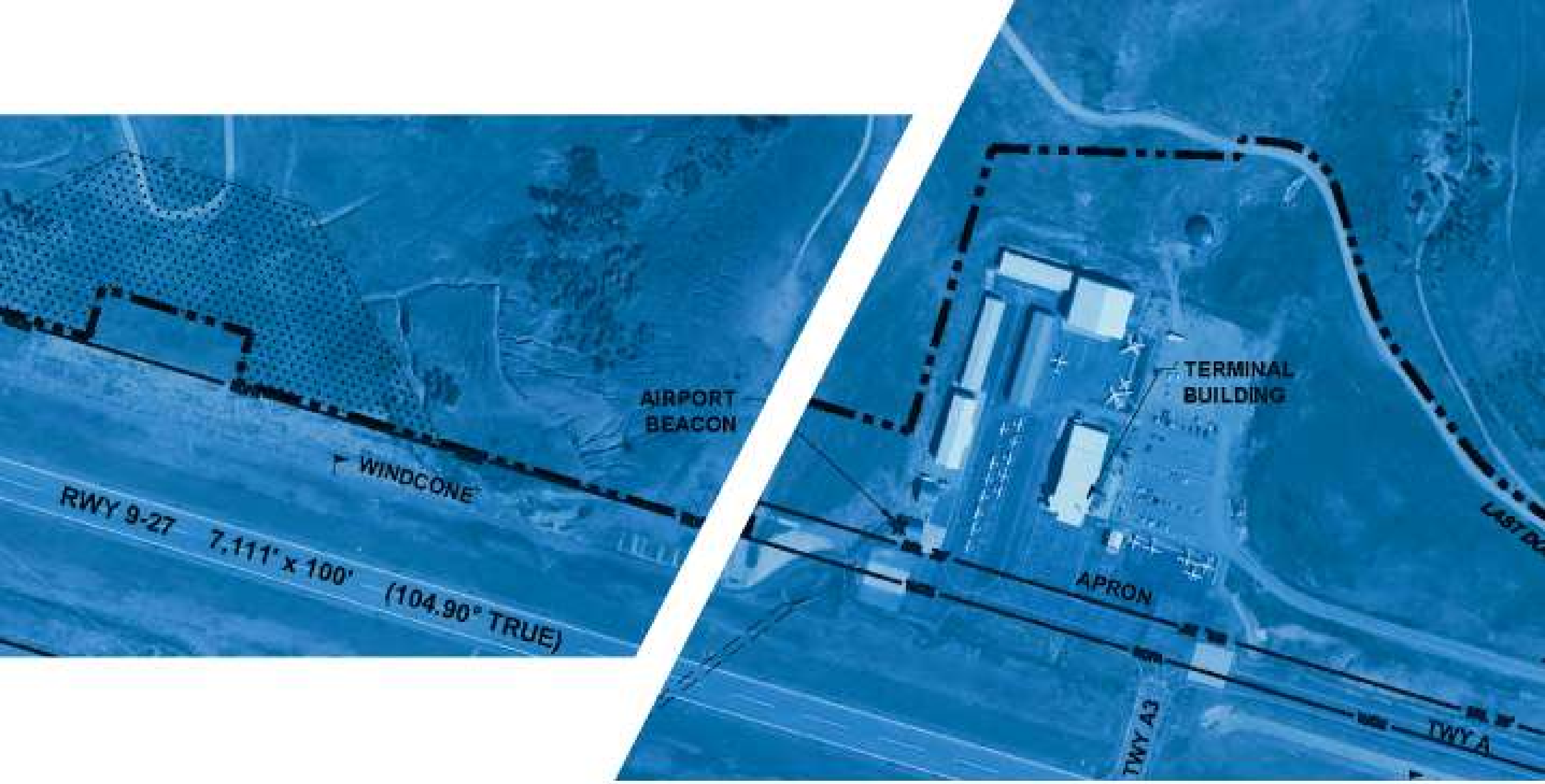

TELLURIDE REGIONAL AIRPORT

MASTER PLAN

Final Report
November 2016

RS&H

TELLURIDE
REGIONAL AIRPORT

The preparation of this document may have been supported, in part, through federally obligated funds as provided under Title 49 U.S.C., Section 47104. The contents of this report reflect the views of the Telluride Regional Airport and the consultants, Reynolds, Smith and Hills, Inc., do not necessarily reflect the views of the policy of the FAA and the Colorado Division of Aeronautics. Acceptance of this report by the FAA and the Colorado Division of Aeronautics, does not in any way constitute commitment on the part of the United States to participate in any development depicted herein nor does it indicate that the proposed development is environmentally acceptable or would have justification in accordance with applicable public laws.

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TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INVENTORY OF EXISTING CONDITIONS

1.1 INTRODUCTION

The Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B *Airport Master Plans*, outlines the necessary steps in the preparation of an airport master plan. The initial step in documenting the master planning process is the identification of an airport's existing conditions. This involves the collection of data pertinent to an airport and the area it serves. The objective of the existing conditions task for the Telluride Regional Airport (Airport or TEX) is to provide background information for subsequent phases of analysis.

The existing conditions information for the Airport has been obtained through:

- The collection and analysis of previous reports and studies including the 2004 Master Plan.
- On-site investigations of the Airport.
- Interviews with Airport management, Airport users and stakeholders, and other tenants and interested parties.

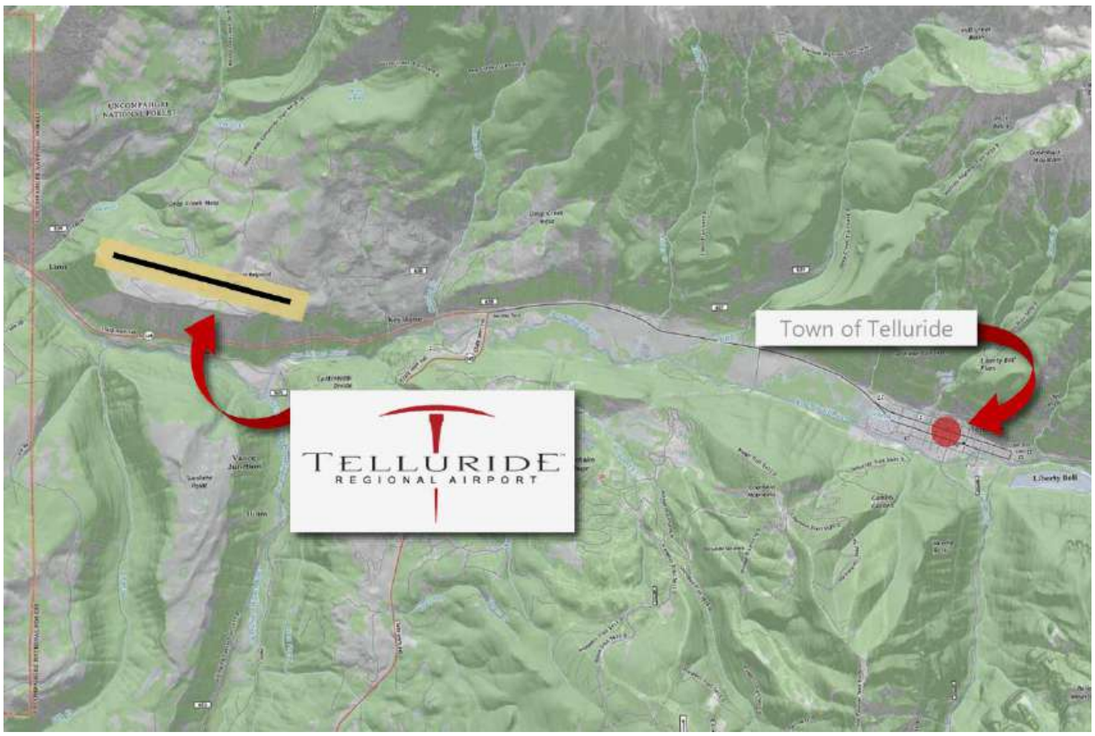
This chapter is organized into the following sections:

- **Background** - provides an overview of the Airport's history as it relates to this Master Plan Update, and background information as to the goals and objectives of this Study.
- **Airside Facilities** - describes existing runways, taxiways, aircraft parking areas, and navigational aids (NAVAIDs).
- **Landside Facilities** - describes roadway access and parking facilities.
- **Passenger Terminal Building** - details space allocations by specific terminal function.
- **Support Facilities** - describes other facilities important to the overall operation of the Airport, including aircraft rescue and firefighting (ARFF) facilities, fixed base operator (FBO), maintenance and general aviation facilities, and utilities.
- **Airport Environs** - describes the Airport's site topography, off-airport land uses, zoning regulations, and weather.
- **Environmental Data** - outlines the National Environmental Protection Agency impact categories and describes those categories currently found on the Airport.

1.2 BACKGROUND

The Telluride Regional Airport is a public airport located in southwest Colorado, approximately four miles west of the Town of Telluride, as illustrated in **Figure 1-1**. The Airport was built using private and federal funds in the 1980's and opened in 1984. The Airport is owned and operated by the Telluride Regional Airport Authority (TRAA). The TRAA is governed by a Board of Commissioners which consists of nine regular members and four alternates who serve four-year terms. The Airport Manager and Airport staff are responsible for the day to day operation of the Airport.

FIGURE 1-1
AIRPORT VICINITY MAP



The Airport is a critical asset for the Telluride resort community which is driven economically by tourism. The Airport was built on the premise that the people coming to recreate in Telluride would fly to the area instead of drive. This objective was partially intended to help ward off increased vehicle usage, and subsequent needs such as parking, in effort to maintain the area's rich historic culture. Serving a resort community, the Airport experiences wide variances of demand, which creates operational challenges as well as opportunities.

The Airport has a history of serving both commercial and general aviation operations. Past commercial passenger airline operators have included Great Lakes Airlines, SkyWest Airlines, Continental Airlines, United Airlines, and America West Airlines. As of the writing of this document, all scheduled commercial passenger airlines have discontinued service to the Airport due to factors that will be discussed in the subsequent chapter, *Aviation Forecast*. Notwithstanding the complications associated with retaining quality commercial air service, TEX remains financially solvent as it is substantially supported by revenues generated from general aviation traffic.

This 2014 Master Plan Update was undertaken in an effort to update Telluride Regional Airport's 2004 Master Plan. Since the 2004 Master Plan was completed, the Airport has undergone numerous changes and upgrades. The objective of this Master Plan Update is to provide a new strategic plan to support the Airport's need through the next 20 years. Information and data from the previous Master Plan will be validated, and if no changes are found, will be carried forward while new data will be analyzed and incorporated into this Update.

A critical element of this study is the impact of the topography surrounding the developed areas of the Airport, specifically the landside areas. TEX is unique in that some existing development has been created through partial removal of the hillsides that surround the Airport. Potential exists for additional such development that maximize the use of the Airport's land. To evaluate this potential, the effort of this study will be largely focused on the three dimensional aspects of the landside as they relate to opportunities and constraints imposed by terrain.

The Planning Team met with the Master Plan Update Advisory Committee (AC) and the TRAA Board during the initial phase of the project. Input was provided by the TRAA Board and the AC as to what the overall vision is for the Airport for the next twenty years. The following is a result of those discussions and summarizes the overall vision for TEX:

- World class facility.
- Strong, robust general aviation community.
- Commercial passenger service.
- Harmony with local community.

These overall goals will be incorporated into the study and integrated into the alternatives and implementation process. The result will be a blueprint for future development that will best accommodate future aviation demand while also moving the Airport toward the overall vision.

1.3 AIRSIDE FACILITIES

For the purpose of this airport master plan, an inventory of the Airport's primary airside facilities has been completed. Airside facilities include runways, taxiways and apron areas. **Figure 1-2** illustrates the layout of the Airport and identifies the major elements.

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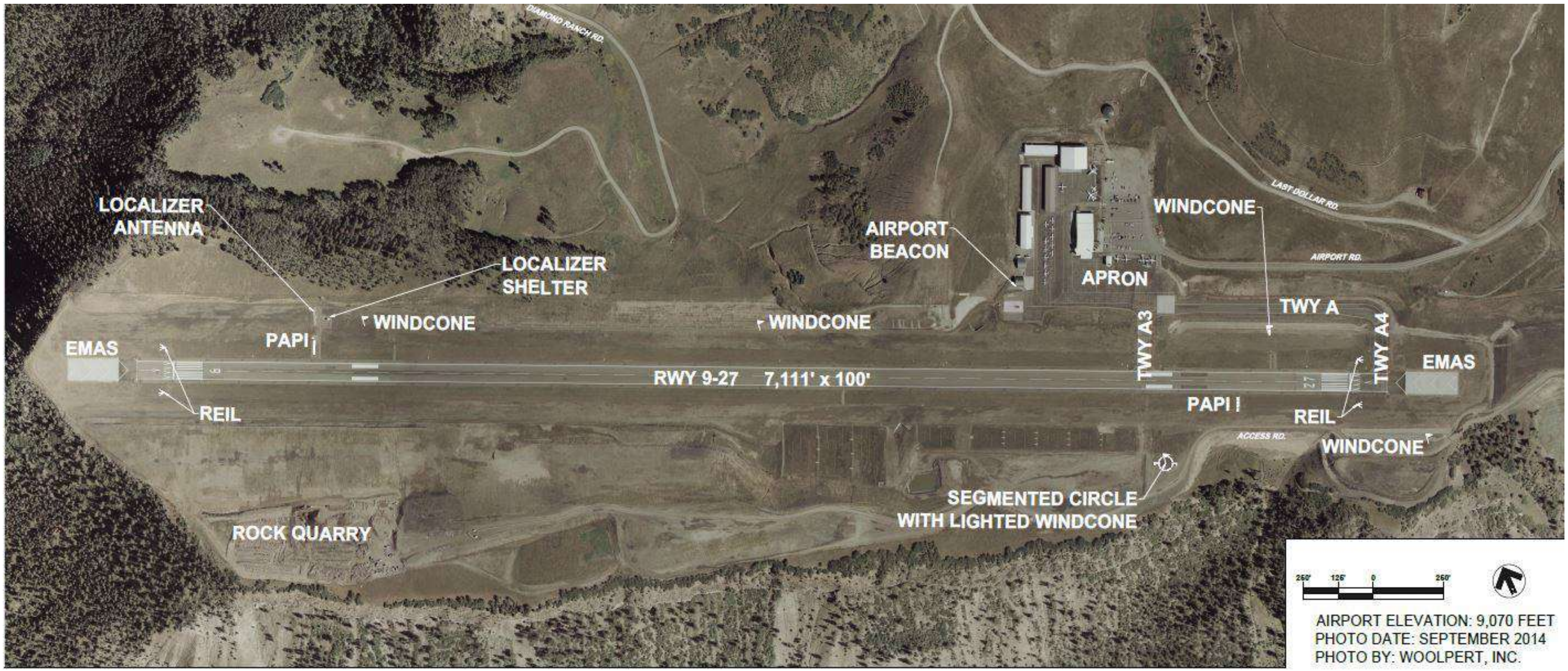

FIGURE 1-2
AIRFIELD FACILITIES LAYOUT

1.3.1 Runway 9-27

The Telluride Regional Airport is served by Runway 9-27. The runway was fully rebuilt in 2009/2010 to a length of 7,111 feet and a width of 100 feet. The runway was extended to its current length based on an analysis of the maximum length that is realistically feasible given the surrounding terrain. As such, this master planning effort will not include further analysis of runway length. **Table 1-1** presents the runway characteristics.

TABLE 1-1
RUNWAY CHARACTERISTICS

Items	RWY 9	RWY 27
Identification	**9**	**27**
True Alignment	105°	285°
Length	7,111 feet	
Width	100 feet	
Paved Shoulder Width	20 feet	
Surface	Asphalt/ Grooved	
Condition	Excellent	
Weight Bearing Capacity	Single Wheel: 45,000 lbs Double Wheel: 89,000 lbs	
Marking	Non Precision in Good Condition	
Edge Lights	High Intensity Runway Lighting (HIRL)	
Runway Design Code	D-III-4000	
Approach Reference Code	D/IV/5000 D/V/5000	D/IV/VIS D/V/VIS
Departure Reference Code	D/IV D/V	D/IV D/V
Traffic Pattern	Right	Left
Visual Slope Indicator	4-light PAPI, Slope 3.55°	4-light PAPI, Slope 4°
Approach	LOC/DME, RNAV, VOR/DME-A	VOR/DME-A
Displaced Threshold	Yes	Yes
TORA/TODA/ASDA	7,111 feet	7,111 feet
Landing Distance Available	6,911 feet	6,911 feet

Source: NOAA, FAA NFDC, FAA AC 150/5300-13A Change 1, RS&H 2014

1.3.2 Taxiways

The Telluride Regional Airport has a taxiway system consisting of one partial parallel taxiway (Taxiway A) which is north of the runway. Taxiway A has two connector taxiways to the runway, identified as A3 and A4. Taxiway A3 currently ties into the apron at a grade which does not meet FAA standard. The apron area is anticipated to be rehabilitated during the summer of 2016, at which time this discrepancy will be corrected.

1.3.3 Aircraft Parking

The Airport's apron areas are located in the immediate vicinity of the terminal complex and aircraft hangars, as illustrated in **Figure 1-3**. The apron was reconstructed and expanded in 1994, and then expanded again in 2001. The 38,560 sq. yard apron is in fair condition, and has a design strength of 50,000 pounds dual wheel loading (DWL). Two north/south taxilanes provide access to the Airport's aircraft hangars and 16 marked tie-downs.

The eastern section of the apron can accommodate larger aircraft with an area of approximately 12,000 square yards and two additional marked positions used for transient aircraft. Out of this area, 2,000 square yards adjacent to the terminal building is dedicated to accommodating commercial service aircraft when necessary. An additional apron area north of the terminal building provides another 1,560-square-yards of apron for aircraft parking.

1.3.4 Lighting, Marking, and Signage

Runway 9-27 and Taxiway A are equipped with High Intensity Runway Lights (HIRL). All lighting elements can be remotely activated by the pilots from their aircraft using a Pilot-Controlled Lighting (PCL) system. Airfield signage includes lighted runway, taxiway, and distance remaining signs.

Both Runway 9 and Runway 27 have non-precision runway pavement markings which include the runway identifier, centerline, displaced thresholds, side stripes, and aiming point makings. The taxiway markings include centerline striping, enhanced centerline striping, and hold line markings adjacent to the runway.

1.3.5 Navigational Aids

Navigational aids (NAVAIDs) are designed to help pilots navigate to and around the airport. These include navigational equipment used for aircraft approaches such as a VHF omnidirectional range (VOR) station, localizer (LOC), and distance measuring equipment (DME). Other equipment is available that informs pilots of immediate conditions on the airfield, such as an automated weather observing station (AWOS).

At TEX, three standardized instrument approach procedures are available, as listed in **Table 1-2**. These approaches assist pilots in navigating to the runway when landing during poor weather conditions. The RNAV approach is a global positioning system (GPS) based approach that provides lateral guidance to aircraft. The LOC/DME approach also provides lateral guidance via a localizer unit on the Airport. The DME equipment provides distance remaining information to the aircraft as it fly's the approach. The VOR-DME approach uses a VOR station and DME equipment to provide the pilot in-route navigation. This approach does not provide lateral guidance and has the highest minimums of all offered approaches.

Note that all existing approaches accommodate only Category A and B aircraft. Currently, approaches for Category C and D aircraft do not exist.

TABLE 1-2
INSTRUMENT APPROACHES

Instrument Approach	Category	Visibility Minimums Category A	Visibility Minimums Category B
RNAV (GPS) RWY 9	Non Precision	>1 1/4 mile	>1 1/2 mile
LOC/DME RWY 9	Non Precision	>1 1/4 mile	>1 1/2 mile
VOR-DME A	Non Precision	>6 mile	>6 mile

Source: FAA NFDC-Instrument Approach Plates

At the time of this writing, the Airport was in the process of beginning a comprehensive study to determine the feasibility of implementing a future Category C approach. This Master Plan Update will consider the effects of a Category C approach in the facility requirements and determine alternatives as applicable.

On the Airport, both runways have four-light Precision Approach Path Indicator (PAPI) light systems and Runway End Identifier Lights (REIL). The Airport also has a segmented circle, three wind socks, rotating beacon, and an Automated Weather Observing System (AWOS-3). **Table 1-3** summarizes available NAVAIDS for each runway end. The FAA owns and maintains the LOC/DME equipment and the Runway 9 PAPI. The Airport owns and maintains all other NAVAIDs.

TABLE 1-3
NAVIGATION AIDS SUMMARY

Runway End	Navigational Aids
9	LOC, DME, VOR-DME, RNAV (GPS), 4-light PAPI, REIL
27	VOR-DME, 4-light PAPI, REIL
Airport	AWOS 3, Rotating Beacon

Source: FAA NFDC-Airport IQ5010

1.3.6 Operations and Noise Abatement

TEX is open for aircraft operations from the hours of 0900 to 1800 Mountain Time. After hours operations are not permitted. The Airport also has in place noise abatement procedures that prohibit touch-and-go practice landings. These types of operations are also restricted in part due to the surrounding terrain.

The procedures list Runway 09 as preferred for landing and Runway 27 as preferred for departures. Other procedures are provided that limit flight tracks over the numerous residential areas to the east of the Airport, as well as Hastings Mesa. Additionally, the airport has noise abatement signage in the terminal building and on the airfield which alert pilots that noise abatement procedures are in effect. The procedures are available to the public on the Airport's website.

1.4 LANDSIDE FACILITIES

Landside facilities include vehicle parking areas and roadway access east of the terminal building. **Figure 1-3** illustrates the location of these facilities along with various landside support facilities, such as ARFF, fueling, and maintenance facilities, which are described in section 1.6.

The Airport has short-term, long-term, rental car, and employee parking adjacent to the terminal building. These parking areas are quantified below in **Table 1-4.** Vehicle parking fees are currently $7 per day, $35 per week, $65 per month, and $650 per year.

TABLE 1-4
TERMINAL AUTOMOBILE PARKING

Parking Area	Capacity	Pavement
Long-Term/Employee/Overflow	100	Unpaved
Short-Term (one week or less)	60	Paved
Rental Car Ready	20	Paved
Rental Car Return	40	Paved

Source: Airport Records, 2014

Access to the Airport is provided by Last Dollar Road, a paved two-lane road maintained by the County which connects the Airport to Colorado State Highway 145. Old Airport Service Road is an unpaved road that serves the southern portion of the airfield and is the primary access to the rock quarry. Old Airport Service Road connects to Last Dollar Road on the east side of Airport property.

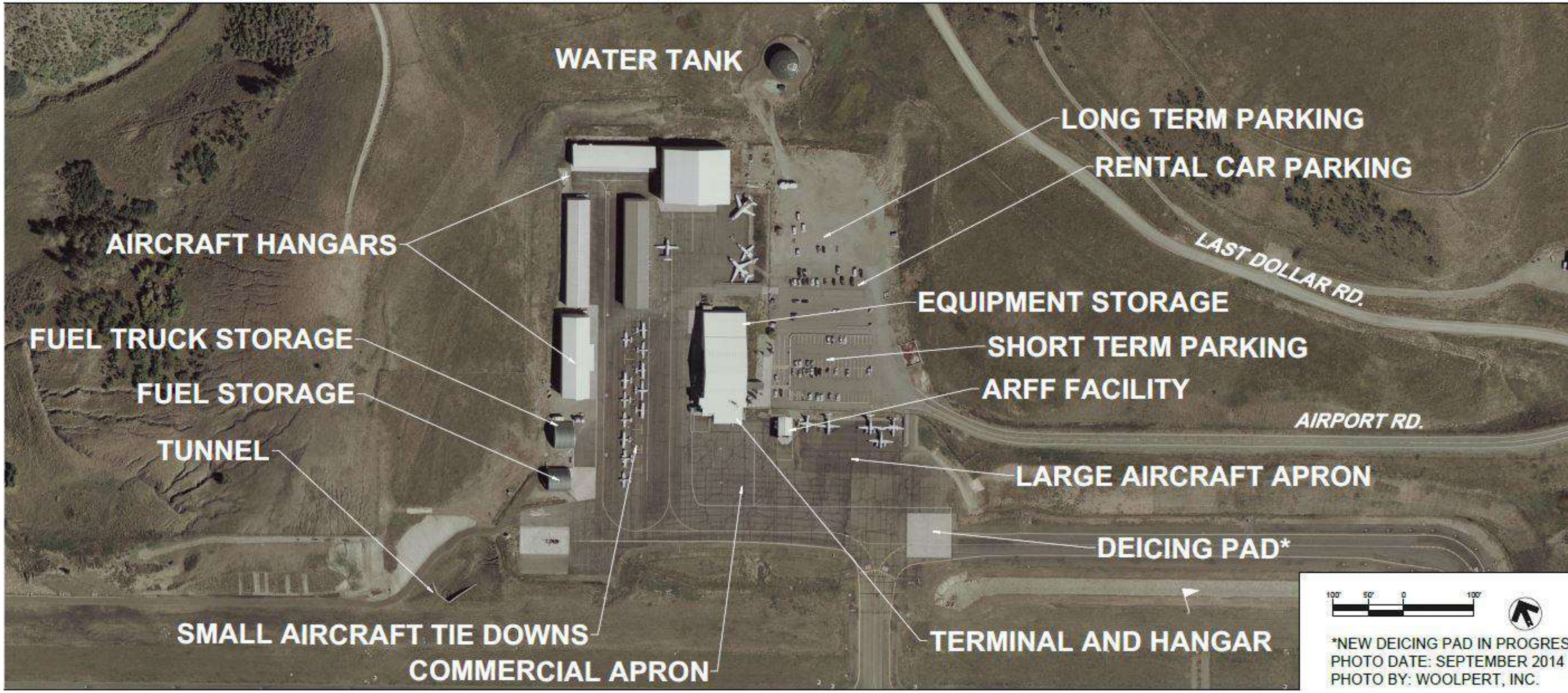

FIGURE 1-3
AIRPORT FACILITIES LAYOUT

1.5 TERMINAL BUILDING

The terminal building is owned and operated by the TRAA. It is located north of Runway 9-27 and has a total area of approximately 27,000 square feet. The terminal building is a modified large aircraft hangar, which was divided into three parts: passenger terminal, aircraft hangar, and snow removal equipment (SRE) storage. The SRE portion of the structure is a 5,000 square foot add-on to the northern portion of the building. The aircraft hangar is roughly 7,600 square feet, oriented west, and sits between the passenger terminal and the SRE storage space.

Functions from the passenger terminal and the SRE space currently spill into the aircraft hangar portion of the building. One third of the aircraft hangar is currently used for SRE equipment storage, while another third is used for airline baggage screening. This situation prevents aircraft from being stored in the hangar, subsequently eliminating the potential for additional revenue to be earned from this building.

The passenger terminal portion includes approximately 16,000 square feet and is the southernmost part of the building. Note that the total square footage of the passenger terminal is estimated based on the 2006 Master Plan, analysis of design drawings, and discussions with Airport management. The estimates in this study account for re-allocations/use of existing space; however, to obtain exact square footage numbers for each programmatic space, a survey is required. For the purpose of this study, existing data and estimates are sufficient for determining future facility requirements. **Figure 1-4** illustrates the existing layout of the terminal building and notes the programmatic space estimates.

The passenger terminal portion of the building includes space for airline, general aviation, and TRAA administrative functions. The upper floor of the facility has a large lounge area that is open to the public. This space provides an area for TRAA meetings and allows waiting passengers to enjoy world class views of the airfield and the mountains. Tenants inside the building include rental car companies, Hertz and Budget; as well as Mountain Limo, and Telluride Express. The Transportation Security Administration (TSA) has space allocated to them in the terminal, but since commercial service has ceased, have removed their equipment and allowed their lease to expire as of February 2015.

In regard to passenger access, aircraft that are dropping-off and picking-up passengers typically park on the south side of the building. Passengers access the apron from the east side of the building when departing, and enter the building from the south when arriving. Vehicle parking is located on the east side. There is approximately a 6 to 8 foot grade differential between the terminal apron and the vehicle parking lot.

This Master Plan Update will address the challenges and opportunities of the existing terminal building, with a focus on future alternatives that will enhance passenger level of service and operational efficiency.

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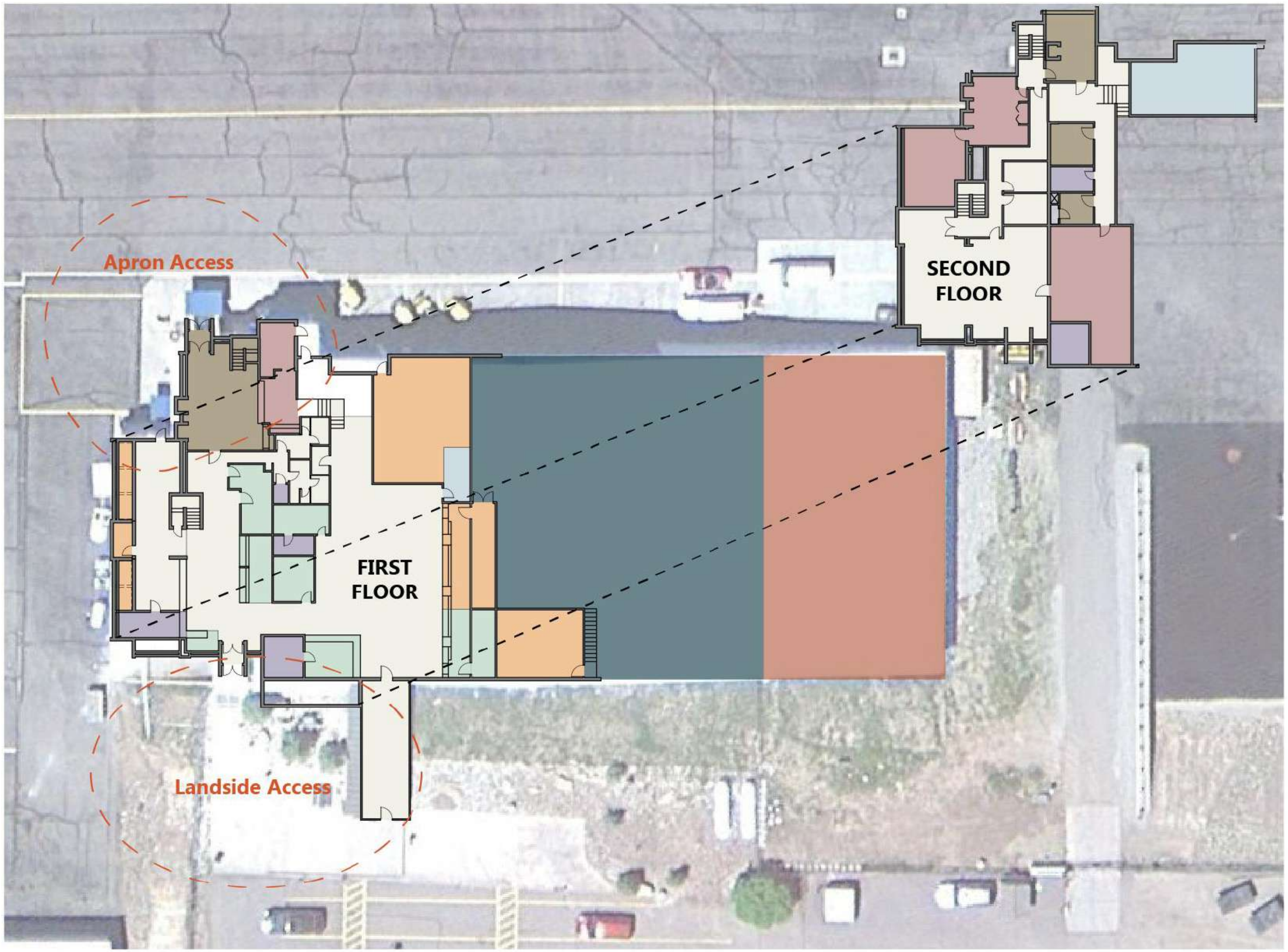


TELLURIDE REGIONAL AIRPORT

Existing Terminal Facility

Program Areas

Program Area	Area
Airline Space	3,000 s.f.
Airport Management Space	2,100 s.f.
Concession Spaces	900 s.f.
General Aviation	1,500 s.f.
Public Space / Circulation	7,500 s.f.
TSA Space	1,100 s.f.
Utilities	1,310 s.f.
Hangar	7,600 s.f.
Snow Removal Equipment	5,000 s.f.
Total Space	**29,000 s.f.**

FIGURE 1-4
TERMINAL PROGRAM AREAS

1.6 SUPPORT FACILITIES

Airport support facilities include those facilities that are used for daily aeronautical operations. These include aircraft hangars, aircraft rescue and firefighting (ARFF) facilities, fuel facilities, maintenance facilities, and fixed based operator facilities.

1.6.1 Aircraft Storage Hangars

The Telluride Regional Airport has a total of six separate aircraft storage hangar facilities:

- Three four-unit hangars (12 hangars) privately-owned and operated with a ground lease with TRAA;
- Three buildings owned by TRAA: one 85 x 90 foot terminal hangar, one 120 x 148 foot transient hangar, and one three-unit, 60 x 60 foot hangar.

The terminal building's 7,650 square foot aircraft hangar is currently used for snow removal equipment storage and baggage screening equipment and is not currently usable for aircraft storage. However, because aircraft storage is limited at the Airport, and the structure's primary intent is aircraft storage, it was included as hangar space for the purpose of this inventory. Discussions with Airport management has indicated the hangars at the Airport are at capacity. There is currently a steady demand for both based aircraft and transient storage space. Currently there are six airplanes on the waitlist for based aircraft hangar storage. The aircraft on this list range from a small single engine to large multi engine turboprop aircraft. The Airport's transient hangar, located north of the terminal building, can accommodate aircraft up to a Gulfstream G-650. **Table 1-5** summarizes the square footage of all the aircraft storage hangar facilities.

TABLE 1-5
AIRCRAFT STORAGE HANGAR FACILITIES

Ownership	Areas (SF)	Number of Individual Units
Private	36,000	12
TRAA – currently usable	28,560	4
TRAA – currently unusable	7,650	1
Total	**72,000**	**17**

Source: Airport Records, 2014

1.6.2 Aircraft Rescue & Firefighting (ARFF)

The Airport's ARFF building is a pre-engineered metal building that was constructed in 1994. The building, located east of the terminal building, is approximately 2,400 square feet and is in good condition. One 2010 Rosenbauer 1,500 gallon ARFF truck is currently stored in the building along with ARFF supplies and gear.

1.6.3 Fuel Facilities

The fuel storage and dispensing facilities, located on the west side of the terminal area, are owned and operated by the Telluride Regional Airport Authority. Aviation fuel is stored in three separate storage tanks in a covered facility that was built in 2005. There are two 20,000 gallon Jet A tanks and one 10,000 gallon 100LL tank. The 100LL tank is also used as a self-service station. The fuel farm foundation is built to provide spill containment. Two 5,000 gallon Jet A trucks and one 750 gallon 100LL truck are used for fueling services. **Table 1-6** details the capacity and age of the storage tanks and the fuel trucks.

TABLE 1-6
FUEL FACILITIES

Fuel Type	Year	Capacity (Gallons)
Storage Tanks		
100LL	2005	10,000
Jet A	2005	40,000
Fuel Trucks		
100LL	1991	750
Jet A	1985	5,000
Jet A	2001	5,000

Source: Airport Records, 2014

1.6.4 Fixed Based Operator

The TRAA owns and operates the only full-service fixed based operator (FBO) on the airport. Services provided include Jet A and 100LL fueling, deice (Type I) and anti-ice (Type IV), hangar storage, and other typical FBO services such as lavatory and oxygen. The FBO is located within the terminal building. The FBO does not provide aircraft maintenance services.

Deicing services are conducted on a 10,000 square foot deicing pad that includes a recollection system and underground tank. The FBO uses a deice/anti-ice trailer which stores and pumps the fluid, and can be towed behind a truck. The deicing pad is scheduled for replacement in 2015.

1.6.5 Airport Snow Removal Equipment Facility

As discussed in **Section 1.5 Terminal Building**, the storage facility for the Airport's snow removal equipment (SRE) was built in 1994 as a 5,000 square foot building attached to the terminal hangar. Currently, SRE equipment is stored in both the SRE building and the terminal hangar. **Table 1-7** lists the Airport's existing SRE equipment and where each is stored.

TABLE 1-7
SNOW REMOVAL EQUIPMENT

SRE Building
2004 tow-behind 18-foot sweeper
1998 Oshkosh plow truck with 22-foot snowplow
1998 Stewart and Stevenson 4,000-tons per hour snow blower
1985 John Deere 644C loader (18-foot snow plow, 2013 runway light plow, bucket, forks)
Terminal Hangar
1985 International plow truck with 22-foot snow plow
2010 Caterpillar skid steer (8-foot sweeper, 10-foot snow plow, snow blower, bucket)

Source: Airport Records, 2014

1.6.6 Utilities

The Airport is served by two water wells that provide water to a 500,000-gallon tank built in 2010. Water is only available at the terminal. Two additional well permits are available for future water if required. The terminal building is equipped with a septic system and has a leach field that sits within the airfield east of Taxiway A3. Connection to the city sewer system would require a new sewer line that would run towards Last Dollar Road, parallel to Taxiway A, and tie in to the existing system. The new line would require a pump to overcome the increase in elevation in-route to the existing system.

The terminal building and all the aircraft hangars are served with natural gas. The ARFF building is the only building that still relies on propane. Electrical service is provided by the San Miguel Power Association. Future development will require consideration of utilities as they relate to demand versus capacity, and the location of existing infrastructure.

1.7 AIRPORT ENVIRONS

This section outlines the existing condition of land use and zoning surrounding the airport, as well as provides an overview of the climate and topography of the area that affect aircraft operations.

1.7.1 Site Topography

The Airport is located in the heart of the San Juan Mountain range within a box canyon surrounded by 13,000 and 14,000 foot high peaks. The airport elevation is 9,070 feet making it the highest commercial service airport in the U.S. Typical of high elevation, mountainous areas; the Airport is exposed to sub-freezing temperatures, high winds, and strong ultra-violet rays.

Situated atop Deep Creek Mesa, the Airport has a limited amount of flat land available for future development. The sides of the mesa are very steep, and the land drops sharply at both ends of the runway, and on the south side of the Airport. The land on the north side of the Airport varies between large drops and gains in elevation. Despite these terrain challenges, the existing facilities are very well located and make for an adequate airport operating environment. However, the terrain heavily constrains future development options at the Airport.

One of the primary goals of this Master Plan Update is to evaluate the landside area for future development opportunities. A complete understanding of the area's topography is required because adjacent grades have a significant effect on development, capacity, and how future projects are designed, phased, and constructed. These considerations are integrated into the facility requirements and alternative phases of this study.

1.7.2 Climate

The climate of Telluride can be characterized as semi-arid. Daytime summer temperatures are typically in the mid-70's to mid-80's, while winter temperatures are typically mid-20's to mid-30's. **Table 1-8** summarizes typical weather information for TEX.

TABLE 1-8
AIRPORT TEMPERATURE AND PRECIPITATION (1984-2013)

Item	Value
Annual Mean Temperature	39.9°F
Annual Mean Max. Temperature	55.9°F
Annual Mean Min. Temperature	24.4°F
Typical Hottest Month	July
Mean Daily Max. Temperature of the Hottest Month	77.9°F
Typical Coolest Month	January
Mean Daily Mean Temperature of the coolest Month	2°F
Average Annual Precipitation (inches)	22.8
Average Annual Snowfall (inches)	164.7

Source: NOAA-National Climactic Data Center – USC00058204

An analysis was conducted to determine the percentage of time the Airport is under instrument metrological conditions (IMC). IMC weather conditions are such that pilots are required to fly by instrument flight rules (IFR) instead of by reference to visual cues under visual flight rules (VFR). Class E airspace is used for all pilots flying by instruments into TEX. Within Class E airspace, the FAA defines IMC as having visibility below 3 miles or a ceiling lower than 1,000 feet.

To identify the occurrence of IMC at the Airport, a total of 240,193 AWOS reports from 2004 to 2013 were tabulated. IMC was reported to occur 4.66 percent of the time with either the visibility or the ceiling below the defined threshold. The ceiling was reported below 1,000 feet approximately 3.15 percent of the time, with visibility reported below three miles approximately 4.25 percent of the time. **Table 1-9** summarizes IMC conditions at TEX.

TABLE 1-9
INSTRUMENT METEOROLOGICAL CONDITIONS ANALYSIS (2004-2013)

Measure	Observations	Total Usable Observations	Percentage Occurrence
Visibility < 3 miles	10,179	239,610	4.25%
Ceiling < 1000 feet	7,574	240,099	3.15%
IMC	11,159	239,607	4.66%

Source: RS&H 2014, TEX AWOS Reports 2004-2013 – WBAN_ID 03011

1.7.3 Land Use

The Airport is located on an unincorporated portion of land within San Miguel County. It is surrounded by U.S. Forest Service land, low density residential development, and open space. Residential areas include the Last Dollar Subdivision located east of the Airport, and Aldasoro Ranch located to the north and north east. Additionally, less developed low density residential subdivisions of Diamond Ranch, Diamond Ridge, and Deep Creek Ranches are located to the north of the Airport.

Land use regarding airports in San Miguel County is guided by the county's Land Use Code Section 5-417 *Airports*. Land Use Code Section 5-418 *Telluride Regional Airport*, provides policy guidance for all unincorporated land beneath the TEX Part 77 Conical Surface. The policy outlines compatible land use, height restrictions, and lighting requirements.

1.8 ENVIRONMENTAL DATA

This section provides an overview of resource categories defined in FAA Order 1050.1E, *Policies and Procedures for Considering Environmental Impacts*, and 5050.4B, *National Environmental Policy Act* (NEPA Implementing Instructions for Airports), as it applies to the environs surrounding the Airport. The environmental resource categories, listed in the order they are presented in Order 1050.1E, are provided in **Table 1-10.** Based on previously completed studies, it was determined that most categories are not currently present on or near the immediate vicinity of the Airport. The categories that are currently present are listed in bold.

It should be noted that a Wildlife Hazard Assessment (WHA) was recently completed at the Airport. The study began in January 2014, and was conducted by a qualified wildlife biologist who meets the requirements in Advisory Circular 150/5200-36, *Qualifications for Wildlife Biologists Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards at Airports*.

TABLE 1-10
NEPA RESOURCE CATEGORIES

Resource Category	Impacts / Requirements
Air Quality	The Airport is located in an attainment area.
Coastal Resources	The State of Colorado has no coastal zone management programs in place.
Compatible Land Use	The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of the airport's noise impacts. The Airport currently does not have noise impacts necessitating additional analyses.
Construction Impacts	All construction related to future airport development projects will comply with guidelines set forth in FAA AC 150/5370-10A, *Standards for Specifying the Construction of Airports*.
Section 4(f)	There are no impacts to qualifying Section 4(f) lands.
Fish, Wildlife, and Plants	Per a 2004 Biological Assessment, the Airport property may provide potential habitat for two species of concern: Bald Eagles and Canada Lynx.
Farmlands	The local branch of the United States Department of Agriculture (USDA) determines if prime or unique farmland exists in the vicinity of the Airport. No prime or unique farmland exists in the vicinity of the Airport.
Floodplains	No floodplains exist within Airport property.
Hazardous Materials, Pollution Prevention, and Solid Waste	The Airport maintains a Spill Prevention and Countermeasure Plan (SPCC), and a Stormwater Pollution Prevention Plan (SWPPP) as required.
Historical, Architectural, Archaeological, and Cultural	According to the Colorado Historical Society and the San Miguel County Historical Commission, no sites of significance are found on Airport property.

Light Emissions And Visual Effects	Normally improvements or relocations to lighting systems used at the Airport will not have a negative impact on people or property located in the vicinity of the Airport. Consideration of aesthetics in the future at the Airport should attempt to adhere to existing design, art, and architecture at the Airport and in the vicinity in order to minimize any perceived negative impacts.
Natural Resources and Energy Supply	Coordination with natural resource and energy supply companies is recommended prior to the construction of new facilities requiring these services.
Noise	The Airport's 65 and 70 Day-Night Level (DNL) noise contours are located within Airport property. There are no noise sensitive land uses located within the 65 and 70 DNL contours.
Secondary (Induced) Impacts	The Airport has not identified any development projects. The Council on Environmental Quality's NEPA implementing regulations (40 CFR 1500 *et. seq.*) requires FAA to consider project-induced indirect effects in its NEPA evaluations. All future Airport development projects will comply with NEPA regulations.
Socioeconomic Impacts, Environmental Justice, and Children's Health and Safety Risks.	The Airport has not identified any development projects that require land acquisition. No impacts were identified. It will be necessary to evaluate the impacts of future projects on surrounding communities
Water Quality	There is currently no impact to Water Quality. The Airport will need to comply with the requirements for their NPDES permit.
Wetlands	Wetlands are found on Airport property. E.O. 11990, Order 56660.1A and the Clean Water Act address activities in wetlands. Future construction activities that require dredging or fill material in wetlands require a section 404 permit to be filed with The Army Corps of Engineers.
Wild and Scenic Rivers	No designated wild or scenic rivers are near the Airport.

Source: 2006 Environmental Assessment, 2004 Airport Master Plan, RS&H 2014

CHAPTER 2

AVIATION FORECAST

2.1 AVIATION DEMAND FORECAST

This chapter presents the forecasts for passenger, based aircraft, and aircraft operations for the Telluride Regional Airport. The objective of the forecast is to identify the long-term trends for the types and levels of future aviation activity. In some instances, multiple forecast scenarios have been created which take into account a broad spectrum of influencing factors. From these scenarios, a comprehensive forecast is carried forward to be used in subsequent chapters of this study in identifying future facility requirements.

Multiple resources were used in the analysis of this forecast including the FAA Terminal Area Forecast Fiscal Years 2013-2040 (TAF), the FAA Aerospace Forecast Fiscal Years 2014-2034, and prior and current studies related to passenger enplanements and operations, cargo volume and operations, and aircraft operations. The forecast is presented in five and ten year increments beginning with a base year of 2014 with projections outward to 2019, 2024, and 2034. It should be noted that this type of forecast is intended to be used for long-term planning purposes, and as such, individual forecast years are less important than trends.

This chapter is organized into sections as follows:

- Local Socioeconomics
- Commercial Airline Passenger Forecast
- Aviation Activity Demand Forecast
- Forecast Summary and TAF Comparison
- Critical Aircraft

2.2 LOCAL SOCIOECONOMICS

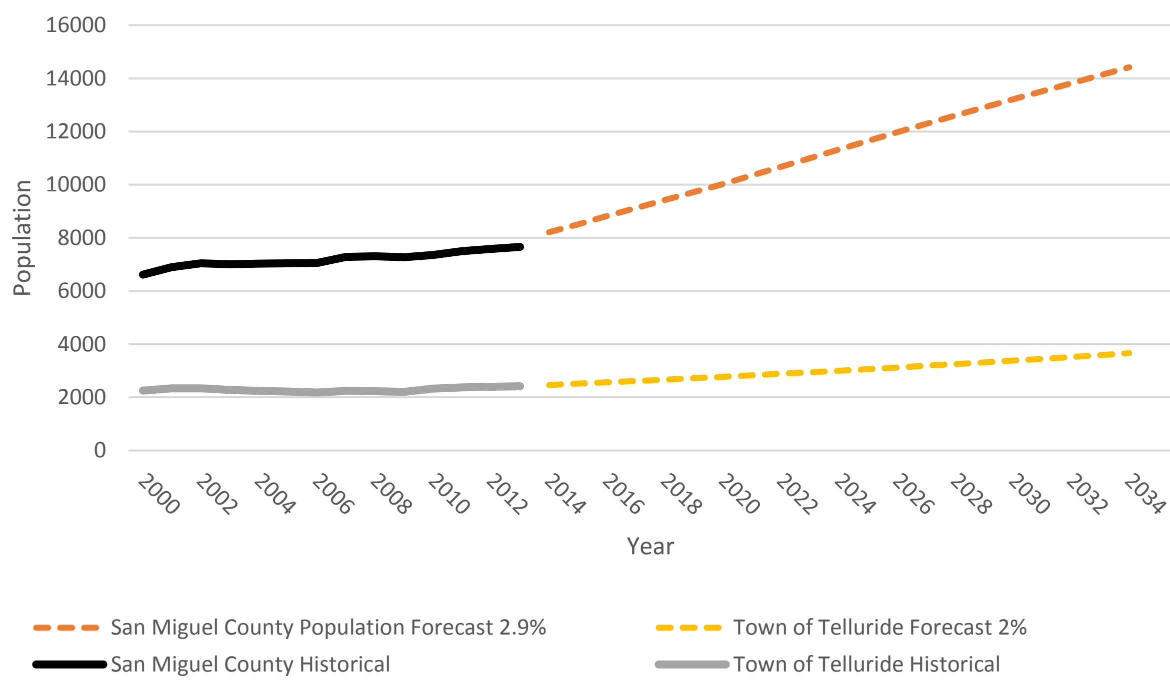
Consideration of a community's economic character is particularly important when estimating the potential growth for air travel and general aviation activity at an airport. Growth in population, income, trade, and business are all metrics which typically correlate to local aviation activity. At TEX, the economic factors which were deemed most relevant to demand for air travel are those metrics related to tourism, local population, and housing unit growth. To better understand the local and regional economic conditions, these indicators were evaluated and then used to generate the aviation related forecasts detailed later in this chapter.

2.2.1 Population

Population often has a strong correlation with the amount of general aviation and commercial service air travel demand at an airport. The Colorado Department of Local Affairs (DOLA) provides historical population data for San Miguel County and for the Town of Telluride. The DOLA 2014 population forecast for the County indicated a 2.9 percent compound annual growth rate (CAGR) through the planning period.

An estimate for population growth of the Town of Telluride was provided in a study commissioned by the Telluride Foundation in 2010[1]. The Study provided a high and low forecast for population growth based on public policies such as land use and zoning regulations. The high forecast for population indicated that the Telluride Region (defined as the Town of Mountain Village and the Town of Telluride) would experience growth of approximately 2 percent annually, while the low forecast indicated one percent. The high growth percentage was applied to the historical Town of Telluride population provided by DOLA. The difference in the forecasts of population for San Miguel County and the Telluride Region, illustrated in **Figure 2-1,** indicate that the majority of population growth within the County is expected to occur outside of the Telluride Region.

FIGURE 2-1
HISTORICAL AND FORECAST POPULATION GROWTH RATES



Sources: CO Department of Local Affairs, Telluride Foundation Study, 2010, RS&H analysis

2.2.2 Housing Units

The Telluride Foundation study also provided a high and low forecast for housing units in the Telluride Region. The high forecast indicated housing units increasing from 4,185 units to 5,190 units, which equates to a 1.7 percent CAGR. The low forecast indicated housing units increasing from 4,185 units to 4,697 units, which equates to a 1.2 percent CAGR. These forecasts project approximately 500 to 1,000 new housing units to be constructed within the planning period. For the Telluride Region, it can be expected that new housing units will be a mix of second homes and homes for full time residents. The forecasts indicate that while there will likely be new housing built in the Telluride Region, growth will be limited to under 2 percent annually.

[1] Harvard University, Massachusetts Institute of Technology. (2010).*Alternative Future for the Telluride Region, Colorado*. Telluride Foundation.

Within the Telluride Region, it is expected that a portion of the new housing units built will be large luxury estates. Many of the second homes in the region are owned by people and/or corporations that travel via private aircraft. Thus, the rate of growth of new housing is expected to have a relationship to future general aviation activity. It was also noted that real estate sales for existing properties has recently accelerated[2]. This factor also has a likelihood of corresponding to an increase in general aviation traffic as new investors visit the region.

2.2.3 Visitors

Winter and summer recreation activities supply the majority of visitors to Telluride, and hospitality services provide a large contribution to the local economy. The year 2007 is considered the "high-water" benchmark year for tourism in Telluride, as roughly 122,000 visitors traveled into the Telluride region. The year 2008 saw tourism traffic drop by over 25,000 visitors as the U.S. recession took hold, but this number has increased steadily since that time. As of 2013, visitor numbers have surpassed the records set in 2007. In 2014, Telluride saw nearly 150,000 visitors[3], which is a 22 percent increase over the 2007 benchmark. This represents a compound annual growth rate of approximately three percent. Additionally, Montrose Regional Airport (MTJ) saw a 21 percent increase in winter guaranteed seats to 106,294 for the 2014-2015 season, which is directly related to visitors to the Telluride Region. The growth in visitors is reflective of a shift in the ski industry business model to focus on attracting higher volumes of visitors using attractive pricing and package deals. As the Telluride brand continues to grow, the growth trend is expected to continue.

2.2.4 Summary

Telluride is primarily a destination area and has a relatively small population base. As such, aviation activity in the region is largely driven by visitor traffic. Two distinct types of air travelers are visiting Telluride: individuals and families that will travel on private aircraft, and individuals and families that will fly via commercial air service. Both types of air travelers are projected to increasingly come to Telluride as evidenced by a resurging luxury home real estate market, record numbers of visitors, and increased air service to MTJ driven by tourism in Telluride. Currently however, only private flyers can access Telluride via TEX, while commercial service passengers access Telluride via MTJ.

The forecasts discussed provide insight into each type of air traveler and airport user. Overall, all indicators point towards continued growth of the region, albeit at a moderate pace. The trend in increased visitors indicates a strong demand for air service into the region. The next section discusses factors related to the future of air service at TEX.

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[2] Rebchook, J. (2015). Telluride Real Estate Riding High. *Inside Real Estate News.*

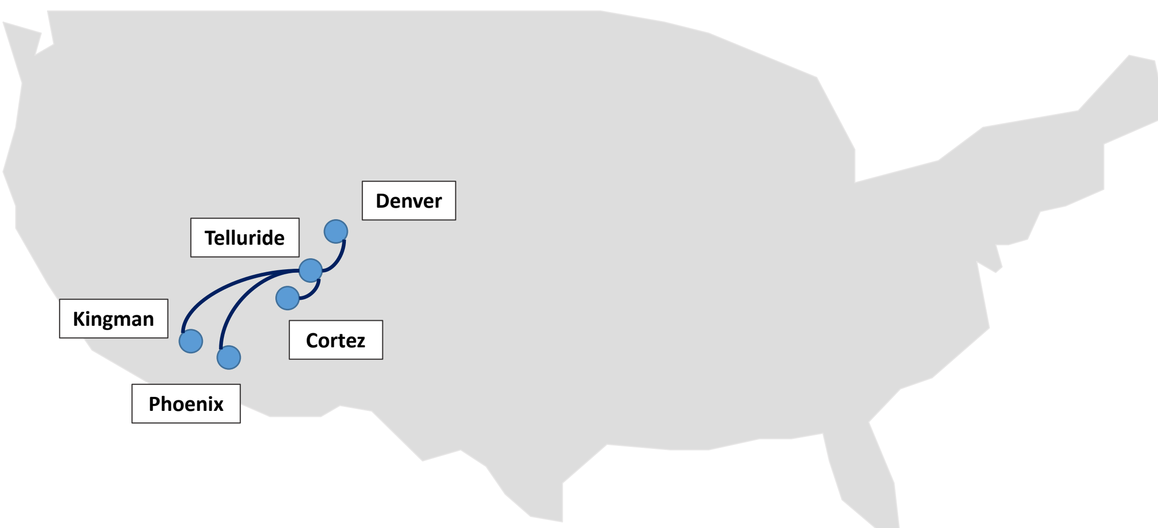
[3] Telluride Tourism Board, 2015

2.3 COMMERCIAL AIRLINE PASSENGER FORECAST

This section details the history of airline passenger service at TEX including historical service, capacity, and enplanement levels. A forecast of future air service is provided, based on an estimated likelihood of air service returning to Telluride. Potential opportunities for the return of air service is discussed.

Telluride has a history of airline passenger service dating back to 1985. **Figure 2-2** illustrates historical direct routes to TEX since 2004. Within the past ten years, the market was served by two airlines. Great Lakes Airlines provided service to Denver, Colorado with 19-seat Beechcraft 1900 aircraft, and US Airways had service to Phoenix, Arizona with the 37-seat Dash 8. In 2012, Great Lakes Airlines served Cortez, Colorado, and in 2014, briefly served Kingman, Arizona. However, as of September 2014, all passenger service has been discontinued. This is due to a combination of factors, including a shortage of early career pilots (lower hour pilots who typically work for Great Lakes Airlines) and an increase by the FAA in the qualification requirements for commercial airline pilots. These factors have required Great Lakes Airlines to focus their resources on their most profitable markets, which TEX was not. TEX is one of the many airports in the mountain region that was effected by these circumstances.

FIGURE 2-2
HISTORIC DIRECT AIR SERVICE TO TEX

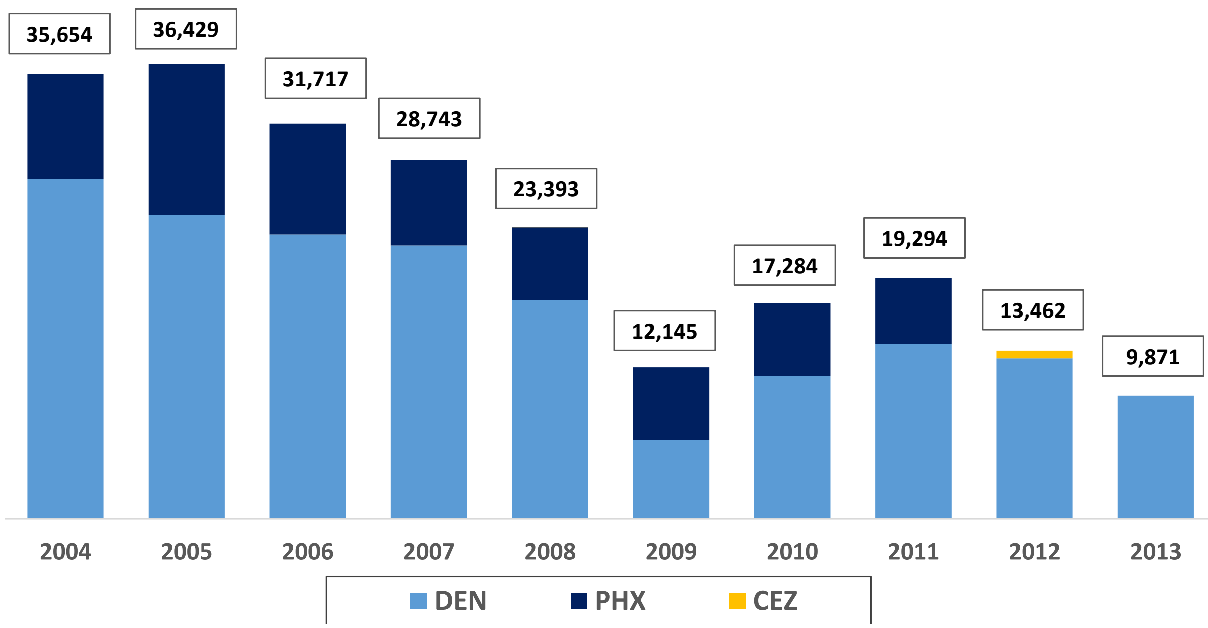


Source: Forecast Inc., 2014

2.3.1 Historical Capacity

Over the last 10 years, historical enplanements have declined by 67 percent. As illustrated in **Figure 2-3**, 2013 was the lowest year for enplanements with a total of 6,060 passengers. This trend correlates with the decline of capacity (available seats) in the market. Since year end 2004, available seats in the TEX market have declined 72 percent.

FIGURE 2-3
HISTORICAL 10 YEAR TEX CAPACITY



Sources: US Department of Transportation T-100 and DB1B Data, Forecast Inc. analysis, 2014

In the last 10 years the highest amount of capacity in the Telluride market was eight daily round trip frequencies. Great Lakes Airlines had a peak of 6 frequencies to Denver and US Airways had a seasonal peak of two frequencies to Phoenix (PHX). In 2009, the airport was closed from the period of April 2009 until November 2009 to facilitate construction on the runway. This drove a significant decline in total enplanements for the same year, and traffic rebounded in the following year but still remained below 2008 levels. By 2011, US Airways was continuing to operate up to twice daily service during peak periods in the market (seasonally), whereas Great Lakes would now only peak at 3 daily frequencies. In 2012, US Airways pulled out of the market and passenger enplanements fell below 14,000. Year end 2013 enplanements dropped by an additional 25 percent due to Great Lakes continuing to reduce capacity. Although enplanements and seats have declined, load factor had been increasing. Average year end load factor had increased nine percent in the last 10 years. Error! Reference source not found. below illustrates the average seasonal daily flight frequency of each airline since 2011. Note that as an average over the slow and busy times of the season, the frequencies shown are not whole numbers.

TABLE 2-1
HISTORICAL AIR SERVICE FREQUENCY

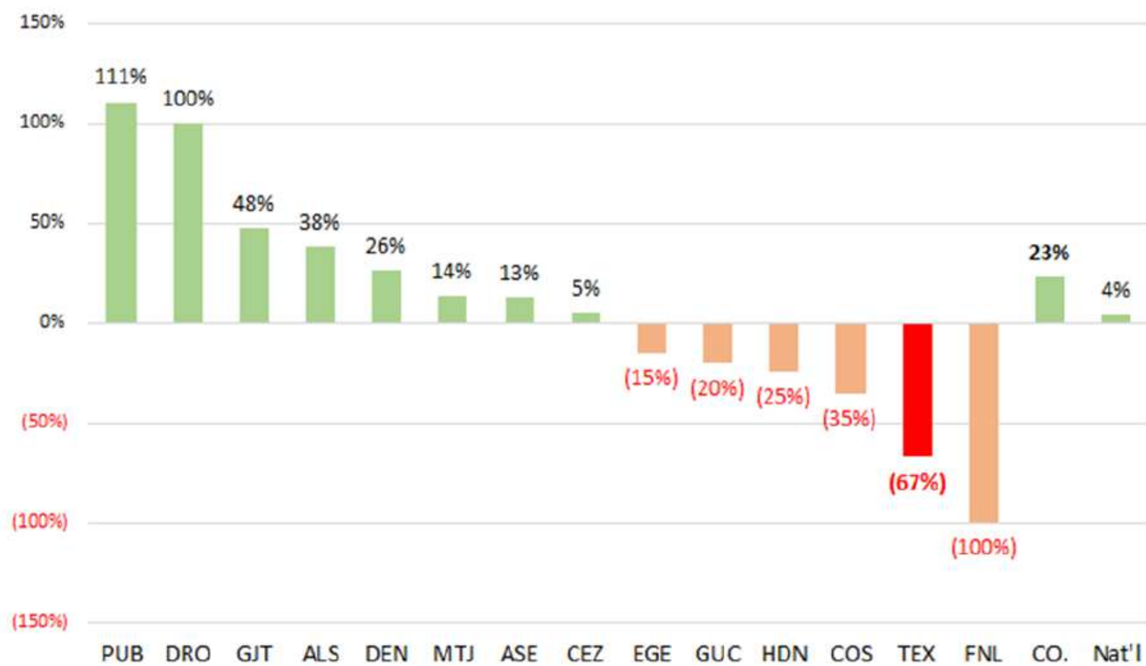
		2011		2012		2013		2014		2015
	Airline	Winter	Summer	Winter	Summer	Winter	Summer	Winter	Summer	ALL
Denver	Great Lakes	2.0	2.5	2.3	2.3	2.3	1.3	1.3	1.3	-
Phoenix	US Airways	1.9	-	-	-	-	-	-	-	-
Cortez	Great Lakes	-	-	1.0	-	-	-	-	-	-
Kingman	Great Lakes	-	-	-	-	-	-	1.0	-	-
TOTAL		**3.9**	**2.5**	**3.3**	**2.3**	**2.3**	**1.3**	**2.3**	**1.3**	**-**

Source: OAG Schedule Data, Forecast Inc. analysis, 2014

2.3.2 Historical Enplanements

Enplanements trends at Telluride have not corresponded with either state, or national trends in the US commercial airline industry. From the period of 2004 to 2013, passenger enplanements in the State of Colorado increased by 23 percent, whereas enplanements nationally increased by 4 percent. Had TEX enplanements grown in line with the national average, 2013 enplanements would have approximately equaled 53,000 or over 400 percent above actual enplanements for that year. **Figure 2-4** illustrates the enplanement trend at Colorado airports between 2004 and 2013.

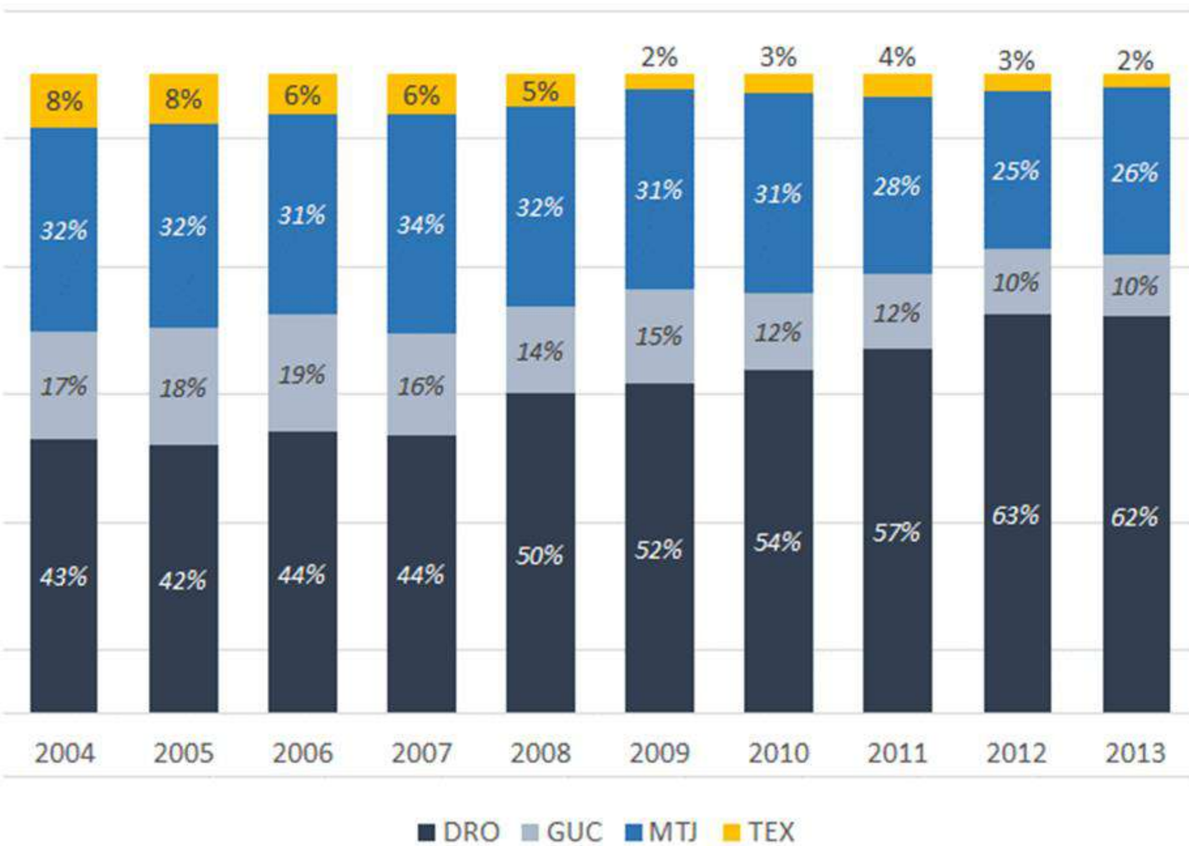
FIGURE 2-4
COLORADO AIRPORTS 10-YEAR ENPLANEMENT TRENDS



Sources: US Department of Transportation T-100 and DB1B Data, Forecast Inc. analysis, 2014

During the period from 2004 through 2013, the percentage of traffic that was handled by TEX in the region (defined as the aggregate enplanement values of Durango (DRO), Gunnision (GUC), Montrose (MTJ), and Telluride (TEX)), declined considerably. In 2004, TEX captured approximately eight percent of this region. By 2013, TEX's enplanement share of the region had declined to approximately two percent. GUC and MTJ also saw a decline during this period, with most regional traffic shifting to DRO. **Figure 2-5** illustrates the percentage share of enplanements that TEX accommodated between 2004 and 2013.

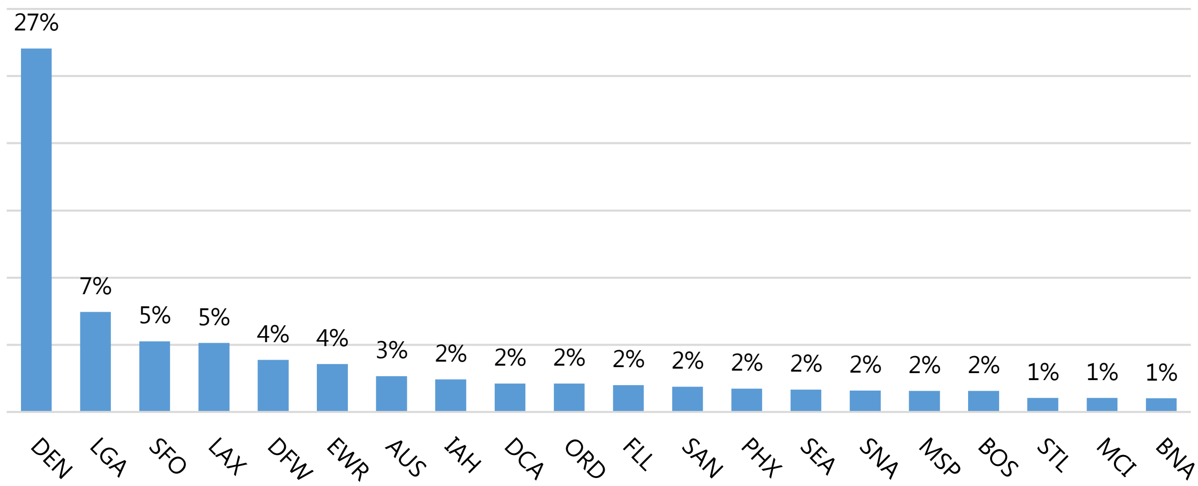
FIGURE 2-5
HISTORICAL REGIONAL TRAFFIC COMPOSITION – BY ORIGIN AIRPORT



Sources: US Department of Transportation T-100 and DB1B Data, Forecast Inc. analysis, 2014

Great Lakes enplanement data in 2013 was substantial enough to give indications of market-sizes by destination/origin from TEX. As illustrated in **Figure 2-6**, the largest origin market to Telluride was Denver (DEN), representing approximately 27 percent of traffic originating or destined to TEX. The second largest market was New York – LaGuardia Airport (LGA), representing 7 percent of demand to and from the airport. Other top markets from Telluride include Los Angeles (LAX), San Francisco (SFO), and Dallas/Ft. Worth (DFW). Denver's high ranking is mostly due to passengers booking flights to and from Denver to connect onto other airlines. Approximately 23 percent of TEX traffic was outside of the top-20 markets.

FIGURE 2-6
HISTORICAL TRUE ORIGIN / DESTINATION COMPOSITION FROM TEX



Sources: US Department of Transportation T-100 and DB1B Data, Forecast Inc. analysis, 2014

2.3.3 Forecast Passenger Activity

Given the elimination of all commercial airline service in Telluride, the first step in the forecast process was to forecast passenger traffic for the geographic region surrounding the Airport. The region includes Telluride Regional Airport (TEX), Gunnison-Crested Butte Regional Airport (GUC), Durango (DRO), and Montrose Regional Airport (MTJ). It should be noted that the geographic region is representative of the nearest airports to TEX. These airports were chosen because the passenger profiles best match those of the population in Telluride. Grand Junction was excluded from the region because as the largest metropolitan area on the western slope, passenger profiles have greater differences then passengers from the included airports.

The baseline for the forecast is the year-ending 2013 traffic for the aggregated three airports. Passenger enplanements between these three airports for 2013 was approximately 305,000. Forward looking traffic will be forecasted based on three primary indicators, which weighted on average, have proved to be strong indicators of passenger enplanements going forward. These include:

- 2014 Woods and Poole Population Forecast
- US Economy Real GDP Forecast
- IATA North American Air Traffic Forecast

In aggregate, these three metrics provide a strong indicator of each element that will impact regional enplanements over the next 20 year period. The Woods and Poole population and economic forecast provides an indication of the expected strength of the region, and the level of local air travel demand. The US Real GDP forecast is typically a stronger indicator of national travel trends, and provides a better indicator of inbound traffic growth to the region. The IATA North American Air Traffic Forecast indicates capacity trends that are industry and regionally specific.

From the period 2014-2034 population growth of the Telluride catchment area is expected to grow by 37 percent. This cumulative growth represents a CAGR of 1.5 percent. The IATA regional traffic forecast predicts 3.6 percent growth, and the US Real GDP forecast shows a growth rate of 2.7 percent. When aggregated, the average of these forecasted growth rates equal a CAGR of 2.6 percent. This would represent a cumulative growth of 67 percent over the next 20 year period. By applying this growth rate to the region's combined number of enplanements in 2013 (305,000), it can be expected that the region will have 509,000 enplanements by 2034.

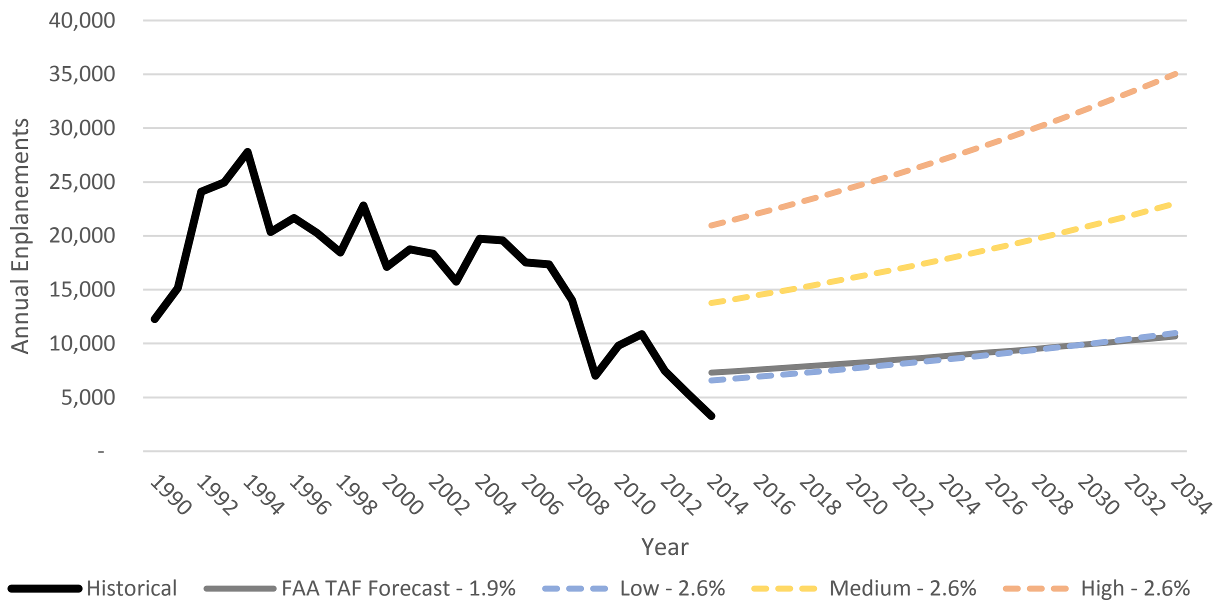
Three forecasts, low, medium, and high, were developed using a market share analysis upon this estimated growth in the region. These are based on the average percentage of regional enplanements that were carried from TEX during the period from 2004 through 2013, as discussed in **Section 2.3.2**. During this period, TEX represented between two percent and eight percent of regional enplanements, with large fluctuations based on overall market capacity. The average standard deviation over this period was 2.3 percent. Accordingly, the low enplanement forecast will be based on TEX representing 2.1 percent of overall enplanements for the region, the medium forecast at 4.4 percent of enplanements for the region, and the high enplanement forecast estimated at 6.7 percent of enplanements for the region.

With the regions enplanements forecasted into the future with a 2.6 percent CAGR, the share of enplanements that TEX would have based on the low, medium, and high forecasts are 10,900, 23,000, and 35,000 respectively by 2034. This forecast is dependent on air service returning to TEX. In regards to the return of air service, multiple factors will effect actual enplanement numbers. These include ramp-up times to establish new air service, equipment, frequency, and the actual date at which air service returns. The enplanement forecast will be used in this study to determine facility needs based on demand associated with the range of enplanements estimated as a possibility through the planning period.

It is difficult to incorporate an estimate of when air service might return or how many enplanements new service would bring initially. As such, this forecast did not attempt to estimate these metrics. Instead, the forecast shows air service returning immediately in the near term planning period. This approach is intended to ensure airport facilities can quickly accommodate air service demands if needed. Additionally, using a planning activity level (PAL) facility requirements approach in the subsequent chapter, the forecasted demand can be shifted forward in time to line up with what actually materializes. Thus, though the dates of estimated demand may not be aligned in the future, the forecasted passenger demand levels and associated facility requirements will remain useful and relevant to the Airport as a planning tool.

As illustrated in **Figure 2-7**, the FAA TAF forecasted annual growth at 1.9 percent while the low scenario indicated 2.6 percent. The TAF was created before air service was discontinued. However, it was noted that the TAF and the low scenario were similar. The medium forecast is preferred because if air service does return to TEX, it is likely it will be through the use of the Q400. That aircraft is larger than the equipment previously serving the Airport, which would provide more reliable service, and would require higher load factors to be economically viable. Thus enplanement levels are estimated to be greater.

FIGURE 2-7
HISTORICAL AND FORECAST PASSENGER ENPLANEMENTS



Source: Airport Records, FAA Terminal Area Forecast, Forecast Inc. analysis, 2014

2.3.4 Future Air Service Opportunities

Due to the runway length, high elevation, and restrictive approaches, the Airport is limited to the type of aircraft that can be accommodated. Historically the market has been served with either the 37-seat Dash 8 or 19-seat Beechcraft 1900. Today the operators of those aircraft are limited to a few remaining service providers; Great Lakes Airlines operates the Beechcraft 1900 and Piedmont, Mesa and Commutair operate the last remaining Dash 8's. With the exception of perhaps Great Lakes, the other airlines do not operate in the mountain west. Thus attracting air services from Piedmont, Mesa, or Commutair will be challenging and require significant financial investments in the form of revenue guarantees.

As the industry continues to evolve through mergers and bankruptcies, there are few operators that could successfully seek to add services into TEX. Besides a reduction in operators who use the Beechcraft 1900 and Dash 8, there has also been a drastic reduction in the use of smaller regional jets, such as the Canadair CRJ-200. The 2004 Master Plan anticipated the CRJ-200 as a viable aircraft for air service at TEX. However, since then, SkyWest and other airlines operating the CRJ-200 in the mountain west have cut the aircraft from their fleet. Additionally, SkyWest has transitioned away from Embraer EMB 120 aircraft to an all jet fleet. This is in-line with the industry trend to replace smaller, older, less efficient aircraft with larger, more efficient jet aircraft; simultaneously cutting flights, reducing capacity, and increasing load factors.

Besides the return of Great Lakes and the Beechcraft 1900, the only remaining realistic candidate for scheduled air service at TEX is by those who operate the Bombardier Q400. This aircraft has the performance to operate with passenger loads that would make air service a feasible and profitable enterprise. The Q400 is typically configured with roughly 70 seats and is currently used by Horizon Air, Alaska Airlines' partner, and Porter Airlines, Westjet and Jazz Air (all Canadian carriers not operating in Colorado).

In the not too distant past, both Frontier Airlines and later United Airlines offered Q400 service from Denver. Frontier, through their acquisition by Republic Airways, shut down its Q400 operator Lynx a few years ago. Meanwhile, both United and Republic decided that the Q400 was no longer a viable option for their long term fleet plans and are in the process of eliminating this aircraft from their operation. All variants of this aircraft from United's fleet will be gone by the summer of 2015.

Thus, the last viable operator in the mountain west that still uses the Q400 is Alaska Airlines. Alaska has historically worked with ski markets in the mountain west (Mammoth, CA and Steamboat Springs, CO) under revenue guarantee partnerships. These services focus on Alaska's hub operations from Seattle, San Francisco, Los Angeles and San Diego. Ideally, Alaska Airlines flights offered through Horizon Air's Q400 fleet would be a good fit for the community from Los Angeles once the FAA has certified the aircraft for operations into and out of TEX.

The challenge TEX faces is that the Q400 is not currently certified to use the TEX airport for scheduled commercial passenger service. This is due to the lack of a Category C approach. The Airport is currently aggressively pursuing the completion of the Category C approach. However, at the present time, it cannot be accurately estimated when the approach will be ready for use by commercial airlines.

2.3.4.1 Potential Destinations for Airline Passenger Service

New destinations for airline passenger service for TEX is dependent upon the combination of four qualifications:

- The destination is within the range of aircraft that can operate at TEX, which is approximately 700 miles or less.
- The destination provides adequate connections to the national transportation system.
- The destination represents a top origin/destination market from TEX.
- The airline to introduce service has operations in place at the new destination.

Based on these four qualifications, five destinations were identified that present opportunities for air service to TEX which include Denver (DEN), Phoenix (PHX), Los Angeles (LAX), San Francisco (SFO), and Dallas/Fort Worth (DFW).

Denver International Airport is the most obvious candidate for re-introducing service to TEX. The airport represents a large hub operation for Great Lakes Airlines, and United Airlines (which operates Q400's from DEN to MTJ currently). Historically, Denver has represented over 25 percent of demand from TEX. A short-stage length minimizes operating cost and aircraft commitment from a carrier. LAX in Los Angeles, California is another top candidate. It is a top five market from TEX and a hub for multiple airlines. Target carriers to operate LAX-TEX include Alaska Airlines which has hub / focus-city operations in LAX and operates Q400 regional aircraft from that airport.

SFO is the third largest market from TEX and United Airlines largest West Coast hub. While the stage length is further vs. other regional hubs, the large local market has incentivized United to introduce new non-stop service from SFO to both Hayden (HDN) and Montrose (MTJ) within the last 5 years. DFW is the 5th largest market from TEX and the largest hub of American Airlines, the world's largest airline. At a range of 700 miles, DFW-TEX is still within a reasonable economic range of regional jet or large turbo-prop aircraft. Given the synergies between Texas and Colorado, coupled with the originating ski-market of DFW, American Airlines serves seven destinations in Colorado non-stop from DFW. PHX is a top 15 market from TEX and also the American Airlines hub in the mountain west. The airport is below 400 miles, putting it within range of all regional aircraft. The proximate nature to TEX keeps operating costs low for an airline and also provides for convenient connections nation-wide on a low-circuity basis.

All of these destinations are viable in that passenger demand for TEX flights exists. However, existing equipment operated by airlines at SFO, PHX, and DFW do not currently match the requirements for operations to TEX. Thus, the best destinations for future air service is DEN and LAX.

2.4 AVIATION ACTIVITY DEMAND FORECAST

This section presents the forecast of annual aircraft operations and based aircraft at the Airport through the planning period. Aviation activity demand at an airport is affected by numerous factors, including economic conditions, regional demographics, geographic elements, and aviation industry trends. These factors were all used in the aviation activity demand analyses.

Note that cargo operations are not included in this forecast as dedicated cargo operations are not typical at TEX. It was determined that cargo in the region is typically transported into the Telluride region via truck from either Grand Junction or Montrose.

2.4.1 Annual Aircraft Operations

This section presents a general overview of the historical trends in annual aircraft operations at the Airport along with a forecast of operations through the planning period.

An aircraft operation is defined as either a takeoff or a landing. Therefore, the typical air carrier flight consists of a landing and a takeoff for a total of two operations. The FAA records annual aircraft operations in the following four categories:

- **Air Carrier** - An air carrier operation involves an aircraft with a seating capacity of more than 60 seats or a cargo payload capacity of more than 18,000 pounds. Additionally, air carrier operations are those carrying passengers or cargo for hire or compensation.
- **Air Taxi** – Air Taxi operations represent scheduled commercial flights, nonscheduled commercial flights, and charter flights with aircraft with 60 seats or fewer or a cargo payload capacity of 18,000 pounds or less. Additionally, air taxi operations are those carrying passengers or cargo for hire or compensation.
- **Military** - Military operations include all classes of U.S. military or federal government aircraft.

- **General Aviation** - General aviation (GA) operations are any type of operation that is not included in one of the previous defined categories. These are typically privately owned aircraft used for training, recreation, business, or personal use.

The Telluride Regional Airport has historically accommodated regular air taxi and general aviation operations, and occasional small helicopter and fixed wing military operations. To date, no air carrier operations have occurred. Air taxi operations have included scheduled commercial passenger service as well as on demand charter operations. For the purpose of this study, all operations have been separated into two general categories: airline operations and general aviation operations. Airline operations include only commercial passenger service operations. General aviation operations account for all other operations, including on demand air taxi operations.

By separating operations in this manner, the forecast is more relevant for establishing the future demands placed on the Airport's GA facilities and the passenger terminal. Additionally, these two groups match the format in which the Airport tracks operations. Because the TRAA collects landing fees for all aircraft operating at TEX, operations records are very accurate, and were thus the primary source of historical operational data for the analysis. It should be noted that the FAA TAF data for TEX did not align with Airport records and was discounted for this analysis.

2.4.1.1 General Aviation Operations

General aviation operations make up the majority of operations at TEX. These operations are all itinerant operations, meaning that the aircraft is either departing TEX for another airport or arriving from another airport. It should be noted that the lack of touch-and-go and night time operations results in an overall decrease in total operations then would be typical at a similarly sized airport with less restrictions.

Since 2000 the Airport has experienced a decline in GA operations, bottoming in 2009 when the Airport's runway was closed for construction. From 2010 on, GA operations have been growing, which can be attributed to the U.S. recovery from the most recent economic recession. The previous Master Plan forecasted GA operations based on an average number of operations per based aircraft. At the time, this methodology worked well as a forecasting tool due to the correlation between historical growth trends of based aircraft, operations, and demographics. Since that study however, based aircraft have more or less plateaued while GA operations have decreased, which removes all correlation between the metrics.

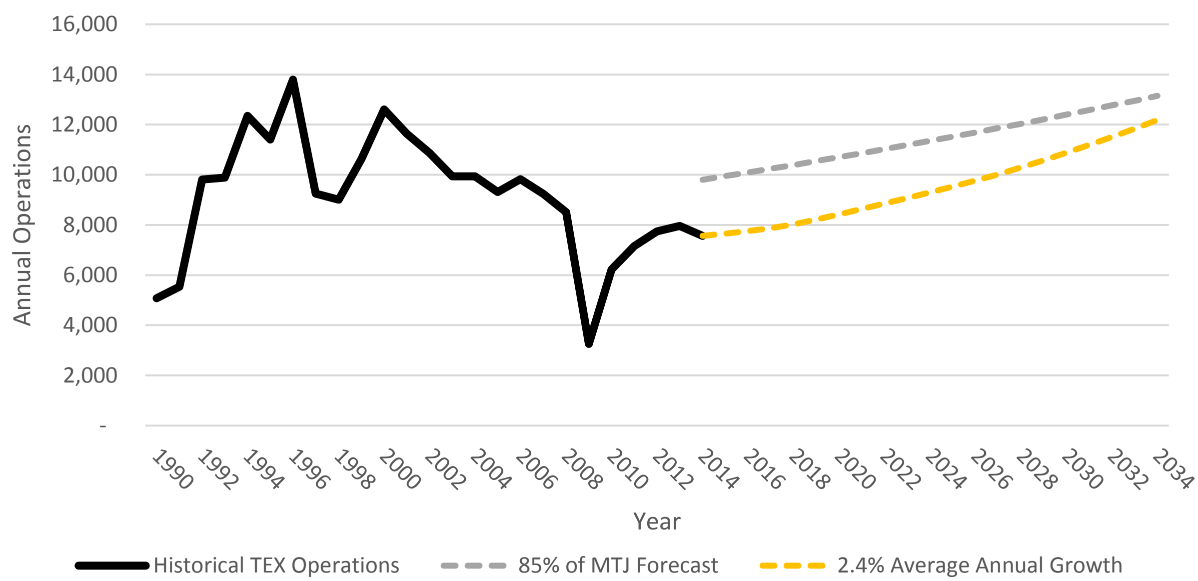
For this study, a market share analysis was conducted based on the historical percentage of itinerant GA operations TEX accommodated compared to Montrose Regional Airport (MTJ). MTJ was the airport of choice for this analysis as it is the most competitive airport to TEX for flyers wanting to travel to the Telluride region. The historical itinerant operations for Montrose was taken from the FAA TAF. The TAF forecast proposes that itinerant GA operations at MTJ will grow at an average of 1.48 percent annually. Statewide, itinerant GA operations are projected to grow at an average of 0.67 percent annually. This data suggests stronger GA growth in the Montrose and Telluride region than the state as a whole.

On average, between 1990 and 2012 (twenty three years), TEX enjoyed a greater number of itinerant GA operations than MTJ. When evaluated from 2003 to 2012 however, TEX has shown to have an average of

85 percent of the operations MTJ accommodated. Over the last few years, that percentage has reached historical lows of roughly 70 to 80 percent. This trend can likely be attributed to the nationwide decline in small piston operations and an increase in large, complex, turbine powered aircraft that are more limited in operating at TEX. Based on the average 85 percent of operations of MTJ, an estimate of future TEX operations was developed using the TAF forecast for MTJ. Using this methodology, it is estimated that TEX will reach approximately 12,000 operations by 2034.

Currently, TEX is trending at less than 85 percent of MTJ itinerant GA operations. It is expected that if TEX gains a Category C IFR approach, its share of itinerant GA operations will increase toward the historical 85 percent average. This forecast assumes that the Airport will obtain a Category C IFR approach, which is illustrated in **Figure 2-8** by the 2.4 percent Average Annual Growth curve. The forecast accounts for TEX slowly regaining its share of itinerant GA operations though the course of the planning period.

FIGURE 2-8
HISTORICAL AND FORECAST GENERAL AVIATION OPERATIONS



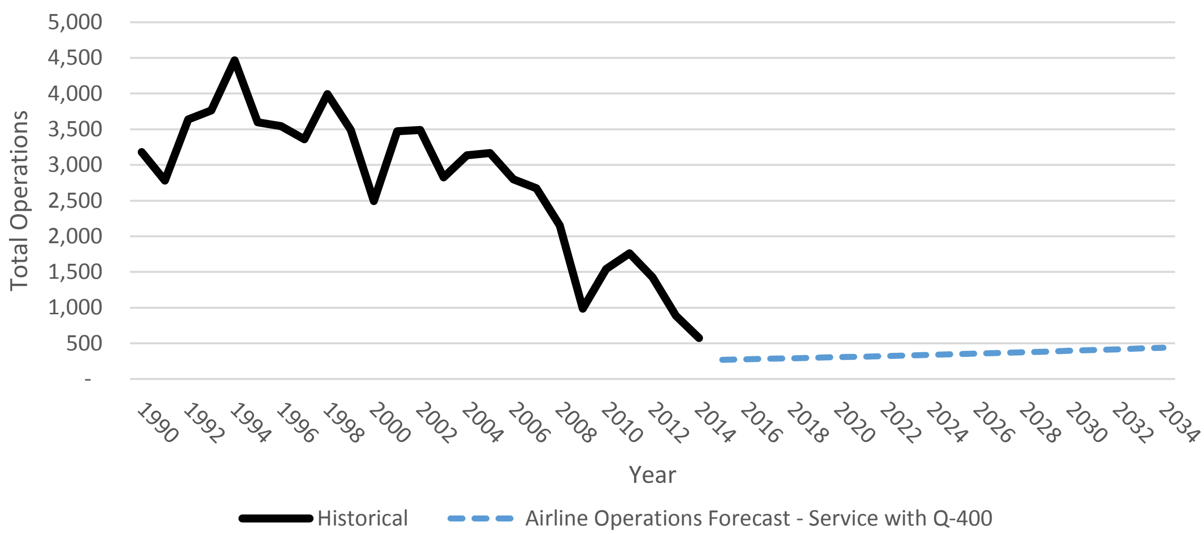
Source: Airport Records, RS&H analysis

2.4.1.2 Airline Operations

For the purpose of this study, airline operations include only operations for scheduled commercial passenger service. Historically, these operations have consisted of scheduled air taxi aircraft with less than 60 seats. **Section 2.3.3** indicated that with the advent of a Category C approach, larger aircraft with greater than 60 seats, such as the Q400, would likely provide passenger service to TEX. Based on the estimated frequency of flights that correlate to the preferred passenger forecast, approximately 440 airline operations could be expected at TEX by 2034.

Figure 2-9 illustrates the airline operations forecasted for TEX if commercial service was to return based on the preferred enplanement forecast. Note that the forecasted number of operations is dramatically less than historical operations due to the fact that the Q400 can hold 70 passengers and for planning purposes, was calculated to operate with a 75 percent load. Because the Q400 holds more people than the commercial aircraft that historically served TEX, greater capacity is provided with fewer operations.

FIGURE 2-9
HISTORICAL AND FORECAST AIRLINE OPERATIONS

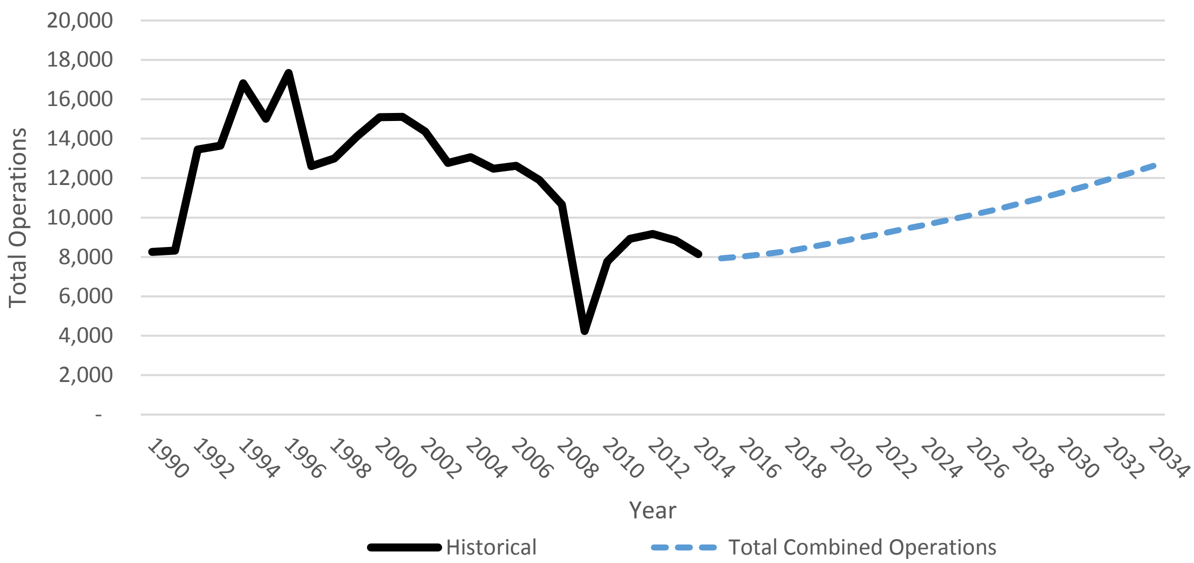


Source: Airport Records, RS&H analysis

2.4.1.3 Total Operations

The airline and general aviation forecasts were combined to create a total operations forecast. As illustrated in **Figure 2-10**, total operations are expected to increase at approximately 2.2 percent from 2014 to 2034. The forecast accounts for an immediate drop in operations in 2014 due to the discontinuation of commercial airline service. From 2014 through the end of the planning period, the airline operations are included in the total operations forecast. While the forecast expects growth and includes airline operations that may not come to fruition, the impact of an increase in future operations is negligible in that the forecast does not expect TEX to reach historical highs. Thus, airfield capacity will not be an issue within the planning period.

FIGURE 2-10
HISTORICAL AND FORECAST TOTAL OPERATIONS



Source: Airport Records, RS&H analysis

2.4.2 Instrument Operations

Instrument operations can be defined as aircraft landing in low visibility conditions (IMC) under instrument flight rules (IFR), and as aircraft landing under IFR despite weather conditions. Both situations account for instrument operations, and both cannot be accurately forecasted at TEX. Due to a lack of an air traffic control tower at TEX, no data exists as to the number of historical IFR operations or operations that take place in IMC conditions. However, in **Chapter 1 Inventory of Existing Conditions**, it was determined that the airfield has historically been under IMC 4.66 percent of the time.

Using this percentage, it can be assumed that the number of IFR landings in IMC conditions is 4.66 percent or less than the total of all aircraft operations. The 2004 Master Plan forecasted that IFR operations during IMC conditions would account for less than one percent of total operations. The one percent is likely more representative of the percentage of operations in IMC conditions due to the fact that aircraft operations do not take place linearly through the day, and many operators will choose not to fly in inclement weather.

The actual number of IFR or IFR-in-IMC operations is less critical then the number of types of aircraft that can be accommodated at the airport using an IFR approach. It is becoming common practice that operators of the more complex, high performance turboprop and turbo jet aircraft create flight plans to only those airports that will accommodate IFR flights through the landing phase of flight. Because TEX lacks a Category C and D IFR approach, some operators of C and D aircraft with IFR specific requirements are excluded. Because these high performance aircraft are expected by FAA to lead the growth within the general aviation fleet, the gap in IFR approaches at TEX will become increasingly accentuated in the future if no additional approaches are added.

2.4.3 Based Aircraft

Based aircraft at an airport represent the total number of active civil aircraft located at the airport 51 percent or more of the year. It should be noted that at seasonally driven airports such as TEX, it is typical to have some aircraft stored at another airport during certain times of the year. The categories that the FAA use to track based aircraft include single-engine, jet, multi-engine, helicopter, and "other" (which accounts for gliders).

The U.S. general aviation industry has been experiencing an overall decline since the early 1980's, largely due to the reduction of older piston aircraft. The fleet mix has also been changing, with continued growth in high performance turbine aircraft. As identified in **Table 2-2**, the FAA Aerospace Forecast for fiscal years 2014-2034 is forecasting continued decline of piston aircraft and an increase in turbine aircraft through the planning period.

TABLE 2-2
U.S. GENERAL AVIATION FLEET FORECAST BY AIRCRAFT TYPE

Year	Piston			Turbine		
	Single-Engine	Multi-Engine	Total	Turbo Prop	Turbo Jet	Total
Historical						
2013	123,730	14,235	137,965	10,195	11,890	22,085
Forecast						
2014	122,755	14,180	136,935	10,160	12,055	22,215
2019	118,700	13,890	132,590	10,355	13,600	23,955
2024	115,660	13,500	129,160	11,000	15,800	26,800
2034	113,975	12,890	126,865	14,370	22,050	36,420
CAGR (2013-2034)	-0.39%	-0.47%	-0.40%	1.65%	2.98%	2.41%

Source: FAA Terminal Area Forecast, 2014

The previous master plan for TEX estimated based aircraft using a regression analysis comparing the growth in based aircraft to population growth. At the time of that study, the regression analysis showed a high degree of correlation. However, since that study was completed growth in based aircraft plateaued while population continued to increase. These factors eliminated correlation, and thus the ability to use similar methodology for this study. At the time this report was written, the Airport had six aircraft owners on a waitlist to store their aircraft in a hangar, which demonstrates a need for additional space.

For this study, based aircraft were forecasted using the FAA Aerospace Forecast of the US fleet. However, it was necessary to adjust the growth rates to account for the growth in the single-engine and multi-engine turbine aircraft that are included with piston aircraft in the FAA based aircraft categories. Because of the high elevation at TEX, and the demographic of the region, it is likely that the fleet mix of based aircraft at the Airport will out-pace the US in regards to a shift from piston aircraft to high performance turbine aircraft.

To account for this in the forecast, the growth rate for single engine aircraft was based on a growth rate of 1.26 percent. This is the difference between the FAA projected growth rate of 1.65 percent for turbo-prop aircraft and the -0.39 percent for single engine piston. The forecast for multi-engine aircraft was derived the same way; it is the difference between the 1.65 percent for turbo-prop aircraft and -0.47 percent for multi-engine pistons.

As illustrated in **Table 2-3**, the forecast begins from the number of based aircraft the Airport had on record in November 2014. Using the mythology described above results in a forecast of 45 based aircraft by 2034, representing a 1.26 percent CAGR. The forecasted rate of growth was validated based on the rate of growth projected for new housing units and population. Those metrics showed a comparable rate of growth to the based aircraft forecast.

Overall, the analysis indicates that based aircraft growth will remain within a range that the airport has previously accommodated. However, the fleet mix of aircraft is expected to change as older piston aircraft are phased out of service and replaced by higher performance turbine aircraft.

TABLE 2-3
GENERAL AVIATION BASED AIRCRAFT FORECAST

Year	Single-Engine	Jet	Multi-Engine	Helicopter	Glider	Total
2014	25	2	6	0	1	34
2019	27	2	6	0	1	36
2024	28	3	7	0	1	39
2034	32	4	8	0	1	45
CAGR (2014-2034)	1.26%	2.98%	1.18%	-	0.00%	1.26%

Source: RS&H analysis

2.5 FORECAST SUMMARY

In summary, the forecast analysis found that based on local and national trends, aviation activity at the Airport will continue to grow at a modest pace. The largest unknown factor is the future of commercial airline service at the Airport. It is evident that air service demand for passengers visiting Telluride is increasing. While it is unlikely that visitors to Telluride will ever entirely shift to using TEX to access the region as opposed to MTJ, there is opportunity for TEX to take a share of those passengers.

Based aircraft is also projected to increase slowly through the planning period. The fleet mix will continue to change as older piston aircraft are phased out of the U.S. fleet, and newer higher performance aircraft continue to grow. These factors may have an impact on the types of facilities required in the future.

2.5.1 Forecast Comparison

This section provides a comparison between the FAA TAF, the 2004 Master Plan forecast, and the forecast detailed in this Chapter. As proposed aviation activity forecasts are submitted to the FAA for review and approval, forecasts are generally considered acceptable if they differ by less than 10 percent in the 5-year forecast period, and less than 15 percent in the 10-year forecast period. As illustrated in Error! Reference source not found., total operations and based aircraft forecasts are within those tolerances, while passenger enplanement and commercial operations forecasts are not. However, the updated forecast is notably more conservative than the previous master plan forecast, and accounts for the realities of commercial and general aviation air service evident today.

In regards to the passenger enplanement and commercial operations forecast, consideration must be given to the major shift in the type of air service by which this forecast is based upon. This study examined numerous scenarios of air service returning to TEX with different airlines, routes, and equipment. The most realistic and feasible of all was determined to be service to TEX from LAX by Alaska Airlines using the Bombardier Q400. This route scenario was chosen because: The forecast identified a large demand for air service to the region from LAX; Alaska Airlines has base operations at LAX; Alaska Airlines operates the Q400 which has the capability to operate at TEX; and Alaska Airlines is accustomed to serving resort airports, such as Steamboat Springs, Colorado.

As previously noted in this Chapter, all passenger service to TEX was discontinued in September 2014. This service was provided by Great Lakes Airlines using 19 seat aircraft. It should be noted that service by Alaska Airlines using 70 seat Q400 aircraft will be vastly different than the service previously offered. Notable improvements, besides capacity, include greater operational consistency and enhanced service by regional jet equivalent aircraft. However, as discussed in **Section 2.3.3 Forecast Passenger Activity**, the Q400 service is based on the assumption that an instrument approach for CAT C aircraft will be developed so as to allow Q400 operations at TEX. Because it is difficult to determine when a CAT C approach might be completed and available for use by airlines, the comparison table below accounts for service beginning in 2019. It should be noted that this forecast is simplistic in that it does not attempt to anticipate when service would begin nor how long the service would take to become established and operate with full passenger loads.

The numbers for the base year of 2014 is made up of historical enplanements and commercial operations taken from Airport records. For the 5, 10, and 20 year forecasts, numbers from the medium passenger enplanement forecast, outlined in **Section 2.3.3 Forecast Passenger Activity**, were used. The medium forecast is the preferred forecast as it best represents the passenger demand associated with the return of air service using Q400 aircraft. The delta between the TAF and the forecast is primarily associated with the fact that the Q400 can hold nearly 30 percent more people than those aircraft that have historically served TEX, and is expected to operate with higher passenger loads.

This equates to the ability to accommodate more passenger enplanements with far fewer operations then what the TAF projected. For example, in the five year forecast, one daily Q400 flight, with service only 300 days of the year, equates to enplanement levels that are nearly double what the TAF projects with 1,482 operations. As previously noted, these enplanement levels do not suggest that passengers shift entirely to using TEX instead of MTJ. Instead, these levels account for TEX drawing a share of those passengers who are travelling specifically to get to the Telluride region.

TABLE 2-4
FORECAST COMPARISON

Description	Year	*2004 Master Plan Forecast	2014 Updated Forecast	TAF	2014 Forecast/TAF (% Difference)
Passenger Enplanements					
Base Yr	2014	29,625	3,268	7,300	-55%
Base Yr + 5 yrs	2019	36,295	15,650	8,025	95%
Base Yr + 10 yrs	2024	44,468	17,790	8,825	102%
Base Yr + 20 yrs	2034	66,749	23,000	10,666	116%
Commercial Operations					
Base Yr	2014	4,302	574	1,442	-60%
Base Yr + 5 yrs	2019	5,038	300	1,482	-80%
Base Yr + 10 yrs	2024	5,901	340	1,522	-78%
Base Yr + 20 yrs	2034	8,094	440	1,602	-73%
Total Operations					
Base Yr	2014	23,012	8,140	9,182	-11%
Base Yr + 5 yrs	2019	30,525	8,520	9,222	-8%
Base Yr + 10 yrs	2024	40,492	9,640	9,262	4%
Base Yr + 20 yrs	2034	71,249	12,620	9,342	35%
Based Aircraft					
Base Yr	2014	76	34	38	-11%
Base Yr + 5 yrs	2019	98	36	38	-5%
Base Yr + 10 yrs	2024	126	39	38	3%
Base Yr + 20 yrs	2034	209	45	38	18%

Source: FAA Terminal Area Forecast, Forecast Inc. and RS&H analysis, 2014
*2004 Master Plan Forecast - normal growth scenario extrapolated

The next chapter, **Chapter 3 - Facility Requirements**, will analyze the impacts of the forecast and determine the requirements for each facility at the Airport based on the predicted demand. In regards to airline passengers, this master plan will provide solutions to meet any facility deficiencies identified, but consideration will be given in all instances to the fact that there is currently no passenger demand and that the future of air service at TEX is unknown. The focus for all elements of this study will be to determine solutions that maximize existing infrastructure, provide future readiness, and conform within the Airport's capital budget.

2.6 CRITICAL AIRCRAFT

FAA Advisory Circular 150/5300-13A Change 1, *Airport Design*, defines the critical aircraft (or design aircraft) as "an aircraft with characteristics that determine the application of airport design standards for a specific runway, taxiway, taxilane, apron, or other facility." FAA Standard Operating Procedure 2.0, *Standard Procedure for FAA Review and Approval of Airport Layout Plans*, further indicates that aircraft used for scheduled service can also be used to identify a critical aircraft.

The critical aircraft can be a specific aircraft model or a composite of several aircraft. One or more aircraft can also be designated as a critical aircraft if certain areas of an airport are designed to accommodate certain portions of the fleet mix. The critical aircraft, for the purposes of airport geometric design, is a composite aircraft representing a collection of aircraft classified by three parameters: Aircraft Approach Category (AAC), Airplane Design Group (ADG) and Taxiway Design Group (TDG). AAC is defined as a grouping of aircraft based on a reference landing speed at the maximum certificated landing weight (**Table 2-5**). ADG is defined as a classification of aircraft based on wingspan and tail height (**Table 2-6**). AAC and ADG combine to define the Airport Reference Code (ARC), a code signifying the design standards to which the runway and taxiways is to be built. TDG is defined as a classification of airplanes based on outer to outer Main Gear Width and Cockpit to Main Gear distance (**Figure 2-11**).

TABLE 2-5
AIRCRAFT APPROACH CATEGORY (AAC)

AAC	VREF/Approach Speed
A	Approach speed less than 91 knots
B	Approach speed 91 knots or more but less than 121 knots
C	Approach speed 121 knots or more but less than 141 knots
D	Approach speed 141 knots or more but less than 166 knots
E	Approach speed 166 knots or more

Source: FAA Advisory Circular 150/5300-13A, Airport Design, Table 1-1

TABLE 2-6
AIRPLANE DESIGN GROUP (ADG)

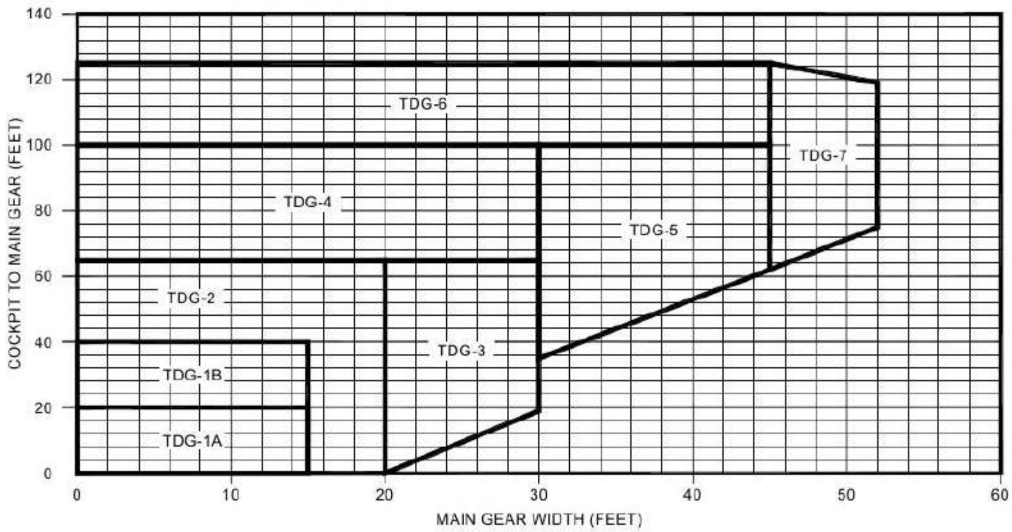
Group #	Tail Height (ft [m])	Wingspan (ft [m])
I	< 20′ (< 6 m)	< 49′ (< 15 m)
II	20′ - < 30′ (6 m - < 9 m)	49′ - < 79′ (15 m - < 24 m)
III	30′ - < 45′ (9 m - < 13.5 m)	79′ - < 118′ (24 m - < 36 m)
IV	45′ - < 60′ (13.5 m - < 18.5 m)	118′ - < 171′ (36 m - < 52 m)
V	60′ - < 66′ (18.5 m - < 20 m)	171′ - < 214′ (52 m - < 65 m)
VI	66′ - < 80′ (20 m - < 24.5 m)	214′ - < 262′ (65 m - < 80 m)

Source: FAA Advisory Circular 150/5300-13A, Airport Design, Table 1-2

For this analysis, a validation of the existing critical aircraft was completed based on an evaluation of the most demanding aircraft that use the airport on a consistent basis. Additionally, a future critical aircraft was identified based on the most demanding aircraft that may be used if commercial passenger service returns in the future.

Existing operations at TEX currently consists of general aviation aircraft. TEX currently does not have commercial service, so the existing critical aircraft is based on the most demanding general aviation aircraft. The current critical aircraft listed on the previous Airport Layout Plan (2012) is the Gulfstream G5, a C-III aircraft. This aircraft was used as the premise of the design for the new runway in 2009. FAA has supported TEX as a C-III airport because of the more demanding terrain and altitude, and because the airport has traditionally served Part 139 air carriers. It was determined through a review of aircraft operations at TEX, that the G5 remains the most demanding aircraft using TEX through the year. Thus, the Gulfstream G5 was carried forward in this study as the existing critical aircraft.

FIGURE 2-11
TAXIWAY DESIGN GROUP (TDG)



Source: FAA Advisory Circular 150/5300-13A, Airport Design, Figure 1-1

Scheduled commercial service is forecast to return to TEX within the planning horizon. The Bombardier Q400, a C-III aircraft, is anticipated to be used by a commercial carrier to service TEX. Therefore, the Q400 was identified as the future critical aircraft for TEX. The Q400, though a C-III aircraft, is a more demanding aircraft than the Gulfstream G5 in regard to its main gear width. The wider stance of the aircraft's main gear puts the Q400 into a TDG 5 category.

A summary of the critical aircraft and geometric design criteria are presented in **Table 2-7.** The Gulfstream G5 is expected to remain the primary critical aircraft through the planning period. This aircraft will be the design aircraft for all future runway, taxiway, taxilane, and general aviation apron projects. If commercial service returns to TEX using a Q400, then that aircraft will become the design aircraft for all future runway, taxiway, and commercial apron projects.

It should be noted that though the Q400 has been identified as the future critical aircraft, no projects will be designed to meet the standards associated with this aircraft until the aircraft shows a continuous presence at TEX. As noted later in this chapter, the current infrastructure of TEX accommodates Q400 operations safely, however taxiway shoulders in some areas are deficient.

TABLE 2-7
EXISTING AND FUTURE CRITICAL AIRCRAFT

Time Period	Critical Aircraft	AAC	ADG	TDG	Design Components
Existing	Gulfstream G5	C	III	2	Airport-Wide
Future	Bombardier Q400	C	III	5	Runway, Taxiways, and Commercial Apron

Source: RS&H, 2015,

CHAPTER 3

FACILITY REQUIREMENTS

3.1 INTRODUCTION

To properly plan for the future requirements of Telluride Regional Airport, it is necessary to translate the forecasts of aviation demand into the specific types and quantities of facilities that are needed. The demand for new or expanded facilities is often driven by capacity shortfalls that leave an airport unable to accommodate forecasted growth with existing facilities. However, the requirements for new or improved facilities can also be driven by other circumstances. For example, facilities may be needed to comply with updated standards developed and adopted by the Federal Aviation Administration (FAA) or other regulatory agencies, to accommodate the strategic vision for the Airport, or replace outdated or inefficient facilities that are prohibitively costly to maintain or modernize. These circumstances can have a significant impact on future needs and have been considered in this analysis for the Airport.

The findings of the capacity analyses and facility requirement determinations, as well as other circumstantial criteria specific to Telluride, form the foundation for identifying realistic alternatives. Evaluation of those alternatives defines a development plan to meet future demand. As such, critical future investment decisions will be based on these analyses. This chapter assesses the following major functional areas of the Airport:

- Runway Requirements
- Airside Facilities
- Landside Facilities
- GA Facilities
- Commercial Facilities
- Support Facilities

3.2 RUNWAY REQUIREMENTS

This section describes the ability for the airport’s single-runway system to meet the needs of its users based on forecast demand and wind coverage.

The demand capacity analysis is accomplished in line with the methodology outlined in FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*. Hourly capacity and annual service volume were calculated as measures of capacity to which the forecast demand is compared.

The hourly capacity is a metric the FAA uses to reasonably estimate an airport’s capacity for the peak hour of the average day. The weighted hourly capacity is a further calculated version of the aforementioned hourly capacity that considers the aircraft fleet mix, operational procedures, runway/taxiway configuration, and weather.

Aircraft mix index is the measure of the relative percentage of annual operations conducted by each of the four classes of aircraft as defined in **Table 3-1.** This is an important factor because according to FAA flight regulations, larger aircraft require greater in-trail separation for trailing aircraft. When aircraft in-trail separation is increased, hourly capacity is reduced as fewer aircraft arrive on a given runway during the same period of time.

The four classes of aircraft are distinguished by maximum takeoff weight. Class A small aircraft include single-engine propeller aircraft such as the Cessna Caravan. Class B aircraft include small multi-engine propeller aircraft such as the Beechcraft King Air. Class B also includes some small business jets such as the Cessna Citation II. Class C aircraft generally range from medium-sized business jets, such as the Citation CJ2 to large narrow-body aircraft such as the Boeing 707 or Boeing 757. The Gulfstream G5 and Bombardier Q400 fits within the C Classification. TEX does not currently, nor is it forecast, to accommodate Class D aircraft.

TABLE 3-1
AIRCRAFT CLASSIFICATIONS

Aircraft Class	Maximum Certified Takeoff Weight (lbs)	Number of Engines	Wake Turbulence Classification
A / B	12,500 or less	Single / Multi	Small
C	12,500 - 300,000	Multi	Large
D	Over 300,000	Multi	Heavy

Source: FAA Advisory Circular 150/5060-5, Airport Capacity and Delay, Table 1-1

The forecast fleet mix at TEX includes a greater proportion of jets than the historical operational fleet mix. The hourly capacity base is determined using the aircraft fleet mix and arrival-departure split, which consists of both commercial and general aviation operations. In the 20014 Master Plan Update, it was assumed that the hourly operations would be split evenly with 50 percent arrivals and 50 percent departures. Based on airport staff observations and fuel record reports, this assumption was found to be correct and was carried forward in this study. Class C aircraft were determined to represent 67 percent[1] of the aircraft fleet mix. Class D aircraft are not expected to operate at TEX during the planning period. The commercial fleet mix is homogeneous during the planning period since no commercial aircraft other than the Q400 is expected to operate at TEX.

A percentage of touch and go operations is typically taken into account when determining runway capacity. A touch and go operation is a training maneuver in which an aircraft simulates an arrival by touching the runway surface and immediately departing without leaving the runway environment. However, touch and go operations are prohibited at TEX due to specifics of the special use permit the Airport has in place with San Miguel County, as well as procedures listed in the voluntary noise abatement program. Therefore, touch and go operations do not impact the capacity at TEX.

The weighted hourly capacity for TEX is approximately 46 operations per hour which is significantly higher than the forecast hourly demand (as shown in **Table 3-2**). The peak hour average day operations were estimated for each of the forecast years using data from the 2014 Fueling Departure Report.

[1] Calculated using a proportional general aviation fleet mix reflected in the 2014 aircraft fueling data for TEX.

TABLE 3-2
DEMAND CAPACITY

	2014	2019	2024	2034
Peak Hour Average Day Operations	9	9	10	13
Weighted Hourly Capacity	46	46	46	46
Forecast Annual Operations	8,140	8,520	9,640	12,620
Annual Service Volume	42,000	42,000	43,000	45,000
Activity Level-Annual Capacity Percentage	19%	20%	22%	28%

Source: RS&H, 2015, TEX 2014 Fueling Departure Report

The Annual Service Volume is an indicator of the annual operational capability of an airport, adjusted for differences in hourly capacities which occur over the course of a year. The Annual Service Volume was calculated based on the weighted hourly capacity, daily demand ratio, and hourly demand ratio. The Annual Service Volume ranges from approximately 42,000 annual operations in the near-term to 45,000 annual operations near the end of the planning period. The increase in Annual Service Volume is attributed to the assumption that there will be a faster rate of growth in the peak hour and the average day of the peak month than other times. The 2004 Master Plan identified an Annual Service Volume of 49,000 in the base year to 47,000 by the end of that document's planning period. The 2004 Master Plan Annual Service Volume is slightly higher than that identified in **Table 3-2** due to the changing fleet mix. TEX fleet mix includes a greater proportion of Class C aircraft (e.g., large business jets) today than was forecast in the 2004 Master Plan. The larger aircraft require greater in-trail separation from other aircraft because of their wake class. Increased in-trail separation requirements then means that less aircraft can be accommodated over a given period of time. As such, the calculated annual service volume is lower when Class C aircraft comprise a larger portion of the fleet mix.

FAA Order 5090.3C, *Field Formulation for the NPIAS,* indicates the activity level trigger points for planning capacity development. When the annual activity level reaches 60 percent to 75 percent of the annual capacity, airfield capacity enhancements become justified. The activity level thresholds are defined by the FAA as the threshold (as defined in Table 3-2 of FAA Order 5090.3C) by which capacity enhancement are financially justified. The forecast annual operations are well below the annual service volume. **Table 3-2** indicates that annual demand will not reach 60 percent of the capacity within the planning period and that the Airport has enough runway capacity to accommodate operational growth beyond the planning period. Therefore, capacity enhancing airfield improvements are not warranted within the planning period. When the TEX annual operations reach approximately 26,000 annual operations, runway capacity enhancements may be justified.

A wind data analysis was completed to evaluate the wind speed and direction as related to the existing and forecast operations during visual and instrument meteorological conditions. The allowable crosswind component for TEX is 16 knots because of the Runway 9-27 RDC is C-III based on the characteristics of the Gulfstream G5 and Bombardier Q400. The wind coverage for Runway 9-27 exceeds 99 percent in all meteorological conditions for the 16-knot crosswind component, as described in **Table 3-3**. Advisory Circular 150/5300-13A indicates that a crosswind runway is justified when the primary runway orientation provides less than 95 percent wind coverage. The analysis determined that the runway configuration at TEX provides greater than 95 percent wind coverage. Therefore, the orientation of Runway 9-27 is adequate and no crosswind runway is required to accommodate the fleet mix during crosswind conditions since the 95 percent threshold is exceeded.

It should be noted that a new crosswind runway is physically infeasible at TEX due to the highly constrained area the Airport is built upon. As such, if wind patterns change and the existing runway configuration does not provide 95 percent coverage in the future, the airport may see a decrease in operations during wind events. Indeed today, according to Airport staff, some aircraft operators have internal standard operating procedures that prohibit them from operating in wind conditions that are within the acceptable crosswind components listed in this section. These factors will continue to affect the number of total annual operations the Airport accommodates through the planning period.

TABLE 3-3
RUNWAY WIND COVERAGE

Crosswind Component	Total Wind Coverage	VFR Wind Coverage	IFR Wind Coverage
10.5Kts	97.68%	97.63%	98.60%
13Kts	98.78%	98.77%	99.15%
16Kts	99.60%	99.60%	99.63%
20Kts	99.89%	99.89%	99.91%

Source: RS&H, 2015; National Oceanic and Atmospheric Administration National Climatic Data Center, 2015
Note – includes observations from 2004 to 2013

In summary, Runway 9-27 provides sufficient capacity and wind coverage. Therefore, the single runway system is adequate and no additional runway enhancements or modifications are required within the planning period.

3.3 AIRSIDE FACILITIES

3.3.1 Runway 9-27 Design Standards

In 2009/2010, the runway was extended and underwent numerous improvements. The basis of design for the runway at that time was the Gulfstream G5, which is a C-III aircraft. That aircraft was identified as the existing and future design aircraft in the previous master plan update. As discussed in Section 3.2, a composite C-III aircraft, made up by the Gulfstream G5 and Bombardier Q400, has been identified as the future critical aircraft for the Airport. The critical aircraft is the driving factor behind what design standards are applied to airfield infrastructure.

Runway 9-27 was evaluated for compliance with FAA design standards as defined in FAA Advisory Circular 150/5300-13A Change 1, *Airport Design*. For this analysis, the more demanding Bombardier Q400 was used as the design aircraft. The evaluation included the Runway Obstacle Free Area (ROFZ), Runway Safety Area (RSA), Runway Object Free Area (ROFA), and Runway Protection Zone (RPZ). Appropriate approach visibility minimums and procedures were also considered for each runway end. The standard dimension for each design component is described in **Table 3-4**. The nonstandard runway conditions are depicted in **Figure 3-1**.

The RSA is a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway. The airport perimeter roadway penetrates a portion of the RSA near the Runway 27 blast pad. A roadway is not specifically prohibited within an RSA; however, the RSA is required to be clear of all fixed or movable objects not serving a navigational purpose during aircraft operations. Because the road is minimally used only by airport staff and employees of the quarry, and is fixed by terrain, the road’s use and location is deemed acceptable.

The ROFA is an area centered on the runway centerline to enhance the safety of aircraft operations by keeping the area clear of objects, except for objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes. Several nonstandard conditions exist for the ROFA. The rock quarry access road presents a nonstandard condition when vehicles traveling on the roadway impact the ROFA south of the Runway, near the east end. The airport perimeter fence also is located within the ROFA in two general locations – south of the Runway 27 end and west of the Runway 9 end. A portion of aircraft parking area is also located within the ROFA which results in a nonstandard condition when aircraft are parked in that area.

Several NAVAIDs are also located within the ROFA which results in a nonstandard condition. The localizer and associated equipment shelter are located within the ROFA, north of the Runway 9 aiming point markings. This NAVAID is not fixed-by-function and is not required to be located within the ROFA to serve their purpose. Two supplemental wind cones are also located within the ROFA – one just east of the localizer, north of the runway and the other near the Runway 29 Precision Approach Path Indicator (PAPI) system, north of the runway. Supplemental wind cones are not fixed-by-function and per AC 150/5340-30G *Design and Installation Details for Airport Visual Aids*, a specific operational need is required for them to exist inside the ROFA.

The Airport Design Advisory Circular indicates that aircraft parking areas should not be in close proximity to the runway. For TEX, aircraft parking should be no closer than 500 feet from the runway centerline. However, the pavement area to the south of fuel tanks extends into the ROFA and is within 500 feet from the runway centerline. Additionally, as the pavement is marked today, the aircraft parking area south of the terminal building extends into the 500 foot separation threshold by roughly 20 feet.

The purpose of the Runway Protection Zone (RPZ) is to enhance the protection of people and property on the ground. The Airport Design Advisory Circular indicates that it is desirable to clear the entire RPZ of all above-ground objects. Where this is impractical, airport owners, at a minimum, should maintain the RPZ clear of all facilities supporting incompatible activities. This is best achieved through airport owner control over RPZs. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ and includes clearing RPZ areas (and maintaining them clear) of incompatible objects and activities. Compatibility of land uses and activities within an RPZ are generally evaluated with the FAA on a case-by-case basis. The FAA issued the Memorandum, *Interim Guidance on Land Uses Within a Runway Protection Zone*, in 2012 which provides guidance for RPZ land use compatibility for new and modified situations.

At TEX, the RPZs extend beyond the property boundary on both the Runway 9 and Runway 27 ends. The area within the RPZs is largely undeveloped. The Airport Access Road meanders through the central portion[2] of the Runway 27 RPZ. This is a private access road used to access the rock quarry, and does not serve the commercial passenger terminal or general aviation facilities at TEX. Because this road is private and traffic volumes are low, no change to the road is required. However, the Airport should continually look for opportunities to secure easements for those portions of the RPZ it doesn't own or control. Changes to land uses or activities within the RPZs will require coordination with FAA to determine compatibility with the Airport.

In summary, several nonstandard runway conditions exist for Runway 9-27, and several objects impact the RSA, ROFA, and RPZ. It should be noted, that initial analysis required for this section indicated that some conditions may not be physically or economically capable of being rectified, which is not an uncommon phenomena at constrained airports. The Alternatives Chapter will further examine these nonstandard conditions and evaluate alternatives that would remedy the condition.

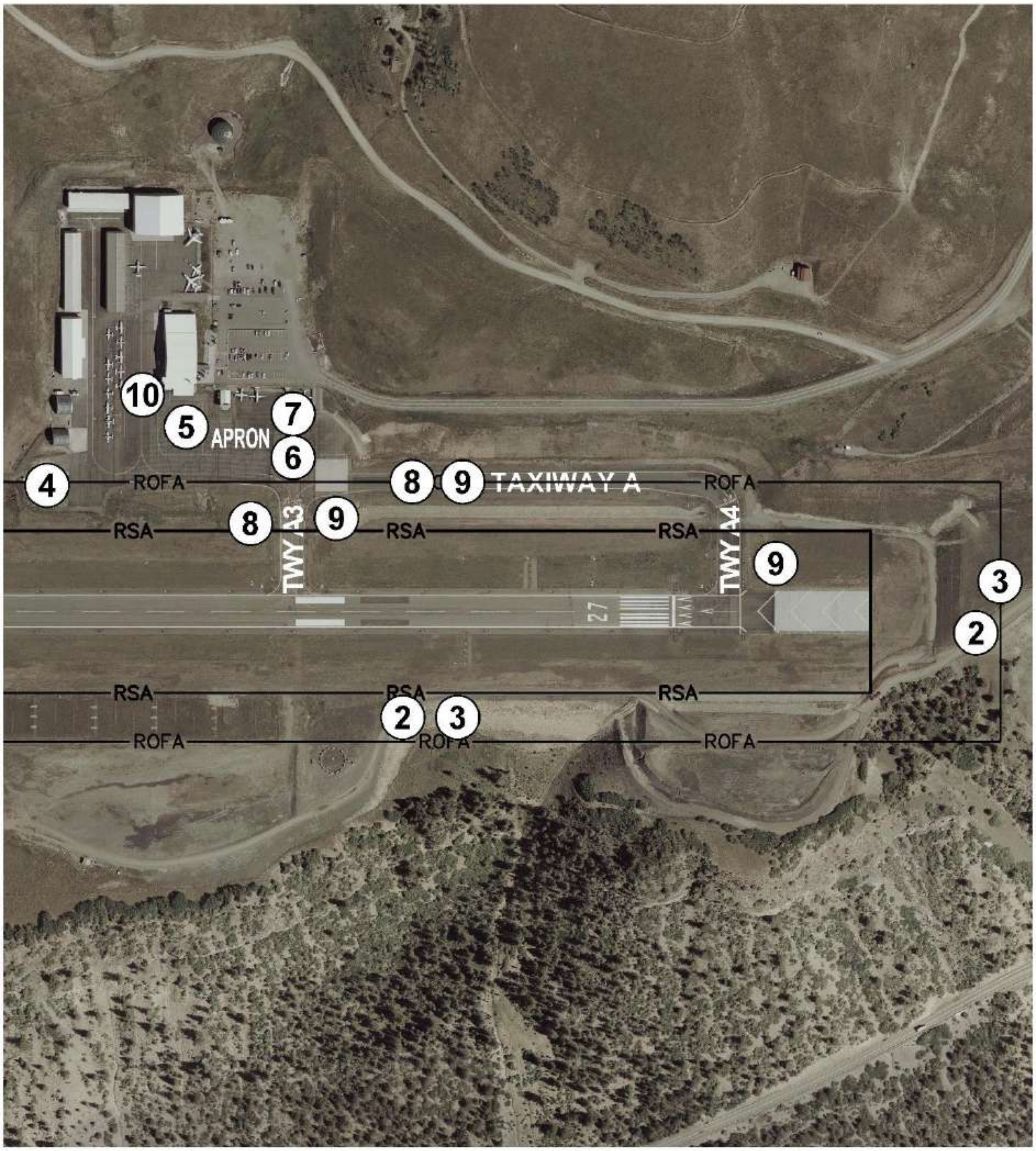
[2] The FAA defines the Central Portion as the portion of the RPZ that extends from the beginning to the end of the RPZ, centered on the runway centerline, at a width equal to the ROFA.

TABLE 3-4
RUNWAY DESIGN STANDARDS

Design Component	FAA Standard (ft)	Standards Currently Met (✓) or Existing (ft)
Runway Width [1]	100	✓
Shoulder Width [1]	20	✓
Blast Pad Width [1]	140	✓
Blast Pad Length [1]	200	✓
Crosswind Component[2]	16 Knots	✓
RSA Length Beyond Departure End [3]	1,000	✓
RSA Width	500	✓
ROFA Length Beyond Departure End [3]	1,000	✓
ROFA Width	800	677 [4]
ROFZ Length	7,511	✓
ROFZ Width	400	✓
Runway Centerline to Parallel Runway Centerline	N/A	N/A
Runway Centerline Holding Position	341	✓
Runway Centerline to Parallel Taxiway Centerline	400	✓
Runway Centerline to Aircraft Parking Area	500	327
Runway Centerline to Helicopter Touchdown Pad	N/A	N/A
Runway 9		
POFZ Length	N/A	N/A
POFZ Width	N/A	N/A
Approach RPZ Length	1,700	✓
Approach RPZ Inner Width	500	✓
Approach RPZ Outer Width	1,010	✓
Departure RPZ Length	1,700	✓
Departure RPZ Inner Width	500	✓
Departure RPZ Outer Width	1,010	✓
Runway 27		
POFZ Length	N/A	N/A
POFZ Width	N/A	N/A
Approach RPZ Length	1,700	✓
Approach RPZ Inner Width	500	✓
Approach RPZ Outer Width	1,010	✓
Departure RPZ Length	1,700	✓
Departure RPZ Inner Width	500	✓
Departure RPZ Outer Width	1,010	✓

Source: RS&H, 2015
Notes: 1 - Standard Width because Critical Aircraft Maximum Takeoff Weight Less Than 150,000 pounds
2 – See Table 3-7 for more detailed description of wind coverage for each crosswind component
3 - Standard Length because Engineered Materials Arresting System in place
4 - Most significant impact to ROFA width is by the perimeter fence east of the Runway 27 end

FIGURE 3-1
AIRFIELD STANDARDS DEFICIENCIES



1. Localizer and Shelter in ROFA*
2. Roadway in ROFA
3. Fence in ROFA
4. Aircraft Parking within ROFA
5. Runway Separation to Aircraft Parking
6. Taxiway A3 - Direct Access to Runway
7. Taxiway A3 - Surface Gradient
8. Taxiway A, A3, A4 - Shoulder Width and Partially Unpaved
9. Taxiway A, A3 and A4 - Taxiway Width and Fillets
10. Buildings and Aircraft Parking in TSA and TOFA

*Localizer and shelter not shown in figure. Existing location is abeam RWY 9 touchdown markings.

3.3.2 Taxiway / Taxilane Design Standards

The airport's taxiways and taxilanes were evaluated for compliance with FAA design standards as defined in FAA Advisory Circular 150/5300-13A Change 1, *Airport Design*. The standard dimension for each design component is described in **Table 3-5**, and the nonstandard taxiway / taxilane conditions which were found are depicted in **Figure 3-1**.

The Bombardier Q400 (ADG III / TDG 5), the commercial service critical aircraft described in **Section 3.2,** was used to evaluate the design standards for Taxiway A, Taxiway A3, and Taxiway A4. These are the taxiways that provide access to the passenger terminal area.

A mix of aircraft design standards were used to evaluate the airport's two apron taxilanes. Apron Taxilane East is currently used by large transient general aviation aircraft accessing the transient apron and hangar on the north side of the airport. That taxilane was evaluated against the requirements for the Gulfstream G5 aircraft (ADG III / TDG 2), which is the future critical general aviation aircraft described in **Section 3.2** Apron Taxilane West was evaluated based on ADG I / TDG 2 standards because this taxilane serves smaller hangars used by small single and twin-piston aircraft. Apron Taxilane East was found to not meet object clearing standards as defined in the Advisory Circular. This is a result of aircraft hangars and tie-downs being placed in close proximity to the taxilane centerline.

Taxiway A is a partial parallel taxiway that only provides access to the Runway 27 end (via Taxiway A4). Construction of a full-length parallel taxiway would eliminate the need to use the runway for taxiing thus enhancing runway safety, especially under low visibility conditions. Paragraph 405 in FAA Advisory Circular 150/5300-13A indicates that a full-length parallel taxiway is required when the runway instrument approach visibility minimum is less than ¾ statute mile and recommended in all other conditions. The instrument approach visibility minimum for Runway 9 is greater than one mile so it is not required. However, land should be reserved for a parallel taxiway in case demand and/or standards require one in the future.

The Taxiway A3 configuration is nonstandard because it provides direct access from the aircraft parking apron to the Runway, and does not tie into the aircraft parking apron at a sufficient grade. In regard to direct access to the runway, the FAA has found that this type of configuration can lead to reduced pilot situational awareness and runway incursions. As such, direct access to runways from parking aprons is an expressly prohibited design element. Paragraph 401.b(5) of the Advisory Circular states that "these and other existing nonstandard conditions should be corrected as soon as practicable." Typically, corrections to these conditions are made during the next associated pavement rehabilitation or reconstruction project.

The pavement widths for Taxiway A, Taxiway A3, and Taxiway A4 are not built to standard for the Bombardier Q400. The undercarriage dimensions of the Bombardier Q400 require greater pavement widths than exists today. Also, fillet design for Taxiway A, Taxiway A3, and Taxiway A4 are nonstandard, which is primarily due to fillet design standards being redefined by the FAA to support cockpit over centerline steering. The Q400, and aircraft similar in size, can operate at TEX, however judgmental oversteering may be required for turning maneuvers on taxiways.

Other taxiway design elements that were noted in this analysis include the lack of fully paved shoulders on Taxiway A and Taxiway A3. This does not result in a nonstandard condition because paved shoulders are not required at TEX. However, the Advisory Circular states that "…paved shoulders are recommended for taxiways, taxilanes and aprons accommodating Airplane Design Group III aircraft." With critical aircraft in the ADG III category, it is recommended that future taxiway projects include paving the remainder of the shoulders on Taxiway A and Taxiway A3.

In summary, several nonstandard conditions exist for the taxiways and taxilanes at TEX. Taxiway A, Taxiway A3, and Taxiway A4 dimensions do not meet the dimensional requirements to satisfy the forecast fleet mix. Additionally, several objects impact the Apron Taxilane West object clearance areas. The alternatives analysis identifies ways to mitigate non-standard issues.

TABLE 3-5
TAXIWAY / TAXILANE DESIGN STANDARDS

Design Component	FAA Standard (ft)	Standards Currently Met (✓) or Existing (ft)
Taxiway A		
Taxiway Width	75	50
Taxiway Shoulder Width	30	20
Taxiway Safety Area	118	✓
Taxiway Object Free Area	186	✓
Taxiway Centerline to Parallel Taxiway Centerline	215	N/A
Taxiway Centerline to Fixed or Movable Object	152	✓
Taxiway Centerline to Parallel Taxiway Centerline w/ 180 Turn	152	N/A
Taxiway A3		
Taxiway Width	75	70
Taxiway Shoulder Width	30	20
Taxiway Safety Area	118	✓
Taxiway Object Free Area	186	✓
Taxiway Centerline to Parallel Taxiway Centerline	215	N/A
Taxiway Centerline to Fixed or Movable Object	152	✓
Taxiway Centerline to Parallel Taxiway Centerline CL w/ 180 Turn	152	N/A
Taxiway A4		
Taxiway Width	75	70
Taxiway Shoulder Width	30	20
Taxiway Safety Area	118	✓
Taxiway Object Free Area	186	✓

Design Component	FAA Standard (ft)	Standards Currently Met (✓) or Existing (ft)
Taxiway Centerline to Parallel Taxiway Centerline	215	N/A
Taxiway Centerline to Fixed or Movable Object	152	✓
Taxiway Centerline to Parallel Taxiway Centerline w/ 180 Turn	152	N/A
Apron Taxilane East		
Taxilane Width	35	✓
Taxilane Safety Area	118	105
Taxilane Object Free Area	162	105
Taxilane Centerline to Parallel Taxilane Centerline	140	N/A
Taxilane Centerline to Fixed or Movable Object	81	52
Apron Taxilane West		
Taxilane Width	35	✓
Taxilane Safety Area	49	✓
Taxilane Object Free Area	79	✓
Taxilane Centerline to Parallel Taxilane Centerline	140	N/A
Taxilane Centerline to Fixed or Movable Object	39.5	✓

Source: RS&H, 2015

3.3.3 Helipad

Helicopters currently operate at TEX without the use of a helipad. Helicopter operators use approach and departure procedures similar to that of fixed-wing aircraft, combined with hover taxi movements to navigate to and from apron parking positions. Helicopter operations are commonplace at TEX, although currently there are no helicopters based at the Airport. Consideration is required as to whether the Airport should implement a helipad in the future. **Section 3.6** describes how helicopter parking was accommodated in the apron parking requirements.

3.3.4 Lighting, Markings, and Signage

Airfield lighting, markings, and signage were evaluated for compliance with FAA Advisory Circular 150/5300-13A, *Airport Design*, and their ability to accommodate aviation demand throughout the planning period.

A Medium Intensity Runway Lights (MIRL) edge light system is required based on the Instrument Approach Procedures in place at TEX. Runway 9-27 is equipped with High Intensity Runway Lights (HIRL) edge light system and Runway End Identifier Lights (REIL). The Runway 9-27 HIRL exceeds the requirements and is sufficient to accommodate the aviation demand throughout the planning period. No change or modification is required for the runway edge light system during the planning period.

Runway 9-27 is also equipped with non-precision runway markings. The runway markings are in good condition and are sufficient to accommodate the aviation demand throughout the planning period.

3.3.5 Navigational Aids

TEX has several Navigational Aid (NAVAID) systems available to support the safe and efficient operation of aircraft in all weather conditions. This section describes the requirements for these NAVAIDs to meet the existing and forecast demand throughout the planning period.

Between the time the Inventory Chapter analysis was conducted, and the writing of this chapter, TEX gained two GPS RNAV approaches. TEX now has four Instrument Approach Procedures that allow pilots to land in Instrument Metrological Conditions (IMC). **Table 3-6** below describes the visibility minimums for each Instrument Approach Procedure. One procedure uses the Localizer / Distance Measuring Equipment (DME) to support safe approach operations. The TEX localizer has a collocated DME that together provides approaching aircraft with a slant range measurement of distance to the runway and lateral guidance to align with the runway centerline. The Localizer, DME, and associated equipment shelter are located approximately 260 feet north of the runway centerline, near the Runway 9 aiming point markings. This location is nonstandard because it is within the Runway Object Free Area. Advisory Circular 150/5300-13A Change 1, *Airport Design*, indicates that this equipment and associated shelter are not fixed-by-function and therefore, should be located outside of the safety area and object free area of a runway. Localizers are typically located beyond the far end of a runway, outside of the Runway Safety Area and Object Free Area; however, the terrain and limited space beyond the Runway 27 end does not allow for placement in this location.

Area Navigation (RNAV) / Global Positioning System (GPS) technology is also used to provide electronic guidance for approach to Runway 9. RNAV / GPS technology uses satellites to provide positive location of the aircraft; therefore, ground-based infrastructure is not required to support this procedure. Both the Localizer / DME and RNAV (GPS) Y procedures provide electronic guidance for Aircraft Approach Category A and B. The RNAV (GPS) Z procedures also provides guidance for Aircraft Approach Category C.

TABLE 3-6
INSTRUMENT APPROACHES

Instrument Approach	Category	Visibility Minimums Category A	Visibility Minimums Category B	Visibility Minimums Category C
RNAV (GPS) Y RWY 9	Non Precision	>1 1/4 mile	>1 1/2 mile	n/a
RNAV (GPS) Z RWY 9	Non Precision	>1 1/4 mile	>1 1/2 mile	>3 mile
LOC/DME RWY 9	Non Precision	>1 1/4 mile	>1 1/2 mile	n/a
VOR-DME A	Non Precision	>6 mile	>6 mile	n/a

Source: FAA NFDC-Instrument Approach Plates

Aircraft Approach Category C general aviation aircraft meet the substantial use threshold today. The FAA recently implemented an RNAV approach for Category C aircraft. However, it should be noted that the visibility minimums required for the approach are greater than three miles, and the approach does not offer vertical guidance. It is often the case that commercial carrier and charter company policies prohibit service at an airport that does not have the capability to accommodate their aircraft fleet mix in IMC. For

TEX, that means that carriers and charter companies may be procedurally prohibited to fly into TEX with an Aircraft Approach Category C aircraft if TEX does not have an approach with lower minimums in place. Currently, TEX is working with its consultant, Lean Photometrics, to implement additional Aircraft Approach Category C approaches that would provide lower ceiling and visibility minimums and serve a wider portion of the fleet mix.

Other Airport NAVAIDs at TEX include four-light Precision Approach Path Indicator (PAPI) light systems on both runway ends. These provide visual vertical guidance for aircraft on approach to both runway ends. The PAPI systems are sufficient to meet the existing and forecast demand. An Automated Surface Observing System (AWOS) is currently installed outside of the ROFA, north of the Runway 9 aiming point markings. An AWOS is a system that measures and reports weather information at the Airport.

TEX is also equipped with a rotating beacon that displays alternating white and green lights. Rotating beacons are required to be located within 5,000 feet of a runway. The beacon at TEX is located approximately 600 feet north of the runway and is elevated atop a tower to support visibility. The rotating beacon was determined to be sufficient, and no changes are required during the planning period.

Runway 9-27 is sufficiently equipped with three wind cones that are adjacent to the runway. The location of the wind cones is in an optimal location for pilot reference during landing and departing operations. Two of the wind cones are within the ROFA. Per AC 150/5340-30G, the wind cones are only permitted within the ROFA if they are mounted on frangible bases and are required based on a specific operational need. Due to the mountainous geography and typical weather patterns at the Airport, the wind cones' relatively close proximity to the runway was determined to be in the best possible location to alert pilots of actual runway wind conditions. As such, the wind cones' location should not be changed during the planning period.

Runway 9-27 is not equipped with an approach lighting system. Advisory Circular 150/5300-13A Change 1, *Airport Design*, indicates that it is recommended for approach lights to be in place for runway ends with instrument approach procedures though it is not required until the visibility minimum is less than ¾ statute mile. In cases where the visibility minimum is greater than ¾ statute mile, the Advisory Circular indicates that ODALS, MALS, SSALS, and SALS are acceptable. Though it is recommended that an approach lighting system for the Runway 9 end be installed in the future, it is understood that existing terrain will likely make the installation infeasible.

3.3.6 Airport Traffic Control Tower

TEX does not have an Airport Traffic Control Tower (ATCT). Pilots use Common Traffic Advisory Frequency (CTAF) to communicate their position and planned maneuvers. CTAF is the common solution for low traffic airports at which a staffed ATCT is not justified. The FAA uses a Benefit/Cost Analysis[3] to justify the establishment and discontinuance for ATCTs via FAA Report APO 90-7, *Establishment and Discontinuance Criteria for Air Traffic Control Towers*. A general rule of thumb to identify the need to conduct a Benefit/Cost Analysis is when annual operations reach approximately 100,000. The TEX forecast aviation

[3] Note that the FAA is in the process of reformulating the Benefit/Cost Analysis ratios. Entrance into the FAA Federal Contract Tower Program has been suspended until the release of the new ratios.

activity is well below this threshold with 12,620 annual operations at the end of the planning period. Therefore, continued use of CTAF is recommended as it is adequate to accommodate the forecast demand throughout the planning period.

3.4 LANDSIDE FACILITIES

This section summarizes the assumptions, methodologies, and resulting space requirements for the landside facilities at TEX. Landside facilities include the passenger terminal curbside, commercial vehicle staging, vehicle parking lots, rental car ready and return lot, and airport access roadways. Landside facility requirements were determined to meet passenger and aircraft operation demand levels as forecast for 2014, 2019, 2023, and 2034.

3.4.1 Landside Facility Usage Assessment

Landside requirements are often determined based on passenger characteristics and travel behavior data, which is typically collected with a passenger survey and other data pertaining to the usage of the facilities, such as parking lot occupancy or revenue data. For TEX, because some of this data was unavailable or unknown, the analyses were determined based on an assessment of the existing physical space layouts.

The vehicle parking areas assessed in this analysis consist of all the areas currently used today. These include the paved parking lot directly in front of the terminal building, the paved rental car lot, and the large dirt parking lot north of the rental car lot. A count of existing parking space (or stall) capacity was conducted to determine existing capacity. This effort took into account the dirt parking lot. For that parking lot, an estimate of capacity was derived by dividing the land available by the average square footage of a parking stall and associated circulation. Using this methodology, area for a total of 220 stalls in all lots was determined to exist today.

The total 220 stalls were then divided into categories of different airport users, as listed in **Table 3-7**. These user and stall shares represent an estimate that is based on the planning team's on-site inventory of the airport, experience at similar airports, and typical industry standards. Both general aviation and commercial service users were taken into consideration when determining the shares. These estimated shares for each user category were used as a basis to determine future facility needs.

TABLE 3-7
SHARE OF EXISTING PARKING LOT USAGE BY AIRPORT USER

Airport User	User or Stall Share	Equivalent Stalls (based on existing 220-stall capacity)
Short-Term Public Parker / Meeters and Greeters [1]	4.0%	9
General Aviation Tenants and Customers	5.0%	11
Taxis and Courtesy Vehicles [2]	20.5%	45
Rental Car Customer	33.0%	73
Long-Term Public Parker	31.9%	70
Employee	5.6%	12

Source: RS&H, 2015
Notes: 1 – The short-term public parker includes passengers driving to the airport on their own who park in the short-term public parking lot as well as meters and greeters who are involved in dropping-off or picking-up passengers at the terminal curbside and may at times park for a short time in the short-term parking lot.
2 – Taxis and courtesy vehicles, such as hotel shuttles, often require staging space away from the terminal curbside.

3.4.2 Terminal Curbside and Commercial Vehicle Staging

Terminal curbside requirements are typically determined based on passenger loads during the airport's peak hour. This is the duration of time where demand at the terminal curbside is anticipated to be the greatest. Terminal curbside requirements were determined for the total number of curbside stalls and the overall curbside length in linear feet. Currently, the terminal curbside measures 140 feet long, but due to the availability of two lanes for passenger drop-off and pick-up, the effective length is 280 feet. It should be noted that the existing radius of the roadway into and out of the curb is not built to a roadway standard geometry. As such, the actual effective length may be slightly reduced depending on the vehicles using the curb. If needed, this situation could be remedied by adjusting the roadway paint stripping and the adjacent concrete barriers.

The terminal curbside is used by private passenger vehicles and commercial vehicles such as taxis and courtesy shuttles. In determining curb requirements to serve commercial passengers, it was assumed that approximately 27.4 percent of all commercial service related passenger-parties[4] are dropped off or picked up at the terminal curbside at TEX.

Through the planning horizon, TEX anticipates one peak hour aircraft operation. In 2014, before commercial service operations were discontinued, the critical aircraft for commercial airline operations was the Beechcraft 1900D, a 19-seat aircraft. With an assumed 75 percent load factor, and accounting for total passenger enplanements and deplanements during the peak hour, the estimated total number of passenger-parties to use the curb was 24. That number reflects the number of vehicles that would pull onto the curb to pick-up or drop-off passengers, and is based on the share of users who would park at the curbside. The analysis determined that seven stalls would be required to serve the 24 vehicles over the course of the peak hour. It is assumed that one stall would be used by passenger vehicles and the other six would be used by commercial vehicles. This requirement accounts for an extra ten percent on top of the stall demand to account for inefficiencies in vehicles waiting at the terminal curbside.

[4] "Passenger-parties" refers to a planning factor that assumes an average of 1.2 commercial service passengers per vehicle.

In the future, the critical aircraft is anticipated to be the Bombardier Q400, a 70-seat aircraft. With an assumed 75 percent load factor and accounting for total passenger enplanements and deplanements during the peak hour, the estimated total number of passenger-parties (total vehicles) to use the curb is 88. The analysis determined that 26 stalls would be required to serve this peak hour demand. Of the 26 stalls, it was assumed that four would be used by passenger vehicles, and the rest by commercial vehicles. This requirement accounts for an extra ten percent on top of the stall demand to account for inefficiencies in vehicles waiting at the terminal curbside.

The total required length was determined by multiplying the stall requirements by a standard vehicle stall length of 30 feet (which also includes maneuvering space). This accounts for a total required terminal curbside length of 210 feet in 2014, and 780 feet when commercial airline service restarts. With an effective terminal curbside length of 280 feet, TEX will need to accommodate a minimum of 500 linear feet of curb to accommodate commercial service with Q400 aircraft. An alternative to expanding the curb length to the full required amount is to provide commercial vehicles a staging area located in close proximity to the terminal entrance. To accommodate all commercial vehicle curb demand, an equivalent 17 stalls would be needed.

Options for providing additional terminal curbside will be identified in the alternatives analysis process. A summary of the terminal curbside and commercial vehicle staging requirements is presented in **Table 3-8**.

TABLE 3-8
TERMINAL CURBSIDE AND COMMERCIAL VEHICLE STAGING AREA REQUIREMENTS

	Existing	2014	2019	2024	2034
Terminal Curbside Stalls	9[1]	7	26	26	26
Terminal Curbside Length (feet)	280[2]	210	780	780	780
Surplus / (Deficit) (f)		70	(500)	(500)	(500)
Commercial Vehicle Staging Stalls[3]	0	0 - 6	17 - 22	17 - 22	17 - 22
Commercial Vehicle Staging Area (sf) [3]	0	0 - 2,100	5,950 - 7,700	5,950 - 7,700	5,950 - 7,700

Source: RS&H, 2015

Notes: 1 – The existing number of stalls at the terminal curbside assumes the standard stall length for passenger vehicles, taxis, and courtesy shuttles is an average of 30 feet. For reference purposes, passenger vehicles and taxis typically have a standard stall length of 25 feet. The standard stall length accounts for maneuvering space at the terminal curbside.
2 – Two lanes are used for dropping-off and picking-up passengers. The effective length is therefore two times the actual terminal curbside length of 140 feet.
3 – No commercial vehicle staging area exists today, but based on the user or stall share in the existing parking lot, the existing supply would be a maximum of 45 stalls (15,785 square feet). The actual stall / area requirements is lower, and considers that not all commercial vehicles may need to stage. The staging requirements is based on a range with the minimum requirement assuming commercial vehicles can park at the terminal curbside and the maximum requirement assuming commercial vehicles are unable to park at the terminal curbside and must instead park in the commercial vehicle staging lot.

3.4.3 Vehicle Parking

Vehicle parking requirements were determined for the total number of required stalls and area in square feet. Vehicle parking includes short-term public parking, long-term public parking, rental car ready / return parking, general aviation parking, and employee parking. The total number of stalls used today for parking is estimated to comprise 79.5 percent of the total parking area, or 175 stalls.

Commercial airline passenger parking requirements for short-term public parking and rental car parking were determined based upon peak hour passenger-party demand and the previously described user shares. The total short-term public parking requirement was increased by ten percent within the analysis to account for a stall search factor. The total rental car parking requirement was increased by 20 percent to account for rental car providers also providing services to residents and visitors during large events. The required stalls and area for short-term parking and rental car parking are summarized in **Table 3-13**. Area requirements were determined by assuming an average of 350 square feet per stall, with the exception of 200 square feet per stall for the rental car return lot where returned vehicles are lined up bumper-to-bumper in several lanes.

Commercial airline passenger parking requirements for long-term public parking was determined based on a longer peak demand duration to account for overnight parkers. Parking data collected and analyzed in the 2004 Master Plan Update determined that 4.8 percent of all peak month passenger enplanements parked in either the short-term or long-term lot. Peak month passengers was determined from five years of historical TEX airport data. That data indicated that the peak month at TEX was typically comprised of 16.7 percent of the total annual commercial passenger enplanements. Based on studies completed by the International Air Transport Association on other airports internationally, it is typical to find 85 percent of all public parking stalls designated for long-term use. At TEX, the estimated share was determined to be 88.9 percent based on historical data. A weekly peak hour demand was used to determine the required number of long-term public parking stalls. This was based on an assumption that the average duration of a resident trip is one week long[5]. An additional 10 percent of stalls was applied to account for a stall search factor in the long-term public parking lot. The required stalls and area for long-term parking is summarized in **Table 3-9**.

General aviation parking requirements were determined for based and itinerant general aviation activity. For based aircraft, an assumption was made that one stall was required per based aircraft and that during peak times, at most 30 percent of based aircraft owners (or people who accompany them) would park in the public parking lot at TEX. For itinerant operations activity, one stall was designated per aircraft, and an assumption was made that during peak times, at most 50 percent of itinerant operations would be associated with a non-commercial vehicle parking at TEX. The requirements were based upon an average day of the peak month demand. Peak month itinerant operations was determined from five years of historical TEX airport data, and was determined to comprise approximately 15.3 percent of total annual itinerant operations. An additional ten percent of stalls was applied to account for other airport business customers, and for a stall search factor. The required general aviation stalls and area is summarized in **Table 3-9**.

Employee parking requirements were determined based on the historical planning factor of 0.0005 employee stalls per total enplaned passenger (commercial airline and general aviation), and an assumption that the airport needed a minimum of eight employees to operate. The resulting stall and area requirements are summarized in **Table 3-9**.

[5] *The International Air Transport Association indicates the average trip duration is 1 to 2 weeks.*

Overall, TEX requires 216 stalls or 72,815 square feet of surface parking to meet forecast demand in 2034. The existing capacity of 220 stalls or 87,775 square feet is adequate to meet future requirements. This is based on the assumption that TEX continues to have a somewhat common use parking area. Today, the parking area is split into three different areas. The area directly in front of the passenger terminal is used for short-term public parking and general aviation parking. The area located to the north of the short-term public parking area is the rental car ready / return parking area. The area located farthest from the passenger terminal is used for long-term parking, employee parking, and based aircraft associated parking. In the future, if the parking areas are further divided by specific types of airport users, additional space may be necessary to accommodate an efficient parking layout.

TABLE 3-9
VEHICLE PARKING REQUIREMENTS

	Existing	2014	2019	2024	2034
Stall Requirement					
Short-Term Public	9	1	4	4	4
Long-Term Public	70	14	62	70	91
Rental Car Ready / Return	73	11	39	39	39
General Aviation	11	32	35	39	49
Employee	12	8	8	9	12
Commercial Vehicle Staging	45	6	22	22	22
TOTAL	220	72	170	183	216
Surplus / (Deficit) (stalls)		148	50	37	4
Area Requirement (sf)					
Short-Term Public	27,055	410	1,510	1,510	1,510
Long-Term Public	39,870	5,050	21,600	24,550	31,740
Rental Car Ready / Return	20,825	2,895	10,600	10,600	10,600
General Aviation	See Short-Term Public	11,370	12,240	13,650	17,180
Employee	See Long-Term Public	2,740	2,740	3,115	4,025
Commercial Vehicle Staging	See Short-Term Public	2,100	7,700	7,700	7,700
TOTAL	87,755	24,565	56,450	61,185	72,815
Surplus / (Deficit) (sf)		63,190	31,305	26,570	14,940

Source: RS&H, 2015

3.4.4 Airport Access Roadways

The current airport access road is a two-lane paved roadway called Airport Road. A standard metric used to determine capacity at airports is 1,200 vehicles per hour per lane, resulting in a roadway capacity of 2,400 vehicles per hour. Roadways are typically designed to achieve a Level of Service C performance. A Level of Service C is defined in the 2000 Highway Capacity Manual as indicative of good traffic conditions with stable flow, moderate volumes, and where the freedom to maneuver is noticeably restricted. Applied to TEX, the airport access roadway, for planning and design purposes, has a capacity threshold of 1,920 vehicles (80 percent of the maximum capacity) per hour. The goal is to ensure airport activity does not result in a demand exceeding the 1,920-vehicle threshold.

To determine the expected peak traffic volume at TEX, analysis was conducted based on peak hour demand estimates for each user group expected to park at the airport. Due to unavailable traffic volume data, peak hour traffic volumes were assumed to be tied to scheduled passenger operations. The resulting maximum traffic volume demand is summarized in **Table 3-10**. The analysis determined that in 2034, the maximum peak hour vehicle volume on the airport access roadway will be 96 vehicles. This demand is far below the existing capacity threshold. As such, the roadway will adequately support traffic volumes through the planning horizon.

TABLE 3-10
ESTIMATED MAXIMUM PEAK HOUR TRAFFIC VOLUME DEMAND ON AIRPORT ROADWAYS

	Existing Capacity Threshold	2014 Estimated Demand	2019 Estimated Demand	2024 Estimated Demand	2034 Estimate Demand
General Aviation	-	4	5	5	7
Employee	-	8	8	9	12
Commercial Airline Activity	-	21	76	76	77
TOTAL	1,920	33	89	90	96

Source: RS&H, 2015
Notes: The maximum peak hour traffic volume demand generated by airport activity was determined by estimating a peak hour traffic volumes per user group individually and summing the values. It was done with the understanding that some of the peak hours may not occur at the same time. However, the purpose in doing so was simply to determine if a potential maximum demand would exceed the capacity of the roadway.
1 – The existing capacity of the airport access roadway is based on meeting a Level of Service C threshold. The actual capacity of the roadway, however, is 2,400 vehicles.

3.5 GENERAL AVIATION FACILITIES

3.5.1 General Aviation Terminal Building

Approximately 1,500 square feet of the terminal building is used to support general aviation terminal activities. Peak hour demand was used as the metric by which general aviation demand was measured in determining future facility requirements. Peak hour general aviation itinerant operations and peak hour general aviation itinerant passengers were estimated, and used to determine future general aviation terminal requirements.

Future peak hour operations were estimated based on the existing ratio of annual operations to peak hour operations as indicated in the 2014 Fueling Departure Report. This ratio was used as a planning factor to determine total peak hour operations for each forecast year. This assumes that future peaking characteristics will be similar to that of 2014 operations. Peak hour operations, however, can be difficult to measure, especially since TEX does not have an Airport Traffic Control Tower. Peak hour passengers is a more intuitive metric by which TEX officials can monitor activity to determine the need for a larger general aviation terminal facility.

To determine a peak hour passenger metric, the average number of general aviation itinerant passengers (including aircraft crew, where applicable) was estimated for each aircraft type based on professional judgement and industry standard metrics. This metric was compared to the existing general aviation space within the terminal. It was determined that approximately 33 square feet per peak hour passenger exists in the terminal today. This ratio was carried forward though the planning period to determine future space requirements. The ratio assumes that the existing space provides a sufficient level of service. If the desire exists to increase the level of service for general aviation passengers, additional space may be required in the near-term, even without an increase in the number of peak hour passengers.

The analysis determined that the existing general aviation terminal area is sufficient to accommodate near-term general aviation demand. Additional general aviation terminal space will be required to accommodate forecast demand in 2024 as the peak hour operations increase. However, enhancing the terminal in the near-term would allow for a more modern and comfortable experience, akin to that of high-end fixed-base operator (FBO) facilities. The type of clientele using TEX in a general aviation capacity are accustomed to high quality FBO facilities. Therefore, it is suggested that TEX enhance the terminal in the near-term rather than waiting until later in the planning period in order to attract more customers. This will support a higher-level of service in the near-term which would encourage the use of TEX as the primary access point into the region; especially if combined with additional aircraft storage area. A summary of general aviation terminal facility requirements is described in **Table 3-11**.

TABLE 3-11
GENERAL AVIATION TERMINAL

	Existing	2014	2019	2024	2034
Annual Operations	7,566	7,566	8,220	9,300	12,180
Total Peak Hour Operations	7	7	7	8	11
Total GA Terminal Area (sf.)	1,500	1,500	1,500	1,700	2,150
Surplus / (Deficit) (sf.)	-	0	0	(200)	(650)
Total Peak Hour Passengers [1]	45	45	45	50	65
SF./ Peak Hour Passenger	33	33	33	34	33

Source: RS&H, 2015, TEX 2014 Fueling Departure Report
Notes: 1 – The peak hour passenger count includes aircraft crewmembers, where applicable

3.5.2 General Aviation Aircraft Apron

General aviation apron requirements were determined through analysis of apron facilities at peer airports. According to the Telluride Tourism Board[6], "Telluride Ski Resort is recognized internationally as a premier ski and snowboard destination." A comparison to peer airports was conducted to determine the size of apron that may be needed at Telluride to provide a level of service similar to airports serving other ski and snowboard destinations.

Telluride's peer airports were selected based on those serving other highly ranked ski resort communities. Top-tier caliber ski resorts were identified based on Forbes' 2015 Top 10 Ski Resorts of North America list and SKI Magazine's 2015 Top-Ranked Western Ski Resorts 2015 rankings. Ski resorts located in the Rocky Mountain region were selected because they offered the greatest similarities in the type of skiing and traveler behavior to Telluride. The visitors traveling to these mountain resorts are assumed to have similar trip durations and travel habits. Top-tier ski resorts in close proximity to, and only served by large commercial airports (e.g., Denver International Airport and Salt Lake City International Airport) were removed from consideration. The list of peer airport and the ski resort communities are identified in **Table 3-12**.

TABLE 3-12
PEER AIRPORTS

Airport	Ski Resort	Apron Space Ratio (sy / operation)
Eagle County Airport	Vail / Beaver Creek, CO	5.8
Aspen/Pitkin County Airport	Snowmass / Aspen, CO	6.1
Jackson Hole Airport	Jackson Hole / Grand Targhee, WY	3.9
Yampa Valley Regional Airport	Steamboat, CO	4.8
Telluride Regional Airport	Telluride, CO	2.6

Source: RS&H, 2015, Forbes 2015 Top 10 Ski Resorts in North America, SKI Magazine 2015 Top-Ranked Western Ski Resorts

[6] http://www.visittelluride.com/winter-activities-detail/skiing-snowboarding, 2015

Total general aviation apron space was calculated for each of the peer airports using satellite imagery. The space calculations included apron circulation areas and apron taxilanes that provide access to the general aviation parking areas. Apron area that was used for commercial passenger aircraft parking was not included in the calculation. The analysis assumed that the apron space at each airport sufficiently met the existing demand.

Space ratios were determined for apron space for each of the airports by establishing a ratio of total general aviation apron to annual itinerant operations for each airport. The apron space ratios are described in **Table 3-13** for comparison to ratios for TEX. The FAA's Terminal Area Forecast was used to obtain 2014 operations data for the peer airports. The median space ratio was calculated to balance for outlier values and used as a planning factor to estimate TEX requirements. This planning factor was applied to the forecast of general aviation operations for TEX to determine general aviation apron requirements for each forecast year.

Table 3-13 describes the apron area required to accommodate demand throughout the planning period. The analysis indicates that today, there is nearly an 8,000 square yard deficit in aircraft parking space. Evidence of the immediate need for apron is demonstrated during peak times when itinerant aircraft are forced to fly to nearby airports to park after dropping off passengers at TEX. The aircraft parking deficit increases to nearly 33,000 square yards by the end of the planning horizon. It is recommended that additional general aviation aircraft parking be constructed in the near-term. The existing space deficit should be addressed in order to raise the level of service at TEX to the service levels at other competitive top-tier ski resort airports.

TABLE 3-13
GENERAL AVIATION AIRCRAFT APRON REQUIREMENT

	Existing	2014	2019	2024	2034
Total (sy.)	32,300	40,100	43,600	49,300	65,000
Surplus / (Deficit) (sy.)	-	(7,800)	(11,300)	(17,000)	(32,700)

Source: RS&H, 2015

Figure 3-2 displays how general aviation aircraft are packed into the available apron area during a typical busy day at Telluride Airport. These busy days happen often during high demand times and create operational difficulties due to the compact area in which they must be parked. The areas in purple show space preserved for movement of aircraft outside of taxiways/taxilanes as well as passenger pickup/drop-off zones. This area is limited thus, causes little room for maneuvering future commercial and general aviation aircraft safely, especially when necessary ARFF clear zones are taken into account

TELLURIDE REGIONAL AIRPORT
AIRCRAFT PARKING - TYPICAL BUSY DAY

Aircraft Parking Zone
ARFF Clear Zone
Transient Aircraft / Passenger Drop Zone

Parked Aircraft (32 Total)

- Gulfstream 550 (3)
- Gulfstream 450 (1)
- Citation X (1)
- Citation Sovereign (1)
- Citation Jet (1)
- Falcon 2000 (1)
- Challenger 600 (1)
- Challenger 300 (2)
- Hawker 400 (3)
- Hawker 800 (1)
- Learjet 45 (2)
- Learjet 60 (2)
- PC-12 (1)
- TBM 700 (1)
- King Air 200 (1)
- King Air 300 (1)
- Cessna 182 (4)
- Cessna 210 (1)
- Cessna 425 (1)
- Cirrus SR-22 (2)
- Robinson R-66 (1)

50' 25' 0 50'

FIGURE 3-2
GENERAL AVIATION PARKING ON TYPICAL BUSY DAY

3.5.3 General Aviation Aircraft Hangar

TEX has a total of six separate aircraft storage hangar facilities: three four-unit hangars (12 hangars), one terminal hangar, one transient hangar, and one three-unit, hangar. In general, aircraft owners and transient aircraft operators at Telluride prefer to store their aircraft in hangars due to the cold weather climate. Smaller piston engine aircraft operators typically store their aircraft in T-hangars as they are more economical than box hangars. Turboprop and jet aircraft operators typically prefer to store their aircraft in more spacious box hangars.

Hangar requirements were determined based on a traditional top-down approach of industry accepted planning factors for space required for each aircraft type. Industry-standard space planning factors were applied to the forecast aircraft fleet mix to determine future hangar requirements. Based aircraft hangar requirements were established on the assumption that roughly the same percentage of aircraft owners with aircraft stored outside today, would continue to store their aircraft outside. Transient hangar requirements were determined based on the estimated number of transient aircraft that would park at the Airport on an average day during the busiest month of the year (peak month average day or PMAD). Only transient jet aircraft were factored into the analysis as it is those operators that most often desire (or demand) hangar accommodations. Additionally, the analysis was conducted on the premise that all transient jet aircraft would demand hangar space.

The based aircraft and transient aircraft areas were summed to determine the total general aviation hangar requirement, as presented in **Table 3-14**. The analysis determined that today, the aircraft hangar space at TEX is undersized to accommodate the existing demand. As such, it is recommended that additional hangars be constructed during the planning period.

TABLE 3-14
AIRCRAFT HANGAR REQUIREMENT

Hangar Requirement	Existing	2014	2019	2024	2034
Based Aircraft Hangar Requirement					
Area Subtotal (sf)	36,000	36,000	39,000	42,000	49,000
Transient Aircraft Hangar Requirement					
Area Subtotal (sf)	28,600	62,000	68,000	77,000	101,000
Total Hangar Requirement Summary					
Area Total (sf)	64,600	98,000	107,000	119,000	150,000
Surplus / (Deficit) (sf)	-	(33,400)	(42,400)	(54,400)	(85,400)

Source: RS&H, 2015

3.6 COMMERCIAL FACILITIES

3.6.1 Commercial Passenger Terminal Building

The commercial passenger component of the terminal building is currently not used since commercial carriers have discontinued service at TEX. However, commercial service is forecast to return to the Airport during the planning period. It is forecasted the future demand will reach 53 enplanements during the peak hour, based on an anticipated 75 percent load factor of one Bombardier Q400 aircraft.

The TEX terminal building occupies a converted aircraft hangar that has been modified and updated throughout the years to meet aviation demand. The "piece-meal" additions have resulted in a disjointed building layout and an inadequate level of service for TEX passengers. Building layout issues were identified through on-site observations in late 2014 and early 2015. Peak period operational observations from the 2004 Master Plan were included in the analysis. Existing peak-period operational observations were not available. Therefore, the operational observations and issues identified in the 2004 Master Plan were considered.

The commercial passenger ticket lobby space is a shared space that is also used to access general aviation and airport administrative facilities. While it is not a requirement that these areas be segregated, it is recommended that the commercial passenger ticket lobby be segregated from the other aforementioned uses to support a higher passenger level of service.

Space requirements for outbound baggage screening and baggage make up functions have surpassed the original amount of allocated space. At the time when commercial operations ceased, outbound baggage functions had occupied a portion of the adjacent aircraft hangar. The highest and best use of the aircraft hangar is for aircraft storage, not passenger terminal functions, given the shortage of aircraft storage area at TEX.

The departure lounge consists of a small room near the airline ticket counters. The lounge is not equipped with restrooms and passengers do not have access to concessions after passing the security checkpoint. Since these amenities are not available, the lounge is not accessible to passengers until the moments leading up to departure. Passengers are expected to dwell in the ticket lobby until that time. The passenger security screening checkpoint is located in the hallway between the general public lobby and the departure lounge. Passenger processing activity is concentrated in a short period of time leading up to the departure time since the departure lounge is not accessible until this time. The 2004 Master Plan noted that the security screening checkpoint becomes congested during peak times because of its location and the concentrated processing demand. Note that this assessment was based on the 19-seat Beechcraft 1900 that historically operated at TEX. Checkpoint congestion will be more acute with the introduction of the larger Bombardier Q400 aircraft.

Departing passengers must exit the building and walk outside, along the terminal building to access the commercial aircraft parking apron. Passengers must walk about 100 feet to access the waiting aircraft without shelter from the elements. The path used by the secure passengers passes a doorway from which unscreened, general aviation passengers access the building. This requires airport and/or airline personnel to restrict the movement of general aviation passengers during the commercial passenger boarding process to avoid comingling of screening and unscreened passengers.

Industry standards and professional planning judgement were used to identify the appropriate space requirement for each functional area to accommodate forecast demand at TEX. Airport Cooperative Research Program (ACRP) Report 25 – *Airport Passenger Terminal Planning and Design*, was used as the basis of determining the future requirement. The industry standard metrics used to determine the future TEX terminal requirement are listed below.

Ticketing

- Length of Check-in Counters – 10 feet
- ATO Airline Office Depth – 20 feet
- ATO Counter Depth – 10 feet
- Depth of Staffed Counter Position Check-in Queue – 25 feet
- Depth of Kiosks Check-in Queue – 25 feet
- Linear Kiosks Length – 6 feet

Concessions

- Area per 1,000 annual enplaned passenger – 14.5 square feet
- Additional area for local service – 50 percent of subtotal

Outbound Baggage

- Level 1 Area for EDS Screening Unit – 800 square feet
- Level 2 Area for OSR Station – 40 square feet
- ETD Screening Unite Area – 100 square feet
- Baggage Make Up Area per EQA – 1,800 square feet

Passenger Security Screening

- Depth of Security Queue – 20 feet
- Width of Scanning Lane Module – 25 feet
- Reconciliation Area Depth – 10 feet

Departure Lounge

- Area per Seated Passenger – 18 square feet
- Area per Standing Passenger – 13 square feet
- Area per Large Regional Aircraft – 1,350 square feet

Baggage Claim

- Percent of Passengers Checking Bags – 75 percent
- Average Traveling Party Size – 2.5 feet
- Claim Frontage per Person – 1.5 feet
- Meeter / Greeter Area per Person at Bag Claim – 15 square feet

Circulation

- Clear Width – 27 feet
- Length of Concourse – 143 feet
- Aircraft Frontage – 143 feet

Utilities

- Additional 10 percent of building subtotal

ACRP Report 25 indicates that a standard size of a small terminal is 15,000 to 18,000 square feet per Narrow-body Equivalent Gates (NBEG). TEX peak hour activity is a single Q400 which is identified as a "Large Regional" aircraft group and is equal to a NBEG of 1.0. Therefore, it is recommended that the terminal facility be between 15,000 to 18,000 square feet. Note that this is high-level generalization does not account for additional functional uses such as administrative space for airport staff. Currently, airport administrative space is provided in the passenger terminal. It is assumed that this function will continue to be included as part of the passenger terminal space allocation in the future. As such, administrative space will be required in addition to the 15,000 to 18,000-square foot estimated described above. **Table 3-15** describes the future required terminal space for each functional use, including additional space for airport administrative space.

TABLE 3-15
COMMERCIAL PASSENGER TERMINAL

	Existing	Future [2]
Annual Enplanements	3,268 [1]	23,006
Peak Hour Enplanements	-	53
Airline Space (sf)	3,000	3,900
Ticketing (sf)	-	900
Airline Offices (sf)	-	200
Departure Lounge (sf)	-	1,400
Bag Claim (sf)	-	1,400
Airline Space Surplus / (Deficit) (sf)	-	(700)
Outbound Baggage (sf)	2,533	1,800
Outbound Baggage Surplus / (Deficit) (sf)	-	733
Concessions (sf)	900	600
Concessions Surplus / (Deficit) (sf)	-	300
TSA (sf)	1,100	1,800
TSA Surplus / (Deficit) (sf)	-	(700)
Public Space / Circulation (sf)	7,500	7,800
Public Space / Circulation Surplus / (Deficit) (sf)	-	(300)
Utilities (sf)	1,310	1,900
Utilities Surplus / (Deficit) (sf)	-	(590)
Airport Management (sf)	2,100	3,300
Airport Management Surplus / (Deficit) (sf)	-	(1,200)
Total Commercial Passenger Terminal Space (sf)	18,450	20,900
Total Surplus / (Deficit) (sf)	-	(2,450)

Source: RS&H, 2015
*Notes: 1 – Existing annual enplanements value from forecast of aviation activity (**Chapter 2 – Forecast**)TEX does not currently have commercial passenger activity.*
2 – Future represents 2034 forecast year.

Industry standards indicate that the TEX terminal needs approximately 2,500 square feet of additional space to meet the forecast demand throughout the planning period. The current layout and arrangement results in facility inefficiencies resulting in a feeling of inadequate level of service for passengers. Therefore, it is recommended that the terminal space be re-allocated to satisfy the space requirements for each functional use. Additional refinement to space quantities should be based on passenger profile data and airline / tenant coordination. This more-detailed analysis should be completed in the advanced planning stages leading up to design work. Advanced planning would also identify intuitive facility layouts to maximize efficiencies and passenger level of service. This should include minimizing walking distances to increase passenger level of service and maximizing post-security concessions to increase sales. The future terminal building layout should also provide flexibility for the future, in order to ensure that changes in passenger flows and customer demand can be accommodated with minimal financial burdens to the airport.

3.6.2 Commercial Aircraft Apron

The commercial aircraft apron requirements were determined based on the number of peak hour parking positions required in the future. The commercial aircraft apron is 2,000 square yards and is currently marked to accommodate two 19-seat Beechcraft 1900 aircraft. These aircraft are smaller than the 70-seat Bombardier Q400 that is forecast to serve TEX within the planning period. Peak hour demand for the Q400 will be one aircraft and will remain constant throughout the planning period. Therefore, the apron should be large enough to accommodate a single Q400 aircraft at any given time. Approximately 2,000 square yards is required to accommodate a Q400 parking position with sufficient circulation space around the aircraft for service vehicles and equipment (e.g., fuel trucks, baggage carts, air stairs) to access the aircraft. Therefore, the existing commercial apron area is sufficient to meet the forecast commercial aircraft demand. **Table 3-16** describes the future required commercial aircraft apron to meet forecast demand.

TABLE 3-16
COMMERCIAL AIRCRAFT APRON

	Existing	2014	2019	2024	2034
Aircraft Parking Positions	2	1	1	1	1
Total Aircraft Parking Area (sy)	2,000	2,000	2,000	2,000	2,000
Area Surplus / (Deficit) (sy)	-	0	0	0	0

Source: RS&H, 2015

3.7 SUPPORT FACILITIES

3.7.1 Aircraft Deicing

Construction of a combined aircraft deicing / run-up pad located along Taxiway A started in 2015. The location of the new run-up pad was determined in consideration of noise concerns and resulted in siting the run-up pad as far west of surrounding residential areas as possible along the existing parallel taxiway. The existing deicing pad, currently situated along Taxiway A near the tie-down apron, will be relocated, along with the construction of the new run-up pad, slightly west along and adjacent to Taxiway A. The relocated deicing pad will resolve non-standard conditions as the existing deicing pad is located within the Runway 9-27 Object Free Area. The existing deice fluid recollection system and underground tank is also anticipated to be relocated to the new location.

3.7.2 Fuel Facilities

TEX owns and operates three fuel storage tanks – two 20,000-gallon Jet A tanks and one 10,000-gallon 100LL Avgas tank. Fuel storage facility requirements were determined using the historic airport fuel sale reports from 2011 to 2014.

Telluride Regional Airport Authority board packets include monthly fuel sale records for both Jet A and 100LL dating back to 2010. These records were extracted from the reports and assembled to identify a historical planning factor of fuel sales per operation. The 2014 Fueling Departure Report was also used to estimate the historic general aviation piston and turbine engine aircraft operation count. It was assumed that the historic average fuel usage rates would remain constant throughout the planning period.

Piston and turbine engine average day peak month fueling operations were estimated for each of the forecast years using a factor derived from the 2014 Fueling Departure Report. The future 100LL Avgas requirement total was calculated based on the assumption that a 14-day fuel supply was required. This is consistent with the minimum fuel storage requirements as identified in the 2004 Master Plan report. The future Jet A requirement total was calculated based on the assumption that a 7-day fuel supply was required. This is slightly higher than the 5-day minimum that was identified in the 2004 Master Plan report.

The increase in daily storage requirement reflects the growing importance to have sufficient Jet A fuel available to accommodate the growing jet fleet at TEX. The analysis results indicate that the existing fuel storage capacity is sufficient to meet the forecast demand throughout the planning period. Therefore, no infrastructure changes are required to meet the forecast demand. **Table 3-17** summarizes the fuel storage requirements to meet future demand.

TABLE 3-17
FUEL STORAGE

	Existing	2014	2019	2024	2034
100LL Avgas Fuel					
Annual Piston Operations	325	325	350	400	525
ADPM Fueling Operations	2	2	2	2	3
Storage Capacity (gallons)	10,000	1,700	1,900	2,100	2,800
Surplus / (Deficit) (gallons)		8,300	8,100	7,900	7,200
Jet-A Fuel					
Annual Turboprop / Jet Operations	7,825	7,825	8,175	9,250	12,100
ADPM Fueling Operations	38	38	41	46	60
Storage Capacity (gallons)	40,000	16,200	17,500	19,700	25,500
Surplus / (Deficit) (gallons)		23,800	22,500	20,300	14,500

Source: RS&H, 2015, 2011-2014 Airport Fuel Sale Records, TEX 2014 Fueling Departure Report

3.7.3 ARFF

TEX does not currently have commercial service but retains its FAA-issued certificate to serve such operations, per 14 CFR Part 139, Certification of Airports. This certificate requires TEX to comply with more stringent safety and emergency response requirements. As such, TEX continues to comply with Aircraft Rescue and Fire Fighting (ARFF) requirements. For the size of commercial aircraft it served, TEX complied with ARFF Index A requirements. TEX is forecast to regain commercial service within the planning period so it is recommended that TEX maintain its Part 139 certification and its ARFF Index.

ARFF Index A classification is for airports serving aircraft less than 90 feet in length and is the minimum Index classification for Part 139 certificated airports. The Q400 aircraft is 107 feet long; however, the Q400 will not meet the threshold of five or more average daily departures of this aircraft. Therefore, TEX is expected to remain at ARFF Index A throughout the planning period.

The equipment requirement for ARFF Index A is for one vehicle that is capable of carrying 500 pounds of sodium-based chemical and 1,500 gallons of water. TEX currently meets this requirement with its 2010 Rosenbauer 1500-gallon response vehicle. The ARFF vehicle is required to reach the midpoint of the runway within three minutes. This requirement is met from the existing ARFF location. There is no anticipated changes to the runway location within the planning horizon. This requirement should be considered if the ARFF is relocated.

The ARFF facility was constructed in 1994 and is in good condition. The facility is capable of accommodating the required vehicle and gear; therefore, no changes or modifications to the facility are required to meet forecast demand. However, the existing ARFF location is not the highest and best use of the land. The ARFF occupies land that may be better suited by airfield or apron expansion. Relocation and consolidation with other support facilities would be more efficient as it allows for economies of scale for equipment storage and crew quarters

3.7.4 Snow Removal Equipment

The airport's storage facility for snow removal equipment (SRE) is attached to the terminal hangar. A portion of the terminal hangar is also used to store SRE. The SRE storage facility is not sufficient to meet the existing storage demand for equipment as indicated by the overflow into the terminal hangar. All SRE should be accommodated in a separate facility that does not compromise the use of the terminal hangar to store aircraft. Storing SRE in the terminal hangar is not the highest and best use of that facility. Consolidation with other support facilities should also be considered. It would be more efficient as it allows for economies of scale for equipment storage and crew quarters.

Similar to ARFF requirements, TEX is required under Part 139 to remove snow and to have a FAA-approved snow removal plan. The SRE storage requirements analysis is based on the relationship between storage area and maintained pavement area. That is, the amount of pavement area that is required to be cleared of snow is proportional to the amount of equipment required to clear snow in an acceptable amount of time. Thus, an increase in pavement area will require additional storage area to store additional and/or larger equipment. Therefore, SRE storage requirements were determined using a planning factor for existing equipment storage area to existing maintained pavement areas (i.e., areas from which snow is removed).

The existing total airside and landside pavement areas were estimated using satellite imagery. The airside pavement total includes Runway 9-27 (including Engineered Materials Arresting System beds and paved runway shoulders), taxiways (including shoulders), and apron areas. The landside pavement total includes the vehicle parking, rental car, and vehicle circulation area. Landside access roadways, such as Last Dollar Road, were not included in the landside total because other entities (e.g., San Miguel County) are responsible for these pavement areas.

The existing SRE storage areas are described in **Chapter One – Inventory**. It was assumed that the total quantity of storage space currently used is sufficient and therefore represents an adequate planning factor of the future needs. The planning factor was applied to the future required pavement areas (e.g., additional apron area required to meet 2024 demand) as described in the sections above.

The existing dedicated SRE storage area is not sufficient to accommodate existing or future SRE storage demand. This is because non-dedicated SRE space (an aircraft hangar) is currently being used to store some SRE equipment. Essentially, the current quantity of space used for SRE storage is adequate, but some of that space is inappropriate for SRE storage. Therefore, it is recommended that additional space be provided in the near-term to accommodate the demand. The increase in apron area to meet forecast demand is the primary reason for the future increased SRE storage area requirement. Future landside area requirement increase is marginal. **Table 3-18** summarizes the SRE requirements to meet support the increased pavement areas required to accommodate the forecast demand. The airside pavement area increase required to accommodate the forecast demand (as described in Sections 3.4, 3.5, and 3.7) is identified in the next table. As mentioned above, the additional storage space and existing equipment space should be accommodated without impact to the terminal hangar space.

TABLE 3-18
SNOW REMOVAL EQUIPMENT STORAGE

	Existing	2014	2019	2024	2034
Airside Pavement Area (sf)	1,859,000	1,867,000	1,888,000	1,912,000	1,976,000
Landside Pavement Area (sf)	155,000	155,000	155,000	155,000	155,000
Total Airport Pavement Area (sf)	2,014,000	2,022,000	2,043,000	2,067,000	2,131,000
SRE Storage Area (sf)	7,550	7,600	7,650	7,750	8,000
Surplus / (Deficit) (sf)	-	(50)	(100)	(200)	(450)

Source: RS&H, 2015

3.7.5 Utilities

High-level utility requirements and considerations were determined for the adequate provision of water, sewer, and electricity.

Water is currently only provided to the terminal building via two water wells where the water is channeled into a single 500,000-gallon water tank that was built in 2010. The water wells and pump are located just east of the long-term public parking lot. The water tank is located north of the long-term public parking lot. As the terminal building expands and the air service continues to grow, the demand for water will grow and it may be necessary to increase the water storage capacity. However, in a hypothetical scenario, if a single passenger use on average 4 gallons, which may be on the higher end of water consumption per enplaned passenger rates due to the implementation of water conservation programs nationwide, by 2034, the forecast 46,000 passengers at TEX would use 184,000 gallons. The need to add capacity within the planning horizon is therefore unlikely. Regardless, in preparation for a substantial increase in passengers, the Airport does have the ability to add additional capacity and obtain two additional permits to draw well water. Finally, it is recommended that airport staff work with general aviation tenants to determine general aviation demand for extending the water lines to existing and future hangar facilities.

Sewer service is currently provided to the terminal building via a septic system which includes a leach field within the airfield west of Taxiway A3. As the terminal building expands, it is recommended that instead of increasing the existing septic system, the Airport consider investing in extending a new line with a lift pump to connect into the city sewer system to minimize the potential for any groundwater contamination.

Electricity is provided by the San Miguel Power Association. Additional electrical infrastructure may need to be provided to support airport expansion to meet future demand and should be coordinated with San Miguel Power Association.

CHAPTER 4

IDENTIFICATION AND EVALUATION OF ALTERNATIVES

4.1 INTRODUCTION

This chapter identifies and evaluates facility development alternatives for the Telluride Regional Airport. These alternatives are designed to meet the following objectives:

- » Adhere to safe operational standards set by the FAA, State of Colorado, and the Telluride Regional Airport Authority (TRAA)
- » Meet the facility demand requirements outlined in the Chapter 3, Facility Requirements
- » Satisfy the strategic objectives and goals of the Telluride Regional Airport Authority

The result of the analyses conducted in this study is a cohesive plan for airport development that functionally combines all recommended improvements. This plan will enable the TRAA to effectively develop airport facilities so that the Airport remains a leading transportation asset for the Telluride region and the State of Colorado.

As identified in Chapter 3, Facility Requirements, some deficiencies were identified in specific airport facilities. Finding solutions to these deficiencies required further analyses related to sizing and siting of new development that would serve future aviation demand. A summary of the major airport facilities to be addressed within this chapter is listed in **Table 4-1**.

The facilities are divided into two groups: leading elements and trailing elements. Leading elements are primary facilities that require significant amounts of land and/or capital investment to implement, and whose placement and configuration must take precedence when formulating alternatives. At TEX, these facilities include terminal facilities, and airfield elements related to the runway and taxiways. Trailing elements are those whose placement and configuration are influenced by, and dependent on, the decisions made for primary facilities. The division between leading and trailing elements allows the initial focus of analysis to be on determining solutions for those high cost, more demanding leading elements. The placement and decisions surrounding the leading elements typically influence the location and layout of the trailing elements.

4.2 ALTERNATIVES ANALYSIS APPROACH

For this master plan, the airfield related leading elements did not require multiple alternatives because there is only one solution that will satisfy their identified need. Within **Table 4-1**, the approach taken for each item is noted as either *Alternatives*, *Phased*, or *No Change*. Those labeled as an *Alternative* were included in the analyses discussed in this chapter. Those labeled as *Phased* have only one possible solution which will be addressed in the Airport Layout Plan and the implementation chapter of this study. The Runway Object Free Area (ROFA) is the only element that is listed as *No Change*. Due to the terrain surrounding the Airport, the perimeter fence sections and the localizer within the ROFA must remain in their current location as no other viable option exists to relocate these items. As such, they will remain in their existing location through the planning period.

TABLE 4-1
ALTERNATIVE ELEMENTS

Item	Identified Need	Approach Alternatives/Phased/ No Change
LEADING ELEMENTS		
Airfield		
Runway Object Free Area (ROFA)	Penetrations to ROFA by localizer and fence	No Change
Aircraft Parking Separation to Runway	Aircraft parking to be 500' away from runway centerline	Phased
All Taxiways	Reconfigure fillet design, change to TDG 5 standards for Q400, and add paved shoulders (which is recommended)	Phased
Taxiway A3	Remove direct access to runway and non-standard grade	Phased
Terminal		
General Aviation Terminal	Modify/build facility to better accommodate passenger needs	Alternatives
Commercial Terminal	Modify/build facility to accommodate new aircraft service	Alternatives
TRAILING ELEMENTS		
Aircraft Apron		
Apron Area for Transient Aircraft Parking	Preserve land for/create parking for an additional 32,700 sq yards	Alternatives
ARFF		
ARFF Facility	Relocate ARFF to land for highest and best use	Alternatives
Snow Removal Equipment (SRE)		
SRE Facility	Replace SRE facility with facility at least 8,000 sq feet in size	Alternatives
Transient Hangars		
Hangar Space for Transient Aircraft	Preserve land /build additional 72,500 sq feet	Alternatives
Based Hangars		
Hangar Space for Based Aircraft	Preserve land /build additional 13,000 sq feet	Alternatives
Vehicle Parking		
Public Parking	Preserve land for 73,000 sq feet of public parking	Alternatives

4.3 ALTERNATIVES DEVELOPMENT AND EVALUATION

The process of determining viable alternatives, and ultimately selecting the preferred development plan, was performed in a series of interrelated steps. The first step included the creation of preliminary alternative concepts based upon the TRAA's strategic vision. Each concept was designed to meet the facility requirements defined in the previous chapter. The preliminary alternatives were then evaluated based on a set of factors, which are outlined below in Section 4.3.1. The evaluation process included stakeholder input, which guided the refinement of each element of study. The result was a preferred alternative that was carried forward into the implementation chapter for phasing and cost analysis.

4.3.1 Evaluation Of Alternatives

The evaluation of alternatives was guided by a combination of general planning criteria and TRAA goals which are encompassed within the following set of development factors.

- FAA Airport Design Standards
  Conforms to best practices for safety and security
  Conforms to the FAA design standards and other appropriate planning guidelines
- Topography
  A sites topography allows construction at a realistic and feasible level of complexity/cost
  Maximize availability of flat developable land

- Fiscal Factors
  Project costs have a realistic potential for funding
- Land Development Strategies
  Provides for the highest and best on- and off-airport land use
- Passenger Enplanements
  Accommodates potential future commercial passenger service demand levels
- Phasing Considerations
  Can be phased without undue disruption to operations.
  Implement projects when actual demand warrants.
  Minimize capital investments until commercial traffic begins.
  Also, includes consideration of how much flexibility exists based on funding levels.
- Operational Performance
  Functions well as part of the Airport system
- Environmental Factors
  Minimizes environmental effects and can meet environmental requirements
  Minimize visual impacts from community

These factors provided the framework necessary to formulate feasible development alternatives to meet future growth at the Airport. The factors were used to evaluate each of the preliminary alternatives to assess how well each would meet the minimum facility requirements and the vision of the TRAA.

4.4 PRELIMINARY ALTERNATIVES

Four preliminary alternatives were created using a conceptual block diagram approach. The objective of this exercise was to determine the layout of the airport's primary facilities. As can be seen by the 10 foot topographic contours shown in **Figure 4-1**, the airport is highly constrained by the adjacent terrain. As such, much consideration was given to the topography of the area as much of the remaining land on the north side of the airport cannot be realistically used for future development. Additionally, the analyses considered how each facility's proposed location would impact other airport facilities.

The four preliminary alternatives incorporated development configurations from prior studies, including the 2004 Master Plan, and a configuration[1] developed by the TRAA's engineer in 2014. Elements from these studies included an acute angle taxiway connector and a large apron south of the runway. The configuration, sizing, and placement of these elements was determined as optimal, and were incorporated into each alternative. Entirely new development configurations were also examined in effort to evaluate the full extent of possibilities and potential layouts. The following is a detailed description of each alternative, and an overview of the findings of the analysis of each.

[1] Kimley Horn, 2014

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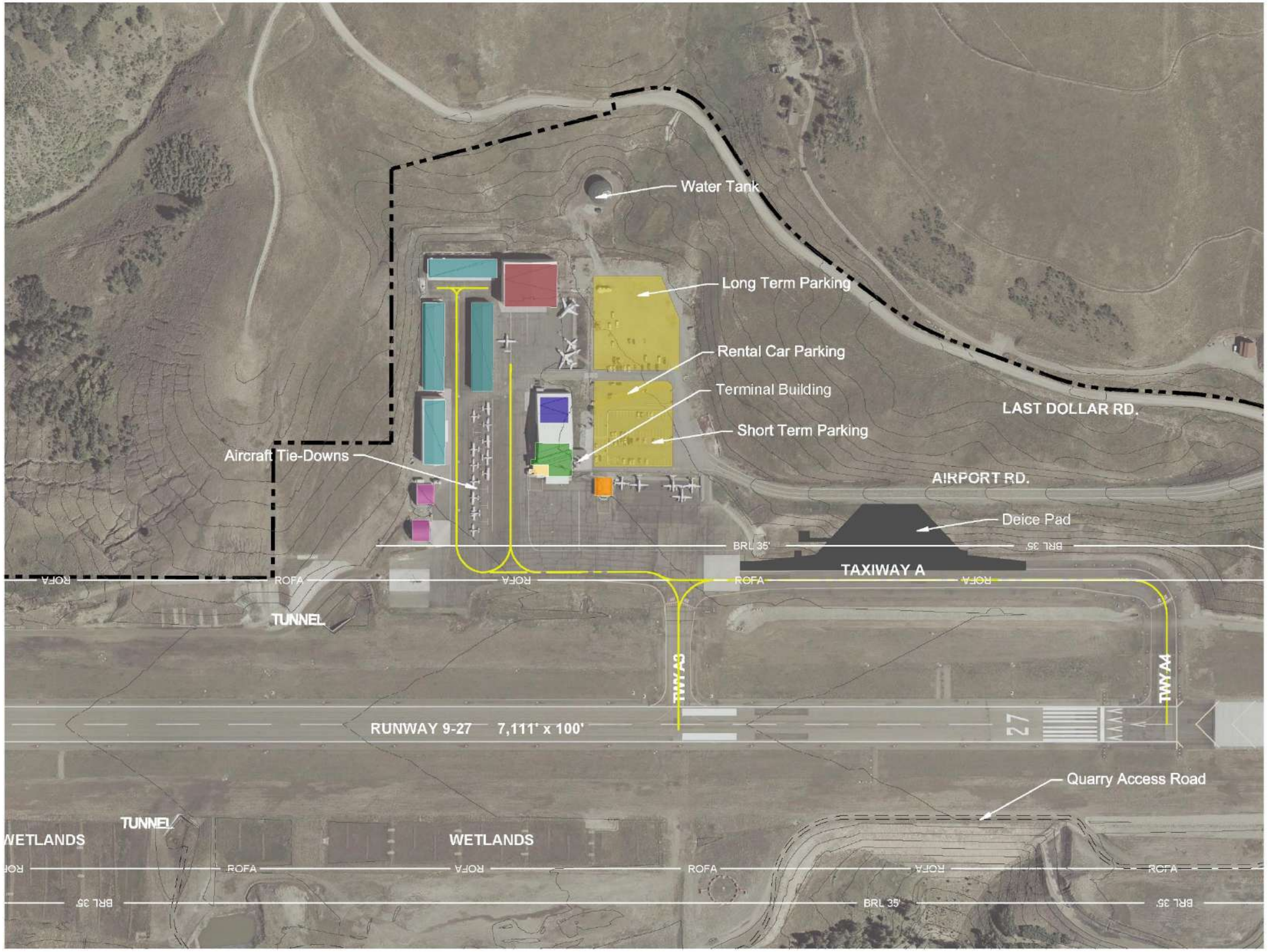


TERMINAL AREA LAYOUT

- ARFF Facility
- SRE Storage and Maintenance
- Commercial Passenger Terminal
- General Aviation Terminal
- Transient Aircraft Hangars
- Based Aircraft Hangars
- Vehicle Parking
- Fuel Tanks / Truck Storage
- Airport Property Line

Existing Conditions

Facility	Existing Condition 2014
GA Apron	32,000 sy
Transient Hangars	28,600 sf
GA Terminal	1,500 sf
Commercial Terminal	18,450 sf
Based Aircraft Hangars	36,000 sf
ARFF Facility	2,500 sf
SRE Facility	5,000 sf
Vehicle Parking	87,700 sf

150 75 0 150

FIGURE 4-1
EXISTING CONDITIONS

4.4.1 Preliminary Alternative One

Alternative One, in large part, features the leading terminal elements in the same general layout that exists today. Alternative One features the snow removal equipment (SRE) facility relocated to the south side of the airfield, and the ARFF facility relocated into the perimeter of the existing terminal area. As shown in **Table 4-2**, all facility requirements for the end of the planning period are met except for transient hangar space. As hangar construction is typically demand driven, it is assumed that one of the proposed based aircraft hangar locations could be reserved for a transient hangar. Additionally, the proposed south apron provides greater space than is required in the planning period, and new hangars (transient and based) could be built adjacent to, or on, the new apron. The area west of the proposed south apron is shown as a future hangar development area in each exhibit, and is identified with a lined orange hatch. That area alone has more than enough space to satisfy all hangar requirements through the planning period.

Overall, with inclusion of the hangar development area, it was determined that Alternative One fulfills the facility requirements. The following are detailed descriptions of each of the elements analyzed in this alternative. The alternative is illustrated in **Figure 4-2**.

TABLE 4-2
ALTERNATIVE ONE REQUIREMENTS MATRIX

Facility	Existing Condition 2014	Planning Criteria 2034	Shown	Criteria Met
GA Apron	32,000 sy	65,000 sy	71,000 sy	✓
Transient Hangars	28,600 sf	101,000 sf	47,000 sf	✓*
GA Terminal	1,500 sf	2,150 sf	3,400 sf	✓
Commercial Terminal	18,450 sf	21,000 sf	21,000 sf	✓
Based Aircraft Hangars	36,000 sf	49,000 sf	57,000 sf	✓
ARFF Facility	2,500 sf	2,500 sf	2,500 sf	✓
SRE Facility	5,000 sf	8,000 sf	8,000 sf	✓
Vehicle Parking	87,700 sf	73,000 sf	95,000 sf	✓

Note: ✓* indicates that the alternative can accommodate the facility requirements, but the block diagrams shown in the exhibit are less than that required by 2034.

4.4.1.1 General Aviation Apron

The need to increase the general aviation apron is a very high priority for the TRAA, as TEX currently must turn away aircraft wanting to park over night during busy times. The facility requirements validated this need and determined that an immediate solution is warranted. During the course of this master plan study, Airport management was simultaneously evaluating plans to increase apron space on the south side of the airfield in accordance with the existing Airport Layout Plan. The south side apron expansion is carried forward in Alternative One, and all subsequent preliminary alternatives. However, specifically for this alternative, an additional 4,000 square yards of apron is proposed on the east side of the existing north apron. This would require that the lower section of Airport Road be relocated slightly to the north. A retaining wall would be required to build the road above the northern section of the new apron. This work is feasible and would resemble the type and complexity of construction required to build the new deice pad.

Challenges: The roadway relocation would require grading and a retention wall.
Opportunities: The expanded north apron would provide additional aircraft parking on the north side of the airfield in the short term.

4.4.1.2 Transient Hangars

Under Alternative One, one new transient hangar would be built adjacent to the existing transient hangar, which is north of the terminal building. Grading would be necessary to level the apron area and remove dirt from the hangar site. Also, the area available for landside parking would be reduced as some space would be needed for hangar development. The exhibit shows preserving an area for future hangar development on the west end of the south apron expansion. This area can accommodate any additional demand for transient hangar storage.

Challenges: Site preparation and grading needed for new pavement to match the existing apron will require dirt removal. Also, the area available for vehicle parking will be reduced.
Opportunities: The apron in front of the existing transient hangar could be extended to the east to allow for additional aircraft parking. If tied into the hangar construction project, that expansion could see efficiencies and cost reduction as compared to a stand-alone project. Dirt from project excavation could be placed on the south side of the airport to create a landscape berm and visual barrier.

4.4.1.3 General Aviation Terminal

Alternative One proposes to enhance the general aviation (GA) terminal by expanding the building slightly to the south and reconfiguring the building interior. The new design would allow passengers and crew to access the aircraft apron to the south. This shift would also provide direct access to the vehicle parking area and curb without circulating through the commercial terminal area. The reconstruction could include upgraded interior furnishings depending on funding. If extra space was desired, the GA function could be expanded to the second floor or to the south and east.

Challenges: Existing commercial terminal functions within the proposed space for the GA terminal would need to be relocated. These include commercial passenger service functions, as well as rental car offices and other storage and administrative spaces. Phasing would need to account for disruptions to operations.
Opportunities: Expansion to the south is possible. Modifications can be implemented while commercial service is terminated to avoid impacts. Depending on aircraft fleet mix, a slight decrease in the apron distance from north to south may not impact overall capacity. Airport-managed fixed based operator (FBO) services could be temporally relocated during construction into the currently unused commercial spaces, thereby decreasing disruptions to operations. The GA interior furnishings and treatments could be greatly enhanced to provide an upgraded experience to passengers and crew.

4.4.1.4 Commercial Passenger Terminal

Similar to the GA function, the commercial passenger facilities could be reconfigured and expanded to occupy the rest of the TRAA terminal/hangar building, including the SRE portion of the north side of the building. This would be possible since hangar and SRE functions are proposed to be relocated. The commercial terminal functions will essentially use all other space not used by the general aviation functions.

Challenges: The space would need to be optimized, as the space is smaller than that required to provide a level of service 'C' to passengers (assuming one Q400 flight). Additionally, the hangar and SRE spaces would need to be relocated elsewhere.
Opportunities: The reconfiguration would avoid the need to build a new commercial terminal facility. It would also allow passengers to access the apron on the south side of the building, as opposed to walking on the west side as they would with today's configuration. Construction of the new commercial terminal functions would have little impact on any other adjacent function, such as the GA terminal.

4.4.1.5 Based Aircraft Hangars

Two new based aircraft hangars are proposed on the west end of the new south side apron. The configuration shown in Alternative One was initially proposed to allow for the maximum amount of usable apron space. However, it is modified in subsequent alternatives to avoid snow and ice accumulation at hangar doors. The size of these hangars is based on the size of an existing three hangar unit on the airport today. Actual demand in the future would determine the type and size of the based hangar unit that would be constructed. Note that the area to the west of these hangars is reserved for future hangar development, and could accommodate any additional future hangar demand.

Challenges: In this configuration, hangar doors are north and east facing which is not ideal for airports in snowy cold climates. Additionally, access to the hangars would be via the tunnel under the runway. This roadway connection will need to be further developed.
Opportunities: The hangar on the west side of the apron could be built with doors to the west, or as a nested t-hangar with doors on both the east and west sides. Additional taxilane and apron would be required for that type of construction. Assuming the construction of the south apron has been completed, these two hangars require no further apron construction for implementation.

4.4.1.6 ARFF Facility

The ARFF facility is proposed to be relocated to the west side of the new deice pad. Construction of the site can be incorporated into the adjacent apron expansion. The ARFF building would have direct access to Taxiway A via an independent road.

Challenges: In this alternative, the ARFF facility and the SRE facility are separated, which would likely reduce some efficiencies and increase work load of airport staff. Additionally, construction of two separate buildings (ARFF and SRE), as opposed to one building typically has less economy of scale and will incur greater cost.
Opportunities: The existing ARFF site can be used as aircraft apron. Also, having ARFF on the north side of the field, adjacent to the FBO, could provide Airport staff some efficiencies.

4.4.1.7 Snow Removal Equipment (SRE) Facility

As noted in the facility requirements, the Airport's SRE facility is undersized, and equipment is currently using space in a hangar that could otherwise be used to generate revenue from transient aircraft storage. As such, a new facility is needed immediately. In Alternative One the SRE building is relocated to the south side of the airfield, adjacent to the east end of the proposed south apron. Access to the new facility would be provided by the roadway tunnel under the runway.

Challenges: The building site will not allow much room for future expansion. However, the facility requirements do not suggest future expansion will be needed in the planning period. Additionally, the facility's location on the south side of the airfield may pose some inefficiencies for airport staff who also operate the FBO. Lastly, new infrastructure, including utilities, is required south of the runway, and the existing segmented circle must be relocated.
Opportunities: Construction of the new facility would bring infrastructure to the south side of the airport, which would open up future development opportunities. Also the site of the facility makes use of a piece of land that otherwise would not provide much benefit.

4.4.1.8 Vehicle Parking

The area presently available for vehicle parking is greater than what the facility requirements analysis determined is necessary to accommodate demand through the planning period. It should be noted too that the area counted as existing parking was less than the entire dirt area on the north side of the parking lots. Thus, when counting that area as parking, an even greater surplus exists. This explains why Alternative One shows more parking being available in the future than exists today.

Challenges: No significant challenges were noted in this alternative.
Opportunities: Greater parking than what is planned to be required by 2034 is provided.

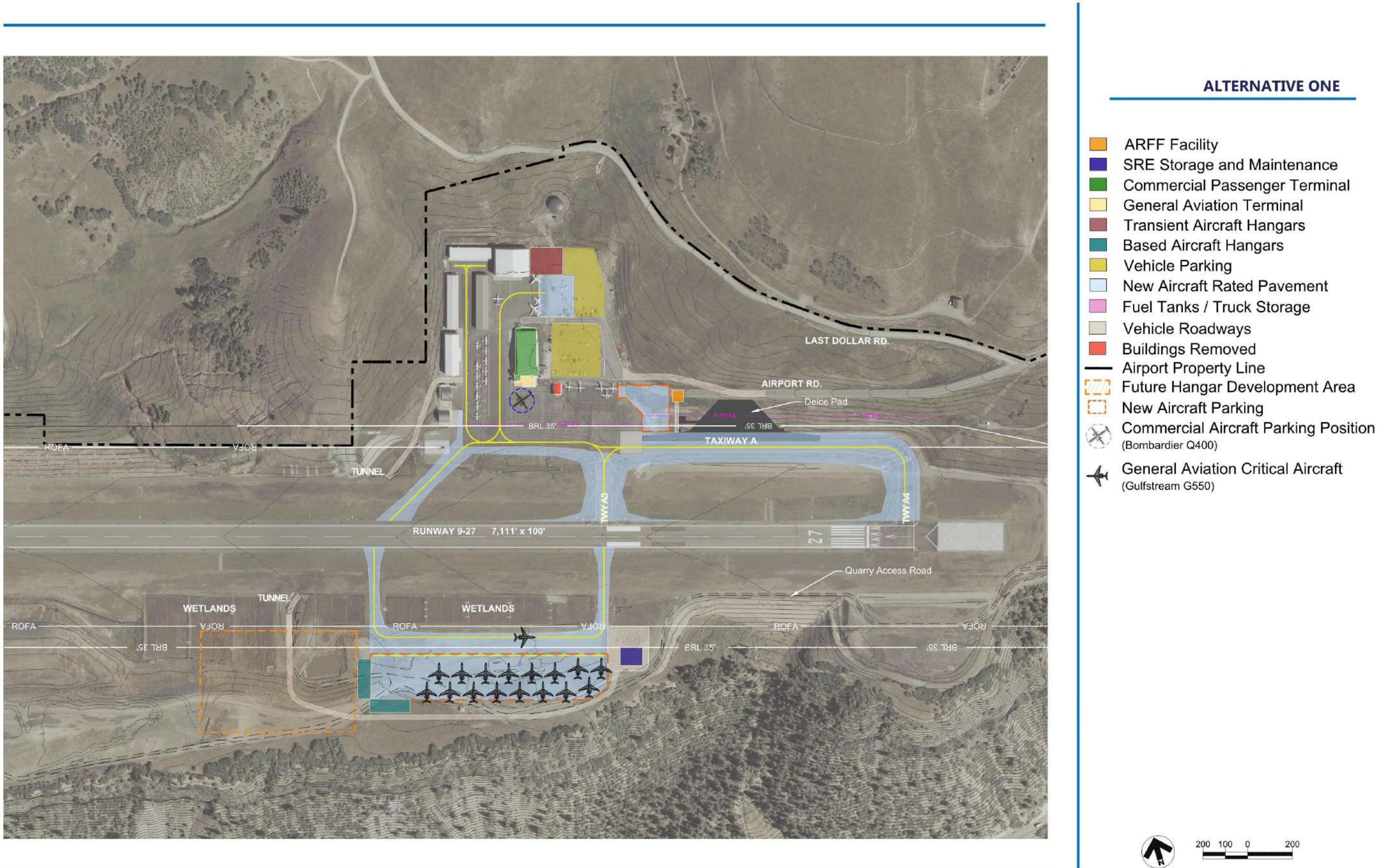


FIGURE 4-2
PRELIMINARY ALTERNATIVE ONE

4.4.2 Preliminary Alternative Two

Alternative Two features a relocation of both the commercial and GA terminals to the outer perimeter of the airport's terminal area. Similarly, the SRE and ARFF facilities would also be relocated. The configuration allows for a large apron expansion on the north side of the airfield. The overall configuration would create a large physical separation between the commercial and general aviation terminal functions.

As shown in **Table 4-3**, all facility requirements for the end of the planning period are met except for transient hangar space. As described in Alternative One, hangar space (transient and/or based) could be built as needed on the south side of the airfield adjacent to, or west of the proposed south apron. The exhibit identifies this area with a lined orange hatch. As such, it was determined that Alternative Two fulfills the facility requirements. The following are detailed descriptions of each of the elements analyzed in this alternative. The alternative is illustrated in **Figure 4-3**.

TABLE 4-3
ALTERNATIVE TWO REQUIREMENTS MATRIX

Facility	Existing Condition 2014	Planning Criteria 2034	Shown	Criteria Met
GA Apron	32,000 sy	65,000 sy	96,000 sy	✓
Transient Hangars	28,600 sf	101,000 sf	35,000 sf	✓*
GA Terminal	1,500 sf	2,150 sf	2,150 sf	✓
Commercial Terminal	18,450 sf	21,000 sf	21,000 sf	✓
Based Aircraft Hangars	36,000 sf	49,000 sf	57,000 sf	✓
ARFF Facility	2,500 sf	2,500 sf	2,500 sf	✓
SRE Facility	5,000 sf	8,000 sf	8,000 sf	✓
Vehicle Parking	87,700 sf	73,000 sf	110,000 sf	✓

Note: ✓* indicates that the alternative can accommodate the facility requirements, but the block diagrams shown in the exhibit are less than that required by 2034.

4.4.2.1 General Aviation Apron

Alternative Two features the same south apron as proposed in Alternative One. It also includes a large apron expansion within the center of the north terminal area. This north expansion would be possible only after the terminal building, ARFF facility, and vehicle parking are relocated. It should be noted that while this option provides a great deal more apron space, some of the apron will be needed for circulation, i.e. taxilanes. The amount of apron that would be available for aircraft parking is defined in **Figure 4-3** by a dashed orange line.

Challenges: A large number of facilities must be relocated, as well as the airport's vehicle parking lot. This requires earth work of not only the apron area, but areas outside the currently developed area; specifically the area north of the hangars. Roadways must be relocated as well.
Opportunities: This option can be broken into multiple phases. Once fully implemented, the apron will provide a great deal of flexibility for operations, as well as convenient aircraft parking adjacent to the GA and commercial terminals.

4.4.2.2 Transient Hangars

The siting of a new transient hangar in Alternative Two is the same as in Alternative One. Additional transient hangars could potentially be built on the south side of the airfield as demand warrants. This area is referenced in the exhibit as a future hangar development area.

Challenges: Some existing vehicle parking area would be displaced and new area for its relocation would be required, and the site preparation associated grading to match the existing apron will increase costs.
Opportunities: The apron in front of the existing transient hangar could be extended to the east to allow for additional aircraft parking. If tied into the hangar construction project, that expansion could see efficiencies and cost reduction as compared to a stand-alone project. Dirt from project excavation could be placed on the south side of the airport to create a landscape berm for a visual barrier.

4.4.2.3 General Aviation Terminal

Alternative Two proposes to relocate the GA terminal to a separate facility east of the terminal apron. The size shown meets the minimum facility requirements determined for the planning period. However, the site provides enough space to construct a larger terminal that would provide a better level of service and experience for GA customers. Additionally, the GA terminal is completely separated from the commercial terminal, which eliminates the conflicts that can occur between GA and commercial function's security and operational needs.

Challenges: The new GA terminal would require a new road, vehicle parking area, and aircraft apron. A new GA terminal would cost significantly more than remodeling the existing GA facility.
Opportunities: Passenger level of service will be greatly enhanced by the implementation of a new facility. The separation of the GA terminal from the commercial terminal will ease difficulties associated with combined facilities. Finally, a phased construction plan can allow uninterrupted service to GA customers while the new facility is being built.

4.4.2.4 Commercial Passenger Terminal

Alternative Two proposes a new commercial passenger facility be constructed in the north east corner of the terminal area. The site shown in this alternative is large enough for a building sized to provide a level of service "C" throughout the planning period (which is approximately 21,000 square feet). As noted above in the discussion about the GA terminal, the commercial terminal is separated from all other passenger functions. As such, security protocol and operations will be less complex and more streamlined.

Challenges: The commercial terminal would require new aircraft apron, as well as vehicle roadways and parking. Existing topography would complicate the design options. Significant costs are incurred to implement this option.
Opportunities: The new facility can be built to provide an excellent passenger experience and high level of service. This option significantly increases the amount of aircraft parking apron available in the terminal area. Commercial operations would be segregated from all other functions. Finally, due to the location of the site, the terminal can be phased into the development plan, and be constructed when demand warrants.

4.4.2.5 Based Aircraft Hangars

The potential of relocating the fuel farm and fuel truck storage area was explored in Alternative Two to create an area for additional based aircraft hangars. A second based aircraft hangar is also proposed in place of the existing aircraft tie-downs located at the west end of the aircraft parking apron.

Challenges: The relocation of the fuel facilities is an expensive endeavor that is not favored. While the site could allow for hangar development, the existing fuel facilities are relatively new. Thus, relocation of these facilities in the near or intermediate term is not financially prudent. In addition, displacing existing tie-down parking to construct a new based aircraft hangar would add another building in the area that could be otherwise be used for parking large jet aircraft. This would restrict the operational flexibility that could be achieved by having a large, unobstructed apron. The other site for the proposed based hangar will reduce the amount of based aircraft tie-downs. However, it is reasonable to estimate that those aircraft on the tie-downs would simply be moved into the new hangars.
Opportunities: The primary opportunity found in this alternative's configuration of based aircraft hangars is that all based hangars will remain consolidated on the north side of the airfield. By keeping all based aircraft on the north side, vehicle access issues to other parts of the airfield are negated for local pilots.

4.4.2.6 ARFF and SRE Facility – Combined Facility

Under Alternative Two, the relocated ARFF facility is very near to the site proposed in Alternative One. However, in this alternative the facility is combined with the SRE function in a single building. By constructing only one building, cost savings can be achieved by reducing the number of systems and materials needed. Truck access to the airfield would be on the west side of the building, and would directly access the new aircraft apron.

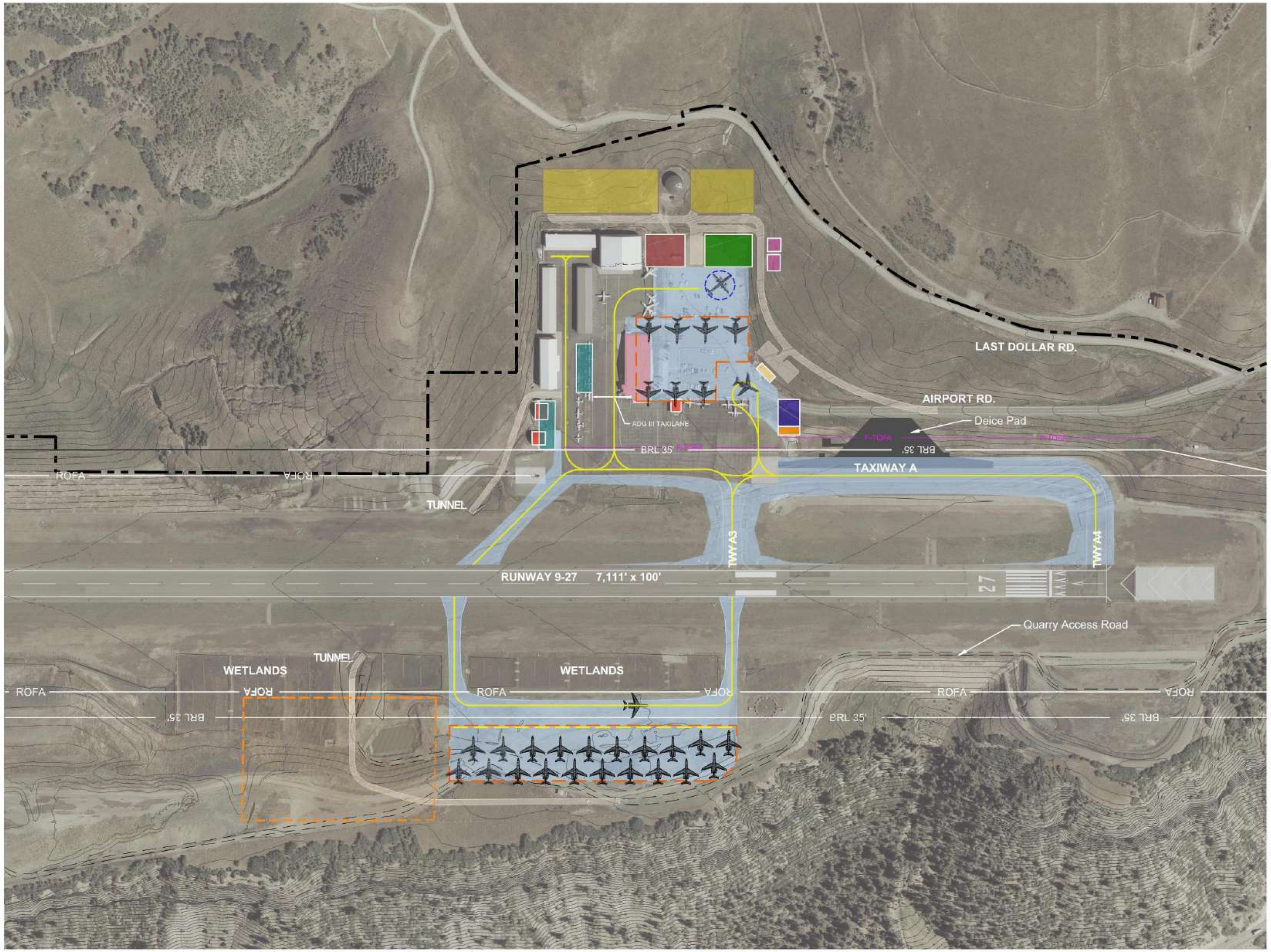
Challenges: The proposed site is small and limits expansion options. The new facility would be able to be expanded in the future, but only to the east. To implement this option, Airport Road must be relocated first before earth work and construction for the ARFF/SRE facility could begin.
Opportunities: A combined ARFF and SRE facility not only reduces overall costs to store the Airport's equipment, but also provides efficiencies for Airport staff. Additionally, having the facility adjacent to the FBO would further increase staff efficiencies. Lastly, the existing Airport Road could provide landside access directly to the east side of the facility.

4.4.2.7 Vehicle Parking

Vehicle parking in Alternative Two is completely relocated to the north side of the development area. The area shown for parking in the exhibit is more than would be needed over the course of the planning period. Thus, the area is suitable for the full relocation of the parking function.

Challenges: Existing terrain would complicate the design options. A large amount of dirt would need to be relocated to get the parking lots to a functional grade. The outer sides of the parking area would require retention walls. A single parking lot could not be created because the existing water tank would bisect the site.
Opportunities: Relocating the parking lots would enable construction of the new apron. Cost savings could be achieved by constructing the parking lots at a higher level then then the buildings. This would

decrease the amount of cut required into the hillside and the amount of retaining walls. However, this could require some sort of vertical circulation between the interface of the terminal, the vehicle curb, and parking lots.



ALTERNATIVE TWO

- ARFF Facility
- SRE Storage and Maintenance
- Commercial Passenger Terminal
- General Aviation Terminal
- Transient Aircraft Hangars
- Based Aircraft Hangars
- Vehicle Parking
- New Aircraft Rated Pavement
- Fuel Tanks / Truck Storage
- Vehicle Roadways
- Buildings Removed
- Airport Property Line
- Future Hangar Development Area
- New Aircraft Parking
- Commercial Aircraft Parking Position (Bombardier Q400)
- General Aviation Critical Aircraft (Gulfstream G550)

200 100 0 200

FIGURE 4-3
PRELIMINARY ALTERNATIVE TWO

4.4.3 Preliminary Alternative Three

Alternative Three, shown in **Figure 4-4**, includes several features similar to those proposed in the previous alternatives. In addition, new options for some facilities are proposed. Similar to Alternative Two, the GA and commercial terminals are proposed to be relocated, albeit adjacent to each other just east of their current location. The existing terminal building/hangar would be demolished to provide additional aircraft parking apron. This alternative also proposes to maximize transient hangar development, by creating sites for three hangars.

As shown in **Table 4-4**, Alternative Three does not include enough transient and based aircraft space to meet the facility requirements through the planning period. However, similar to the previous alternatives, it was determined that the area west of the proposed south apron could accommodate hangar demand beyond the planning period. As such, the alternative was deemed to meet the facility requirements.

TABLE 4-4
ALTERNATIVE THREE REQUIREMENTS MATRIX

Facility	Existing Condition 2014	Planning Criteria 2034	Shown	Criteria Met
GA Apron	32,000 sy	65,000 sy	67,000 sy	✓
Transient Hangars	28,600 sf	101,000 sf	70,000 sf	✓*
GA Terminal	1,500 sf	2,150 sf	5,500 sf	✓
Commercial Terminal	18,450 sf	21,000 sf	11,000 sf x2 floors	✓
Based Aircraft Hangars	36,000 sf	49,000 sf	36,000 sf	✓*
ARFF Facility	2,500 sf	2,500 sf	2,500 sf	✓
SRE Facility	5,000 sf	8,000 sf	8,000 sf	✓
Vehicle Parking	87,700 sf	73,000 sf	100,000 sf	✓

Note: ✓* indicates that the alternative can accommodate the facility requirements, but the block diagrams shown in the exhibit are less than that required by 2034.

4.4.3.1 General Aviation Apron

The same concept for the south apron as shown in Alternatives One and Two is also proposed in Alternative Three. Additionally, new apron is proposed in place of the existing TRAA terminal/hangar building and more apron is provided in front of the proposed transient hangars. Depending on usage, some of that apron could be used for aircraft parking.

Challenges: Construction of the north apron portion requires demolition of the existing terminal/hangar building. The apron in front of the transient hangars requires dirt removal, grading, and relocation of some vehicle parking.
Opportunities: The apron area proposed in the site of the exiting terminal would be relatively low cost and provide space for an additional three Gulfstream G5 aircraft.

4.4.3.2 Transient Hangars

Alternative Three features three sites for transient hangars. This includes two new hangars to the north of the existing terminal building and a third hangar on a site west of the existing fuel facilities. That hangar would have an east facing door with direct access to the small north/south taxilane.

Challenges: Each of the three hangars will require earthwork. The hangar proposed at the existing fuel facility site will require complex earthwork and soil retention. Additionally, the fuel facility would need to be relocated and is proposed to be moved to the east side of the apron. As noted previously, displacement of the fuel storage area is undesirable. The hangar development on the north side of the terminal area would also require relocation of vehicle parking.
Opportunities: Each of the proposed hangars can be developed based on demand.

4.4.3.3 General Aviation Terminal

Under Alternative Three, the general aviation terminal function would be relocated to a new facility that could be built just east of the existing terminal building. This site has room enough for a GA terminal with a footprint of 5,500 square feet. Thus, the site is sufficiently flexible to allow for a larger facility than exists today, and would accommodate future expansion. The building can be built upon the existing parking lot grade, or dirt can be removed so the building can be built at apron grade. The different configurations will vary in costs, and require consideration as to how passengers and staff access the building from the airside and the landside.

Challenges: Depending on finished grades of the building, vertical circulation may be required to get passengers and staff from the parking lot grade to the aircraft apron. Some parking lot area will be used for the new site, and the terminal curb will need to be reconfigured. The parking lot and building would bisect the available apron area creating less flexibility for aircraft circulation and parking.
Opportunities: The building can be constructed without any large disruptions to operations. Additionally, if no other project consumes vehicle parking area, this project could proceed without any need to relocate vehicle parking.

4.4.3.4 Commercial Passenger Terminal

Similar to the GA terminal function, Alternative Three proposes that the commercial passenger function is relocated into a stand-alone building east of the existing TRAA terminal/hangar, and adjacent to the proposed GA terminal building. The new commercial passenger building has a footprint of 11,000 square feet, but would be constructed as a two story building. With some dirt removal, the lower level could be constructed at the aircraft apron grade. With this type of design, passenger access from the parking lot would need consideration, as would the terminal curb. If needed, cut and fill could conceivably be used to raise the curb grade to the same elevation as the base of the second floor.

Challenges: Elevations of vehicle curb and passenger access could require additional complexity and cost. The vehicle parking area and terminal loop will need to be reconfigured. The site uses some existing vehicle parking and circulation. The commercial function also remains adjacent to the general aviation functions. This adjacency can create operational conflicts. The parking lot and building would bisect the available apron area creating less flexibility for aircraft circulation and parking.

Opportunities: Much like the GA terminal building, this terminal building can be constructed without any major disruptions to operations. Also, depending on the amount of development already displacing vehicle parking, this project may not require any parking to be relocated.

4.4.3.5 Based Aircraft Hangars

No based aircraft hangars were included in Alternative Three as the primary focus was put toward evaluating areas for transient hangars. The area to the west of the proposed south apron is suggested for future hangar development, which could accommodate future based aircraft hangars.

4.4.3.6 ARFF and SRE Facility – Combined Facility

As suggested in Alternative Two, the ARFF and SRE facilities are combined in Alternative Three. The combined facility is proposed on the south side of the airfield, abeam the center point of the runway. This location was chosen to evaluate whether a site at the midfield of the runway would provide any benefit. It was determined that the benefits of having a midfield facility were outweighed by being removed from the primary aeronautical functions and the advantages of having the facility close to the terminal area.

Challenges: The facility would require more infrastructure and utilities to reach the remote site. Additionally, an independent runway access road would be required. Grading and topography would also require consideration to minimize cost of final design. Finally, inefficiencies would exist for staff who need to work at both the SRE/ARFF facility and the FBO throughout the work day.
Opportunities: The removal of the facility from the immediate terminal area would allow for other uses. The location of the facility would provide immediate ARFF access to the center point of the runway.

4.4.3.7 Vehicle Parking

If Alternative Three were fully implemented, existing vehicle parking would become undersized. New vehicle parking is proposed to be built into the side of the hill on the east side of the terminal area. This could be phased as needed depending on the development of the transient hangars proposed on the north side of the area. Multiple roadway access options exist, including a relocation of Airport Road, or new access provided from Last Dollar Road. A combination of the two access roads could also be used to provide a terminal loop configuration.

Challenges: Dirt removal, grading, and a retaining wall would be necessary to expand the vehicle parking lots. Roadway access would also require earth work and likely retaining walls. Once the new parking lot is constructed, future expansions would be difficult.
Opportunities: Relocating the parking lot would allow for greater flexibility of the terminal area.

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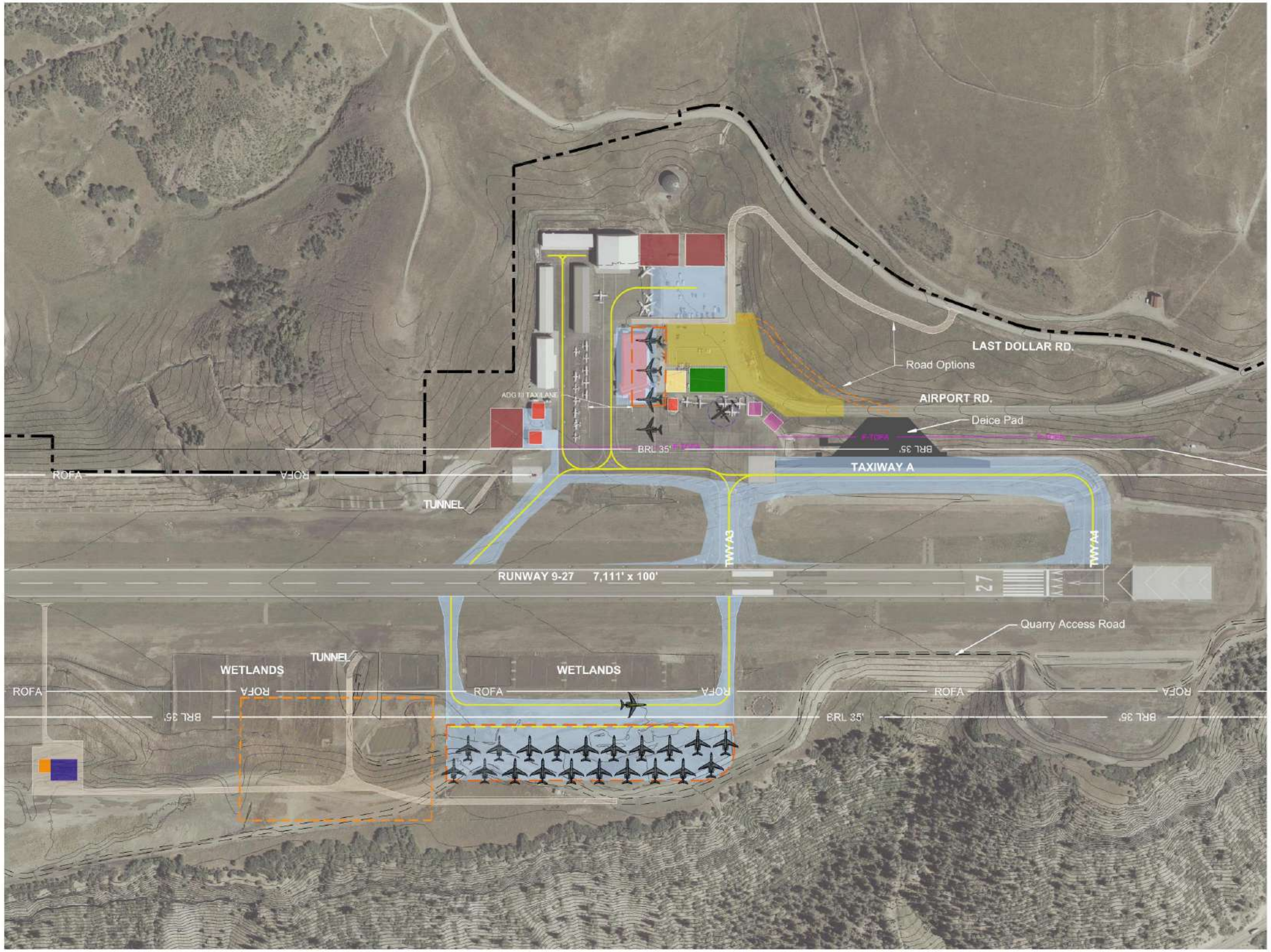

ALTERNATIVE THREE

- ARFF Facility
- SRE Storage and Maintenance
- Commercial Passenger Terminal
- General Aviation Terminal
- Transient Aircraft Hangars
- Based Aircraft Hangars
- Vehicle Parking
- New Aircraft Rated Pavement
- Fuel Tanks / Truck Storage
- Vehicle Roadways
- Buildings Removed
- Airport Property Line
- Future Hangar Development Area
- New Aircraft Parking
- Commercial Aircraft Parking Position (Bombardier Q400)
- General Aviation Critical Aircraft (Gulfstream G550)

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FIGURE 4-4
PRELIMINARY ALTERNATIVE THREE

4.4.4 Preliminary Alternative Four

Alternative Four, illustrated in **Figure 4-5**, features the leading elements relocated to the outer perimeter of the terminal area. This is similar to the configuration proposed in Alternative Two, except that the commercial terminal is proposed as a two story building with vehicle and passenger access to the second floor. This configuration is centered upon the idea of taking advantage of the elevation of the hill on the eastern side of the terminal area. Additionally, a different aircraft parking configuration than Alternative Three was explored on the north apron in effort to examine proof of concept.

Alternative Four features a combined SRE and ARFF building located on the east side of the proposed south apron. Additionally, two new transient hangars are proposed on the north side of the terminal area. The alternative does not show any new based aircraft hangars in the terminal area. Instead, the alternative proposes that all based aircraft hangars and any additional transient hangars be constructed in the hangar development area adjacent to the proposed south apron. Overall, the alternative satisfies the facility requirements, as shown in **Table 4-5**.

TABLE 4-5
ALTERNATIVE FOUR REQUIREMENTS MATRIX

Facility	Existing Condition 2014	Planning Criteria 2034	Shown	Criteria Met
GA Apron	32,000 sy	65,000 sy	96,000 sf	✓
Transient Hangars	28,600 sf	101,000 sf	53,000 sf	✓*
GA Terminal	1,500 sf	2,150 sf	3,000 sf	✓
Commercial Terminal	18,450 sf	21,000 sf	11,000 sf x 2 floors	✓
Based Aircraft Hangars	36,000 sf	49,000 sf	36,000 sf	✓*
ARFF Facility	2,500 sf	2,500 sf	2,500 sf	✓
SRE Facility	5,000 sf	8,000 sf	8,000 sf	✓
Vehicle Parking	87,700 sf	73,000 sf	73,000 sf	✓

Note: ✓* indicates that the alternative can accommodate the facility requirements, but the block diagrams shown in the exhibit are less than that required by 2034.

4.4.4.1 General Aviation Apron

This alternative features the same proposed south apron as proposed in the previous alternatives. It also includes a large apron expansion within the center of the north terminal area, similar to Alternative Two. The north expansion is possible only after the terminal building, ARFF facility, and vehicle parking are relocated. This alternative provides the largest consolidated apron which yields maximum flexibility for movement and parking of general aviation aircraft. It should be noted that while this option provides a great deal more apron space, some of the apron will be needed for circulation, i.e. taxilanes.

Challenges: Numerous facilities must be relocated, as well as the Airport's vehicle parking lot. This requires earth work of not only the apron area, but areas outside the currently developed area; specifically the hill side to the east of the terminal area.

Opportunities: This option can be broken into multiple phases. Once fully implemented, the apron will provide a great deal of flexibility for operations, as well as convenient aircraft parking adjacent to the GA and commercial terminals.

4.4.4.2 Transient Hangars

Similar to Alternative Three, this alternative features two new transient hangars on the north end of the terminal area. The hangars can be phased into construction independently depending on parking needs at the time. As previously mentioned, additional transient hangar space can be accommodated west of the proposed south apron.

Challenges: Each of the two hangars will require earthwork and the relocation of vehicle parking, depending on parking needs.
Opportunities: Each of the proposed hangars can be developed based on demand.

4.4.4.3 General Aviation Terminal

The GA terminal in this alternative is relocated to a separate facility on the east side of the terminal area, in the same area as proposed in Alternative Two. The size shown is larger than the minimum facility requirements determined for the planning period. The site provides enough area for a larger building if needed or desired. Additionally, the GA terminal is completely separated from the commercial terminal. This eliminates the operational and security challenges that can arise when the two different functions are located in close proximity.

Challenges: The new GA terminal will require a new road, vehicle parking area, and aircraft apron. The proposed GA terminal would be segregated from the transient hangars. This configuration could create issues from customers accidently crossing the commercial Security Identification Display Area (SIDA) area when walking between the hangars and GA terminal.
Opportunities: Passenger level of service will be greatly enhanced by the implementation of a new facility. The separation of the GA terminal from the commercial terminal will ease difficulties associated with combined facilities. Finally, a phased construction plan can allow uninterrupted service to GA customers while the new facility is being built.

4.4.4.4 Commercial Terminal

The alternative features a relocated commercial terminal in the north east corner of the terminal area. The new terminal building has a footprint of approximately 11,000 square feet in a two story building. The configuration is based on the concept of a hill side parking lot and roadway that would connect to the upper level of the terminal building. This concept further maximizes the terminal area and allows for a transient hangar to be constructed to the northwest of the new terminal building. However, the configuration assumes that when commercial aircraft are parked, and/or the SIDA is active, access to the adjacent hangar would be limited.

Challenges: Site work would be complex as the terminal building would be placed partially into the hillside. Additionally, roadway and parking integration with the terminal will add complexity and cost to

the construction. The commercial function also is adjacent to a general aviation hangar which could create operational complications with the SIDA area.
Opportunities: Much like the GA terminal building, this terminal building can be constructed without any major disruptions to operations. Additionally, the location of the building fully maximizes the space available for development, and takes advantage of potential benefits gained from relocating vehicle parking onto the hillside.

4.4.4.5 Based Aircraft Hangars

This alternative did not include any new configuration of based aircraft hangars. It is assumed that new hangars would be developed west of the proposed south apron within the future hangar development area.

4.4.4.6 ARFF and SRE Facility – Combined Facility

As proposed in Alternative Two and Three, this alternative also includes a combined ARFF and SRE facility. The facility is proposed on the south side of the airfield, on the east side of the south apron. This location allows for quick access to the runway and to the terminal area. The location also minimizes the amount of infrastructure needed for implementation.

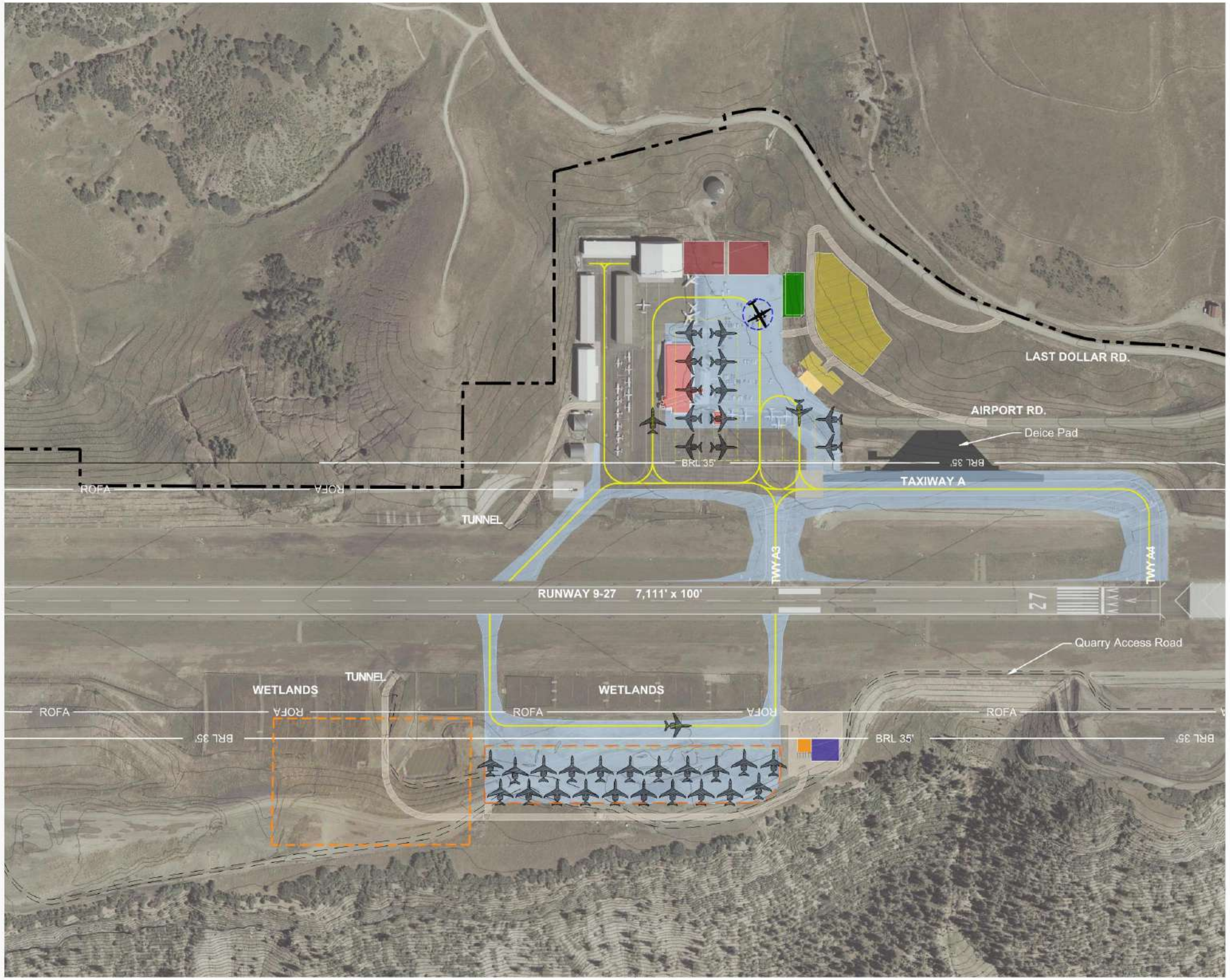
Challenges: Some inefficiencies may exist for staff who work at both the SRE/ARFF facility and the FBO throughout the work day. Site work and infrastructure, including utilities, are required for implementation. Additionally, the existing segmented circle must be relocated.
Opportunities: The relocation of the facility from the immediate terminal area would allow for higher and better use of the land around the terminal. The proposed location of the facility provides a direct route to the runway and the terminal area. The facility uses land that otherwise would not provide much value or use. Finally, of all the areas on the south side, the site proposed requires the least amount of new utility infrastructure.

4.4.4.7 Vehicle Parking

The vehicle parking facilities in this alternative are proposed to be relocated to the hillside east of the terminal area. This concept is a key component of this alternative, as it opens up a variety of opportunities in the terminal area, including the two story terminal building and additional transient hangars. Moving the parking onto the hillside allows the terminal area to be built-out to its full potential. It was noted that the concept could also offer cost savings over other vehicle parking alternatives that required large amounts of dirt to be relocated. However, it was noted too that the concept may require a complex, potentially expensive construction for retaining walls. Further analysis would be needed to understand if the concept would be viable.

Challenges: Actual construction of vehicle parking and the road way is complex. Numerous hurdles have been noted included Part 77 surfaces, topography, and elevations related to the terminal building. These factors all require further consideration.
Opportunities: Potential cost savings may be had by moving parking up in elevation on the hillside which could reduce the amount of dirt needing to be cut and relocated. Additionally, with vehicle parking at a higher elevation, an opportunity is opened for a more consolidated terminal building with a second floor

integration to the vehicle curb and parking lots. The proposed location of the parking lots would also allow a loop access road be developed to serve the terminal building.



ALTERNATIVE FOUR

- ARFF Facility
- SRE Storage and Maintenance
- Commercial Passenger Terminal
- General Aviation Terminal
- Transient Aircraft Hangars
- Based Aircraft Hangars
- Vehicle Parking
- New Aircraft Rated Pavement
- Fuel Tanks / Truck Storage
- Vehicle Roadways
- Buildings Removed
- Airport Property Line
- Future Hangar Development Area
- New Aircraft Parking
- Commercial Aircraft Parking Position (Bombardier Q400)
- General Aviation Critical Aircraft (Gulfstream G550)

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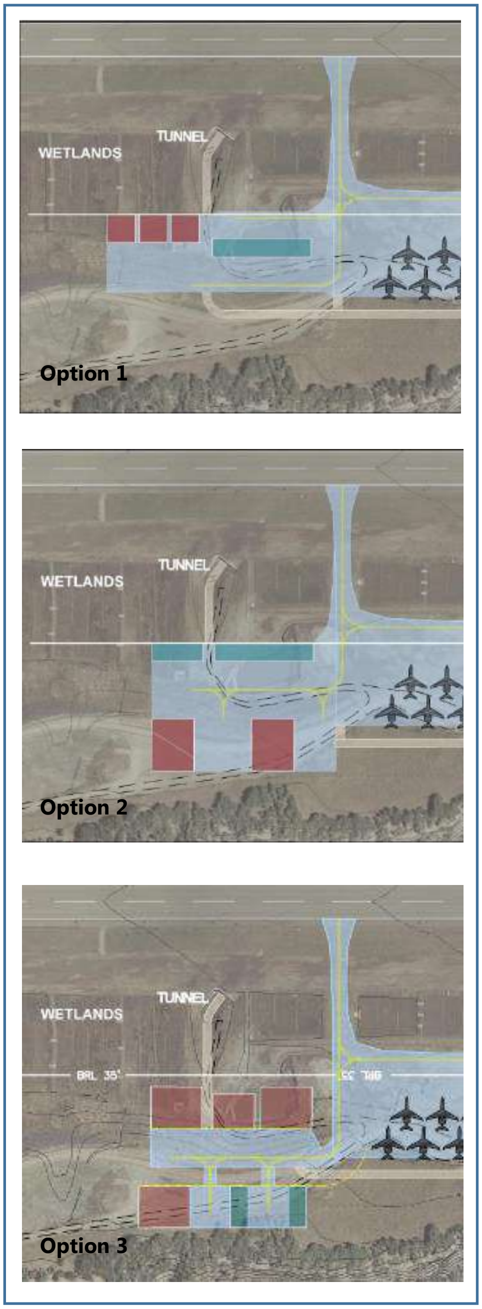
FIGURE 4-5
PRELIMINARY ALTERNATIVE FOUR

4.4.5 Hangar Development Area

FIGURE 4-6
HANGAR DEVELOPMENT AREA CONFIGURATIONS



The hangar development area east of the proposed south apron is capable of accommodating both general aviation and transient hangars. The area provides more room then is required within the planning period based on the facility requirements analysis. The area's size and location provides great flexibility in regard to configuration of hangars, and taxiways.

Hangar development will be demand driven, and is a business decision that will be made by the Airport or private owner as additional storage is needed. Aircraft storage hangars are manufactured in many different configurations, each with their own financial impacts and requirements. The buildings can be large, small, pre-formed, and/or custom built. Demand and financial decisions will drive what specific type of hangar needed at the time. Thus, it is unknown what type of hangar will be built first, second, third, and so on, within the development area. Because of this, conceptual configurations for aircraft hangars in greenfield sites require a large degree of flexibility.

Considering these facts, three conceptual layouts for the hangar development area were examined, as illustrated in **Figure 4-6**. Option 1 includes one long unit containing multiple small nested t-hangars, and three larger box hangars. The nested t-hangar would have doors on the north and south sides. The northern facing hangar units could be problematic during the winter months due to ice and snow accumulations, and are not preferred. Option 2 includes multiple south facing t-hangar units and two large transient hangars. Option 3 includes a mix of t-hangars, and medium and large sized hangars.

The layouts are intended to provide a starting point for future design. No one layout is more preferred than the other, and it is likely that demand and financial factors will require a new layout that is a conglomeration of these three. A more detailed assessment should be conducted when demand occurs. However, for the preferred alternative, Option 3 was carried forward as it includes the most variety of hangar types.

4.5 PREFERRED ALTERNATIVE

The four preliminary alternatives were presented to the TRAA, Airport management, and Airport stakeholders during the Master Plan's second Advisory Committee meeting and first public open house. Input was gained at these meetings and the following fundamental objectives for future development was determined:

- Commercial and general aviation passenger functions should be physically separated into two facilities that are not adjacent to each other. Having separation between the functions will decrease operational issues that can occur between the two different uses.
- Though the Airport operates the FBO and the terminal functions, future layouts should provide for fully independent functions. I.E. – transient hangar and terminal aprons should not be shared.
- The hillside to the east of the terminal area should be used to accommodate vehicle parking in the future. A study will be required to determine the most cost effective design.
- Circulation provided for aircraft should be generous and not constrained. Additionally, open sites should be provided within the terminal area for snow disposal.
- Building siting and setbacks should account for the potential of larger, more demanding, aircraft, perhaps including regional jets.
- The future commercial terminal apron and SIDA area should be planned to accommodate two simultaneous aircraft operations or a single larger regional jet aircraft.
- Consideration of visual impacts to the surrounding valley is critical, and design elements should be implemented as necessary. Landscape berms should be considered where appropriate.
- Strategic phasing should be implemented to reduce costs. Strategies include:
    - Use of existing TRAA terminal building in the near term.
    - Future construction of a temporary GA terminal building that will later be expanded and converted into the commercial terminal holdroom.
    - Future construction of a replacement GA terminal when commercial service returns.
- ARFF and SRE functions should be combined within one building.
- Wetland areas should be avoided, and all future development should consider environmental permitting and impacts.
- Existing fuel facilities should remain in place.
- Future development in the north terminal area will be focused on accommodating large general aviation and commercial aircraft. Smaller general aviation type development will be focused in the area south of the runway.
- Small based GA aircraft hangars should be located in the south apron area.
- The south apron development should include a self-serve fuel station, pilot lounge, restrooms, and vehicle parking.
- Taxiway connections to the south development areas should be designed with the most economical and efficient configuration possible.

- A future terminal loop road is advantageous. Additionally, the connection between the existing Airport Road and Last Dollar Road should not be changed.

Those objectives and considerations drove the development of the preferred alternative. It must be noted that the preferred alternative is representative of the long term vision of the TRAA and Airport stakeholders. While each element is sized appropriately to accommodate the forecasted demand over the 20-year planning period, actual development will depend on actual demand. Thus, the preferred alternative could be realized in 20 years, or perhaps longer as demand materializes. What is important to note is that demand will drive the development, and development will be implemented with the ultimate goal being this preferred alternative.

Because the preferred alternative, illustrated in **Figure 4-7**, represents the end of a long term succession of development, it has been called the Long-Term Preferred Concept. The concept fulfills the facility requirements determined for the planning period, and fully maximizes the developable area of the Airport. The following is a brief description of notable elements that were included in the concept.

GA Apron- The concept includes the proposed south apron as well as the large north GA apron, as was proposed in Preliminary Alternative Two and Four.

GA and Commercial Terminals- It was determined that the commercial terminal would be better suited on the south side of the terminal area, as it would best separate commercial and GA functions. The terminals should be designed for easy access to parking lots which may require two-story structures. As such, this concept shows the eventual location of the GA terminal to the north of the commercial terminal. However, actual implementation over the planning period is expected to consist of numerous steps and include a temporary GA terminal that will convert into a portion of the commercial terminal shown in this concept. The details of this approach will be discussed in **Chapter 5, *Implementation***.

ARFF and SRE Facility- The site and configuration from Alternative Four was carried into the preferred concept. A new building was added to the concept, which will provide a flight planning/weather room and restrooms for those pilots and based aircraft owners on the south side. Additionally, a self-serve Avgas station is proposed on the east side of the apron. The segmented circle will require relocation.

Vehicle Parking- The concept of relocating vehicle parking to the hillside east of the terminal area was carried forward in this concept. A specific study is recommended before this phase of construction is implemented to determine the most cost effective and efficient means of constructing parking in this area.

Landscaping Berm- It was noted that the proposed south apron could have visual impacts within the valley. As such, a landscaped earth berm is proposed that will be designed with native plants and ground covering. The berm will block across-valley lines-of-sight to the apron, and lessen overall visual impacts of Airport development. Additionally, an opportunity exists for the berm's construction to include excavated dirt from other Airport projects, that otherwise would have to be hauled off site.

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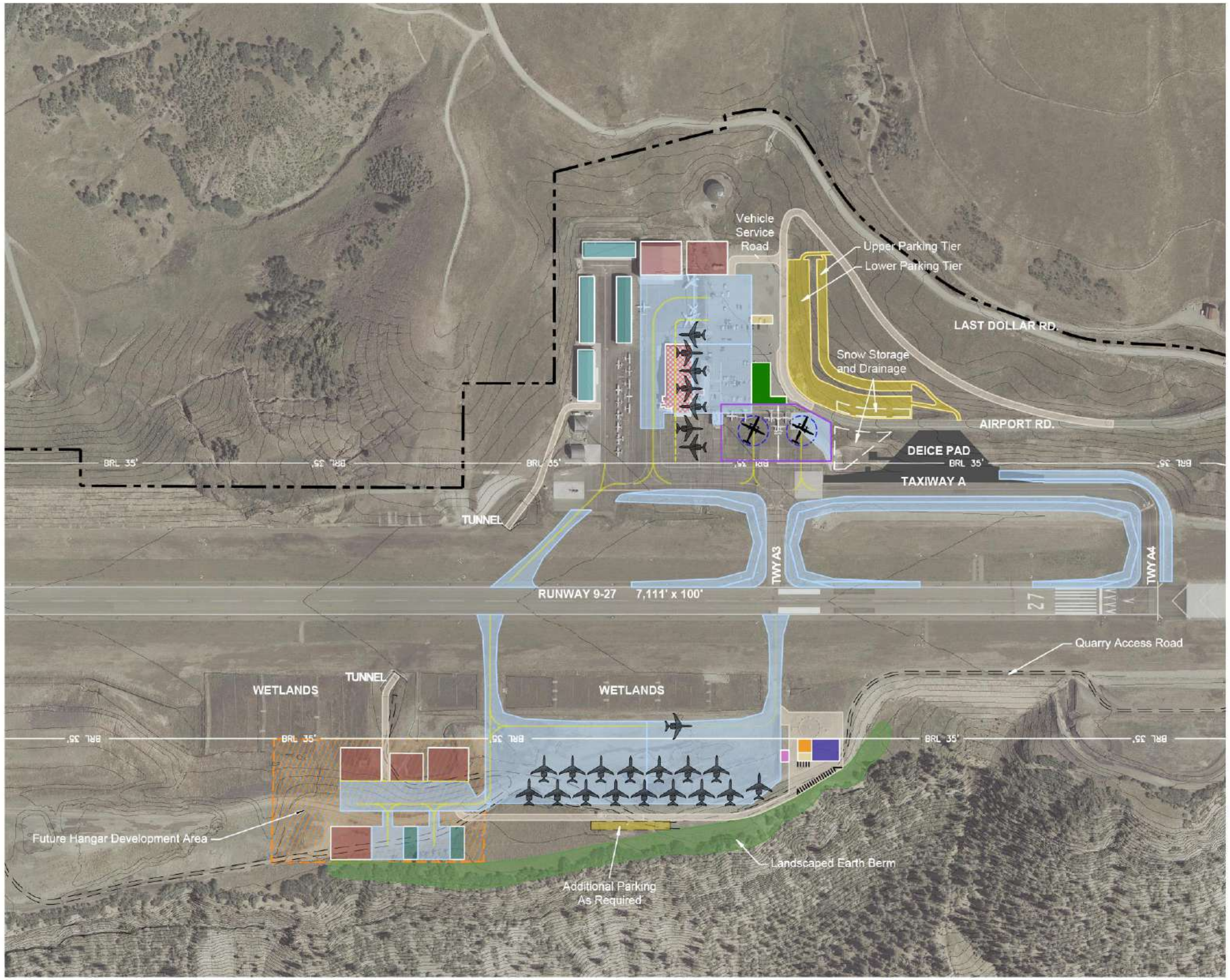


LONG-TERM PREFERRED CONCEPT

- ARFF Facility
- SRE Storage and Maintenance
- Commercial Passenger Terminal
- General Aviation Terminal
- Transient Aircraft Hangars
- Based Aircraft Hangars
- Vehicle Parking
- New Aircraft Rated Pavement
- Vehicle Roadways
- Self Fueling Facility
- Buildings Removed
- SIDA Boundary
- Airport Property Line
- Taxilane Object Free Area (TOFA)
- Future Hangar Development Area
- Commercial Aircraft Parking Position (Bombardier Q400)
- General Aviation Critical Aircraft (Gulfstream G550)
- 10' Terrain Contour

200 100 0 200

FIGURE 4-7
PREFERRED ALTERNATIVE

CHAPTER 5

IMPLEMENTATION PLAN

5.1 INTRODUCTION

Using stakeholder input, the *Alternatives* chapter of this Master Plan Update selected and refined potential airport development paths into a preferred option. With the ultimate development in mind, the *Implementation Plan* chapter identifies a strategic and financially feasible phased approach to implement the components of that preferred development plan. As communicated by the previous chapters, achieving the ultimate vision of TEX development is dependent upon many variables, some well within the Telluride Regional Airport Authority's (TRAA) realm of influence, and others to a lesser extent. The ultimate development plan intentionally seeks to simultaneously attain flexibility in mitigating uncertainties, such as the permanent return of commercial air service, while developing in a responsible way that makes the highest and best use of all available airport land. The implementation plan seeks to achieve three critical airport development goals: 1) providing suitable GA facilities (terminal, apron, hangars, etc.) and improving the GA customer experience, 2) planning for the permanent return of commercial air service, and 3) providing necessary support facilities for Snow Removal Equipment (SRE) and Airport Rescue and Fire Fighting (ARFF) functions. The final purpose of this implementation plan is to provide an updated Capital Improvement Program (CIP) which the TRAA can draw from when making future development decisions and seeking financial assistance to implement those projects.

At the time of this writing, the TRAA has just finalized a deal with Great Lakes Airlines to bring commercial air service back to the Airport. Year-round commercial air service returns between Telluride Airport and Denver International Airport beginning December 17, 2016.[1] The TRAA partnered with Colorado Flights Alliance in order to bring commercial air service back to Telluride and its surrounding communities. Having commercial service re-opens the opportunity to receive additional federal funding and complete projects necessary maintain and develop the airport. This implementation plan and CIP recognize the return of commercial air service and prioritize projects accordingly, but do so strategically and cautiously as the permanent return of commercial service is not guaranteed in the long-term.

5.2 IMPLEMENTATION PROCESS

To implement each capital project, a number of specific steps are necessary, many beginning up to four years before the facility is needed. This time is necessary in order to coordinate the funding, environmental documentation, and design, as well as complete the actual construction. Below is the sequence of events necessary to complete a complex airport project per FAA guidance.

Typical Steps Four Years Prior To Construction

- Identify the project in the approved Airport Layout Plan
- Validate project justification and funding eligibility
- Determine probable level of environmental review *(If an environmental impact statement is required, planning may need to begin much earlier)*
- Identify if in-flight procedure modifications will be required

[1] Source: "Telluride Airport to Get Commercial Flights", *Telluride Daily Planet*, July 26, 2016

- Coordinate with local officials and airport users

Typical Steps Three Years Prior To Construction

- Identify funding sources
- Determine if a Benefit/Cost Analysis is necessary
- Determine if a reimbursable agreement is necessary for affected NAVAIDs
- Begin purchase or assembly of all necessary land for the project

Typical Steps Two Years Prior To Construction

- Refine project scope
- Solicit professional design services
- Prepare preliminary design, site plan and cost estimates
- Initiate reimbursable agreements and coordinate any NAVAID requirements with the FAA
- Submit requests for new/modified flight procedures with the FAA
- Submit a request for airspace review of projects under non-rulemaking authority (NRA)
- Begin Benefit/Cost Analysis if determined to be necessary
- Submit environmental assessment or categorical exclusion documentation for FAA review and funding
- Coordinate with local officials and airport users on refined project scope and schedule

Typical Steps One Year Prior To Construction

- Complete airspace study
- Complete significant environmental documentation
- Complete 90 percent design, plans, and specifications after FAA environmental findings are made
- Execute reimbursable agreements to support NAVAIDs, if relevant
- Prepare and coordinate Construction Safety Phasing Plan
- Secure all necessary local funding
- Secure environmental and other necessary permits
- Submit Benefit/Cost Analysis *(by March 1st)*
- Coordinate Safety Risk Management Panel with FAA-ATO or FAA-ARP, as necessary
- Finalize construction bidding, grant application and acceptance schedules

Year of Construction

- Complete 100 percent design, plans, and specifications
- Complete FAA environmental documentation for current fiscal year *(by January 15th)*
- Advertise and secure bids according to acceptance schedules
- Submit grant applications *(by May 1st, if discretionary funds expected bid by April 1st)*

- 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

After Construction

- Submit final report and close any accepted federal grants
- Monitor environmental mitigation measures
- Update Airport Layout Plan drawing set

5.2.1 Environmental Considerations

The environmental processing for projects within each development phase will need to be completed in advance of the design and construction to allow for project completion in accordance with applicable federal rules and regulations. In the immediate- and short-term, a five-year developmental environmental assessment may be appropriate to analyze the potential environmental consequences associated with the proposed action prior to construction beginning.

FAA Order 1050.1F, *Policies and Procedures for Considering Environmental Impacts*, and 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airports*, require the evaluation of airport development projects as they relate to specific environmental impact categories. A complete evaluation of the impact categories identified in FAA Orders 1050.1F and 5050.4B is required during an environmental assessment (EA) or environmental impact statement (EIS). Categorical exclusions (CE) require evaluations of extraordinary circumstances to ensure that projects, typically causing minimal environmental effects, would not cause effects requiring more analyses in an EA, or possibly, an EIS.

In preparing for implementation of CIP projects, discussion with FAA environmental staff should take place to determine the best course of action for environmental processing. Due to the type and number of future capital projects that will likely require environmental documentation, it is recommended that the TRAA consider developing an overall strategic environmental plan. This effort should determine the scale of environmental compliance needed for each future project, and examine opportunities to group environmental projects together to minimize project costs and maximize efficiency.

5.3 AIRPORT DEVELOPMENT PHASING PLAN

The Ultimate Airport Development Plan, shown later in **Figure 5-5**, makes highest and best use of the limited developable airport land. It also achieves TRAA goals in an efficient and financially responsible manner. The following sections outline airport development over the short-, mid-, and long-term phases. Each phase represents a timeline of strategic development actions, improvement rationale, triggering events justifying investments and their associated expenditures, along with any additional project implementation considerations. The Short-Term Development Phase recommends projects over the first five years of the twenty-year master planning horizon (FY 2016-2020) and the Mid-Term Development Phase completes the last fifteen years of the planning horizon (FY 2021-2035). Long-Term Development

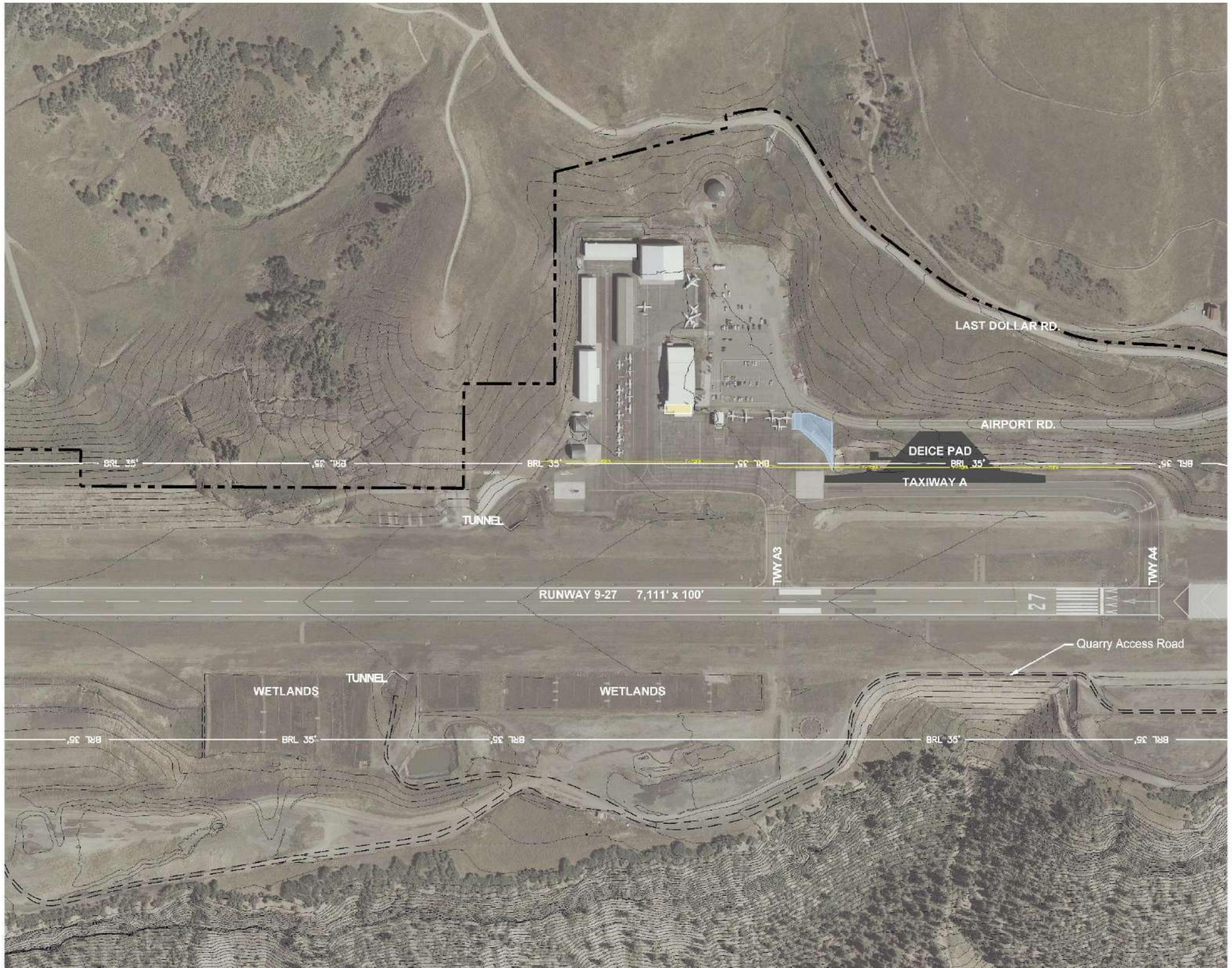
Phase projects are included in the implementation strategy and Capital Improvement Plan as an element of completing the ultimate airport development vision but are not anticipated to occur within the twenty-year planning horizon. All recommendations are based on the following factors:

- Facilities should be updated to meet current FAA design standards
- General aviation facilities are insufficient to meet current and future demand
- Commercial service will permanently return in the future
- Solutions must be financially feasible and make use of existing geographic limitations
- Logical sequencing of projects based on triggering events that optimize operational efficiency
- Make highest and best use of land to meet ultimate airport development vision
- Eliminate or mitigate environmental and community impacts

Planning level cost estimates are provided for each project. Planning-level for this purpose is a rough order of magnitude cost estimate that considers gross areas multiplied by a realistic unit cost factor, plus contingencies and mobilization costs. Design costs are not factored into each project but can be anticipated at between 8 and 10 percent of the project cost prior to mobilization and contingency considerations. The intent of planning level cost estimates is to budget enough funding for each project in the program and to evaluate the feasibility of each project. **Appendix A** contains a more detailed breakdown of project costs.

5.3.1 Short-Term Development

Short-term capital improvement projects include those which are expected to begin within the next five years (FY 2016-2020). These projects focus on improving the experience of general aviation customers and providing adequate parking facilities for general aviation aircraft as a means to recapture revenue leakage occurring within the region. These improvements, shown in **Figure 5-1**, are achieved first through the renovation of the existing general aviation terminal and the addition of an approximately 500 square foot building expansion. The renovation will modernize the terminal's functional space with a layout akin to that of a fixed-base operator bringing in an upscale interior which is tailored to the clientele being served. Short-term improvements also include an apron expansion and rehabilitation which will enhance aircraft parking areas necessary to accommodate current general aviation activity levels. This apron should be designed with a pavement strength high enough to accommodate the critical aircraft (Bombardier Q-400) as commercial service to the airport becomes reliably permanent and future commercial terminal facilities are built (as described in future development phases) adjacent to this new pavement section.



SHORT-TERM PREFERRED CONCEPT

- ARFF Facility
- SRE Storage and Maintenance
- Commercial Passenger Terminal
- General Aviation Terminal
- Transient Aircraft Hangars
- Based Aircraft Hangars
- Vehicle Parking
- New Aircraft Rated Pavement
- Vehicle Roadways
- Self Fueling Facility
- Buildings Removed
- SIDA Boundary
- Airport Property Line
- Taxilane Object Free Area (TOFA)
- Commercial Aircraft Parking Position (Bombardier Q400)
- General Aviation Critical Aircraft (Gulfstream G550)
- 10' Terrain Contour

200 100 0 200 Feet

FIGURE 5-1
SHORT-TERM DEVELOPMENT PHASE

Project Title	General Aviation Terminal Renovation and Expansion	Short-Term No. 1
Description	This project renovates the existing General Aviation Terminal and expands it by approximately 500 square feet. The improved facility follows the design of modern Fixed-Base Operators tailoring amenities to an upscale, high-end clientele experience.	
Cost	$699,000	

Trigger Point

General aviation activity has already reached levels associated with triggering the need for a renovated and expanded General Aviation Terminal.

Justifications

Current GA facilities lack amenities and space. The facility is dated and lacking the level of service demanded by the public it serves. Attracting, retaining, and providing a high level of service to general aviation clients generates income required to support self-sufficient airport operations and future development.

Additional Considerations

Flexible design should allow the easy repurposing of the facility to meet the needs of a commercial departure lounge on a temporary basis during future development phases. The project's total budgeted cost is estimated based on a price per square foot construction/renovation cost of $350-$500. The total affected area is assumed to be approximately 4,100 square feet. With a project budget of $700,000, the actual cost may vary significantly as design progresses and scope is further developed. Changes to the project may require changes in the architectural and engineering efforts, thus impacting overall project cost.

Project Title	North Apron Expansion #1	Short-Term No. 2
Description	This project expands a small portion of the North Apron, creating additional space for aircraft parking.	
Cost	$2,375,000	

Trigger Point

General aviation activity has already reached levels associated with triggering the need for additional apron space.

Justifications

General aviation aircraft are currently dropping off passengers and leaving to fuel and park aircraft at other regional airports because space is not available at TEX. Attracting, retaining, and providing services to this traffic generates the income needed to support self-sufficient airport operations and future development. Figure 3-2 in the Facility Requirements chapter of this master plan demonstrates the need for additional aircraft parking.

Additional Considerations

Drainage and de-icing infrastructure exist immediately east of the project area. This should be preserved to meet present and future airport needs. A significant portion of the cost for this project comes from the required utility upgrades which lie underneath the new pavement. A new sewer transer station along with new sewer, telecommunication, water, and power lines are included in the project to prepare for the needs of future development.

5.3.2 Mid-Term Development

Mid-term capital improvement projects include those which are expected to occur within the last fifteen years (FY 2021-2035) of the master planning horizon. Mid-term development (**Figure 5-2**) begins by establishing a new taxiway connection across from the existing Taxiway A3 connected which serves as access to a new Snow Removal Equipment (SRE), Aircraft Rescue and Fire Fighting (ARFF), and general aviation lounge facility. This move enables the hangar currently holding SRE to be used for housing transient aircraft, allowing further growth in airport revenue opportunities. The new co-located SRE and ARFF facilities will provide improved operations for both functions, especially since the Airport operates with a limited, cross-trained staff. A new GA facility should be incorporated into the new SRE/ARFF facilities to create a place for GA pilots to meet, rest, and flight plan near their aircraft parked on the future South Apron. Once the ARFF facility is operational, the existing ARFF building can be demolished, eliminating an operational impediment in the North Apron area. Pavement under the demolished ARFF building will need to match the strength of all other pavement in the North Apron area.

The new taxiway connector also enables an apron expansion south of Runway 9-27 which is needed to accommodate general aviation aircraft parking. The South Apron area can be phased as long as necessary as dictated by demand and airport funding availability. Self-fueling facilities should be provided at the South Apron for smaller aircraft to self-fuel without requiring them to taxi to and from the North Apron or for the FBO to travel to the South Ramp. A new paved vehicle service road (VSR) will need to extend from the existing tunnel road to the new SRE/ARFF/GA facilities at the South Apron to allow vehicle access to landside airport roads. Location of this VSR should leave space for future expansion of the South Apron as well as potential parking space for vehicles. Due to the terrain conditions at Telluride Airport, most CIP projects require some degree of earthwork which creates an excess or shortfall of dirt. Any removed earth can be used in other airport projects such as the development of a South Apron, the landscaped earth berm, or tiered parking on the hillside north of Airport Road (long-term development project). By using some of the dirt to create a landscaped berm, the TRAA can save money required to export dirt off-site while also mitigating the visual impacts of development upon the community.

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MID-TERM PREFERRED CONCEPT

- ARFF Facility
- SRE Storage and Maintenance
- Commercial Passenger Terminal
- General Aviation Terminal
- Transient Aircraft Hangars
- Based Aircraft Hangars
- Vehicle Parking
- New Aircraft Rated Pavement
- Vehicle Roadways
- Self Fueling Facility
- Buildings Removed
- SIDA Boundary
- Airport Property Line
- Taxilane Object Free Area (TOFA)
- Commercial Aircraft Parking Position (Bombardier Q400)
- General Aviation Critical Aircraft (Gulfstream G550)
- 10' Terrain Contour

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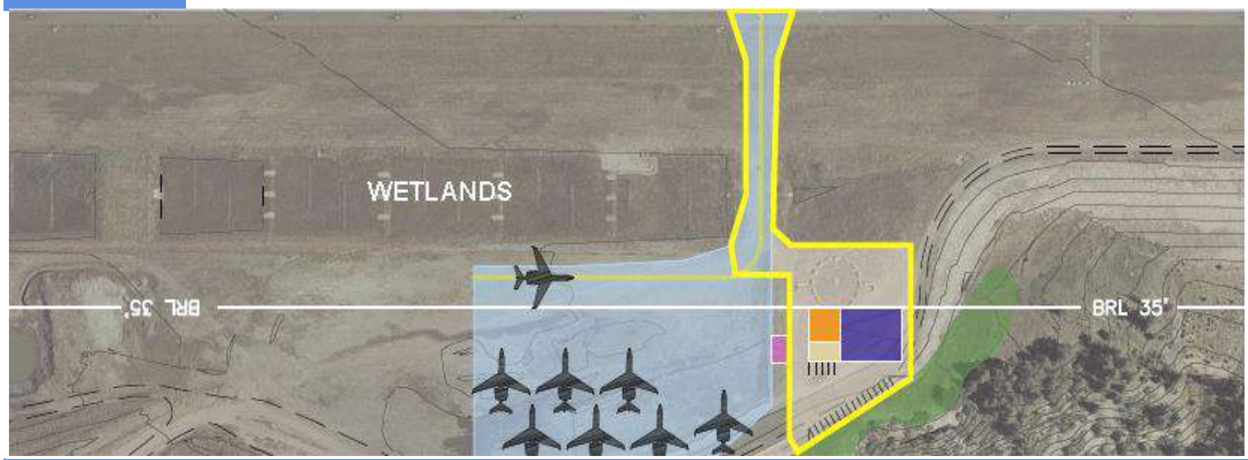
FIGURE 5-2
MID-TERM DEVELOPMENT PHASE

Project Title	SRE/ARFF/GA Construction, South Taxiway A3, and Vehicle Parking	Mid-Term No. 3, 4, 5
Description	This project builds new facilities for Snow Removal Equipment and Airport Rescue and Firefighting operations. It also creates a modest area to accommodate general aviation clients performing flight planning functions adjacent to aircraft parked on the new south apron. Airfield access to the new facilities is provided through a new south Taxiway A3. Vehicle parking is built south of the new buildings and will be connected to the roadway system using the tunnel road.	
Cost	$4,786,000	



Trigger Point

SRE and ARFF facilities are already space deficient so this project is heavily dependent upon available funding.

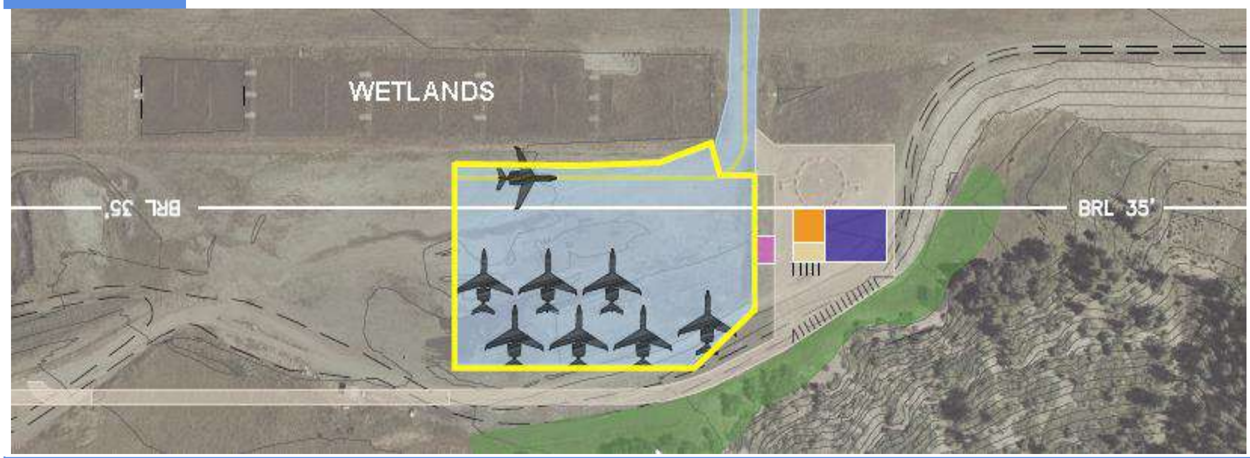
Justifications

Current SRE is stored in a hangar originally designed to house transient aircraft. The hangar is not large enough to accommodate the required SRE and eliminates hangar space necessary to generate revenue needed to sustain self-sufficiency. Additionally, it is preferred that SRE and ARFF facilities be co-located when limited staff is tasked with both duties. The new facilities are intentionally co-located for optimal access and operational efficiency including improved safety and response times.

Additional Considerations

Placement of these support facilities should maximize the capacity of the South Apron development. Efforts should be made to keep garage doors facing south or east to prevent freezing during colder months and combining SRE and ARFF facilities into one large facility will benefit emergency response time as well as operational efficiency during inclement weather. The segmented circle would need to be relocated to build these facilities and the associated pavement.

Project Title	South Apron Construction	Mid-Term No. 6
Description	This project builds a new apron which connects to south Taxiway A3, paving a portion of the area between the existing wetlands and existing Quarry Road for GA aircraft parking.	
Cost	$5,288,000	



Trigger Point

General aviation demand exceeds available passenger and aircraft parking facilities.

Justifications

As general aviation traffic continues to grow, revenue generating apron space will be needed to park aircraft and provide airport revenue.

Additional Considerations

The extent of this new apron area will be driven by demand and can be portioned out in as many phases as the TRAA deems necessary. Apron construction and phasing decisions will ultimately effect overall South Apron development costs.

Project Title	Existing ARFF Demolition	Mid-Term No. 7
Description	This project demolishes the old ARFF building. The underlying pavement is then open to park aircraft.	
Cost	$13,000	

Trigger Point

The old ARFF building can be demolished as soon as the new ARFF facility is built and operational.

Justifications

Once the new ARFF facility is complete, the old ARFF facility will no longer be needed. This space can now preserved for it's ultimate and highest aviation use, aircraft parking.

Additional Considerations

The earlier the old ARFF building is demolished, the sooner it can be out of the way of the newly expanded North Apron. The pavement under the old ARFF building will need to be tested or replaced to ensure it has the strength and durabilty suitable for aircraft parking. Repaving this section would add cost to the project.

Project Title	**Tunnel Road Construction**	**Mid-Term** **No. 8**
Description	This project paves an access road for vehicles to reach the South Apron without having to cross the runway.	
Cost	$2,459,000	

Trigger Point

Development of the South Apron and SRE/ARFF support facilities create the need for this road.

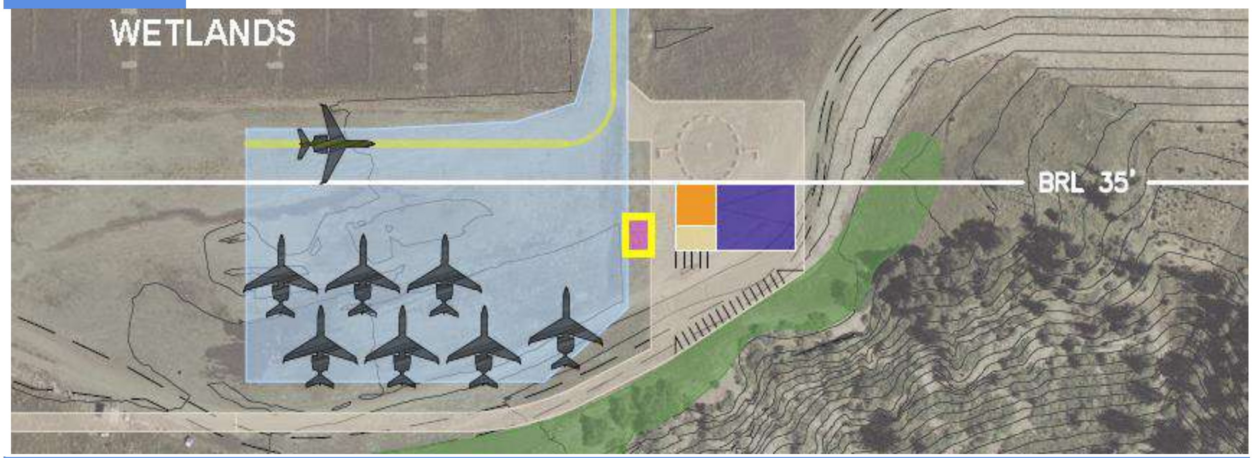
Justifications

The tunnel below the runway and the tunnel road already exist, they would just be realigned in portions and paved. The runway and taxiways are designed for aircraft so avoiding unnecessary vehicle movements dramatically improves airfield safety and capacity.

Additional Considerations

Tunnel road alignment in the South Apron area should avoid paving in future development areas to every extent possible. The North Apron portion of the tunnel road is realigned to begin between an existing based aircraft hangar and the fuel farms. Placing proper pavement markings, signage, and a barrier between fuel infrastructure and the tunnel road would reduce the chance of vehicles accidentally conflicting with and disrupting fueling operations.

Project Title	Self-Fueling Facility	Mid-Term No. 9
Description	This project contructs a self-fueling station at the South Apron.	
Cost	$187,000	



Trigger Point

Aircraft parking at the South Apron reaches a level requiring a conveniently located self-fueling station.

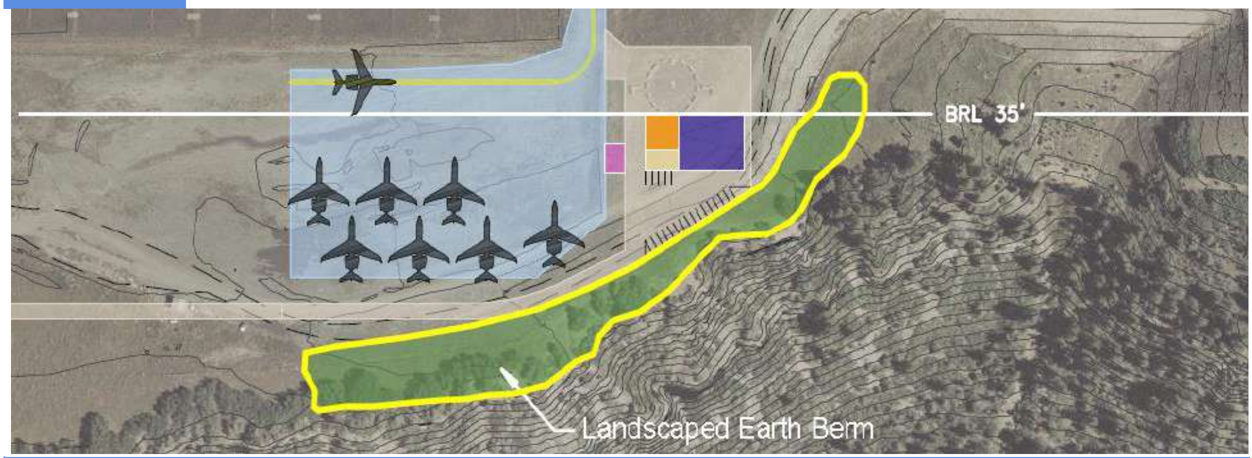
Justifications

Taxiing small general aviation aircraft between the South Apron and North Apron self-fueling facilities would reduce airfield capacity when the runway and taxiways are occupied and create unnecessary potential for ground collisions. This project creates operational efficiencies, eliminates a potential hazard, and improves airfield capacity.

Additional Considerations

Fuel tanks and lines should be placed to provide safe and easy access to fuel trucks with minimal disruption to aircraft and operations.

Project Title	Landscaped Earth Berm	Mid-Term No. 10
Description	This project creates a landscaping berm to block community views of airport development with natural features.	
Cost	$91,000	



Trigger Point

Development of the South Apron and support facilities necessitates this project. Scraped dirt from previous projects can be used in this project.

Justifications

All Airport projects seek to minimize or eliminate any negative impacts on the surrounding community. Visual and noise impacts can be mitigated by building a landscaped earth berm which blocks negative externalities associated with airports and blends into the landscape with a natural aesthetic.

Additional Considerations

Ideally, dirt used in this project should only come from on-airport projects which need a place to put scraped dirt. Aircraft tail heights vary and the height and width of the berm can be assumed to be at least 15 feet high by 30 feet wide. Planted trees can raise the effective barrier height while retaining the natural aesthetics.

5.3.3 Long-Term Development

Airport master planning and CIP's may occur within the context of a twenty-year horizon, but development continues long past this timeline. The Long-Term Development Phase for the Airport includes projects beyond the twenty year period that have not yet been constructed because of funding limitations or for which enough demand has not yet materialized.

The first long-term development project is a new commercial terminal. Design of the new commercial terminal will become the passenger transition zone between landside and airside operations while taking advantage of the terrain on airport property. Landside access will take place on the second floor and airside access will take place on the first floor, which lies at apron grade. This design will make efficient use of terrain grades and preserve space for airside activities while allowing for the incorporation of unique, creative architectural elements that preserve Telluride Airport's stunning views. The placement of this new terminal is critical because it acts as the cornerstone of future development at the eastern side of the airfield, directly impacting the location of a future general aviation terminal building (described later in this section). This new airfield boundary becomes the limiting factor on apron expansion and therefore the amount of aircraft which can be parked in the North Apron area.

As the available apron is expanded throughout the Airport's lifespan, apron space previously developed in the short-term (CIP project "North Apron Expansion #1") for general aviation aircraft parking can be repurposed to bring the Bombardier Q-400 commercial aircraft close to the new commercial gates. This aircraft parking placement, and the associated Secure Identification Display Area (SIDA) boundary, has the advantage of creating a distinct separation between commercial and general aviation aircraft. This separation promotes security and operational safety on the airport movement surfaces. The long-term development plan also has the ability to accommodate two of the critical commercial aircraft. The space available for a second commercial aircraft would be used for general aviation parking but could easily be converted, if necessary, through a simple expansion of the SIDA boundary marking.

Vehicle parking areas will be impacted by the new commercial terminal building and the later expansion of the apron, but existing vehicle parking can be reorganized and additional spaces can be developed as needed east of the new GA terminal on/into the hillside north of Airport Road. This project, dubbed the "Hillside Parking Lower Tier Construction" is heavily dependent upon peak enplanements and passenger ground transportation choices. The timing of this project will require further evaluation as the new commercial terminal project becomes a reality.

With the construction of a new commercial terminal comes the need for a new airport loop road. This new road provides an efficient and safe design which directs one-way traffic into, and out from, the landside airport environment. Consolidating traffic in one direction to Airport Road works to increase not just roadway safety, but capacity as well. Curbside pickup/drop-off space is created along the loop road at the second level of the new commercial terminal. Design of the airport loop road will need to be performed in collaboration with the design of the commercial terminal building in which it serves and with considerations of how it will work with the future general aviation terminal. Study has shown that it would also be possible to create a loop road environment using a new entry point at Last Dollar Road, but analysis and community feedback of this option proved it is less optimal due to less efficient traffic flows and greater impacts on residents using Last Dollar Road to access nearby homes, issues that would only grow as the nearby residential area further develop.

With the new commercial terminal in place, preparations for a new general aviation terminal can begin by constructing a new apron space north of the existing parking lot. Constructing the new apron will require grading and it is necessary for the ultimate apron grade to meet the taxilane running west of the existing terminal/SRE hangar building within FAA standards. Grading for the ultimate apron build-out also needs to meet the future first floors of both the adjacent commercial terminal building and the future GA terminal building. This apron construction also opens up the opportunity to build a new north side transient hangar.

The long-term development path leaves some room for flexibility in design and location of the new GA terminal because a large swath of land has been preserved north of the new commercial terminal. It is recommended that the new GA terminal be placed in relative close proximity to the commercial terminal so that airport staff can readily serve both buildings. A campus-like setting could be created with a pedestrian-oriented plaza connecting the two buildings. With cost in mind, the closer the placement of the new GA terminal to the new commercial terminal, the lower the ultimate cost. Building them closer together would require less apron development and less terrain grading. It would also require less utility extensions and provide a terminal campus environment which is beneficial to the user. Creating this campus environment produces efficiencies in the development of vehicle parking and opens opportunities for a central pedestrian plaza which connects the commercial and general aviation terminals, giving users an outdoor space to take in the aesthetic beauty of the region. The design of the apron and terminal campus should also take sheltered Ground Service Equipment (GSE) storage into consideration.

Upon completion of the new commercial terminal and the new general aviation terminal, the old commercial terminal and its adjacent transient hangar can be demolished to allow for the final construction phase of the North Apron, dubbed in the CIP as "North Apron Expansion #3." This apron expansion fills the gap between all the surrounding apron areas. Previous apron designs will have accounted for this project and provided boundaries allowing the new apron area to meet required FAA specifications for grading and drainage.

As parking options are eliminated by new buildings and apron expansion, the need for landside vehicle parking grows. The hillside tiered parking design takes advantage of dirt removed from apron expansion projects and uses it to build hillside vehicle parking while also allowing room to expand as demand dictates. As shown in **Figure 5-3**, tiered hillside vehicle parking should be designed to fit into the one-directional loop roadway design. Another consideration in parking lot design is creating additional space which can hold plowed snow near drainage infrastructure during snow removal operations in the winter. Infrastructure already exists in the marked areas and should be retained to avoid superfluous expenses. Additionally, a VSR will need to be provided from Airport Road to the apron area. The most sensible location for this road is near the new transient hangar at the north end of the apron. This entrance/exit point allows GA vehicle traffic to access all airside GA facilities, including the South Apron area via the tunnel road, while avoiding disruption to commercial activity.

Development at the apron area south of Runway 09-27 will be strongly dictated by demand. Full buildout of the South Apron parking area enables the addition of a new taxiway somewhat paralleling the existing tunnel road. The new angled portion of the taxiway located north of the runway does divert from FAA recommended practices but with justifiable rationale for the geographic limitations unique to Telluride Airport. First, the taxiway is designed to avoid impact to airport wetland areas so it mitigates environmental disruption as well as reducing overall development costs. Second, Runway 09 is the primary landing surface for arriving aircraft and the 45 degree angle provided by the new taxiway can expedite the removal of aircraft from the runway, thus increasing safety and airfield capacity. Third, the taxiway configuration creates a corresponding taxiway connection on the south side of the runway thereby permitting a circular flow of aircraft surface movements between the North and South Aprons. This configuration has the added benefit of reducing runway occupancy time for any aircraft requiring back-taxi to take off from Runway 09.

Long-term Airport development brings the potential to expand south airfield facilities through the construction of new hangars for based or transient aircraft. Placement of these hangars is highly dependent upon the location of the Building Restriction Line (BRL) as well as the ability for direct sunlight to reach hangar doors. The climate of the region makes north facing hangar doors highly undesirable due to the likelihood of ice and snow buildup during winter months which results in hangar doors freezing shut. Hangar doors are best positioned facing south or east. Development of this area would need to allow access for vehicles from the tunnel road to the SRE/ARFF/GA buildings. It should be noted that as the South Apron area develops and stretches westward, it will begin to disrupt existing wetlands. Future hangar layouts should adhere to best practices demonstrated in the long-term development plan and described above.

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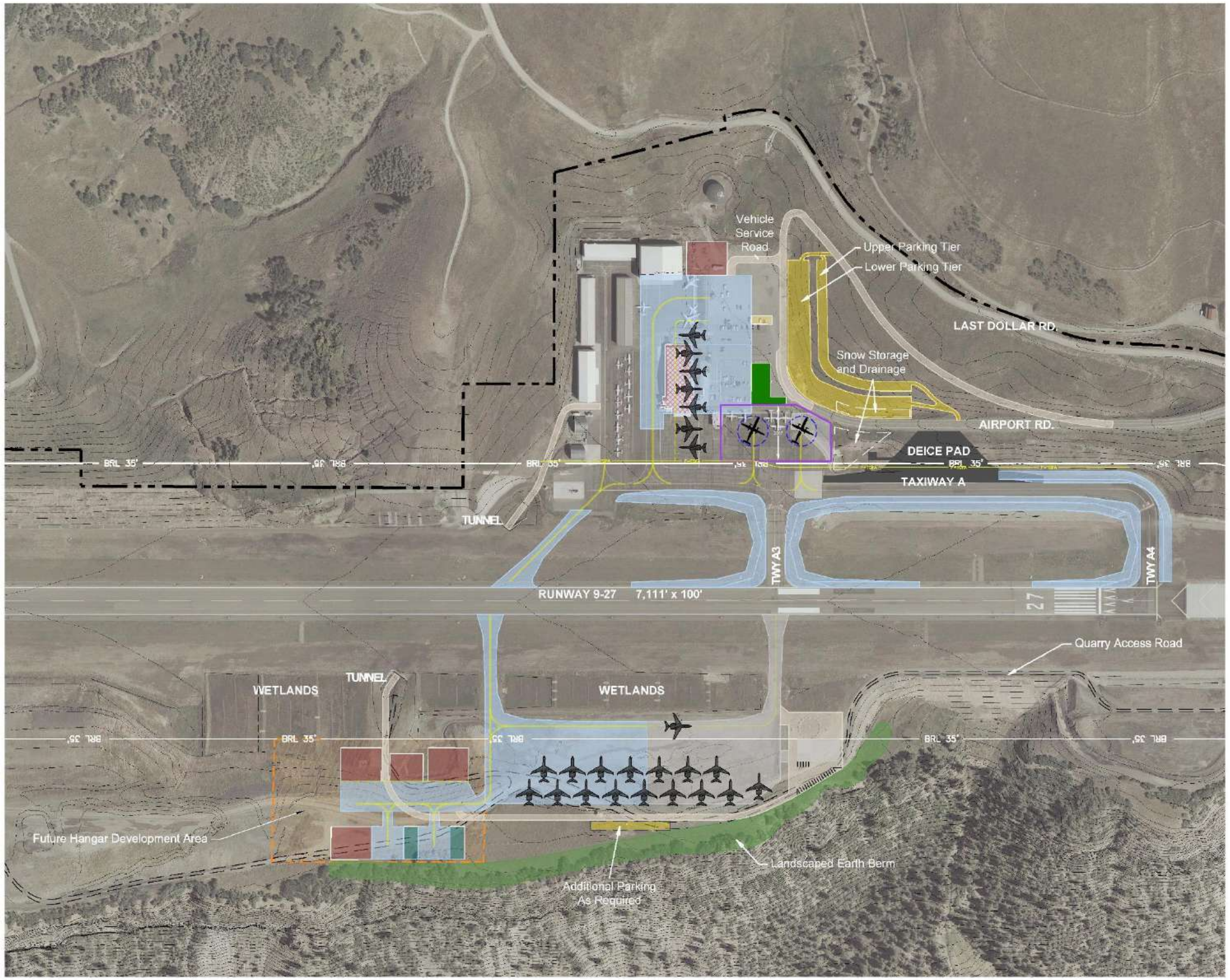

LONG-TERM PREFERRED CONCEPT

- ARFF Facility
- SRE Storage and Maintenance
- Commercial Passenger Terminal
- General Aviation Terminal
- Transient Aircraft Hangars
- Based Aircraft Hangars
- Vehicle Parking
- New Aircraft Rated Pavement
- Vehicle Roadways
- Self Fueling Facility
- Buildings Removed
- SIDA Boundary
- Airport Property Line
- Taxilane Object Free Area (TOFA)
- Future Hangar Development Area
- Commercial Aircraft Parking Position (Bombardier Q400)
- General Aviation Critical Aircraft (Gulfstream G550)
- 10' Terrain Contour

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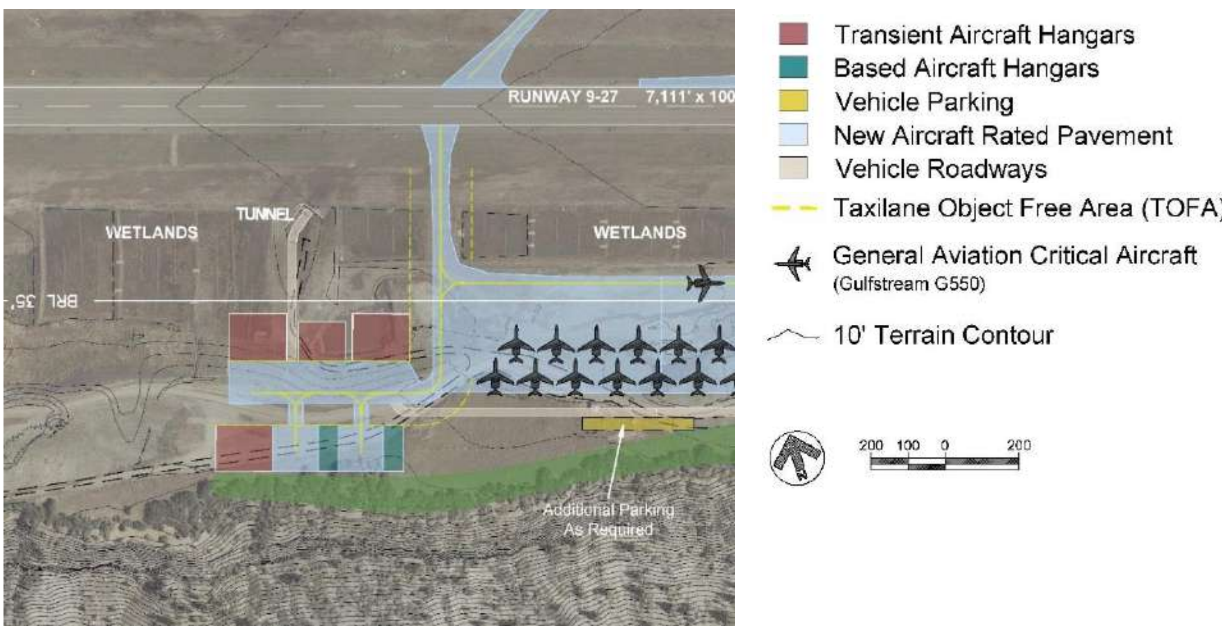
FIGURE 5-3
LONG-TERM DEVELOPMENT PHASE

5.3.4 Recommended Long-Term South Apron Hangar Development

As stated previously, hangar development for the future South Apron area is demand driven. Planning for this type of development must remain flexible, especially when considering that the market for hangar development is in a constant state of flux. Despite market uncertainties, planning appropriate locations and orientations for future hangar development is a necessary activity. **Figure 5-4** shows an example of the recommended development pattern on the south side of the airfield. This layout uses the best practices stated in **Section 5.3.3 – Long-Term Development**. Hangar doors face south and east to maximize solar exposure and prevent door freezes during the cold season. Pavement surfaces efficiently use FAA pavement design standards and required OFA areas accommodate the future critical GA aircraft. Space is also preserved for future planning and design efforts to allow an expansion going further west from what is being recommended at this time.

FIGURE 5-4
RECOMMENDED SOUTH AIRFIELD HANGAR DEVELOPMENT



5.3.5 Ultimate Airport Development

The projects associated with the short-, mid-, and long-term phases all culminate in the ultimate vision for airport development. **Figure 5-5** shows the Ultimate Airport Development Plan. The Ultimate Airport Development Plan achieves immediate-term TRAA goals, while retaining a strategic and flexible plan for implementing projects that use limited land to its highest potential.

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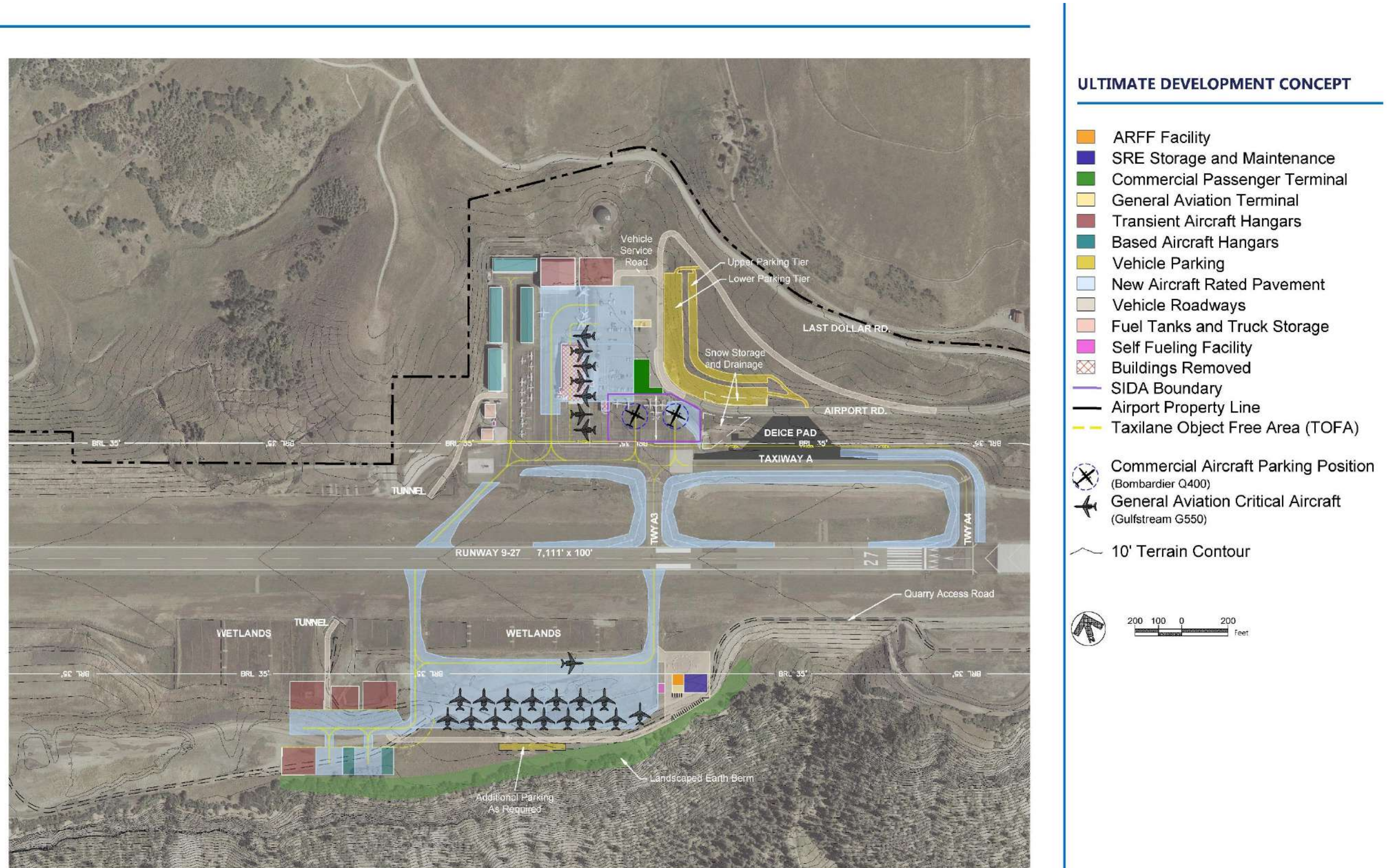

FIGURE 5-5
ULTIMATE DEVELOPMENT CONCEPT

5.4 CAPITAL IMPROVEMENT PROGRAM UPDATE

The Capital Improvement Program begins with ongoing and planned projects carried over from the 2004 Master Plan Update CIP. The TRAA recently completed construction of new de-icing facilities and is planning a North Apron rehabilitation project for which AIP funding has already been allocated. The North Apron Rehabilitation project is slated to commence in two phases from 2016 to 2017. Renovations for the General Aviation Terminal are also being planned at the time of this writing which are being funded solely by the TRAA. A summary of the ongoing and currently funded projects for the existing Telluride Regional Airport Capital Improvement Plan (CIP) is provided below in **Table 5-1**.

TABLE 5-1
ONGOING AND PLANNED PROJECTS FROM PREVIOUS AIRPORT CIP

Telluride Regional Airport Capital Improvement Project Goals					
Non-Grant Funded	**Total**	**FAA Discretionary**	**FAA Entitlement**	**State Aeronautics**	**TRAA Contribution**
General Aviation Terminal Improvements (2016)	$ 700,000	$ -	$ -	$ -	$ 700,000
Replace Existing 31-Year Old Loader (2016)	$ 300,000	$ -	$ -	$ -	$ 300,000
Total 12 Month Costs:	**$ 1,000,000**	**$ -**	**$ -**	**$ -**	**$ 1,000,000**
Potential Grant Funding					
Apron/Taxiway Rehabilitation (2017)	$ 6,923,635	$ 5,931,272	$ 300,000	$ 250,000	$ 442,364
Pavement Seal Coating & Striping (2017)	$ 450,000	$ -	$ -	$ -	$ 450,000
Airport Generator System (2018)	$ 150,000	$ -	$ -	$ -	$ 150,000
Total 2-Year Costs	**$ 7,523,635**	**$ 5,931,272**	**$ 300,000**	**$ 250,000**	**$ 1,042,364**

This Master Plan Update CIP rethinks and reworks the 2004 Master Plan CIP in order to meet Airport needs under new and changing conditions. This revised CIP retains the projects listed above, which have been planned for the immediate-term, and adds to them in the Short-Term Phase. In the short-term, the "North Apron Expansion #1" project should be considered as an additional piece of the immediate-term planned "Apron/Taxiway Rehabilitation (2017)" project. The Short-Term Phase also plans for a General Aviation Terminal building renovation and expansion. At the time of this writing, this is in the early phases of contracting and design. The TRAA has currently budgeted $700,000 to the project, but with the return of commercial service, opportunities exist to improve the connected commercial terminal facility. Immediate-term projects are already funded and budgeted for with a total expense reaching $8.5 million of which the TRAA will expend slightly over $2 million. The additional "North Apron Expansion #1" project adds $2.4 million in expenses over the five-year period, equating to below $500k per year. Mid-term projects total approximately $13 million over the remaining fifteen year period, meaning annual expenditures of below $1 million which is very feasible if commercial service remains. Much of this development is eligible for federal funding given the renewal of commercial air service. **Table 5-2** on the following page shows a summary CIP project list broken out into Short-, Mid-, and Long-Term Phases. **Appendix A** contains a more detailed breakdown of updated CIP project costs.

TABLE 5-2
CIP SUMMARY

Term	Project	Cost
Short-Term	General Aviation Terminal Renovation and Expansion	$ 699,000
	North Apron Expansion #1	$ 2,375,000
Total		$ 3,074,000
Mid-Term	SRE/ARFF/GA Construction	$ 3,727,000
	Taxiway A3 Construction South Side (TDG II)	$ 969,000
	South Vehicle Parking Lot	$ 90,000
	South Apron Construction	$ 5,288,000
	Existing ARFF Demolition	$ 13,000
	Tunnel Road Construction	$ 2,459,000
	New Self-Fueling Facility	$ 187,000
	Landscaped Earth Berm	$ 91,000
Total		$ 12,824,000
Long-Term	Commercial Terminal Construction	$ 16,706,000
	North Apron Expansion #2	$ 3,655,000
	Airport Loop Road Extension	$ 5,294,000
	General Aviation Terminal Construction	$ 2,199,000
	Hillside Parking Lower Tier Construction	$ 1,185,000
	North Apron Expansion #3	$ 2,186,000
	Commercial Terminal Demolition	$ 54,000
	North Apron VSR Construction	$ 290,000
	Hillside Parking Lower Tier Expansion	$ 1,212,000
	Hillside Parking Upper Tier Construction	$ 2,185,000
	Taxiway A2 Construction (TDG II)	$ 2,587,000
	Existing Taxiway Widening (TDG V) North Side	$ 5,876,000
	South Apron Expansion	$ 6,687,000
	South Vehicle Road Construction	$ 62,000
	Vehicle Parking Lot Expansion (South Side)	$ 90,000
	New South Development Area Apron Construction	$ 4,278,000
	New South Development Area Hangar Construction	$ 19,922,000
	North Apron Transient Hangar Construction	$ 9,935,000
Total		$ 84,403,000
Ultimate Development Total		$100,301,000

Note: Project costs are planning-level ROM estimates in 2016 dollars rounded up to the nearest thousand.

5.5 SOURCES OF CAPITAL FUNDING

Airports can be funded in multiple ways including federal, state and local government grants, revenue generated by the airport itself, municipal bonding, and private contributions.

5.5.1 Federal Funding

Federal funding is available to airports through the FAA Airport Improvement Program (AIP) dependent upon the airport category, the role filled within the National Plan of Integrated Airport Systems (NPIAS), and the priority of the improvement as determined within the national priority ranking system. Entitlement grants are offered annually based on the number of passenger enplanements and the amount of enplaned cargo. Discretionary grants are offered depending on the availability of funds and the FAA's assessment of need and priority ranking. When the AIP has more than $3.2 billion available in a fiscal year, additional discretionary funding may be available. Large and medium primary hub airports can receive 75-80 percent of eligible project costs and small primary, reliever, and general aviation airports can receive 90-95 percent of eligible costs. FAA Order 5100.38D *Airport Improvement Program Handbook* details the grant process, project eligibility, allowable costs, and other information relevant to grant acceptance.

With the departure of commercial air service from the airport, TEX functioned for a few years solely as a general aviation airport, thereby reducing the eligibility for AIP Entitlement funds. As a general aviation airport, TEX was eligible for up to $150,000 under the AIR-21[2] grant program so long as $3.2 billion or more AIP funding is available in the Fiscal Year. The return of commercial service has now re-opened the availability to receive federal AIP funds allocated to commercial service airports. The enplanement forecast for TEX was performed at a time when commercial service was still not a reality so future enplanements were not predicted. The FAA TAF had predicted over 8,000 enplanements by the year 2019. With this number in mind, Telluride Airport is a non-primary commercial service airport and is thereby capable of receiving AIP Nonprimary Entitlement and Small Airport discretionary funding. Again dependent upon FAA priorities and whether at least $3.2 billion AIP is available in the fiscal year, the TRAA could be eligible for anywhere from $650,000 to $1 million per fiscal year at a minimum.

5.5.2 Passenger Facility Charge Program

The Passenger Facility Charge Program allows commercial airports operated by public agencies to collect Passenger Facility Charges (PFCs) for every enplaned passenger. These fees are currently capped at $4.50 per flight segment with a maximum of two PFCs charged on a one-way trip and four PFCs charged on a round trip. Although FAA approval is required to impose PFCs, the program allows for local collection of PFC revenue through the airlines operating at an airport and provides more spending flexibility to airport sponsors versus AIP funds. With the return of commercial air service, the TRAA would need to consider whether it would be beneficial to collect PFCs to help fund FAA-approved projects.

[2] AIR-21 is the common name for the federal grant program established under the Wendell H. Ford Aviation Investment and Reform Act of 2000.

5.5.3 State Funding

The State of Colorado funds airports in two ways: the Colorado Discretionary Aviation Grant (CDAG) Program and airport fuel tax disbursements. This funding is generated through two different types of aviation fuel tax: sales tax and excise tax[3]. Airport fuel tax disbursements are simply the direct reimbursement of a portion of the fuel taxes collected by the specific airport based on the quantity and type of fuel sold. The complete portion (i.e. 100 percent) of all state taxes collected on avgas fuel sales at Telluride Regional Airport is reimbursed and 65 percent of jet fuel sales collected at TEX is reimbursed. The remaining portion of the aviation fuel sales tax and the excise tax funds are dedicated to the CDAG Program. CDAG funding is predominantly used for airfield capital improvements, airfield maintenance, capital equipment investment, local match for federal projects, and other various programs. This money, less administrative costs, is distributed to select aviation projects which are prioritized based upon how they meet established Colorado Division of Aeronautics (CDOA) goals under the Colorado Aviation System Plan (CASP). CASP objectives include the following:

- Support a system that is adequate to meet current and projected demand.
- Provide a system that meets future demand while considering community and environmental compatibility.
- Have a system of airports that supports economic growth and diversification.
- Provide a system of airports that is convenient and one that supports emergency services.
- Support a system that maximizes historic investment by optimizing the useful life of existing facilities.
- Encourage a general aviation system that is secure.

For federal AIP funded projects, the State of Colorado typically assists airports by providing up to half of the required 5 percent local match, as long as the cap set by the Colorado Aeronautics Board (CAB) is not exceeded. For state and local projects, CDAG funding traditionally includes a local contribution in one of two ways: money or in-kind work. Typical grants are issued at an 80/20 match, meaning 80 percent of the cost is paid by the state and the remaining 20 percent is covered locally by the grantee.

In addition to the normal CDAG Program, CDOA offers grants under a “Tier Two Request”. This type of grant request is available for projects that do not fit within the framework of the traditional grant program, although the application and review process is the same. Projects fitting within a Tier Two Request are large-scale, high priority projects listed on an airport’s CIP that provide necessary benefits to the Colorado state aviation system. The requests can be made anytime throughout the year only for projects deemed to be the airport’s highest priority, but in most cases, eliminates the airport from consideration for any additional funding through the traditional grant program for that fiscal year. All requests are reviewed by the CAB and funding is not guaranteed on an annual basis.

[3] Commercial airlines are exempt from paying the Colorado state excise tax on aviation fuel.

5.5.4 Local and Private Funding

The TRAA has many resources available to remain self-sustaining and generate revenue. Even if the Airport was operating solely as a general aviation airport it would produce revenue from fuel sales, aircraft parking, line services, land/hangar leases, and land/hangar sales. Capturing and growing these revenues is still critical for the TRAA to remain financially self-sustaining.

Private funding is another avenue for TEX to pursue when seeking assistance in implementing projects found within the CIP. The Airport is a critical asset for bringing money into the region and because tourism and hospitality make up so much of the local economy, local businesses may see the benefit in helping to develop and grow the Airport's ability to accommodate more potential customers. Airport tenants, users, and investors may also find value in contributing the airport's development.

With or without airline and passenger generated revenue, small airports often rely on supplemental funding from local city or county governments to assist with funding their capital needs. Within the public sector, sustaining positive intergovernmental relationships with San Miguel County is important because many airport goals overlap with those of the county. These shared goals are likely to overlap in areas such as planning and land management, transportation, public works, public health, economic development, and parks and recreation. Identifying and building key partnerships with local businesses and departments within San Miguel County government is an important element in identifying mutually beneficial opportunities and securing funding for the airport and related development projects. Pairing local funds with loans or bonds could be a vital component in completing projects found within the CIP.

6.1 INTRODUCTION

The Airport Layout Plan serves several roles for the Airport, Colorado Department of Transportation (CDOT) Division of Aeronautics, and the Federal Aviation Administration (FAA). As presented in the FAA Advisory Circular 150/5070-6B, *Airport Master Plans*, there are five primary functions of the ALP that define its purpose:

- The approved plans are necessary in order to receive financial assistance under the terms of the Airport and Airway Improvement Act of 1982 (AIP), as amended, and specific passenger facility charge actions. The maintenance of a current plan and conformity to the plan are grant assurance requirements at an airport on which Federal funds have been expended under the AIP and the previous airport development programs, including the 1970 Airport Development Aid Program (ADAP) and Federal Aid Airports Program (FAAP) of 1946, as amended. While ALPs are not required for airports other than those developed with assistance under the aforementioned Federal programs, this guidance can be applied to all airports.
- The plans create a blueprint for airport development by depicting proposed facility improvements consistent with the strategic vision of the airport sponsor. The plans provide a guideline by which the airport sponsor can assure that development maintains airport design standards and safety requirements, and is consistent with airport and community land use plans.
- The ALP serves as a public document that is a record of aeronautical requirements, both present and future, and as a reference for community deliberations on land use proposals and budget resource planning.
- The approved ALP provides the FAA with a plan for airport development. This will allow compatible planning for FAA owned facility improvements at the airport. It also allows the FAA to anticipate needs for budgetary and procedural needs. The approved ALP will also allow the FAA to protect necessary airspace for planned facility or approach procedure improvements.
- The plans can be a working tool for use by the airport sponsor, including development and maintenance staff.

Development of the ALP is a direct result of the master plan processes presented in the previous chapters. The ALP reflects the airport technical requirements defined through the master planning process and the strategic vision for the airport development as defined by the TRAA. The ALP requires approval independent of the master plan. As such, review of the ALP drawing set is accomplished through several intermediate steps, including reviews by the Airport, CDOT, the FAA Airports District Office (ADO), and several other FAA offices involved in the associated airspace review. A current ALP that has airport sponsor approval and FAA approval from the standpoint of safety, utility, and efficiency of the airport is required by United States Code, Title 49, 47107(a)(16).

The Telluride Regional Airport Layout Plan drawing set is prepared using several applicable guidelines and checklists. These sources include:

- » FAA Advisory Circular 150/5300-13, *Airport Design*
- » FAA Advisory Circular 150/5070-6B, *Airport Master Plans*
- » FAA Advisory Circular 150/5070-6B, Appendix F, *Airport Layout Plan Drawing Set*
- » FAA Northwest Mountain Region *Airport Layout Plan (ALP) Checklist*, (revised May 2007)
- » FAA ARP SOP 2.00, *Standard Procedures for FAA Review and Approval of Airport Layout Plans*

6.2 AIRPORT COMPLIANCE WITH FAA DESIGN STANDARDS

The FAA provides airport design standards to ensure safe and efficient airport operations. The primary guidance is contained in FAA Advisory Circular (AC) 150/5300-13, *Airport Design*. The master planning process also relies on numerous other FAA and Federal agency documents, including, but not limited to:

- » Federal Aviation Regulations Part 77, *Objects Affecting Navigable Airspace*
- » FAA Order 8260.3B, *United States Standards for Terminal Instrument Procedures*
- » FAA Order 5200.8, *Runway Safety Area Program*

6.3 MODIFICATION TO STANDARDS

Telluride Regional Airport has one modification to standard. The modification is for the air carrier and general aviation apron gradients. This modification was approved on May 25, 1993.

6.4 AIRPORT LAYOUT PLAN DRAWING SHEETS

The ALP drawing set graphically illustrates the development of the Airport over the 20-year planning period. An ALP set is required by the FAA to be considered for future funding and to be compliant with the Airport's Federal Grant Assurances. The complete set for the Telluride Regional Airport consists of the following drawings:

- » Sheet 1 Title Sheet
- » Sheet 2 Facilities Layout Plan
- » Sheet 3 Airport Data Sheet
- » Sheet 4 Airport Layout Plan
- » Sheet 5 Terminal Area Plan
- » Sheet 6 FAR Part 77 Airspace Surfaces Drawing
- » Sheet 7 FAR Part 77 Obstruction Tables
- » Sheet 8 Inner Portion of the Approach Surface Drawing (Runway 9)
- » Sheet 9 Inner Portion of the Approach Surface Drawing (Runway 27)
- » Sheet 10 Obstruction Table for Runway 27
- » Sheet 11 Airport Land Use Plan
- » Sheet 12 Airport Property Map
- » Sheet 13 Airport Development Phasing Plan

6.4.1 Sheet 1 - Title Sheet

This sheet denotes the Airport name and an index chronicling the ALP drawing sheets contained in the drawing set. This sheet also provides an Airport location and vicinity map, as well as a title block organized to include approval signatures and a history of ALP revisions.

6.4.2 Sheet 2 - Facilities Layout Plan

The Facilities Layout Plan provides an uncomplicated view of existing and future Airport features including runways and taxiways, runway protection zones, roadways, and boundaries. The limited amount of data included on the sheet allows better visibility and understanding of the primary facilities and their relation to other key features.

6.4.3 Sheet 3 - Airport Data Sheet

This sheet provides various data tables containing detailed information about the Airport's existing and anticipated conditions. This sheet also provides critical information about the Airport's runways and safety area dimensions. Major components on this sheet include:

» Airport Data Table
» Runway Data Table
» NGS Monument Data Table
» Declared Distance Table
» Wind Rose Data

6.4.4 Sheet 4 - Airport Layout Plan Drawing

The Airport Layout Plan Drawing is a key document which serves as a graphic representation of existing and future Airport facilities. The future Airport facilities include those that are scheduled to be completed during the planning period, as well as those that make up the Airport's ultimate development. One of the primary purposes of this drawing is to depict those areas at which future facilities are planned to be constructed so that the associated land can be reserved for future use.

The drawing also reflects changes to physical features on and in the vicinity of the Airport that may affect navigable airspace or the ability of the Airport to operate. Development shown on the ALP corresponds to the Airport's Capital Improvement Program (CIP) for the 20-year period. Specifically, the sheet depicts the limits of the Airport property interests, land uses, and configuration of facilities in compliance with geometric design separation and clearance standards. It also includes airspace and navigational aid (NAVAID) facilities.

Additionally, the ALP includes the dimensional information in order for recommended development to be designed in accordance with FAA planning and design specifications outlined in FAA Advisory Circular 150/5300-13A – Change 1, *Airport Design* and 150/5070-6B - Change 2, *Airport Master Plans*. Dimensional information aids users of the ALP to determine and plan for adequate separation between future development and existing and future runways, taxiways, taxilanes, and associated airspace. Lastly, the sheet provides a location to chronicle the ALP reviewer and approval stamps/letter(s).

6.4.5 Sheet 5 - Terminal Area Plan

The Terminal Area Plan is a large-scale view centered on the area surrounding the commercial passenger terminal building. The sheet depicts existing and future facilities as well as dimensional criteria involving runway and taxiway surfaces.

6.4.6 Sheet 6 - FAR Part 77 Airspace Surface Drawing

These scaled drawings identify obstacle identification surfaces for the full extent of all airport development. The surfaces define the limits of recommended land use control for the height of objects surrounding the Airport based upon the Airport's Part 77 surfaces. Airspace features correspond with the runway dimensions as depicted on the ALP Drawing. A digital USGS map is used as the base map for the drawings in which each of the Federal Aviation Regulations (FAR) Part 77, Subpart C imaginary surfaces (primary, horizontal, conical, approach, and transitional) are depicted.

6.4.7 Sheet 7 - FAR Part 77 Obstruction Tables

This sheet provides data for all the obstructions that were visually depicted in the Airport Airspace Drawings. Each obstruction is identified with a description, a top elevation, the surface it is penetrating and that surfaces' elevation at the penetrating point, the amount of penetration, and a mitigation recommendation if applicable. Obstructions include various types of vegetation, which can be mitigated through removal or trimming. Because vegetation typically continues upward growth over time, the data sheet includes vegetation that is not yet an obstruction, but is within 10 feet of the nearest Part 77 surface. These potential obstructions are identified by a negative number in the "Part 77 Surface Penetration (+)" column. These are included so that the Airport can proactively monitor and/or mitigate the vegetation prior to it penetrating a surface.

6.4.8 Sheet 8 through 10 - Runway Inner Approach Plan and Profile

Sheets 8 through 10 provide a plan and profile view of each of the Airport's runway approach surfaces. These sheets provide a more detailed view of the first 3,600 feet for Runway 9, and 2,400 feet for Runway 27 feet, off each runway end, where manmade penetrating obstructions are typically found. Similar to previous sheets, any penetrating obstruction is depicted in blue and identified with its top elevation. Additionally, the runway protection zone, navigational aids, and roadways are identified, and applicable data is provided.

6.4.9 Sheet 11 - Airport Land Use Plan

The Airport Land-Use Plan drawing depicts land use and zoning within the airport property boundary. There are five on airport land uses for the Telluride Airport. The largest out of the five is airfield operations. This drawing also depicts a noise contour line at 65 Day-Night Average Sound Level (DNL) per the environmental assessment that was completed in 2005.

6.4.10 Sheet 12 - Airport Property Map

The Airport Property Map depicts the airport property boundary and the property interests consistent with the Airport Layout Plan drawing. This drawing documents past airport land acquisition by individual tracts of land, and the method of acquisition. Both fee-simple and easement acquisitions as well as property disposed of since 1991 are shown.

6.4.11 Sheet 13 – Airport Development Phasing Plan

The Airport Development Phasing Plan provides a visual depiction of the proposed phasing of enhancements and additions over the course of the planning period. The phasing plan directly correlates with the implementation plan provided in the previous chapter. This sheet helps to visibly tie together the Airport's CIP to the timing and location of future projects and enhancements.

6.5 AIRPORT LAYOUT PLAN HIGHLIGHTS AND MODIFICATIONS

This section highlights some of the key elements and modifications that have been made since the Airport's last ALP update. The modifications to the plan are based either on the Master Plan's analyses which identified a future need, a change in FAA design criteria, or a combination of both.

- **Taxiway Improvements** – Future taxiway improvements include, but are not limited to, adding paved shoulders to Alpha taxiway, and the existing taxiway connectors.
- **Apron Improvements** – Future apron improvements include, but are not limited to, construction of apron space on the north and south sides of the airfield.
- **Facilities Improvement** – Future facility improvements include, but are not limited to, the general aviation and passenger terminals, snow removal equipment facility, aircraft rescue and firefighting facility, and general aviation hangar developments.
- **Landside Improvements** – Future landside improvements include, but are not limited to, improvements in terminal parking lot and the construction of a new airport entrance road.

6.6 AIRPORT LAYOUT PLAN DRAWING SET

The Airport Layout Plan drawing set inserted as part of this report is a reduced-size version of the 24-inch by 36-inch drawings that have been reviewed and approved by the FAA, Colorado Division of Aeronautics, and the Airport Boards of Trustees.

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AIRPORT LAYOUT PLAN

FOR

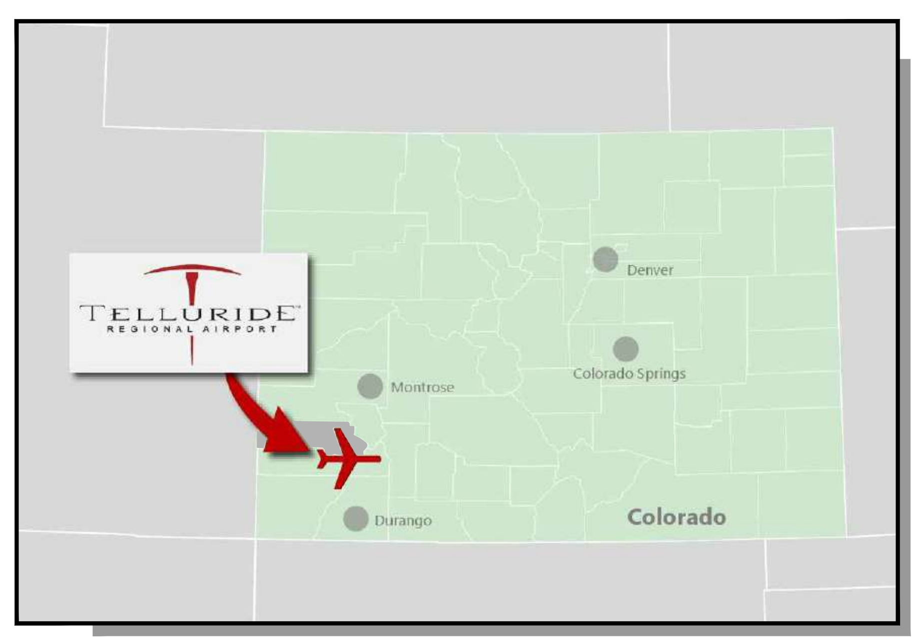
TELLURIDE REGIONAL AIRPORT (TEX)

TELLURIDE, COLORADO

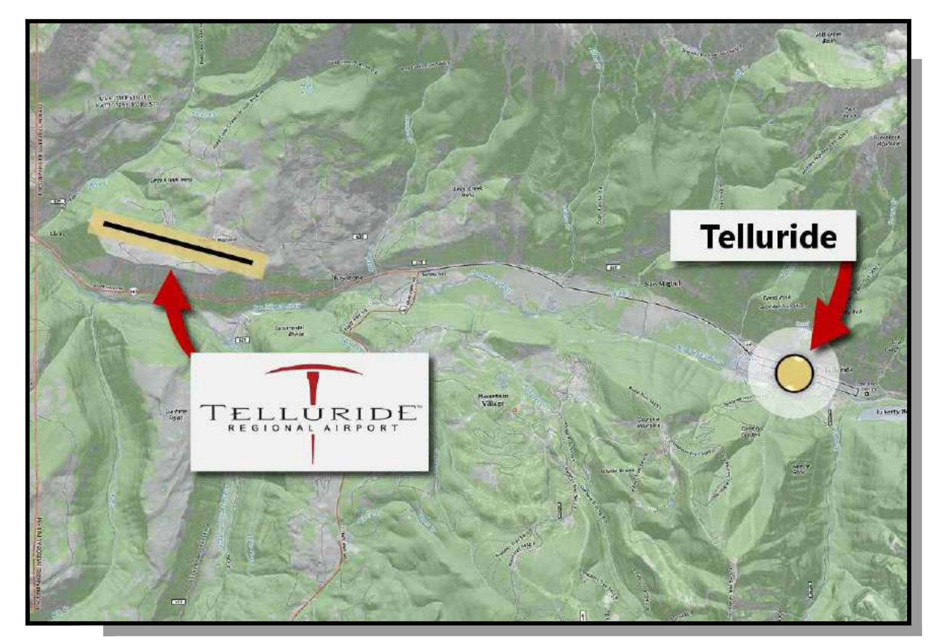
TELLURIDE
REGIONAL AIRPORT

JUNE 2016

DRAFT DOCUMENTS



LOCATION MAP
SCALE: NTS



VICINITY MAP
SCALE: NTS

INDEX TO SHEETS

SHEET NUMBER	DRAWING TITLE	REVISION DATE
1	COVER SHEET	
2	FACILITIES LAYOUT PLAN	
3	AIRPORT DATA SHEET	
4	AIRPORT LAYOUT PLAN	
5	TERMINAL AREA PLAN	
6	FAR PART 77 AIRSPACE SURFACES DRAWING	
7	FAR PART 77 OBSTRUCTION TABLES	
8	INNER PORTION OF THE APPROACH SURFACE DRAWING - RUNWAY 9	
9	INNER PORTION OF THE APPROACH SURFACE DRAWING - RUNWAY 27	
10	OBSTRUCTION TABLE FOR RUNWAY 27	
11	ON-AIRPORT LAND USE PLAN	
12	AIRPORT PROPERTY MAP	
13	AIRPORT DEVELOPMENT PHASING PLAN	

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APPROVED ______________ ______
MICHAEL BECKER — DATE

COLORADO DIVISION OF AERONAUTICS

APPROVED ______________ ______
DATE

TELLURIDE REGIONAL AIRPORT AUTHORITY

APPROVED ______________ ______
RICHARD W. NUTTALL / AIRPORT MANAGER — DATE

REVISIONS

NO.	DESCRIPTION	DATE

Drawing: T:\P\224.3624.001 Telluride MPU\CAD\C\TEX_01_Cover.dwg Plotted on: 7/7/2016 1:40 PMPlotted by: Derengowski, Steven

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TELLURIDE REGIONAL AIRPORT

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TELLURIDE, CO

AIRPORT LAYOUT PLAN

CONSULTANTS

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: JUNE 2016

REVIEWED BY: DC / MLB

DRAWN BY: SD

DESIGNED BY: TJM

PROJECT NUMBER

224-3624-001

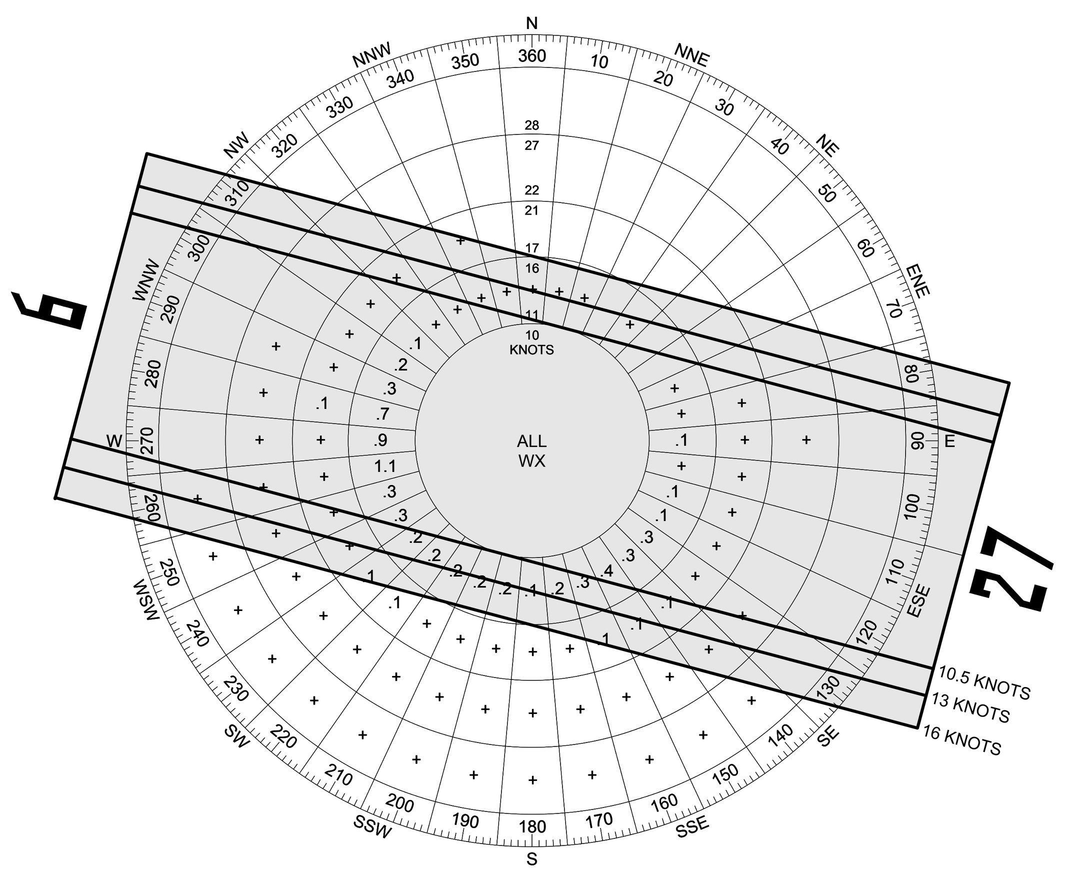
SHEET TITLE

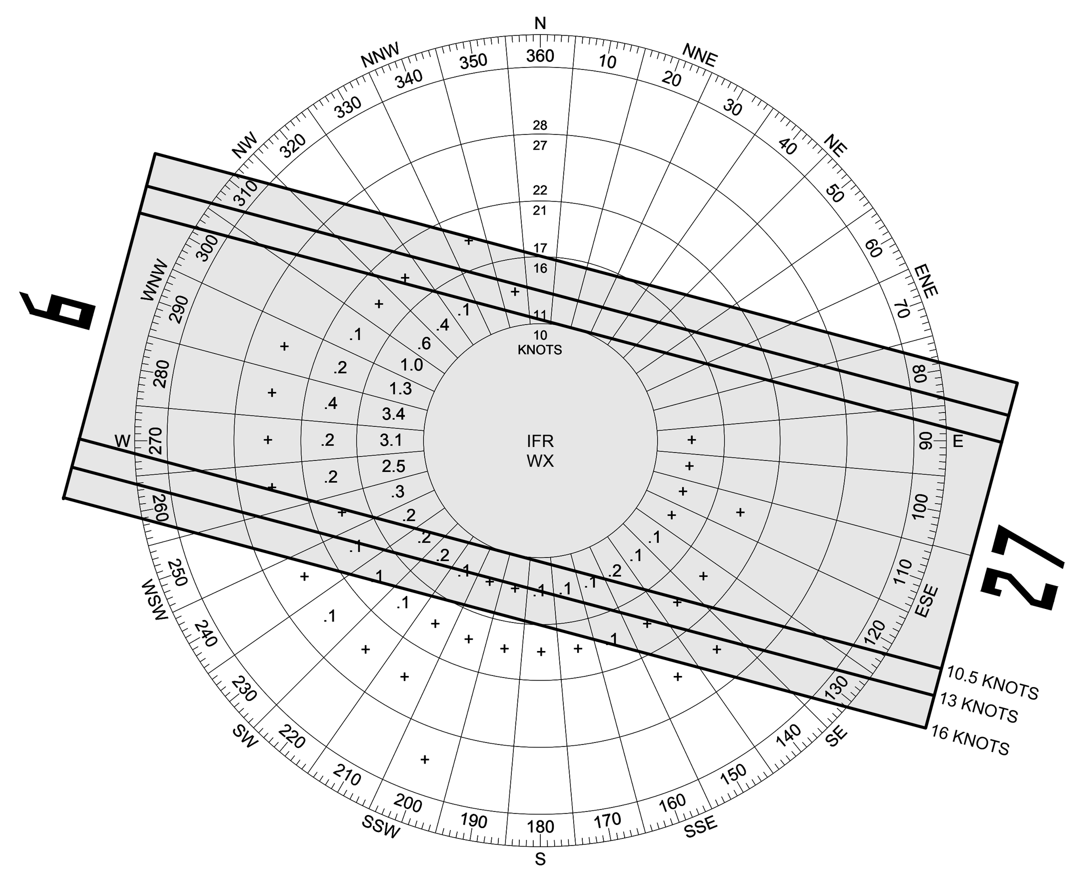
FACILITIES LAYOUT PLAN

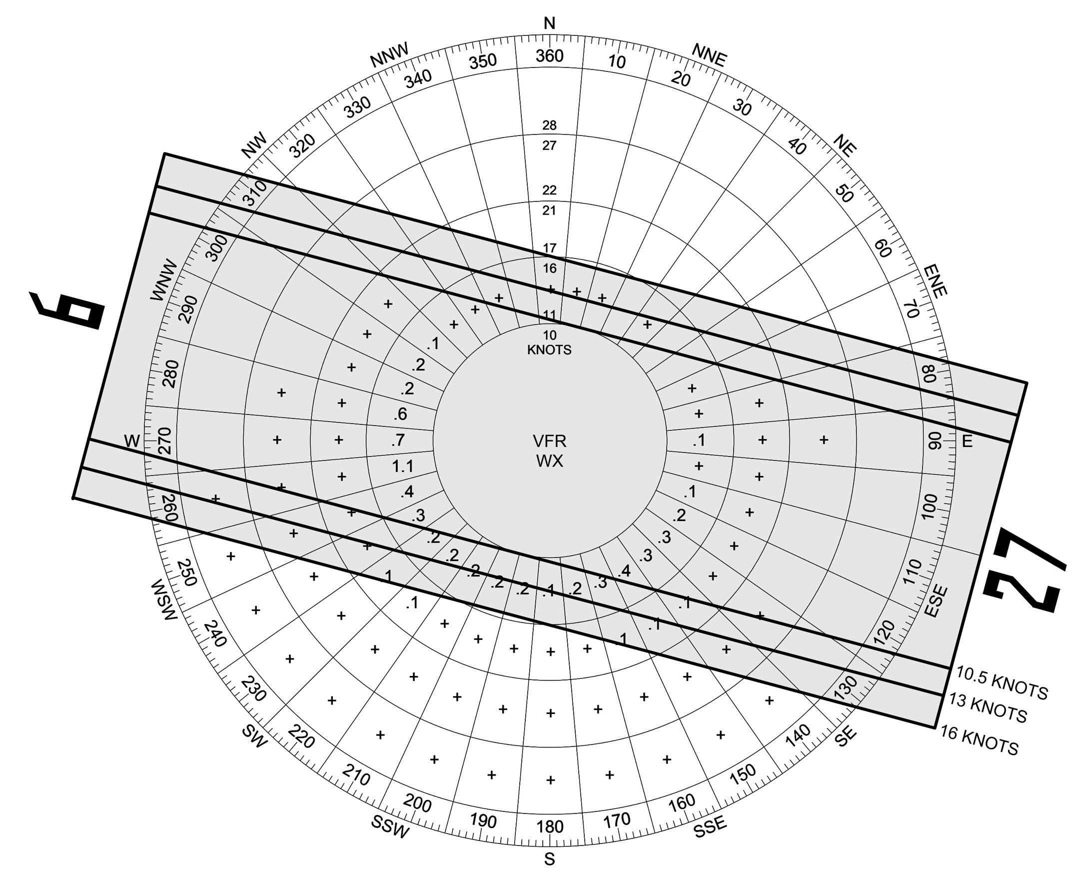
SHEET NUMBER

2 OF 13

DRAFT







DATA SOURCE: NOAA NATIONAL CLIMATIC DATA CENTER
STATION: TELLURIDE REGIONAL AIRPORT - AWOS
DATA RANGE: 2006 - 2015

ALL WEATHER WIND DATA			
RUNWAY	10.5 KNOTS	13 KNOTS	16 KNOTS
RUNWAY 9-27	97.77%	98.79%	99.57%

ALL WEATHER OBSERVATIONS: 214,850

IFR WIND DATA			
RUNWAY	10.5 KNOTS	13 KNOTS	16 KNOTS
RUNWAY 9-27	98.55%	99.09%	99.58%

IFR OBSERVATIONS: 10,925

VFR WIND DATA			
RUNWAY	10.5 KNOTS	13 KNOTS	16 KNOTS
RUNWAY 9-27	97.72%	98.77%	99.57%

VFR OBSERVATIONS: 203,033

ABBREVIATIONS:

AGL	ABOVE GROUND LEVEL
ARP	AIRPORT REFERENCE POINT
ASDA	ACCELERATE STOP DISTANCE AVAILABLE
AWOS	AUTOMATED WEATHER OBSERVING SYSTEM
DME	DISTANCE MEASURING EQUIPMENT
DWG	DUAL WHEEL GEAR AIRCRAFT
E	EXISTING CONDITIONS
EMAS	ENGINEERED MATERIALS ARRESTING SYSTEMS
F	FUTURE CONDITIONS (1-20 YEARS)
GPS	GLOBAL POSITIONING SYSTEM
GS	GLIDESLOPE
HIRL	HIGH INTENSITY RUNWAY LIGHTS
HITL	HIGH INTENSITY TAXIWAY LIGHTS
IFR	INSTRUMENT FLIGHT RULES
ILS	INSTRUMENT LANDING SYSTEM
LDA	LANDING DISTANCE AVAILABLE
LOC	LOCALIZER
MSL	MEAN SEA LEVEL
NGS	NATIONAL GEODETIC SURVEY
NPI	NON-PRECISION INSTRUMENT
PACS	PRIMARY AIRPORT CONTROL STATION
PAPI	PRECISION APPROACH PATH INDICATOR
RCO	REMOTE COMMUNICATIONS OUTLET
REIL	RUNWAY END IDENTIFIER LIGHTING
RNAV	AREA NAVIGATION
SACS	SECONDARY AIRPORT CONTROL STATION
SWG	SINGLE WHEEL GEAR AIRCRAFT
TODA	TAKEOFF DISTANCE AVAILABLE
TORA	TAKEOFF RUN AVAILABLE
TSS	THRESHOLD SITING SURFACE
VFR	VISUAL FLIGHT RULES
VOR	VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE

RUNWAY DATA TABLE					
		RUNWAY 9		RUNWAY 27	
		EXISTING	FUTURE	EXISTING	FUTURE
RUNWAY DESIGN CODE (RDC)		C-III-5000	SAME	C-III-VIS	SAME
APPROACH REFERENCE CODE (APRC)		D/IV/5000 D/V/5000	SAME	D/IV/VIS D/V/VIS	SAME
DEPARTURE REFERENCE CODE (DPRC)		D/IV D/V	SAME	D/IV D/V	SAME
PAVEMENT SURFACE		ASPHALT	SAME	ASPHALT	SAME
SURFACE TREATMENT		GROOVED	SAME	GROOVED	SAME
PAVEMENT STRENGTH - WHEEL LOADING (POUNDS)	SW DW	45,000 89,000	SAME	45,000 89,000	SAME
PAVEMENT STRENGTH - PCN		UNKNOWN	SAME	UNKNOWN	SAME
RUNWAY GRADIENT		0.4%[3]	SAME	0.4%[3]	SAME
PERCENT WIND COVERAGE (ALL WEATHER)	10.5 KNOTS 13 KNOTS 16 KNOTS	97.77% 98.79% 99.57%	SAME	97.77% 98.79% 99.57%	SAME
RUNWAY LENGTH		7,111'	SAME	7,111'	SAME
RUNWAY WIDTH		100'	SAME	100'	SAME
RUNWAY END - COORDINATES (NAD 83)	LAT. LONG.	37° 57' 22.76" 107° 55' 14.35"	SAME	37° 57' 04.68" 107° 53' 48.59"	SAME
RUNWAY END - ELEVATION (NAVD 88)		9038.1'	SAME	9069.7'	SAME
DISPLACED THRESHOLD - LENGTH		200'	SAME	200'	SAME
DISPLACED THRESHOLD - COORDINATES (NAD 83)	LAT. LONG.	37° 57' 22.25" 107° 55' 11.94"	SAME	37° 57' 05.19" 107° 53' 51.00"	SAME
DISPLACED THRESHOLD - ELEVATION (NAVD 88)		9036.7'	SAME	9068.1'	SAME
RUNWAY LIGHTING		HIRL	SAME	HIRL	SAME
RUNWAY PROTECTION ZONE (RPZ)		500'x1,700'x1,010'	SAME	500'x1,700'x1,010'	SAME
RUNWAY MARKING		NON-PRECISION	SAME	NON-PRECISION	SAME
14 CFR PART 77 APPROACH CATEGORY		34:1	SAME	20:1	SAME
APPROACH TYPE		NON-PRECISION	SAME	VISUAL	SAME
VISIBILITY MINIMUMS		> 1 MILE	SAME	VISUAL	SAME
AERONAUTICAL SURVEY		VERTICALLY GUIDED	SAME	NON-VERTICALLY GUIDED	SAME
RUNWAY DEPARTURE SURFACE		YES	SAME	N/A	SAME
RUNWAY SAFETY AREA (RSA)	WIDTH LENGTH BEYOND DEPARTURE END	500' (500' STD.) 601' (1,000' STD.)[4]	SAME	500' (500' STD.) 601' (1,000' STD.)[4]	SAME
RUNWAY OBJECT FREE AREA (ROFA)	WIDTH LENGTH BEYOND RWY END	800' (800' STD.) 1,000' (1,000' STD.)	SAME	800' (800' STD.) 1,000' (1,000' STD.)	SAME
RUNWAY OBSTACLE FREE ZONE (ROFZ)	WIDTH LENGTH BEYOND RWY END	400' (400' STD.) 200' (200' STD.)	SAME	400' (400' STD.) 200' (200' STD.)	SAME
PRECISION OBSTACLE FREE ZONE (POFZ)	WIDTH LENGTH BEYOND RWY END	N/A N/A	SAME	N/A N/A	SAME
THRESHOLD SITING SURFACE (TSS)		20:1 (TYPE 5)[5]	SAME	20:1 (TYPE 3)[5]	SAME
VISUAL AND INSTRUMENT NAVAIDS		LOC, DME, VOR-DME, RNAV (GPS), PAPI, REIL	SAME	VOR-DME, PAPI, REIL	SAME
TOUCHDOWN ZONE ELEVATION (NAVD 88)		9036.7'	SAME	9068.1'	SAME

1. ALL COORDINATES ARE IN NORTH AMERICAN DATUM OF 1983 (NAD 83)
2. ALL ELEVATIONS ARE IN NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)
3. RUNWAY MEETS LINE OF SIGHT REQUIREMENT
4. THE FULL DIMENSION RSA REQUIREMENTS MET WITH 401' EMAS AND 200' DISPLACED THRESHOLD, PER AC 150/5300-13A, AIRPORT DESIGN, CHANGE 1.
5. PENETRATIONS LOCATED WITHIN RUNWAY 9 TSS
6. NO TSS PENETRATIONS FOR RUNWAY 27

MODIFICATION TO STANDARDS			
APPROVAL DATE	AIRSPACE CASE NO.	STANDARD TO BE MODIFIED	DESCRIPTION
MAY 25, 1993	---	AIR CARRIER AND GA APRON GRADIENTS	TRANSVERSE AND LONGITUDINAL

AIRPORT DATA TABLE			
		EXISTING	FUTURE
AIRPORT REFERENCE CODE		C-III	C-III
MEAN MAXIMUM TEMPERATURE / HOTTEST MONTH		78° / JULY	SAME
AIRPORT ELEVATION (NAVD 88)		9069.7'	SAME
AIRPORT NAVIGATIONAL AIDS (OWNERSHIP)		VOR/DME (TEX), BEACON (TEX)	SAME
AIRPORT REFERENCE POINT (NAD 83)	LAT. LONG.	37° 57' 14" 107° 54' 32"	SAME
MISCELLANEOUS FACILITIES (OWNERSHIP)		SEGMENTED CIRCLE W/ LIGHTED, LOCALIZER (FAA) WINDCONE (TEX), AWOS-3 (TEX),	SAME
AIRPORT REFERENCE CODE AND CRITICAL AIRCRAFT		C-III / G550	C-III / Q400
MAGNETIC VARIATION		9° 37' WEST 0° 6' FEBRUARY 2016	SAME
NPIAS SERVICE LEVEL		NON-PRIMARY / COMMERCIAL SERVICE	SAME
STATE EQUIVALENT SERVICE ROLE		COMMERCIAL SERVICE	SAME

1. ALL COORDINATES ARE IN NORTH AMERICAN DATUM OF 1983 (NAD 83)
2. ALL ELEVATIONS / VERTICAL CONTROL DATUM ARE IN NAVD 88 AND EXPRESSED IN FEET ABOVE MEAN SEA LEVEL (MSL).
3. MAGNETIC VARIATION SOURCE: NOAA NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION, WORLD MAGNETIC MODEL (WMM) (2014-2019)

DECLARED DISTANCES					
RUNWAY END		TORA	TODA	ASDA	LDA
RUNWAY 9	EXISTING	7,111'	7,111'	7,111'	6,911'
	FUTURE	7,111'	7,111'	7,111'	6,911'
RUNWAY 27	EXISTING	7,111'	7,111'	7,111'	6,911'
	FUTURE	7,111'	7,111'	7,111'	6,911'

SURVEY MONUMENTS					
IDENTIFIER	NGS PID	PACS OR SACS	LATITUDE	LONGITUDE	ELEVATION
TEX E	DP6610	PACS	37° 57' 13.233"	107° 54' 16.624"	9043.9'
TEX F	DP6611	SACS	37° 57' 22.805"	107° 54' 58.980"	9024.6'
TEX G	DP6612	SACS	37° 57' 07.899"	107° 53' 50.179"	9063.2'

SOURCE: NATIONAL GEODETIC SURVEY, NAD 83 (2011), NAVD 88

TAXIWAY / TAXILANE DATA TABLE										
	TWY A	TWY A (F)	TWY A2 (F)	TWY A3	TWY A3 (F)	TWY A4	TWY A4 (F)	T/L B (F)	TWY B2 (F)	TWY B3 (F)
TAXIWAY / TAXILANE WIDTH	50' (TDG 4)	75' (TDG 5)	35' (TDG 2)	70' (TDG 4)	75' (TDG 5)	70' (TDG 4)	75' (TDG 5)	35' (TDG 2)	35' (TDG 2)	35' (TDG 2)
TAXIWAY EDGE SAFETY MARGIN	10'	15'	7.5'	10'	15'	10'	15'	7.5'	7.5'	7.5'
TAXIWAY / TAXILANE SAFETY AREA	118' (ADG III)	118' (ADG III)	118' (ADG III)	118' (ADG III)	118' (ADG III)	118' (ADG III)	118' (ADG III)	118' (ADG III)	118' (ADG III)	118' (ADG III)
TAXIWAY / TAXILANE SEPARATION (OBJECTS WITHIN TSA)	MEETS STANDARDS	MEETS STANDARDS	MEETS STANDARD	MEETS STANDARDS	MEETS STANDARDS	MEETS STANDARDS	MEETS STANDARDS	MEETS STANDARD	MEETS STANDARD	MEETS STANDARD
TAXIWAY / TAXILANE OBJECT FREE AREA	186' (ADG III)	186' (ADG III)	186' (ADG III)	186' (ADG III)	186' (ADG III)	186' (ADG III)	186' (ADG III)	162' (ADG III)	186' (ADG III)	186' (ADG III)
TAXIWAY / TAXILANE SEPARATION (OBJECTS WITHIN TOFA)	MEETS STANDARDS	MEETS STANDARDS	MEETS STANDARD	MEETS STANDARDS	MEETS STANDARDS	ROAD 69' EAST	ROAD 69' EAST	MEETS STANDARD	MEETS STANDARD	MEETS STANDARD
TAXIWAY / TAXILANE LIGHTING	HITL	HITL	HITL	HITL	HITL	HITL	HITL	HITL	HITL	HITL

FUTURE TAXIWAY/ TAXILANE

1. TAXIWAY DESIGN GROUP SHOWN IS LARGEST GROUP ALLOWABLE FOR TAXIWAY WIDTH

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TELLURIDE REGIONAL AIRPORT

TELLURIDE REGIONAL AIRPORT
TELLURIDE, CO

AIRPORT LAYOUT PLAN

CONSULTANTS

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: JUNE 2016
REVIEWED BY: DC / MLB
DRAWN BY: SD
DESIGNED BY: TJM

PROJECT NUMBER
224-3624-001

SHEET TITLE

AIRPORT DATA SHEET

SHEET NUMBER

DRAFT

FAA CONDITIONAL APPROVAL

SUBJECT TO LETTER DATED: ____________

CASE NO.: ____________

FEDERAL AVIATION ADMINISTRATION
DENVER AIRPORT DISTRICT OFFICE — DATE

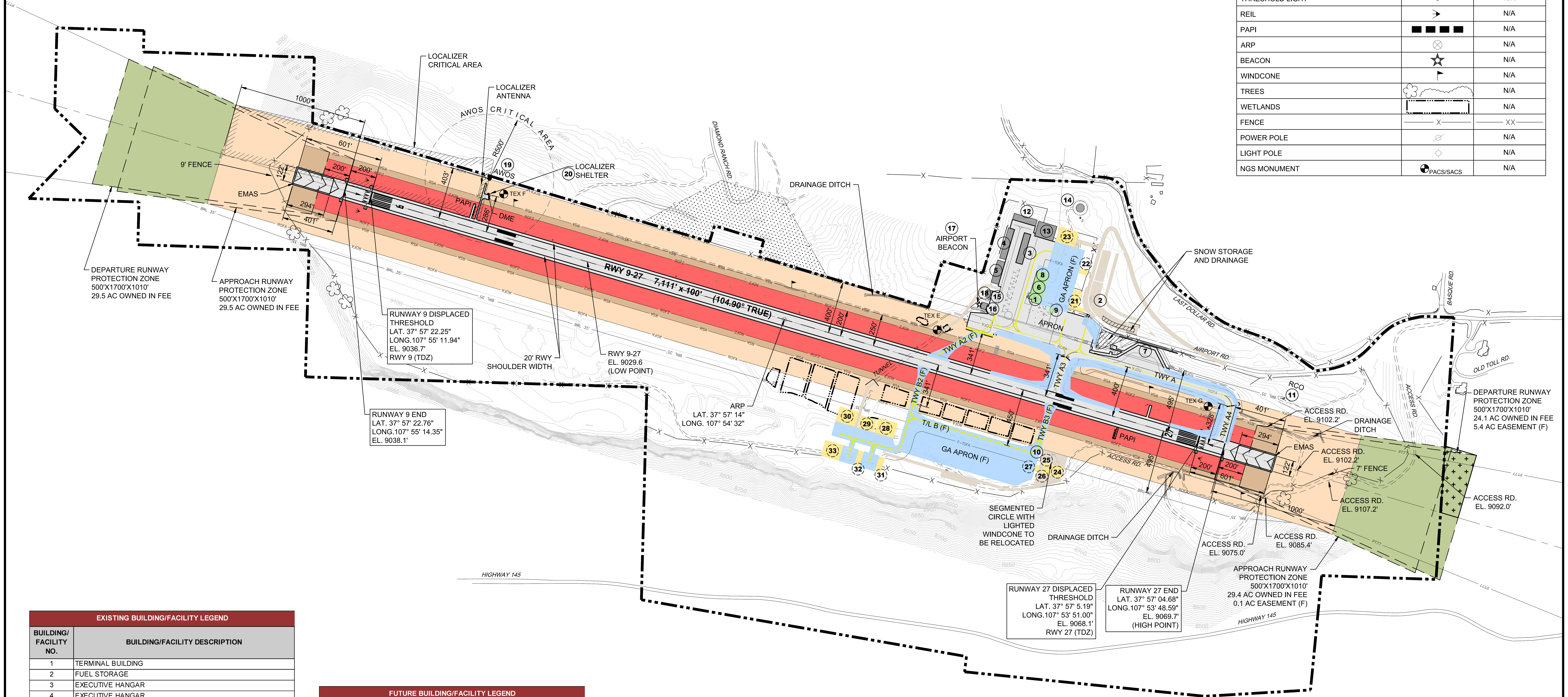
FAA DISCLAIMER

AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA OR COLORADO DIVISION OF AERONAUTICS. ACCEPTANCE OF THIS REPORT BY THE FAA AND COLORADO DIVISION OF AERONAUTICS DOES NOT IN ANYWAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES OR COLORADO DIVISION OF AERONAUTICS TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

CONSTRUCTION NOTICE REQUIREMENT

THESE ALP DRAWINGS ARE FOR PLANNING PURPOSES ONLY. THE DRAWING INFORMATION, INCLUDING LOCATION DETAILS AND ELEVATIONS SHOULD NOT BE USED FOR CONSTRUCTION. TO PROTECT THE AIRPORT'S OPERATIONAL SAFETY AND FUTURE DEVELOPMENT, ALL PROPOSED CONSTRUCTION ON THE AIRPORT MUST BE COORDINATED BY THE AIRPORT OWNER WITH FAA/STATE AERONAUTICS PRIOR TO CONSTRUCTION. REVIEW TAKES APPROXIMATELY 60 DAYS.

DESCRIPTION	EXISTING	FUTURE
PROPERTY LINE		N/A
EASEMENT		
RUNWAY SAFETY AREA		N/A
RUNWAY OBJECT FREE AREA		N/A
RUNWAY OBSTACLE FREE ZONE		N/A
RUNWAY PROTECTION ZONE		N/A
TAXIWAY SAFETY AREA	TSA	F-TSA
TAXIWAY OBJECT FREE AREA	TOFA	F-TOFA
BUILDING RESTRICTION LINE	BRL 35'	N/A
PART 77 SURFACE	PT77	N/A
AIRFIELD PAVEMENT		
BUILDINGS		
BUILDINGS TO BE REMOVED	N/A	
PAVED ROADWAY/PARKING		
UNPAVED ROADWAY/PARKING		N/A
THRESHOLD LIGHT		N/A
REIL		N/A
PAPI		N/A
ARP		N/A
BEACON		N/A
WINDCONE		N/A
TREES		N/A
WETLANDS		N/A
FENCE	X	XX
POWER POLE		N/A
LIGHT POLE		N/A
NGS MONUMENT	PACS/SACS	N/A



EXISTING BUILDING/FACILITY LEGEND

BUILDING/ FACILITY NO.	BUILDING/FACILITY DESCRIPTION
1	TERMINAL BUILDING
2	FUEL STORAGE
3	EXECUTIVE HANGAR
4	EXECUTIVE HANGAR
5	HANGAR (S1-S3) 180' X 60'
6	CONVENTIONAL HANGAR
7	DEICING PAD
8	AIRPORT MAINTENANCE
9	ARFF
10	SEGMENTED CIRCLE WITH LIGHTED WINDCONE
11	REMOTE COMMUNICATION OUTLET (RCO)
12	EXECUTIVE HANGAR (185' X 50')
13	CONVENTIONAL HANGAR (146' X 120')
14	WATER STORAGE TANK
15	FUEL TRUCK SHADE
16	FUEL FARM
17	AIRPORT BEACON
18	SELF FUELING FACILITY
19	AWOS
20	LOCALIZER SHELTER

FUTURE BUILDING/FACILITY LEGEND

BUILDING/ FACILITY NO.	BUILDING/FACILITY DESCRIPTION
21	COMMERCIAL PASSENGER TERMINAL
22	GENERAL AVIATION TERMINAL
23	TRANSIENT AIRCRAFT HANGAR
24	SRE STORAGE AND MAINTENANCE
25	ARFF FACILITY
26	GENERAL AVIATION TERMINAL
27	SELF FUELING FACILITY
28	TRANSIENT AIRCRAFT HANGAR
29	TRANSIENT AIRCRAFT HANGAR
30	TRANSIENT AIRCRAFT HANGAR
31	BASED AIRCRAFT HANGARS
32	BASED AIRCRAFT HANGARS
33	TRANSIENT AIRCRAFT HANGAR

NOTES:
1. ALL LATITUDE AND LONGITUDE COORDINATES ARE IN NORTH AMERICAN DATUM OF 1983 (NAD 83).
2. ALL ELEVATIONS / VERTICAL CONTROL DATUM ARE IN NAVD 88 AND EXPRESSED IN FEET ABOVE MEAN SEA LEVEL (MSL).
3. ROADWAY ELEVATIONS INCLUDE TRAVERSEWAY ADJUSTMENT (23' RAILROADS 17' HIGHWAYS 15' PUBLIC ROADS 10' PRIVATE ROADS).
4. THE FULL DIMENSION RSA REQUIREMENT MET WITH 401' EMAS AND 200' DISPLACED THRESHOLD, PER AC 150/5300-13A, AIRPORT DESIGN, CHANGE 1.

MAGNETIC DECLINATION
9° 37' EAST
FEBRUARY, 2016
ANNUAL CHANGE 0° 6' WEST

N

400' 200' 0 400'

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4700 S. Syracuse Street, Suite 300
Denver, CO 80237
303-409-9700 FAX 303-409-9701
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TELLURIDE REGIONAL AIRPORT

TELLURIDE REGIONAL AIRPORT

TELLURIDE, CO

AIRPORT LAYOUT PLAN

CONSULTANTS

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: JUNE 2016
REVIEWED BY: DC / MLB
DRAWN BY: SD
DESIGNED BY: TJM

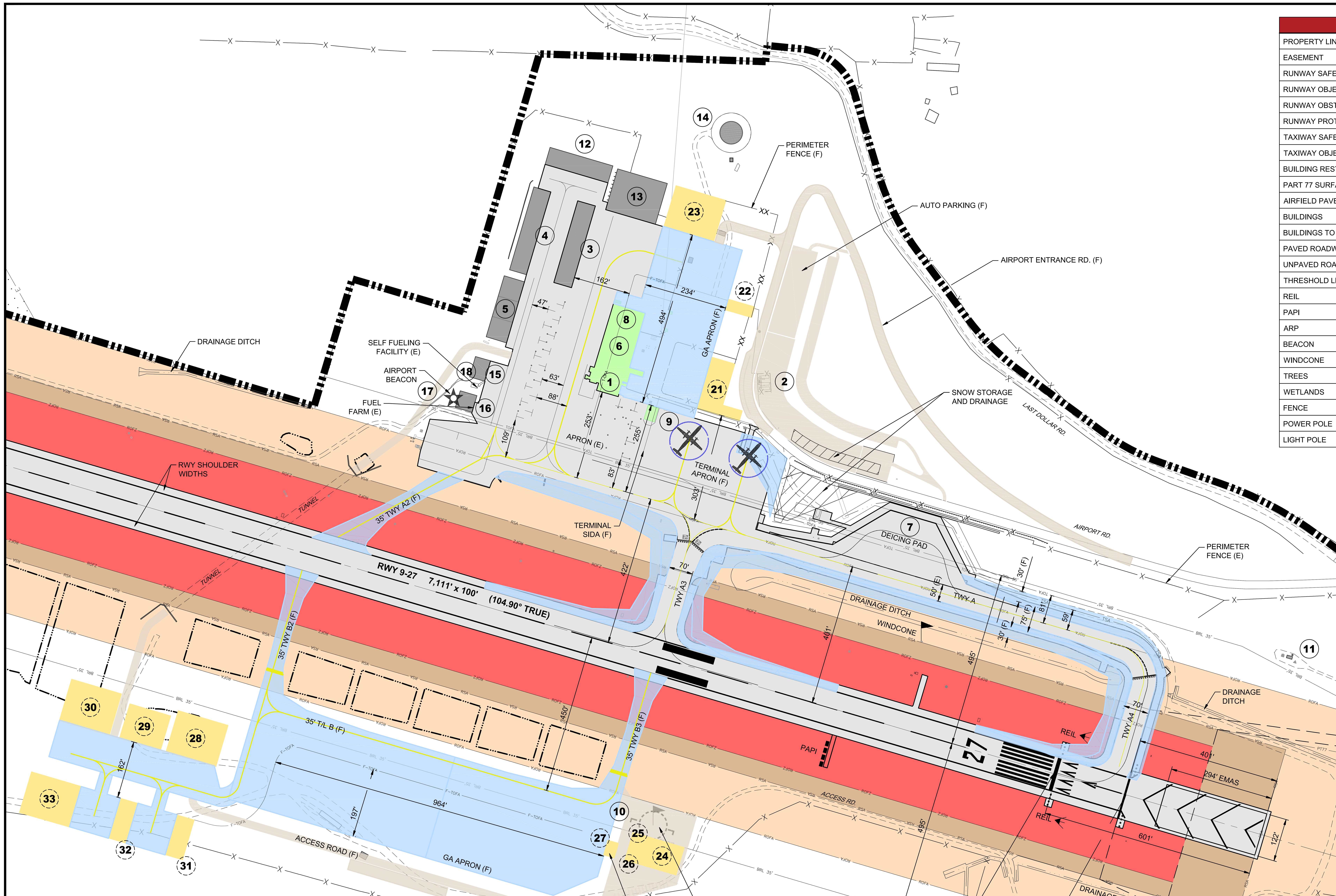
PROJECT NUMBER
224-3624-001

SHEET TITLE

AIRPORT LAYOUT PLAN

SHEET NUMBER

DRAFT



DESCRIPTION	EXISTING	FUTURE
PROPERTY LINE		N/A
EASEMENT		
RUNWAY SAFETY AREA	RSA	N/A
RUNWAY OBJECT FREE AREA	ROFA	N/A
RUNWAY OBSTACLE FREE ZONE	ROFZ	N/A
RUNWAY PROTECTION ZONE		N/A
TAXIWAY SAFETY AREA	TSA	F-TSA
TAXIWAY OBJECT FREE AREA	TOFA	F-TOFA
BUILDING RESTRICTION LINE	BRL 35'	N/A
PART 77 SURFACE	PT77	N/A
AIRFIELD PAVEMENT		
BUILDINGS		
BUILDINGS TO BE REMOVED	N/A	
PAVED ROADWAY/PARKING		
UNPAVED ROADWAY/PARKING		N/A
THRESHOLD LIGHT		N/A
REIL		N/A
PAPI		N/A
ARP		N/A
BEACON		N/A
WINDCONE		N/A
TREES		N/A
WETLANDS		N/A
FENCE		XX
POWER POLE		N/A
LIGHT POLE		N/A

EXISTING BUILDING/FACILITY LEGEND

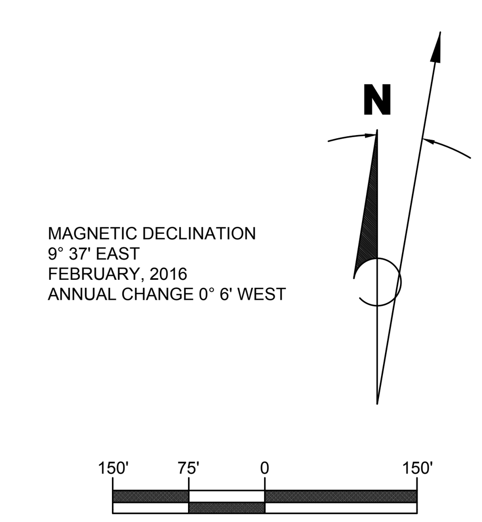
BUILDING/ FACILITY NO.	BUILDING/FACILITY DESCRIPTION	TOP ELEVATION
1	TERMINAL BUILDING	9084.8'
2	FUEL STORAGE	9079.5'
3	EXECUTIVE HANGAR	9082.1'
4	EXECUTIVE HANGAR	9080.3'
5	HANGAR (S1-S3) 180' X 60'	9086.1'
6	CONVENTIONAL HANGAR	9116.0'
7	DEICING PAD	N/A
8	AIRPORT MAINTENANCE	9076.9'
9	ARFF	9082.1'
10	SEGMENTED CIRCLE WITH LIGHTED WINDCONE	9079.3'
11	REMOTE COMMUNICATION OUTLET (RCO)	9138.8'
12	EXECUTIVE HANGAR (185' X 50')	9085.0'
13	CONVENTIONAL HANGAR (146' X 120')	9105.3'
14	WATER STORAGE TANK	9123.1'
15	FUEL TRUCK SHADE	9078.0'
16	FUEL FARM	9076.1'
17	AIRPORT BEACON	9091.7'
18	SELF FUELING FACILITY	9076.1'
19	AWOS	9052.0'
20	LOCALIZER SHELTER	9043.0'

NOTE: ALL ELEVATIONS ARE EXPRESSED IN FEET ABOVE MEAN SEA LEVEL (MSL).

FUTURE BUILDING/FACILITY LEGEND

BUILDING/ FACILITY NO.	BUILDING/FACILITY DESCRIPTION	TOP ELEVATION
21	COMMERCIAL PASSENGER TERMINAL	9101'
22	GENERAL AVIATION TERMINAL	9101'
23	TRANSIENT AIRCRAFT HANGAR	9106'
24	SRE STORAGE AND MAINTENANCE	9085'
25	ARFF FACILITY	9085'
26	GENERAL AVIATION TERMINAL	9085'
27	SELF FUELING FACILITY	9062'
28	TRANSIENT AIRCRAFT HANGAR	9100'
29	TRANSIENT AIRCRAFT HANGAR	9104'
30	TRANSIENT AIRCRAFT HANGAR	9098'
31	BASED AIRCRAFT HANGARS	9087'
32	BASED AIRCRAFT HANGARS	9087'
33	TRANSIENT AIRCRAFT HANGAR	9102'

NOTE: FUTURE BUILDING ELEVATIONS ARE ESTIMATED.



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TELLURIDE REGIONAL AIRPORT

TELLURIDE REGIONAL AIRPORT
TELLURIDE, CO

AIRPORT LAYOUT PLAN

CONSULTANTS

REVISIONS

NO.	DESCRIPTION	DATE

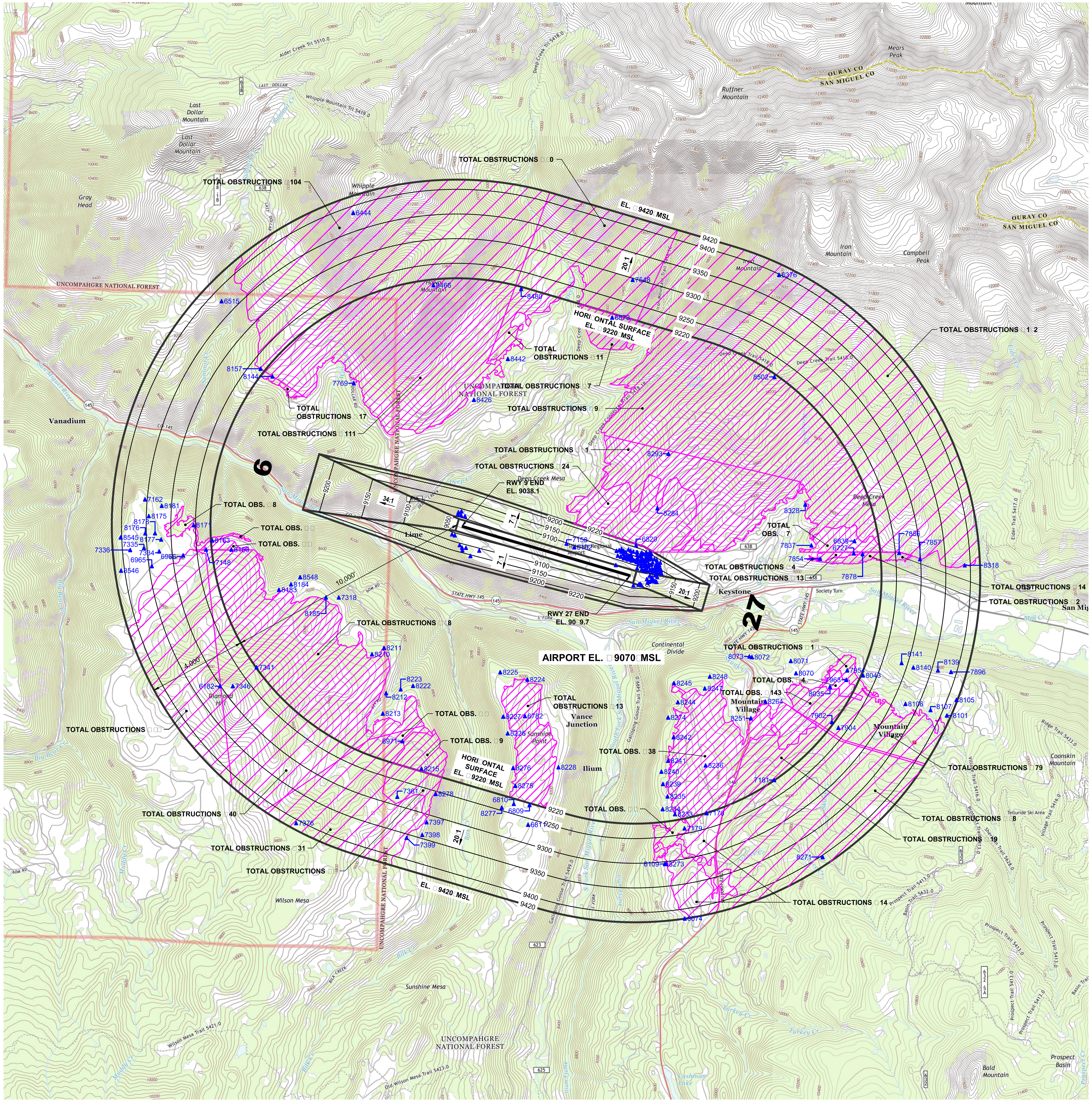
DATE ISSUED: JUNE 2016
REVIEWED BY: DC / MLB
DRAWN BY: SD
DESIGNED BY: TJM
PROJECT NUMBER
224-3624-001

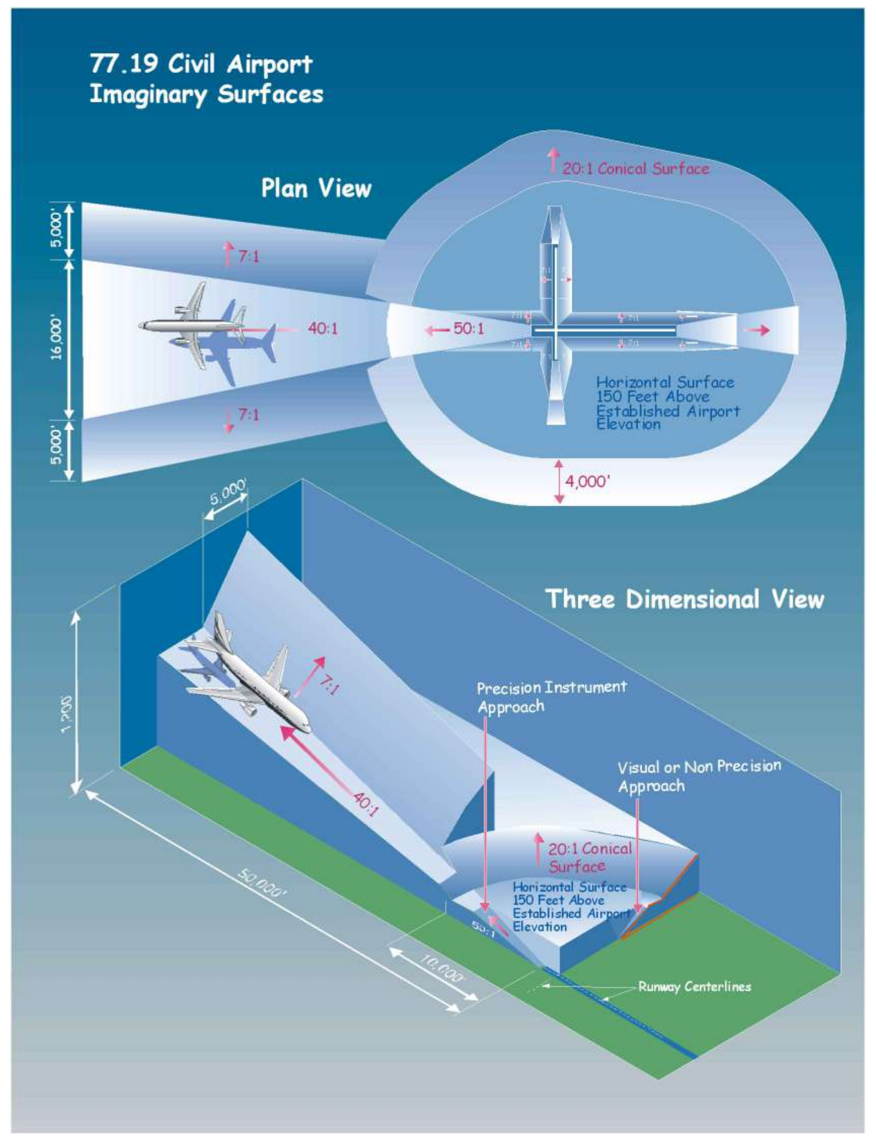
SHEET TITLE

TERMINAL AREA PLAN

SHEET NUMBER

DRAFT





DIM	ITEM	DIMENSIONAL STANDARDS □FEET□					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	□
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	□

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
□ - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

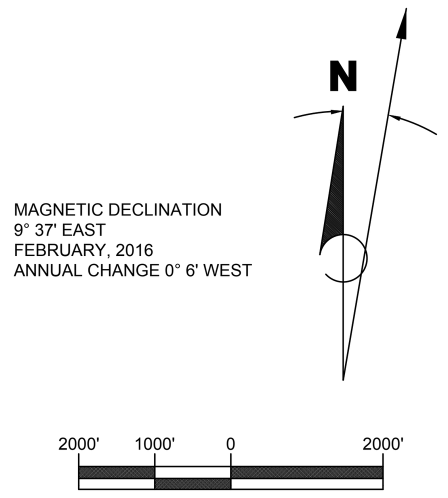
NOTES:

1. OBSTRUCTIONS SHOWN WITHIN OBSTRUCTION GRID AREA ARE OBJECTS WITH THE HIGHEST PENETRATION AMOUNT FOR THAT AREA.
2. "TOTAL OBSTRUCTIONS = ##" REFERS TO THE TOTAL NUMBER OF OBSTRUCTIONS WITHIN THE HATCHED OBSTRUCTION GRID AREA.
3. SEE SHEET 7 FOR OBSTRUCTION TABLES.
4. SEE INNER APPROACH PLAN AND PROFILE SHEETS FOR CLOSE-IN OBSTRUCTIONS. (SHOWN AS SYMBOL ONLY)
5. USGS QUADRANGLE BASE MAPS OBTAINED NOVEMBER, 2014.

LEGEND	
DESCRIPTION	SYMBOL
OBSTRUCTION	▲ 5000
OBSTRUCTION GRID AREA	

□ONING RESTRICTIONS

SEE SAN MIGUEL COUNTY LAND USE CODE, ARTICLE 5-STANDARDS, SECTION 5-418 TELLURIDE REGIONAL AIRPORT



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TELLURIDE, CO

AIRPORT LAYOUT PLAN

CONSULTANTS

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: JUNE 2016
REVIEWED BY: DC / MLB
DRAWN BY: SD
DESIGNED BY: TJM

PROJECT NUMBER
224-3624-001

SHEET TITLE
FAR PART 77 AIRSPACE SURFACES DRAWING

SHEET NUMBER
6 OF 13

DRAFT

OBSTRUCTION TABLE

OBJECT NO.	OBJECT DESCRIPTION	GROUND SURFACE ELEVATION (FT.) (2)	OBJECT TOP ELEVATION (FT.)	PART 77 SURFACE ELEVATION (FT.)	PART 77 CLEARANCE (+ PENETRATE) (- CLEAR)	PART 77 SURFACE VIOLATION	PROPOSED DISPOSITION
5102	ANTENNA	9080.0	9100.6	9089.8	10.8	TRANSITIONAL	OBSTRUCTION LIGHT
6074	BUILDING	9373.0	9420.0	9419.4	0.6	CONICAL	OBSTRUCTION LIGHT
6109	BUILDING	9301.0	9311.0	9304.8	6.2	CONICAL	OBSTRUCTION LIGHT
6156	BUSH	9250.0	9256.4	9219.7	36.7	HORIZONTAL	NO ACTION
6182	FENCE	10094.0	10099.9	9301.2	798.7	CONICAL	NO ACTION
6376	GRND	11901.1	11901.1	9398.9	2502.2	CONICAL	NO ACTION
6444	GRND	11795.6	11795.6	9386.7	2408.9	CONICAL	NO ACTION
6515	GRND	9391.7	9391.7	9378.6	13.1	HORIZONTAL	NO ACTION
6727	GRND	9389.6	9389.6	9219.7	169.9	HORIZONTAL	NO ACTION
6782	GRND	9361.4	9361.4	9219.7	141.7	HORIZONTAL	NO ACTION
6809	GRND	9295.7	9295.7	9223.2	72.5	CONICAL	NO ACTION
6810	GRND	9256.1	9256.1	9230.0	26.1	CONICAL	NO ACTION
6811	GRND	9264.6	9264.6	9262.4	2.2	CONICAL	NO ACTION
6820	GRND	9270.7	9270.7	9212.0	58.7	TRANSITIONAL	NO ACTION
6839	GRND	9461.9	9461.9	9219.7	242.2	HORIZONTAL	NO ACTION
6873	GRND	10175.1	10175.1	9219.7	955.4	HORIZONTAL	NO ACTION
6954	ROAD	9476.0	9491.0	9405.6	85.4	CONICAL	NO ACTION
6965	ROAD	9333.2	9348.2	9344.4	3.8	CONICAL	NO ACTION
6966	ROAD	9278.2	9293.2	9278.7	14.5	CONICAL	NO ACTION
6971	ROAD	9274.4	9289.4	9219.7	69.7	HORIZONTAL	NO ACTION
7148	ROAD	9241.2	9256.2	9231.4	24.8	CONICAL	NO ACTION
7158	TREE	9066.0	9097.0	9096.0	1.0	TRANSITIONAL	NO ACTION
7162	TREE	9302.0	9356.0	9354.7	1.3	CONICAL	NO ACTION
7170	TREE	9389.0	9412.5	9220.0	192.5	CONICAL	NO ACTION
7179	TREE	9286.0	9371.1	9239.2	131.9	CONICAL	NO ACTION
7181	TREE	9521.0	9615.8	9219.7	396.1	HORIZONTAL	NO ACTION
7281	TREE	9542.0	9618.2	9390.9	227.3	CONICAL	NO ACTION
7318	TREE	9147.0	9220.9	9219.7	1.2	HORIZONTAL	NO ACTION
7334	TREE	9310.0	9368.6	9326.2	42.4	CONICAL	NO ACTION
7335	TREE	9334.0	9390.3	9356.5	33.8	CONICAL	NO ACTION
7336	TREE	9355.0	9393.9	9384.5	9.4	CONICAL	NO ACTION
7341	TREE	9755.0	9797.5	9219.7	577.8	HORIZONTAL	NO ACTION
7346	TREE	10062.0	10093.6	9279.9	813.7	CONICAL	NO ACTION
7361	TREE	9556.0	9614.3	9282.9	331.5	CONICAL	NO ACTION
7376	TREE	9826.0	9853.0	9407.0	446.0	CONICAL	NO ACTION
7397	TREE	9293.0	9342.8	9315.6	27.2	CONICAL	NO ACTION
7398	TREE	9277.0	9347.5	9342.7	4.8	CONICAL	NO ACTION
7399	TREE	9361.0	9374.0	9357.4	16.6	CONICAL	NO ACTION
7548	TREE	10534.0	10569.0	9297.0	1272.1	CONICAL	NO ACTION
7769	TREE	9147.0	9221.9	9219.7	2.2	HORIZONTAL	NO ACTION
7837	TREE	9178.0	9240.2	9219.7	20.5	HORIZONTAL	NO ACTION
7854	TREE	9240.0	9261.7	9219.7	42.0	HORIZONTAL	NO ACTION
7856	TREE	9486.0	9505.8	9258.0	247.9	CONICAL	NO ACTION
7857	TREE	9297.0	9365.5	9299.3	66.2	CONICAL	NO ACTION
7878	TREE	9397.0	9421.7	9219.7	202.0	HORIZONTAL	NO ACTION
7896	TREE	9466.0	9498.4	9389.2	109.2	CONICAL	NO ACTION
7902	TREE	9475.0	9536.1	9219.7	316.4	HORIZONTAL	NO ACTION
7904	TREE	9540.0	9606.4	9233.3	373.1	CONICAL	NO ACTION
7954	TREE	9302.0	9365.4	9219.7	145.7	HORIZONTAL	NO ACTION
7963	TREE	9273.0	9354.6	9219.7	134.9	HORIZONTAL	NO ACTION
8043	TREE	9186.0	9242.9	9223.7	19.2	CONICAL	NO ACTION
8070	TREE	9191.0	9235.7	9219.7	16.0	HORIZONTAL	NO ACTION
8071	TREE	9191.0	9251.1	9219.7	31.4	HORIZONTAL	NO ACTION
8072	TREE	9175.0	9223.8	9219.7	4.1	HORIZONTAL	NO ACTION
8073	TREE	9184.0	9222.4	9219.7	2.7	HORIZONTAL	NO ACTION
8101	TREE	9408.0	9472.3	9412.0	60.4	CONICAL	NO ACTION
8105	TREE	9417.0	9454.3	9418.4	36.0	CONICAL	NO ACTION
8106	TREE	9297.0	9358.3	9325.9	32.4	CONICAL	NO ACTION
8107	TREE	9304.0	9393.2	9377.2	16.0	CONICAL	NO ACTION

OBSTRUCTION TABLE

OBJECT NO.	OBJECT DESCRIPTION	GROUND SURFACE ELEVATION (FT.) (2)	OBJECT TOP ELEVATION (FT.)	PART 77 SURFACE ELEVATION (FT.)	PART 77 CLEARANCE (+ PENETRATE) (- CLEAR)	PART 77 SURFACE VIOLATION	PROPOSED DISPOSITION
8139	TREE	9461.0	9472.2	9362.8	109.4	CONICAL	NO ACTION
8140	TREE	9381.0	9421.9	9313.5	108.4	CONICAL	NO ACTION
8141	TREE	9340.0	9366.8	9288.1	78.8	CONICAL	NO ACTION
8144	TREE	9308.0	9312.0	9219.7	92.3	HORIZONTAL	NO ACTION
8157	TREE	9273.0	9281.5	9228.7	52.8	CONICAL	NO ACTION
8163	TREE	9214.0	9280.0	9219.7	60.3	HORIZONTAL	NO ACTION
8171	TREE	9220.0	9308.6	9254.0	54.6	CONICAL	NO ACTION
8175	TREE	9301.0	9373.5	9345.1	28.4	CONICAL	NO ACTION
8176	TREE	9317.0	9357.7	9352.3	5.4	CONICAL	NO ACTION
8177	TREE	9295.0	9362.1	9320.7	41.4	CONICAL	NO ACTION
8178	TREE	9299.0	9347.6	9332.5	15.1	CONICAL	NO ACTION
8181	TREE	9253.0	9329.0	9320.0	9.1	CONICAL	NO ACTION
8183	TREE	9195.0	9306.0	9219.7	86.3	HORIZONTAL	NO ACTION
8184	TREE	9178.0	9244.8	9219.7	25.1	HORIZONTAL	NO ACTION
8185	TREE	9221.0	9257.3	9219.7	37.6	HORIZONTAL	NO ACTION
8210	TREE	9260.0	9329.5	9219.7	109.8	HORIZONTAL	NO ACTION
8211	TREE	9217.0	9256.2	9219.7	36.5	HORIZONTAL	NO ACTION
8212	TREE	9165.0	9252.3	9219.7	32.6	HORIZONTAL	NO ACTION
8213	TREE	9206.0	9287.5	9219.7	67.8	HORIZONTAL	NO ACTION
8215	TREE	9466.0	9533.8	9219.7	314.1	HORIZONTAL	NO ACTION
8222	TREE	9175.0	9241.2	9219.7	21.5	HORIZONTAL	NO ACTION
8223	TREE	9164.0	9225.6	9219.7	5.9	HORIZONTAL	NO ACTION
8224	TREE	9239.0	9344.0	9219.7	124.3	HORIZONTAL	NO ACTION
8225	TREE	9201.0	9270.2	9219.7	50.5	HORIZONTAL	NO ACTION
8226	TREE	9219.0	9229.3	9219.7	9.6	HORIZONTAL	NO ACTION
8227	TREE	9191.0	9220.1	9219.7	0.4	HORIZONTAL	NO ACTION
8228	TREE	9163.0	9241.0	9219.7	21.3	HORIZONTAL	NO ACTION
8233	TREE	9246.0	9275.2	9219.7	55.5	HORIZONTAL	NO ACTION
8234	TREE	9164.0	9234.1	9219.7	14.4	HORIZONTAL	NO ACTION
8235	TREE	9222.0	9262.7	9219.7	43.0	HORIZONTAL	NO ACTION
8236	TREE	9427.0	9445.1	9219.7	225.4	HORIZONTAL	NO ACTION
8239	TREE	9227.0	9268.0	9219.7	48.3	HORIZONTAL	NO ACTION
8240	TREE	9172.0	9229.5	9219.7	9.8	HORIZONTAL	NO ACTION
8241	TREE	9219.0	9291.1	9219.7	71.4	HORIZONTAL	NO ACTION
8242	TREE	9242.0	9298.6	9219.7	78.9	HORIZONTAL	NO ACTION
8244	TREE	9211.0	9276.9	9219.7	57.2	HORIZONTAL	NO ACTION
8245	TREE	9219.0	9265.9	9219.7	46.2	HORIZONTAL	NO ACTION
8247	TREE	9331.0	9377.8	9219.7	158.1	HORIZONTAL	NO ACTION
8248	TREE	9245.0	9306.8	9219.7	87.1	HORIZONTAL	NO ACTION
8251	TREE	9236.0	9258.8	9219.7	39.1	HORIZONTAL	NO ACTION
8264	TREE	9188.0	9220.3	9219.7	0.6	HORIZONTAL	NO ACTION
8271	TREE	10062.0	10115.9	9403.4	712.5	CONICAL	NO ACTION
8273	TREE	9312.0	9320.8	9305.2	15.6	CONICAL	NO ACTION
8274	TREE	9135.0	9231.5	9219.7	11.8	HORIZONTAL	NO ACTION
8275	TREE	9277.0	9296.7	9219.7	77.0	HORIZONTAL	NO ACTION
8276	TREE	9217.0	9243.6	9219.7	23.9	HORIZONTAL	NO ACTION
8277	TREE	9226.0	9253.1	9244.3	8.8	CONICAL	NO ACTION
8278	TREE	9158.0	9270.4	9255.4	15.0	CONICAL	NO ACTION
8284	TREE	9505.0	9513.4	9219.7	293.7	HORIZONTAL	NO ACTION
8293	TREE	9744.0	9817.4	9219.7	597.7	HORIZONTAL	NO ACTION
8328	TREE	9133.0	9225.5	9219.7	5.8	HORIZONTAL	NO ACTION
8426	TREE	9177.0	9239.3	9219.7	19.6	HORIZONTAL	NO ACTION
8442	TREE	9141.0	9224.8	9219.7	5.1	HORIZONTAL	NO ACTION
8466	TREE	10910.0	10941.1	9219.7	1721.4	HORIZONTAL	NO ACTION
8480	TREE	9468.0	9545.3	9219.7	325.6	HORIZONTAL	NO ACTION
8502	TREE	10376.0	10454.0	9219.7	1234.3	HORIZONTAL	NO ACTION
8545	TREE	9343.0	9404.1	9402.3	1.8	CONICAL	NO ACTION
8546	TREE	9366.0	9421.7	9407.5	14.2	CONICAL	NO ACTION
8548	TREE	9164.0	9220.2	9219.7	0.5	HORIZONTAL	NO ACTION

1. OBSTRUCTION SURVEY COMPLETED BY WOOLPERT, INC. SEPTEMBER, 2014.
2. OBJECTS ARE OUTSIDE OF GROUND SURVEY LIMITS. GROUND SURFACE ELEVATIONS ARE APPROXIMATE.
3. ELEVATIONS IN TABLE REFLECT THE RECOMMENDED AIRSPACE CLEARANCES:
23' RAILROADS | 17' HIGHWAYS | 15' PUBLIC ROADS | 10' PRIVATE ROADS.

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TELLURIDE REGIONAL AIRPORT

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TELLURIDE, CO

AIRPORT LAYOUT PLAN

CONSULTANTS

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: JUNE 2016
REVIEWED BY: DC / MLB
DRAWN BY: SD
DESIGNED BY: TJM

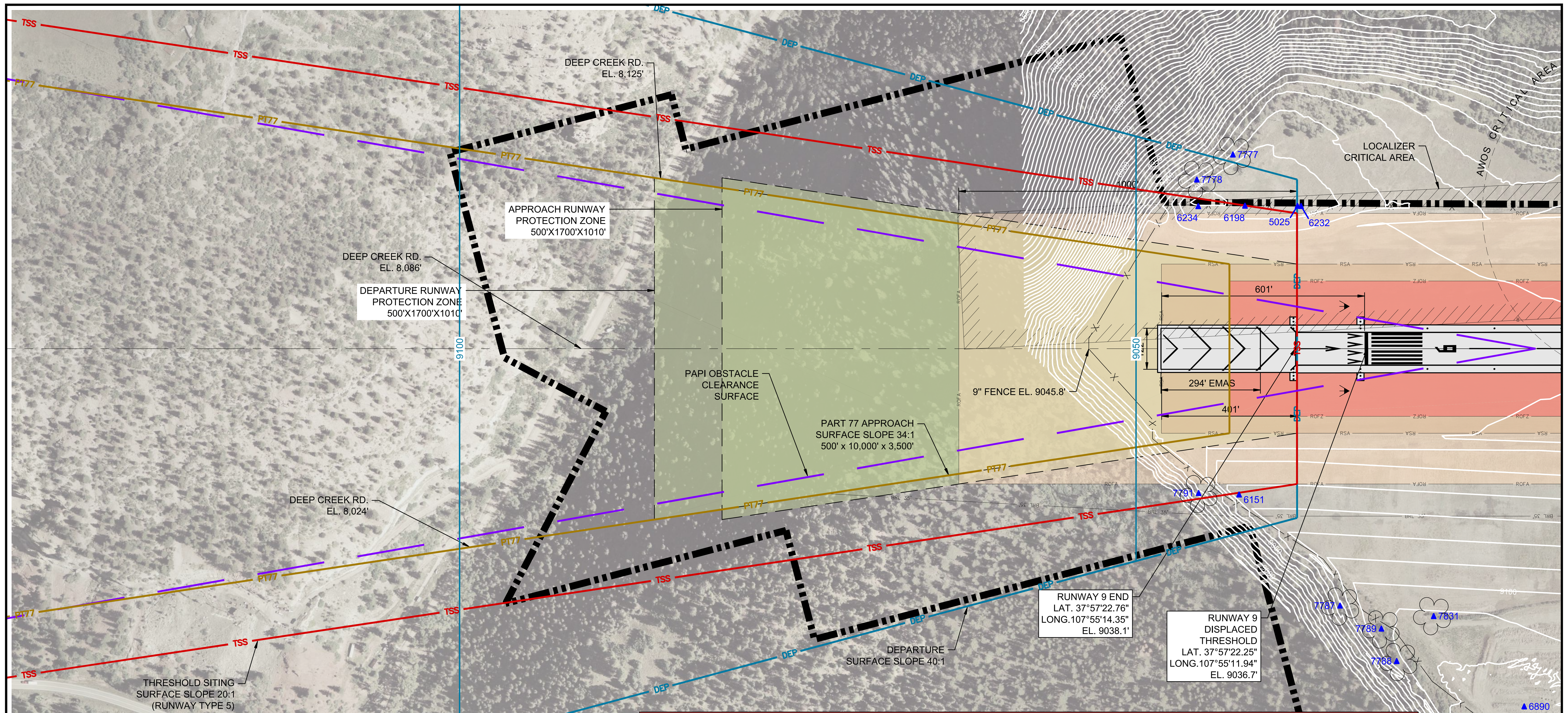
PROJECT NUMBER
224-3624-001

SHEET TITLE

FAR PART 77 OBSTRUCTION TABLES

SHEET NUMBER

DRAFT

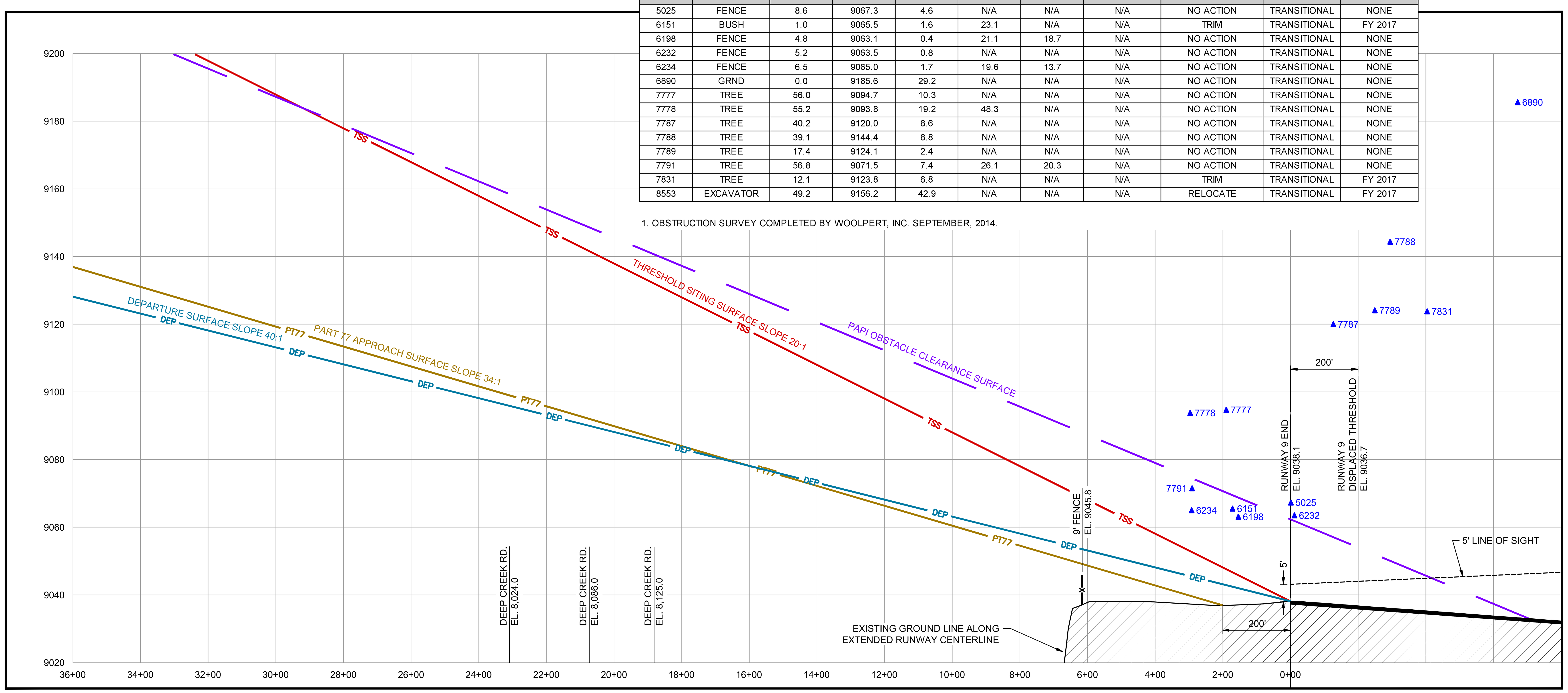


DESCRIPTION	EXISTING	FUTURE
PROPERTY LINE		N/A
EASEMENT		
RUNWAY SAFETY AREA		N/A
RUNWAY OBJECT FREE AREA		N/A
RUNWAY OBSTACLE FREE ZONE		N/A
RUNWAY PROTECTION ZONE		N/A
TAXIWAY SAFETY AREA		
TAXIWAY OBJECT FREE AREA		
BUILDING RESTRICTION LINE		N/A
DEPARTURE SURFACE	DEP	N/A
PART 77 SURFACE	PT77	N/A
PAPI OBSTACLE CLEARANCE SURFACE		N/A
THRESHOLD SITING SURFACE	TSS	N/A
AIRFIELD PAVEMENT		
PAVED ROADWAY/PARKING		
UNPAVED ROADWAY/PARKING		N/A
THRESHOLD LIGHT		N/A
REIL		N/A
PAPI		N/A
TREES		N/A
FENCE		
POWER POLE		N/A
LIGHT POLE		N/A
OBSTRUCTION	5000	N/A

RUNWAY 9 OBSTRUCTION TABLE

OBJECT NO.	OBJECT DESCRIPTION	ABOVE GROUND LEVEL (FT.)	OBJECT TOP ELEVATION (FT.)	CLEARANCE (+ PENETRATE) (- CLEAR)				PROPOSED DISPOSITION	PART 77 SURFACE VIOLATION	TRIGGERING EVENT
				PART 77 APPROACH SURFACE (FT.)	DEPARTURE SURFACE (FT.)	THRESHOLD SITING SURFACE (FT.)	PAPI OBSTACLE CLEARANCE SURFACE (FT.)			
5025	FENCE	8.6	9067.3	4.6	N/A	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6151	BUSH	1.0	9065.5	1.6	23.1	N/A	N/A	TRIM	TRANSITIONAL	FY 2017
6198	FENCE	4.8	9063.1	0.4	21.1	18.7	N/A	NO ACTION	TRANSITIONAL	NONE
6232	FENCE	5.2	9063.5	0.8	N/A	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6234	FENCE	6.5	9065.0	1.7	19.6	13.7	N/A	NO ACTION	TRANSITIONAL	NONE
6890	GRND	0.0	9185.6	29.2	N/A	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7777	TREE	56.0	9094.7	10.3	N/A	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7778	TREE	55.2	9093.8	19.2	48.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7787	TREE	40.2	9120.0	8.6	N/A	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7788	TREE	39.1	9144.4	8.8	N/A	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7789	TREE	17.4	9124.1	2.4	N/A	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7791	TREE	56.8	9071.5	7.4	26.1	20.3	N/A	NO ACTION	TRANSITIONAL	NONE
7831	TREE	12.1	9123.8	6.8	N/A	N/A	N/A	TRIM	TRANSITIONAL	FY 2017
8553	EXCAVATOR	49.2	9156.2	42.9	N/A	N/A	N/A	RELOCATE	TRANSITIONAL	FY 2017

1. OBSTRUCTION SURVEY COMPLETED BY WOOLPERT, INC. SEPTEMBER, 2014.



NOTES:
1. ROADWAY ELEVATIONS INCLUDE TRAVERSEWAY ADJUSTMENT (23' RAILROADS I 17' HIGHWAYS I 15' PUBLIC ROADS I 10' PRIVATE ROADS).
2. DEEP CREEK RD. ELEVATIONS ARE APPROXIMATE.

N

MAGNETIC DECLINATION
9° 37' EAST
FEBRUARY, 2016
ANNUAL CHANGE 0° 6' WEST

200' 100' 0 200'
HORIZONTAL SCALE

20' 10' 0 20'
VERTICAL SCALE

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REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: JUNE 2016
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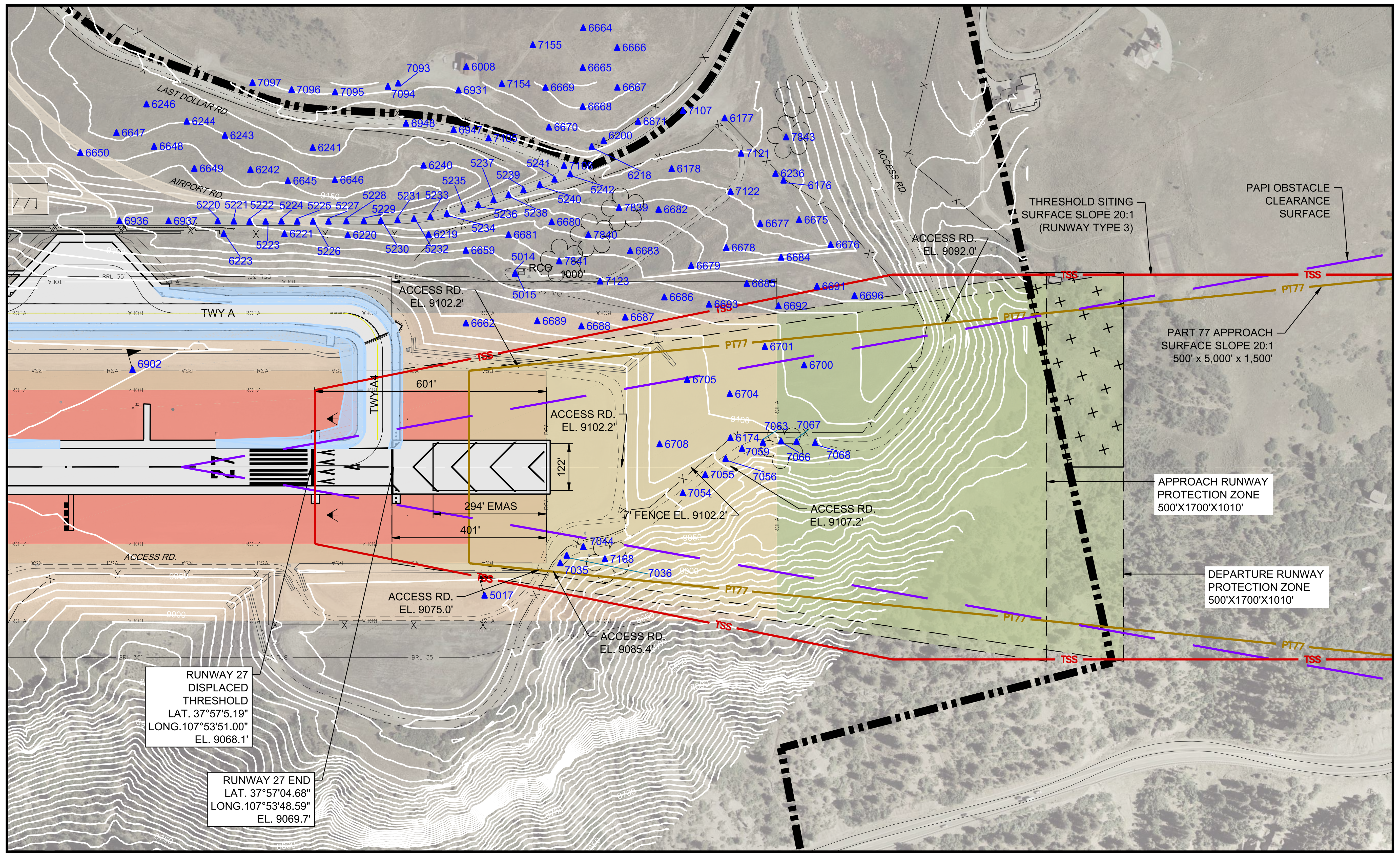
DESIGNED BY: TJM

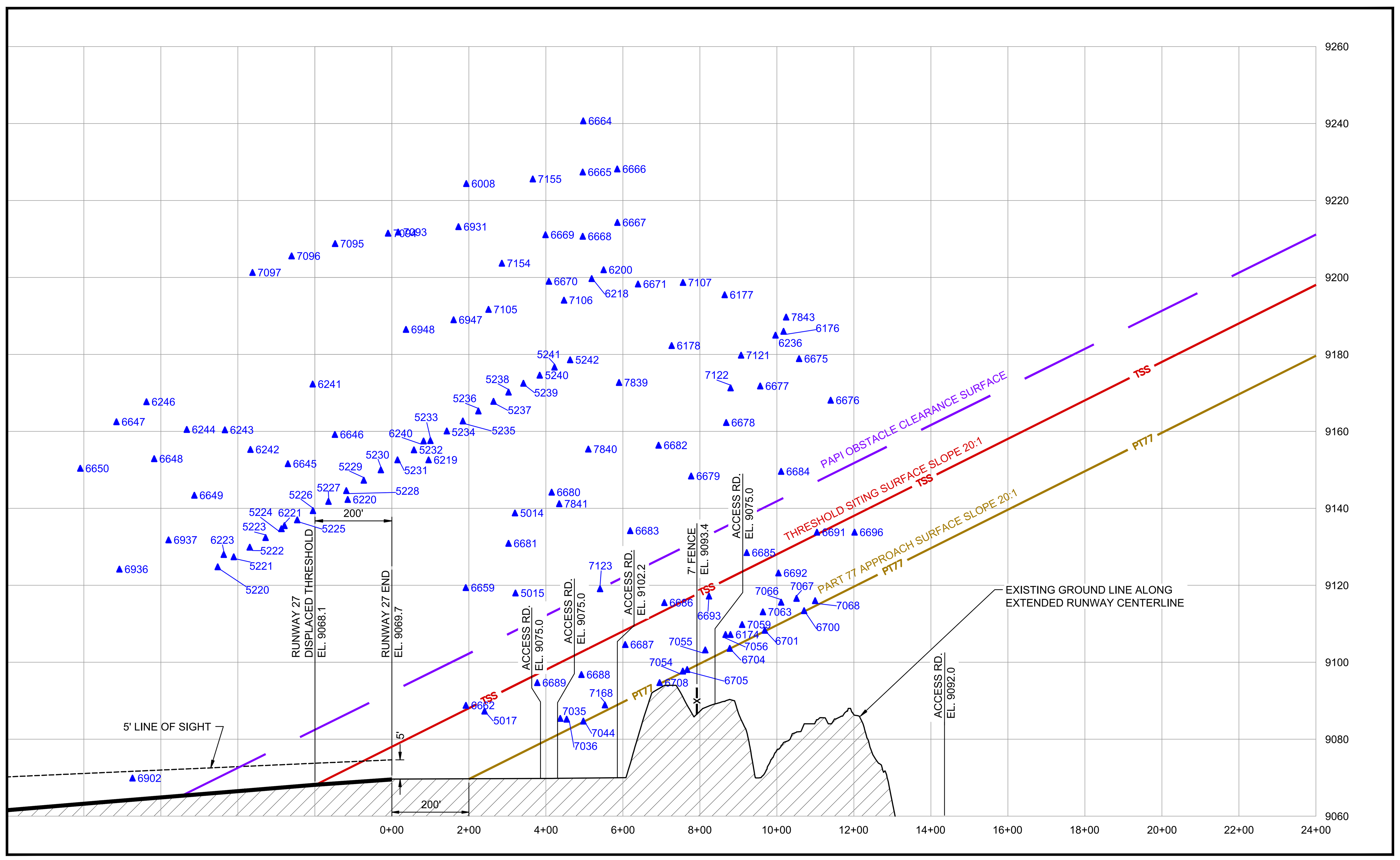
PROJECT NUMBER
224-3624-001

SHEET TITLE
INNER PORTION OF THE APPROACH SURFACE DRAWING RUNWAY 9

SHEET NUMBER
8 OF 13

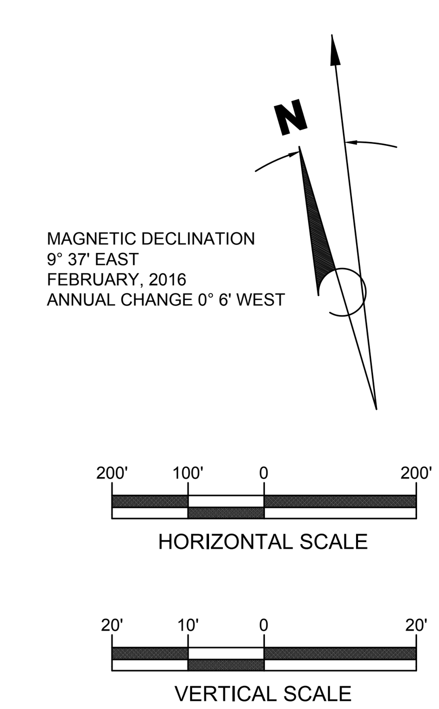
DRAFT





DESCRIPTION	EXISTING	FUTURE
PROPERTY LINE		N/A
EASEMENT		
RUNWAY SAFETY AREA		N/A
RUNWAY OBJECT FREE AREA		N/A
RUNWAY OBSTACLE FREE ZONE		N/A
RUNWAY PROTECTION ZONE		N/A
TAXIWAY SAFETY AREA		
TAXIWAY OBJECT FREE AREA		
BUILDING RESTRICTION LINE		N/A
DEPARTURE SURFACE	DEP	N/A
PART 77 SURFACE	PT77	N/A
PAPI OBSTACLE CLEARANCE SURFACE		N/A
THRESHOLD SITING SURFACE	TSS	N/A
AIRFIELD PAVEMENT		
PAVED ROADWAY/PARKING		
UNPAVED ROADWAY/PARKING		N/A
THRESHOLD LIGHT		N/A
REIL		N/A
PAPI		N/A
TREES		N/A
FENCE		
POWER POLE		N/A
LIGHT POLE		N/A
OBSTRUCTION	5000	N/A

NOTES:
1. ROADWAY ELEVATIONS INCLUDE TRAVERSEWAY ADJUSTMENT (23' RAILROADS I 17' HIGHWAYS I 15' PUBLIC ROADS I 10' PRIVATE ROADS).
2. SEE SHEET 10 FOR OBSTRUCTION TABLE



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PROJECT NUMBER
224-3624-001

SHEET TITLE
INNER PORTION OF THE APPROACH SURFACE DRAWING RUNWAY 27

SHEET NUMBER
9 OF 13

DRAFT

RUNWAY 27 OBSTRUCTION TABLE

OBJECT NO.	OBJECT DESCRIPTION	ABOVE GROUND LEVEL (FT.)	OBJECT TOP ELEVATION (FT.)	CLEARANCE (+ PENETRATE) (- CLEAR)			PROPOSED DISPOSITION	PART 77 SURFACE VIOLATION	TRIGGERING EVENT
				PART 77 APPROACH SURFACE (FT.)	THRESHOLD SITING SURFACE (FT.)	PAPI OBSTACLE CLEARANCE SURFACE (FT.)			
5014	OL_ON_ANTENNA	20.7	9138.8	28.6	N/A	N/A	FIXED BY FUNCTION	TRANSITIONAL	NONE
5015	GRND	0.0	9118.0	7.9	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5017	WSK	9.3	9087.3	4.3	N/A	N/A	FIXED BY FUNCTION	TRANSITIONAL	NONE
5220	CL_ROAD	0.0	9124.8	1.5	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5221	CL_ROAD	0.0	9127.4	3.9	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5222	CL_ROAD	0.0	9129.9	6.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5223	CL_ROAD	0.0	9132.4	8.6	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5224	CL_ROAD	0.0	9134.7	10.7	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5225	CL_ROAD	0.0	9137.0	12.8	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5226	CL_ROAD	0.0	9139.4	15.1	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5227	CL_ROAD	0.0	9141.8	17.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5228	CL_ROAD	0.0	9144.6	19.8	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5229	CL_ROAD	0.0	9147.3	22.2	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5230	CL_ROAD	0.0	9150.0	24.6	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5231	CL_ROAD	0.0	9152.6	26.9	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5232	CL_ROAD	0.0	9155.2	29.0	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5233	CL_ROAD	0.0	9157.6	30.7	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5234	CL_ROAD	0.0	9160.1	31.9	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5235	CL_ROAD	0.0	9162.7	33.0	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5236	CL_ROAD	0.0	9165.3	33.0	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5237	CL_ROAD	0.0	9167.8	32.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5238	CL_ROAD	0.0	9170.2	31.5	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5239	CL_ROAD	0.0	9172.5	30.6	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5240	CL_ROAD	0.0	9174.6	29.1	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5241	CL_ROAD	0.0	9176.7	27.9	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
5242	CL_ROAD	0.0	9178.6	26.4	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6008	BUILDING	41.8	9224.4	41.8	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6174	FENCE	11.0	9107.2	3.5	-14.9	-28.7	NO ACTION	APPROACH	NONE
6176	FENCE	8.0	9186.0	16.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6177	FENCE	8.6	9195.5	8.2	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6178	FENCE	8.9	9182.3	18.7	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6200	FENCE	5.9	9202.0	34.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6218	FENCE	4.5	9199.7	35.2	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6219	FENCE	9.2	9152.6	32.2	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6220	FENCE	8.8	9142.3	22.6	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6221	FENCE	8.7	9135.5	16.1	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6223	FENCE	7.0	9128.0	9.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6236	FENCE	7.0	9185.0	13.5	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6240	GRND	0.0	9157.5	11.4	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6241	GRND	0.0	9172.3	20.6	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6242	GRND	0.0	9155.3	12.5	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6243	GRND	0.0	9160.4	5.2	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6244	GRND	0.0	9160.5	0.5	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6246	GRND	0.0	9167.7	1.8	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6645	GRND	0.0	9151.6	12.5	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6646	GRND	0.0	9159.2	19.2	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6647	GRND	0.0	9162.5	7.5	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6648	GRND	0.0	9152.9	2.6	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6649	GRND	0.0	9143.4	0.8	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6650	GRND	0.0	9150.4	3.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6659	GRND	0.0	9119.4	4.9	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6662	GRND	0.0	9088.8	1.4	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6664	GRND	0.0	9240.7	33.0	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6665	GRND	0.0	9227.4	34.5	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6666	GRND	0.0	9228.2	24.7	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6667	GRND	0.0	9214.3	25.5	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6668	GRND	0.0	9210.7	32.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6669	GRND	0.0	9211.1	29.1	N/A	N/A	NO ACTION	TRANSITIONAL	NONE

RUNWAY 27 OBSTRUCTION TABLE

OBJECT NO.	OBJECT DESCRIPTION	ABOVE GROUND LEVEL (FT.)	OBJECT TOP ELEVATION (FT.)	CLEARANCE (+ PENETRATE) (- CLEAR)			PROPOSED DISPOSITION	PART 77 SURFACE VIOLATION	TRIGGERING EVENT
				PART 77 APPROACH SURFACE (FT.)	THRESHOLD SITING SURFACE (FT.)	PAPI OBSTACLE CLEARANCE SURFACE (FT.)			
6670	GRND	0.0	9199.0	31.4	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6671	GRND	0.0	9198.3	20.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6675	GRND	0.0	9178.9	22.5	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6676	GRND	0.0	9168.1	17.9	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6677	GRND	0.0	9171.8	20.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6678	GRND	0.0	9162.3	22.9	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6679	GRND	0.0	9148.4	19.0	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6680	GRND	0.0	9144.2	11.5	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6681	GRND	0.0	9130.9	7.0	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6682	GRND	0.0	9156.4	9.1	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6683	GRND	0.0	9134.2	4.9	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6684	GRND	0.0	9149.6	8.8	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6685	GRND	0.0	9128.5	0.6	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6686	GRND	0.0	9115.5	0.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6687	GRND	0.0	9104.6	0.5	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6688	GRND	0.0	9096.8	0.0	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6689	GRND	0.0	9094.7	0.1	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6691	GRND	0.0	9133.8	0.4	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6692	GRND	0.0	9123.2	0.6	-5.1	N/A	NO ACTION	TRANSITIONAL	NONE
6693	GRND	0.0	9117.2	0.5	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6696	GRND	0.0	9133.8	0.4	-4.4	N/A	NO ACTION	TRANSITIONAL	NONE
6700	GRND	0.0	9113.4	0.2	-18.2	-31.9	NO ACTION	APPROACH	NONE
6701	GRND	0.0	9108.3	0.2	-18.2	N/A	NO ACTION	APPROACH	NONE
6704	GRND	0.0	9103.6	0.0	-18.4	-32.2	NO ACTION	APPROACH	NONE
6705	GRND	0.0	9098.1	0.1	-18.3	-32.2	NO ACTION	APPROACH	NONE
6708	GRND	0.0	9094.7	0.2	-18.2	-32.1	NO ACTION	APPROACH	NONE
6902	NAVAID	9.8	9069.9	2.8	N/A	N/A	FIXED BY FUNCTION	TRANSITIONAL	NONE
6931	PRKNG_LOT	0.0	9213.2	39.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6936	ROAD	0.0	9124.2	1.9	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6937	ROAD	0.0	9131.8	9.0	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6947	ROAD	0.0	9189.0	29.8	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
6948	ROAD	0.0	9186.5	24.9	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7035	ROAD	0.0	9085.4	3.8	-14.6	N/A	NO ACTION	APPROACH	NONE
7036	ROAD	0.0	9085.2	2.8	-15.6	N/A	NO ACTION	APPROACH	NONE
7044	ROAD	0.0	9084.7	0.1	-18.3	N/A	NO ACTION	APPROACH	NONE
7054	ROAD	0.0	9097.7	0.2	-18.2	-32.0	NO ACTION	APPROACH	NONE
7055	ROAD	0.0	9103.2	2.8	-15.6	-29.4	NO ACTION	APPROACH	NONE
7056	ROAD	0.0	9107.2	4.2	-14.2	-28.0	NO ACTION	APPROACH	NONE
7059	ROAD	0.0	9109.8	4.6	-13.8	-27.6	NO ACTION	APPROACH	NONE
7063	ROAD	0.0	9113.1	5.2	-13.2	-26.9	NO ACTION	APPROACH	NONE
7066	ROAD	0.0	9115.6	5.4	-13.0	-26.8	NO ACTION	APPROACH	NONE
7067	ROAD	0.0	9116.6	4.4	-14.0	-27.8	NO ACTION	APPROACH	NONE
7068	ROAD	0.0	9116.0	1.3	-17.1	-30.8	NO ACTION	APPROACH	NONE
7093	ROAD	0.0	9211.8	35.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7094	ROAD	0.0	9211.5	36.2	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7095	ROAD	0.0	9208.8	36.2	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7096	ROAD	0.0	9205.6	32.6	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7097	ROAD	0.0	9201.3	26.1	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7105	ROAD	0.0	9191.7	33.8	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7106	ROAD	0.0	9194.1	39.4	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7107	ROAD	0.0	9198.7	12.5	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7121	ROAD	0.0	9179.8	4.1	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7122	ROAD	0.0	9171.3	10.7	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7123	ROAD	0.0	9119.1	3.9	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7154	DIRT_TRAIL	0.0	9203.7	24.3	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7155	DIRT_TRAIL	0.0	9225.6	28.9	N/A	N/A	NO ACTION	TRANSITIONAL	NONE
7168	TREE	34.5	9088.9	1.6	-16.9	N/A	TRIM	APPROACH	FY 2017
7839	TREE	12.7	9172.7	28.4	N/A	N/A	TRIM	TRANSITIONAL	FY 2017
7840	TREE	13.2	9155.4	24.1	N/A	N/A	TRIM	TRANSITIONAL	FY 2017
7841	TREE	12.9	9141.2	22.3	N/A	N/A	TRIM	TRANSITIONAL	FY 2017
7843	TREE	14.8	9189.7	3.7	N/A	N/A	TRIM	TRANSITIONAL	FY 2017

1. OBSTRUCTION SURVEY COMPLETED BY WOOLPERT, INC. SEPTEMBER, 2014.

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REVISIONS

NO.	DESCRIPTION	DATE

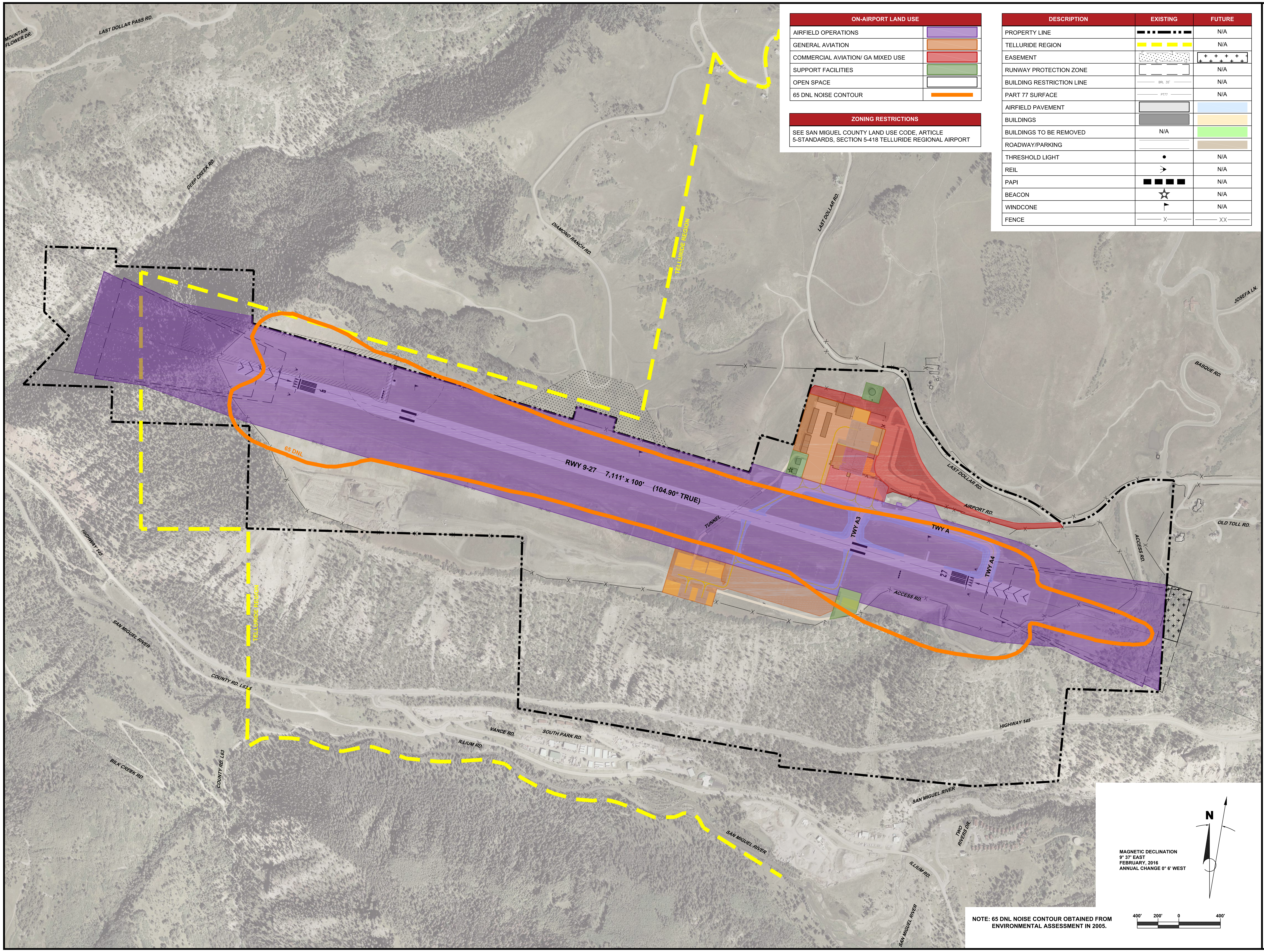
DATE ISSUED: JUNE 2016
REVIEWED BY: DC / MLB
DRAWN BY: SD
DESIGNED BY: TJM

PROJECT NUMBER
224-3624-001

SHEET TITLE
OBSTRUCTION TABLE FOR RUNWAY 27

SHEET NUMBER
10 OF 13

DRAFT



ON-AIRPORT LAND USE	
AIRFIELD OPERATIONS	
GENERAL AVIATION	
COMMERCIAL AVIATION/ GA MIXED USE	
SUPPORT FACILITIES	
OPEN SPACE	
65 DNL NOISE CONTOUR	

ZONING RESTRICTIONS
SEE SAN MIGUEL COUNTY LAND USE CODE, ARTICLE 5-STANDARDS, SECTION 5-418 TELLURIDE REGIONAL AIRPORT

DESCRIPTION	EXISTING	FUTURE
PROPERTY LINE		N/A
TELLURIDE REGION		N/A
EASEMENT		
RUNWAY PROTECTION ZONE		N/A
BUILDING RESTRICTION LINE	BRL 35'	N/A
PART 77 SURFACE	PT77	N/A
AIRFIELD PAVEMENT		
BUILDINGS		
BUILDINGS TO BE REMOVED	N/A	
ROADWAY/PARKING		
THRESHOLD LIGHT		N/A
REIL		N/A
PAPI		N/A
BEACON		N/A
WINDCONE		N/A
FENCE	X	XX

NOTE: 65 DNL NOISE CONTOUR OBTAINED FROM ENVIRONMENTAL ASSESSMENT IN 2005.

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TELLURIDE REGIONAL AIRPORT

TELLURIDE REGIONAL AIRPORT

TELLURIDE, CO

AIRPORT LAYOUT PLAN

CONSULTANTS

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: JUNE 2016
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SHEET TITLE

ON-AIRPORT LAND USE PLAN

SHEET NUMBER

11 OF 13

DRAFT

SURVEY MONUMENTS					
IDENTIFIER	NGS PID	PACS OR SACS	LATITUDE	LONGITUDE	ELEVATION
TEX E	DP6610	PACS	37° 57' 13.233"	107° 54' 16.624"	9043.9'
TEX F	DP6611	SACS	37° 57' 22.805"	107° 54' 58.980"	9024.6'
TEX G	DP6612	SACS	37° 57' 07.899"	107° 53' 50.179"	9063.2'

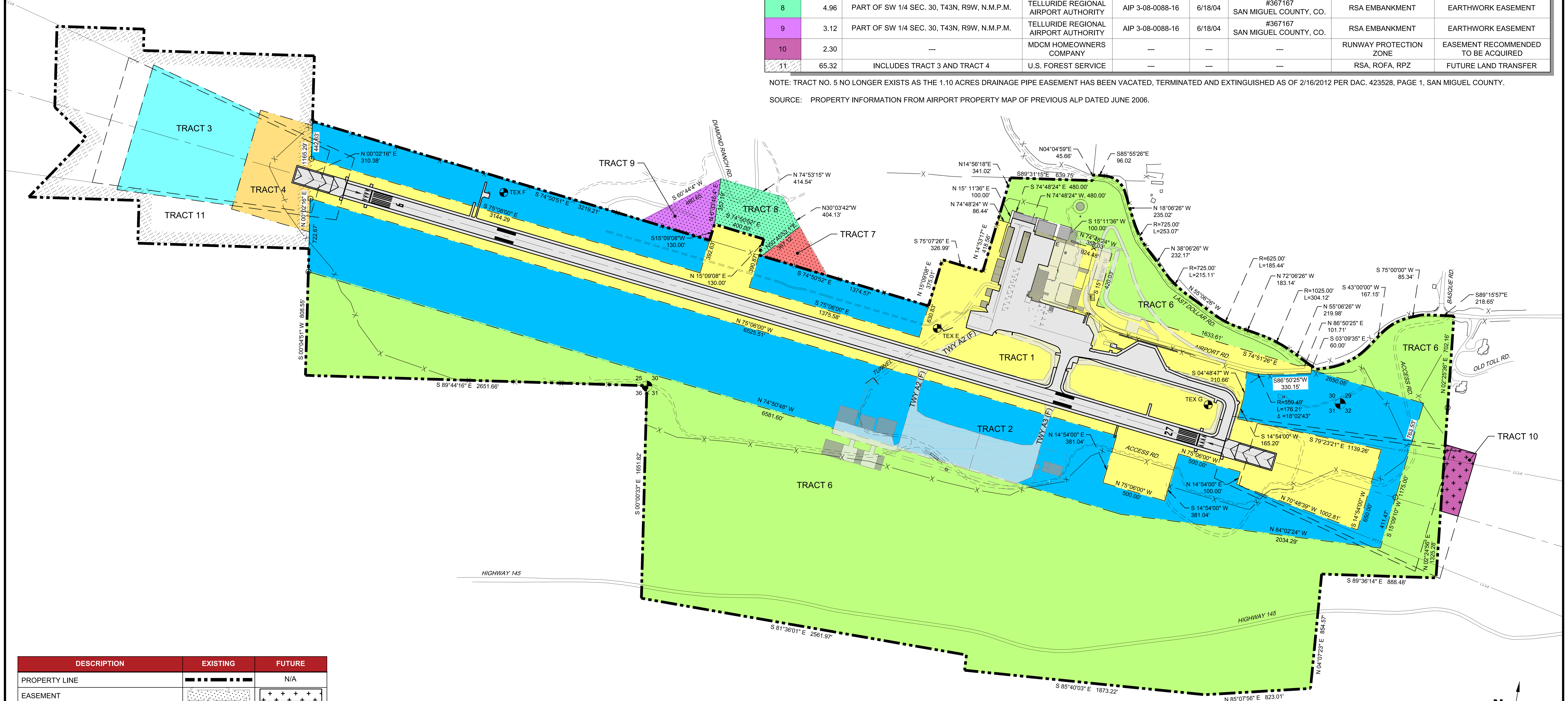
SOURCE: NATIONAL GEODETIC SURVEY, NAD 83 (2011), NAVD 88

PROPERTY DATA

TRACT	ACREAGE	LOCATION	OWNER	FEDERAL PROJECT	DATE	RECORDING INFORMATION	USAGE	INTEREST HELD
1	120.00	PART OF S 1/2 SEC. 30, T43N, R9W, N.M.P.M. PART OF N 1/2 SEC. 31, T43N, R9W, N.M.P.M. PART OF NW 1/4 SEC. 32, T43N, R9W, N.M.P.M. PART OF S 1/2 SEC. 25, T43N, R10W, N.M.P.M.	TELLURIDE REGIONAL AIRPORT AUTHORITY	AIP 3-08-0088-02	6/20/91	BOOK 479, PAGE 1-4 BY CASE 89, CV 59 DISTRICT COURT SAN MIGUEL COUNTY, CO.	RUNWAY, APRON AND TERMINAL BUILDINGS (AERONAUTICAL)	FEE SIMPLE
2	141.94	PART OF S 1/4 SEC. 29, T43N, R9W, N.M.P.M. PART OF S 1/2 SEC. 30, T43N, R9W, N.M.P.M. PART OF N 1/2 SEC. 31, T43N, R9W, N.M.P.M. PART OF NW 1/4 SEC. 32, T43N, R9W, N.M.P.M. PART OF S 1/2 SEC. 25, T43N, R10W, N.M.P.M.	TELLURIDE REGIONAL AIRPORT AUTHORITY	AIP 3-08-0088-02	5/31/91	BOOK 478, PAGES 975-980 SAN MIGUEL COUNTY, CO.	RUNWAY PROTECTION ZONE (AERONAUTICAL) (AIRPORT DEVELOPMENT)	FEE SIMPLE
3	10.63	PART OF SW 1/4 SEC. 25, T43N, R10W, N.M.P.M.	U.S. FOREST SERVICE	NONE	1/9/95	PERMIT NO. FS-2700-4 (7-93) OMB 0596-0082	RSA, ROFA, RPZ (AERONAUTICAL)	SPECIAL USE PERMIT EXPIRES 12-31-2014 FUTURE LAND TRANSFER
4	18.18	PART OF SW 1/4 SEC. 25, T43N, R10W, N.M.P.M.	U.S. FOREST SERVICE	NONE	1/9/95	PERMIT NO. FS-2700-4 (7-93) OMB 0596-0082	APPROACH PROTECTION (AERONAUTICAL)	SPECIAL USE PERMIT EXPIRES 12-31-2014 FUTURE LAND TRANSFER
5	---	SEE NOTE	---	---	---	---	---	---
6	247.23	PART OF SW 1/4 SEC. 29, T43N, R9W, N.M.P.M. PART OF S 1/2 SEC. 30, T43N, R9W, N.M.P.M. PART OF N 1/2 SEC. 31, T43N, R9W, N.M.P.M. PART OF NW 1/4 SEC. 32, T43N, R9W, N.M.P.M. PART OF S 1/2 SEC. 25, T43N, R10W, N.M.P.M. PART OF NE 1/4 SEC. 36, T43N, R10W, N.M.P.M.	TELLURIDE REGIONAL AIRPORT AUTHORITY	AIP 3-08-0088-16	9/11/03	#367167 SAN MIGUEL COUNTY, CO.	RSA GRADING	FEE SIMPLE
7	1.79	PART OF SW 1/4 SEC. 30, T43N, R9W, N.M.P.M.	TELLURIDE REGIONAL AIRPORT AUTHORITY	AIP 3-08-0088-16	6/18/04	#367167 SAN MIGUEL COUNTY, CO.	RSA EMBANKMENT	EARTHWORK EASEMENT
8	4.96	PART OF SW 1/4 SEC. 30, T43N, R9W, N.M.P.M.	TELLURIDE REGIONAL AIRPORT AUTHORITY	AIP 3-08-0088-16	6/18/04	#367167 SAN MIGUEL COUNTY, CO.	RSA EMBANKMENT	EARTHWORK EASEMENT
9	3.12	PART OF SW 1/4 SEC. 30, T43N, R9W, N.M.P.M.	TELLURIDE REGIONAL AIRPORT AUTHORITY	AIP 3-08-0088-16	6/18/04	#367167 SAN MIGUEL COUNTY, CO.	RSA EMBANKMENT	EARTHWORK EASEMENT
10	2.30	---	MDCM HOMEOWNERS COMPANY	---	---	---	RUNWAY PROTECTION ZONE	EASEMENT RECOMMENDED TO BE ACQUIRED
11	65.32	INCLUDES TRACT 3 AND TRACT 4	U.S. FOREST SERVICE	---	---	---	RSA, ROFA, RPZ	FUTURE LAND TRANSFER

NOTE: TRACT NO. 5 NO LONGER EXISTS AS THE 1.10 ACRES DRAINAGE PIPE EASEMENT HAS BEEN VACATED, TERMINATED AND EXTINGUISHED AS OF 2/16/2012 PER DAC. 423528, PAGE 1, SAN MIGUEL COUNTY.

SOURCE: PROPERTY INFORMATION FROM AIRPORT PROPERTY MAP OF PREVIOUS ALP DATED JUNE 2006.



DESCRIPTION	EXISTING	FUTURE
PROPERTY LINE		N/A
EASEMENT		
SECTION CORNER	30 29 31 32	N/A
RUNWAY PROTECTION ZONE		N/A
PART 77 SURFACE		N/A
AIRFIELD PAVEMENT		
BUILDINGS		
BUILDINGS TO BE REMOVED	N/A	
ROADWAY/PARKING		
FENCE	X	XX

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TELLURIDE REGIONAL AIRPORT

TELLURIDE REGIONAL AIRPORT
TELLURIDE, CO

AIRPORT LAYOUT PLAN

CONSULTANTS

REVISIONS

NO.	DESCRIPTION	DATE

DATE ISSUED: JUNE 2016
REVIEWED BY: DC / MLB
DRAWN BY: SD
DESIGNED BY: TJM

PROJECT NUMBER
224-3624-001

SHEET TITLE

AIRPORT PROPERTY MAP

SHEET NUMBER

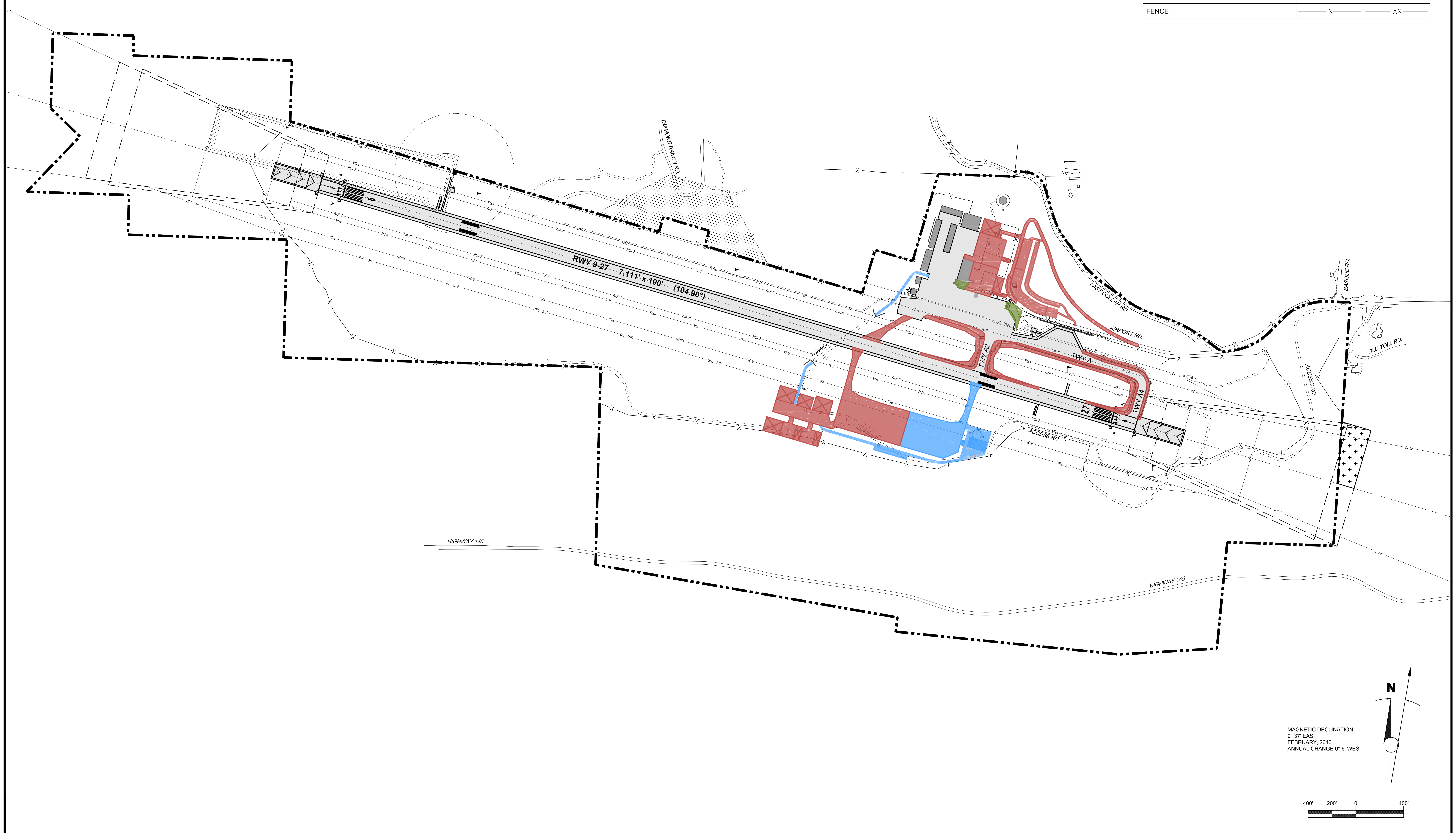
12 OF 13

DRAFT

Drawing: T:\P\224.3624.001 Telluride MPU\CAD\C\TEX_12_Prop.dwg Plotted on: 5/31/2016 10:46 AM Plotted by: Derengowski, Steven

PHASING LEGEND	
SHORT-TERM (2016-2020)	(green)
MID-TERM (2021-2035)	(blue)
LONG-TERM (2035+)	(red)

DESCRIPTION	EXISTING	FUTURE
PROPERTY LINE		N/A
EASEMENT		
RUNWAY SAFETY AREA	RSA	N/A
RUNWAY OBJECT FREE AREA	ROFA	N/A
RUNWAY OBSTACLE FREE ZONE	ROFZ	N/A
RUNWAY PROTECTION ZONE		N/A
TAXIWAY SAFETY AREA	TSA	F-TSA
TAXIWAY OBJECT FREE AREA	TOFA	F-TOFA
BUILDING RESTRICTION LINE	BRL 35'	N/A
PART 77 SURFACE	PT77	N/A
THRESHOLD LIGHT		N/A
REIL		N/A
PAPI		N/A
BEACON		N/A
WINDCONE		N/A
FENCE	X	XX



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SHEET TITLE

AIRPORT DEVELOPMENT PHASING PLAN

SHEET NUMBER

DRAFT

Drawing: T:\P\224.3624.001 Telluride MPU\CAD\C\TEX_13_Phasing.dwg Plotted on: 8/24/2016 10:06 AM Plotted by: Derengowski, Steven

APPENDIX A

TELLURIDE PROBABLE CONSTRUCTION COST

APPENDIX A Date Prepared: March 28, 2016
TELLURIDE REGIONAL AIRPORT MASTER PLAN Prepared by: JFF/DJA/KAR

Estimate of Probable Construction Cost

	WORK ITEM DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL AMOUNT
	Short-Term Development				
North Apron Expansion #1					
	Mobilization	LS	N/A	1	$ 129,370.00
	Full Depth Pavement Demo - Road	SY	$19.00	190	$ 3,610.00
	Full Depth Pavement Demo - Parking Lot	SY	$19.00	385	$ 7,315.00
	Unclassified Excavation	CY	$15.00	5,600	$ 84,000.00
	New Full Depth Pavement - Apron	SY	$179.00	2,710	$ 485,090.00
	New Retaining Wall - 5'to 10' Height	LF	$200.00	220	$ 44,000.00
	New Security Fence	LF	$30.00	550	$ 16,500.00
	Markings (No Beads)	SF	$4.00	550	$ 2,200.00
	Markings (With Beads)	SF	$5.00	825	$ 4,125.00
	Utilities Improvements				
	Sewer/Transfer Station (with lines and connection)	LS	$1,000,000.00	1	$ 1,000,000.00
	Telecommunication Line (Buried)	LF	$40.00	800	$ 32,000.00
	Water Lines	LF	$30.00	75	$ 2,250.00
	Power Lines (Buried)	LF	$40.00	400	$ 16,000.00
	Sub-Total				$ 1,826,460.00
	Contingency	30%			$ 547,938.00
	Total Project Cost				**$ 2,374,398.00**
GA Terminal Renovation and Expansion					
	Mobilization	LS	N/A	1	$ 116,500.00
	New Building Addition	SF	$350.00	500	$ 175,000.00
	Building Renovation	SF	$250.00	1,630	$ 407,500.00
	Sub-Total				$ 699,000.00
	Contingency	0%			$ -
	Total Project Cost				**$ 699,000.00**
SHORT-TERM TOTAL COST					**$ 3,073,398.00**

APPENDIX A Date Prepared: March 28, 2016

TELLURIDE REGIONAL AIRPORT MASTER PLAN Prepared by: JFF/DJA/KAR

Estimate of Probable Construction Cost

	WORK ITEM DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL AMOUNT
	Mid-Term Development				
SRE/ARFF/GA Construction					
	Mobilization	LS	N/A	1	$ 477,750.00
	New SRE Building	SF	$185.00	8,800	$ 1,628,000.00
	New GA Building	SF	$150.00	1,680	$ 252,000.00
	New ARFF Building	SF	$185.00	2,750	$ 508,750.00
	Sub-Total				$ 2,866,500.00
	Contingency	30%			$ 859,950.00
	Total Project Cost				**$ 3,726,450.00**
Taxiway A3 Construction South Side (TDG II)					
	Mobilization	LS	N/A	1	$ 124,150.00
	Embankment	CY	$15.00	8,300	$ 124,500.00
	New Full Depth Taxiway Pavement	SY	$179.00	2,690	$ 481,510.00
	Markings (No Beads)	SF	$4.00	2,110	$ 8,440.00
	Markings (With Beads)	SF	$5.00	1,260	$ 6,300.00
	Sub-Total				$ 744,900.00
	Contingency	30%			$ 223,470.00
	Total Project Cost				**$ 968,370.00**
ARFF Demolition					
	Mobilization	LS	N/A	1	$ 1,560.00
	Building Demolition	SF	$5.00	1,560	$ 7,800.00
	Sub-Total				$ 9,360.00
	Contingency	30%			$ 2,808.00
	Total Project Cost				**$ 12,168.00**

APPENDIX A Date Prepared: March 28, 2016

TELLURIDE REGIONAL AIRPORT MASTER PLAN Prepared by: JFF/DJA/KAR

Estimate of Probable Construction Cost

	WORK ITEM DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL AMOUNT
Tunnel Road Construction					
	Mobilization	LS	N/A	1	$ 315,250.00
	Unclassified Excavation	CY	$15.00	3,800	$ 57,000.00
	New Full Depth Pavement - Roadway	SY	$117.00	12,940	$ 1,513,980.00
	Markings (With Beads)	SF	$5.00	1,050	$ 5,250.00
	Sub-Total				$ 1,891,480.00
	Contingency	30%			$ 567,444.00
	Total Project Cost				**$ 2,458,924.00**
New Self-Fueling Facility					
	Mobilization	LS	N/A	1	$ 23,970.00
	New Fuel Facility	SF	$85.00	1,410	$ 119,850.00
	Sub-Total				$ 143,820.00
	Contingency	30%			$ 43,146.00
	Total Project Cost				**$ 186,966.00**
South Vehicle Parking Lot					
	Mobilization	LS	N/A	1	$ 11,460.00
	Unclassified Excavation	CY	$15.00	780	$ 11,700.00
	New Full Depth Pavement - Parking Lot Pavement	SY	$117.00	385	$ 45,045.00
	Markings (With Beads)	SF	$5.00	110	$ 550.00
	Sub-Total				$ 68,755.00
	Contingency	30%			$ 20,626.50
	Total Project Cost				**$ 89,381.50**

APPENDIX A Date Prepared: March 28, 2016

TELLURIDE REGIONAL AIRPORT MASTER PLAN Prepared by: JFF/DJA/KAR

Estimate of Probable Construction Cost

	WORK ITEM DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL AMOUNT
South Apron Construction					
	Mobilization	LS	N/A	1	$ 677,940.00
	Embankment	CY	$15.00	31,500	$ 472,500.00
	New Full Depth Pavement - Apron	SY	$179.00	16,220	$ 2,903,380.00
	Markings (No Beads)	SF	$4.00	2,030	$ 8,120.00
	Markings (With Beads)	SF	$5.00	1,140	$ 5,700.00
	Sub-Total				$ 4,067,640.00
	Contingency	30%			$ 1,220,292.00
	Total Project Cost				**$ 5,287,932.00**
Landscaped Earth Berm					
	Mobilization	LS	N/A	1	$ 11,660.00
	Topsoiling, Hydromulch, & Seeding	AC	$5,300.00	11	$ 58,300.00
	Sub-Total				$ 69,960.00
	Contingency	30%			$ 20,988.00
	Total Project Cost				**$ 90,948.00**
MID-TERM TOTAL COST					**$ 12,821,139.50**

APPENDIX A Date Prepared: March 28, 2016

TELLURIDE REGIONAL AIRPORT MASTER PLAN Prepared by: JFF/DJA/KAR

Estimate of Probable Construction Cost

	WORK ITEM DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL AMOUNT	
	Long-Term Development					
Commercial Terminal Construction						
	Mobilization	LS	N/A	1	$	2,141,750.00
	Full Depth Pavement Demo - Parking Lot	SY	$19.00	9,130	$	173,470.00
	Unclassified Excavation	CY	$15.00	2,350	$	35,250.00
	New Building	SF	$500.00	21,000	$	10,500,000.00
	Sub-Total				$	12,850,470.00
	Contingency	30%			$	3,855,141.00
	Total Project Cost				**$**	**16,705,611.00**
North Apron Expansion #2						
	Mobilization	LS	N/A	1	$	468,520.00
	Full Depth Pavement Demo - Apron	SY	$24.00	950	$	22,800.00
	Full Depth Pavement Demo - Parking Lot	SY	$19.00	4,600	$	87,400.00
	Unclassified Excavation	CY	$15.00	27,300	$	409,500.00
	New Full Depth Pavement - Apron	SY	$179.00	10,080	$	1,804,320.00
	New Security Fence	LF	$30.00	380	$	11,400.00
	Markings (No Beads)	SF	$4.00	1,100	$	4,400.00
	Markings (With Beads)	SF	$5.00	550	$	2,750.00
	Sub-Total				$	2,811,090.00
	Contingency	30%			$	843,327.00
	Total Project Cost				**$**	**3,654,417.00**

APPENDIX A Date Prepared: March 28, 2016

TELLURIDE REGIONAL AIRPORT MASTER PLAN Prepared by: JFF/DJA/KAR

Estimate of Probable Construction Cost

	WORK ITEM DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL AMOUNT
Airport Loop Road Extension					
	Mobilization	LS	N/A	1	$ 678,660.00
	Unclassified Excavation	CY	$15.00	157,700	$ 2,365,500.00
	New Full Depth Pavement - Roadway	SY	$117.00	6,750	$ 789,750.00
	New Retaining Wall - 5'- 10' Height	LF	$200.00	1,170	$ 234,000.00
	Markings (With Beads)	SF	$5.00	810	$ 4,050.00
	Sub-Total				$ 4,071,960.00
	Contingency	30%			$ 1,221,588.00
	Total Project Cost				**$ 5,293,548.00**
General Aviation Terminal Construction					
	Mobilization	LS	N/A	1	$ 281,880.00
	Unclassified Excavation	CY	$15.00	1,000	$ 15,000.00
	Full Depth Pavement Demo - Parking Lot	SY	$19.00	440	$ 8,360.00
	New Building	SF	$350.00	3,960	$ 1,386,000.00
	Sub-Total				$ 1,691,240.00
	Contingency	30%			$ 507,372.00
	Total Project Cost				**$ 2,198,612.00**
Hillside Parking Lower Tier Construction					
	Mobilization	LS	N/A	1	$ 151,910.00
	Unclassified Excavation	CY	$15.00	12,700	$ 190,500.00
	New Full Depth Pavement - Parking Lot Pavement	SY	$117.00	4,760	$ 556,920.00
	Markings (With Beads)	SF	$5.00	2,420	$ 12,100.00
	Sub-Total				$ 911,430.00
	Contingency	30%			$ 273,429.00
	Total Project Cost				**$ 1,184,859.00**

APPENDIX A Date Prepared: March 28, 2016

TELLURIDE REGIONAL AIRPORT MASTER PLAN Prepared by: JFF/DJA/KAR

Estimate of Probable Construction Cost

	WORK ITEM DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL AMOUNT	
North Apron Expansion #3						
	Mobilization	LS	N/A	1	$	280,260.00
	Existing Building Demolition	SF	$5.00	2,270	$	11,350.00
	Unclassified Excavation	CY	$15.00	14,100	$	211,500.00
	Full Depth Pavement Demo - Parking Lot	SY	$19.00	4,040	$	76,760.00
	New Full Depth Pavement - Apron	SY	$179.00	6,030	$	1,079,370.00
	New Security Fence	LF	$30.00	480	$	14,400.00
	Markings (No Beads)	SF	$4.00	1,210	$	4,840.00
	Markings (With Beads)	SF	$5.00	610	$	3,050.00
	Sub-Total				$	1,681,530.00
	Contingency	30%			$	504,459.00
	Total Project Cost				**$**	**2,185,989.00**
Commercial Terminal Demolition						
	Mobilization	LS	N/A	1	$	7,640.00
	Building Demolition	SF	$10.00	3,370	$	33,700.00
	Unclassified Excavation	CY	$15.00	300	$	4,500.00
	Sub-Total				$	41,340.00
	Contingency	30%			$	12,402.00
	Total Project Cost				**$**	**53,742.00**
North Apron VSR Construction						
	Mobilization	LS	N/A	1	$	37,150.00
	Unclassified Excavation	CY	$15.00	6,770	$	101,550.00
	New Full Depth Pavement - Roadway	SY	$117.00	715	$	83,655.00
	Markings (With Beads)	SF	$5.00	100	$	500.00
	Sub-Total				$	222,855.00
	Contingency	30%			$	66,856.50
	Total Project Cost				**$**	**289,711.50**

APPENDIX A Date Prepared: March 28, 2016

TELLURIDE REGIONAL AIRPORT MASTER PLAN Prepared by: JFF/DJA/KAR

Estimate of Probable Construction Cost

	WORK ITEM DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL AMOUNT
Hillside Parking Lower Tier Expansion					
	Mobilization	LS	N/A	1	$ 155,300.00
	Unclassified Excavation	CY	$15.00	28,000	$ 420,000.00
	New Full Depth Pavement - Parking Lot Pavement	SY	$117.00	2,960	$ 346,320.00
	Markings (With Beads)	SF	$5.00	2,030	$ 10,150.00
	Sub-Total				$ 931,770.00
	Contingency	30%			$ 279,531.00
	Total Project Cost				**$ 1,211,301.00**
Hillside Parking Upper Tier Construction					
	Mobilization	LS	N/A	1	$ 280,130.00
	Unclassified Excavation	CY	$15.00	48,600	$ 729,000.00
	New Full Depth Pavement - Parking Lot Pavement	SY	$117.00	4,280	$ 500,760.00
	New Retaining Wall - 5'- 10' Height	LF	$200.00	820	$ 164,000.00
	Markings (With Beads)	SF	$5.00	1,370	$ 6,850.00
	Sub-Total				$ 1,680,740.00
	Contingency	30%			$ 504,222.00
	Total Project Cost				**$ 2,184,962.00**
Taxiway A2 Construction (TDG II)					
	Mobilization	LS	N/A	1	$ 331,570.00
	Embankment	CY	$15.00	44,800	$ 672,000.00
	New Full Depth Taxiway Pavement	SY	$179.00	5,320	$ 952,280.00
	Markings (No Beads)	SF	$4.00	4,810	$ 19,240.00
	Markings (With Beads)	SF	$5.00	2,860	$ 14,300.00
	Sub-Total				$ 1,989,390.00
	Contingency	30%			$ 596,817.00
	Total Project Cost				**$ 2,586,207.00**

APPENDIX A Date Prepared: March 28, 2016

TELLURIDE REGIONAL AIRPORT MASTER PLAN Prepared by: JFF/DJA/KAR

Estimate of Probable Construction Cost

	WORK ITEM DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL AMOUNT
Existing Taxiway Widening (TDG V) North Side					
	Mobilization	LS	N/A	1	$ 753,340.00
	Full Depth Pavement Demo - Taxiway Shoulder	SY	$20.00	880	$ 17,600.00
	Unclassified Excavation	CY	$15.00	15,000	$ 225,000.00
	New Full Depth Taxiway Pavement	SY	$179.00	9,200	$ 1,646,800.00
	New Full Depth Taxiway Shoulder Pavement	SY	$128.00	14,180	$ 1,815,040.00
	Markings (No Beads)	SF	$4.00	8,830	$ 35,320.00
	Markings (With Beads)	SF	$5.00	5,380	$ 26,900.00
	Sub-Total				$ 4,520,000.00
	Contingency	30%			$ 1,356,000.00
	Total Project Cost				**$ 5,876,000.00**
South Apron Expansion					
	Mobilization	LS	N/A	1	$ 857,230.00
	Embankment	CY	$15.00	44,870	$ 673,050.00
	New Full Depth Pavement - Apron	SY	$179.00	20,090	$ 3,596,110.00
	Markings (No Beads)	SF	$4.00	2,510	$ 10,040.00
	Markings (With Beads)	SF	$5.00	1,390	$ 6,950.00
	Sub-Total				$ 5,143,380.00
	Contingency	30%			$ 1,543,014.00
	Total Project Cost				**$ 6,686,394.00**
South Vehicle Road Construction					
	Mobilization	LS	N/A	1	$ 7,870.00
	Unclassified Excavation	CY	$15.00	480	$ 7,200.00
	New Full Depth Pavement - Roadway	SY	$117.00	270	$ 31,590.00
	Markings (With Beads)	SF	$5.00	110	$ 550.00
	Sub-Total				$ 47,210.00
	Contingency	30%			$ 14,163.00
	Total Project Cost				**$ 61,373.00**

APPENDIX A Date Prepared: March 28, 2016

TELLURIDE REGIONAL AIRPORT MASTER PLAN Prepared by: JFF/DJA/KAR

Estimate of Probable Construction Cost

	WORK ITEM DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL AMOUNT	
Vehicle Parking Lot Expansion (South Side)						
	Mobilization	LS	N/A	1	$	11,430.00
	Unclassified Excavation	CY	$15.00	770	$	11,550.00
	New Full Depth Pavement - Parking Lot Pavement	SY	$117.00	385	$	45,045.00
	Markings (With Beads)	SF	$5.00	110	$	550.00
	Sub-Total				$	68,575.00
	Contingency	30%			$	20,572.50
	Total Project Cost				**$**	**89,147.50**
New South Development Area Apron Construction						
	Mobilization	LS	N/A	1	$	548,430.00
	Full Depth Vehicle Roadway Demolition	SY	$19.00	253	$	4,807.00
	Unclassified Excavation	CY	$15.00	57,700	$	865,500.00
	New Full Depth Pavement - Apron	SY	$179.00	10,370	$	1,856,230.00
	Markings (No Beads)	SF	$4.00	2,290	$	9,160.00
	Markings (With Beads)	SF	$5.00	1,290	$	6,450.00
	Sub-Total				$	3,290,577.00
	Contingency	30%			$	987,173.10
	Total Project Cost				**$**	**4,277,750.10**
New South Development Area Hangar Construction						
	Mobilization	LS	N/A	1	$	2,529,000.00
	Unclassified Excavation	CY	$15.00	10,000	$	150,000.00
	New Building	SF	$150.00	84,300	$	12,645,000.00
	Sub-Total				$	15,324,000.00
	Contingency	30%			$	4,597,200.00
	Total Project Cost				**$**	**19,921,200.00**

APPENDIX A Date Prepared: March 28, 2016

TELLURIDE REGIONAL AIRPORT MASTER PLAN Prepared by: JFF/DJA/KAR

Estimate of Probable Construction Cost

	WORK ITEM DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	TOTAL AMOUNT	
North Apron Transient Hangar Construction						
	Mobilization	LS	N/A	1	$	1,273,650.00
	Unclassified Excavation	CY	$15.00	31,800	$	477,000.00
	New Retaining Wall - 10'- 15' Height	LF	$300.00	360	$	108,000.00
	New Building	SF	$150.00	38,555	$	5,783,250.00
	Sub-Total				$	7,641,900.00
	Contingency	30%			$	2,292,570.00
	Total Project Cost				**$**	**9,934,470.00**
LONG-TERM TOTAL COST					**$**	**84,395,294.10**

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TEX

Telluride Regional Airport Master Plan

November 2016

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