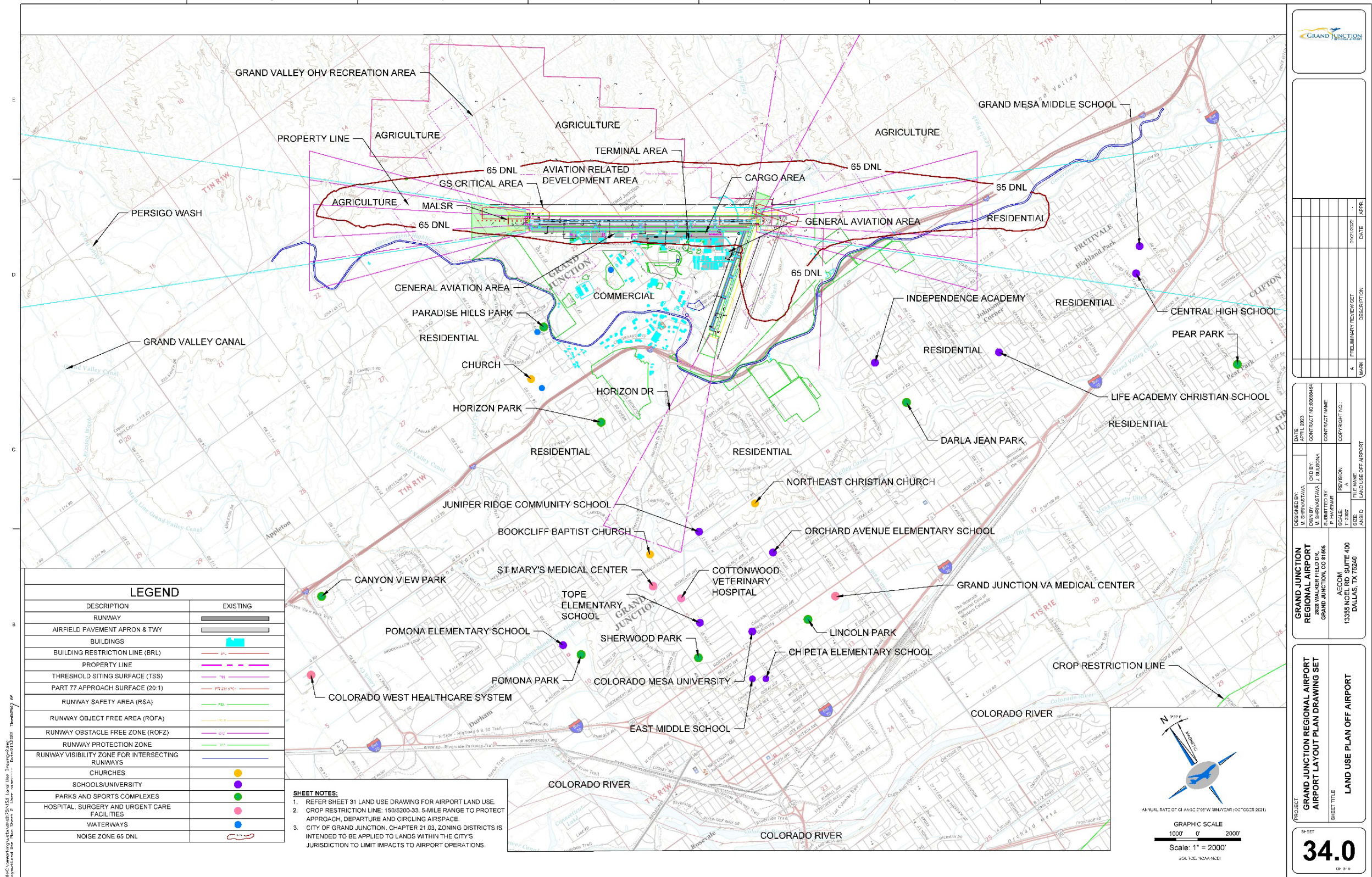


Figure 8-34. Existing Land Use Plan Off Airport



SPONSOR APPROVAL

GRAND JUNCTION REGIONAL AIRPORT
ANGELA PADALEC
EXECUTIVE DIRECTOR
DATE: 6/25/2023

GRAND JUNCTION REGIONAL AIRPORT
TOM BENTON
CHAIRMAN OF THE BOARD
DATE: 6/27/2023

FAA CONDITIONAL APPROVAL

SUBJECT TO LETTER DATED: July 11, 2023

FEDERAL AVIATION ADMINISTRATION
DENVER AIRPORTS DISTRICT OFFICE
DATED: July 11, 2023
AIRSPACE CASE NO.: 2023-ANM-1187-NRA

Metes and Bounds

Curve	Distance (FT)	Radius (FT)	Delta	Chord Direction	Chord Length (FT)
C1	1495.02	1487.57	57.58	S64° 19' 19"E	1432.89
C2	306.14	319.98	54.82	S55° 54' 24"W	294.59
C3	377.28	772.43	27.98	N69° 19' 21"E	373.54
C4	374.35	555.17	38.63	N35° 58' 17"E	367.3
C5	251.02	610.3	23.57	N7° 34' 01"W	249.26
C6	186.78	575.18	18.61	N28° 39' 10"W	185.96
C7	255.66	475	30.84	N14° 26' 33"W	252.58
C8	218.36	575	21.76	N40° 44' 28"W	217.05
C9	134.66	273.42	28.22	S37° 30' 42"E	133.3
C10	238.86	273.42	50.05	S1° 37' 30"W	231.34
C11	154.08	526.22	16.78	N18° 18' 43"E	153.53
C12	275.37	325	48.55	N14° 20' 58"W	267.21
C13	256.33	1424.81	10.31	N46° 58' 32"W	255.98
C14	280.83	1275	12.62	N57° 51' 25"W	280.26
C15	200.11	240	47.77	S40° 33' 58"E	194.36
C16	313.46	665	27.01	N30° 11' 04"W	310.57
C17	744.31	5856.84	7.28	N81° 12' 13"W	743.81

Metes and Bounds

Line	Bearing	Distance (FT)
L1	S79° 52' 31.40"W	1465.22
L2	S82° 09' 11.40"W	381.49
L3	N34° 32' 18.60"W	383.25
L4	N28° 31' 18.60"W	715.71
L5	N14° 38' 41.40"E	108.71
L6	N28° 29' 55.40"E	150.15
L7	N83° 18' 54.40"E	339.66
L8	N55° 19' 48.84"E	97.21
L9	S2° 08' 02.40"W	19.23
L10	N55° 18' 19.40"E	258.84

Metes and Bounds

Line	Bearing	Distance (FT)
L11	N34° 41' 40.50"W	15.00
L12	N80° 25' 29.40"E	158.57
L13	N9° 34' 30.60"W	100.03
L14	S80° 25' 29.41"W	63.81
L15	S70° 39' 00.83"W	35.12
L16	N37° 57' 19.65"W	84.89
L17	N56° 53' 51.40"E	1305.40
L18	N31° 38' 43.60"W	454.72
L19	N87° 42' 44.60"W	145.82
L20	N57° 05' 27.40"E	121.09
L21	N31° 38' 31.60"W	1470.81
L22	N87° 41' 02.60"W	200.16
L23	N2° 07' 53.40"E	30.01
L24	N2° 07' 35.80"E	1317.37
L25	N52° 42' 54.20"W	2274.29
L26	S6° 59' 58.20"E	982.96
L27	N77° 26' 13.20"W	567.21
L28	S82° 47' 59.80"W	357.85
L29	N58° 21' 24.20"W	510.30
L30	S66° 28' 31.80"W	961.94
L31	N2° 01' 42.80"E	198.94
L32	N87° 52' 10.20"W	148.74
L33	N29° 51' 41.17"W	137.33
L34	N78° 31' 00.80"E	83.39
L35	N11° 28' 59.20"W	50.00
L36	S78° 31' 00.80"W	100.00
L37	N29° 51' 41.20"W	1187.06
L38	N77° 07' 08.80"E	100.00
L39	N29° 51' 41.20"W	104.56
L40	S77° 07' 08.80"W	100.00
L41	N29° 51' 42.20"W	34.14
L42	N51° 37' 14.10"W	118.01
L43	N26° 39' 07.80"E	224.24
L44	N9° 55' 25.80"E	89.76
L45	N38° 37' 22.73"W	12.39
L46	N15° 48' 17.80"E	135.76
L47	N74° 11' 42.20"W	100.00
L48	S15° 48' 17.80"W	64.24
L49	N38° 37' 23.20"W	87.10
L50	N51° 30' 46.20"W	119.69
L51	N64° 10' 01.20"W	231.78
L52	N64° 27' 07.20"W	570.45
L53	N16° 40' 48.94"W	1303.61
L54	N43° 41' 19.20"W	423.32
L55	N2° 07' 09.80"E	382.50
L56	N2° 08' 03.85"E	1317.11
L57	S87° 57	

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LEGEND

DESCRIPTION	SYMBOL
TAXIWAY/RUNWAY	
ROAD	
BUILDING	
RUNWAY SAFETY AREA (RSA)	
RUNWAY OBJECT FREE AREA (ROFA)	
RUNWAY PROTECTION ZONE (RPZ)	
RUNWAY OBSTACLE FREE ZONE (ROFZ)	
AVIGATION EASEMENT	

ANNUAL RATE OF CHANGE OF DEPTH (M/ YEAR) (JULY 2021)

GRAPHIC SCALE

1000' 0' 2000'

Scale: 1" = 2000'

SOURCE: NOAA-NCEI

NOT ISSUED FOR CONSTRUCTION

Airport Layout Plan

Grand Junction Regional Airport

211



Prepared by
InterVISTAS Consulting USA LLC.

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