AIRPORT MASTER PLAN



FINAL REPORT

SAN LUIS VALLEY REGIONAL AIRPORT

ALAMOSA, COLORADO | JUNE, 2022

SAN LUIS VALLEY
REGIONAL AIRPORT

ARMSTRONG

San Luis Valley Regional Airport

Airport Master Plan

Prepared for
Alamosa County, Colorado

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Chapter One

Airport Master Plan Overview

Chapter 1 –Airport Master Plan Overview

1.1 Introduction

San Luis Valley Regional Airport (three letter identifier ALS) is a Primary Commercial service airport located in southern Colorado, approximately two miles south of Alamosa, in Alamosa County. The airport encompasses approximately 1,659 acres and is owned by the County and City of Alamosa, and operated by the County of Alamosa.

The current Airport Layout Plan (ALP) for San Luis Valley Regional Airport was completed in 2007. Since that time, the Airport has successfully completed several capital improvement projects shown on the Airport Layout Plan and subsequent "as-built" ALPs have been prepared. Alamosa County is conducting this airport master plan study to comprehensively study the short, medium and long-term development plans for the airport in order to meet current and future aviation demands. This study will be used by the County, State and Federal officials to plan, prioritize and fund the operation, maintenance and development for the airport.

Airport Master Plans are prepared by the operators of individual airports and are usually completed with the assistance of consultants. San Luis Valley Regional Airport is completing this master plan with the assistance of Armstrong Consultants, Inc.

1.2 Purpose

The purpose and goal of an airport master plan (AMP) is to provide the framework needed to guide future airport development that will cost-effectively satisfy local and regional aviation demand, while producing an efficient and economically feasible facility that meets the current Federal Aviation Administration (FAA) design standards. As part of the planning process, consideration will be given to the potential environmental and socioeconomic impacts associated with alternative development concepts as well as the possible means of avoiding, minimizing, or mitigating potential impacts to sensitive resources.

The master plan report describes and depicts the long-term development concepts of the airport. The document also presents the concepts graphically in the ALP drawing set and includes the supporting data and logic on which the concepts are based.

1.3 Objectives

The primary objective of the master plan is to provide guidance to decision makers, airport users and the general public in implementing airport development actions, while remaining in line with both the airport's and community's concerns and objectives.

The master plan's recommended development is presented for three planning periods— short-term (5 years), medium-term (10 years), and long-term (20 years). The recommended development program is intended to satisfy aviation demand and be compatible with the environment, community development, and other transportation modes. The following objectives serve as a guide in the preparation of this study.

Specific objectives of the San Luis Valley Regional Airport Master Plan include, but are not limited to:

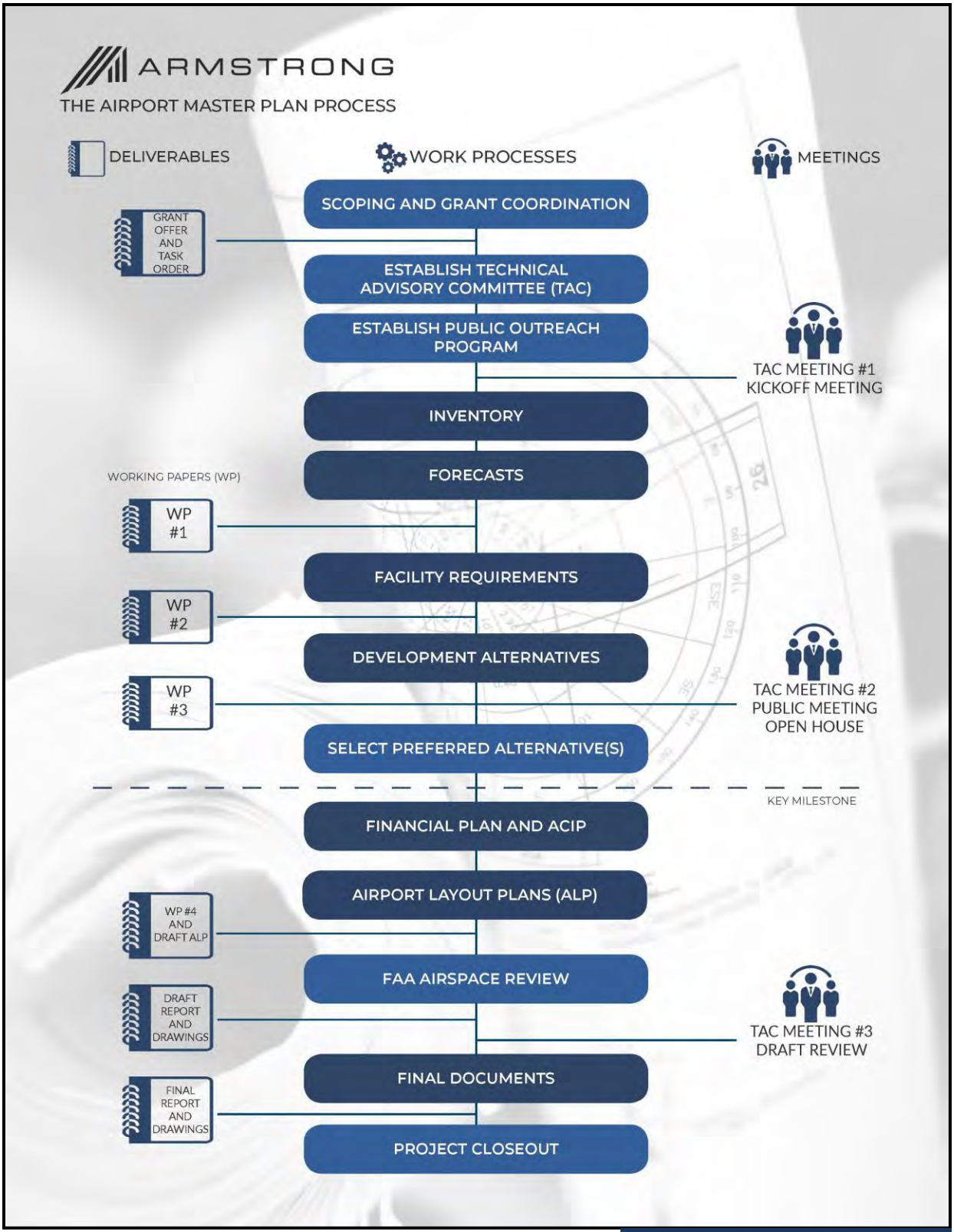
- Clearly identify the present and future roles of the Airport;
- Depict design standards for the determined Airport Reference Code (ARC);
- Evaluate the potential airport needs to accommodate increased commercial air service
- Provide the basis for future federal, state, local government and private investment in the airport;
- Develop realistic, phased development and maintenance plans for the airport;
- Provide an Airport Layout Plan (ALP) in accordance with the current FAA ALP checklist and Standard Operating Procedures (SOPs);
- Identify future land acquisition requirements;
- Prepare an Environmental Overview for proposed development indicating the nature of alternatives that must be reviewed;
- Develop an achievable financial plan for the airport to support the implementation schedule and operation and maintenance costs; and
- Present for public consideration, a plan which addresses the needs and satisfies local, state and federal regulations.

The airport master planning process involves collecting data, forecasting demand, determining facility requirements, studying various alternatives and developing plans and schedules. The flow chart in **Figure 1-1** depicts the steps in the master planning process. This process will take into consideration the needs and concerns of the airport sponsor, airport tenants and users, as well as the general public.

When completed, this airport master planning study will be incorporated into larger airport planning efforts that takes place at national, state, and local levels. On the Federal level, the National Plan of Integrated Airport Systems (NPIAS) is a ten-year airport system plan that FAA continually updates and publishes biannually. This publication lists developments at public use airports that are considered to be of national interest and identifies development needs based on input from airport master plans. To be eligible for Federal financial assistance for airport planning and development, an airport must be included in the NPIAS.

Statewide airport system planning identifies the needs of existing airports and identifies location and characteristics of new airports needed to meet statewide air transportation goals. This planning is performed by state transportation or aviation planning agencies. In Colorado, this state airport planning is performed by the Colorado Department of Transportation, Division of Aeronautics (CDOT). Using Federal and local input, state system plans are coordinated with other transportation planning and comprehensive land use planning.

The San Luis Valley Regional Airport Master Plan Technical Advisory Committee (TAC) consists of members representing varied interests in the airport. Their involvement and input throughout the master planning process will help to keep interested parties informed and will foster consensus for future development actions.



Source: Armstrong Consultants, Inc.

Figure 1-1 Airport Master Plan Flow Chart

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Chapter Two

Inventory of Airport Assets

Chapter 2 – Inventory of Airport Assets

2.1 Introduction to Airport Background and Setting

Airport Background and History

San Luis Valley Regional Airport is a Primary Commercial service airport located in southern Colorado, approximately two miles south of the City of Alamosa The Airport is approximately 160 miles south of Denver, the state capitol. The Airport is owned and operated by Alamosa County. Section 2.2, *Airport Grant History*, provides additional details on historical improvement projects at the Airport.

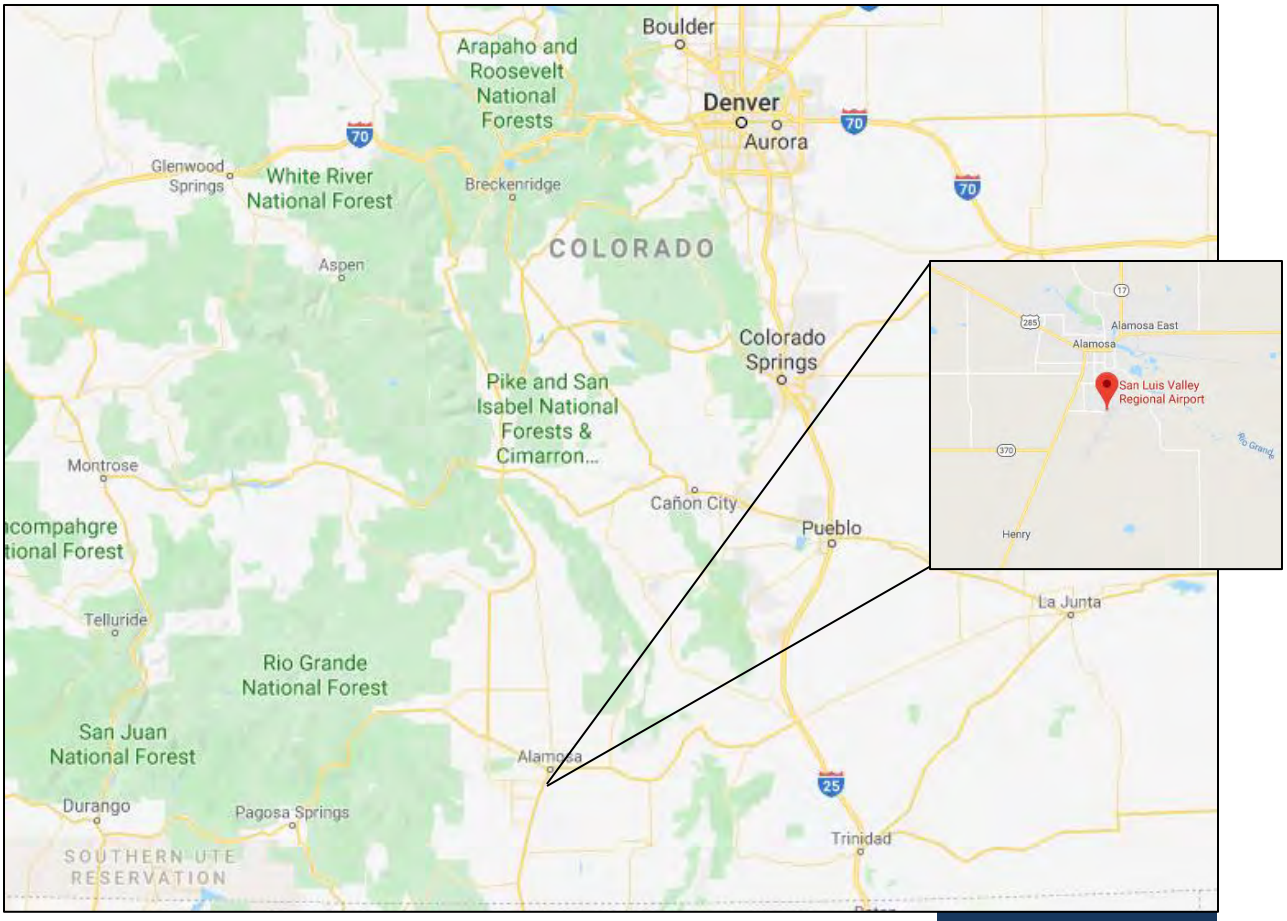
According to a 2019 Class I Cultural Resource Study conducted for the Airport by SWCA Environmental Consultants, "The idea for the San Luis Regional Airport began in 1939 when the U.S. Government directed most towns and cities to construct airports to build an aviation network that would link the nation. To that end, the town of Alamosa condemned a small airfield west of town and began the search for suitable land for a larger, modern airfield close to town. The current space south of Alamosa was chosen, and work began to secure funds for the project.

Later that same year, with funding acquired from a combination of the Junior Chamber of Commerce and various private individuals including the mayor himself, the main airstrip was built as well as an auxiliary crosswind runway. The first hangar was built, co-owned by Carl Bergman and Lloyd Jones, and the humble airstrip was christened as "Bergman Field." Later, a second hangar was built by the city and a terminal was installed from a repurposed house. The airfield was officially operational by March 1941.

The first commercial airline to service Alamosa was Monarch Airlines who began flights to Denver in December 1947 on propeller-driven DC-3s. A flurry of remodeling and modernizing of the airport was undertaken in the mid-1950s including the extension and paving of the main runway by 1954, and the construction of an actual terminal facility. Historic aerial imagery indicates that the main runway was again extended sometime between 1960 and 1998."

Airport Setting

An airport's location is defined by its Airport Reference Point (ARP), which is the geometric center of the runway system. ARPs are calculated based on existing and future runway lengths and locations. The existing ARP at San Luis Valley Regional Airport is located at N 37°26'05.70" latitude, W 105°51'59.60" longitude. The Airport encompasses approximately 1,659 acres of land at an elevation of 7,539.8 feet. The location of San Luis Valley Regional Airport is depicted in **Figure 2-1**.



Source: Google Maps 2019

Figure 2-1 Location Map

2.2 Airport Grant History

The Airport Improvement Program (AIP) is the Federal Aviation Administration (FAA) grant program that provides grants to public agencies for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS). Grant funding levels for airports vary on their role in the NPIAS. Due to San Luis Valley Regional Airport's role hosting Essential Air Service for an Economically Distressed Community as defined by Section 301(a) of the Public Works and Economic Development Act of 1965 (42 U.S.C. § 3161(a)), AIP grants cover 95 percent of eligible costs, with a 2.5 percent match by the state on federal projects and the remaining portion covered by the sponsor. Eligible projects include improvements related to enhancing airport safety, capacity, security, and environmental analysis; however, aviation demand at the airport must justify the projects. Airports can use AIP funds on most airfield capital improvements or repairs and in some specific situations, for terminals, hangars and equipment. Professional services necessary for eligible projects such as planning, surveying, and design are also eligible. The projects must also meet federal environmental and procurement requirements. **Table 2-1** contains a summary of federal grants issued to San Luis Valley Regional Airport under the current Federal airport grant program, AIP.

Table 2-2 contains a list of projects that were funded with Colorado Department of Transportation-Division of Aeronautics (CDOT) State grant funds for the Airport. CDOT operates the Colorado Discretionary Aviation Grant Program (CDAG). These grants are funded through an aviation fuel tax, which is collected by the State.

Table 2-1 FAA Grant History

Year	Project Description	Entitlement	State Apportionment	Total
2008	Install Airfield Guidance Signs, Rehabilitate Taxiway	$123,693	$0.00	$123,693
2013	Acquire ARFF Equipment	$306,000	$22,222	$328,222
2013	Construct Terminal Building / Wildlife Hazard Assessment	$888,889	$34,105	$922,994
2016	Install Airfield Guidance Signs	$93,366	$0.00	$93,366
2016	Rehabilitate Runway 2-20	$206,634	$16,666	$223,300
2017	Rehabilitate Runway 2-20 / Rehabilitate Runway Lighting 2-20	$6,382,570	$150,000	$6,532,570
2018	Install Perimeter Fencing	$2,767,771	$56,579	$2,824,350
2019	Master Plan Update and Design Taxiway A	$800,000	$21,051	$821,051
	Total	**$10,568,923**	**$300,623**	**$11,869,546**

Source: Federal Aviation Administration, Denver Airport District Office, 2019

Table 2-2 CDOT Grant History

Year	Project Description	Total
2011	ILS Maintenance	$23,868
2012	ILS Maintenance	$24,084
2013	ILS Maintenance / Overmatch Passenger Terminal Building Construction	$1,127,084
2014	ILS Maintenance / Construction Terminal Building	$400,000
	Total	**$1,575,036**

Source: Colorado Department of Transportation, Aeronautics Division, 2019

Airport sponsors agree to certain obligations, or grant assurances, when they accept Federal grant funds or Federal property transfers for airport purposes. These obligations serve to protect the public's interest in civil aviation and ensure compliance with Federal statutes and requirements, including FAA safety standards. As a recipient of AIP funds, San Luis Valley Regional Airport and Alamosa County have accepted the contractual obligation to comply with Federal grant assurances.

FAA Order 5190.6B, *Airport Compliance Manual*, currently has 39 grant assurances that are accepted by an airport sponsor whenever federal grant funds are used to fund a project. Among other requirements, the grant assurances require the airport sponsor to keep the airport open to the public for at least the useful life of the improvement or while it complies with safety requirements. In most cases, the useful life is considered to be 20 years from the date of acceptance of the grant. Grant assurance agreements associated with land acquisition run in perpetuity.

2.3 Airport Service Level and Role

Airport Service Level

Since 1970, the FAA has classified a subset of the 5,400 public-use airports in the United States as being vital to serving the public needs for air transportation, either directly or indirectly, and therefore may be made eligible for federal funding to maintain their facilities. These airports are categorized within the NPIAS based on the type of aircraft that uses the airport and the type of passenger and cargo operations available. As established by Congress, the level of Federal funding is tied to these categories.

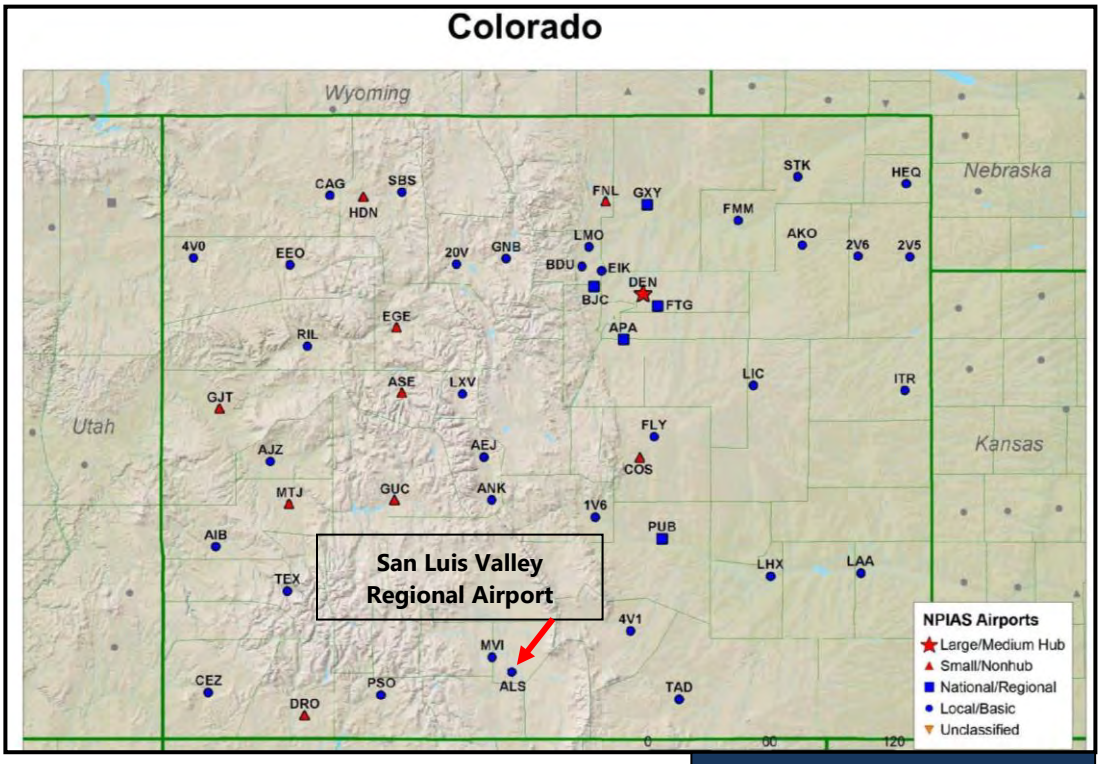
The categories of airports listed in the NPIAS are:

- **Commercial Service (CS)** – These are public airports that accommodate scheduled air carrier or air taxi service provided by US and international certificated air carriers. Commercial service airports are either:
    - **Primary (P) –** a public-use airport that enplanes more than 10,000 passengers annually, or
    - **Non-primary (NP) –** a public-use airport that enplanes between 2,500 and 10,000 passengers annually.
- **Reliever** – This is an airport designated by the FAA as having the function of relieving congestion at a commercial service airport by providing more general aviation access. These airports comprise a special category of general aviation (GA) airports and are generally located within a relatively short distance of primary airports. Privately owned airports may also be identified as reliever airports.
- **General Aviation (GA)** – These airports are used almost exclusively by private and business aircraft and private charter services are available. Scheduled air carrier passenger service in larger aircraft does not operate at these airports. Within the General Aviation category, there are four subcategories:
    - **National** – Serves national and global markets. Very high levels of activity with many jets and multiengine propeller aircraft. These airports average about 200 total based aircraft, including at least 30 jets.
    - **Regional** – Serves regional and national markets. High levels of activity with some jets and multiengine propeller aircraft. These airports average about 90 total based aircraft, including at least three jets.
    - **Local** – Serves local and regional markets. Moderate levels of activity, with some multiengine propeller aircraft. These airports average about 33 based propeller-driven aircraft and no jets.
    - **Basic** – Often serving critical aeronautical functions within local and regional markets. Moderate to low levels of activity, averaging about 10 propeller-driven aircraft and no jets.

There are many GA airports that are not included in the NPIAS. For an airport to be included in the NPIAS, it must have at least 10 based aircraft, be located at least 30 miles away from the nearest NPIAS

airport, be a facility identified and used by certain federal agencies (U.S. Forest Service, U.S. Customs and Border Protection, etc.) or serve an operation specified by statute, such as the Essential Air Service (EAS) program.

San Luis Valley Regional Airport is categorized in the NPIAS as Primary Commercial Service airport. According to FAA and airport management records, the Airport has 38 based aircraft as of 2018. The Airport is located approximately 10 miles southeast of Monte Vista Municipal Airport (MVI) in Monte Vista, and 70 miles northwest of the Taos Regional Airport (SKX) in Taos, New Mexico; Both airports are also included in the NPIAS as General Aviation - Local. **Figure 2-2** depicts San Luis Valley Regional Airport's location in relation to other NPIAS airports in the State of Colorado.



Source: Federal Aviation Administration, 2019

Figure 2-2 NPIAS Airports in Colorado

At the State level, CDOT has recognized the importance of planning as a proactive approach to ensuring aviation continues its role in the statewide transportation system. They created a similar plan to the FAA's NPIAS called the Colorado Aviation System Plan (CASP). The purpose of the CASP is to provide a framework for the integrated planning, operation, and development of Colorado's aviation assets. The most current version of the CASP was published in 2011. CDOT Aeronautics is currently updating the CASP. San Luis Valley Regional Airport is listed as a Major Airport in the CASP, however the plan recommends that the Airport be reclassified as an Intermediate Airport. Major Airports primarily serve and meet the operating requirements of single-engine, multi-engine or small to medium jet aircraft. The CASP recommends Major Commercial Airports meet and maintain an Airport Reference Code of C-II. The 2020 Draft CASP Report has planned to reconfigure the airport classifications in the State and the Airport would be classified as Commercial Service. This category applies to all airports in Colorado which provide scheduled commercial service.

Locally, San Luis Valley Regional Airport serves as a Primary Commercial service airport serving central southern Colorado. The Airport primarily serves business, recreational, commercial and medical users. Users include the following aircraft types and operations:

2.3.1 Airline Transportation

Commercial air service at San Luis Valley Regional Airport is subsidized under the United States Department of Transportation's Essential Air Service (EAS) program. The EAS program was developed as a result of the Airline Deregulation Act of 1978, which afforded airlines the ability to select their own destinations and routes free of government control. As a safeguard to protect smaller communities from losing air service, the EAS program was developed. To maintain eligibility in the EAS program, an airport must meet the following criteria:

- Received scheduled commercial air service prior to October 24, 1978
- Ten passenger enplanements per day (exemption provided for airports located 175 miles or more from nearest large or medium hub airport)
- Average passenger subsidy is less than $200 (exception provided for airports located 210 miles or more from nearest large or medium hub airport)

San Luis Valley Regional Airport is currently served through the EAS program by United Express with non-stop service to Denver International Airport operated on the Bombardier CRJ-200 aircraft.

2.3.2 Business and Recreational Transportation

This category includes both privately-owned and corporate-owned aircraft operated for personal and business transportation include, and a mix of single-engine, multi-engine, turboprop, and turbo jet aircraft. These users prefer the utility and flexibility offered by general aviation aircraft, including tourism and recreational flights. This is the most common type of user at the Airport.

2.3.3 Air Ambulance Services and Local Health Care Support

A variety of air ambulance operators provide essential emergency medical transportation for life threatening situations and assists in patient transfers by air from local hospitals to higher level care facilities that are typically located in Denver or Albuquerque (approximately 218 and 203 miles by road, respectively). The air ambulance services provide quick and efficient transportation in emergency situations when time is of the essence. One operator, Guardian Flight, maintains a base at the Airport. Their flights are usually operated by KingAir turboprops or AS350 helicopters.

2.3.4 Flight Training

There are no flight schools currently based at the Airport; however, it is regularly utilized by flight training schools from southern Colorado and the Denver-metropolitan area for cross-country training. The location of the Airport provides a strategic location for cross country and high-altitude flight training. Local flight instructors also offer flight training at the Airport with rental or customer-owned aircraft.

2.3.5 Agricultural Spray Operators

This category includes operations by aircraft with the purpose of spraying nearby land with products such as pesticides, fertilizers, seeding and mosquito control. Operations are typically conducted by single-engine turboprop aircraft. These users prefer close proximity to the lands they spray to reduce fuel consumption and increase aircraft utilization.

2.3.6 Military

Military operations are those conducted by U.S. or foreign military aircraft and personnel for the purposes of national security and defense. Almost all military operations are training or proficiency activities and may include fuel stops. A wide range of aircraft may be used for these operations, including multi-engine piston or turbo-prop, turbo-jet, jet, or rotary.

2.3.7 Air Cargo

Air cargo services at the Airport are provided by Alpine Air Express and Key Lime Air with the Beechcraft 1900, Beechcraft 99, or Fairchild Swearingen Metroliner III. Both operate flights to sorting facilities at Denver International Airport. These services allow connectivity for both domestic and international parcel shipments to have expedited and direct access to the San Luis Valley.

2.4 Existing Activity Levels

There are various federal, state, and local sources available for determining existing activity levels at an airport. These include, but are not limited to, FAA Form 5010-1, *Airport Master Record*, FAA Terminal Area Forecast (TAF), FAA Traffic Flow Management System (TFMS), on-site inventory and airport management records.

The FAA Form 5010-1 is the official record maintained by the FAA to document airport physical conditions and other pertinent information. The information on the 5010 Form is typically collected from the airport sponsor and includes an annual estimate of aircraft activity and the number of based aircraft. The accuracy of the information contained in the Form 5010-1 varies directly with the date of its last revision and the reliability of the source of the information. The current FAA 5010-1 Form for San Luis Valley Regional Airport reports 27 based aircraft and 8,403 annual operations. The National Based Aircraft Inventory, the web portal for reporting based aircraft for the 5010, lists 27 based aircraft for San Luis Valley Regional Airport.

The FAA TAF is a historical record of aircraft activity and contains forecast projections of based aircraft and annual operations based on information from the Form 5010-1. The TAF is maintained and utilized by the FAA for planning and budgeting purposes. The 2019-2039 TAF data reports 39 based aircraft at the airport and 5,767 annual operations in 2019, with a forecasted 49 based aircraft and 6,911 annual operations by 2039 at the Airport. The aviation forecast developed as part of this master plan study and approved by the FAA will be used to update the forecast operations and based aircraft numbers in FAA Form 5010-1 and the FAA TAF.

2.5 Airport Service Area

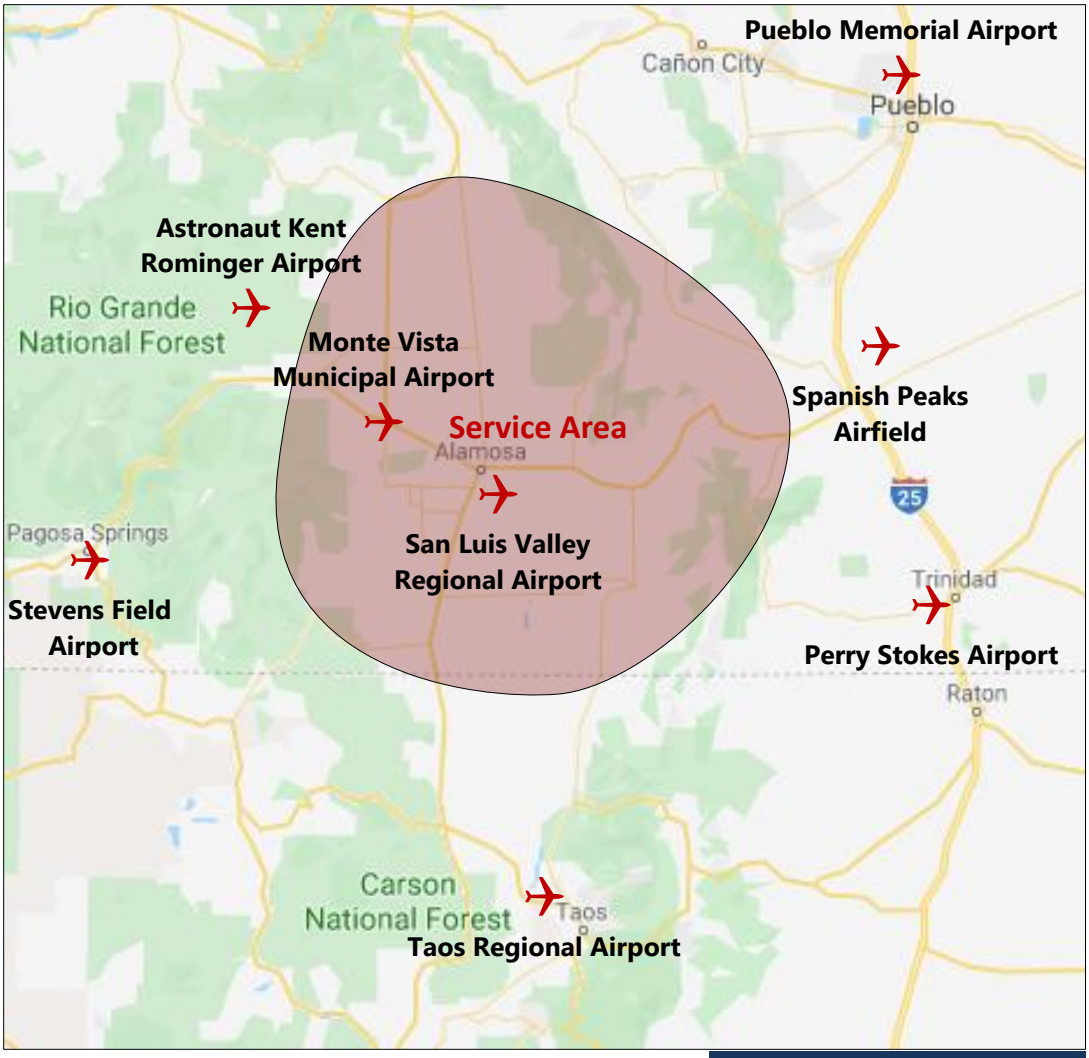
An airport service area is defined by the communities and surrounding areas that are served by the airport facility. Generally, the airport service area includes the area within a thirty-minute drive or twenty-mile radius, of the airport. However, the actual service area is dependent upon several factors including surrounding terrain, proximity to its users, quality of ground access and the proximity of the facility to other airports that offer the same or similar services. Generally, aircraft operators will usually operate at the closest airport to their residence, place of business or destination that provides adequate facilities and services to accommodate their aircraft.

The San Luis Valley Regional Airport service area generally includes Alamosa County, located in southern Colorado, and extends to the Colorado/New Mexico border including portions of Conejos and Costilla Counties. The City of Alamosa is the most populated municipality in the County, situated on the U.S. Highway 285 corridor at the intersection of Colorado State Highway 17 and U.S. Highway 160.

The factors influencing the service area for San Luis Valley Regional Airport include:

- Updated airport facilities;
- Air service to a major airport;
- Limited airports with substantive pilot services in vicinity of San Luis Valley Regional Airport;
- Available runway length;
- Full service Fixed Based Operator (FBO) facility;
- Available instrument approach procedures; and
- Proximity to recreational areas and educational campuses.

Figure 2-3 depicts the San Luis Valley Regional Airport service area and other airports in the region. Taking into account the factors discussed above, airports in the vicinity were reviewed. **Table 2-3** provides information on the five closest airports to San Luis Valley Regional Airport that provide fuel and other similar services, which are key factors in attracting airport users.



Source: www.google.com/maps, 2019
Note: Airport locations have been approximated

Figure 2-3 Airport Service Area Map

Table 2-3 Airports Near San Luis Valley Regional Airport

Airport Name	Distance (NM)	NPIAS Status	Runway Dimensions	Pavement Type	Instrument Approaches	Fuel Available
SLV Regional Airport Alamosa, Colorado	0	CS	8,521′ x 100′	Asphalt	ILS, GPS VOR/DME	100LL Jet-A
Monte Vista Municipal Airport Monte Vista, Colorado	10	GA	5,901′ x 60′ 2,300′ x 30′ 2,100′ x 50′	Asphalt Dirt Dirt	GPS VOR/DME	100LL
Astronaut Kent Rominger Airport Del Norte, Colorado	28	GA	6,051′ x 75′ 4,812′ x 60′	Asphalt Turf	GPS	100LL
Spanish Peak Airfield Walsenburg, Colorado	54	GA	4,712′ x 75′ 2,012′ x 40′	Asphalt Turf/Dirt	GPS	100LL Jet-A
Stevens Field Airport Pagosa Springs, Colorado	57	GA	8,100′ x 100′	Asphalt	GPS	100LL Jet-A
Taos Regional Airport Taos, New Mexico	60	GA	8,600′ x 100′ 5,504′ x 75′	Asphalt Asphalt	GPS VOR/DME	100LL Jet-A
Perry Stokes Airport Trinidad, Colorado	85	GA	5,500′ x 100′ 5,500′ x 100′	Asphalt Turf	GPS	100LL Jet-A
Pueblo Memorial Airport Pueblo, Colorado	95	CS	10,498′ x 150′ 8,310′ x 150′ 4,690′ x 75′	Asphalt Asphalt Asphalt	ILS, GPS VOR/DME	100LL Jet-A

Source: www.airnav.com, 2019

2.6 Existing Airside Facilities at San Luis Valley Regional Airport

Airside facilities include the runway, taxiway system, aircraft parking area and any visual or electronic approach navigational aids. San Luis Valley Regional Airport is a currently single-runway airport that is designated to serve all types of general aviation and commercial aircraft up to 52,000 pounds Single Wheel Gear (SWG) and 70,000 pounds Dual Wheel Gear (DWG) or a Pavement Classification Number (PCN) of 44/F/C/X/T. The Airport is served by a taxiway system and aircraft parking aprons. Existing airside facilities are further described within this section and are depicted in **Figure 2-4.**



Figure 2-4 Existing Airside Facilities

2.6.1 Runway System

Runways are a defined rectangular surface on an airport, prepared or suitable for the landing or takeoff of aircraft. The runway configuration relates to the number and orientation of runways. The number of runways provided at an airport depends largely on the volume of air traffic and prevailing wind conditions. Since aircraft takeoff and land into the wind, the orientation of the runways depends primarily on the direction of the prevailing wind patterns in the area. The size and shape of the area available for development, local land-use requirements, surrounding terrain and airspace restrictions in the vicinity of the airport also will influence runway orientation.

The runway configuration at San Luis Valley Regional Airport consists of one asphalt-grooved runway, Runway 2-20. Runway 2-20 is 8,521 feet long by 100 feet wide and has a published pavement strength of 52,000 pounds single wheel gear (SWG) and 70,000 dual wheel gear (DWG). The runway is also designated with a PCN which indicates the strength of a runway, taxiway or aircraft apron. A PCN has a minimum value of 0 and has no upper limit. The numerical value equals the calculated operating weight. In addition to the numerical value, the PCN is reported with four codes; R or F = pavement type; A, B, C, or D = subgrade strength category; W, X, Y, or Z = maximum allowable tire pressure; T or U = pavement evaluation method. The current reported PCN for Runway 2-20 is 44/F/C/X/T. The runway was rehabilitated in 2017. The runway pavement is in excellent condition. Both Runway 2 and 20 are marked with precision runway markings and the markings are in excellent condition.

2.6.2 Taxiway System

Taxiways provide aircraft access between an aircraft parking apron and corresponding runways. They are intended to expedite aircraft departures from the runway and eliminate back-taxiing on the runway. As such, they enhance operational safety and efficiency of an airport.

The taxiway system at San Luis Valley Regional Airport consists of a full-length parallel taxiway to Runway 2-20, located to the east of the runway. The parallel taxiway, Taxiway A, includes five entrance and exit taxiways, Taxiways A1, A2, A3, A4, and A5 to Runway 2-20. There is also a connector taxiway, Taxiway B, located to the west of Runway 2-20. Taxiway B connects the East Hangar Area to Runway 2-20. Taxiway A is constructed of asphalt and has a width of 35 feet. Taxiway A1, A2, A3, A4 and A5 connectors at San Luis Valley Regional Airport are constructed of asphalt and have a width of 92, 53, 82, 71 and 72 feet respectively. Taxiway B is constructed of asphalt and is a width of 26 feet. Taxiway A is in excellent condition, with A connectors in good condition. A taxiway reconstruction and reconfiguration project was conducted during the process of this Master Plan Study. The project included the reduction of pavement width from 50 feet to 35 feet for Taxiway A, removal of the previous Taxiway A2 and A3, and constructing a new Taxiway A2 with a 90-degree entry. Taxiway B is poor condition (See *Section 2.6.4*).

2.6.3 Aircraft Parking Apron

The aircraft apron provides an area for aircraft to park. The apron is connected to the runway via taxiways. There are two aircraft parking aprons serving aircraft at San Luis Valley Regional Airport. **Table 2-4** provides further details on the apron areas. The existing apron is depicted in **Figure 2-5**.

Table 2-4 San Luis Valley Regional Airport Apron Information

Apron Area	Area Size	Pavement Type	Pavement Condition	Number of Tie Downs / Parking Positions
Commercial Apron	10,100 S.Y.	Asphalt	Fair	1
General Aviation Apron	23,735 S.Y.	Asphalt	Good to Poor	40

Source: Armstrong Consultants, Inc., 2019



Figure 2-5 Existing Aircraft Parking Apron

Source: Armstrong Consultants, Inc.

2.6.4 Airfield Pavement Conditions

The Pavement Condition Index (PCI) is a numerical index between 0 and 100 and is used to indicate the condition of the pavement. The PCI, as outlined by the Colorado Department of Transportation, is based on a visual survey of the pavement and a numerical value between 0 and 100 defining the pavement condition. Numerical values are grouped into three condition levels - Preventative Maintenance, Major Rehabilitation and Reconstruction.

Table 2-5 depicts the results of the 2018 PCI inspection report for San Luis Valley Regional Airport. The specific ratings and recommended corrective actions are listed for each pavement area. Condition levels are shown in the legend of **Figure 2-6.**

Table 2-5 Pavement Condition Indexes

Location	Branch Name	Pavement Condition Index	Recommended Action
Aircraft Parking Apron	A01AL	53	Preventative Maintenance / Major Rehabilitation
Runway 2-20	R02AL	90	Preventative Maintenance
Taxiway A	TAAL	99	Preventative Maintenance
Taxiway A1	TA1AL	86	Preventative Maintenance
Taxiway A2	TA2AL	100	Preventative Maintenance
Taxiway A3	TA3AL	89	Preventative Maintenance
Taxiway A4	TA4AL	88	Preventative Maintenance
Taxiway A5	TA5AL	88	Preventative Maintenance

Source: Colorado Department of Transportation, Aeronautics Division, 2021



PCI	Repair Type
86-100	Preventive Maintenance
71-85	
56-70	Major Rehabilitation
41-55	
26-40	Reconstruction
11-25	
0-10	

Source: Colorado Department of Transportation, Aeronautics Division, 2018

Figure 2-6 Pavement Condition Index Map

2.6.5 Airfield Lighting and Visual Aids

Airport lighting enhances safety during periods of inclement weather and nighttime operations by providing visual guidance to pilots in the air and on the ground. Several common airfield lighting features of airports include:

- **Precision Approach Path Indicator (PAPI)** located on the left side of the runway, consists of two or four lights installed in a single row. A PAPI provides visual approach path guidance by emitting a series of white and red lights. These lights can be seen for up to five miles during the day and up to twenty miles at night and provides guidance to the runway touchdown zone.

- **Visual Approach Slope Indicators (VASIs)** is another type of visual approach path guidance that consist of two sets of lights and typically provides less precise visual guidance than a PAPI. One set is located at the start of the runway, while the other is 695 feet down the runway. Each set of lights are designed to appear either white or red, depending on the angle at which the lights are viewed. When an aircraft is on the glide slope, the first set of lights appears white, while the second set appears red. If an aircraft drops below the glide slope both sets appear red and if an aircraft is above the glide slope both sets will indicate white.

- **Approach Lighting Systems (ALS)** are installed at the approach end of a runway and consists of a series of lights that provide the pilot with transition from the aircraft instruments to the visual runway environment. For traditional ground-based NAVAID approaches (e.g., Very High Frequency Omni-Directional Range (VOR), ILS, NDB) and ALS is required for visibility minimums of less than 3/4-mile. Types of ALS include: Approach Lighting System with Sequenced Flashing Lights (ALSF), Simplified Short-Approach Light System with Sequenced Flashing Lights/Runway Alignment Indicator Lights (SSALF/SSALR), Medium-Intensity Approach Lighting System with Sequenced Flashing Lights/Runway Alignment Indicator Lights (MALSF/MALSR), Lead-in Light System (LDIN), Runway Alignment Indicator Lights (RAIL) and Omnidirectional Approach Lighting System (ODALS). San Luis Valley Regional Airport is equipped with a MALSR.

- A **rotating beacon** is used to guide pilots to lighted airports with a sequence of yellow, green and/or white lights. Most general aviation airports are considered to be civilian land airports, consisting of alternating white and green lights or a water airport, consisting of alternating white and yellow lights. A beacon is normally operated from dusk until dawn. If the beacon is on during other hours, it typically indicates that the airport is operating under instrument flight rules due to poor visibility conditions.

- **Runway edge lights** consist of a single row of white lights bordering each side of the runway, outlining the runway edges during periods of darkness or low visibility. Runway edge lights are classified into three types according to the

intensity of light of which they are capable of producing: they include High Intensity Runway Lights (HIRL), Medium Intensity Runway Lights (MIRL) and Low Intensity Runway Lights (LIRL). Both HIRLs and MIRLs have variable intensity settings, whereas LIRLs have only one. Instrument runway lights include yellow edge lights on the last 2,000 feet of runway to visually inform pilots of the amount of runway remaining. At most non-towered airports, runway lights are activated by pilot controlled lighting which is utilized by transmitting a series of "clicks" on the radio transmitter to activate and control lighting intensity settings.

- **Runway End Identifier Lights (REIL)** consist of a pair of synchronized high intensity white flashing lights placed on each side of the runway threshold to enable rapid identification of the runway threshold.

- **Runway markings** vary depending on whether the runway is used exclusively for visual flight rule operations (VFR) or instrument flight rule (IFR) operations. A visual runway is typically marked with the runway designator numbers and a dashed white centerline. Threshold bars and aiming point markings are added to provide non-precision instrument markings. A precision instrument runway includes touchdown zone markings.

- **Threshold lights** consist of a single row of green lights used to indicate the beginning of the usable landing surface. These lights are two-directional and appear red from the opposite end of the runway to mark the end of the usable runway.

- **Taxiway edge lights** consist of a single row of blue lights bordering each side of the taxiway. These lights mark the edge of the taxiways and guide aircraft from the runway to the ramp or apron area.

- **Retroreflectors**, used in lieu of taxiway lighting, consists of a single row bordering each side of the taxiway of reflective tape mounted on a pole.

- A **wind direction indicator** consists of a windcone, wind tee or tetrahedron. A windcone aligns itself into the wind as the wind blows through a truncated cloth aligning itself with the wind indicating both wind direction and approximate velocity. The tail of a wind tee aligns itself in the wind similar to that of a weather vane. A tetrahedron may either swing around to align the small end pointing into the wind or it may be manually positioned to show landing direction. Wind indicators can be lighted for use during periods of darkness and low visibility.

- A **segmented circle** is located around the wind direction indicator. The segmented circle has two purposes, including identifying the location of the wind direction indicator and identifying non-standard traffic patterns.

- **Lighted signs** provide airfield location and direction information to pilots.

The airfield lighting and visual aids at San Luis Valley Regional Airport consist of High Intensity Runway Lights (HIRLs), Runway End Identifier Lights (REILs), threshold lights, a four-light Precision Approach Path Indicators (PAPIs) on Runway 2, and a four-box Visual Approach Slope Indicators (VASIs) on Runway 20, which are pilot controlled on the Common Traffic Advisory Frequency (CTAF) frequency 122.8 MHz. A new pilot controlled lighting system was installed to resolve reception issues for airport users operating on the ground towards the southern portions of the airside environment. A Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) is located on the approach end of Runway 2. The airfield lighting and visual aids are in good condition. There is a lighted wind cone with segmented circle and a rotating airport beacon that operates from sunset to sunrise and both are in good condition. The rotating beacon is located to the west of the existing terminal building. The lighted wind cone with segmented circle is located to the east of midfield of Runway 2-20. Taxiway A is lighted with Medium Intensity Taxiway Lights (MITLs) and lighted airfield signage. The existing beacon at ALS is depicted in **Figure 2-7**. Examples of various airfield lighting and visual aids can be found in **Figure 2-8**. The locations of the airfield lighting and visual aids are shown in **Figure 2-9**.



Figure 2-7 Existing Beacon at ALS

Source: Armstrong Consultants, Inc.



Visual Approach Slope Indicators (VASI)

Guides pilots to airports during nighttime or IFR conditions



Precision Approach Path Indicator (PAPI)

Guides pilots to airports during nighttime or IFR conditions



Runway End Identifier Lights (REIL)

Identifies runway threshold



Runway Edge Lighting

Outline runway boundary during nighttime or IFR conditions



Threshold Lights

Identifies beginning and end of usable landing area



Retroflectors

Reflectors outlining airfield pavement



Taxiway Edge Lighting

Outlines taxiway boundary during nighttime or IFR conditions



Rotating Beacon

Guides pilots to airports during nighttime or IFR conditions



Wind Direction Indicator

Provides current wind direction at airport



Segmented Circle

Identifies wind direction indicator and non-standard traffic patterns, if any

Source: Armstrong Consultants, Inc.

Figure 2-8 Typical Lighting and Visual Aids



Source: Armstrong Consultants, Inc.

Figure 2-9 Existing Visual and Lighting Aids

2.6.6 Navigational Aids

A Navigational Aid (NAVAID) is any ground based visual or electronic device used to provide course or altitude information to pilots. Typical NAVAIDs include Very High Omni-directional Range (VORs), Very High Frequency Omni-directional Range with Tactical Information (VOR-TAC), Non-directional Beacons (NDBs), Instrument Landing System (ILS), and Tactical Air Navigational Aids (TACANs), as examples. An ILS, consisting of a glideslope and localizer, I-VQR, is located at the Airport and is used to assist with navigation and instrument approaches. It can be utilized on a frequency of 111.9 MHz. The existing Mark 3 ILS was acquired as surplus from the former Denver Stapleton Airport and is approximately 40 years old. The system has encountered several reliability issues in previous years and availability of replacement parts has become difficult. The nearest VOR-TAC is the ALAMOSA VOR-TAC which is located 6 nautical miles southeast of the airport on a frequency of 113.9. The FAA recently notified the airport management a desire to cancel the VOR/DME-B and VOR-A due to cost associated to maintain the VOR approaches.

San Luis Valley Regional Airport is currently served by three instrument approach procedures, listed in **Table 2-6**.

Table 2-6 San Luis Valley Regional Airport Instrument Approach Procedures

Runway End	Approach Procedure	Visibility Minimums / Lowest Ceiling (Above Ground Level)	Approach Type
2	ILS/LOC	1/2 Statute Mile / 200′	Precision
2	GPS/RNAV	1/2 Statute Mile* / 200′	Precision
20	GPS/RNAV	1 Statute Mile / 328′	Non-Precision
2 or 20	VOR/DME-B	1 Statute Mile / 501′	Circling
2 or 20	VOR-A	1 Statute Mile / 501′	Circling

Source: Federal Aviation Administration, 2019

* GPS LNAV/VNAV visibility minimums ¾ SM and LNAV Categories C/D visibility minimums 7/8 SM when approach lighting system inoperative.

2.6.7 Air Traffic Control

There is no air traffic control tower (ATC) located at the airport. Instead, pilots coordinate their position in the airport traffic pattern over the radio via the Common Traffic Advisory Frequency (CTAF, 122.8 MHz) assigned to the Airport. In-flight air traffic control services are provided by FAA's Denver Center Air Route Traffic Control Center (ARTCC) and Denver Flight Service Station (FSS). Enroute radar and coverage for San Luis Valley Regional Airport is provided by Denver ARTCC. The Denver FSS provides additional weather data and other pertinent weather information to pilots on the ground and enroute.

2.6.8 Weather Reporting Systems

The Weather reporting system at San Luis Valley Regional Airport includes an Automated Surface Observing System. This system generally reports the following parameters: barometric pressure, altimeter setting, wind speed and direction, temperature and dew point in degrees Celsius, density altitude, visibility, and cloud ceiling, while also having the additional capabilities of reporting

temperature and dew point in degrees Fahrenheit, present weather, icing, lighting, sea level pressure and precipitation accumulation. The ASOS information may be obtained via radio at 135.175 MHz or by phone at (719)-589-5669.

2.6.9 FAA Design Standards and Airport Reference Code (ARC)

FAA Advisory Circular 150/5300-13A, Change 1, *Airport Design* provides design standards for use in the design of civil airports. Each runway and operational area serving the particular design aircraft must be identified. Generally, runway standards are related to aircraft approach speed, aircraft wingspan and designated or planned approach visibility minimums. Each runway is assigned a Runway Design Code (RDC). The Aircraft Approach Category (AAC), Airplane Design Group (ADG) and approach visibility minimums (runway visual range - RVR) are combined to determine the RDC. The RDC provides the information needed to determine design standards that apply. The first component, depicted by a letter is the AAC and relates to aircraft approach speed (operational characteristic). The second component, depicted by a Roman numeral, is the ADG and relates to either the aircraft wingspan or tail height (physical characteristics) whichever is most restrictive. The third component relates to the visibility minimum expressed by RVR values in feet which include 1,200, 1,600, 2,400, 4,000, and 5,000 feet. The third component will read "VIS" for runway designed with visual approaches only.

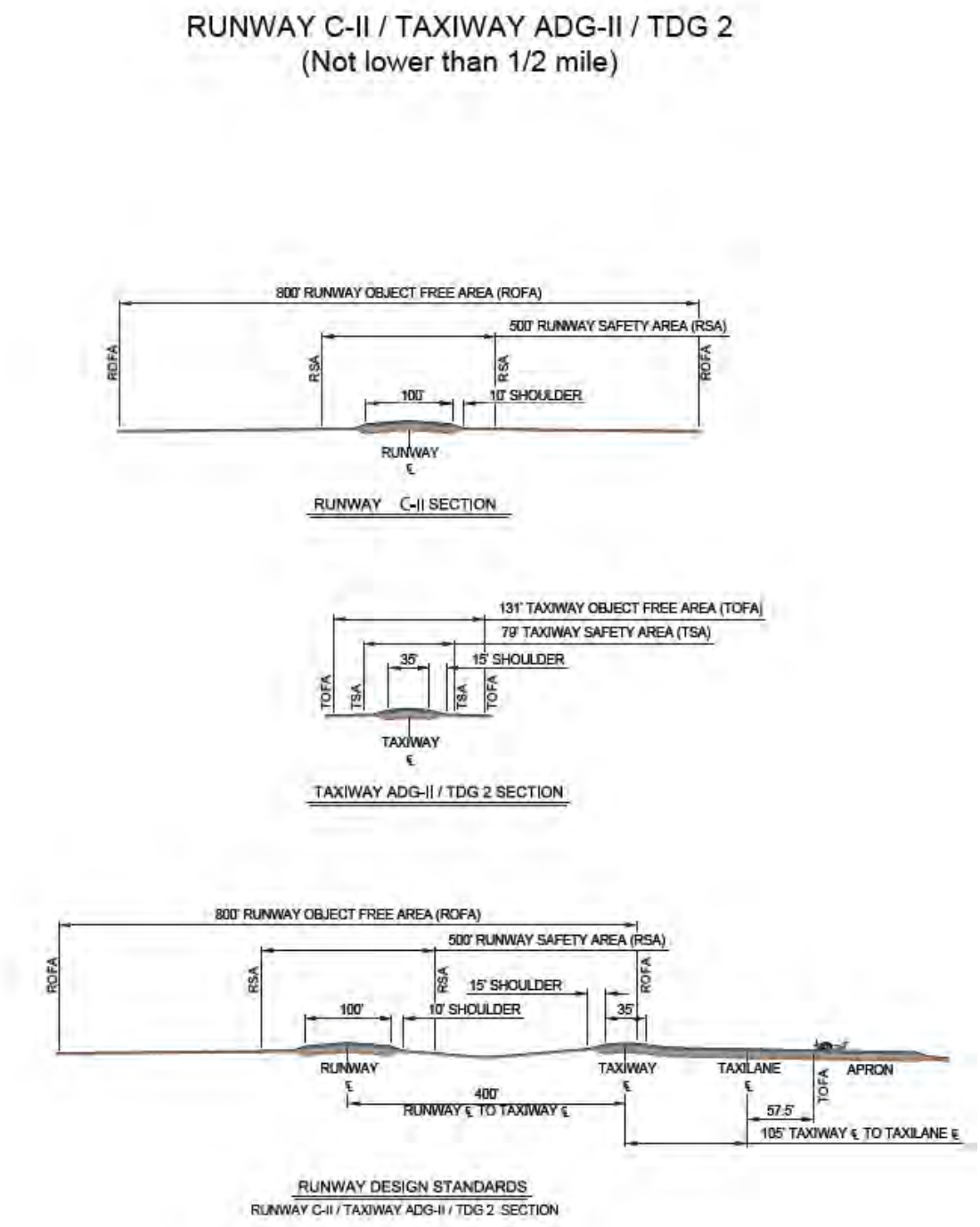
The Airport Reference Code (ARC) of the airport signifies the airport's highest RDC. The ARC is used for planning and design purposes only and does not limit the aircraft that may be able to operate safely on the airport. **Table 2-7** lists the RDC criteria.

The current RDC for Runway 2-20 and ARC for San Luis Valley Regional Airport is C-II. The design aircraft for Runway 2-20 is the Bombardier Challenger 600. A more detailed discussion of RDCs and ARCs is included in Chapter Three, *Forecast of Aviation Demand*. **Figure 2-10** depicts the FAA design standards as they apply to the Airport. **Figure 2-11** depicts San Luis Valley Regional Airport's current FAA design standards.

Table 2-7 Runway Design Code

Approach Category	Approach Speed	
Category A	less than 91 knots	
Category B	91 to 120 knots	
Category C	121 to 140 knots	
Category D	141 to 165 knots	
Category E	166 knots or more	
Design Group	**Wingspan**	**Tail Height**
Group I	< than 49 feet	< than 20 feet
Group II	49 to 78 feet	20 to 29 feet
Group III	79 to 117 feet	30 to 44 feet
Group IV	118 to 170 feet	45 to 59 feet
Group V	171 to 213 feet	60 to 65 feet
Group VI	214 to 261 feet	66 to 79 feet
Runway Visual Range (in feet)	**Flight Visibility Category (Statute Mile)**	
VIS	Visual	
5,000	1-mile or greater	
4,000	Lower than 1 mile but not lower than 3/4 mile (APV ≥ 3/4 but < 1 mile)	
2,400	Lower than 3/4 mile but not lower than 1/2 mile (CAT - I PA)	
1,600	Lower than 1/2 mile but not lower than 1/4 mile (CAT - II PA)	
1,200	Lower than 1/4 mile (CAT - III PA)	

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



Source: Armstrong Consultants, Inc.

Figure 2-10 RDC C-II Design Standards

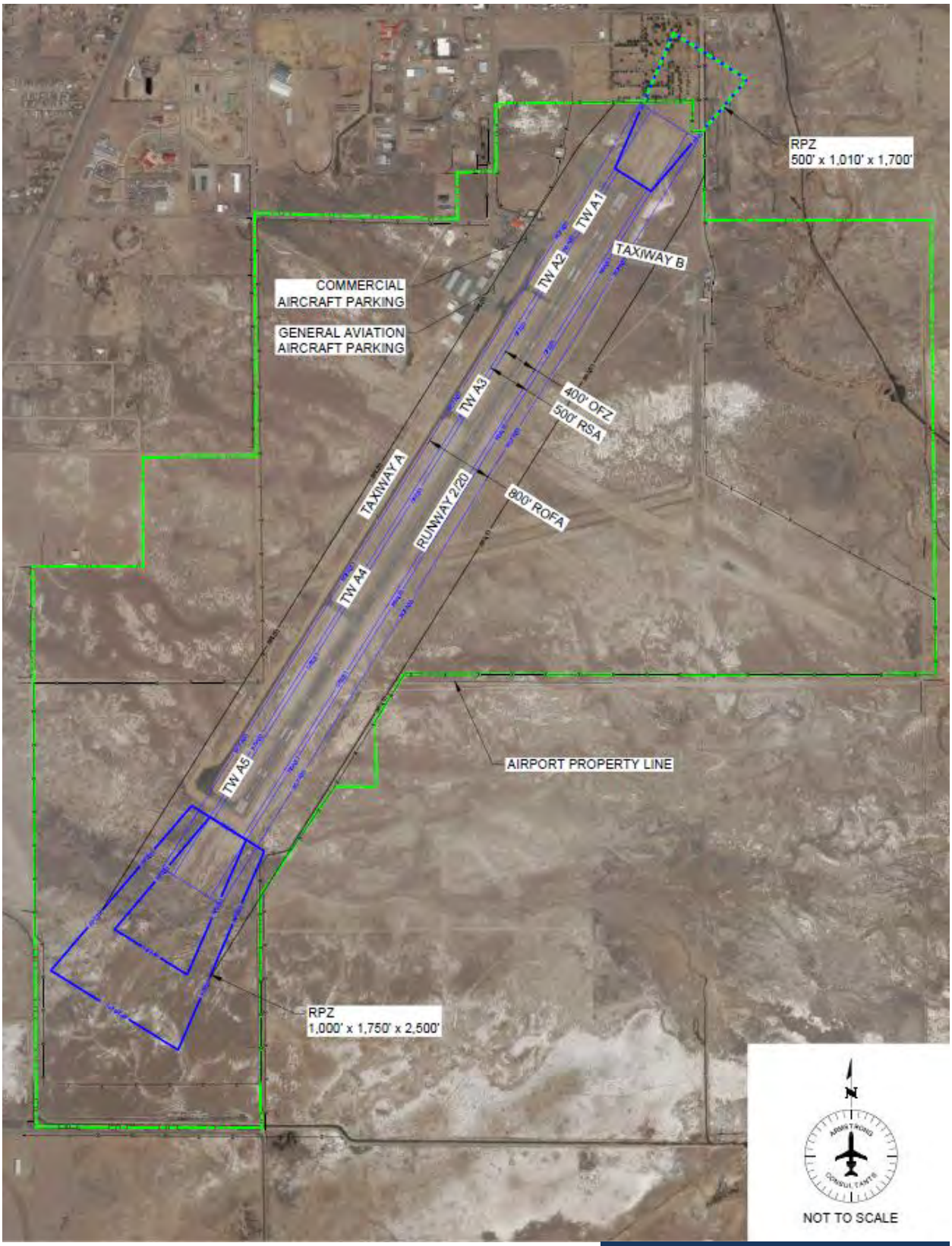


Figure 2-11 Existing Design Standards at ALS

2.6.9.1 Safety Areas

Runway and taxiway safety areas (RSAs and TSAs) are defined surfaces surrounding the runway and taxiways that are prepared specifically to minimize bodily injury and reduce damage to aircraft and property in the event of an under-shoot, over-shoot or excursion from a runway or taxiway.

According to FAA Advisory Circular 150/5300-13A, Change 1, safety areas must be:

- Cleared and graded and have no potentially hazardous surface variations.
- Drained so as to prevent water accumulation.
- Capable, under dry conditions of supporting snow removal equipment (SRE) and aircraft rescue and firefighting (ARFF) equipment and the occasional passage of aircraft without causing structural damage to the aircraft.
- Free of objects, except for objects that need to be located in the runway or taxiway safety area because of their function.

San Luis Valley Regional Airport meets all RSA and TSA standards.

2.6.9.2 Obstacle Free Zones and Object Free Areas

The runway Obstacle Free Zone (OFZ) is a three-dimensional volume of airspace that supports the transition of ground to airborne aircraft operations. The clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function. The OFZ is similar to the Part 77 Primary Surface, as discussed in the next section, insofar that it represents the volume of space longitudinally centered on the runway. The Inner-approach Obstacle Free Zone is a defined volume of airspace centered on the approach area. It applies only to runways with an approach lighting system. It performs the same function as the OFZ and extends outwards 200 feet from the approach end of the runway threshold along the ALS.

The Object Free Areas (OFA) are two-dimensional areas centered on the ground on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by remaining clear of objects. This excludes objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

The San Luis Valley Regional Airport meets standards for OFA and OFZ requirements.

2.6.9.3 Displaced Thresholds

A displaced threshold is a threshold located at a point other than that of the physical end of the runway. The displaced portion of the runway maybe used for takeoff but not for landing. Landing aircraft may only use the displaced area on the opposite end for roll out.

There are no displaced thresholds at San Luis Valley Regional Airport.

2.6.9.4 Runway Protection Zone

The Runway Protection Zone (RPZ) is trapezoidal in shape and centered on the extended runway centerline that is intended to protect persons and property from aircraft that land short or overrun the runway. It begins 200 feet beyond the end of the area usable for takeoff or landing. The RPZ dimensions are functions of the design aircraft, type of operation and visibility minimums.

While it is desirable to clear all objects from the RPZ, uses that FAA may permit include:

- Farming that meets minimum buffers, irrigation channels as long as it does not attract birds
- Airport service roads, as long as they are not public roads and are directly controlled by the airport operator
- Underground facilities and unstaffed NAVAIDs and facilities, such as equipment for airport facilities that are considered fixed-by-function in regard to the RPZ.

All new land uses within the RPZ must be evaluated and approved by the FAA. **Table 2-8** further describes the RPZs at San Luis Valley Regional Airport.

Table 2-8 San Luis Valley Regional Airport RPZ Information

Runway Protection Zone	Dimension	Ownership	Conveyance	Existing Land Uses
Runway 2	1,000′ x 1,750′ x 2,500	San Luis Valley Regional Airport	Fee Simple	Open Space / Undeveloped
Runway 20	500′ x 1,010′ x 1,700′	San Luis Valley Regional Airport / City of Alamosa	Fee Simple and Future Easement	Cemetery / Undeveloped / Roadway

Source: Armstrong Consultants, Inc., 2019

2.6.9.5 Indirect Aircraft Parking Apron to Runway Access

FAA AC 150/5300-13A, Change 1, *Airport Design*, recommends against configuring taxiways to lead directly from an aircraft parking apron to a runway without requiring a turn. An optimal taxiway layout should include indirect access from the aircraft parking apron to the runway created by an additional turn. This configuration increases situational awareness and is intended to minimize runway incursions.

During the process of this Master Plan Study the Airport underwent a taxiway reconstruction and reconfiguration project. Prior to the completion of the reconfiguration project Taxiways A2 and A3 provided direct access from the aircraft parking apron to Runway 2-20 without the recommended turns and were therefore considered to be a non-standard design condition. The taxiway reconstruction and reconfiguration corrected the A2 and A3 direct access condition, as well as reduced the Taxiway A width from 50 feet to 35 feet.

2.6.9.6 Summary of FAA Design Standards at San Luis Valley Regional Airport

Table 2-9 lists the current FAA design standards conditions at San Luis Valley Regional Airport, as listed in FAA AC 150/5300-13A, Change 1, *Airport Design*.

Table 2-9 Existing Design Standards

	Runway 2	Runway 20
Runway Design Code (RDC)	C-II-2400	C-II-5000
Runway Centerline to Parallel Taxiway Centerline	400′ (440′ Actual)	300′ (440′ Actual)
Runway Centerline to Aircraft Parking Apron	500′ (535′ Actual)	400′ (535′ Actual)
Runway Width	100′	100′
Runway Safety Area Width	500′	500′
Runway Safety Area Length Beyond RW End	1,000′	1,000′
Runway Object Free Area Width	800′	800′
Runway Object Free Area Length Beyond RW End	1,000′	1,000′
Runway Obstacle Free Zone Width	400′	400′
Runway Obstacle Free Zone Length Beyond RW End	200′	200′
Runway Protection Zone	1,000′ x 1,750′ x 2,500′	500′ x 1,010′ x 1,700
Taxiway System		
Taxiway Design Group (TDG)	2	
Airplane Design Group (ADG)	II	
Taxiway Width	35′ (A connectors vary: 50′- 90' Actual)	
Taxiway Safety Area Width	79′	
Taxiway Object Free Area Width	131′	
Taxilane Object Free Area Width	115′	
Runway Centerline to Aircraft Hold Lines	250′ (325′ Actual)	

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

2.6.10 Airspace Surfaces

Title 14 Code of Federal Regulations (CFR) Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace,* (Part 77) includes several imaginary surfaces that are used as a guide to provide a safe and unobstructed operating environment for aviation. These surfaces, which are typical for civilian airports, are shown in **Figure 2-12**. The primary, approach, transitional, horizontal and conical surfaces identified in Part 77 are applied to each runway at both existing and new airports on the basis of the type of approach procedure available or planned for that runway and the specific Part 77 runway category criteria.

For the purpose of this section, a utility runway is a runway that is constructed for and intended for use by propeller driven aircraft of a maximum gross weight of 12,500 pounds or less. A visual runway is a runway intended for the operation of aircraft using only visual approach procedures (no instrument-aided approach). A non-precision instrument runway is a runway with an approved or planned straight-in instrument approach procedure that has no existing or planned precision instrument approach procedure. A precision runway is served by an instrument procedure with vertical and horizontal guidance that allows for lower visibility landings.

Runway 2-20 is currently considered a precision instrument larger than utility runway for Part 77 purposes.

The Part 77 airspace surfaces for these classifications are defined as follows:

- The **primary surface** is an imaginary surface of specific width, longitudinally centered on a runway. The primary surface extends 200 feet beyond each end of the paved surface of runways, but does not extend past the end of unpaved runways. The elevation of any point on the primary surface is the

same as the elevation of the nearest point on the runway centerline. The width is 1,000 feet for precision instrument runways, 250 feet for visual-utility runways and 500 feet for visual larger than utility and non-precision instrument runways. The existing primary surface width for San Luis Valley Regional Airport is 1,000 feet.

- The **approach surface** is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of the runway based upon the type of approach available or planned for that runway, with approach gradients of 20:1, 34:1 or 50:1. The inner edge of the surface is the same width as the primary surface. It expands uniformly to a width corresponding to the Part 77 runway classification criteria. At San Luis Valley Regional Airport, the approach surface of Runway 2 is 1,000 feet by 16,000 feet by 10,000 feet at a slope of 50:1, with an additional 40,000 feet at a slope of 40:1. The approach surface for Runway 20 is 1,000 feet by 3,500 feet by 10,000 feet at a slope of 34:1.

- The **transitional surfaces** extend outward and upward at right angles to the runway centerlines from the sides of the primary and approach surfaces at a slope of 7:1 and end at the horizontal surface.

- The **horizontal surface** is considered necessary for the safe and efficient operation of aircraft in the vicinity of an airport. As specified in Part 77, the horizontal surface is a horizontal plane 150 feet above the established airport elevation. The airport elevation is defined as the highest point of an airport's useable runways, measured in feet above mean sea level. The perimeter is constructed by arcs of specified radius from the center of each end of the primary surface of each runway. The radius of each arc is 5,000 feet for runways designated as utility or visual and 10,000 feet for all other runways. The existing horizontal surface arc at San Luis Valley Regional Airport is 10,000 feet.

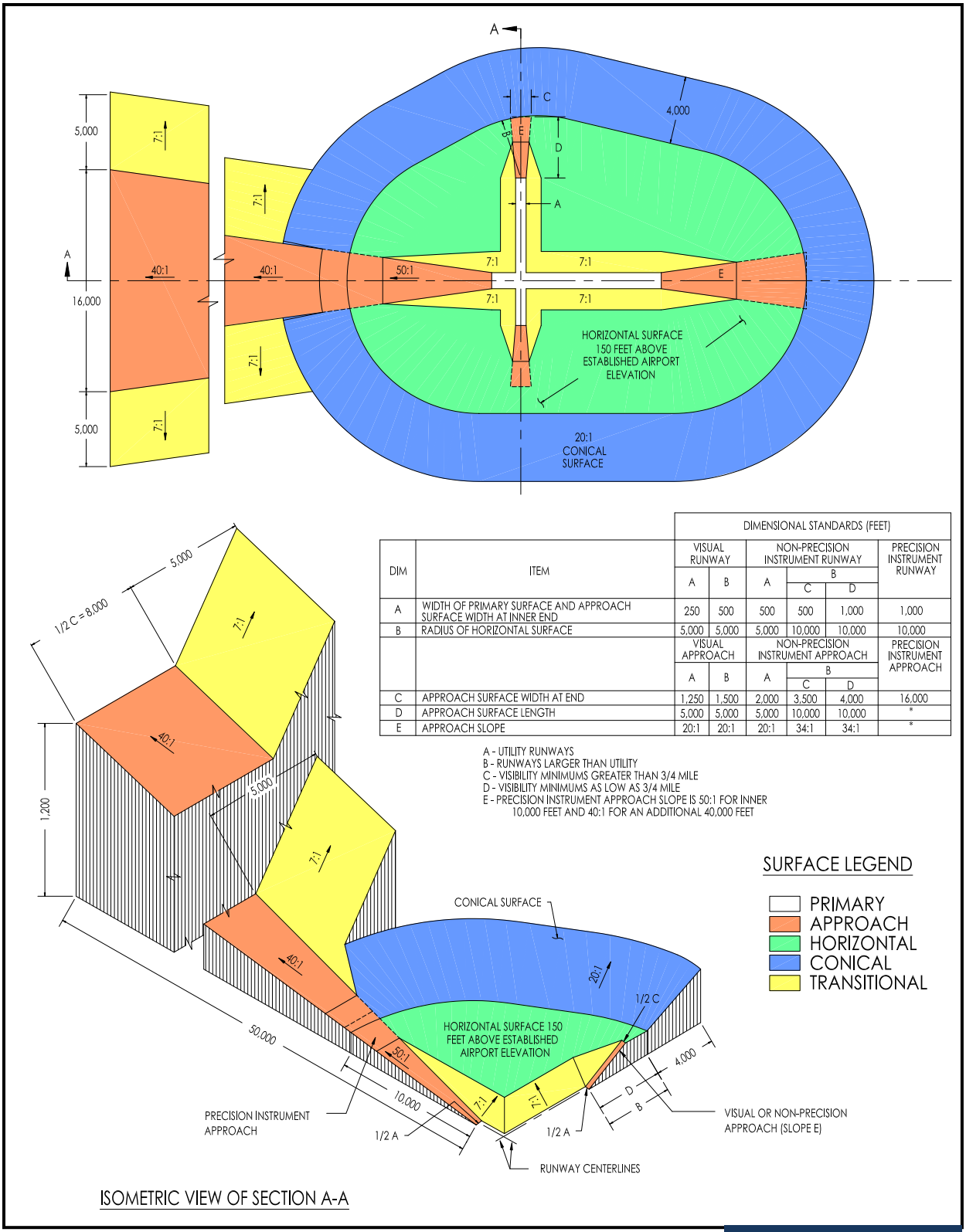
- The **conical surface** extends outward and upward from the periphery of the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet.

Table 2-10 summarizes the current Part 77 surfaces described above for San Luis Valley Regional Airport.

Table 2-10 Part 77 Surfaces

Surface	Dimensions
Primary Surface width	1,000′
Primary Surface beyond Runway end	200′
Approach Surface dimensions	RW 2: 1,000′ x 16,000′ x 10,000′ x 40,000′ RW 20: 1,000′ x 3,500′ x 10,000
Approach Surface slope	RW 2: 50:1 / 40:1 RW 20: 34:1
Transitional Surface slope	7:1
Horizontal Surface radius	10,000′

Source: Title 14 Code of Federal Regulations (CFR) Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspace*



ISOMETRIC VIEW OF SECTION A-A

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 WIDTH 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 APPROACH
		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
E - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

Source: Federal Aviation Administration

Figure 2-12 Part 77 Surfaces

2.6.11 Surrounding Airspace

2.6.11.1 National Airspace System

The National Airspace System consists of various classifications of airspace regulated by the FAA. Airspace classification is necessary to ensure the safety of all aircraft utilizing the facilities during periods of inclement weather, with the primary function of airspace classification being the separation of IFR traffic from VFR traffic. Pilots flying in controlled airspace are subject to air traffic control requirements and must either follow VFR or IFR regulations. These regulations, which include combinations of operating rules, aircraft equipment and pilot certification, vary depending on the class of airspace and are described in 14 CFR Part 91, *General Operating and Flight Rules*.

Figure 2-13 shows the airport is located within Class E airspace from the floor (ground) up to 18,000 feet Mean Sea Level (MSL). Class E airspace requires pilots to comply with weather requirements and certain air traffic control procedures for IFR operations. **Figure 2-14** depicts the various airspace classifications.



Source: www.skyvector.com, 2019

Figure 2-13 VFR Sectional Map

There are multiple victor airways, Victor 484, 210, 368, and 83, that are routed via the ALAMOSA VORTAC located to the southeast of the Airport (victor airways are low altitude flight paths between ground-based navigational equipment known as VHF Omni-directional Receivers or VORs).

San Luis Valley Regional Airport is an uncontrolled airport; which means navigation and traffic awareness relies on the pilots using the airport. Traffic patterns at the Airport include standard left

hand traffic for Runway 2 and 20. Pilots in the area can communicate or announce their intentions via the CTAF frequency of 122.8 MHz.

2.6.11.2 Airspace Restrictions

San Luis Valley Regional Airport is located within Class E airspace shown on **Figure 2-14.** Military Operation Areas (MOAs) and low level military training routes (MTRs) are established for the purpose of separating certain military training activities, which routinely necessitate acrobatic or abrupt flight maneuvers, from IFR traffic. The LA VETA HIGH MOA is located approximately 20 nautical miles northeast of the Airport. There is no known impact on Airport operations caused by the MOA's.

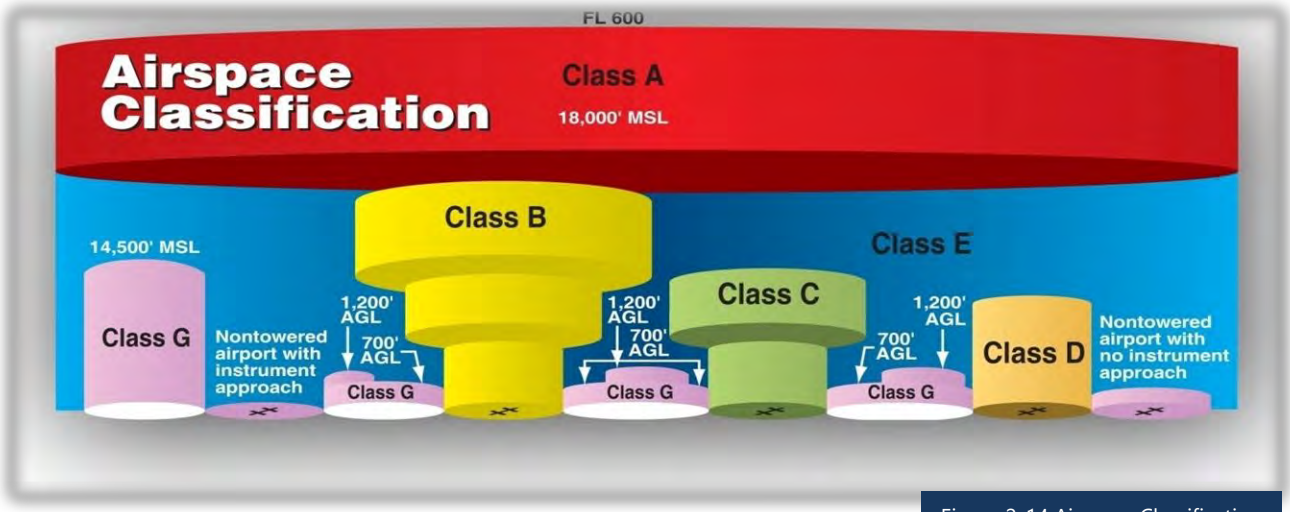


Figure 2-14 Airspace Classification

Source: Federal Aviation Administration

2.7 Existing Landside Facilities at San Luis Valley Regional Airport

The landside facilities of an airport consist of those facilities that are not included on the airfield. Examples of such landside facilities include any structure adjoining the airfield, terminal buildings, hangars, ground access routes to and from the airport, automobile parking areas, airport fencing, utilities, fuel provisions and snow removal equipment storage facilities. **Figure 2-15** illustrates the existing landside facilities**.**



Figure 2-15 Existing Landside Facilities

2.7.1 Terminal Building

Airport passenger terminal buildings are used to transfer passengers between aircraft and ground transportation and provide facilities for passengers enplaning and deplaning aircraft. Terminal buildings houses ticket counters for airlines serving the airport, including space for issuing tickets, transferring checked baggage, security screening of checked bags, area for the Transportation Security Administration (TSA) personnel to screen passengers and sterile waiting area for passengers that have been processed through the security checkpoint. Terminal buildings also have gates to provide passengers access to and from the aircraft in some cases jet bridges are utilized to load passengers onto the airport. In other cases, passengers are ground loaded with air stairs, loading ramps, or aircraft stairs. The number of gates varies depending on the volume of airline traffic utilizing the airport. Terminal buildings also provide baggage claim areas which usually include baggage carousels for passengers to retrieve checked baggage upon arrival at the airport. The terminal building is also typically utilized by airport management for office space and by airport tenants including rental car companies, restaurants and gift shops.

The size of these different areas varies depending on the amount of traffic the facility receives. Large commercial service airports have several concourses which may be connected by walkways, sky-bridges or underground tunnels. Concourses can be set up to accommodate one or two specific airlines depending on the size. Smaller commercial service airports typically share one satellite concourse with gates. Smaller regional aircraft may be accessed through either a jet-bridge or through ground loading.

San Luis Valley Regional Airport has a single-story terminal building approximately 8,975 square feet in size. The terminal building was constructed in 2014 and is in excellent condition. The terminal building has two airline ticket counters with office space and a baggage processing area located to the right of the foyer. Passengers are able to obtain boarding passes, check in luggage, or obtain customer services at this location. All outgoing luggage receives security screening and evaluation in the TSA's designated area.

The terminal building has a single-lane passenger security checkpoint (SCCP) located in the central portion of the terminal building directly past the foyer of the main entrance. The TSA owns and operates aviation security equipment such as a full-body scanner, a metal detector and X-ray to detect any foreign devices which can pose harm to other passengers, flight crew or the general population. A secondary screening area is available to provide the TSA a secure location to conduct further investigation. A sterile waiting area with two single stall restrooms are located beyond the TSA screening area which allows passengers that have passed through security screening to wait until it is time to board their aircraft.

The baggage claim is located on the northern side of the building and includes direct to outdoor slide doors where the luggage is manually placed for passenger pick up.

The terminal lobby area is located adjacent to the foyer and consists of chairs, tables, vending machines, and local information. This area serves as a non-sterile waiting area for departing passengers.

Two rental car counters are located adjacent to the main entry doors within the terminal building. The rental car services are available to San Luis Valley Regional Airport passengers, general aviation users and the general public. Customers are able to check-in for car rentals and obtain customer services at this location.

The passenger terminal building also contains multiple offices for various uses, including airport administration, along with men's and women's restrooms. The passenger terminal building is depicted in **Figure 2-16**. The layout of the passenger terminal building is depicted in **Figure 2-17**.



Figure 2-16 Passenger Terminal Building

Source: Armstrong Consultants, Inc.



Figure 2-17 Terminal Building Layout

2.7.2 Fixed Base Operator and Pilot Services

A fixed base operator (FBO) is usually a private enterprise that leases land/hangars from the airport sponsor on which to provide services to based and transient aircraft. The extent of the services an FBO provides varies from airport to airport; but typically, these services include aircraft fueling, minor maintenance and repair, aircraft rental and/or charter services, flight instruction, pilot lounge, flight planning facilities, aircraft tie down and/or hangar storage. FBO services are provided by Centric Aviation, shown in **Figure 2-18**. The FBO facility is located to the south of the passenger terminal building adjacent to the aircraft parking apron. Services provided by Centric include: transient hangar parking, deicing, conference room services, a pilot lounge, concierge services, catering, flight-planning,

courtesy cars, ground power unites, lavatory services, oxygen service, and aircraft maintenance. An avionics shop is also available at the Airport.



Figure 2-18 Centric Aviation

Source: San Luis Valley Regional Airport

2.7.3 Hangar Facilities

Existing hangar facilities at San Luis Valley Regional Airport include a mix of five T-hangar structures (with 38 aircraft spaces and six storage spaces) and five conventional box hangar structures. The hangars at the Airport include a combination of private and County-owned facilities. The hangars at the Airport are in good to fair condition. An example of an existing hangar at ALS is depicted in **Figure 2-19**.



Figure 2-19 Box Hangar at ALS

Source: Armstrong Consultants, Inc.

2.7.4 Access Routes and Signage

The Airport can be accessed by traveling south on U.S. Highway 285 to Airport Road, approximately two miles south of the City of Alamosa. Signage located in the City provides guidance to the Airport.

2.7.5 Ground Transportation

San Luis Valley Regional Airport has several ground transportation access options including rental car services, and taxi cab services. Taxi cab services are available within the City. There are no local public transportation options. Regional bus service operated by CDOT's Bustang is available from Alamosa to Pueblo. A Greyhound Bus stop is located to the northeast of the City.

2.7.6 Automobile Parking

Automobile parking facilities are necessary for originating and terminating airport users and visitors. It is important that vehicle parking is adequate to serve the needs of all airport users and visitors. The Airport has an asphalt parking area of approximately 7,800 square yards servicing the Airport terminal area, FBO, and hangar facilities. Secured parking facilities are also available for rent.

2.7.7 Utilities

Available utilities at San Luis Valley Regional Airport include propane, electric, water, sewer and telecommunications. Telecommunication services are provided by private vendors.

2.7.8 Fencing

The primary purpose of airport fencing is to prevent inadvertent intrusions by persons or animals entering airport property. Airport fencing also provides an increased level of safety and security for the airport. Fencing is commonly installed along the perimeter of the airport property and outside of any safety areas or below all imaginary surfaces as defined by FAA Advisory Circular 150/5300-13A, Change 1 and Federal Aviation Regulation Part 77. The airport perimeter is surrounded by new six-foot-high wire chain-link fencing topped with three strand barbed wire, installed in 2018. There is also terminal area fencing encompassing the aircraft parking apron and landside/hangar areas.

2.7.9 Fuel Facilities

The Airport owns and operates one above-ground 12,000 gallon Jet-A and one above-ground 12,000 gallon 100 Low Lead AvGas above ground fuel storage tanks. Aircraft refueling is conducted via fuel trucks operated by the FBO. New fuel storage facilities were constructed during the process of the master plan update. The current fuel storage tanks are in excellent condition.

2.7.10 Emergency and Security Services

Operators of certificated Part 139 airports are required to provide aircraft rescue and fire fighting (ARFF) services during air carrier operations that require a Part 139 certificate. San Luis Valley Regional Airport is currently classified as a Class I Part 139 Airport receiving scheduled air service. As a result of being a Class I airport, certain criteria are required to be met by the Airport including providing a certain level of emergency response.

FAR Part 139 also establishes the level of aircraft rescue and fire fighting (ARFF) equipment and agents required for an airport. The ARFF Index level required is determined by the longest passenger aircraft with an average of five daily departures serving the airport as follows:

- Index A – Aircraft less than 90 feet in length;
- Index B – Aircraft at least 90 feet but less than 126 feet;
- Index C – Aircraft at least 126 feet but less than 159 feet;
- Index D – Aircraft at least 159 feet but less than 200 feet;
- Index E – Aircraft greater than 200 feet in length

San Luis Valley Regional Airport is currently classified as Index A. The Airport maintains an existing Index A ARFF truck to fulfill Part 139 requirements. The ARFF station (approximately 1,600 square feet) is located on the Airport and is actively staffed by firefighting personnel during periods of scheduled air service. The ARFF building has two vehicle storage bays. The existing ARFF equipment is shown in **Figure 2-20**.



Figure 2-20 ARFF Response Vehicle

Source: Armstrong Consultants, Inc.

2.7.11 Snow Removal and Maintenance Equipment

Snow removal and airfield maintenance is conducted by the Airport. According to *the 2020 San Luis Valley Regional Airport Snow and Ice Control Plan*, Snow Removal Equipment (SRE) operated by the Airport includes a 1985 22 foot International plow, a 1985 22 foot Autocar plow, a 2003 22 foot Oshkosh runway broom, an additional International plow, a 2006 Chevy plow, a 2008 Ford F-150, a Chevy ¾ ton service truck with Meyer Spreader, a skid steer, and a Bowmonk friction meter. The Airport acquired an additional blower and Oshkosh/Sweepster broom SRE. Examples of the SRE at the Airport are depicted in **Figure 2-21**. During the process of the master plan update the airport also acquired a snow blower and an additional Oshkosh Sweepster broom. The SRE operated by the Airport is currently stored outdoors. The County provides secondary snow removal assistance when needed and able.



Source: San Luis Valley Regional Airport

Figure 2-21 Snow Removal Equipment

2.8 Land Use Compatibility

The FAA recommends that airport sponsors protect the areas surrounding an airport from incompatible development. Incompatible development includes those land uses which would be sensitive to aircraft noise or over flight, such as residences, schools, churches and hospitals and those uses which could attract wildlife and cause a hazard to aircraft operations such as certain agriculture crops, landfills, ponds and wastewater treatment facilities. The height of objects surrounding airports

also needs to be considered in order to avoid airspace impacts and future instrument approach procedures.

The area surrounding the Airport consists of a cemetery and open space; which is generally considered to be compatible with an airport.

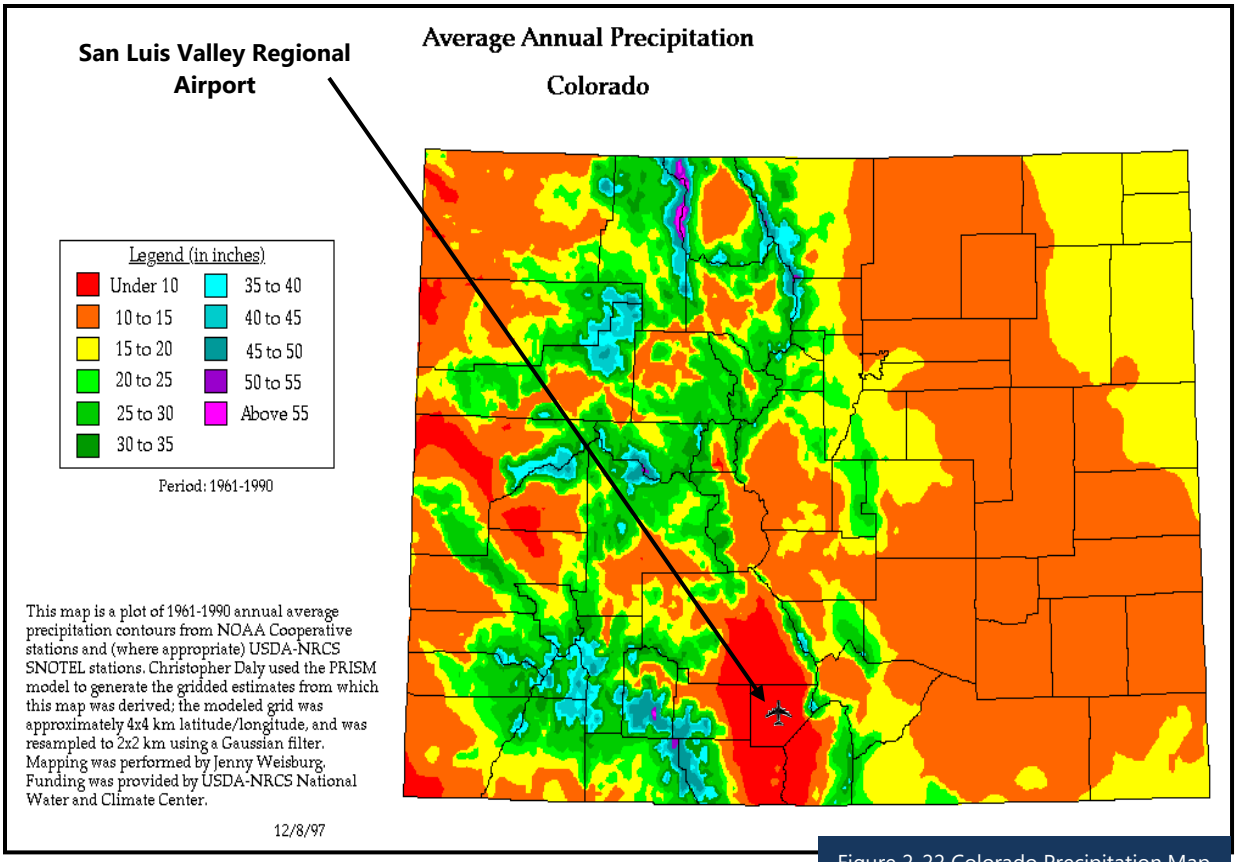
Alamosa County has implemented an Airport Overlay district as outlined in the 2009 Alamosa County Land Use and Development Code. It provides protections for the Part 77 standards for both visual and precision runways. The Airport Overlay district is intended to:

- Minimize the danger to public health and safety or to property in designated areas around airports;
- Encourage land us patterns for housing and other local government needs that will separate uncontrollable noise sources from residential and other noise sensitive areas, and encourage compatibility of development with non-motorized traffic; and
- Avoid danger to public safety and health or to property due to aircraft crashes, traffic congestion, air pollution or water pollution.

2.9 Meteorological Conditions

Meteorological conditions have a direct impact on the operational characteristics of an airport. These conditions determine the regulations under which operations may be conducted, the frequency of use for each operational configuration and the instrumentation required to assist aircraft in landing and departing. Temperatures combined with airport elevation also have an impact on aircraft performance capabilities.

As depicted in **Figure 2-22**, the San Luis Valley Regional Airport is located within an area that receives an average of under 10 inches of precipitation and 20 inches of average snowfall a year, according to the Western Regional Climate Center.



Source: Western Regional Climate Center, 2019

Figure 2-22 Colorado Precipitation Map

2.9.1 Local Climatic Data

Ceiling and visibility conditions are important considerations for an airport as the occurrence of low ceiling and/or poor visibility limits the use of the airport until conditions improve. According to the Western Regional Climate Center, San Luis Valley Regional Airport receives an average of 9.58 inches of rainfall per year, with snowfall averaging 20 inches. Temperatures range from an average maximum temperature of 80.8 degrees Fahrenheit in July to an average minimum temperature of 3.7 degrees Fahrenheit in January. It is estimated that the Airport experiences IFR conditions approximately eight percent of the recorded observation periods. A summary of the climate at the Airport is shown in **Table 2-11**.

Table 2-11 Temperature and Precipitation

Month	Mean Maximum Temperature (Fahrenheit)	Mean Minimum Temperature (Fahrenheit)	Precipitation (Inches)	Snowfall (Inches)
January	36.4	**3.7**	0.29	2.2
February	39.8	10.3	0.40	2.9
March	48.7	20.2	0.53	**4.3**
April	57.1	26.0	0.76	2.5
May	67.5	33.5	0.88	0.3
June	77.3	41.0	0.83	0.0
July	**80.8**	46.0	**1.56**	0.0
August	77.9	44.8	1.56	0.0
September	72.5	37.4	1.13	0.0
October	60.8	26.6	0.81	1.9
November	47.0	16.5	0.47	3.5
December	37.1	6.4	0.36	2.5
Annual	57.8	26.0	9.58	20.0

Source: Western Regional Climate Center, retrieved 2018

2.9.2 Runway Wind Coverage

An analysis of wind is essential in evaluating the alignment and configuration of the runway system. It is beneficial to align runways as closely as practicable in the direction of the prevailing winds. Aircraft land and takeoff into the wind and, therefore, can only tolerate limited crosswind components (winds that blow perpendicular to the runway centerline). The maximum allowable crosswind depends on the aircraft size, design characteristics and pilot proficiency. **Table 2-12** shows allowable crosswind components for aircraft according to their Airport Reference Code.

Table 2-12 Allowable Crosswind Component

Crosswind (knots)	Airport Reference Code
10.5	A-I, B-I
13.0	A-II, B-II
16.0	A-III, B-III, C-I through D-III
20.0	A-IV through D-VI

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

FAA Advisory Circular 150/5300-13A, Change 1, *Airport Design*, recommends that a runway be oriented so that it yields 95 percent wind coverage under stipulated crosswind coverage defined by the ARC. If a single runway alignment cannot meet the recommended 95 percent wind coverage then construction of an additional runway may be advisable.

Runway crosswind coverage was determined using 10 years of windspeed and directional data from the ASOS at San Luis Valley Regional Airport with observations from 2009 to 2018. **Table 2-13** lists

the wind data information from the ASOS. **Figure 2-23** depicts the existing wind rose for San Luis Valley Regional Airport.

Table 2-13 Wind Data for San Luis Valley Regional Airport

Crosswind (knots)	Runway 2-20 Percent of Coverage
10.5	92.28%
13.0	95.29%
16.0	97.88%

Source: San Luis Valley Regional Airport ASOS, 2009-2018, Number of Observations: 96,490

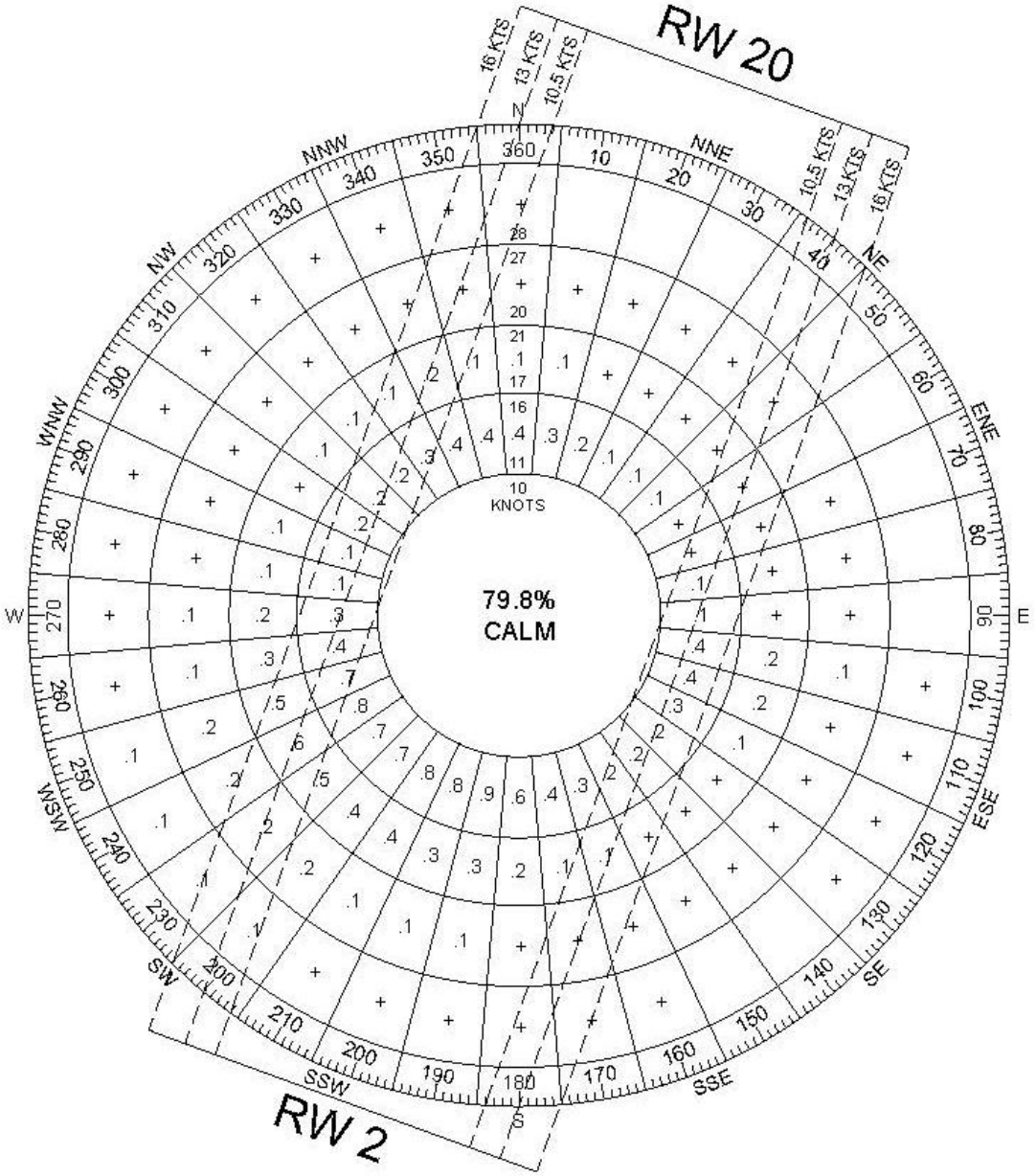


Figure 2-23 ALS All-Weather Windrose

Source: San Luis Valley Regional Airport ASOS, 2009-2018

2.10 Environmental Overview

The purpose of the environmental inventory is to identify key environmental resources that may be affected by potential airport development. The data compiled in this section will be used throughout the report when evaluating potential airport development alternatives and identifying potential environmental impacts and environmental related permits that may be required for recommended development projects.

2.10.1 Air Quality

The Clean Air Act was passed in part to define the standards of pollutants that may be harmful to public health and welfare. National Ambient Air Quality Standards (NAAQS) were developed by the Environmental Protection Agency in compliance with the Clean Air Act which identifies six principal pollutants that could have adverse effects on the public. Areas which exceed the acceptable standard for these pollutants are considered to be non-attainment. As depicted within **Figure 2-24**, the airport is located within an attainment area. The air quality map identifies counties that are designated as Nonattainment for one or more NAAQS. Alamosa County is considered to be within attainment with NAAQS.

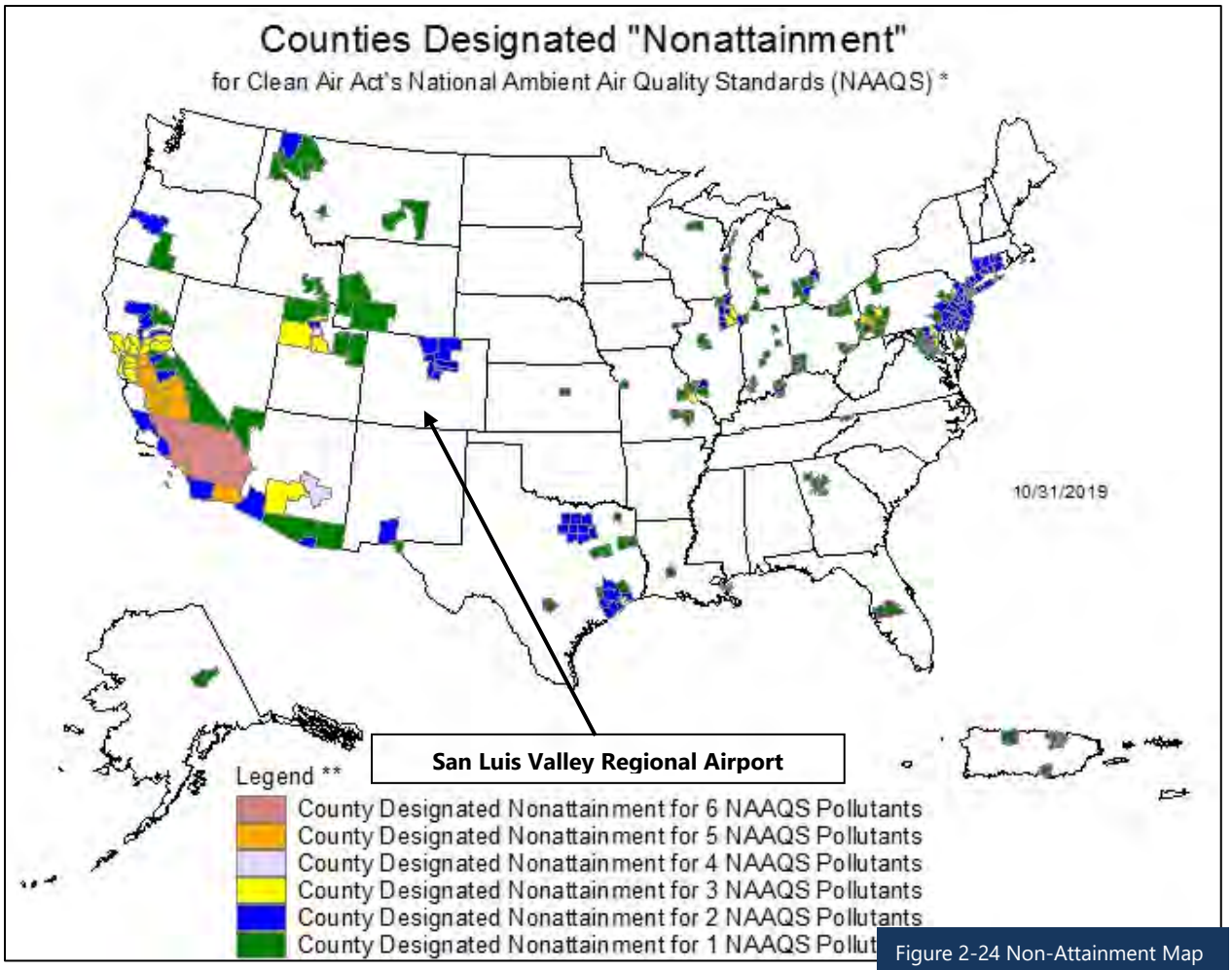


Figure 2-24 Non-Attainment Map

Source: Environmental Protection Agency, 2019

2.10.2 Department of Transportation Act – Section 4(f)

Section 4(f) resources are publicly owned and include public parks, recreation areas, or wildlife and waterfowl refuges of national, state, or local importance; and publicly or privately-owned land from a historic site of national, state, or local significance. Section 4(f) properties in the vicinity of the Airport include: a historic cemetery is located immediately north of the Airport property and Lee Field Complex Ball Fields, owned and operated by the City of Alamosa, is located approximately 0.5 miles northwest of the Airport. There are no other Section 4(f) properties located near the Airport.

2.10.3 Farmlands

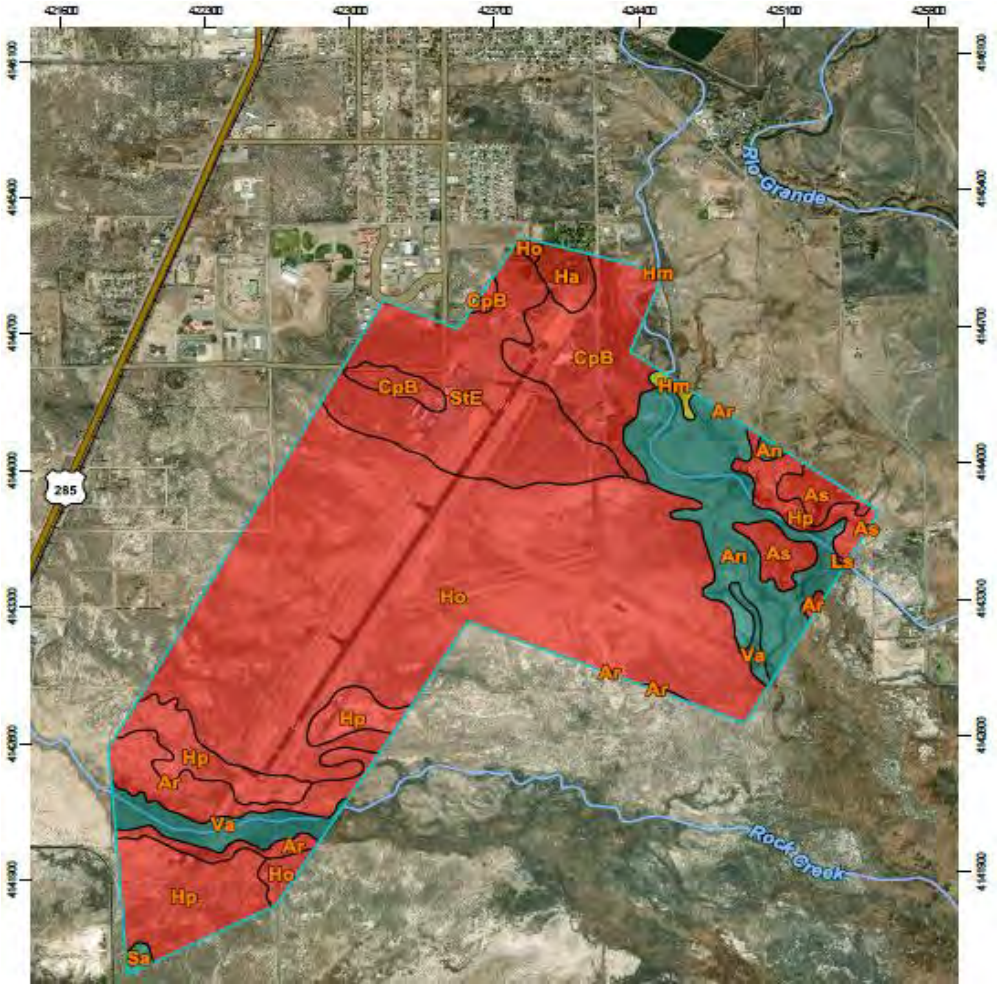
According to FAA Order 5050.4B: "Important farmlands include all pasturelands, croplands, and forests (even if zoned for development) considered to be prime, unique, or statewide or locally important lands as defined below:

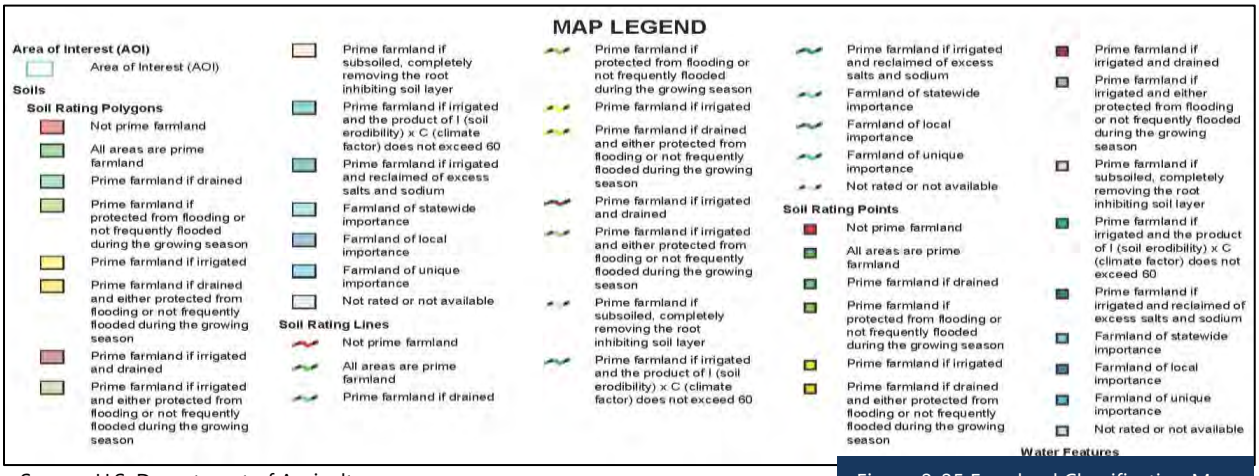
(1) Prime farmland. This is land having the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimal use of fuel, fertilizer, pesticides, or products.

(2) Unique farmland. This is land used for producing high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture necessary to produce high quality crops or high yields of them economically.

(3) Statewide and locally important farmland. This is land that has been designated as "important" by either a state government (State Secretary of Agriculture or higher office) or by county commissioners or an equivalent elected body. The State Conservationist representing the Natural Resource Conservation Service (NRCS) must agree with the designation."

The U.S. Department of Agriculture has rated the San Luis Valley Regional Airport and surrounding lands as prime farmland, if irrigated, or not prime farmlands, as shown in **Figure 2-25**. The majority of the land on and adjacent to the Airport is designated as not prime farmlands.





Source: U.S. Department of Agriculture

Figure 2-25 Farmland Classification Map

2.10.4 Floodplains

Portions of the Airport and surrounding areas have been mapped for floodplains by the Federal Emergency Management Agency (FEMA). The majority of the mapped areas have been designated as Zone X, 0.2 percent chance flood hazard, areas of one percent annual chance flood with average depth less than one square mile. **Figure 2-26** depicts FEMA floodplains mapped within the area. There are no areas within a 100-year floodplain or adjacent to the Airport. It should be noted, while it does not have a direct influence, the Airport is located approximately one mile to a Zone AE. According to FEMA, Zone AE is "the base floodplain where base flood elevations are provided."

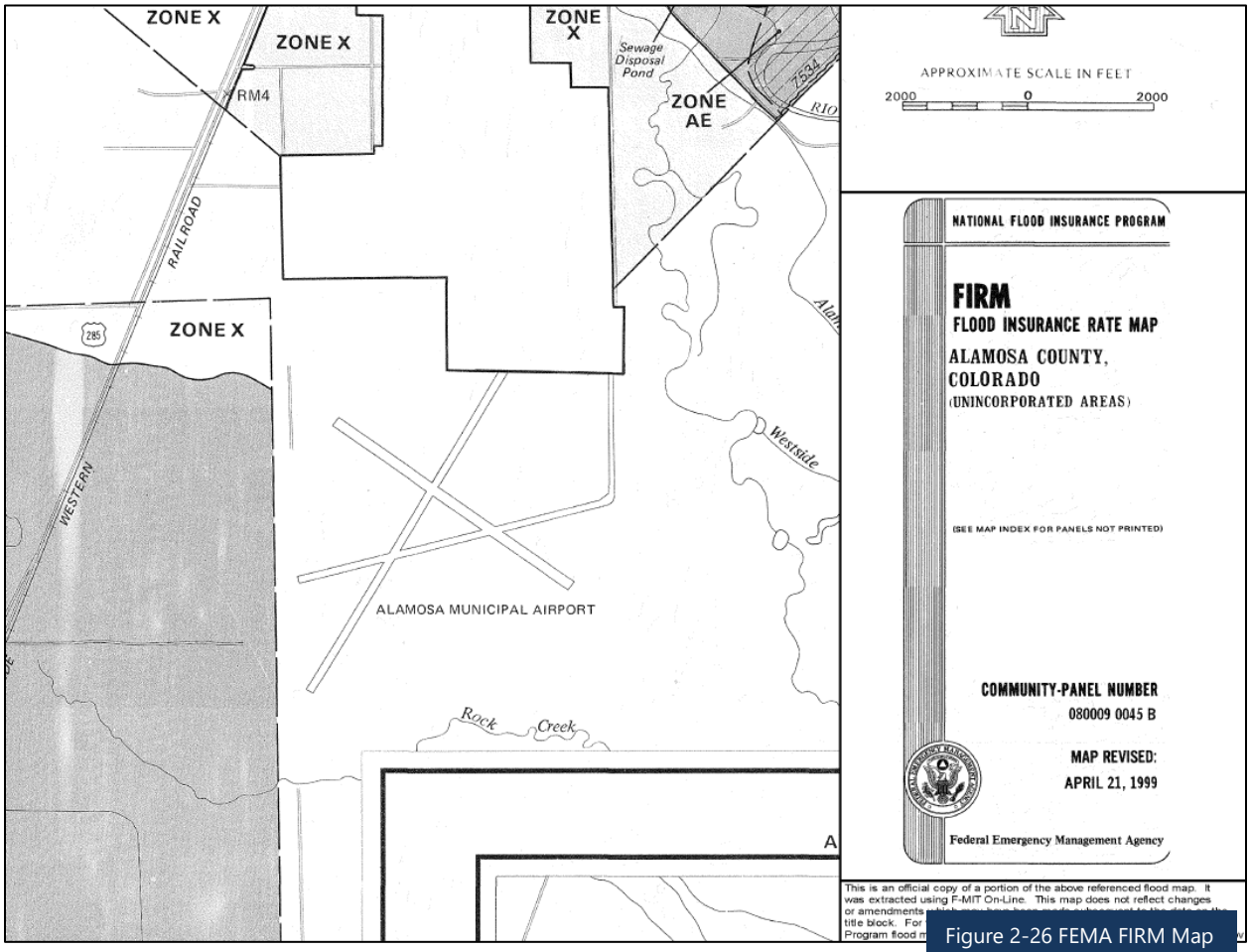


Figure 2-26 FEMA FIRM Map

Source: Federal Emergency Management Agency

2.10.5 Fish, Wildlife and Plants

Traditionally, biotic resources apply to plants, fish, birds, reptiles, amphibians, marine mammals, coral reefs, and rivers, lakes wetlands, forests, upland communities, or other habitat types supporting flora and aquatic and avian fauna. The U.S. Fish and Wildlife Service database was researched to obtain an Official Threatened and Endangered Species List for the area encompassing San Luis Valley Regional Airport. Five species were identified as threated or endangered for the area:

- Mammals:
  - Canada Lynx, *Lynx canadensis* (Threatened)
  - North American Wolverine, *Gulo gulo luscus* (Proposed Threatened)
- Birds:
  - Mexican Spotted Owl, *Strix occidentalis lucinda* (Threatened)
  - Southwestern Willow Flycatcher, *Empidonax traillii extiumus* (Endangered)
  - Yellow-billed Cuckoo, *Coccyzus americanus* (Threatened)

No critical habitat was identified on the airport property for any of these species.

2.10.6 Historical, Architectural, Archaeological and Cultural Resources

According to 36 CFR Section 800.16 (I): "A historic property is, "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior".

A Class I Record Search was performed by SWCA Environmental Consultants in September 2019 for the Airport Property. According to the report: "A Class I desktop study of the study area resulted in the conclusion that no documented cultural resources are present within the project area. However, the airport itself, as a historic property, may eventually require documentation as part of any proposed undertaking within the study area. Additionally, the Colorado OAHP COMPASS map's depiction of the Alamosa Municipal Cemetery (5AL308) extending into the boundaries of the study area is likely an error as no topographic map or historic aerial portrays the cemetery in that location. Finally, study of the depositional and environmental setting across the project area indicates there is a moderate to high potential for surficial and buried—possibly deeply—prehistoric cultural resources given the mixed alluvial and aeolian origination of sediment."

The nearest resource listed on the National Register of Historic Places is the Denver and Rio Grande Railroad Depot located in the City of Alamosa, two miles north of the Airport.

2.10.7 Wetlands

The U.S. Fish and Wildlife Service *National Wetlands Inventory* was reviewed to determine the location of wetlands within the vicinity of the Airport. A freshwater emergent wetland was identified as being located within the airfield; however, the area has historically been dry. **Figure 2-27** depicts the location of wetlands surrounding San Luis Valley Regional Airport.

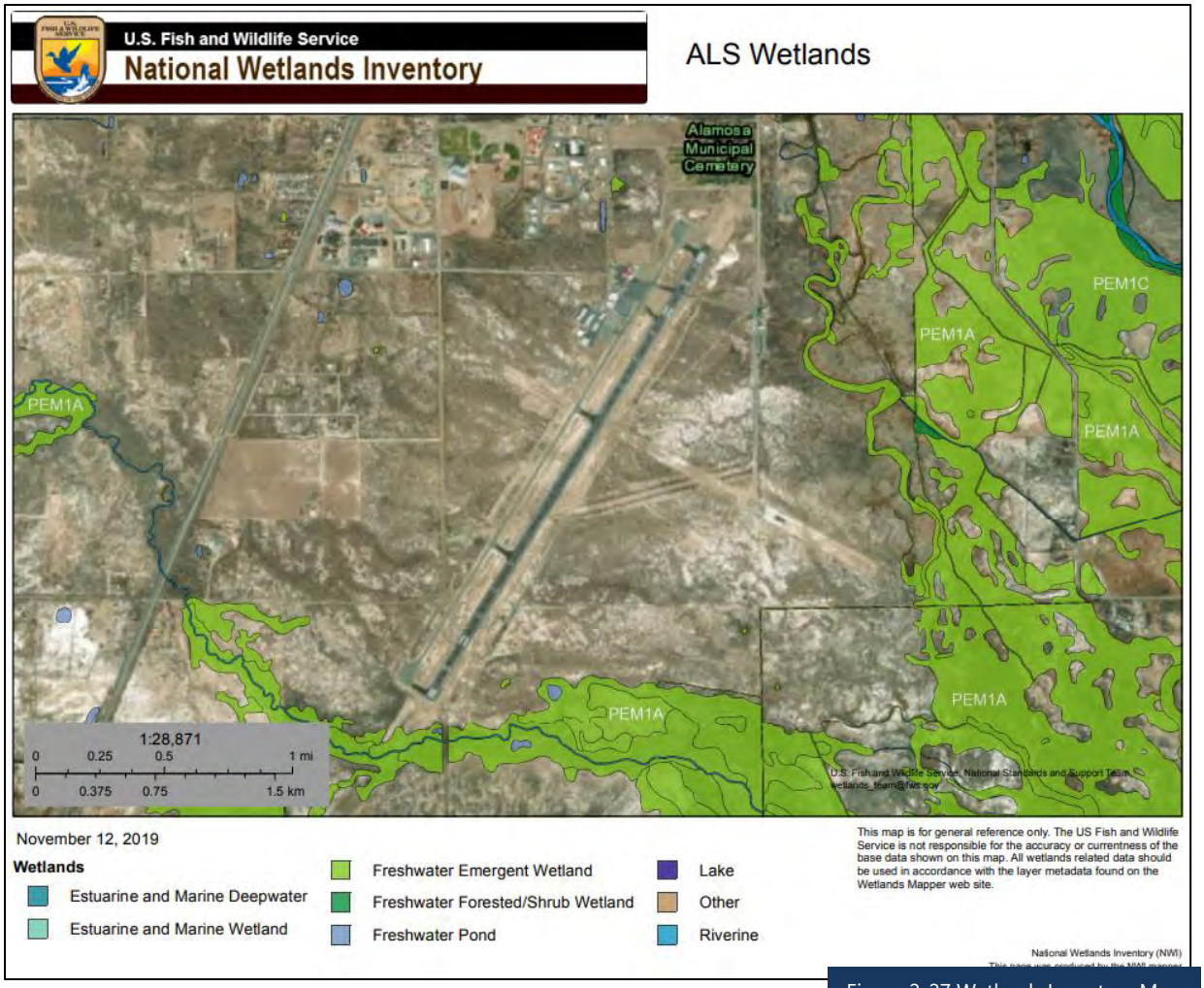


Figure 2-27 Wetlands Inventory Map

Source: U.S. Fish and Wildlife Service

2.11 Summary of Airport Facilities

Table 2-14 provides a summary of the existing facilities available at San Luis Valley Regional Airport.

Table 2-14 Existing Airport Facilities

Airport Data	Description
Identifier	KALS
FAA Site Number	02510.*A
FAA NPIAS Number	08-0002
Owner	County of Alamosa
Airport Elevation	7,539.8' MSL
Airport Facility	**Description**
Runways	Runway 2-20
Airport Reference Code	C-II-2400
Runway Dimensions	8,521' x 100'
Runway Markings	Precision
Runway Lighting	HIRL
Instrument Approach	ILS, GPS, and VOR/DME
Approach Minimums	1/2 Statute Mile / 200' Ceiling
Approach Lighting	RW 2: MALSRs
Runway Pavement Strength	52,000 lbs. SWG / 70,000 lbs. DWG 44 F/C/X/T PCN
Runway Pavement Condition	Excellent
Taxiways	Full-Length Parallel and 7 Entrance/Exit
Aprons	Approximately 33,835 S.Y.
Tie Downs	40
Visual Aids	Threshold Lights, REILs, PAPI-4s, VASI-4s, MALSR, Beacon, HIRLs, Lighted Windcone and Segmented Circle, MITLs
Pilot Lounge	Yes
Hangar Facilities	5 T-Hangars (38 Aircraft / 6 Storage Units) 5 Box Hangars
Fuel Storage	100LL AvGas and Jet-A
Fuel Service	Centric Aviation
Weather Equipment	ASOS
Automobile Parking	Approximately 7,800 S.Y. Paved
Passenger Terminal Building	8,975 S.F.

Source: Armstrong Consultants, Inc., 2019

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Chapter Three

Forecast of Aviation Demand

Chapter 3 – Forecast of Aviation Demand

3.1 Introduction

A forecast of aviation demand provides the basis for evaluating the adequacy of existing airport facilities and its capability of handling potential traffic demand. Forecasts are the foundation for effective decision making in airport planning and establish when improvements are needed, the level of capital improvements and the timing of the necessary investments.

While forecast information is necessary for successful comprehensive airport planning, it is important to recognize that forecasts are only approximations of future activity, based upon historical data and viewed through present situations. Therefore, forecasts must be used with careful consideration, as they may lose their validity with the passage of time or are impacted by unforeseen changes in the surrounding market.

Aviation forecasts are typically based on historical data and other broadly accepted industry and governmental estimates of aviation activity, as well as the primary socioeconomic drivers of aviation activity.

For this reason, an ongoing program of examination of local airport needs and national and regional trends is recommended and encouraged in order to promote the logical development of aviation facilities at San Luis Valley Regional Airport.

At airports not served by air traffic control towers, approximations of existing aviation activity are necessary in order to form a basis for the development of reliable forecasts. Unlike towered airports, non-towered general aviation airports have historically not tracked or maintained comprehensive logs of aircraft operations. Therefore, approximations of existing aviation activity are based upon the most reliable data available, including reviews of based aircraft, fuel sales, historical data, local information and regional, state and national data forming the baseline to which forecasted aviation activity trends are applied.

Forecast methodologies and analysis in this study consider historical aviation trends at San Luis Valley Regional Airport, as well as throughout the nation. The latest local historical data was collected from the following sources: Federal Aviation Administration (FAA) Terminal Area Forecast (TAF) records from 2019 FAA Form 5010-1, *Airport Master Record*; Draft 2020 Colorado Aviation System Plan (CASP); the FAA Traffic Flow Management System (TFMS); and Airport management records. The CASP was in process of being updated at the initiation of this AMP.

Aviation activity projections are made based upon estimated growth rates, area demographics and socioeconomic, industry trends and other relevant indicators. Forecasts are prepared for the short-term (0-5 years); the medium-term (6-10 years); and long-term (11-20 years) time frames. Using forecasts within this planning horizon will allow the airport's improvements to be timed in order to efficiently meet the expected demand.

3.2 Local Profile

Examining the specific socioeconomic characteristics of the County of Alamosa and the City of Alamosa helps determine the factors influencing aviation activity in the area and determine the extent to which aviation facility developments are needed. Characteristics, such as population, employment and income will provide a foundation upon which to base the potential growth rate of aviation activity at the airport.

The County of Alamosa is located within southern Colorado. The City of Alamosa is the largest community within the County. According to the County: "Alamosa is the commercial hub of the San Luis Valley and the gateway to the Great San Dunes National Park and Preserve. Equipped with prime agricultural land, innovative business in energy, industry, cultural heritage, and transportation, Alamosa County residents and visitors also enjoy access to some of Colorado's best wilderness and outdoor recreation. Our climate is perfect for the agricultural production of barley, potatoes, alfalfa, and with 350+ days of sunshine a year, we are one of the most productive locations for solar power plants in the U.S."

3.2.1 Population

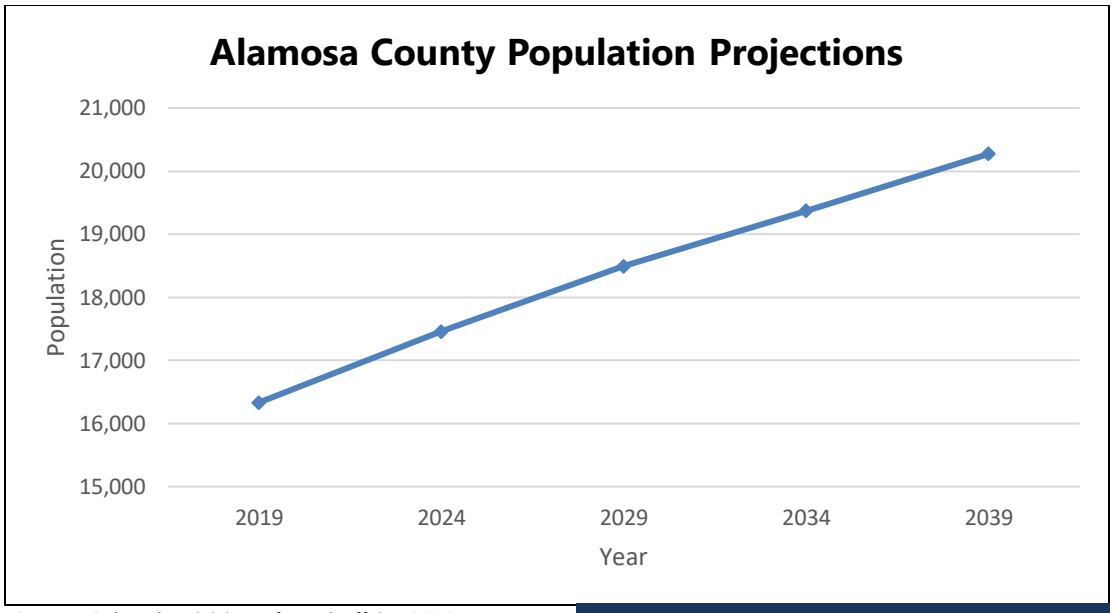
According to the United States Census Bureau and the Colorado Division of Local Affairs (CDLA), the population for the State of Colorado increased from 5,050,332 in 2010 to an estimated 5,769,985 in 2019 with Alamosa County's population increasing from an estimated 15,474 in 2010 to 16,333 in 2019.

The CDLA also developed population projections for all Colorado counties and the State of Colorado. Population projections for Alamosa County and the State of Colorado are shown in **Table 3-1**, **Figure 3-1** and **Figure 3-2**. The population forecast indicates an increase of 28.09 percent population for the State of Colorado and an increase of 24.18 percent for Alamosa County between 2019 and 2039.

Table 3-1 Population Projections for Alamosa County and Colorado

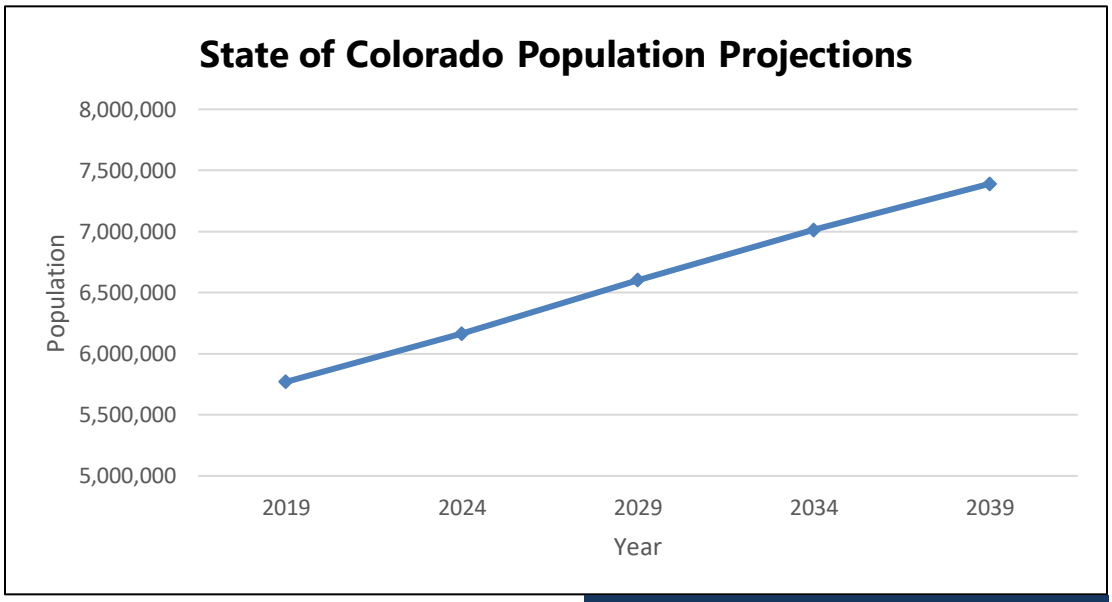
	2019	2024	2029	2034	2039	Average Annual Growth Rate
Alamosa County	16,333	17,459	18,491	19,371	20,271	1.21%
Colorado	5,769,985	6,165,395	6,601,706	7,014,361	7,390,824	1.40%

Source: Colorado Division of Local Affairs, 2019.



Source: Colorado Division of Local Affairs, 2019.

Figure 3-1 Alamosa County Population Projections



Source: Colorado Division of Local Affairs, 2019.

Figure 3-2 State of Colorado Population Projections

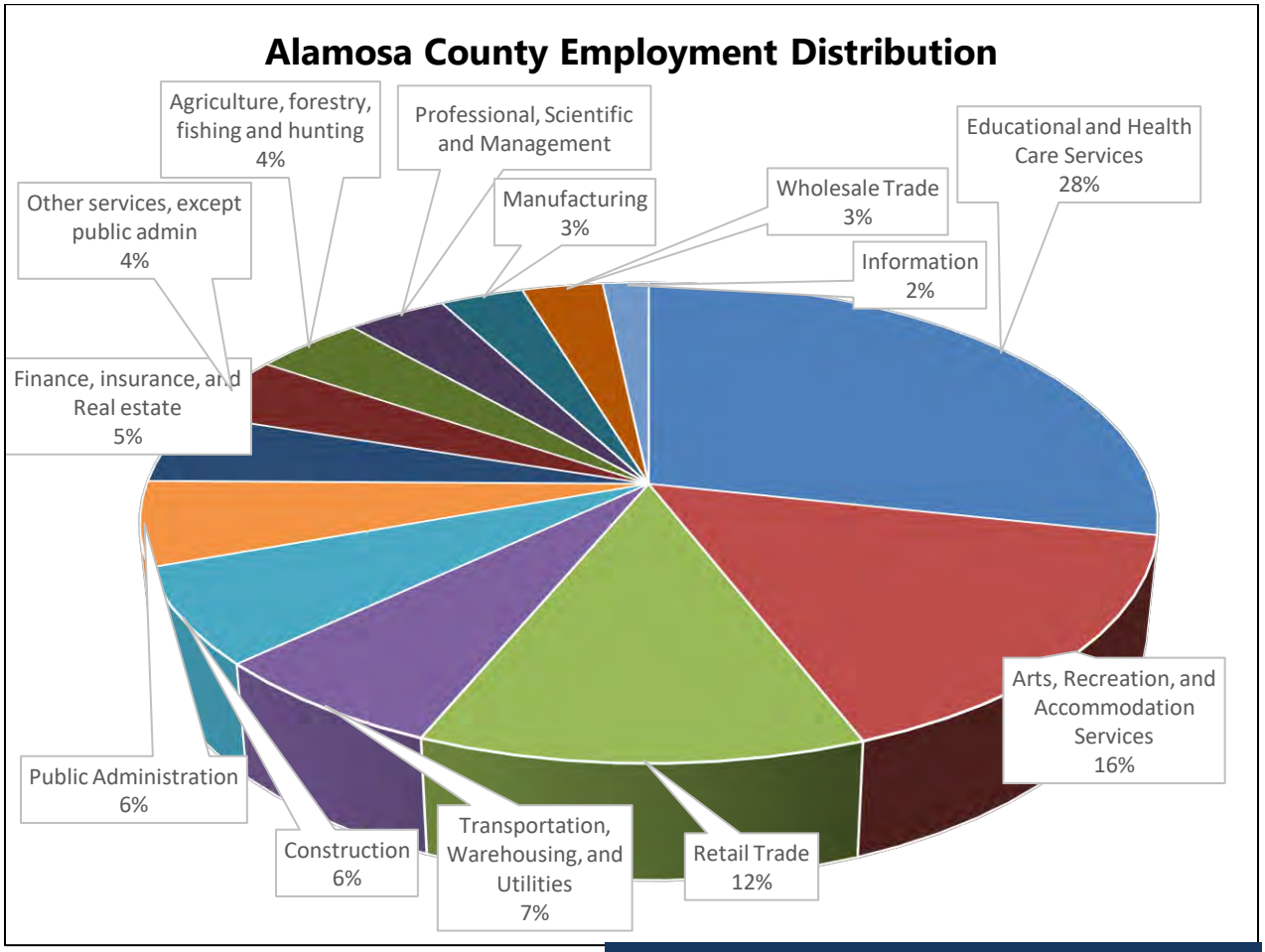
3.2.2 Employment and Largest Industries

According to the Bureau of Labor Statistics, the estimated unemployment rate in Alamosa County was 3.0 percent in October, 2019. This is above the unemployment rate for the State of Colorado and below the United States which is 2.6 percent and 3.6 percent, respectively. The largest industry in Alamosa County is the Educational Services, and Health Care and Social Assistance sector according to the U.S. Economic Census. The employment distribution by industry for Alamosa County is shown in **Table 3-2** and **Figure 3-3**.

Table 3-2 Alamosa County Employment Distribution by Industry

Industry	Number of Employed County Residents	Percent of Employed County Residents
Educational Services, and Health Care and Social Assistance	1,872	28.4%
Arts, entertainment, and recreation, and accommodation and food services	1,038	15.7%
Retail Trade	802	12.2%
Transportation and warehousing, and utilities	440	6.7%
Construction	430	6.5%
Public Administration	377	5.7%
Finance and insurance, and real estate and rental and leasing	314	4.8%
Other services, except public administration	291	4.4%
Agriculture, forestry, fishing and hunting, and mining	273	4.1%
Professional, scientific, and management, and administrative and waste management services	245	3.7%
Manufacturing	204	3.1%
Wholesale Trade	200	3.0%
Information	107	1.7%

Source: U.S. Census Bureau, 2012 Economic Census.



Source: U.S. Economic Census Bureau, 2012.

Figure 3-3 Alamosa County Employment Distribution by Industry

3.2.3 Income

According to the U.S. Census Bureau, the median household income is $36,315 for Alamosa County in 2017. These are lower than the median household incomes for the State of Colorado and the United States which is $65,458 and $57,652, respectively. The per capita income is $19,217 for Alamosa County.

3.3 Aircraft Operation Categories

There are four types of aircraft operations considered in the planning process. These are termed "local, based, itinerant and transient." They are defined as follows:

Local operations: Represents operations that stay within the traffic pattern airspace (non-itinerant).

Itinerant operations: Represents operations that arrive from outside the traffic pattern or depart the airport traffic pattern.

Based aircraft operations: The total operations made by aircraft based (stored at the airport on a permanent, seasonal or long-term basis) at the study airport, with no attempt to classify the operations as to purpose. If based at more than one airport, the airport at which the aircraft is stored at the most days is the base airport (example: the airport at which the aircraft is located at more than 6 months out of the year if operated out of two different airports).

Transient operations: The total operations made by aircraft other than those based at the airport under study. These operations typically consist of business or pleasure flights originating at other airports, with termination or a stopover at the study airport.

The terms transient and itinerant are sometimes erroneously used interchangeably. This study will confine analysis to local and itinerant operations to correlate with FAA and State forecasting criteria.

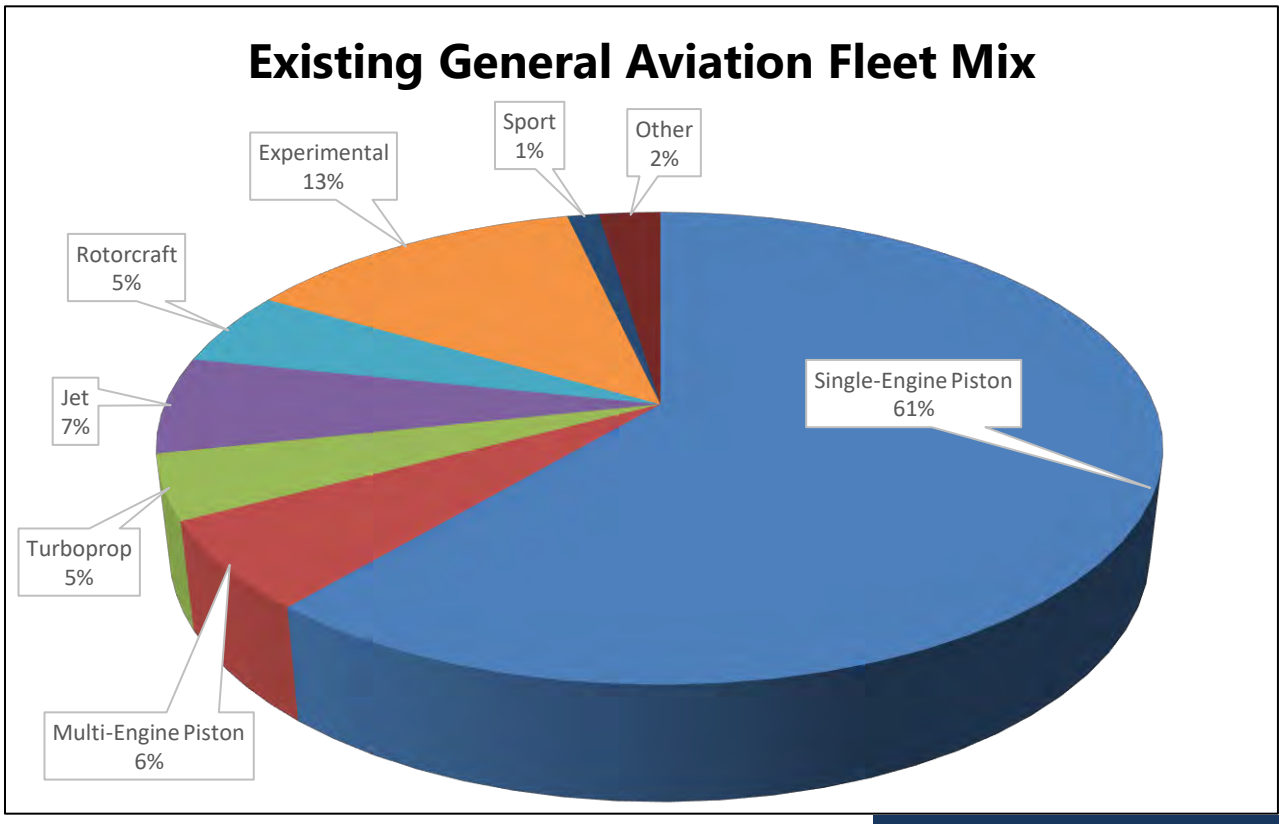
3.4 National and Regional Trends in Aviation

According to factors such as aircraft production, pilot activity and hours flown, general aviation reached a peak in the late 1970s. This peak was followed by a long downturn that persisted through most of the 1980s and the early 1990s and has been attributed to high manufacturing costs associated with product liability issues as well as other factors. The General Aviation Revitalization Act (GARA) of 1994 was enacted with the goal of revitalizing the industry by limiting product liability costs. The Act established an 18-year statute of repose on liability related to the manufacture of all general aviation aircraft and their components. According to a 2001 report to Congress by the General Accounting Office (GAO), trends in general aviation since GARA was enacted suggest that liability costs have been less burdensome to manufacturers, shipments of new aircraft have increased and technological advances have been made. Indicators of general aviation activity, such as the numbers of hours flown and active pilots, have also increased in the years since GARA, but their growth has not been as substantial as the growth in manufacturing.

The FAA annually convenes expert panels in aviation and develops forecasts for future activity in all areas of aviation, including general aviation. The FAA's 2019-2039 forecast predicts that the total general aviation fleet will decrease at an average annual rate of 0.03 percent during the 20-year forecast period, from 212,885 aircraft in 2018 to 211,800 aircraft in 2039. The fleet of jet turbine aircraft is expected to increase at a greater rate while fixed-wing piston aircraft are expected to decline slightly; as a result, piston aircraft are expected to represent a smaller percentage of the total general aviation fleet.

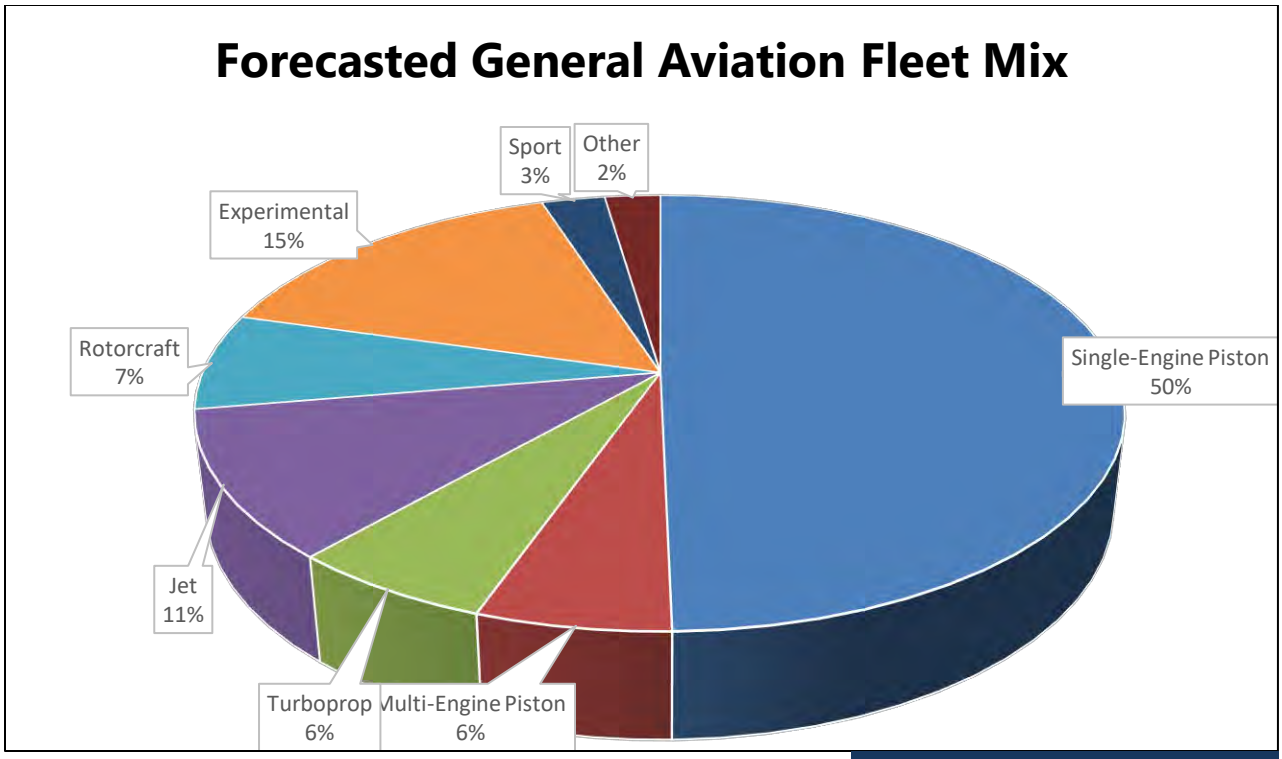
The active regional carrier passenger aircraft fleet is expected to decrease at a rate of 0.4% annually over the forecasted period. The projected decline in the regional carrier passenger aircraft fleet can be attributed to the industry trend of utilizing fewer, larger aircraft that are able to carry more passengers each flight, while retiring a larger amount of smaller aircraft. **Figure 3-4** and **Figure 3-5** illustrate this forecasted change to the general aviation fleet that is forecast to occur over the 21-year period.

In 2005 the category of "light sport" aircraft was created. By 2018 a total of 2,665 aircraft were included in this category. By 2039, a total of 5,555 light sport aircraft are projected to be in the fleet.



Source: Federal Aviation Administration, 2019.

Figure 3-4 Existing National GA Fleet



Source: Federal Aviation Administration, 2019.

Figure 3-5 Forecasted National GA Fleet

The Federal Aviation Aerospace Forecast produces activity forecasts based on general aviation and air taxi hours flown. As shown in **Table 3-3**, the biggest predicted increase is for turbo jet and light sport aircraft at 2.8 percent and 4.3 percent growth respectively from 2019 through 2039. Fixed wing piston aircraft categories are forecast to decline slightly through the forecast period.

Table 3-3 Active General Aviation and Air Taxi Hours Flown (In Thousands)

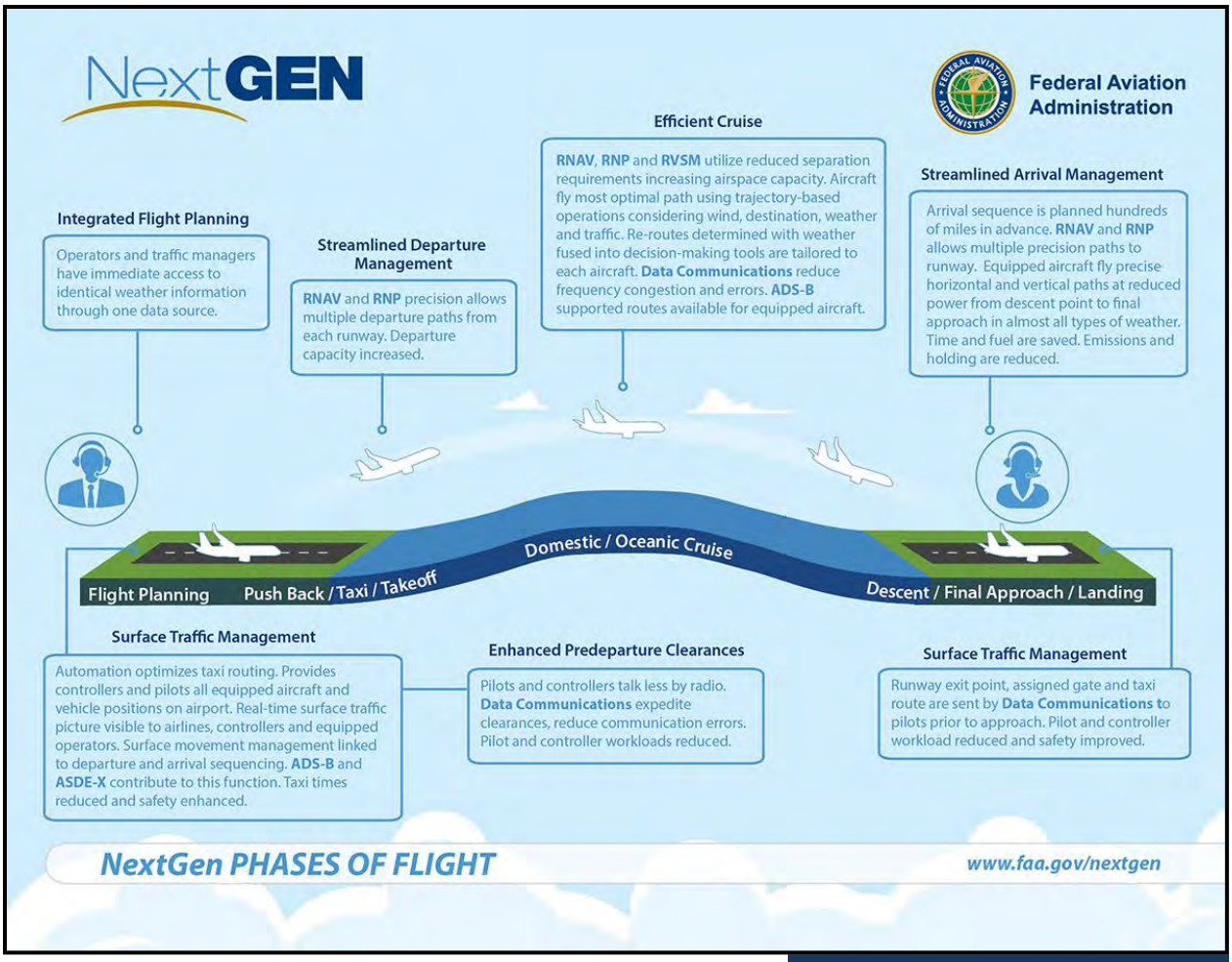
Year	Fixed Wing Aircraft				Rotorcraft		Experimental	Sport	Other	Total
	Piston		Turbine							
	Single-Engine	Multi-Engine	Turboprop	Turbojet	Piston	Turbine				
2019	11,894	1,578	2,713	4,528	832	2,688	1,305	233	170	25,943
2020	11,689	1,578	2,750	4,596	855	2,748	1,333	247	171	26,115
2021	11,488	1,578	2,787	4,664	878	2,808	1,361	261	171	26,287
2022	11,291	1,577	2,824	4,732	901	2,868	1,389	275	172	26,459
2023	11,097	1,577	2,861	4,800	924	2,928	1,417	289	172	26,631
2024	10,906	1,577	2,898	5,571	946	2,986	1,445	301	173	26,802
2025	10,758	1,574	2,939	5,740	966	3,045	1,470	316	173	26,984
2026	10,611	1,571	2,980	5,909	986	3,104	1,495	331	173	27,166
2027	10,467	1,568	3,021	6,078	1,006	3,163	1,520	346	174	27,348
2028	10,325	1,565	3,062	6,247	1,026	3,222	1,545	361	174	27,530
2029	10,186	1,563	3,105	6,417	1,044	3,279	1,570	374	175	27,713
2030	10,071	1,560	3,157	6,568	1,064	3,340	1,592	390	175	27,930
2031	9,957	1,557	3,209	6,719	1,084	3,401	1,614	406	175	28,147
2032	9,845	1,554	3,261	6,870	1,104	3,462	1,636	422	175	28,364
2033	9,733	1,551	3,313	7,021	1,124	3,523	1,658	438	176	28,581
2034	9,672	1,547	3,365	7,173	1,145	3,584	1,681	456	176	28,798
2035	9,515	1,544	3,433	7,321	1,166	3,651	1,701	473	176	29,101
2036	9,407	1,541	3,501	7,469	1,187	3,718	1,721	490	176	29,404
2037	9,301	1,538	3,569	7,617	1,208	3,785	1,741	507	177	29,707
2038	9,196	1,535	3,637	7,765	1,229	3,852	1,761	524	177	30,010
2039	9,483	1,532	3,707	7,916	1,249	3,920	1,784	542	177	30,311
AAG	-1.1%	-0.1%	1.6%	2.8%	2.0%	1.9%	1.6%	4.3%	0.2%	0.8%

Source: FAA Aerospace Forecast, 2019.

The FAA projects the number of active pilots (excluding student pilots) to increase by an average annual rate of 0.1 percent over the forecast period. Airline Transport Pilots are projected to increase at an average annual increase of 0.7 until 2039. The number of private pilots is projected to decrease at an average yearly rate of 0.7 percent over the forecast period. The FAA is also projecting an annual increase of 4.3 percent of sport pilots reflecting a growing interest in this "entry level" pilot certificate.

NextGen

Next Generation Air Transportation System (NextGen) is a new era in flight that is transforming how aircraft navigate the sky and is a replacement to the World War II era technology that has until recently been the primary navigation technology. NextGen utilizes satellite technology which allows pilots to know the precise locations of other aircraft around them. This allows more planes in the sky while enhancing the safety of air travel. Satellite landing procedures also allow pilots arrive at airports more efficiently by providing for more direct flight routes. **Figure 3-6** illustrates the NextGen system.



Source: Federal Aviation Administration.

Figure 3-6 NextGen Program Improvements

Unmanned Aerial Systems

The integration of Unmanned Aerial Systems (UAS) into the National Airspace System poses a unique situation for airports throughout the United States. The UAS Integration Pilot Program (IPP) is currently investigating many applications of this new technology including agricultural management including spray operations, package delivery (retail and medical), emergency response management, and infrastructure inspection. Additionally, the IPP is also looking into operational considerations of UAS such as operations beyond visual line of sight, operations over residential areas, ability to "see and avoid", and ADS-B detection. The 2019-2039 FAA Aerospace Forecasts expects a rapid growth in commercial UAS uses within the forecast period. As a result of this evolving component to the National Airspace System, it is important to recognize that UAS may have an impact on the operational use of the San Luis Valley Regional Airport and should be planned for accordingly.

Regional / Commuter Airline Fleet Mix

There is an overall trend in general aviation and regional airline fleet mix transitioning from smaller aircraft to larger aircraft. The hours flown and number of piston driven general aviation aircraft are forecasted to decline while turbine and jet powered aircraft are expected to increase.

Regional carriers have fluctuated the retirement of both turboprop and jet powered aircraft with passenger capacities less than 50 seats in favor of larger capacity regional aircraft. In the early 2010's, many regional airlines stored their 50 seat passenger jets only to reintroduce them into service recently. These aircraft include the Bombardier Canadair Regional Jet (CRJ) 200 or Embraer 140/145. As previously indicated, the CRJ-200 and ERJ-140/145 have a capacity of 50 seats or less and are also slated for retirement from passenger service prior during the planning period. It is likely the CRJ-200 and ERJ-140/145 will be retired in the late-2020's according to recent projections. By the mid to late-2020's and onwards, the regional air carrier fleet mix will likely consist of the Bombardier CRJ-700/900 or Embraer 170 and 175.

3.5 Factors Affecting Aviation Demand at San Luis Valley Regional Airport

In order to develop aviation forecasts to truly reflect the unique conditions at San Luis Valley Regional Airport, the factors impacting the Airport's demand must be evaluated. As of 2019, regional and national indicators (i.e. population, unemployment, and general national trends in general aviation) depict a relatively low-growth rate for aviation activity. However, there has been demand to expand the existing hangar facilities at the Airport. If additional hangar space became available, it is likely there would be a growth in based aircraft exceeding standard forecasting methodologies.

3.6 Available Activity Forecasts

The first step in preparing aviation forecasts is to examine historical and existing activity levels and currently available forecasts from other sources. The FAA TAF was reviewed. The FAA TAF forecast provide different figures for forecasted based aircraft and total operations.

The TAF is the official FAA forecast of aviation activity for U.S. airports. The forecasts are prepared to meet the budget and planning needs of FAA and provide information for use by state and local authorities, the aviation industry, and the public. The 2019 TAF indicates 38 existing based aircraft for San Luis Valley Regional Airport and 8,461 existing annual operations. The TAF indicates a 1.30 percent and 0.80 percent average annual growth in based aircraft and operations at the Airport, respectively. The TAF is used as a reference to compare existing activity levels at San Luis Valley Regional Airport.

At the time of this document's preparation, the forecast included as a part of the Draft 2020 CASP was not available and the forecast from the 2011 CASP was no longer considered relevant.

3.7 Existing Aviation Activity

The FAA Form 5010-1, *Airport Master Record*, is an FAA document which contains aeronautical data describing the physical and operational characteristics of civil public-use airports. Information is usually provided by the local operator of the airport. The most current Form 5010-1 indicates 27 based aircraft, one glider, and 8,403 total annual operations. The Airport also indicated 7,125 enplanements for the 2018 calendar year.

Table 3-4 depicts the existing based aircraft fleet and operations mix at San Luis Valley Regional Airport as reported by airport management.

Table 3-4 Existing Aviation Activity

Year	Based Aircraft				Operations					Enplanements
	Single-Engine	Multi-Engine	Turbo Prop	Total	GA – Local	GA – Itinerant	Military	Air Taxi	Total	
2018	21	6	-	27	690	3,702	1,476	2,535	8,403	7,125

Source: ALS Airport Management, 2019.

As discussed in Chapter Two, *Inventory of Airport Assets*, San Luis Valley Regional Airport serves a mix of single-engine piston and multi-engine piston driven, turboprop, turbojet, and helicopter aircraft. These users include airline transportation, business and recreational transport, air ambulance, spray aircraft and flight training. San Luis Valley Regional Airport provides easy access and a user-friendly environment for all aviation activities.

- **Business and Recreational Transportation -** These users desire the utility and flexibility offered by general aviation aircraft and is made up of business, recreational users, as well as tourism related activities. These operators include a mix of single-engine, multi-engine and turbojet aircraft.

- **Air Ambulance Services –** Guardian Flight provides essential emergency medical transportation for life threatening situations and assists in patient transfers by air from local hospitals to higher level care facilities that are typically located in Denver or Albuquerque (approximately 218 and 203 miles by road, respectively). The air ambulance services provide quick and efficient transportation in emergency situations when time is of the essence.

- **Spray Operators** - This category includes operations by aircraft with the purpose of spraying nearby land with products such as pesticides, fertilizers, seeding and mosquito control. Operations are typically conducted by single-engine turboprop aircraft. These users prefer close proximity to the lands they spray to reduce fuel consumption and increase aircraft utilization

- **Flight Training -** San Luis Valley Regional Airport is regularly utilized by flight training schools from southern Colorado and the Denver-metropolitan area for cross-country training. The location of the Airport provides a strategic location for cross country and high-altitude flight training.

- **Air Cargo –** Air cargo services at the Airport are provided by Alpine Air Express and Key Lime Air with the Beechcraft 99 and Fairchild Swearingen Metroliner III, respectively. Both operate flights to sorting facilities at Denver International Airport. These services allow connectivity for both domestic and international parcel shipments to have expedited and direct access to the San Luis Valley.

- **Airline Transportation** - Commercial air service at San Luis Valley Regional Airport is subsidized under the United States Department of Transportation's Essential Air Service (EAS) program. The EAS program was developed as a result of the Airline Deregulation Act of 1978, which afforded airlines the ability to select their own destinations and routes free of government control. As a safeguard to protect smaller communities from losing air service, the EAS program was developed. To maintain eligibility in the EAS program, an airport must meet the following criteria:

- Received scheduled commercial air service prior to October 24, 1978
- Ten passenger enplanements per day (exemption provided for airports located 175 miles or more from nearest large or medium hub airport)
- Average passenger subsidy is less than $200 (exception provided for airports located 210 miles or more from nearest large or medium hub airport)

San Luis Valley Regional Airport is currently served by Boutique Air with non-stop service to Denver International Airport by a Pilatus PC-12 turboprop.

3.8 Forecasts of Aviation Activity

3.8.1 Based Aircraft Forecast

The forecasts for San Luis Valley Regional Airport took into consideration growth rates for the community, county, and state with a comparative analysis of existing based aircraft levels using three methodologies to determine a preferred forecast of based aircraft.

Forecasting methods were developed with the assumption that airport services would have reasonable growth in the future. These figures factor in the potential growth associated with future hangar development.

Per Capita Method

A per capita forecast projects the number of based aircraft in direct proportion to the projected population for Alamosa County. According to the Colorado Department of Local Affair's, the population for Alamosa County is expected to increase from 16,333 in 2019 to 20,271 in 2039. Using the per capita forecast method results in 35 based aircraft in 2039. The results of the per capita forecast are shown in **Table 3-5**.

Table 3-5 Per Capita Method

Year	Alamosa County Population	Average Annual Rate of Growth	Based Aircraft
2019	16,333	N/A	27
2024	17,459	1.38%	29
2029	18,491	1.18%	32
2034	19,371	0.95%	33
2039	20,271	0.93%	35

Source: Armstrong Consultants, Inc., 2019.

General Aviation Hours Flown Method

This method factors general aviation hours flown data provided by the Federal Aviation Administration Aerospace Forecast to the current aircraft fleet mix operating at San Luis Valley Regional Airport, primarily jet and turbo prop aircraft. This method assumes a 1.80 percent average annual growth rate, which is consistent with the national general aviation fleet trend. This method results in a total of 39 based aircraft at the Airport in 2039. The result of the General Aviation Hours Flown scenario is shown in **Table 3-6**.

Table 3-6 General Aviation Hours Flown Method

Year	Average Annual Rate of Growth	Based Aircraft
2019	N/A	27
2024	1.80%	30
2029	1.80%	32
2034	1.80%	35
2039	1.80%	39

Source: Armstrong Consultants, Inc., 2019.

State of Colorado TAF Market Share Method

This method utilizes based aircraft projections from the FAA TAF projections for the State of Colorado. The existing 27 based aircraft at San Luis Valley Regional Airport accounted for 0.57 percent of the total based aircraft market share in the State of Colorado for 2019. To determine forecasted based aircraft at the Airport, the 0.57 percent market share was applied to the FAA TAF based aircraft projections for Colorado. This forecast method results in a total of 32 based aircraft at San Luis Valley Regional Airport in 2039. The result of the State of Colorado TAF Market Share scenario is shown in **Table 3-7**.

Table 3-7 TAF Market Share Method

Year	Annual Rate of Growth	Based Aircraft
2019	N/A	27
2024	0.89%	28
2029	0.86%	29
2034	0.87%	31
2039	0.84%	32

Source: Armstrong Consultants, Inc., 2019.

Preferred Method

Based on the results of the three forecasting methods discussed, the Per Capita method has been selected as the preferred forecast for based aircraft. This method factors in regional and community trends corresponding to aviation demand with the current fleet mix at the Airport. **Figure 3-7** depicts the forecasting methods against the FAA TAF. The FAA TAF shown in **Figure 3-7** utilize the forecasted average annual growth rates from the 2019-2039 FAA TAF is applied to the confirmed existing activity at the Airport.

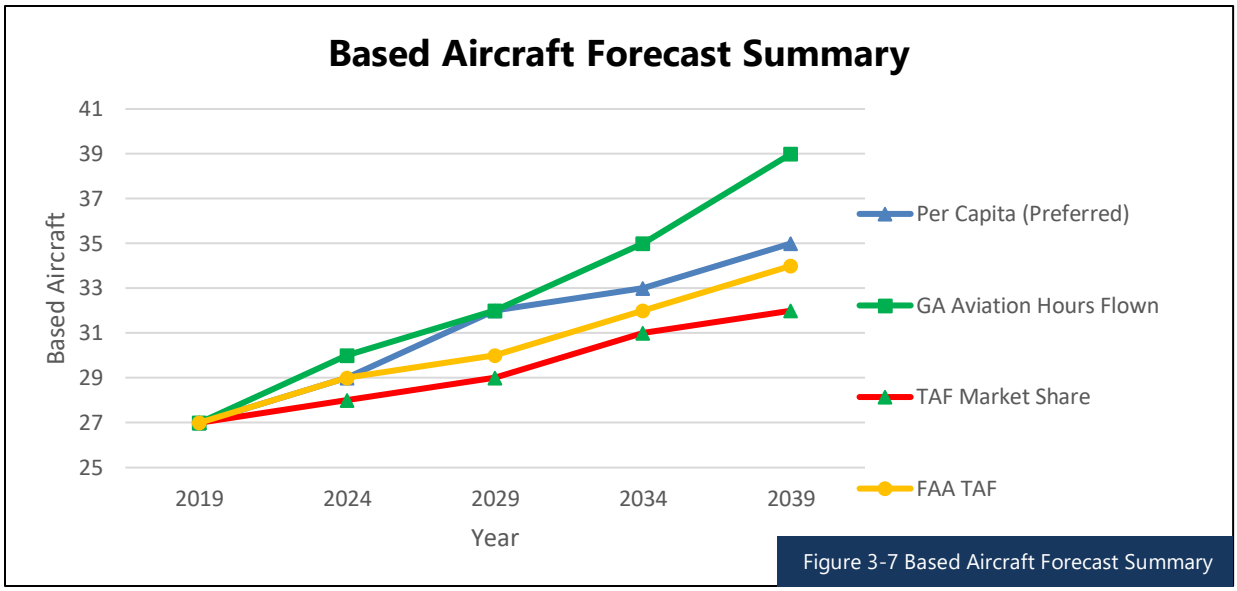


Figure 3-7 Based Aircraft Forecast Summary

Source: Armstrong Consultants, Inc., 2019; Federal Aviation Administration, 2019; Colorado Aviation System Plan, 2011.

3.8.2 Aircraft Operations Forecast

In order to develop a preferred method of forecasting aircraft operations at San Luis Valley Regional Airport, the following methods were used:

Method 1 uses the projected annual growth rate for regional population in relation to aircraft operations. This method applies the projected average annual growth rates of the County to existing aircraft operations. This method resulted in a total forecasted operations of 10,429 in 2039.

Method 2 uses the projected increase in general aviation hours flown for the existing fleet mix of aircraft currently operating at the Airport. Due to the large amount of turbo jet and turbo prop aircraft operating at the Airport, this method assumes a 1.8 percent annual growth from the existing 8,403 operations. This method resulted in 12,006 operations in 2039.

These methods provide a likely estimate of activity for future operations at San Luis Valley Regional Airport. The FAA TAF was also used for comparison. The FAA TAF shown in **Figure 3-8** utilize the forecasted average annual growth rates from the 2019-2039 FAA TAF which is applied to the confirmed existing activity at the Airport. **Figure 3-8** and **Table 3-8** summarize the operations forecasts. Based on an evaluation of operations forecast methods, Method 1 was selected as the preferred method as it reflects the current conditions and future trends of the community surrounding the San Luis Valley Regional Airport.

Activity estimates are currently 10 percent local and 90 percent itinerant. The operations are expected to remain at these percentages through 2039.

Table 3-8 Total Annual Operations Forecast Summary

Year	Method 1	Method 2	FAA TAF
2019	8,403	8,403	8,403
2024	8,982	9,187	8,792
2029	9,513	10,044	9,200
2034	9,966	10,981	9,626
2039	10,429	12,006	10,072

Source: Armstrong Consultants, Inc., 2019.

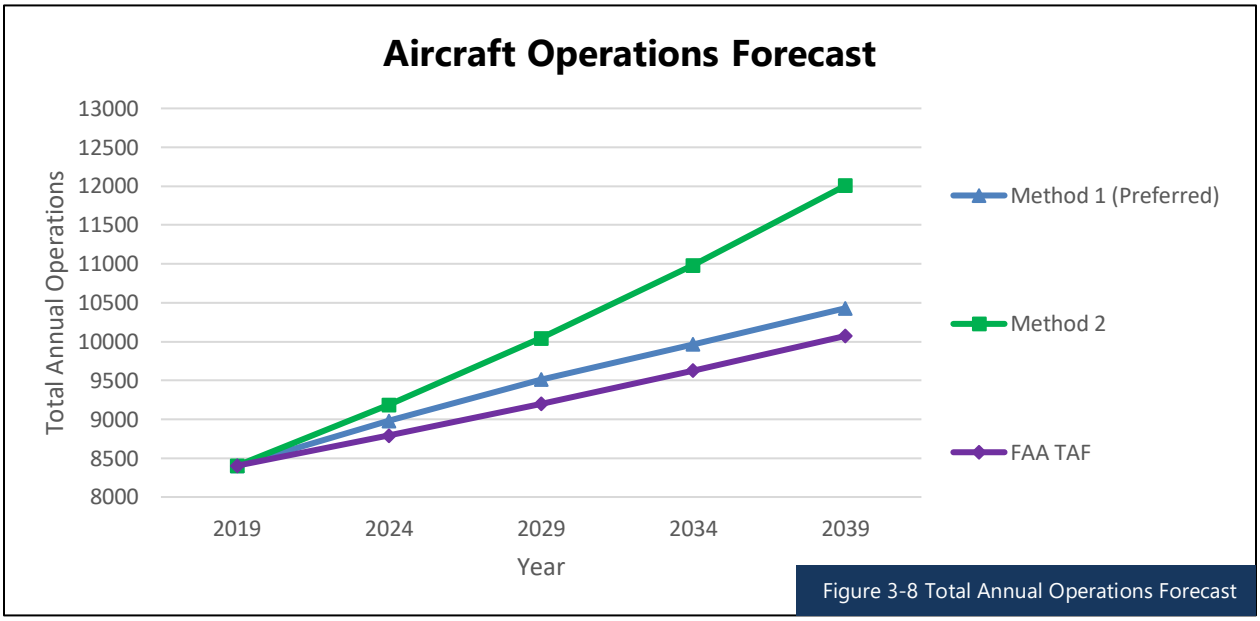


Figure 3-8 Total Annual Operations Forecast

Source: Armstrong Consultants, Inc., 2019; Federal Aviation Administration, 2019.

3.8.3 Enplanement Forecast

As mentioned, San Luis Valley Regional receives subsidized air service through the Essential Air Service program. Carriers which are awarded EAS routes are typically regional airlines (i.e. SkyWest Airlines, Endeavor Air, Envoy Air, etc.) which operate under Federal Aviation Regulation (FAR) Part 121, or commuter airlines (i.e. Boutique Air, Denver Air Connection, etc.) which operate under FAR Part 135.

Regional airlines offer a streamlined service to mainline carriers to provide seamless onward connections. Regional airlines usually operate under the brand of a major airline as an affiliate carrier. For example, SkyWest Airlines operates as United Express in cooperation with United Airlines. Currently, passengers departing on SkyWest Airlines check-in at a United-branded counter, receive a United-branded ticket and obtain frequent flier miles through United's program. Additionally, once at their hub, passengers can connect to another United flight without having to recheck-in or be re-screened by security. Regional airlines also tend to operate jet-powered aircraft which typically have greater maintenance reliability and are able to operate in less favorable weather conditions. Overall, these carriers are able to provide a nearly equivalent level of service and convenience offered by major carriers.

Commuter airlines (also known as air taxis) offer standalone services between small communities and medium to large-sized cities. They typically do not offer interline agreements which are utilized by regional airlines and therefore are not able to provide a seamless onward connection. Additionally, commuter airlines do not offer integrated service with major carriers, so their passengers are unable to check their luggage through to their final destination or obtain frequent flier miles. Passengers are typically required to recheck-in at their connecting airport and often times are required to be re-screened. Commuter airlines typically operate smaller single or multi-engine turbine-driven and multi-engine piston-driven aircraft which tend to have lower maintenance reliability and greater wind restrictions.

The type of carrier operating at San Luis Valley Regional Airport can have a strong impact on the airport's forecasted enplanements. As EAS contracts can be awarded to either regional or commuter airlines, it is prudent to evaluate the impacts of the type of carrier operating at San Luis Valley Regional Airport on forecasted enplanements. Three scenarios have been developed to evaluate these potential impacts.

Scenario 1 – Service Introduction by Regional Airline

The San Luis Valley Regional Airport recently conducted a market study analysis on existing and forecasted demand and enplanements for the Airport in 2018 (the full market study report is attached in the Appendix for reference). The analysis provided in the market study was utilized for forecasted enplanements at the Airport. The factors and methodologies discussed within the study are discussed below:

"It is projected that a regional jet operator may bid on the Essential Air Service contract for Alamosa on or around April of 2020 for service to begin on October 1, 2020. We would expect two departures and arrivals per weekday and one per Saturday and Sunday for a total of 24 operations per week. Using a 50-seat regional jet, that equates to 600 outbound seats or 1,200 total seats available per week. Over the course of a year that is 31,200 outbound seats.

In order to estimate enplanements, 31 other comparable communities that also have regional jet service were evaluated. Communities in excess of 100,000 population within 30 miles (for example Lancaster, PA) or with an LCC operator (for example Hagerstown, MD) were eliminated from the comparison. The 31 comparable communities' range in size from Brainerd, MN (pop. within 30 miles of 95,924) to Moab, UT (pop. within 30 miles of 9,833). The 31 comparable communities' average population within 30 miles of the airport is 44,998 while the population of Alamosa's catchment area is 37,596. The 31 communities' average 36,086 outbound seats per year and 20,239 outbound enplanements per year for an average load factor of 56.1%. The main variable for comparison used was enplanements per person. This averages .45 enplanements per capita. This number, when applied to Alamosa's catchment area population, equals 16,910 enplanements per year. The 16,910 estimated enplanements in year one at Alamosa provides for a load factor of 54.2%, just slightly under the 31 comparable communities' average. It is estimated conservatively that load factors will grow at a rate of one percentage point per year."

The forecasted enplanements for the Airport identified in the market study resulted in 22,526 forecasted enplanements in 2039.

Scenario 2 – Continued Service by Commuter Airline

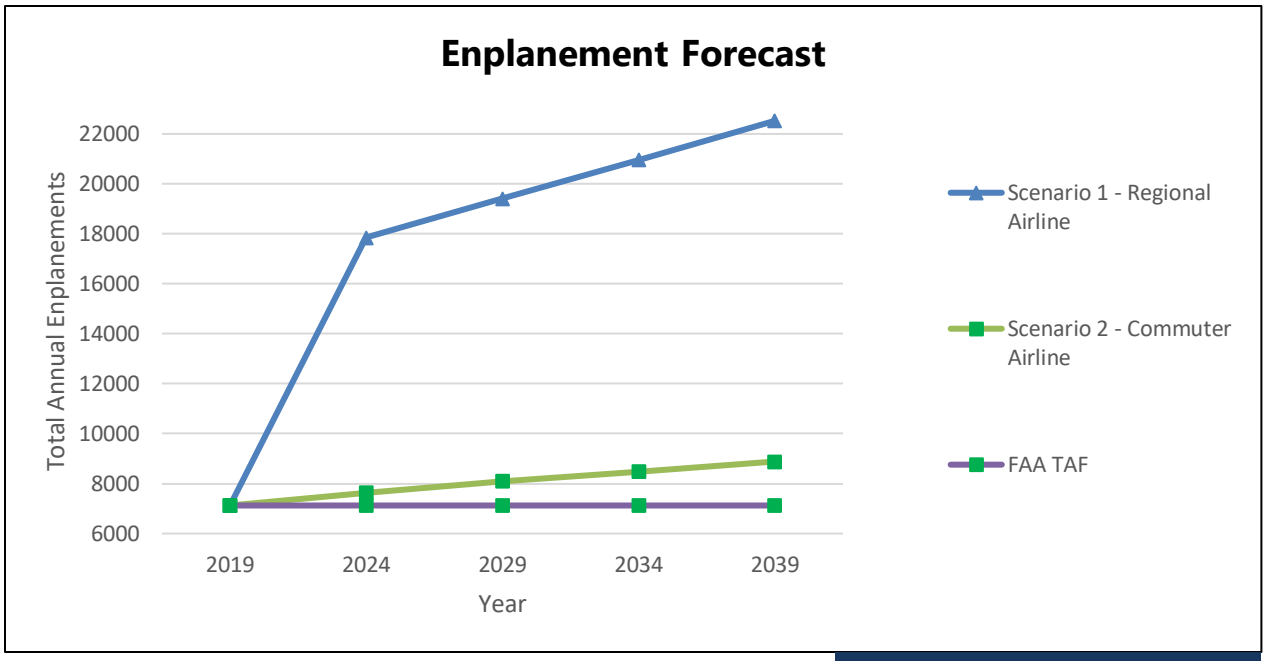
This scenario assumes the existing level of airline service provided at the Airport remains in the future. It is assumed enplanements would grow at a level proportional to the regional population and utilizes the forecasted average annual growth rate of Alamosa County population. This scenario would result in 8,885 enplanements by 2039.

Figure 3-9 and **Table 3-9** depicts the preferred enplanement forecast along the FAA TAF forecast. The FAA TAF currently shows a no growth model for enplanements at the San Luis Valley Regional Airport. The FAA TAF commonly depicts a no growth model for enplanements at airports similar to San Luis Valley Regional Airport. However, the no growth models do not always reflect the existing or future trends through the forecasted period, and can be attributed to the large differential in forecasted enplanements between methods.

The level of enplanements served by an airport directly impacts their access to funding levels through the Airport Improvement Program. Once an airport surpasses 10,000 annual enplanements, they are entitled to a minimum of $1,000,000 in federal funding for airport improvement projects for each year they maintain or exceed that activity level. Additionally, the FAA Reauthorization Act of 2018 created a new funding threshold of at least $600,000 for airports serving 8,000 or more to less than 10,000 enplanements for each year they maintain this activity level. During the course of this planning study, San Luis Valley Regional Airport began receiving air service with the CRJ-200 aircraft operated by SkyWest Airlines, surpassing 10,000 annual passenger enplanements and is therefore eligible for Primary entitlement funding of $1,000,000 per year.

Year	Scenario 1	Scenario 2	FAA TAF
2019	7,125	7,125	7,125
2024	17,846	7,630	7,125
2029	19,406	8,091	7,125
2034	20,966	8,483	7,125
2039	22,526	8,885	7,125

Source: Armstrong Consultants, Inc., 2019.



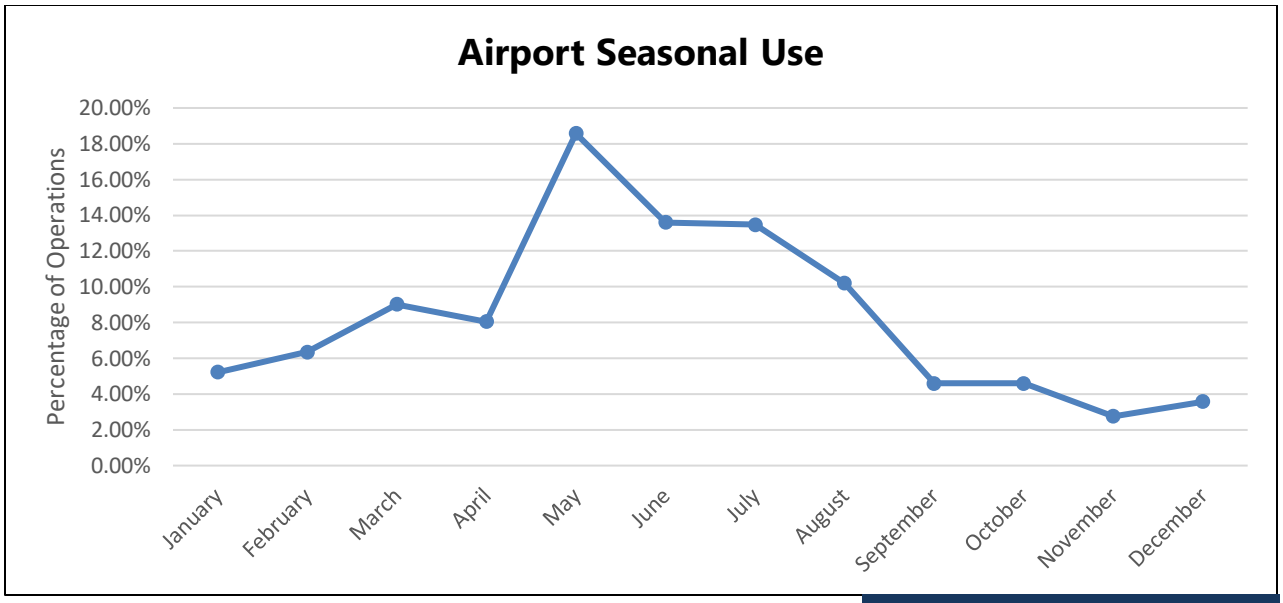
Source: 2018 *True Market / Leakage Study*, FAA TAF 2019.

Figure 3-9 Annual Enplanement Forecast

3.9 Seasonal Use Determination

Some level of seasonal fluctuation in aircraft operations can be expected at nearly all airports. This fluctuation is most apparent in regions of the country with severe winter weather patterns or in resort communities were the local economy is driven by tourism. The fluctuation is less pronounced at major hub airports, with a high percentage of commercial and scheduled airline activity. Fuel flowage activity at the Airport was utilized to determine seasonal usage.

San Luis Valley Regional Airport's operations peak between the late spring and summer months when local weather conditions are most favorable for aircraft operations and travel, as shown in **Figure 3-10.** The peak month of operations has been determined to be May and this will be utilized to determine monthly/hourly peaking tendencies at the airport.



Source: Armstrong Consultants, Inc., 2019.

Figure 3-10 Seasonal Use Determination

3.10 Hourly Demand and Peaking Tendencies

In order to arrive at a reasonable estimate of demand at the airport facilities, it was necessary to develop a method to calculate the levels of activity during peak periods. The periods normally used to determine peaking characteristics are defined below:

Peak Month: The calendar month when peak enplanements or operations occur.

Design Day: The average day in the peak month derived by dividing the peak month enplanements or operations by the number of days in the month.

Busy Day: The Busy Day of a typical week in the peak month. In this case, the Busy Day is equal to the Design Day.

Design Hour: The peak hour within the Design Day. This descriptor is used in airfield demand/capacity analysis, as well as in determining terminal building, parking apron and access road requirements.

Busy Hour: The peak hour within the Busy Day. In this case, the Busy Hour is equal to the Design Hour.

Using the Seasonal Use information, a formula was derived which will calculate the average daily operations in a given quarter, based on the percentage of the total annual operations for that month, as determined by the graph. The formula is as follows:

$$M = A\ (T / 100)$$

$$D = M / (365 / 12)$$

Where T = Quarterly percent of use (from graph)

M = Average quarterly operations

A = Total annual operations

D = Average Daily Operations in a given quarter

Approximately 90% of total daily operations occur between the hours of 7:00 AM and 7:00 PM (12 hours) at a typical general aviation airport, meaning the maximum peak hourly occurrence may be 50% greater than the average of the hourly operations calculated for this time period.

The Estimated Peak Hourly Demand (P) in a given quarter was, consequently, determined by compressing 90% of the Average Daily Operations (D) in a given quarter into the 12-hour peak use period, reducing that number to an hourly average for the peak use period and increasing the result by 50% as follows:

P = 1.5 (0.90D / 12)

Where D = Average Daily Operations in a given quarter.

P = Peak Hourly Demand in a given month.

The calculations were made for each quarter of the planning period. The results of the calculations are shown in **Table 3-10**. The Design Day and Design Hour peak demand in the planning year occurs under VFR weather conditions in the July (highlighted in bold), with an average of 67 daily operations and approximately 5.0 operations per hour in 2039.

Table 3-10 Monthly/Daily/Hourly Demand

Planning Year: 2024 Operations: 8,982					Planning Year: 2029 Operations: 9,513				
		Operations					Operations		
Month	% Use	Monthly	Daily	Hourly	Month	% Use	Monthly	Daily	Hourly
January	5.23%	470	16	1.2	January	5.23%		16	1.2
February	6.34%	569	19	1.4	February	6.34%		20	1.5
March	9.03%	811	27	2.0	March	9.03%		28	2.1
April	8.05%	723	24	1.8	April	8.05%		25	1.9
May	**18.57%**	1,668	55	**4.1**	**May**	**18.57%**		58	**4.4**
June	13.60%	1,222	41	3.0	June	13.60%		43	3.2
July	13.46%	1,209	40	3.0	July	13.46%		42	3.2
August	10.19%	915	30	2.3	August	10.19%		32	2.4
September	4.60%	413	14	1.0	September	4.60%		14	1.1
October	4.60%	413	14	1.0	October	4.60%		14	1.1
November	2.75%	247	8	0.6	November	2.75%		9	0.6
December	3.58%	322	11	0.8	December	3.58%		11	0.8
Planning Year: 2034 Operations: 9,966					**Planning Year: 2039 Operations: 10,429**				
		Operations					Operations		
Month	% Use	Monthly	Daily	Hourly	Month	% Use	Monthly	Daily	Hourly
January	5.23%	521	17	1.3	January	5.23%	545	18	1.3
February	6.34%	632	21	1.6	February	6.34%	661	22	1.6
March	9.03%	900	30	2.2	March	9.03%	942	31	2.3
April	8.05%	802	26	2.0	April	8.05%	840	28	2.1
May	**18.57%**	1,851	61	**4.6**	**May**	**18.57%**	1,937	64	**4.8**
June	13.60%	1,355	45	3.3	June	13.60%	1,418	47	3.5
July	13.46%	1,341	44	3.3	July	13.46%	1,404	46	3.5
August	10.19%	1,016	33	2.5	August	10.19%	1,063	35	2.6
September	4.60%	458	15	1.1	September	4.60%	480	16	1.2
October	4.60%	458	15	1.1	October	4.60%	480	16	1.2
November	2.75%	274	9	0.7	November	2.75%	287	9	0.7
December	3.58%	357	12	0.9	December	3.58%	373	12	0.9

Source: Armstrong Consultants, Inc., 2019.

3.11 Peak Hour General Aviation Pilot and Passenger Flow

The number of pilots and general aviation passengers relates to the peak hour operations forecast in **Table 3-11**. Based upon a historical economic impact studies; an average of 3.44 persons per aircraft operation is considered reasonable for general aviation forecasts. The average of 3.44 passengers per peak hour operation results in a peak hour flow of 17 general aviation pilots and passengers by 2039. **Table 3-11** lists the forecasted peak hour general aviation pilot and passenger flow.

Table 3-11 Peak Hour General Aviation Pilot and Passenger Flow

Year	Peak Hour Aircraft Operations	Peak Hour GA Pilot/Passenger Flow
2024	4.1	14
2029	4.4	15
2034	4.6	16
2039	4.8	17

Source: Armstrong Consultants, Inc., 2019.

Peak airline passenger enplanements were also calculated to determine the passenger terminal building holding capacity. Due to the limited number of existing and forecasted airline operations, it is anticipated the peak hour of passenger enplanements would be directly related to the total number of passenger seats available at a given time. It would be expected to protect for a peak hour of 67 passengers.

3.12 Design Aircraft

A variety of aircraft, ranging from RDC of A-I through D-III, are expected to utilize the airport in the short, medium and long-term time frames. Typically, the design aircraft best represents the most demanding aircraft using the airport that has at least 500 annual operations. The design aircraft is used to determine both existing and future facility needs at the airport.

According to the FAA's *Traffic Flow Management System Counts*, between May 1, 2018 and May 1, 2019, there were a total of 166 documented operations of aircraft with an RDC of C-II or greater. However, this database only records a portion of the actual aircraft operations at San Luis Valley Regional Airport. Aircraft that are operating under Visual Flight Rules (VFR) are not reflected in the *Traffic Flow Management System Counts*. Some of these operations include turbo-prop and smaller turbo-jet aircraft at the Airport. The Airport frequently has operations of C-II and larger turbo-prop and turbo-jet aircraft being utilized for business, personal, and recreational travel. The existing design aircraft is identified as the Bombardier Challenger 600, a corporate jet. It is likely if regional airline service occurs at San Luis Valley Regional Airport, it would likely commence with 50-seat Bombardier CRJ-200 aircraft and would be replaced with the 67-seat Bombardier CRJ-700 due to CRJ-200 retirements by the end of the planning horizon. Therefore, the future design aircraft is projected to be the Bombardier CRJ-700, a C-II aircraft.

3.13 Annual Service Volume

Airfield capacity is determined by using an airport's Annual Service Volume (ASV). An airport's ASV has been defined by the FAA as "a reasonable estimate of an airport's annual capacity. It accounts for differences in runway use, aircraft mix, weather conditions, etc., that would be encountered over a year's time." Therefore, ASV is a function of the hourly capacity of the airfield and the annual, daily, and hourly demands placed upon it. According to FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, the ASV for the single runway configuration for San Luis Valley Regional Airport is approximately 230,000 annual operations.

Based on existing and forecasted activity levels, operations are not expected to exceed 4.5 percent of capacity over the 20-year planning period. Therefore, no additional runways are needed (from a

capacity perspective) to accommodate the existing or forecasted activity. **Table 3-12** summarizes the ASV relationship developed in this section.

Table 3-12 Annual Service Volume

Year	Total Annual Operations	Annual Service Volume	Annual Service Ratio
2019	8,403	230,000	3.7%
2024	8,982	230,000	3.9%
2029	9,513	230,000	4.1%
2034	9,966	230,000	4.3%
2039	10,429	230,000	4.5%

Source: FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*.

3.14 Forecast Summary

Table 3-13 provides a summary of the preferred forecast for San Luis Valley Regional Airport through the 20-year planning period, while utilizing the most current based aircraft data for the baseline year.

Table 3-14 depicts the preferred forecast against the FAA TAF. As previously discussed, the forecast of enplanements exceeds the current TAF by more than 10 percent.

Table 3-13 Preferred Forecast Summary

Year	Based Aircraft			Operations			Enplanements*
	Piston	Other	Total	GA – Local	GA – Itinerant	Total	
2019	27	--	27	840	7,563	8,403	7,125
2024	27	2	29	898	8,084	8,982	17,846
2029	27	5	32	951	8,562	9,513	19,406
2034	27	6	33	997	8,969	9,966	20,966
2039	27	8	35	1,043	9,386	10,429	22,526

Source: Armstrong Consultants, Inc., 2019.

* The preferred enplanement forecast reflects a scenario in which a regional airline provides service at San Luis Valley Regional Airport.

Table 3-14 FAA TAF Comparison

Year	Total Enplanements			Total Based Aircraft		
	Market Study Forecast	TAF	Difference	Airport Forecast	TAF	Difference
2019	7,125	7,125	0.0%	27	27	0.0%
2024	17,846	7,125	150.5%	29	29	0.0%
2029	19,406	7,125	172.4%	32	30	6.7%
2034	20,966	7,125	194.3%	33	32	3.1%
2039	22,526	7,125	216.2%	35	34	2.9%

Year	Itinerant Operations			Local Operations		
	Airport Forecast	TAF	Difference	Airport Forecast	TAF	Difference
2019	7,563	7,563	0.00%	840	840	0.00%
2024	8,084	7,913	2.2%	898	879	2.2%
2029	8,562	8,280	3.4%	951	920	3.4%
2034	8,969	8,663	3.5%	997	963	3.5%
2039	9,386	9,065	3.5%	1,043	1,007	3.6%

Year	Total Operations		
	Airport Forecast	TAF	Difference
2019	8,403	8,403	0.00%
2024	8,982	8,792	2.2%
2029	9,513	9,200	3.4%
2034	9,966	9,626	3.5%
2039	10,429	10,072	3.5%

Source: FAA Terminal Area Forecast, 2019

Note: The TAF has been updated within this section to reflect the current based aircraft and total annual operations. The TAF's baseline year data does not currently reflect existing activity at the Airport. It is requested that the FAA update the TAF based on the data shown within this section.

Chapter Four

Facility Requirements

Chapter 4 – Facility Requirements

4.1 Introduction

This chapter identifies the requirements for airside and landside facilities to accommodate the forecasted demand levels at the San Luis Valley Regional Airport. In order to meet the demand levels, an assessment of the existing airport facilities to meet current and future demand was conducted. The facility requirements were based on information derived from capacity and demand calculations, information from FAA advisory circulars and design standards, the sponsor's vision for the future of the airport, the condition and functionality of existing facilities, and other pertinent information.

Facility requirements have been developed for the various airport functional areas listed below:

- Commercial service requirements;
- General aviation requirements;
- Runways, Taxiways, and Aircraft parking aprons;
- Support facilities, including the Passenger Terminal Building;
- Ground access, circulation, and parking requirements;
- Infrastructure and utilities; and
- Land use compatibility and control.

The time frame for addressing development needs usually involves short-term (up to five years), medium-term (six to ten years), and long-term (eleven to twenty years) planning periods. Long-term planning primarily focuses on the ultimate role of the airport and is related to development. Medium-term planning focuses on a more detailed assessment of needs, while the short-term analysis focuses on immediate action items. Most important to consider is that a good plan is one that is based on actual demand at an airport rather than time-based predictions. Actual activity at the Airport will vary over time and may be higher or lower than what the demand forecast predicts. Using the three planning milestones (short-term, medium-term, and long-term) the airport sponsor can make an informed decision regarding the timing of development based on the actual demand. This approach will result in a financially responsible and demand-based development of the Airport.

4.2 Design Standards

Airport design standards provide basic guidelines for a safe, efficient, and economically beneficial airport system. The standards cover the wide range of size and performance characteristics of aircraft that are anticipated to use an airport. Various elements of airport infrastructure and their functions are also covered by these standards. Choosing the correct aircraft characteristics for which the Airport will be designed needs to be done carefully so that future requirements for larger and more demanding aircraft are taken into consideration, while at the same time remaining mindful that designing for large aircraft that may never serve the Airport is not economical.

As discussed previously in Chapter Two, *Inventory of Airport Assets*, the design aircraft and Runway Design Code (RDC) are key components of the FAA's design standards. The design aircraft (or family of design aircraft), along with the RDC, provide the information needed to determine which FAA design standards apply to the

airfield, and in turn can be used to determine some of the necessary facility requirements. As mentioned, the existing RDC for Runway 2 is C-II/2400 and Runway 20 is C-II/5000. The existing design aircraft for Runway 2-20 is a Bombardier Challenger 600 (**Figure 4-1**), with the future design aircraft being a Bombardier CRJ 700 (**Figure 4-2**). Should regional air service operate at the Airport in the early to intermediate terms of the planning period, it is possible that the Embraer ERJ-145 or the CRJ-200 aircraft would be utilized. These aircraft are typically being utilized at airports offering similar air service, as regional air carriers are continuing to update their fleets and replace those aircraft with newer and larger aircraft such as the CRJ-700. Examples of the various types of aircraft that operate at the Airport frequently and their specifications are illustrated in **Table 4-1**.

Table 4-1 Example of Similar Aircraft Types Operating at San Luis Valley Regional Airport

Aircraft	AAC/ADG	Approach Speed (kts)	Wingspan (ft)	Tail Height (ft)	Max. Take Off Weight (lbs.)
Beech Bonanza V35B	A-I	70	33.5	6.6	3,400
Cessna 172	A-I	60	36.0	9.8	2,200
Eclipse 500 Jet	A-I	90	37.9	13.5	5,920
Piper Archer II	A-I	86	35.0	7.4	2,500
Pilatus PC-12	A-II	85	52.3	14.0	9,920
Beech King Air B-100	B-I	111	45.9	15.3	11,799
Cessna 182	B-I	64	36.0	9.2	2,950
Beech King Air B-200	B-II	103	54.5	14.1	12,500
Cessna 441	B-II	100	49.3	13.1	9,925
Cessna Citation 525A	B-II	118	49.8	14.0	12,500
Cessna Citation 560XL	B-II	107	55.8	17.2	16,830
Cessna Citation 650	B-II	126	53.6	16.8	23,000
Dassault Falcon 50	B-II	113	61.9	22.9	37,480
Dassault Falcon 2000	B-II	114	63.3	23.2	35,888
Grumman Gulfstream I	B-II	113	78.5	23.0	35,100
Hawker 125-400A	C-I	124	47.0	16.5	23,300
Learjet 25	C-I	137	35.6	12.6	15,000
Learjet 55	C-I	128	43.7	14.7	21,500
Bombardier CL-604	C-II	132	64.3	20.3	47,600
Bombardier CL-600[1]	**C-II**	**125**	**64.3**	**20.7**	**41,100**
Embraer ERJ-145	C-II	124	65.75	22.17	46,275
CRJ-200	C-II	140	68.67	20.75	51,000
Gulfstream IV	C-II	128	77.1	24.1	73,200
Bombardier CRJ 700[2]	**C-II**	**135**	**76.27**	**24.8**	**72,750**
Gulfstream 450	D-II	149	77.1	24.1	74,600

Note. [1] Existing design aircraft for Runway 20. [2] Ultimate design aircraft for Runway 2-20
Source: FAA AC 150/5300-13A, Change 1 *Airport Design*, 2017; Armstrong Consultants, 2020

As previously discussed in Chapter Three, *Forecasts of Aviation Demand*, the fleet mix at the Airport is expected to remain consistent with the existing levels throughout the planning period, with a continual increase in operational numbers of higher performance C-II and C-III aircraft. Based on existing and forecasted demand levels, these aircraft represent the likely types of aircraft to use the facility in the planning period, and it is

reasonable to maintain the existing RDC of C-II for Runway 2-20 over the course of the short to medium-term. As discussed in Chapter Three, regional air carriers are currently transitioning and replacing an aging fleet of primarily C-II aircraft, with newer and more capable C-III aircraft. With the forecasted continual increase of C-II / C-III aircraft operating at the Airport, in addition to regional air carrier trends transitioning to a C-III fleet, it is reasonable to protect for an ultimate Runway 2-20 RDC of C-III. The *Development Alternatives* chapter will further discuss any recommended changes to the Airport and the airfield to meet the prescribed design standards.



Figure 4-1 Challenger 600



Figure 4-2 Bombardier CRJ 700

Source: Google Images, 2020

4.3 Non-Standard Conditions

As previously noted, airport design standards provide for a safe, efficient, and economically beneficial airport system. During the inventory and data collection phase, some areas on the Airport were identified that did not meet prescribed airport design standards (non-standard conditions). The following were the non-standard conditions identified at the time of inventory at the San Luis Valley Regional Airport:

- Taxiway Geometry – Taxiways A2 and A3 previously provided direct access from the aircraft parking apron to Runway 2-20 without the recommended turns. Current FAA guidance considers that geometry to be an undesirable and non-standard airfield design condition. As previously mentioned, a taxiway reconstruction and reconfiguration was conducted during the process of this Master Plan study which corrected the A2 and A3 direct access condition. It is recommended to maintain taxiway geometry in accordance with FAA design standards and guidance. Additionally, Taxiway B provides a non 90-degree entry to Runway 2-20. To enhance safety and mitigate runway incursions, it is recommended to reconfigure taxiway B to intersect Runway 2-20 to provide a 90-degree entry.

4.4 Airfield Capacity

The airfield capacity analysis is determined by using an airport's annual service volume (ASV). An airport's ASV has been defined by the FAA as "a reasonable estimate of an airport's annual capacity. It takes into account differences in runway utilization, weather conditions and aircraft mix that would be encountered in one year. According to FAA Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*, the ASV for an airfield configuration similar to San Luis Valley Regional Airport (a single runway system) is approximately 230,000 operations.

The existing 8,403 aircraft operations in 2019 and the 230,000 ASV per AC 150/5060-5, account for approximately 3.65 percent of San Luis Valley Regional Airport's ASV. By 2039, the forecasted operations are estimated to be at approximately 4.53 percent of the total ASV for the Airport. Under the current and forecasted conditions, the existing runway configuration will adequately meet the airfield capacity demand throughout the planning period. **Table 4-2** summarizes the projected ASV and annual capacity ratio for the Airport.

Table 4-2 Airfield Capacity Analysis Summary

Year	Annual Operations	Annual Service Volume	Annual Service Ratio
2019	8,403	230,000	3.65%
2024	8,982	230,000	3.91%
2029	9,513	230,000	4.14%
2034	9,966	230,000	4.33%
2039	10,429	230,000	4.53%

Source: FAA AC 150/5060-5, *Airport Capacity and Delay*; Armstrong Consultants, 2020

4.5 Airside Facility Requirements

All airports are comprised of both airside and landside facilities. Airside facilities consist of those facilities that are related to aircraft arrival, departure, and ground movement, along with all associated navigational aids, airfield lighting, pavement markings, and signage.

4.5.1 Runway Orientation

The FAA AC 150/5300-13A, Change 1, *Airport Design*, recommends that a runway's orientation provide at least 95 percent crosswind coverage. Based on the wind data presented in **Table 2-13** in Chapter 2, Runway 2-20 provides 92.28 percent wind coverage for A-I and B-I aircraft (10.5 knots), 95.29 percent wind coverage for A-II and B-II aircraft (13 knots), and 97.88 percent wind coverage for A-III, B-III, and C-I through D-III aircraft (16 knots).

The existing airfield configuration exceeds the FAA's recommended crosswind coverage of 95 percent for both 13 and 16 knot crosswind categories. However, at 92.28 percent coverage, the existing runway configuration does not meet the recommended 95 percent coverage for the 10.5 knot crosswind category. It is recommended that a crosswind runway at the Airport be further analyzed and evaluated to provide sufficient coverage for A-I and B-I aircraft. To accommodate aircraft in the short and intermediate planning term, a gravel/turf runway may be considered, while planning for an asphalt or concrete crosswind runway construction in the long term. The recommendations for runway configuration and orientations at the Airport will be further discussed in Chapter Five, *Development Alternatives*.

4.5.2 Runway Length

There are many factors that may determine the runway length for an airport. FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, provides guidance for determining runway length requirements. The information required to determine the recommended runway length(s) includes airfield elevation, mean maximum temperature of the hottest month, and the effective gradient for the runway. Also, the performance characteristics and operating weight of an aircraft impacts the amount

of runway length needed. The following information for San Luis Valley Regional Airport was used for the runway length analysis:

- Field elevation: 7,539.8 feet mean sea level (MSL)
- Mean maximum temperature of hottest month (July): 80.8° F
- Maximum difference in runway centerline elevation (Runway 2-20): 2.2 feet
- Performance characteristics and operating weight of aircraft

The process to determine recommended runway lengths for a selected list of critical design aircraft begins with determining the weights of the critical aircraft that are expected to use the airport on a regular basis. For aircraft weighing 60,000 pounds or less, the runway length is determined by family groupings of aircraft having similar performance characteristics. The first family grouping is identified as small aircraft, which is defined by the FAA as airplanes weighing 12,500 pounds or less at maximum takeoff weight (MTOW). The second family grouping is identified as large aircraft, which is defined by the FAA as aircraft exceeding 12,500 pounds but weighing less than 60,000 pounds. For aircraft weighing more than 60,000 pounds, the required runway length is determined by aircraft-specific length requirements. **Table 4-3** depicts the aircraft weight categorization as recommended by the FAA.

Table 4-3 Airplane Weight Categorization for Runway Length Requirements

Airplane Weight Category MTOW			Aircraft Grouping
≤ 12,500 Pounds	Approach Speed < 30 knots		Family groupings of small airplanes
	Approach Speed ≥ 30 knots, but < 50 knots		Family groupings of small airplanes
	Approach Speed ≥ 50 knots	With < 10 Passengers	Family groupings of small airplanes
		With ≥ 10 Passengers	Family grouping of small airplanes
Over 12,500 pounds, but < 60,000 pounds			Family groupings of large airplanes
≥ 60,000 pounds or more, or Regional Jets			Individual large airplane

Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*

Recommended runway lengths are determined using charts in AC 150/5325-4B based on the seating capacity and the mean daily maximum temperature of the hottest month of the year at the airport. According to the AC, small airplanes with an approach speed of greater than or equal to 50 knots with less than 10 passenger seats and a MTOW less than 12,500 pounds recommends a runway length of 8,900 feet and 8,950 feet in order to accommodate 95 and 100 percent of the fleet. Due to a high field elevation of the Airport, the existing length of Runway 2-20, 8,521 feet, may not be adequate to accommodate up to 95 percent of the small aircraft fleet during the warmest month at the hottest time of day.

Recommended runway lengths to serve large aircraft weighing over 12,500 pounds, but less than 60,000 pounds, are determined using a certain percentage of the useful load. The term useful load, as defined by the FAA, is the difference between the maximum allowable structural gross weight and the operating empty weight. A typical operating empty weight includes the airplane's empty weight, crew, baggage, other crew supplies, removable passenger service equipment, removable emergency equipment, engine oil and unusable fuel. According to the above referenced Advisory Circular, 75 percent of the fleet at

60 and 90 percent useful load requires runway lengths of 7,700 and 8,610 feet respectively. Similarly, the Advisory Circular indicates that 100 percent of the large fleet at 60 and 90 percent useful load requires a runway length of 11,010 feet. With an existing runway length of 8,521 feet, Runway 2-20 can accommodate the majority of the aircraft that fall within the large aircraft category (over 12,500 pounds, but less than 60,000 pounds), and also aircraft that weigh more than 60,000 pounds according to FAA calculations. The recommended runway length for the ultimate design aircraft (CRJ-700), is approximately 6,800 feet and 8,500 feet at 60 and 90 percent useful load.

Based on the analysis, it is recommended that the Runway 2-20 length of 8,521 feet be maintained to accommodate the ultimate design aircraft for operations at 90 percent useful load. The recommended runway length information for Runway 2-20 as discussed above is summarized in **Table 4-4**. A depiction of recommended takeoff distances for aircraft that typically operate that the Airport is shown in **Figure 4-3**.

Table 4-4 Runway 2-20 Length Analysis

Existing Runway 2-20 Length (ft)	**8,521**
Aircraft Grouping:	**Recommended Runway Length (ft)**
Small Aircraft (<12,500 lbs., < 10 passenger seats)	
95 percent of these small airplanes	8,900
100 percent of these small airplanes	**8,950**
Large Aircraft (<60,000 lbs.)	
75 percent of these planes at 60 percent useful load	7,700
75 percent of these planes at 90 percent useful load	8,610
100 percent of these planes at 60 percent useful load	11,010
100 percent of these planes at 90 percent useful load	11,010
CRJ-700 (Ultimate Design Aircraft)	
60 percent useful load	6,800
90 percent useful load	8,500
CRJ-200	
60 percent useful load	8,000
90 percent useful load	9,600
ERJ-145	
60 percent useful load	7,800
90 percent useful load	9,200

Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, 2005; Bombardier and Embraer/Canadair Airport Planning Manuals for CRJ-200, CRJ-700, and ERJ-145.

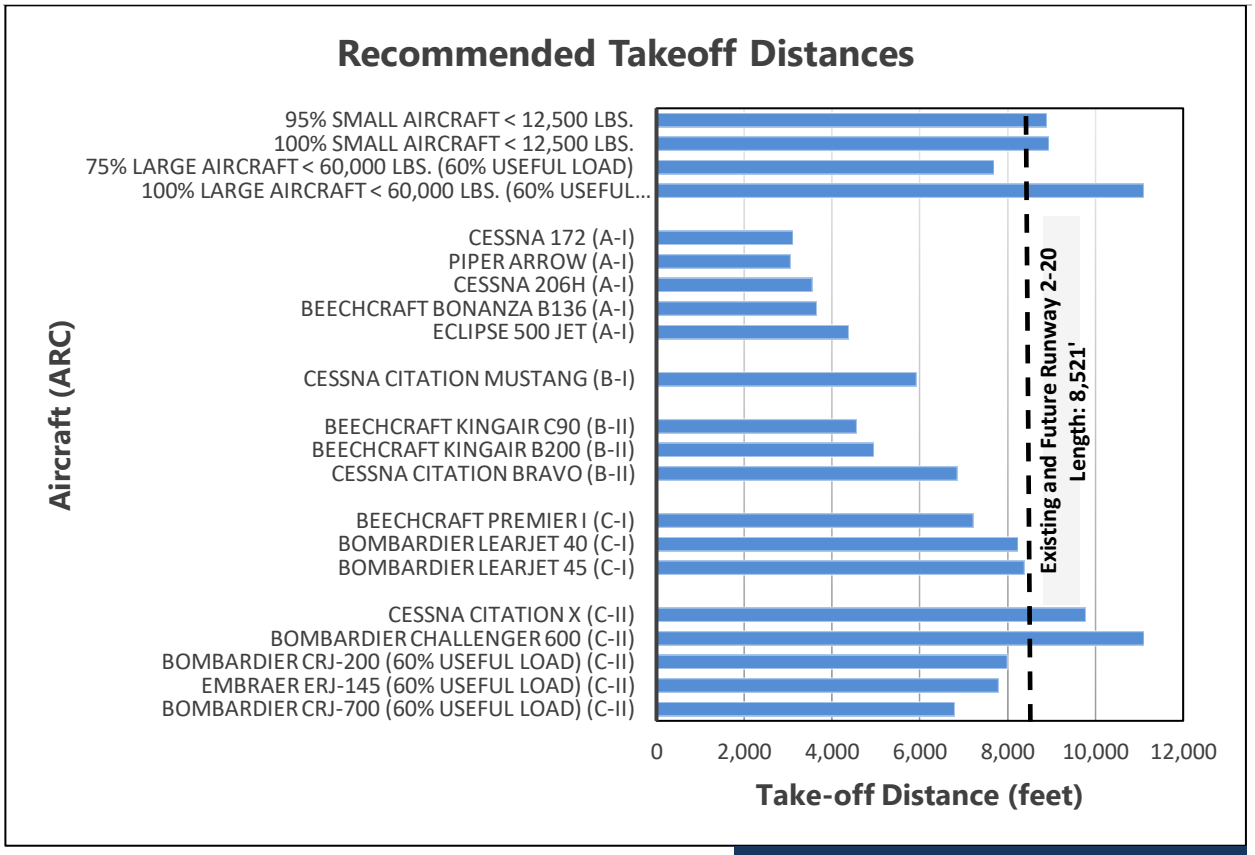


Figure 4-3 Recommended Takeoff Distances Chart

FAA AC 150/5325-4B recommends the same guidelines be followed to determine the recommended runway length for crosswind runways. Small aircraft weighing less than 12,500 pounds primarily have less crosswind performance capabilities. A crosswind runway length of 8,950 feet is required in order to accommodate 100 percent of small aircraft weighing less than 12,500 pounds. However, due to the prevailing winds in the area the Airport's crosswind runway is only utilized a small percentage of the time, and therefore it is not necessary to accommodate 100 percent of small aircraft at all times. A crosswind runway with a length of approximately 5,000 feet would be recommended to accommodate most A-I and B-I aircraft. Recommendations and evaluations for the length of the Airport's crosswind runway will be further discussed in Chapter Five, *Development Alternatives*.

4.5.3 Runway Width

The required runway width is a function of airplane approach category, airplane design group, and the approach minimums for the design aircraft expected to use the runway on a regular basis. The existing runway pavement width of 100 feet for Runway 2-20 meets the FAA design standard of 100 feet for C-II, and the forecasted C-III design standards for aircraft with a maximum takeoff weight less than 150,000 pounds. It is recommended that the existing width of 100 feet for Runway 2-20 be maintained throughout the planning period.

Should a crosswind runway be developed, it is recommended that the runway width be constructed to 60 feet to meet B-I(Small) standards.

4.5.4 Runway Pavement Strength and Condition

According to FAA guidance on pavement strength, the aircraft types and the critical aircraft expected to use the airport during the planning period are used to determine the required pavement strength, or Pavement Classification Number (PCN), of airfield surfaces. The required PCN is based on average levels of activity of the critical aircraft's Aircraft Classification Number (ACN). PCN strength is not the maximum allowable weight; limited operations by heavier aircraft other than the critical aircraft may be permissible. However, it is important to note that frequent operations by aircraft with a higher ACN will shorten the lifespan of the pavement.

The existing reported PCN for Runway 2-20 is 44/F/C/X/T. The maximum ACN for the future design aircraft, the CRJ-700, is reported to be no greater than 23.17 for flexible pavement, (Asphalt). Runway pavement strength can also be expressed in allowable maximum weight for specified landing gear configurations. Runway 2-20 is published to have a pavement strength of 52,000 lbs. SWG and 70,000 lbs. DWG. The maximum takeoff weight (MTOW) for the ERJ-145, CRJ-200, and CRJ-700 are 46,275 lbs., 51,000 lbs., and 72,750 lbs. respectively. It is recommended to maintain the existing Runway 2-20 PCN pavement strength throughout the planning period. Should Runway 2-20 undergo pavement rehabilitation during the planning period, it is recommended to strengthen Runway 2-20 maximum allowable operating weight to 73,000 lbs. to accommodate the future design aircraft, the CRJ-700. Should operations occur by aircraft with an ACN outside the existing Runway 2-20 PCN capabilities, it is recommended further analysis be conducted to determine adequate PCN pavement strengths. As shown in **Figure 2-6** of Chapter 2, Runway 2-20 PCI is listed being in excellent condition. Maintaining runway pavement is an important factor to providing a safe environment for aircraft operations at an airport.

It is recommended that the pavement strength of a future crosswind runway designed to B-I (Small) design standards be 12,500 pounds single-wheel configuration. Should the Airport experience a significant increase in heavier aircraft operations in the future, it is recommended that further analysis be conducted to determine adequate pavement strength for the runway.

4.5.5 Taxiway and Taxilane Requirements

By definition, a taxiway is a defined path established for the taxiing of aircraft from one part of an airport to another. A taxilane is a taxiway designated for low speed and precise taxiing. Taxilanes are usually, but not always, located outside the movement area, providing access from taxiways to aircraft parking positions, hangars, and terminal areas.

FAA AC 150/5300-13A, Change 1, *Airport Design*, provides planners with guidance on recommended taxiway and taxilane layouts to avoid runway incursions and to enhance the overall safety at the airport. According to the FAA, a runway incursion is "any occurrence at an airport involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft." In addition, according to *Airport Design*, "good airport design practices keep taxiway intersections simple by reducing the number of taxiways intersecting at a single location and allows for proper placement of airfield markings, signage, and lighting." Existing taxiway geometry

should be improved whenever feasible with emphasis on "hot spots," and to the extent practical, the removal of existing pavement to correct confusing layouts is advisable.

As discussed previously in Chapter 2, to arrive at the TDG (Taxiway Design Group), the undercarriage dimensions of the aircraft are used. The TDG design standards are based on the overall main gear width (MGW) and the cockpit-to-main gear (CMG) distance. Taxiway/taxilane width and fillet standards, and in some instances, runway-to-taxiway and taxiway/taxilane separation requirements, are determined by the TDG. The FAA advises that it is appropriate for a series of taxiways on an airport to be built to a different TDG standards based on anticipated use. On the other hand, the Airplane Design Group (ADG) is based on the wingspan and tail height and determines the safety area, object free area, and separation standards for a taxiway.

The existing and future design aircraft for Runway 2-20 falls within the TDG 2 design standards. The prescribed taxiway width for TDG 2 is 35 feet. During the process of the Airport Master Plan study, the Airport conducted a taxiway reconstruction project that ensured Taxiway A meets current FAA TDG 2 design standards. The existing taxiways, taxiway connectors, and taxilanes meet TDG 2 design standards.

It is recommended that the Airport continue to maintain the taxiways to dimensions that accommodates the existing design aircraft and its corresponding TDG. However; it would be prudent to protect for TDG 3 object free areas

Per FAA's stance on the importance of preventing runway incursions, no aircraft apron should provide direct access to an active runway. Taxiway connectors A2 and A3 previously provided direct access from the aircraft parking apron to Runway 2-20 without requiring a turn by taxiing aircraft. The taxiway reconstruction and reconfiguration project corrected the non-standard conditions. Additionally, it is recommended to realign the Taxiway B entrance to Runway 2-20 to a right angle which would enhance safety by providing greater visibility to each runway end, and provide straight through access over Runway 2-20.

Runway 2-20 is served by a full-length parallel taxiway, Taxiway A, which provides aircraft adequate circulation for aircraft operations on either end of the runway. A partial-parallel taxiway located to the east of Runway 2-20 to accommodate future east side development will be further evaluated in Chapter Five *Development Alternatives*. The minimum Runway separation to parallel taxiway for a C-II Runway with instrument approach visibility minimums of less than ¾ of a statute mile is 400 feet. Taxiway A meets the required runway separation to parallel taxiway requirement. It is recommended to maintain at least a 400 foot runway to parallel taxiway separation for Runway 2-20 to ensure the viability of instrument approach procedures with lower visibility minimums. Further discussion for taxiway configurations will be discussed in Chapter Five, *Development Alternatives*.

As shown in **Figure 2-6** the existing taxilanes servicing the general aviation aircraft parking apron are in poor or failing condition. It is recommended to reconstruct any failing taxilanes to adequately service the aircraft operating on them. Additionally, it was noted that there was a lack of drainage structures servicing the taxilanes and aircraft parking aprons. To preserve and maintain existing and future pavements, it is recommended that a drainage study be conducted for the Airport.

4.5.6 Aircraft Apron

An aircraft apron is typically located in the non-movement area of an airport near or adjacent to the terminal area. The function of an apron is to accommodate aircraft during loading and unloading of passengers and/or cargo. Activities such as fueling, maintenance, and short to long-term parking take place on an apron. The layout and size of an apron depends on aircraft and ground vehicle circulation needs and specific aircraft clearance requirements. There are several types of aircraft aprons:

- ***Commercial service apron –*** The commercial service apron should be able to accommodate the projected types and volume of commercial service aircraft that are anticipated to use the airport during the planning period. The commercial service apron needs to provide adequate space for the movement of baggage carts, fuel trucks and other aircraft service equipment. The commercial service apron should accommodate adequate spacing to conduct deicing operations.
- ***FBO/Itinerant aircraft apron -*** These aprons are adjacent to the Passenger Terminal Building where passengers enplane and deplane from the aircraft. The apron also accommodates multiple activities such as fueling, maintenance, limited aircraft service, etc. Itinerant aprons handle itinerant aircraft activities which are usually only on the airport for a few days. At general aviation airports, this type of apron can also provide some tie-down locations for both itinerant and based aircraft.
- ***Tie-down apron –*** An apron area for both short-term and long-term aircraft parking (based and itinerant aircraft).
- ***Other services apron –*** Apron areas that will accommodate aircraft servicing, fueling, and the loading/unloading of cargo.
- ***Hangar aprons –*** This is an area on which aircraft move into and out of a storage hangar.
- ***Helicopter Apron –*** This is an area that is designated specifically for helicopter parking and is typically connected or adjacent to other aircraft parking aprons.

FAA AC 150/5300-13A, Change 1, *Airport Design*, provides design criteria to assist in apron layout and capacity. For the purpose of calculating the aircraft apron size, the following planning criterions were used:

- 800 square yards of apron per aircraft for single-engine and multi-engine aircraft
- 1,500 square yards per aircraft for turbo-props and business jets
- Itinerant aircraft apron requirements are based on the design hour operations

Table 4-5 depicts the aircraft parking apron requirements for the Airport based on the above criterion. It is recommended the Airport monitor the utilization of the apron and make adjustments in the apron size as needed. It is recommended that routine reconstruction and pavement maintenance projects take place on the existing apron as well. Additionally, it is recommended to protect for an expanded commercial service apron to meet the forecasted demand. The existing commercial operations at the Airport require small additional equipment to support the aircraft and passengers. Aircraft operated by regional airlines, such as the CRJ or ERJ fleet, require extensive ground support equipment to assist

operations. It is recommended to protect for future commercial service apron that can accommodate regional air service aircraft and supporting equipment, such as ramp loading bridges, tugs, ground power units and baggage carts.

The best course of action regarding aircraft parking apron, including protecting for post-planning period development, will be included in Chapter Five, *Development Alternatives*.

Table 4-5 Aircraft Parking Apron Requirements

Aircraft Parking Apron Requirements (Based on Forecasts)	Year				
	Available in 2019	2024	2029	2034	2039
Single and Multi Engine Based Aircraft Area (Square Yards)	15,900	23,200	25,600	26,400	28,000
Itinerant Aircraft Area (Square Yards)	6,250	6,000[1]	6,000[1]	6,000[1]	7,500
Total General Aviation Apron (Square Yards)	**24,200**	**29,200**	**31,600**	**32,400**	**35,500**
Tiedowns (Based Aircraft)	30	29[1]	32	33	35
Tiedowns (Itinerant Aircraft)	3	4	4	4	5
Helicopter Parking Pads	0	1	2	2	2
Total GA Tiedowns and Hardstands	**33**	**34**	**38**	**39**	**42**
Commercial Apron Area (Square Yards To accommodate CRJ-700 aircraft)	**6,000**	**12,000**	**12,000**	**12,000**	**12,000**
Commercial Aircraft Parking Spots	1	2	2	2	2
Total Aircraft Parking Apron Area	**30,200[2]**	**41,200[2]**	**43,600[2]**	**44,400[2]**	**47,500[2]**

[1] Identifies minimum requirements; It is recommended to maintain existing aircraft apron facility sizes should they meet/exceed minimum requirements.
[2]Total apron area identified does not include additional helicopter parking pads.
Source: Armstrong Consultants, Inc., 2020

The following recommendations for aircraft apron development are discussed below:

General Aviation Aircraft Parking Apron:

- Reconfigure the general aviation apron tie-downs and aircraft parking spots to meet FAA design standards. It is recommended to continually configure the general aviation apron to meet FAA design standards and optimize aircraft parking layouts as needed with apron expansion.
- Reconstruct portions of the general aviation aircraft parking apron. Portions of the general aviation aircraft parking apron are in failed condition with a PCI of 39. It is recommended to reconstruct and maintain existing apron that is in failed or failing condition.
- Install helicopter parking pads and concrete hardstands for large corporate jet traffic. It is recommended to construct dedicated helicopter parking pads and concrete hardstands near the general aviation and transient apron to help prevent damage to the aircraft parking apron. Recommended locations and layouts will be identified in Chapter Five, *Development Alternatives*.
- Provide a dedicated apron are for cargo operations. It is recommended to protect for a dedicated apron area to service loading and unloading of aircraft cargo. Air cargo operations

typically require access to a landside loading/sorting facility. Recommended locations and layouts for a dedicated air cargo apron area and sorting facility will be identified in Chapter Five, *Development Alternatives*.

- It is recommended to protect for additional infrastructure and circulation for electric charging stations serving electric aircraft (currently in development) which may utilize the airport over the planning period.

Commercial Aircraft Parking Apron:

- Install concrete aircraft parking hardstand(s) with deicing capabilities for CRJ-200 /ERJ-145 / 700. It is recommended to protect for concrete aircraft parking hardstand(s) for the future design aircraft on the commercial apron. Deicing capabilities are essential for airports and aircraft to ensure reliable service during icing conditions. Should regional jet service occur at the Airport, concrete hardstand(s) would protect the commercial apron and aircraft from damage and excessive pavement maintenance. It is recommended to located the hardstand(s) near the passenger terminal building to efficiently load/unload passengers and cargo. Recommended locations and layouts will be identified in Chapter Five, *Development Alternatives*.

Special Use Aprons:

- Provide a dedicated apron for large unmanned aerial systems UAS operations. As UAS become more prevalent and sophisticated it is prudent to plan for their integration at airports. It is recommended to protect for a dedicated UAS apron area to the east of Runway 2-20. Separating special use apron areas from general and commercial aviation aprons provides enhanced safety and efficiency. Recommended locations and layouts will be identified in Chapter Five, *Development Alternatives*.

- Provide a dedicated apron for an air tanker operation base to accommodate firefighting aircraft. As firefighting aircraft frequently utilize the Airport as a base of operations and to refuel, it is recommended to protect for a dedicated air tanker operations apron to accommodate large firefighting aircraft. Recommended locations and layouts will be identified in Chapter Five, *Development Alternatives*.

- Provide a dedicated helicopter testing area and heliport. Due to the unique characteristics and location of the Airport, demand for helicopter testing and operations may occur during the planning period. It is recommended to protect for a heliport and dedicated helicopter testing area. Recommended locations and layouts will be identified in Chapter Five, *Development Alternatives*.

- Provide a dedicated agricultural spray operations area. With numerous agriculture spray aircraft operators in the vicinity of the Airport it is recommended to protect for a dedicated agricultural spray operations area to the east of Runway 2-20. Recommended locations and layouts will be identified in Chapter Five, *Development Alternatives*.

4.5.7 Instrument Approaches and Navigational Aids

The airport has non-precision GPS and VOR instrument approach procedures, and an ILS precision approach procedure. The GPS procedure for Runway 2 provides for visibility minimums as low as one half mile and cloud ceiling down to 200 feet AGL. The ILS procedure to Runway 2 provides similar

minimums with one half mile visibility and cloud ceiling down to 200 feet AGL. Runway 20 is also served by a GPS procedure which provides minimums with one statute mile visibility and cloud ceiling down to 328 feet AGL.

Some of the existing ILS components at the Airport are beginning to reach the end of their useful life, causing reliability issues for the system and requiring frequent maintenance and replacement parts. Airport management has expressed difficulty in locating and acquiring replacement parts to maintain the ILS at the airport. It is recommended to further evaluate the existing ILS at the Airport in Chapter Five, *Development Alternatives*,

4.5.8 Airfield Lighting, Signage, Markings, and Visual Aids to Navigation

Based on findings from the airport inventory as discussed in Chapter Two, *Inventory of Airport Assets*, the Airport lighting, signage, markings and visual aids consists of the following:

- Precision-approach markings on Runway 2-20
- High Intensity Runway Lights (HIRLs)
- Four-Light Precision Approach Path Indicators (PAPI) on Runway 2
- Four-box Visual Approach Slope Indicators (VASI) on Runway 20
- Medium-Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) on Runway 2
- Runway End Identifier Lights (REILs) on Runway 20
- Threshold Lights on Runway 2-20
- Lighted runway and taxiway signage
- Lighted wind cone with segmented circle
- Rotating Beacon
- Medium Intensity Taxiway Lights (MITLs) on Taxiway A and Connectors

The existing airfield signage, marking and lighting is considered to be in good condition. It is recommended to maintain and replace these facilities as needed. Light-Emitting Diodes (LED) lights should be considered for any new lighting system on the Airport. LED's are energy efficient and have a longer useful life. It is recommended to install MITL(s) on Taxiway B. Additionally, it is recommended to replace the existing rotating beacon at the Airport with a tip-down style beacon. The existing beacon has reached the end of its useful life, the tip-down style beacons provide improved maintenance and safety.

4.5.9 Weather Aids

The existing Airport ASOS meets the existing and projected needs of the Airport and is in good overall condition. Replacement of the ASOS equipment may be necessary during the planning period due to technological improvements.

4.6 Landside Facility Requirements

Landside facilities are another important aspect of any airport as they handle aircraft and passengers while on the ground at the airport. Landside facilities serve as the processing interface between two modes of transportation – air and ground. Likewise, landside facilities also offer travelers the first impression of the airport and the local community.

The capacity, condition, and functionality of the various facilities were examined in relation to the anticipated aviation demand presented in Chapter Three, *Forecasts of Aviation Demand* to identify future facility needs.

4.6.1 Terminal Building

The terminal building at San Luis Valley Regional Airport is a single-level building located to the west of Runway 2-20. The terminal building has a total square footage of approximately 8,975 square feet. Overall, the existing terminal building is in excellent condition. It is recommended that an airport's terminal building be able to satisfy the forecasted peak-hour general aviation pilot and passenger demand. The following terminal building facilities were reviewed:

- Circulation
- Sterile and Non-Sterile Passenger Waiting Areas
- Airline Ticket Counters
- Transportation Security Administration (TSA) Passenger Screening Checkpoint
- Baggage Security Screening and Processing
- Passenger Boarding Gate and Aircraft Parking Positions
- Restrooms
- Restaurant and Concessions
- Baggage Claim

4.6.1-1 Terminal Building Facility Size

FAA AC 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Nonhub Locations*, recommends the minimum facility size be between 6,000 to 8,000 square feet or to meet demand of the number of passengers. As previously discussed, the existing terminal building at the Airport is approximately 8,975 square feet. It is recommended that the existing facility size be maintained throughout the planning period, with updates and remodels to the terminal building conducted as needed to keep the facility looking modern and useful. The 2020 CASP recommends a terminal building facility size of 15,000 square feet for those accommodating commercial air service. A terminal building sizing and requirements analysis was conducted to evaluate the capabilities of the facility to accommodate existing and forecasted demand. The analysis provides recommendations to accommodate the future design aircraft, the CRJ-700. Terminal building requirements are summarized

in **Table 4-6** and terminal building configuration will be further evaluation in Chapter Five, *Development Alternatives*. The complete terminal analysis is located within **Appendix F**.

4.6.1-2 Baggage Claim

The existing baggage claim area in the terminal building consists of a two-door bay system located within the lobby area. The baggage claim garage is approximately 285 square feet and occupies approximately 10 linear feet of frontage on the north side of the non-sterile area. It is recommended to protect for an expanded baggage claim frontage as well as additional waiting space in the baggage claim area to meet forecasted demand.

4.6.1-3 Airline Ticket Counter

The airline ticketing counter is located adjacent to the TSA screening area and is operated by Sky West. The airline occupies the ticketing counter, baggage drop area, and an office. The existing ticketing counter is designed to accommodate two ticket agents, and should be sufficient for single carrier commercial service with no over-lapping flight schedules. It is recommended to maintain the existing facility and update as needed to meet actual demand. Additionally, it is recommended to protect for an expanded passenger queuing area to meet forecasted demand as the existing passenger queuing area would flow over into the concessions and lobby area.

4.6.1-4 Baggage Security and Processing

Checked baggage screening currently takes place adjacent to the airline ticketing counter within the terminal building offices. The checked baggage is then transported through the office hallway and baggage makeup area and out to the aircraft to be loaded. The checked baggage screening area and transport process are not ideal for existing demand, and would not be considered adequate to handle forecasted demand. It is recommended to provide a dedicated checked baggage screening and processing area to accommodate existing demand, and protect for an expanded area that is able to accommodate an automated baggage screening machine to meet forecasted demand.

4.6.1-5 TSA Passenger Screening Checkpoint

TSA passenger screening is located in the center portion of the terminal building adjacent to the airline ticketing counter. A glass wall and doors divide the sterile portion and non-sterile portion of the terminal building. Passenger screening occurs in a single linear checkpoint, starting from the lobby area of the terminal building. The passenger screening area is approximately 900 square feet. The existing TSA screening area is considered to be adequate for the existing and future peak hour passenger demand. It is recommended to maintain the existing TSA screening checkpoint and update as needed by actual demand. It is also recommended to protect for additional TSA screening checkpoint queuing area to accommodate forecasted demand. It is recommended to consult with the TSA prior to design of any enhanced or expanded passenger screening checkpoint.

4.6.1-6 Sterile Passenger Waiting Area

The terminal building has one departure gate area located adjacent to the passenger screening checkpoint. The gate area provides direct access to the terminal apron to the east. The passenger

boarding gate is approximately 950 square feet in size. The passenger boarding gate and aircraft parking positions adequately serve the existing peak hour passenger demand. It is recommended to protect for an expanded sterile passenger waiting area to accommodate the peak hour passenger demand. Peak hour passenger demand at airports with regional carrier service is typically driven by the size of aircraft operated by the airline. It is recommended to protect for a sterile passenger waiting area that can accommodate the service of the CRJ-700 aircraft.

4.6.1-7 Rental Car Counter

A rental car counter is located at the northwest corner of the passenger terminal building. The existing facility provides a designated area for passengers, general aviation users and the general public to obtain rental car services at the terminal. The existing rental car counter occupies approximately 25 linear feet of counter space. An additional counter space is available in the terminal building that could accommodate an additional vendor. It is recommended to maintain the existing facilities throughout the planning period.

4.6.1-8 Restrooms

Public restrooms are available adjacent to the TSA screening area and within the sterile waiting area. The existing restroom facilities servicing the non-sterile area are adequate to accommodate the existing and forecasted demand throughout the planning period. It is recommended to maintain the restroom facilities throughout the planning period. It is recommended to protect for additional restroom facilities within the sterile waiting area to accommodate service by the CRJ-700 or as warranted by demand.

4.6.1-9 Restaurant and Concessions

The terminal building at San Luis Valley Regional Airport has several vending machines serving a variety of food and beverages in the main lobby. FAA Advisory Circular 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Nonhub Locations*, recommends additional space for full-service food and beverage providers. It is recommended to maintain the existing concession facilities. Additionally, it is recommended to protect for space to accommodate a snack bar, lounge, coffee shop or restaurant should any providers decide to pursue.

4.6.1-10 Circulation

The majority of passenger circulation in the passenger terminal building occurs in the main lobby area and the entry vestibule located along the west boundary of the Airport. The lobby area in the Passenger Terminal Building provides approximately 2,800 square feet for circulation. FAA guidelines recommend that approximately 30 percent of the terminal building size be allocated to circulation. It is recommended to protect for an expanded facility size with adequate circulation to accommodate service by the CRJ-700 or as warranted by demand.

4.6.1-11 Offices and Administration Facilities

The existing offices within the passenger terminal building are located to the east of the ticketing counter. The offices provide workspace for airport and airline staff and administration. The existing

facilities are constrained and cannot meet the existing or forecasted demand. It is recommended to protect for expanded office space for additional airline and airport staff to accommodate service by the CRJ-700.

4.6.1-12 Terminal Building Requirements Summary

The recommendations from the terminal building analysis to accommodate air service by the CRJ-700 aircraft are summarized in **Table 4-6**.

Table 4-6 Summary of Passenger Terminal Building Requirements

Passenger Terminal Facility	Recommended Requirements
Facility Size	Protect for an expanded facility to accommodate air service by the CRJ-700.
Baggage Claim	Protect for approximately 12 linear feet of additional baggage claim frontage, and an additional 700 square feet of baggage claim waiting area.
Airline Ticket Counter	Maintain existing airline ticketing counters.
Baggage Security and Processing	Provide a dedicated screening and processing area for checked baggage. Protect for an expanded baggage screening and processing area that can accommodate an automated baggage screening machine to meet regional air service demand.
TSA Passenger Screening Checkpoint	Protect for additional TSA passenger screening checkpoint queuing area to accommodate regional air service by the CRJ-700.
Sterile Passenger Waiting Area	Maintain existing sterile passenger waiting area. Protect for approximately 450 square foot expansion to the sterile waiting area to accommodate passenger capacity for a CRJ-700 aircraft.
Rental Car Counter	Maintain existing facilities throughout planning period.
Restroom Facilities	Maintain existing restroom facilities. Protect for approximately 550 square foot expanded restroom facilities to accommodate increase demand for air service by the CRJ-700.
Restaurant and Concessions	Protect for space to accommodate additional restaurant/concession facilities should providers decide to pursue.
Circulation	Protect for an additional 800 square foot expansion to the existing lobby and queuing areas to accommodate air service by the CRJ-700.

Source: Armstrong Consultants, Inc., 2020

4.6.2 FBO and Pilot Services

A fixed based operator (FBO), Centric Aviation, and an avionics and maintenance facility are located on the Airport. These types of facilities typically provide aircraft fueling, aircraft rental and/or charter services, flight instruction, pilot lounge, flight planning facilities, aircraft tie-down and/or hangar storage, and aircraft maintenance. It is recommended to replace and update FBO facilities as needed and as required by demand. It is recommended that the Airport protect for an additional FBO or aircraft maintenance facility to be located on the general aviation apron.

4.6.3 Hangar Facilities

Hangar facilities are typically classified as either T-hangars, (small multi-unit storage complexes that usually accommodate one single engine aircraft within each unit) or conventional box hangars, (small to very large units) which accommodate a variety of aircraft types or corporate fleets. The number of aircraft that each conventional hangar can hold varies according to the size of the aircraft and building. As previously mentioned in Chapter Two, *Inventory of Airport Assets*, there are five T-hangar structures and five conventional box hangar structures located on the Airport. It is recommended to repair/replace and improve the west hangar facilities and drainage as needed. The east side T-hangars are reaching the end of their useful life. It is recommended to replace the facilities as needed and warranted by demand.

Based Aircraft Hangar Requirements: The facility requirements for based aircraft typically determine the number of tiedown locations, number of shaded spaces, number of T-hangars, and number of conventional type hangars required for the future. It is recommended to protect for expanded general aviation tie-downs, T-hangars, and conventional type hangars to meet forecasted demand at San Luis Valley Regional Airport. Development areas will be identified on the ALP for additional tie-downs and a mix of T-hangars and conventional hangars. Additionally, it is recommended to remove the general aviation facilities located on the east side of the Airport property to accommodate future aeronautical uses. It is recommended to protect for T-hangar and conventional hangar development approximately 10% above the forecasted based aircraft demand for the planning period. **Table 4-7** outlines the hangar development requirements to accommodate forecasted demand for the planning period.

Table 4-7 Aircraft Hangar Requirements

Aircraft Hangar Requirements (Based on Forecasts)[1]	Year				
	Available in 2019	2024	2029	2034	2039
T-Hangar Spaces	38	41	44	47	50
Conventional Hangars	6	7	8	9	10
Total Hangar Spaces	**43**	**48**	**52**	**56**	**60**

[1] Identifies minimum requirements to accommodate based aircraft forecast; It is recommended to maintain existing aircraft hangar facilities and protect for additional hangar development areas to accommodate additional demand.
Source: Armstrong Consultants, Inc., 2020

Transient Aircraft Hangar Requirements: Transient single-engine aircraft operators generally do not require aircraft storage facilities unless there is inclement weather expected or if the operator is planning an extended stay. Some higher performance single-engine and multi-engine and jet aircraft operators may desire overnight aircraft storage or a heated hangar in the winter. It is recommended to protect for additional corporate/FBO hangar development for transient aircraft and aircraft maintenance operations. Development areas for additional transient hangar space will be identified on the ALP.

4.6.4 Aviation Fuel Facilities

As discussed in Chapter Two, *Inventory of Airport Assets*, the Airport owns and operates two fuel storage tanks on the Airport. Each fuel tank has a capacity of 12,000 gallons for both Jet-A and 100LL. Aircraft refueling is conducted via fuel trucks owned by the FBO. It is recommended to update and expand fueling facilities as determined by demand.

4.6.5 Airport Access and Vehicle Parking

The San Luis Valley Regional Airport can be accessed by traveling south on U.S. Highway 285 to Airport Road, approximately two miles south of the City of Alamosa. The existing entrance road is expected to be adequate to accommodate current and future activity for the planning period. Possible reconfiguration or additional access roads will be evaluated in Chapter Five, *Development Alternatives* to accommodate additional vehicle parking.

The existing terminal, FBO and hangar facility vehicle parking area consists of approximately 8,000 square yards of asphalt. It is recommended to protect for an expanded vehicle parking layout with designated areas for the passenger terminal, FBO and hangar facilities. Additionally, it is recommended to protect for a potential short and long-term vehicle pay lot located near the passenger terminal building. It is recommended to protect for approximately 120 vehicle parking spaces to accommodate short- and long-term terminal parking and rental vehicle parking, in addition to protecting for approximately 60 vehicle parking spaces for FBO facilities. Chapter Five, *Development Alternatives* will provide more information on vehicle parking recommendations. It is recommended to protect for the development of overflow/event parking for the future to accommodate increase automobile activity such as airshows and fly-ins. Chapter Five, *Development Alternatives* will include options for special event parking.

4.6.6 Fencing

According to FAA AC 150/5300-13A, Change 1, *Airport Design*, the primary purpose of airport fencing is to restrict inadvertent entry to the airport by unauthorized people and wildlife. There are several types of airport fencing that are eligible for FAA funding as part of the AIP program depending on the airport's classification (commercial service, GA, etc.) and fencing needs. The different types include wire fencing (with wooden or steel posts), chain-link fencing with steel posts, and wildlife deterrent fencing.

The Airport has newly installed wildlife fence around the perimeter of the airfield. Several gates with access control systems are located at various locations around the perimeter as well. The existing perimeter fencing is currently adequate for the needs of the Airport. It is recommended to maintain the existing perimeter and terminal area fencing.

4.6.7 Aircraft Rescue and Fire Fighting (ARFF) Equipment

According to FAA guidance, operators of Part 139 certificated airports must provide Aircraft Rescue and Fire Fighting (ARFF) services. San Luis Valley Regional Airport is currently classified as a Class I, Index A Part 139 airport. The Airport currently meets ARFF requirements for Index A. The ARFF Index level required is determined by the longest passenger aircraft with an average of five daily departures serving the airport (**Table 4-8**). The airport's existing Index A ARFF vehicle is considered adequate for the current existing operations. It is recommended to acquire an Index B ARFF truck should Index B aircraft operate at the airport, or as replacement at the end of the usefull life of the current ARFF vehicle.

The equipment and storage facility should be updated and replaced as needed based on the useful life of the equipment to meet the specified ARFF requirements.

It is recommended that the ARFF facility meet the requirements prescribed in **Federal Aviation Regulations (FAR) Part 139.315-319**. Additional coordination and support from local fire departments is recommended to conduct familiarization with the San Luis Valley Regional Airport, aircraft and firefighting equipment.

Table 4-8 ARFF Requirements

Index	Aircraft Length	Vehicle and Extinguishing Agent Requirements
A	Less than 90 feet	One vehicle carrying the following: One vehicle carrying at least 500 pounds of sodium based dry chemical, halon 1211, or clean agent, or One vehicle carrying 450 pounds of potassium based dry chemical and water with a commensurate quantity of ARFF to total 100 gallons.
B	At least 90 feet but less than 126 feet	Either of the following: One vehicle carrying at least 500 pounds of sodium based dry chemical or halon 1211 and 1,500 gallons of water and the commensurate quantity of AFFF for foam production Two vehicles: One vehicle carrying the extinguishing agents as specified for in Index A; and one vehicle carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons
C	At least 126 feet but less than 159 feet	Either of the following: Three vehicles: One carrying the extinguishing agents as specified for Index A; and two vehicles carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam Two vehicles: One vehicle carrying the extinguishing agents as specified for in Index B; and one vehicle carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 3,000 gallons Each ARFF vehicle used to comply with Index B and C requirements with a capacity of at least 500 gallons, but less than 2,000 gallons shall be equipped with a turret. Vehicle turret discharge rate should be at least 500 gallons per minute but less than 1,000 gallons per minute.

Source: 14 CFR Part 139.

4.6.8 Airport Support and Maintenance Building

The existing snow removal equipment (SRE) vehicles are stored outdoors. As a result, SRE vehicles and equipment are exposed to the elements which reduces their useful life and ability to sufficiently function during times of snow removal or maintenance. It is recommended the Airport construct a dedicated SRE storage facility to maintain and house SRE vehicles and equipment.

4.7 New Infrastructure Needs

The existing electric, water, and telecommunication utilities are considered adequate for the existing facility. Upgrades and extensions to the existing utilities are recommended, as needed, in order to accommodate expansion. It would also be recommended to protect for additional infrastructure and circulation for electric charging stations serving electric aircraft (currently in development) which may utilize the airport over the planning period. It is recommended to protect for future expansion of a 10-inch water line and 12-inch sewer line to accommodate facility demand. It is recommended to protect for fiber optic communication lines to provide telecommunication services at the Airport.

4.8 Land Use Compatibility and Control

As previously discussed in Chapter 2, Section 2.6.10, 14 CFR Part 77 establishes several imaginary surfaces that are used as a guide to provide a safe and unobstructed operating environment for aviation. In addition to ensuring that penetrations to these imaginary surfaces are avoided or appropriately marked and lighted, the FAA recommends that the airport sponsor make reasonable efforts to prevent incompatible land uses, such as residential encroachment, from developing in the immediate area of the airport. Many times, this can be achieved by the municipality creating an airport overlay zone. The County implemented an Airport Overlay district as outlined in the 2009 Alamosa County Land Use and Development Code, which provides protection for Part 77 standards for both visual and precision runways. It is recommended to maintain and update Airport Overlay zone as needed to comply with standards. The Part 77 surfaces will be updated during the Airport Layout Plan drawing set.

Private development proposals should also be reviewed to ensure compatibility in the vicinity of the airport. Land use compatibility considerations include safety, height hazards, and noise exposure. Although extremely rare, most aircraft accidents occur within 5,000 feet of a runway. Therefore, the ability of the pilot to bring the aircraft down in a manner that minimizes the severity of an accident is dependent upon the type of land uses within the vicinity of the Airport.

4.8.1 Airport Property

The existing airport property encompasses approximately 1,659 acres. FAA recommends that airports control the land within the RPZ. The land located within the Runway 2 end Runway Protection Zone (RPZ) is currently controlled via fee simple ownership. The portions of the Runway 20 end RPZ that extend off existing Airport property are controlled via avigation easement. It is recommended the Airport acquire the entirety of the Runway 20 end RPZ via fee simple acquisition. Additionally, the Old Airport Road is located within the Runway 20 end RPZ. Interim guidance recommends roadways not be included in the RPZ. All other RPZ land uses are considered to be compatible with the Airport.

4.8.2 Airport Zoning

Airport zoning ordinances should include height restrictions and land use compatibility regulations. Development around airports can pose certain hazards to air navigation if appropriate steps are not taken to ensure that existing, as well as future, buildings and other types of structures do not penetrate 14 CFR Part 77 imaginary surfaces.

Airport zoning ordinances should include height restrictions and land use compatibility regulations. Development around airports can pose certain hazards to air navigation if appropriate steps are not taken to ensure that buildings and other structures do not penetrate the Part 77 Airspace Surfaces (described in the following section). The FAA therefore recommends that all Airport Sponsors implement height restriction zoning in the vicinity of the airport to protect these Part 77 Surfaces. The *2009 Alamosa County Land Use and Development Code* outlines an Airport Overlay zone which includes development and height restrictions in accordance with Part 77 Surfaces. It is recommended that the County continuously update the Airport Zone, and Airport Corridor Protection restrictions based on existing and future configuration to protect from any incompatible development.

In addition to ensuring that obstructions to Part 77 Surfaces are avoided or appropriately marked and lighted, it is recommended that the Airport Sponsor make reasonable efforts to prevent incompatible land uses such as residential encroachment from the immediate area of the airport. According to the FAA Order 5190.6B, *Airport Compliance Manual*, incompatible land use at or near airports may result in the creation of hazards to air navigation and reductions in airport utility resulting from obstructions to flight paths or noise-related incompatible land use resulting from residential construction too close to the airport. For areas over which the airport sponsor has the authority to zone or control land use, FAA expects the airport sponsor to zone and use other measures to restrict the use of land in the vicinity of the airport to activities and purposes compatible with normal aircraft operations. The FAA does not consider an airport sponsor's lack of direct jurisdictional control over land uses of property near its airport as a reason for the sponsor to decline to take any action at all to achieve land use compatibility outside the airport boundaries. The airport has been proactive at protecting the surrounding land uses from incompatible development. It is recommended to continue to protect the surrounding land uses in the future.

FAA Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airport*, that landfills and/or transfer stations are incompatible land uses with airports. Therefore, these types of facilities should be located at least 5,000 feet from any point on a runway that serves piston type aircraft and 10,000 feet from any point on a runway that serves turbine type aircraft. Furthermore, any facility which may attract wildlife (especially birds) such as sewage treatment ponds and wastewater treatment plants should also be located this same distance from any point on the runway. The Alamosa Recycling Center and Alamosa wastewater treatment pond are located approximately on mile north of Runway 2-20. It is recommended that relocation of the wastewater treatment pond be considered in the future to mitigate hazard to aircraft operating at the Airport. The Advisory Circular also states that recycling centers which accept non-food items are considered to be acceptable land use. High density residential development within approach and departure corridors can also be concern. Development proposals should also be reviewed to ensure compatibility in the vicinity of the Airport.

Consideration for completing a CFR Part 150 *Airport Noise Compatibility Planning* study would be prudent if zoning changes are made allowing residential development to encroach towards the Airport.

4.9 Summary of Facility Requirements

The facility requirements for the Airport are summarized in **Table 4-9**. The recommendations are based on the types and volume of aircraft currently using, and expected to use, the airport in the short- and long-term time frames. In the next chapter, *Development Alternatives*, various airside and landside improvements will be presented

and evaluated, which will in turn lead to the recommended airside and landside development for the Airport. The recommended facilities will enable the Airport to continue to serve its current and future users in a safe and efficient manner.

Table 4-9 Facility Requirements Summary

Facility Description	Base Year (2019)	Short-Term (0 – 5 yrs.)	Medium-Term (6 – 10 yrs.)	Long-Term (11 – 20 yrs.)
Runways				
2-20				
Runway Design Code (RDC)	RWY 2: C-II/2400	C-II/2400	C-II/2400	C-III/2400
	RWY 20: C-II/4000	C-II/4000	C-II/4000	C-III/4000
Length (ft)	8,521′	8,521′	8,521′	8,521′
Width (ft)	100′	100′	100′	100′
Pavement Strength (lbs.)	52,000 SWG / 70,000 DWG	52,000 SWG / 73,000 DWG	52,000 SWG / 73,000 DWG	52,000 SWG / 73,000 DWG
Lighting	HIRL	HIRL	HIRL	HIRL
Markings	Precision	Precision	Precision	Precision
Crosswind Runway				
Runway Design Code (RDC)	N/A		B-I Small/VIS	
Runway Length	N/A		5,000′	
Width (ft)	N/A		60′	
Pavement Strength (lbs.)	N/A		12,500 SWG/DWG	
Lighting	N/A		MIRL	
Markings	N/A		Visual	
Taxiways				
Taxiway A and Connectors				
Taxiway Design Group (TDG)	TDG 2		TDG 2	
Width (ft)	35′ (A Connectors vary 50'-90')		35′	
Lighting	MITL		MITL	
Taxiway B				
Taxiway Design Group (TDG)	TDG 1A		TDG 1A	
Width (ft)	25′		25′	
Lighting	N/A		MITL	
Navigational and Visual Aids				
Rotating Beacon	Yes		Same	
Approaches	ILS/GPS/VOR	ILS/GPS/VOR	ILS/GPS/VOR	ILS/GPS/VOR
Lowest Visibility Minimum	1/2 - Mile		1/2 - Mile	
REIL	RWY 2-20	RWY 2-20	RWY 2-20	RWY 2-20 X-Wind RWY
PAPI	RWY 2	RWY 2	RWY 2	RWY 2 X-Wind RWY
VASI	RWY 20	RWY 20	RWY 20	RWY 20 X-Wind RWY
Wind cone/segmented circle	Yes		Same	
Approach Lighting System	MALSR RWY 2		Same	

Table 4-9 Facility Requirements Summary - Continued

Facility Description	Base Year (2019)	Short-Term (0 – 5 yrs.)	Medium-Term (6 – 10 yrs.)	Long-Term (11 – 20 yrs.)
Landside Facilities				
Terminal Building	8,975 SF	8,975 SF	16,000 SF	16,000 SF
T-Hangars	38 Spaces	41	47	50
Conventional Box Hangars	5	6	8	10
100 LL AvGas	12,000 Gallon		Expand as Needed	
Jet-A	12,000 Gallon		Expand as Needed	
Perimeter Fencing	Yes		Same	
ARFF Index	Meets A	A	B	B
Weather Reporting Station	ASOS		Same	
Aprons				
Total Apron Area	30,200 SY	41,200 SY	43,600 SY	47,500 SY
Tie Downs and Hard Stands	33	34	38	42

Abbreviations: SWG = Single-wheel landing gear, DWG = Dual-wheel landing gear
Source: Armstrong Consultants, Inc., 2020

Chapter Five

Development Alternatives

Chapter 5 – Development Alternatives

5.1 Introduction

This chapter contains the description and evaluation of alternatives to determine the recommended development for San Luis Valley Regional Airport. The basis for the airside and landside alternatives was derived from the recommendations contained in Chapter Four, *Facility Requirements*. Airside facilities are those used during takeoff, landing, taxiing, and parking of aircraft. Landside facilities generally consist of buildings, fuel systems, roadways, and vehicle parking areas.

According to FAA Advisory Circular 150/5070-6B, *Airport Master Plans*, each identified alternative's technical feasibility, economic and fiscal soundness, and aeronautical utility should be examined. Ultimately, development alternatives will only be considered that meet the County's planning needs and those that the FAA or CDOT will be realistically able to implement. Not all development shown may be eligible or available for FAA or CDOT grant funding.

5.2 Development Concepts

The overall objective of the alternatives analysis is to:

1) Define a path for future development that is capable of accommodating the forecast demand and facility needs of the airport.

2) Evaluate the best way to implement the facility requirements as presented in Chapter Four, *Facility Requirements*.

As part of the master plan process, a range of airside and landside alternatives are typically created and evaluated based on design standards, environmental concerns, and financial feasibility for implementing the facility requirements. In other instances, where less development is anticipated, the selection of a preferred development plan can result from a logical evaluation of the various options resulting from discussions with the sponsor and input from airport users.

The following best planning tenets, as recommended in FAA Advisory Circular 150/5070-6B, *Airport Master Plans*, apply to the evaluation of the development alternatives:

- Conforms to best practices for safety and security
- Conforms to FAA and other appropriate design standards
- Provides for the land use on and off airport
- Allows for forecast growth throughout the planning period
- Provides for growth beyond the planning period
- Provides balance between developmental elements
- Provides flexibility to adjust to unforeseen changes
- Conforms to the County's strategic vision
- Conforms to relevant local, regional, and state transportation plans
- Is technically and financially feasible

- Is socially and politically feasible
- Satisfies user's needs
- Considers potential environmental impacts

A combination of effective airside and landside planning is essential to the successful development of the airport.

5.3 Airside Development

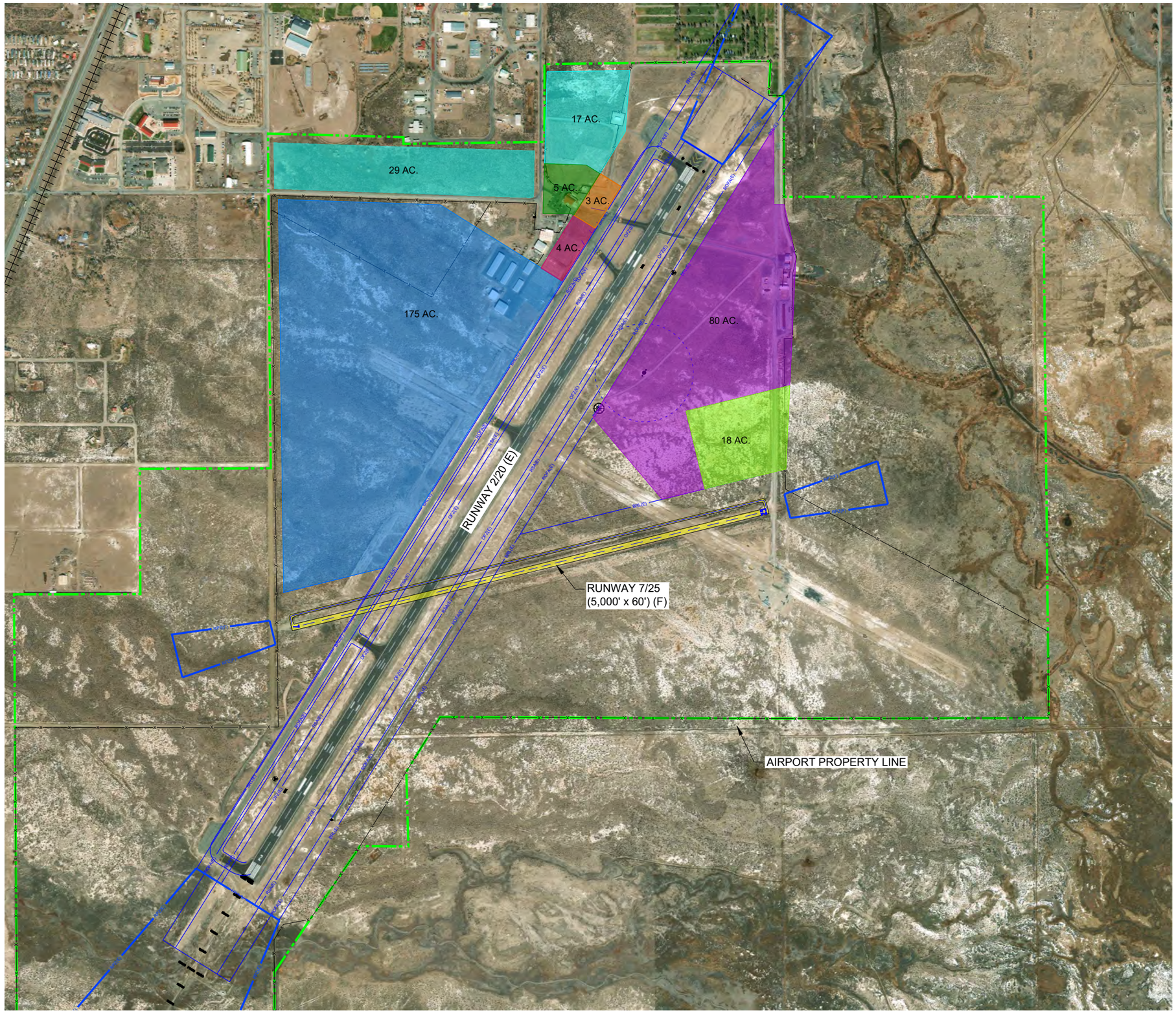
Airside development is typically the most critical and physically dominant feature of airport development and therefore a focal point of an airport's planning process. This section discusses the airside development alternatives and addresses the needs of the existing and future aviation demand identified in Chapter Four, *Facility Requirements*.

5.3.1 Crosswind Runway

As identified in Chapter Two, *Inventory of Airport Assets*, the existing airfield configuration provides 92.28 percent coverage for the 10.5 knot crosswind category (A-I, B-I Aircraft), below the recommended 95 percent coverage. To enhance safety and operational capabilities of the Airport it was recommended to protect for a crosswind runway to provide the recommended 95 percent for A-I and B-I aircraft.

Alternative 1: Construct Runway 7-25 (5,000' x 60')

This alternative would construct a northeast to southwest orientated crosswind runway that would intersect Runway 2-20 just south of the Runway 2-20 midfield. The crosswind runway would be approximately 5,000' in length and designed to B-I (Small) design standards, serviced by a full-length parallel taxiway. This alternative would protect for continuous aeronautical and non-aeronautical landside development to the west of Runway 2-20. Additionally, this alternative would protect for special use aeronautical development to the east of Runway 2-20, and north of the future 7-25 crosswind runway. **Exhibit 5-1** depicts Alternative 1.



DEVELOPMENT LEGEND

- COMMERCIAL / TERMINAL APRON
- FBO CORPORATE / CARGO APRON
- GA APRON / HANGAR DEVELOPMENT
- HELICOPTER TESTING AREA
- NON-AERONAUTICAL & AERONAUTICAL DEVELOPEMENT
- SPECIAL USE / GA
- TERMINAL & TERMINAL PARKING DEVELOPMENT
- FUTURE PAVEMENT
- FUTURE PROPERTY LINE
- FUTURE FENCE

N

600 0 600 1200

SCALE IN FEET

Exhibit 5-1

SAN LUIS VALLEY REGIONAL AIRPORT
ALAMOSA, COLORADO

AIRPORT DEVELOPEMENT - ALT. 1

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
www.armstrongconsultants.com

S:_Colorado\Alamosa\Project Files\Active Projects\196593 Alamosa – Airport Master Plan\CAD\dwg\6593604.dwg 9/15/2020 12:01:00 PM JIM.SMITH

Operational and Safety Considerations

A 5,000' x 60' 7-25 crosswind runway would provide adequate runway length for approximately 65 percent of the small aircraft fleet, during the most demanding conditions. This crosswind runway orientation would allow for continuation of future aeronautical landside development to the west of Runway 2-20. This alternative would also protect for special use aeronautical development and a helicopter testing area to the east of Runway 2-20 and north of runway 7-25. A Runway Visibility Zone (RVZ) would be required for the intersecting runways, and slightly constrain the special use aeronautical development area available. An RVZ is a defined area to protect line of sight standards between two intersecting runways. The RVZ requires any point five feet above the runway centerline and within the runway visibility zone to be mutually visible with any other point five feet above the centerline of the intersecting runway. This alternative would provide a combined 10.5 knot crosswind coverage of 97.12 percent.

Land Acquisition

Alternative 1 would not require land acquisition.

Potential Environmental Impacts

Alternative 1 would result in minor air quality impacts and an increase in solid waste; however, these impacts would be temporary and occur during construction only. While this alternative includes constructing a new runway, the existing footprint has already been disturbed and graded. It is anticipated the development would have minor impacts. The proposed project could also result in positive socioeconomic impacts as it would increase the overall utility of the Airport.

FAA Funding Eligibility/Justification

Alternative 1 would be considered eligible for Airport Improvement Program funds; However, it would be considered a lower priority project for federal funding.

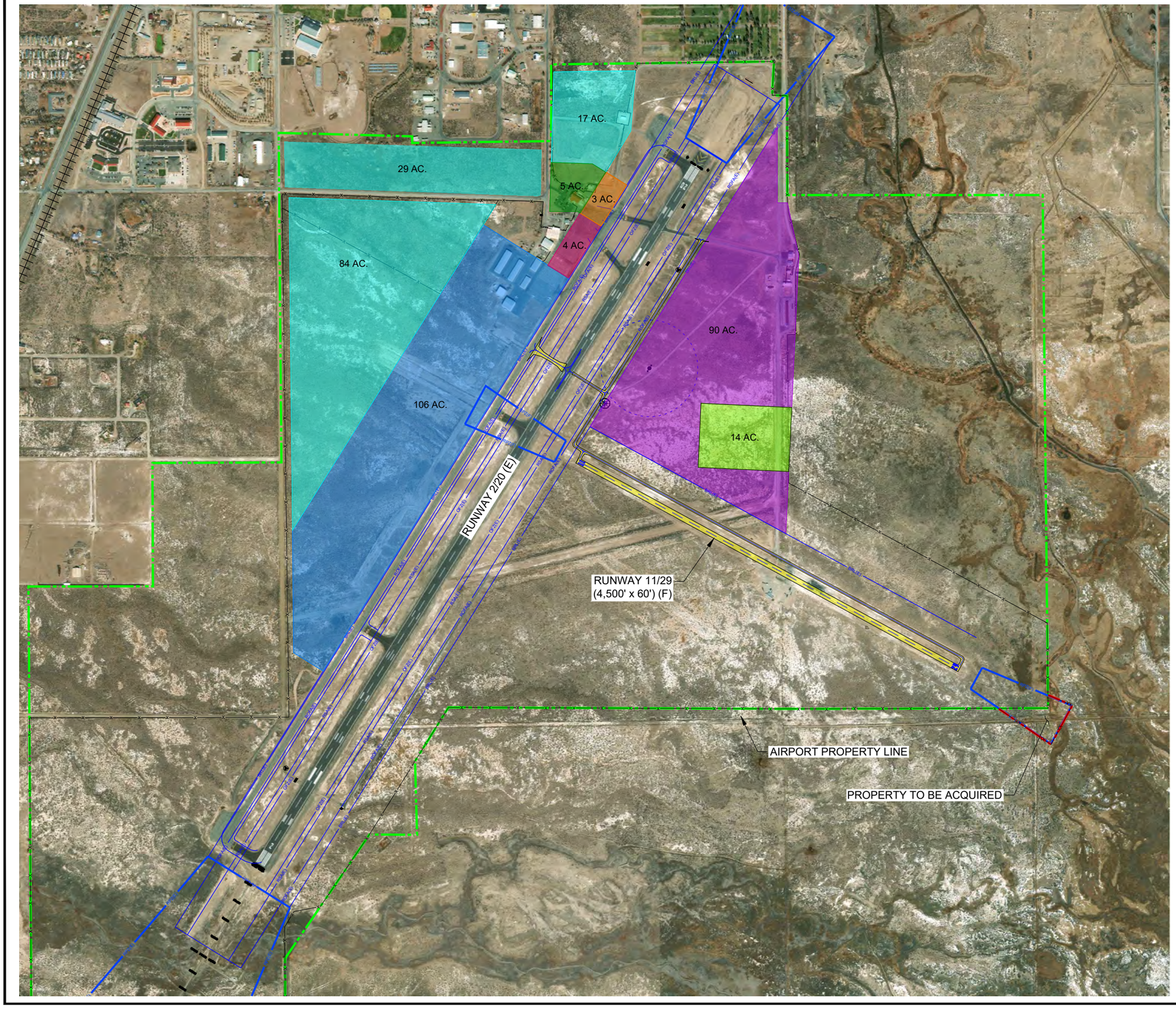
Estimated Cost

The total estimated cost of Alternative 1 is: $7,000,000 (The initial development of the crosswind runway could be a dirt runway which would significantly reduce the development costs.)

Alternative 2: Construct Runway 11-29 (4,500' x 60')

This alternative would construct a northwest to southeast orientated crosswind runway to the east of Runway 2-20. The crosswind runway would be approximately 4,500' in length and designed to B-I (Small) design standards, serviced by a full-length parallel taxiway in addition to a partial-parallel taxiway to the east of Runway 2-20. This alternative would maximize and protect for continuous and unimpeded aeronautical and non-aeronautical landside development to the west of Runway 2-20. Additionally, this alternative would protect for special use aeronautical development to the east of Runway 2-20, and north of the future 11-29 crosswind runway. **Exhibit 5-2** depicts Alternative 2.

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DEVELOPMENT LEGEND

- COMMERCIAL / TERMINAL APRON
- FBO CORPORATE / CARGO APRON
- GA APRON / HANGAR DEVELOPMENT
- HELICOPTER TESTING AREA
- NON-AERONAUTICAL & AERONAUTICAL DEVELOPEMENT
- SPECIAL USE / GA
- TERMINAL & TERMINAL PARKING DEVELOPMENT
- FUTURE PAVEMENT
- FUTURE PROPERTY LINE
- FUTURE FENCE

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SCALE IN FEET

Exhibit 5-2

SAN LUIS VALLEY REGIONAL AIRPORT
ALAMOSA, COLORADO

AIRPORT DEVELOPEMENT - ALT. 2

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Operational and Safety Considerations

Runway 11-29 would be able to accommodate approximately 55 percent of the small aircraft fleet during the most demanding conditions. This crosswind runway orientation would allow for an unimpeded continuation of future aeronautical, and non-aeronautical development to the west of Runway 2-20, and special use aeronautical development to the east of Runway 2-20 and north of Runway 11-29. Additionally, this alternative would not require a Runway Visibility Zone (RVZ) to be implemented, allowing greater airport property to be utilized for landside development. This alternative would provide a combined 10.5 knot crosswind coverage of 97.15 percent.

Land Acquisition

Alternative 2 would require approximately four acres of land acquisition for the future RPZ on the approach end of Runway 29.

Potential Environmental Impacts

Alternative 2 would result in minor air quality impacts and an increase in solid waste; however, these impacts would be temporary and occur during construction only. While this alternative includes constructing a new runway, the existing footprint has already been disturbed and graded. It is anticipated the development would have minor impacts. The proposed project could also result in positive socioeconomic impacts as it would increase the overall utility of the Airport.

FAA Funding Eligibility/Justification

Alternative 2 would be considered eligible for Airport Improvement Program funds; However, it would be considered a lower priority project for federal funding.

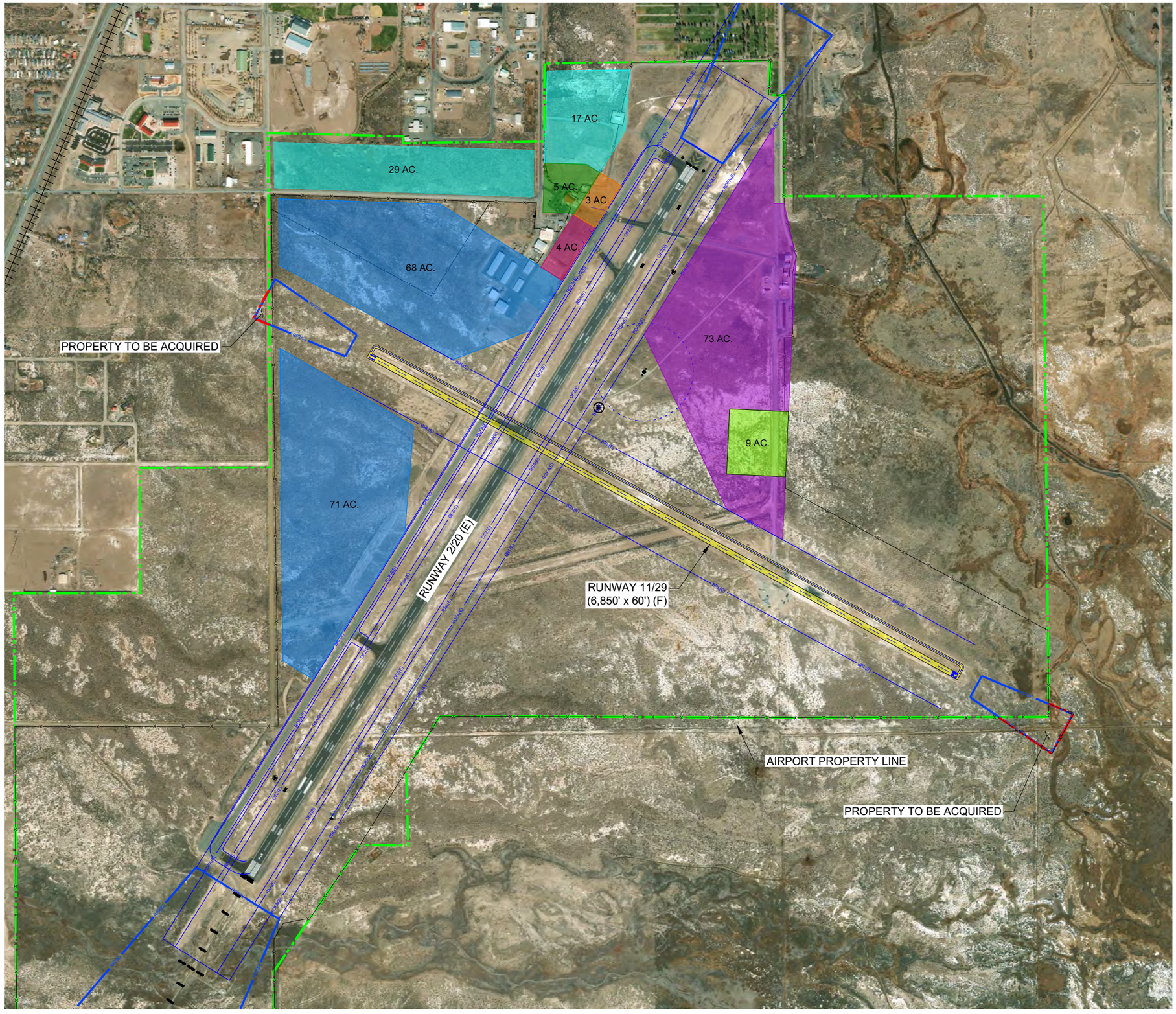
Estimated Cost

The total estimated cost of Alternative 2 is: $8,300,000 (The initial development of the crosswind runway could be a dirt runway which would significantly reduce the development costs.)

Alternative 3: Construct Runway 11-29 (6,850' x 60')

This alternative would construct an intersecting northwest to southeast orientated crosswind runway near midfield of Runway 2-20. The crosswind runway would be approximately 6,850' in length and designed to B-I (Small) design standards, serviced by a full-length parallel taxiway. This alternative would maximize operational capabilities for small aircraft to operate on the crosswind runway by providing a length of 6,850 feet. This alternative would also protect for aeronautical and non-aeronautical landside development to the west of Runway 2-20, on both the north and south sides of the future Runway 11-29. Additionally, this alternative would protect for special use aeronautical development to the east of Runway 2-20, and north of the future 11-29 crosswind runway. **Exhibit 5-3** depicts Alternative 3.

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DEVELOPMENT LEGEND

- COMMERCIAL / TERMINAL APRON
- FBO CORPORATE / CARGO APRON
- GA APRON / HANGAR DEVELOPMENT
- HELICOPTER TESTING AREA
- NON-AERONAUTICAL & AERONAUTICAL DEVELOPEMENT
- SPECIAL USE / GA
- TERMINAL & TERMINAL PARKING DEVELOPMENT
- FUTURE PAVEMENT
- FUTURE PROPERTY LINE
- FUTURE FENCE

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SCALE IN FEET

Exhibit 5-3

SAN LUIS VALLEY REGIONAL AIRPORT
ALAMOSA, COLORADO

AIRPORT DEVELOPEMENT - ALT. 3

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Operational and Safety Considerations

Runway 11-29 in Alternative 3 would be able to accommodate approximately 75 percent of the small aircraft fleet. This crosswind runway orientation would require an RVZ which would constrain future aeronautical and non-aeronautical landside development to the north and south of the future Runway 11-29. An RVZ is a defined area to protect line of sight standards between two intersecting runways. The RVZ requires any point five feet above the runway centerline and within the runway visibility zone to be mutually visible with any other point five feet above the centerline of the intersecting runway. The special use aeronautical development area to the north of Runway 11-29 would be constrained to meet RVZ requirements. This alternative would provide a combined 10.5 knot crosswind coverage of 97.15 percent.

Land Acquisition

Alternative 3 would require approximately five acres of land acquisition to accommodate the RPZs for Runway 11-29.

Potential Environmental Impacts

Alternative 3 would result in minor air quality impacts and an increase in solid waste; however, these impacts would be temporary and occur during construction only. While this alternative includes constructing a new runway, the existing footprint has already been disturbed and graded. It is anticipated the development would have minor impacts. The proposed project could also result in positive socioeconomic impacts as it would increase the overall utility of the Airport.

FAA Funding Eligibility/Justification

Alternative 3 would be considered eligible for Airport Improvement Program funds; However, it would be considered a lower priority project for federal funding.

Estimated Cost

The total estimated cost of Alternative 3 is: $9,700,000 (The initial development of the crosswind runway could be a dirt runway which would significantly reduce the development costs.)

No Action Alternative: Maintain existing runway configuration

The No Action Alternative would not protect for future airside development.

Operational and Safety Considerations

This Alternative would not provide a crosswind coverage for small aircraft of at least 95 percent. The existing crosswind coverage for Runway 2-20 is 92.28 percent. This could restrict small aircraft from operating at the airport during times of inclement weather with high crosswind conditions for Runway 2-20, limiting the operational capabilities of the airport.

Land Acquisition

This Alternative would not require land acquisition due to no change in the airfield layout.

Potential Environmental Impacts

This Alternative would not have the potential for environmental impacts as there would be no future planned development.

FAA Funding Eligibility/Justification

The No Action Alternative is not applicable for FAA funding eligibility or justification analysis.

Estimated Cost

There would be no additional development costs for this alternative.

Crosswind Runway Alternatives Summary

Table 5-1 lists a summary of the runway options along with critical factors to consider when selecting the preferred runway alternative. A Technical Advisory Meeting was held to determine the preferred alternative. After evaluation and discussion, the TAC elected to carry forward Alternative 2 as the preferred crosswind runway layout. **Exhibit 5-5** depicts the preferred crosswind runway layout with the recommended development for the airport.

Table 5-1 Crosswind Runway Alternatives Summary

Evaluation Criteria	Alternative 1	Alternative 2	Alternative 3	No Action
Operational and Safety Considerations*				
Land Acquisition				
Potential for Environmental Impacts				
FAA Funding Eligibility and Justification				
Crosswind Coverage Meet 95%				
Landside Development Availability				
Estimated Cost				
Option Score	**10**	**10**	**11**	**9**

Point Scale

Positive, 2 points

Neutral, 1 point

Negative, 0 points

*Operational and Safety Considerations are weights as double due to the importance this factor has on aviation safety.

5.3.2 Taxiways

Chapter Four, *Facility Requirements*, recommends to maintain the existing 400 feet Taxiway A separation from Runway 2-20 to accommodate instrument approach procedures with visibility minimums of less than ¾ of a statute mile. In addition, it is recommended to protect for a partial parallel taxiway along the east side of Runway 2-20. This taxiway and its connectors would accommodate existing and future east side aeronautical development at the Airport. **Exhibit 5-4** depicts the proposed taxiway layout.

Operational and Safety Considerations

Maintaining the existing taxiway separation is required based on the existing and future instrument approach minimums of ½ statute mile visibility on Runway 2-20. A partial parallel taxiway to the east

of Runway 2-20 would provide improved circulation, operational and safety capabilities for future east side aeronautical development by providing access for aircraft and equipment and reducing taxiing time on Runway 2-20 for crossing aircraft.

Land Acquisition
The taxiway development could be accommodated on existing airport property.

Potential Environmental Impacts
The taxiway development would result in minor air quality impacts and an increase in solid waste; however, these impacts would be temporary and occur during construction only. This area would create a negligible increase of energy resources to power the development area.

FAA Funding Eligibility/Justification
The taxiway development is considered eligible and justified, if warranted by documented demand, for Airport Improvement Program funds. The increased hangar development on the east side of the airport would provide increased justification for the development of the partial parallel taxiway.

5.3.3 Aircraft Parking Apron

Chapter Four, *Facility Requirements*, recommends expanding and reconfiguring the existing aircraft parking aprons to accommodate forecasted transient and commercial aircraft and hangar development, while protecting for an expanded apron beyond the planning period. It is recommended to protect for an expanded commercial service apron to the north of the existing commercial aircraft parking apron to accommodate future passenger demand for CRJ-700 aircraft parking. Additionally, it is recommended to protect for dedicated corporate jet and helicopter concrete parking pads located within the existing FBO/Itinerant aircraft apron area. It is recommended to protect for an expanded and reconfigured Tie-down apron to the south of the existing apron. This area would accommodate general aviation and other transient aircraft and be configured to meet design standards for ADG-I and II aircraft. It is also recommended to protect for an aircraft wash/deicing pad. **Exhibit 5-4** depicts the proposed apron developments.

Operational and Safety Considerations
The apron expansion area would be located outside of the Runway Visibility Zone and Taxiway/Taxilane Object Free Areas.

Land Acquisition
The apron expansion area could be accommodated on existing airport property.

Potential Environmental Impacts
The apron expansion area would result in minor air quality impacts and an increase in solid waste; however, these impacts would be temporary and occur during construction only. This area would create a negligible increase of energy resources to power the development area.

FAA Funding Eligibility/Justification
The apron expansion is considered eligible and justified, if warranted by documented demand, for Airport Improvement Program funds.

5.3.4 Air Tanker Base

As identified in Chapter Four, *Facility Requirements*, it is recommended to protect for an air tanker base. The air tanker base would consist of a dedicated apron to accommodate large firefighting aircraft. The base would also protect an area for a dedicated fueling system, fire retardant holding tanks and hangar. The air tanker operation base is recommended to be located to the east of Runway 2-20. **Exhibit 5-4** depicts the proposed air tanker base development.

Operational and Safety Considerations
The apron expansion area would be located outside of the Runway Visibility Zone and Taxiway/Taxilane Object Free Areas.

Land Acquisition
The apron expansion area could be accommodated on existing airport property.

Potential Environmental Impacts
The apron expansion area would result in minor air quality impacts and an increase in solid waste; however, these impacts would be temporary and occur during construction only. This area would create a negligible increase of energy resources to power the development area.

FAA Funding Eligibility/Justification
Typically, the development of an air tanker base is funded by the government agency providing fire protection for the local area and can be either the Bureau of Land Management, the Forrest Service or a combination interagency agreement.

5.3.5 Helicopter Testing Area

As identified in Chapter Four, *Facility Requirements*, it is recommended to protect for a helicopter testing area. The helicopter testing area would consist of dedicated helicopter parking pads and include a helicopter testing tether point. The area would also protect for aircraft hangars. The helicopter testing area is recommended to be located to the east of Runway 2-20. **Exhibit 5-4** depicts the proposed helicopter testing development.

Operational and Safety Considerations
The helicopter testing area would be located outside of the Runway Visibility Zone and Taxiway/Taxilane Object Free Areas. The ASOS would be relocated to avoid rotor downwash from the helicopter testing area.

Land Acquisition
The helicopter testing area could be accommodated on existing airport property.

Potential Environmental Impacts
The helicopter testing area would result in minor air quality impacts and an increase in solid waste; however, these impacts would be temporary and occur during construction only. This area would create a negligible increase of energy resources to power the development area. The location of the testing area is recommended to avoid noise impacts and rotor down wash impacts to other on airport users.

FAA Funding Eligibility/Justification

The helicopter parking pads would likely be considered eligible and justified, if warranted by documented demand, for Airport Improvement Program funds; The tether point for helicopter testing would not be considered eligible for Airport Improvement Program funds. The testing site would typically be developed and funded by the users.

5.3.6 Instrument Approach Procedures

As mentioned in Chapter Four, *Facility Requirements*, the existing ILS components are beginning to reach the end of their useful life. Airport management has expressed difficulty in locating and acquiring replacement parts to maintain the ILS. An analysis of the existing equipment at the airport was conducted by the manufacturer to provide recommendations for maintaining an operational ILS. It was recommended to replace the existing (Mark 1F) ILS with the newer (420) model ILS, as the Mark 1F system and components are no longer supported by the manufacturer, making purchasing and locating spares increasingly difficult and costly. Given the difficulty in locating and purchasing replacement spares, should the existing ILS experience an equipment failure, the system may be at risk of being inoperable. (The full ILS equipment analysis can be found in **Appendix G**). It should be noted that the existing GPS LPV instrument approach procedure has the same visibility minimums as the ILS approach procedure. However, not all aircraft users of the Airport are equipped to utilize precision GPS approaches. Additionally, it is recommended to protect for instrument approach procedures with visibility minimums as low as one statute mile for the future crosswind runways.

Operational and Safety Considerations

Maintaining the existing ILS provides enhanced capabilities and safety for aircraft, especially when operating during periods of inclement weather. Additionally, the ILS provides a precision approach procedure for many of the aircraft users at the Airport that are not equipped to utilize GPS approaches. Should an operational ILS approach not be available at the airport, the precision GPS approach would still provide an instrument approach with the same visibility capabilities. However, aircraft users that are not GPS equipped may be restricted from utilizing the Airport.

Land Acquisition

The existing ILS equipment is located within existing Airport property. Maintaining the ILS and/or upgrading to newer ILS equipment could be accommodated on existing airport property.

Potential Environmental Impacts

Maintaining the ILS and/or upgrading to newer ILS equipment would have negligible energy and raw material requirements.

FAA Funding Eligibility/Justification

Maintaining the ILS and/or upgrading to newer ILS equipment is considered eligible and justified, if warranted by documented demand, for Airport Improvement Program funds. A phased approach may be taken to upgrade the ILS system.

5.3.7 Weather Reporting Systems

It is recommended to relocate the ASOS near the Runway 2 end. The existing ASOS is located to the east of Runway 2-20 near midfield. FAA guidance recommends the ASOS be located near the end of the runway with the lowest instrument approach minimums. Additionally, relocating the ASOS would provide additional space for aeronautical development to the east of Runway 2-20.

Operational and Safety Considerations
FAA guidance recommends the weather reporting system be located within 3,000 feet of the end of the runway with the lowest instrument approach minimums, to provide accurate readings for procedures with the most demanding capabilities. Relocating the ASOS near the end of the Runway 2 end, would enhance safety for aircraft utilizing the instrument approach procedures.

Land Acquisition
Relocating the ASOS could be accommodated on existing airport property.

Potential Environmental Impacts
Relocating the ASOS would result in minor air quality impacts and an increase in solid waste; however, these impacts would be temporary and occur during construction only. The ASOS would have negligible energy and raw material requirements.

FAA Funding Eligibility/Justification
Relocating the ASOS is considered eligible and justified, if warranted by documented demand, for Airport Improvement Program funds.

Estimated Cost
Total estimated cost of relocating the ASOS is: $300,000.

5.3.8 Airside Development Summary

The proposed airside development items discussed are depicted in **Exhibit 5-5**.

5.4 Landside Development

Landside development is typically driven by existing and future airside configuration along with availability and suitability of property available for landside development. This section discusses the landside development alternatives and addresses the needs of the existing and future aviation demand identified in Chapter Four, *Facility Requirements*.

5.4.1 Hangar Development Areas

It is recommended to develop hangar development areas in multiple phases, as warranted by demand. This area should also include protecting for vehicle parking and facilities supporting the hangars. In addition, it is recommended to protect for development areas to accommodate ARFF storage, Snow Removal Equipment storage, generator, and administrative offices. Areas should be configured to

accommodate both Group I and II aircraft. It is recommended to protect for hangar development to the south and west of the existing hangar facilities at the airport. This area is anticipated to accommodate the forecasted hangar development for the planning and post-planning period. The future hangar development is configured to avoid north facing hangars as they have the potential to freeze shut during winter conditions. It is also recommended to enhance the airport access to the hangar development areas by paving the airport entrance road and expanding the public parking area servicing the hangar development areas. **Exhibit 5-4** depicts the recommended development.

Operational and Safety Considerations
The hangar development area would be located outside of the Building Restriction Line, Runway Visibility Zone and Taxiway/Taxilane Object Free Areas.

Land Acquisition
The hangar development could be accommodated on existing airport property.

Potential Environmental Impacts
The hangar development area would result in minor air quality impacts and an increase in solid waste; however, these impacts would be temporary and occur during construction only. The hangar development area would create a negligible increase of energy resources to power the development area.

FAA Funding Eligibility/Justification
Taxilane development to privately funded hangars are no longer eligible for FAA funding. The taxilane development is typically funded by private hangar development or by the airport's local funding sources.

5.4.2 Terminal Building Development Area

It is recommended to protect for expanded Terminal Building development. The proposed expansion would be developed in multiple phases, as warranted by demand. The development would accommodate expanded facilities as outlined in Chapter Four, *Facility Requirements*, to meet forecasted demand. The proposed expansion would occur off of the existing terminal building structure to accommodate additional baggage handling/screening, offices, passenger waiting area, restrooms and circulation. This expansion is anticipated to accommodate the forecasted passenger demand for the planning and post-planning period. The proposed Terminal Building expansion is further detailed in **Appendix F**. It is also recommended to enhance the supporting facilities for the Terminal Building to accommodate forecasted demand. This alternative would protect for additional automobile parking, improved access road/vehicle circulation servicing the Terminal Building, ground handling equipment including tugs, baggage carts, ground power units, and aircraft passenger access ramps. The proposed automobile parking would be located to the northwest of the Terminal Building. **Exhibit 5-4** and **Exhibit 5-5** depict the location and layout of the recommended development.

Operational and Safety Considerations
The Terminal Building development area would be located outside of the Building Restriction Line, Runway Visibility Zone and Taxiway/Taxilane Object Free Areas. The proposed development would expand off of existing facilities.

Land Acquisition

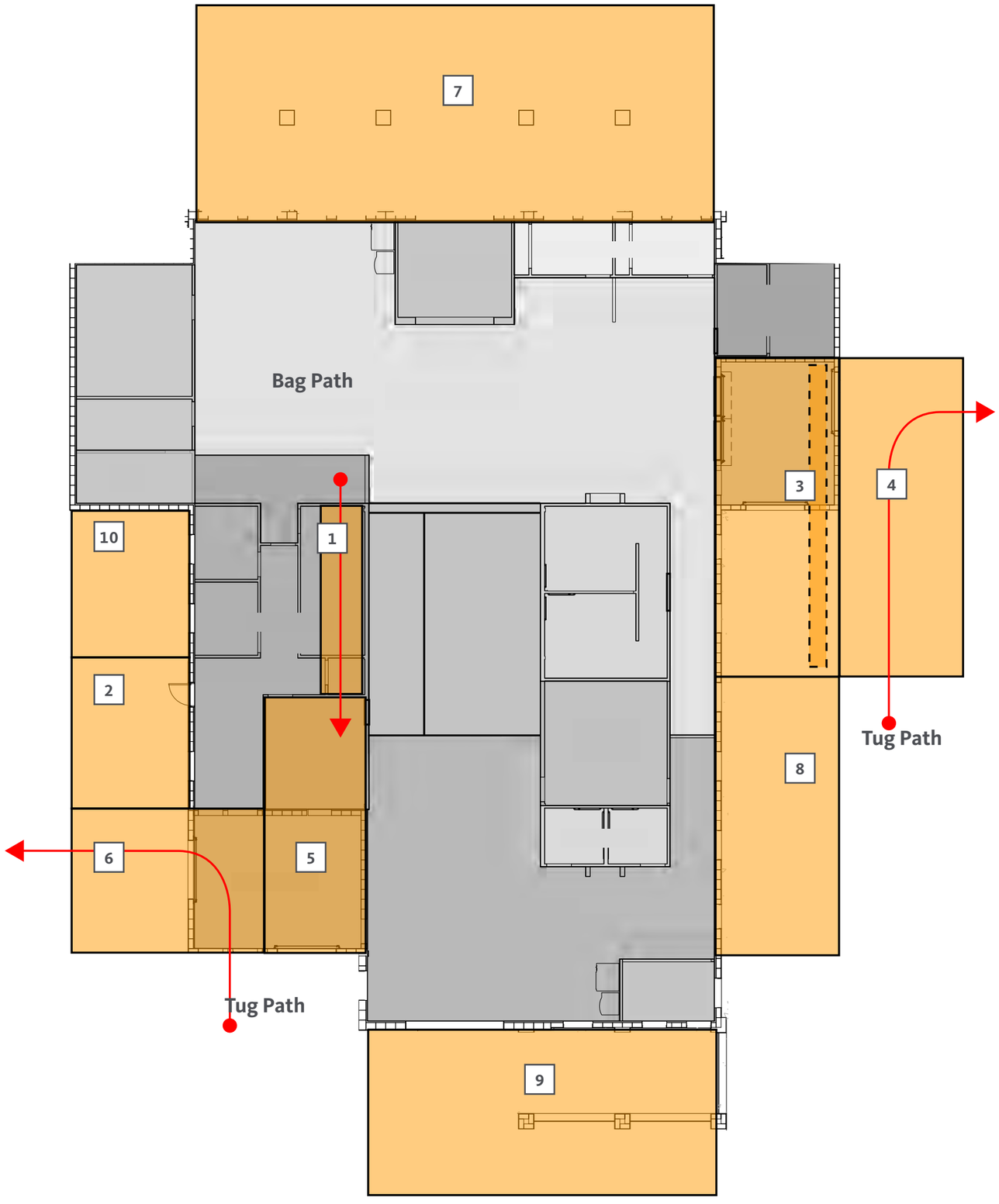
The Terminal Building development could be accommodated on existing airport property.

Potential Environmental Impacts

The Terminal Building development would result in minor air quality impacts and an increase in solid waste; however, these impacts would be temporary and occur during construction only. The Terminal Building development would create a negligible increase of energy resources to power the development area.

FAA Funding Eligibility/Justification

The Terminal Building development is considered eligible and justified, if warranted by documented demand, for Airport Improvement Program funds.



PLANNING OPTIONS

PHASE 2

Key Program Options, Aircraft Basis of Design: CRJ-700

*Phase 2 plan begins to accommodate for end years of forecast needs with CRJ-700, therefore resulting in +/- 50 passengers, with a 74% load factor.

1 Checked Baggage Path:

In order to more efficiently process checked baggage, an automated baggage belt may be required to accommodate Peak passenger count with a 74% load factor (per forecast year 2039), +/- 50 bags, assuming 100% of passengers pack a bag. Bag belt path would lead to relocation of existing office space.

2 Office

Due to new right-of-way for baggage belt, office space relocated into new expansion, replace existing sf in kind, +/- 400 sf.

3 Bag Claim

Expansion of baggage claim into current baggage garage, would allow for approximate additional 12 ft of bag slide frontage (20ft total) and 700 sf of additional space for the baggage claim area.

4 Baggage Garage

Due to the relocation of the expansion of the baggage claim, a new baggage garage for unloading of the bag tugs may be required, +/- 700 sf.

5 Baggage Screening

Due to the increased processing capacity, an enlarged baggage screening room may be required. Conversion of existing baggage make-up garage is +/- 240 sf.

6 Baggage Make-Up

Relocation of baggage make-up garage, +/- 425 sf

7 Non-sterile Side Expansion

+/- 1,600 sf expansion of vendors, ticketing queue, and Security Screening and Checkpoint queueing

8 Restrooms

+/- 550 sf to accommodate for additional restroom and Mechanical, Electrical, and Plumbing needs

9 Hold Room Expansion

+/- 850 sf expansion of hold room and vendors

10 Additional Office Expansion

Additional office expansion of +/- 320 sf, would require re-location of transformer

Exhibit 5-4

5.4.3 Aeronautical Revenue Generating Areas

It is recommended to protect the area and the surrounding land located to the east of Runway 2-20 to accommodate specialized aviation service operators, and other aeronautical revenue generating development. It is also recommended to protect for expanded hangar development, aprons, and other aeronautical revenue generating uses to the south of the proposed hangar development area. This area would accommodate future demand beyond the twenty-year forecast. Additionally, it is recommended to protect for support facilities to accommodate the aeronautical revenue generating area such as frontage to operator facilities, vehicle parking for employees and users, and vehicle access to this area. **Exhibit 5-5** depicts the proposed aeronautical revenue generating areas.

Operational and Safety Considerations
The aeronautical revenue generating area would be located outside of the Building Restriction Line, Runway Visibility Zone and Taxiway/Taxilane Object Free Areas.

Land Acquisition
The aeronautical revenue generating area would be accommodated on existing airport property.

Potential Environmental Impacts
The aeronautical revenue generating area would result in minor air quality impacts and an increase in solid waste; however, these impacts would be temporary and occur during construction only. The aeronautical revenue generating area would create a negligible increase of energy resources to power the development area.

FAA Funding Eligibility/Justification
Aircraft parking apron and taxiway access to the airfield is considered to be eligible and justified, if warranted by documented demand, for Airport Improvement Program funds; however, would be considered a lower priority project for federal funding. However; site grading and construction of specialized aviation use operator structures, taxilanes, development of access roads, and parking for these operators is not considered eligible.

5.4.4 Non-Aeronautical Revenue Generating Areas

It is recommended to protect the area and the surrounding land located on Airport property to the north of Airport Road to accommodate non-aeronautical revenue generating development. This area would accommodate future development that would not require airfield frontage or direct access to the aircraft aprons or taxilanes. The proposed non-aeronautical revenue generating areas are depicted in **Exhibit 5-5**, and may be adjusted pending the selection of the preferred airside alternative and discussion with the Technical Advisory Committee.

Operational and Safety Considerations
The non-aeronautical revenue generating area would be located outside of the Building Restriction Line, Runway Visibility Zone and Taxiway/Taxilane Object Free Areas.

Land Acquisition
The non-aeronautical revenue generating area would be accommodated on existing airport property.

Potential Environmental Impacts
The non-aeronautical revenue generating development would be analyzed on a case by case basis to determine environmental impact.

FAA Funding Eligibility/Justification
Non-aeronautical revenue generating development would not be considered eligible for Airport Improvement Program funds; Development costs are typically funded by the users. Typically, the airport generates revenue via land lease for non-aeronautical development on airport property.

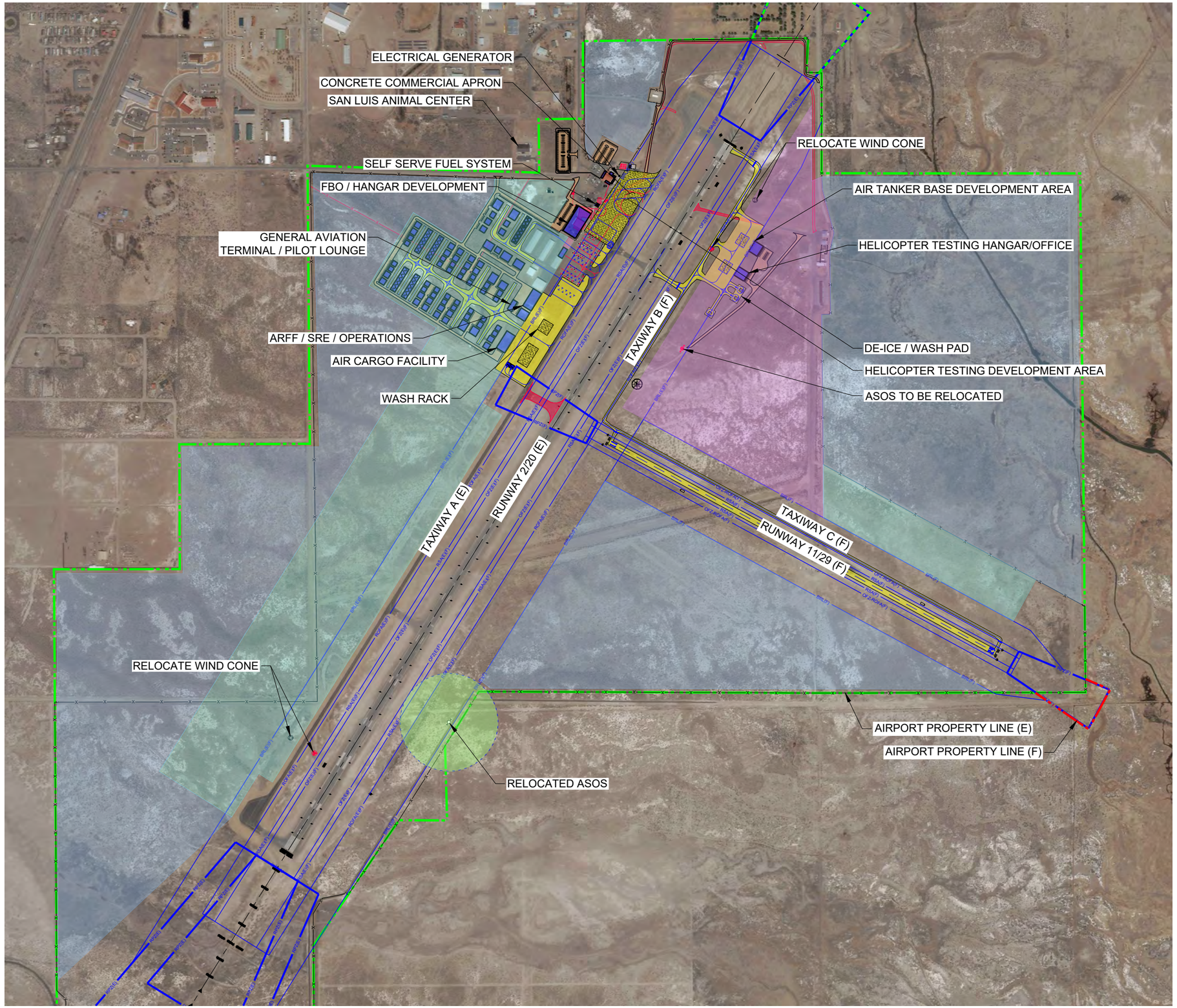
5.5 Summary of Recommended Development and Preferred Alternatives

The development alternatives presented in this Chapter were derived to accommodate the forecasted aviation demand and the corresponding facility requirements for San Luis Valley Regional Airport for the twenty-year planning period. Projects such as pavement maintenance will have to be done in addition to the recommended development. The timing and funding of both maintenance and the recommended development will be further discussed in Chapter Seven, *Implementation and Financial Plan*.

A TAC meeting comprised of Airport stakeholders was held to obtain input and feedback on the recommended development for the Airport Master Plan. In addition to the topics previously discussed in this chapter, the TAC elected to include the following development items on the preferred alternative:

- ARFF/SRE facility location near existing infrastructure;
- Removal of hangar facility to enhance safety of aircraft and persons;
- Protection for additional automobile parking;
- Protection for additional itinerant/jet aircraft parking apron;
- Protection for an airport perimeter road;
- Protection for a reconstructed FBO facility; and
- Protection for additional hangar facilities.

Exhibit 5-5 and **Exhibit 5-6** depict the preferred airside and landside alternative layouts, respectively, to be carried forward on the Airport Layout Plan.



LEGEND

- FUTURE AIRFIELD DEVELOPMENT
- FUTURE CONCRETE HARDSTAND
- FUTURE HANGAR BUILDING / FACILITY
- FUTURE ROAD / AUTO PARKING
- TO BE REMOVED
- FUTURE PAVEMENT MARKING
- EXISTING AIRPORT PROPERTY LINE
- AERONAUTICAL DEVELOPMENT
- SPECIAL USE / GA
- NON-AERONAUTICAL DEVELOPMENT

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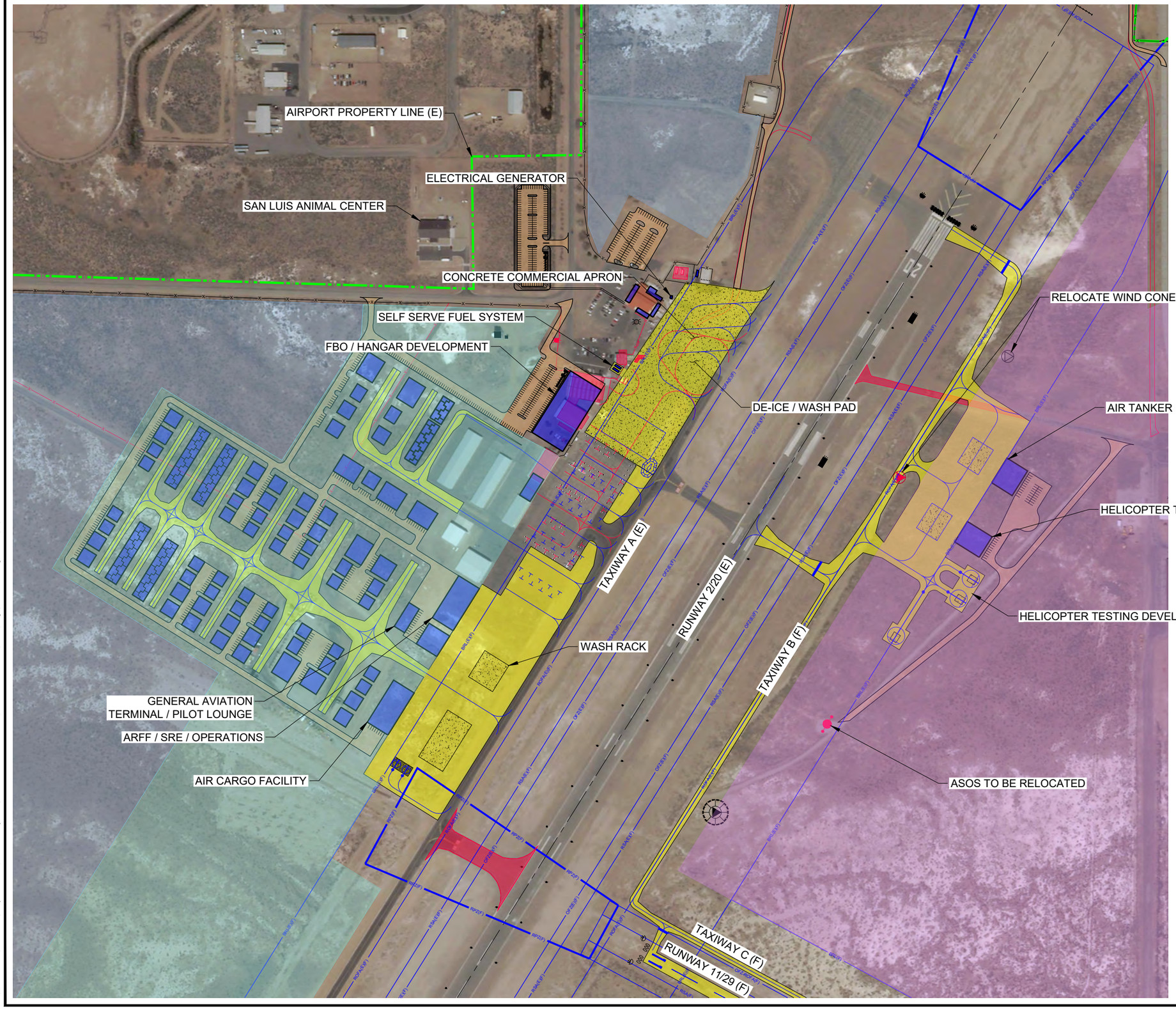
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EXHIBIT 5-5 PREFERRED AIRSIDE LAYOUT

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LEGEND

- FUTURE AIRFIELD DEVELOPMENT
- FUTURE CONCRETE HARDSTAND
- FUTURE HANGAR BUILDING / FACILITY
- FUTURE ROAD / AUTO PARKING
- TO BE REMOVED
- FUTURE PAVEMENT MARKING
- EXISTING AIRPORT PROPERTY LINE
- AERONAUTICAL DEVELOPMENT
- SPECIAL USE / GA
- NON-AERONAUTICAL DEVELOPMENT

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EXHIBIT 5-6 PREFERRED LANDSIDE LAYOUT

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5.6 Environmental Overview

The protection and preservation of the local environment is an essential part of the airport master planning process. Council on Environmental Quality (CEQ) regulation 1501.2 states, "agencies shall integrate the NEPA process with other planning at the earliest possible time to ensure that planning decisions reflect environmental values, avoid delays later in the process, and head off potential conflicts."

Accordingly, the environmental overview was conducted in accordance with FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions,* FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures,* and the FAA's *Environmental Desk Reference for Airport Actions*, which requires the analysis of the following environmental resource categories prior to project implementation:

- Air Quality, including greenhouse gases (GHGs) and climate
- Biotic Resources/Federally-listed Endangered and Threatened Species
- Coastal Barriers and Coastal Zone Management
- Compatible Land Use/Noise
- Construction Impacts
- Cumulative Impacts
- Department of Transportation Act, Section 4(f)
- Energy Supplies, Natural Resources, and Sustainable Design
- Farmlands
- Floodplains
- Hazardous Materials
- Historical, Architectural, Archeological, and Cultural Resources
- Light Emissions and Visual Effects
- Secondary (Induced) Impacts
- Social Impacts/Environmental Justice
- Solid Waste
- Water Quality
- Wetlands
- Wild and Scenic Rivers

FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, describes the types of impacts and thresholds that determine if an impact is considered to be significant. The proposed development projects will require a determination to be made regarding which of the following environmental clearance documents would be required prior to project implementation. These environmental clearance documents include the following:

- Categorical Exclusions – Projects or actions that do not normally require an EA or EIS because they do not individually or cumulatively have a significant effect on the environment.
- Environmental Assessment (EA) – Preparation of a concise document used to describe a proposed project's anticipated environmental impacts and mitigation measures.

- Environmental Impact Statement (EIS) – Preparation of a clear, concise, and appropriately detailed document that provides the FAA, decision makers, and the public with a full and fair discussion of significant environmental impacts of the proposed project and reasonable alternatives.

NEPA analysis is required for any future airport development projects, regardless of the funding source. Ultimately, the FAA will determine whether the proposed development project constitutes a major federal action subject to an EA or EIS, or whether it is a Categorical Exclusion not expected to have a significant adverse effect on the environment.

5.6.1 Environmental Impacts of Recommended Development

The purpose of an environmental overview is to identify significant thresholds for the resource categories contained in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementation Instructions for Airport Actions*. The environmental overview for San Luis Valley Regional Airport is illustrated in **Table 5-2**.

Table 5-2 Environmental Overview for San Luis Valley Regional Airport

NEPA Resource Category	Potential Environmental Impacts	Anticipated Impact Level	Supporting Documentation
Air Quality	The U.S. Environmental Protection Agency (EPA) has adopted air quality standards that (Table 5-2 continued on next page) specify the maximum permissible short-term and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants which include: Ozone (O3), Carbon Monoxide (CO), Sulfur Dioxide (SOx), Nitrogen Oxide (NOx), Particulate matter (PM10), and Lead (Pb). Areas that exceed allowable thresholds for criteria pollutants are designated "non-attainment" areas.	**No impacts** Alamosa County is not located in a non-attainment area. No significant air quality impacts are anticipated to occur as a result of the development shown.	See **Figure 2-17**
Threatened or Endangered Species and Biological Resources	A significant impact to Federally-listed threatened and endangered species would occur when the Fish and Wildlife Service determines that the proposed action would be likely to jeopardize the continued existence of the species in question, or would result in the destruction or adverse modification of Federally-designated critical habitat in the affected area. (Table 5-2 continued on next page)	**No impacts** The proposed projects are not anticipated to impact plant communities or cause the displacement of wildlife. An online search was conducted and identified five threatened, endangered and or candidate species that may occur within the development area. No critical habitats have been identified for the areas of	See **Section 2.10.5**

Table 5-2 Environmental Overview for San Luis Valley Regional Airport

NEPA Resource Category	Potential Environmental Impacts	Anticipated Impact Level	Supporting Documentation
		recommended development at San Luis Valley Regional Airport.	
Coastal Barriers and Coastal Zone Management (CZM)	The Airport is not located within or adjacent to a coastal zone.	**No impacts** Airport is located in the State of Colorado.	Not Applicable
Compatible Land Use/Noise	**Compatible Land Use**: Federal Aviation Regulations (F.A.R.) Part 150 recommends guidelines for planning land use compatibility within various levels of aircraft noise exposure. In addition, Advisory Circular 150/5200-33 identifies land uses that are incompatible with safe airport operations because of their propensity for attracting birds or other wildlife, which in turn results in an increased risk of aircraft strikes and damage. Finally, F.A.R. Part 77 regulates the height of structures within the vicinity of the airport. **Noise**: The Yearly Day-Night Average Sound Level (DNL) is used in this study to assess aircraft noise. DNL is the metric currently accepted by the Federal Aviation Administration (FAA), Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD) as an appropriate measure of cumulative noise exposure. These three federal agencies have each identified the 65 DNL noise contour as the threshold of incompatibility.	**Minor impacts** The proposed airport improvements are not anticipated to result in significant noise impacts, or attract wildlife.	Not Applicable
Construction Impacts	Significant impacts would most likely occur when unusual circumstances exist (e.g. construction-induced traffic congestion that would substantially degrade air quality) and when the severity of the impact cannot be mitigated below FAA's threshold levels for the affected resource.	**Minor impacts** A temporary increase in particulate emissions and fugitive dust may result from construction activities. The provisions contained in FAA Advisory Circular 150/5370-10H, *Standards for Specifying Construction of Airports,* should be incorporated into all project specifications.	Not Applicable
Cumulative Impacts	The significance threshold for cumulative impacts varies according to the affected resource. Past, present, and reasonably foreseeable future actions trigger the significance threshold for the resource analyzed. (Table 5-2 continued on next page)	**No impacts** The proposed projects are not anticipated to cause a cumulative impact when considering past, present and foreseeable future projects.	Not Applicable

Table 5-2 Environmental Overview for San Luis Valley Regional Airport

NEPA Resource Category	Potential Environmental Impacts	Anticipated Impact Level	Supporting Documentation
Department of Transportation (DOT) Act, Section 4(f)	**Section 4(f) Lands**. These include publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state or local significance, or any land from a historic site of national, state or local significance.	**No impacts** An historic cemetery is located immediately north of the Airport, Lee Field Complex Ball Fields is located approximately 0.5 miles northwest of the Airport. The extent of the recommended development would remain within existing Airport property.	Not Applicable
Energy Supplies, Natural Resources, and Sustainable Design	When proposed construction, operation, or maintenance would cause demands that would exceed available or future (project year) natural resource or energy supplies.	**No impacts**	
Farmlands	According to the Farmland Protection Policy Act, the regulation does not apply to land already committed to "urban development or water storage," i.e., airport developed areas, regardless of its importance as defined by the NRCS.	**No impacts** Portions of the airport are designated as Prime Farmland and/or Farmland of Statewide Importance. However, Farmland Protection Policy Act does not apply to land already committed to "urban development or water storage."	See **Figure 2-25**
Floodplains	When notable adverse impacts on natural and beneficial floodplain values would occur.	**No impacts** San Luis Valley Regional Airport is not located within or adjacent to a 100-year floodplain.	Not Applicable
Hazardous Materials	The action involves a property on, or eligible for, the National Priority List (NPL).	**No impacts**	Not Applicable
Historical, Architectural, Archaeological, and Cultural Resources	When an action adversely affects a protected property the state and /or tribal Historic Table Preservation Officer addressing alternatives to avoid adverse effects and mitigation warrants further study.	**Limited Potential for Impacts** Coordination with the SHPO would be conducted prior to construction. A Class I Record Search was performed by SWCA in September 2019. The study resulted in the conclusion that no documented cultural resources are present within the project area.	See **Section 2.10.6**
Light Emissions and Visual Effects	**For light emissions:** When an action's light emissions create annoyance to or interfere with normal activities. (Table 5-2 continued on next page)	**Minor impacts** No significant light emissions or visual effects impacts are	Not Applicable

Table 5-2 Environmental Overview for San Luis Valley Regional Airport

NEPA Resource Category	Potential Environmental Impacts	Anticipated Impact Level	Supporting Documentation
	For visual effects: When consultation with Federal, State or local agencies, tribes or the public shows these effects cause a disturbance and the agencies state the effect is objectionable.	anticipated as a result of the proposed development.	
Secondary (Induced) Impacts	Induced impacts will normally not be significant except where there are also significant impacts in other categories, especially noise, land use, or direct social impacts.	**No impacts**	Not Applicable
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health Risks and Safety Risks	**For socioeconomic issues:** When an action would cause: Extensive relocation, but sufficient replacement housing is unavailable. Extensive relocation of community businesses that would cause severe economic hardship for affected communities. Disruption of local traffic patterns that substantially reduce the Levels of Service of roads serving the airport and its surrounding communities. A substantial loss in community tax base. **For Environmental Justice issues:** When an action would cause disproportionately high and adverse human health or environmental effects on minority and low-income populations, a significant impact may occur. **For Children's Health & Safety Risks:** An action causing disproportionate health and safety risks to children may indicate a significant impact.	**Socioeconomic Issues:** **No adverse impacts** **Environmental Justice:** **No impacts** **Children's Health & Safety:** **No impacts**	Not Applicable
Solid Waste	Solid waste generated during future project construction would be contained in designated areas and receptacles and removed once the project is completed. Pollution related to construction activities (i.e. dust) would be minimal and would not adversely affect the Airport.	**Minor impacts** Solid waste would likely be generated during construction of the recommended development. These impacts would only be temporary during construction.	Not Applicable
Water Quality	When an action has the potential to exceed water quality standards, there are water quality problems that cannot be avoided or satisfactorily mitigated, or there would be	**No impacts**	Not Applicable

(Table 5-2 continued on next page)

Table 5-2 Environmental Overview for San Luis Valley Regional Airport

NEPA Resource Category	Potential Environmental Impacts	Anticipated Impact Level	Supporting Documentation
	difficulty in obtaining a permit or authorization, there may be a significant impact.		
Wetlands	When an action would: Adversely affect a wetland's function to protect the quality or quantity of a municipal water supply. Substantially alter the hydrology needed to sustain the affected wetland's values and functions or those of a wetland to which it is connected. Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare. Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected area surrounding wetlands. Promote development of secondary activities or services that would affect the above functions.	**No impacts** Coordination with the U.S. Army Corps of Engineers would be conducted during future NEPA analysis to confirm no significant impacts would occur.	See **Figure 2-27**
Wild and Scenic Rivers	There are no wild or scenic rivers on or near future project areas.	**No impacts**	Not Applicable

Source: FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, FAA Order 5050.4B, NEPA Implementing Instructions for Airport Projects, & Armstrong Consultants, Inc., 2020

5.6.2 Summary of Potential Environmental Impacts

Table 5-2 provides a summary of the analysis ratings for each of the environmental impact categories with regard to the recommended development. While some categories indicate a potential minor impact, they are all estimated to be below the threshold of significance as described in FAA Order 5050.4B, *NEPA Implementing Instructions for Airport Projects*. It is expected that most recommended development projects would be categorically excluded.

Chapter Six

Airport Layout Plans

SAN LUIS VALLEY REGIONAL / BERGMAN FIELD
ALAMOSA, COLORADO

SAN LUIS VALLEY REGIONAL AIRPORT

SPONSOR APPROVAL

Will Hickman (May 27, 2022 16:50 MDT) — May 27, 2022

ALAMOSA COUNTY — DATE

AIRPORT LAYOUT PLAN

PREPARED BY:

ARMSTRONG CONSULTANTS, INC.

AIP No. 3-08-0002-024-2019

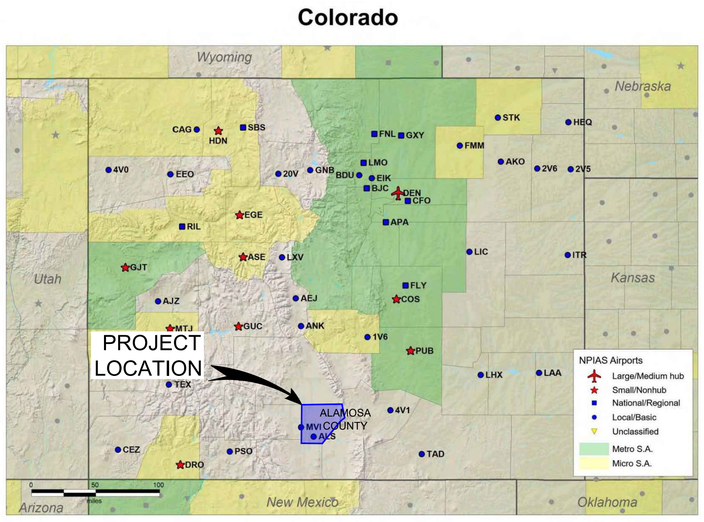
ACI No. 196593

MAY 2022

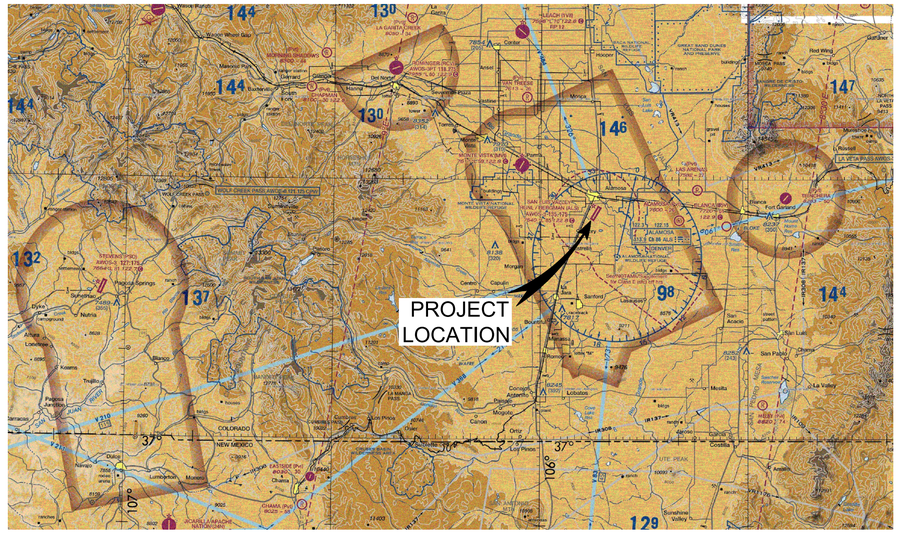
INDEX TO SHEETS

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(E = EXISTING, F = FUTURE)



LOCATION MAP



VICINITY MAP

No.	ACI No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	196593	05/2022	ORIGINAL ISSUE	6593501	LKB	MJT	JZP

THE PREPARATION OF THIS DOCUMENT MAY HAVE BEEN SUPPORTED, IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER TITLE 49 U.S.C., SECTION 47104. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS REPORT BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES 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.

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PLANNING ENGINEERING CONSTRUCTION
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S:_Colorado\Alamosa\Project Files\Active Projects\196593 Alamosa – Airport Master Plan\CAD\dwg\6593501.dwg 8/23/2021 11:27:45 AM LBACHMAN

8°8'

MAGNETIC NORTH SOURCE:
NOAA GEOPHYSICAL DATA CENTER
MAGNETIC DECLINATION 8°8' EAST
RATE OF CHANGE 0°6' WEST PER YEAR
OBTAINED: 05/10/2021

600 0 600 1200
SCALE IN FEET

FAA APPROVAL

FAA CONDITIONAL APPROVAL

SUBJECT TO LETTER DATED 08/23/2021

Jun 1, 2022

FEDERAL AVIATION ADMINISTRATION
DENVER AIRPORTS DISTRICT OFFICE

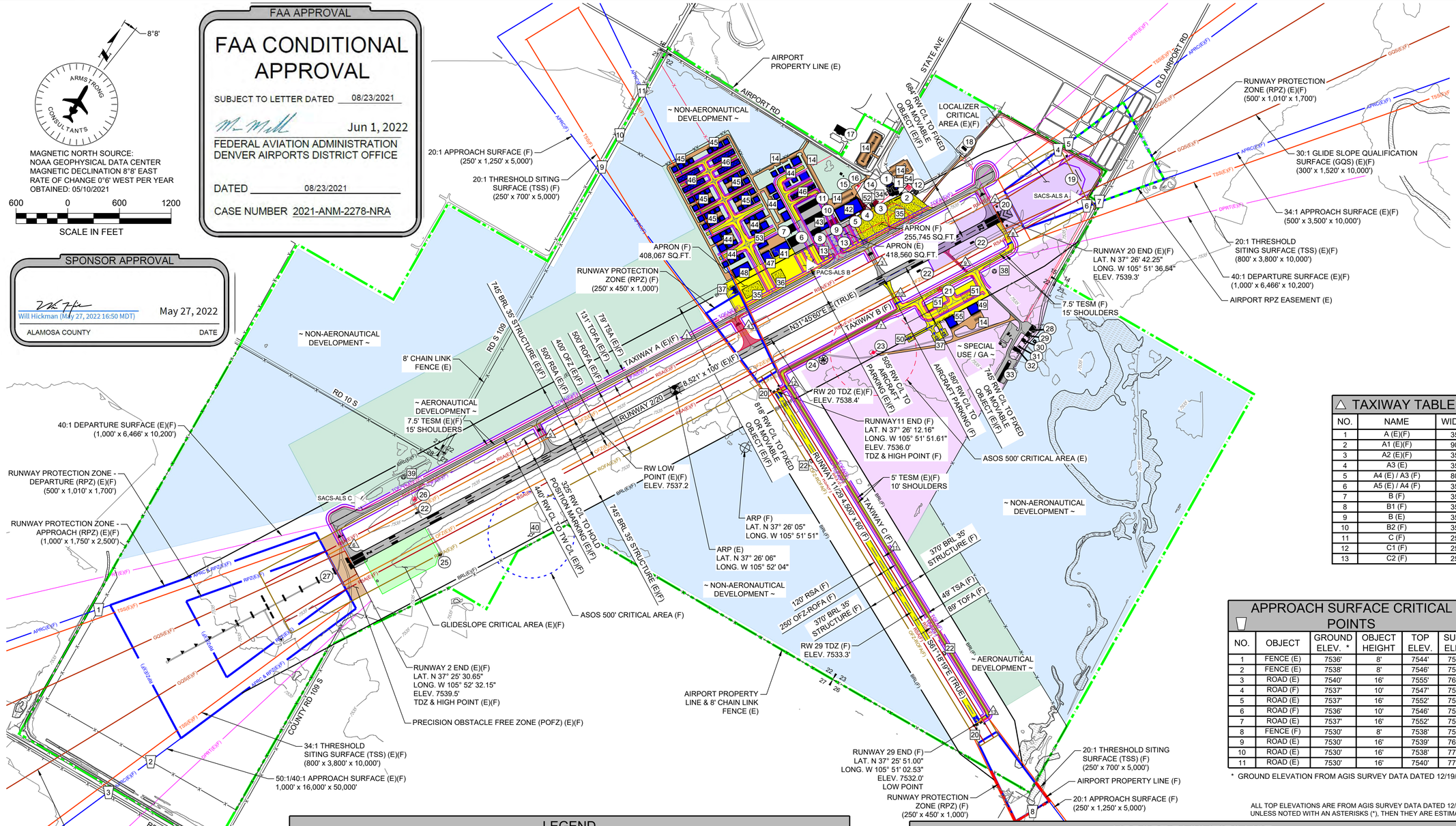
DATED 08/23/2021

CASE NUMBER 2021-ANM-2278-NRA

SPONSOR APPROVAL

Will Hickman (May 27, 2022 16:50 MDT) May 27, 2022

ALAMOSA COUNTY DATE



△ TAXIWAY TABLE

NO.	NAME	WIDTH
1	A (E)(F)	35'
2	A1 (E)(F)	90'
3	A2 (E)(F)	35'
4	A3 (E)	35'
5	A4 (E) / A3 (F)	80'
6	A5 (E) / A4 (F)	35'
7	B (F)	35'
8	B1 (F)	35'
9	B (E)	35'
10	B2 (F)	35'
11	C (F)	25'
12	C1 (F)	25'
13	C2 (F)	25'

APPROACH SURFACE CRITICAL POINTS

NO.	OBJECT	GROUND ELEV. *	OBJECT HEIGHT	TOP ELEV.	SURF. ELEV.
1	FENCE (E)	7536'	8'	7544'	7592'
2	FENCE (E)	7538'	8'	7546'	7598'
3	ROAD (E)	7540'	16'	7555'	7610'
4	ROAD (F)	7537'	10'	7547'	7563'
5	ROAD (E)	7537'	16'	7552'	7565'
6	ROAD (F)	7536'	10'	7546'	7562'
7	ROAD (E)	7537'	16'	7552'	7566'
8	FENCE (F)	7530'	8'	7538'	7582'
9	ROAD (E)	7530'	16'	7539'	7689'
10	ROAD (E)	7530'	16'	7538'	7702'
11	ROAD (E)	7530'	16'	7540'	7716'

* GROUND ELEVATION FROM AGIS SURVEY DATA DATED 12/19/18.

ALL TOP ELEVATIONS ARE FROM AGIS SURVEY DATA DATED 12/19/18, UNLESS NOTED WITH AN ASTERISKS (*), THEN THEY ARE ESTIMATED.

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
		ASPHALT/CONCRETE DEVELOPMENT			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)			VASI/PAPI
	N/A	AIRPORT RPZ EASEMENT			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			SUPPLEMENTAL WIND CONE
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			ASOS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	MALSR
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)		N/A	LOCALIZER
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	N/A		HELICOPTER PARKING
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)		N/A	SECTION CORNER
	N/A	PRECISION OBSTACLE FREE ZONE	4125	N/A	CONTOURS
	N/A	GLIDESLOPE CRITICAL AREA			ROADS
	N/A	LOCALIZER CRITICAL AREA			MARKINGS
	N/A	SPECIAL USE / GA	X	XX	FENCING
	N/A	AERONAUTICAL DEVELOPMENT		N/A	WATERWAY/WETLAND
	N/A	NON-AERONAUTICAL DEVELOPMENT			AIRPORT REFERENCE POINT (ARP)
N/A		TO BE REMOVED		N/A	PACS/SACS MONUMENT

AIRPORT FACILITIES LIST

NO.	FACILITY DESCRIPTION	TOP ELEV. (MSL-EST.)	NO.	FACILITY DESCRIPTION	TOP ELEV. (MSL-EST.)	NO.	FACILITY DESCRIPTION	TOP ELEV. (MSL-EST.)
1	TERMINAL BUILDING	7568'	20	REIL'S	-	39	SUPPLEMENTAL WIND CONE *	7547'
2	ELECTRICAL VAULT	7548'	21	WIND CONE	7549'	40	ASOS *	7562'
3	ARFF STATION	7555'	22	PAPI'S / VASI'S	-	41	ARFF/SRE/OPERATIONS *	7573'
4	FBO HANGAR	7560'	23	ASOS	7568'	42	FBO/HANGAR DEVELOPMENT *	7572'
5	EXECUTIVE HANGAR	7561	24	SEGMENTED CIRCLE/LIGHTED WIND CONE	7557'	43	T-HANGAR *	7556'
6	BOX HANGAR	7568'	25	ILS GLIDE SLOPE ANTENNA	7586'	44	BOX HANGAR-LARGE *	7573'
7	BOX HANGAR *	7569'	26	WIND CONE	7546'	45	BOX HANGAR-SMALL *	7561'
8	T-HANGAR	7555'	27	MALSR	-	46	T-HANGAR *	7555'
9	T-HANGAR	7556'	28	BOX HANGAR	7559'	47	FBO/HANGAR DEVELOPMENT *	7571'
10	T-HANGAR	7556'	29	BOX HANGAR	7557'	48	AIR CARGO FACILITY *	7572'
11	T-HANGAR	7558'	30	BUILDING	7581'	49	AIR TANKER BASE *	7571'
12	FUEL FARM	7549'	31	SRE BUILDING	7545'	50	HELICOPTER TESTING TETHER POINT *	-
13	AIRCRAFT PARKING	-	32	BUILDING	7552'	51	AIR TANKER RE-LOADING PITS *	-
14	AUTOMOBILE PARKING	-	33	T-HANGAR	7549'	52	SELF SERVE FUEL SYSTEM *	7550'
15	WEATHER RADAR *	-	34	AIRPORT BEACON *	7596'	53	GENERAL AVIATION TERMINAL/PILOT LOUNGE *	7562'
16	AIRPORT BEACON	7594'	35	CONCRETE HARD STAND *	-	54	ELECTRICAL GENERATOR *	7548'
17	SAN LUIS ANIMAL CENTER *	7565'	36	AIRCRAFT WASH BAY	-	55	HELICOPTER TESTING/HANGAR/OFFICES *	7571'
18	RCO	7552'	37	HELICOPTER PARKING	-	◯	EXISTING	
19	LOCALIZER	-	38	SUPPLEMENTAL WIND CONE *	7546'	□	FUTURE	

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SAN LUIS VALLEY REGIONAL / BERGMAN FIELD
ALAMOSA, COLORADO
AIP No. 3-08-0002-024-2019
AIRPORT LAYOUT PLAN

No.	ACI No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	196593	05/2022	ORIGINAL ISSUE	6593502	LKB	MJT	JZP

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AIRPORT LAYOUT PLAN

Sheet: 2 of: 24

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RUNWAY DATA

ITEM		RW 2/20 - EXISTING (E)(F)		RW 11/29 - FUTURE (F)	
RUNWAY IDENTIFICATION		2	20	11	29
RUNWAY DESIGN CODE (RDC)		C-II-2400		B-I (SMALL) VIS	
DEPARTURE REFERENCE CODE (DPRC)		D-IV		B-I (SMALL) VIS	
SURFACE MATERIAL, PAVEMENT STRENGTH & MATERIAL TYPE	SURFACE MATERIAL	ASPHALT		ASPHALT	
	STRENGTH BY WHEEL LOADING (LBS)	52,00 / 70,000		12,500 SWG	
	PCN (FOR BEARING STRENGTH OF 12,500 LBS OR GREATER)	44 / F / C / X / T		N/A	
	SURFACE TREATMENT	GROOVED		N/A	
RUNWAY GRADIENT	EFFECTIVE (%)	0.00		0.09	
	MAXIMUM (%)	0.46		0.09	
	LINE OF SIGHT MET (Y OR N)	Y		Y	
PERCENT WIND COVERAGE	A-I / B-I - 10.5 KTS	92.28%		87.32%	
	A-II / B-II - 13 KTS	95.29%		N/A	
	C-I - C-II - 16 KTS	97.88%		N/A	
RUNWAY DIMENSIONS (FT)		100 x 8,521		60 x 4,500	
RUNWAY SAFETY AREA (RSA)	WIDTH (FT)	500		120	
	LENGTH BEYOND RUNWAY END (FT)	1,000	1,000	240	240
RUNWAY COORDINATES (NAD 83)	RUNWAY END LATITUDE	N 37° 25' 30.65"	N 37° 26' 42.25"	N 37° 26' 12.16"	N 37° 25' 51.00"
	RUNWAY END LONGITUDE	W 105° 52' 32.15"	W 105° 51' 36.54"	W 105° 51' 51.61"	W 105° 51' 02.53"
	DISPLACED THRESHOLD LAT.	N/A	N/A	N/A	N/A
	DISPLACED THRESHOLD LONG.	N/A	N/A	N/A	N/A
RUNWAY ELEVATIONS (NAVD 88)	RUNWAY END (FT)	7539.5	7539.3	7536.0	7532.0
	DISPLACED THRESHOLD (FT)	N/A	N/A	N/A	N/A
	TOUCHDOWN ZONE (TDZ) (FT)	7539.5	7538.4	7536.0	7533.3
	HIGH POINT (FT)	7539.5		7536.0	
	LOW POINT (FT)	7537.2		7532.0	
RUNWAY LIGHTING TYPE		HIRL		MIRL	
RUNWAY PROTECTION ZONE (RPZ)	APPROACH (FT)	1,000 x 1,750 x 2,500	500 x 1,010 x 1,700	250 x 450 x 1,000	250 x 450 x 1,000
	DEPARTURE (F)	500 x 1,010 x 1,700	500 x 1,010 x 1,700	250 x 450 x 1,000	250 x 450 x 1,000
RUNWAY MARKING TYPE		PRECISION	PRECISION	NON-PRECISION	NON-PRECISION
14 CFR PART 77 APPROACH SURFACES	APPROACH TYPE	PRECISION	NON-PRECISION	VISUAL	VISUAL
	VISIBILITY MINIMUMS (FT)	2400	5000	N/A	N/A
	APPROACH SURFACE DIMENSIONS (FT)	1,000 x 16,000 x 10,000' x 40,000	500 x 3,500 x 10,000	250 x 1,250 x 5,000	250 x 1,250 x 5,000
	APPROACH SURFACE SLOPE	50:1 / 40:1	34:1	20:1	20:1
TYPE OF AERONAUTICAL SURVEY REQUIRED FOR APPROACH		VERTICAL		NON-VERTICAL	
RUNWAY DEPARTURE SURFACE (YES OR N/A)		YES	YES	N/A	N/A
RUNWAY OBJECT FREE AREA (ROFA)	WIDTH (FT)	800		250	
	LENGTH BEYOND RUNWAY END (FT)	1,000	1,000	240	240
OBSTACLE FREE ZONE (OFZ)	WIDTH (FT)	400		250	
	LENGTH BEYOND RUNWAY END (FT)	200	200	200	200
THRESHOLD SITING SURFACE (TSS)	DIMENSIONS (FT)	800 x 3,800 x 10,000	800 x 3,800 x 10,000	250 x 700 x 5,000	250 x 700 x 5,000
	SLOPE	34:1	20:1	20:1	20:1
	PENETRATIONS	NONE	NONE	NONE	NONE
VISUAL AND INSTRUMENT NAVAIDS		PAPI-4, MALSR, GLIDE SLOPE ANTENNA, LOCALIZER ANTENNA, REIL's	VASI-4, REIL's	PAPI-2 / REILS	PAPI-2 / REILS

TAXIWAY AND TAXILANE DIMENSIONS

TAXIWAYS AND TAXILANES	TW A & CONNECTORS (E)(F)	TW B & CONNECTORS (F)	TW C & CONNECTORS (F)
TAXIWAY AND TAXILANE DESIGN GROUP (TDG)	2	2	1
TAXIWAY AND TAXILANE WIDTH (FT)	35	35	25
TAXIWAY AND TAXILANE SAFETY AREA (FT)	79	79	49
TAXIWAY AND TAXILANE OBJECT FREE AREA (FT)	131 / 115	131 / 115	89 / 79
TAXIWAY AND TAXILANE SEPARATION (FT)	105 / 97	105 / 97	70 / 64
TAXIWAY AND TAXILANE LIGHTING	MITL	MITL	MITL

HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD 83); VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM 1988 (NAVD 88). ELEVATIONS & RUNWAY END COORDINATES FROM AGIS SURVEY DATED 12/19/18.

MODIFICATION TO STANDARDS APPROVAL

	STANDARD TO BE MODIFIED	EXISTING	APPROVAL DATE	CASE #
NONE				

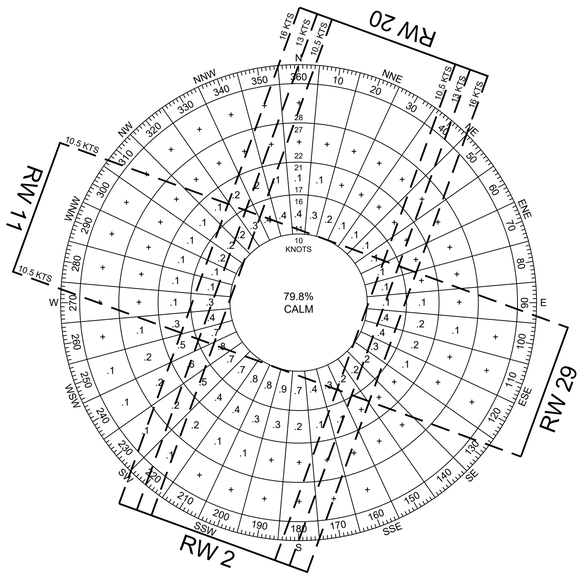
AIRPORT DATA

ITEM		EXISTING (E)	FUTURE (F)
AIRPORT REFERENCE CODE (ARC)		C-II	C-II
MEAN MAX. TEMP OF HOTTEST MONTH (°F) (JULY)		80.8	TBD
AIRPORT ELEVATION (MSL, FT) (NAVD 88) *		7539.5	7539.5
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	LATITUDE	N 37° 26' 06"	N 37° 26' 05"
	LONGITUDE	W 105° 52' 04"	W 105° 51' 51"
AIRPORT NAVIGATIONAL AIDS		BEACON, ILS	BEACON, ILS
MISCELLANEOUS FACILITIES		ASOS, SEGMENTED CIRCLE, WIND CONES	ASOS, SEGMENTED CIRCLE, WIND CONES
ARC AND CRITICAL AIRCRAFT	ARC	C-II	C-II
	AIRCRAFT	CRJ-200	CRJ-700
	WINGSPAN (FT)	61.8	76.3
	UNDERCARRIAGE WIDTH (FT)	10.4	16.4
	APPROACH SPEED (KTS)	125	135
AIRPORT MAGNETIC VARIATION	VARIATION	8° 8' E	TBD
	DATE	5/10/2021	TBD
	SOURCE	NOAA	TBD
NPIAS SERVICE LEVEL		PRIMARY COMMERCIAL	PRIMARY COMMERCIAL
STATE EQUIVALENT SERVICE		COMMERCIAL	COMMERCIAL

* ELEVATIONS FROM AGIS SURVEY DATED 12/19/18.

DECLARED DISTANCES

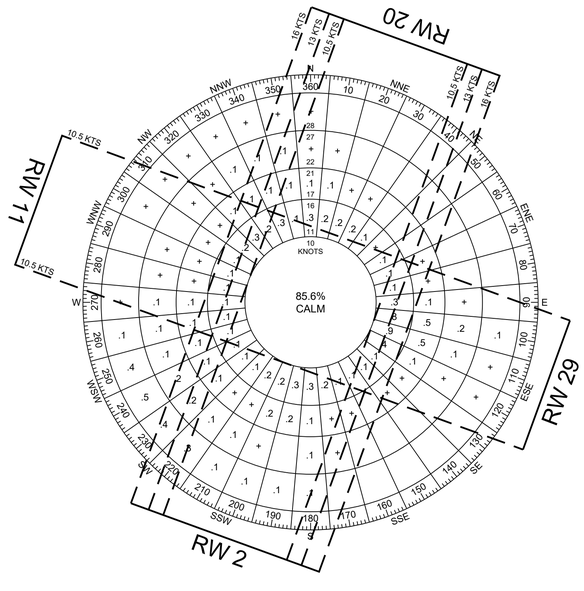
	RUNWAY OPERATIONAL DIRECTION	TORA	TODA	ASDA	LDA	STOPWAY PROVIDED	CLEARWAY PROVIDED	FAA APPROVAL DATE
EXISTING / FUTURE	2	8,521'	8,521'	8,521'	8,521'	NO	NO	N/A
	20	8,521'	8,521'	8,521'	8,521'	NO	NO	N/A
FUTURE	11	4,500'	4,500'	4,500'	4,500'	NO	NO	N/A
	29	4,500'	4,500'	4,500'	4,500'	NO	NO	N/A



RUNWAY	10.5 KNOTS 13 MPH	13 KNOTS 16 MPH	16 KNOTS 20 MPH
2/20	92.28%	95.29%	97.88%
11/29	87.32%	N/A	N/A
COMB.	96.99%	N/A	N/A

ALL WEATHER WIND ROSE

WIND DATA SOURCE: SAN LUIS VALLEY REGIONAL AIRPORT ASOS (COLLECTION BETWEEN 2011 - 2021). NUMBER OF OBSERVATIONS: 96,420



RUNWAY	VISIBILITY MINIMUMS	10.5 KNOTS 13 MPH	13 KNOTS 16 MPH	16 KNOTS 20 MPH
2/20	IFR	92.28%	95.29%	97.88%
11/29	IFR	92.41%	N/A	N/A
COMB.	IFR	96.65%	N/A	N/A

IFR WIND ROSE

WIND DATA SOURCE: SAN LUIS VALLEY REGIONAL AIRPORT ASOS (COLLECTION BETWEEN 2011 - 2021). NUMBER OF OBSERVATIONS: 96,420

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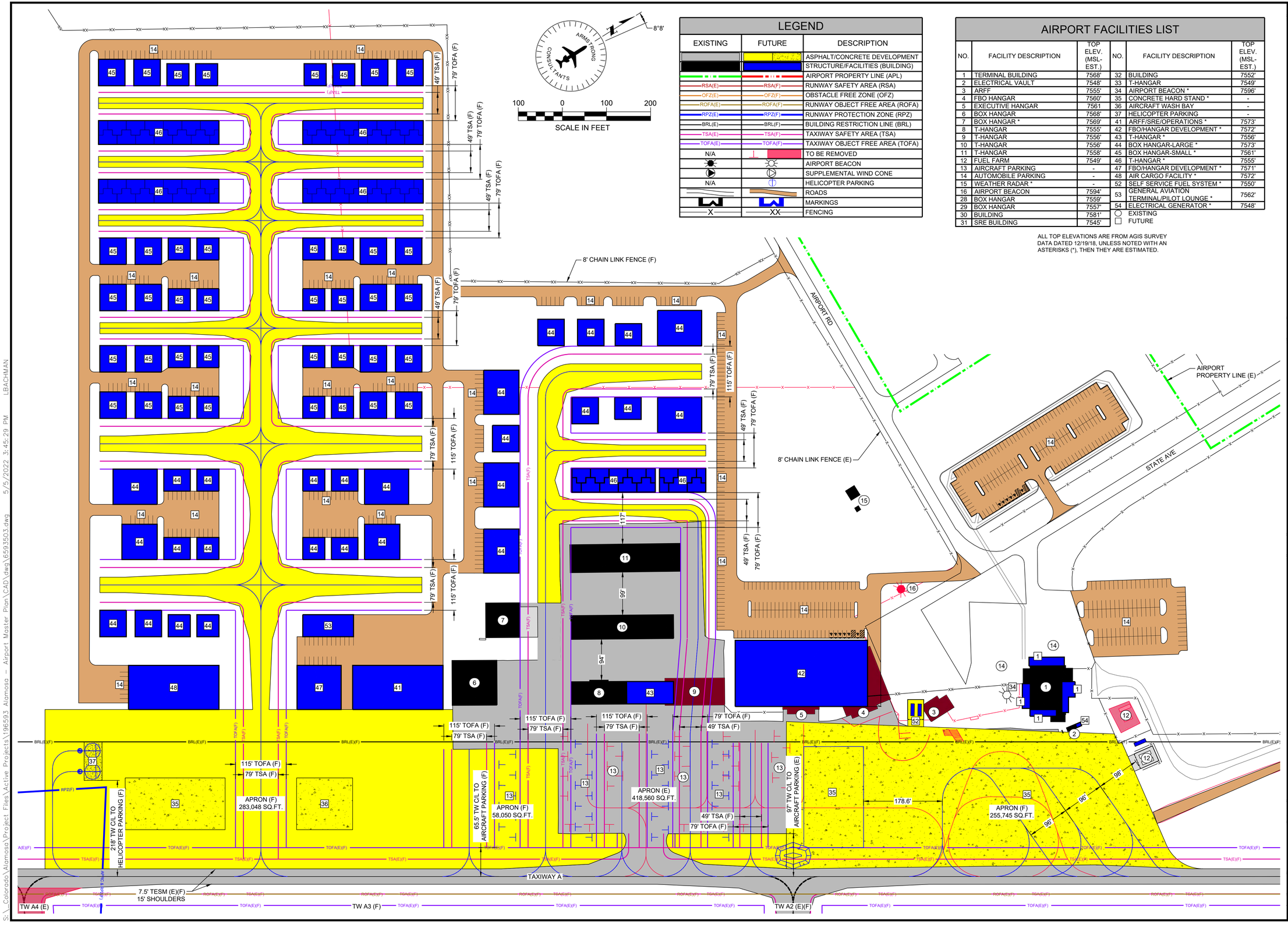
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ALAMOSA, COLORADO
AIP No. 3-08-0002-024-2019
AIRPORT LAYOUT PLAN

No.	ACI No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd
0	196593	05/2022	ORIGINAL ISSUE	6593502	LKB	MJT	JZP

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AIRPORT DATA SHEET

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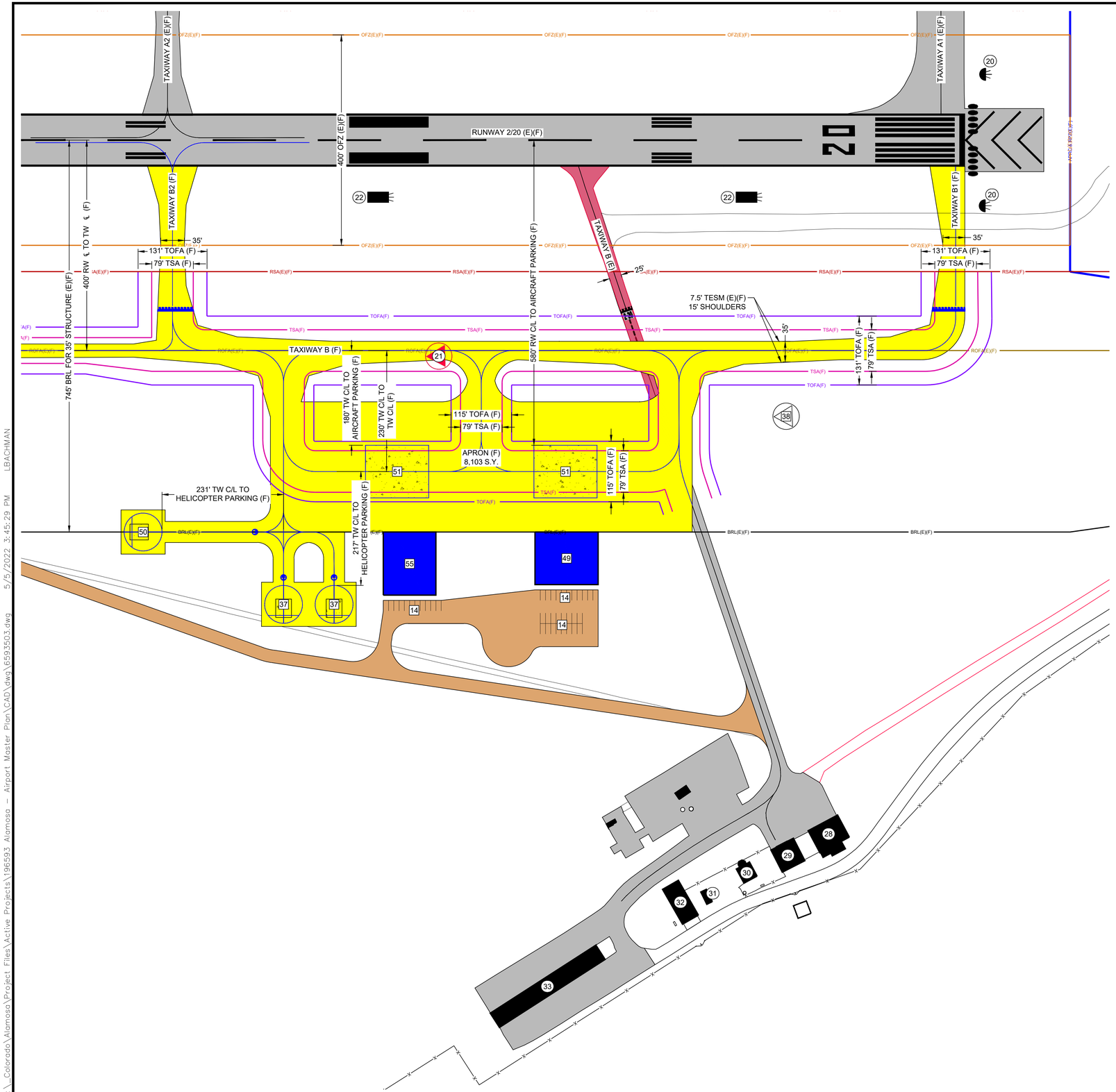
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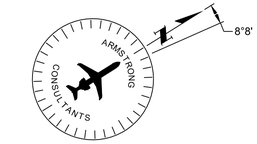
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TERMINAL AREA DRAWING

Sheet: 4 of: 24





LEGEND		
EXISTING	FUTURE	DESCRIPTION
		ASPHALT/CONCRETE DEVELOPMENT
		STRUCTURE/FACILITIES (BUILDING)
		AIRPORT PROPERTY LINE (APL)
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)
N/A	T	TO BE REMOVED
0000 0000	0000 0000	THRESHOLD LIGHTS
		REIL
		VASI/PAPI
		AIRPORT BEACON
		SUPPLEMENTAL WIND CONE
N/A		HELICOPTER PARKING
		ROADS
		MARKINGS
X	XX	FENCING

AIRPORT FACILITIES LIST

NO.	FACILITY DESCRIPTION	TOP ELEV. (MSL-EST.)
14	AUTOMOBILE PARKING	-
20	REIL'S	-
21	WIND CONE	7549'
22	PAPI'S / VASI'S	-
28	BOX HANGAR	7559'
29	BOX HANGAR	7557'
30	BUILDING	7581'
31	SRE BUILDING	7545'
32	BUILDING	7552'
33	T-HANGAR	7549'
37	HELICOPTER PARKING	-
38	SUPPLEMENTAL WIND CONE *	7546'
49	AIR TANKER BASE *	7571'
50	HELICOPTER TESTING TETHER POINT *	-
51	AIR TANKER RE-LOADING PITS *	-
55	HELICOPTER TESTING HANGAR/OFFICES *	7571'

◯ EXISTING
☐ FUTURE

ALL TOP ELEVATIONS ARE FROM AGIS SURVEY DATA DATED 12/19/18, UNLESS NOTED WITH AN ASTERISKS (*), THEN THEY ARE ESTIMATED.

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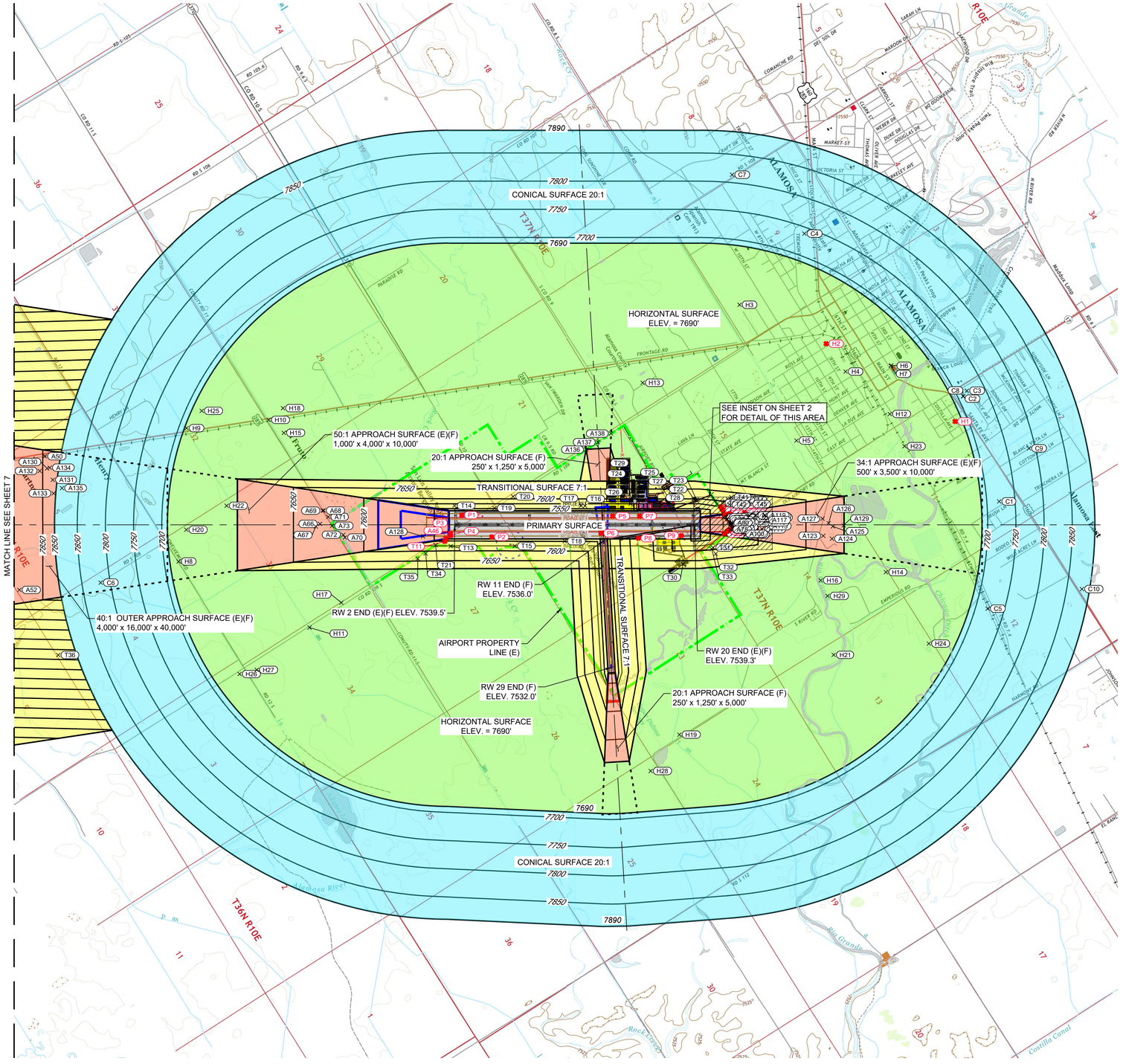
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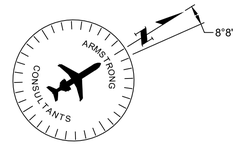
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PLAN (E)(F)

SCALE: PER BARSCALE



2000 0 2000 4000

SCALE IN FEET

NOTES

A. REFER TO "INNER PORTION OF THE APPROACH SURFACE" DRAWINGS FOR DETAILS ON ANY CLOSE-IN APPROACH OBSTRUCTIONS.

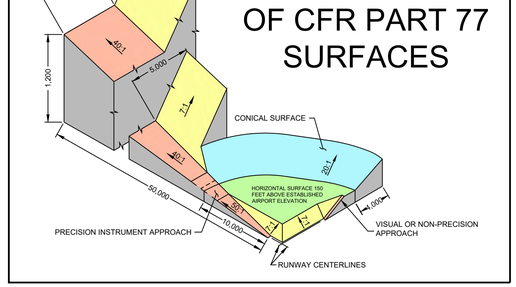
B. AN FAA FORM 7460-1, "NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION" MUST BE SUBMITTED FOR ANY CONSTRUCTION OR ALTERATION (INCLUDING HANGARS AND OTHER ON-AIRPORT AND OFF-AIRPORT STRUCTURES, TOWERS, ETC.) WITHIN 20,000 HORIZONTAL FEET OF THE AIRPORT GREATER IN HEIGHT THAN AN IMAGINARY SURFACE EXTENDING OUTWARD AND UPWARD FROM THE RUNWAY AT A SLOPE OF 100 TO 1 OR GREATER IN HEIGHT THAN 200 FEET ABOVE GROUND LEVEL.

C. APPROACH SURFACES BASED ON ULTIMATE CONDITION.

D. OBSTRUCTION INFORMATION WAS DETERMINED FROM IFPA / OAS OBSTACLE DATA DOWNLOADED 09/01/2020 AND TOP ELEVATIONS ESTIMATED FROM 30m DEM AND AN INQUIRY OF THE FAA OE/AAA DATABASE.

NOTES:

1. SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, REMOVE OR TAKE APPROPRIATE ACTION PER FAA FLIGHT PROCEDURES OFFICE DETERMINATIONS.
2. TOP ELEVATIONS AND OBJECT LOCATIONS OBTAINED FROM IFPA / OAS OBSTACLE DATA DOWNLOADED 09/01/2020.
3. * TOP ELEVATIONS ESTIMATED FROM 30m DEM.
4. ** TOP ELEVATIONS FROM OE/AAA DATA BASE.
5. AIRPORT ELEVATION: 7539.5'



LEGEND

- HORIZONTAL SURFACE
- TRANSITIONAL SURFACE
- CONICAL SURFACE
- APPROACH SURFACE
- PRIMARY SURFACE
- WATERWAY

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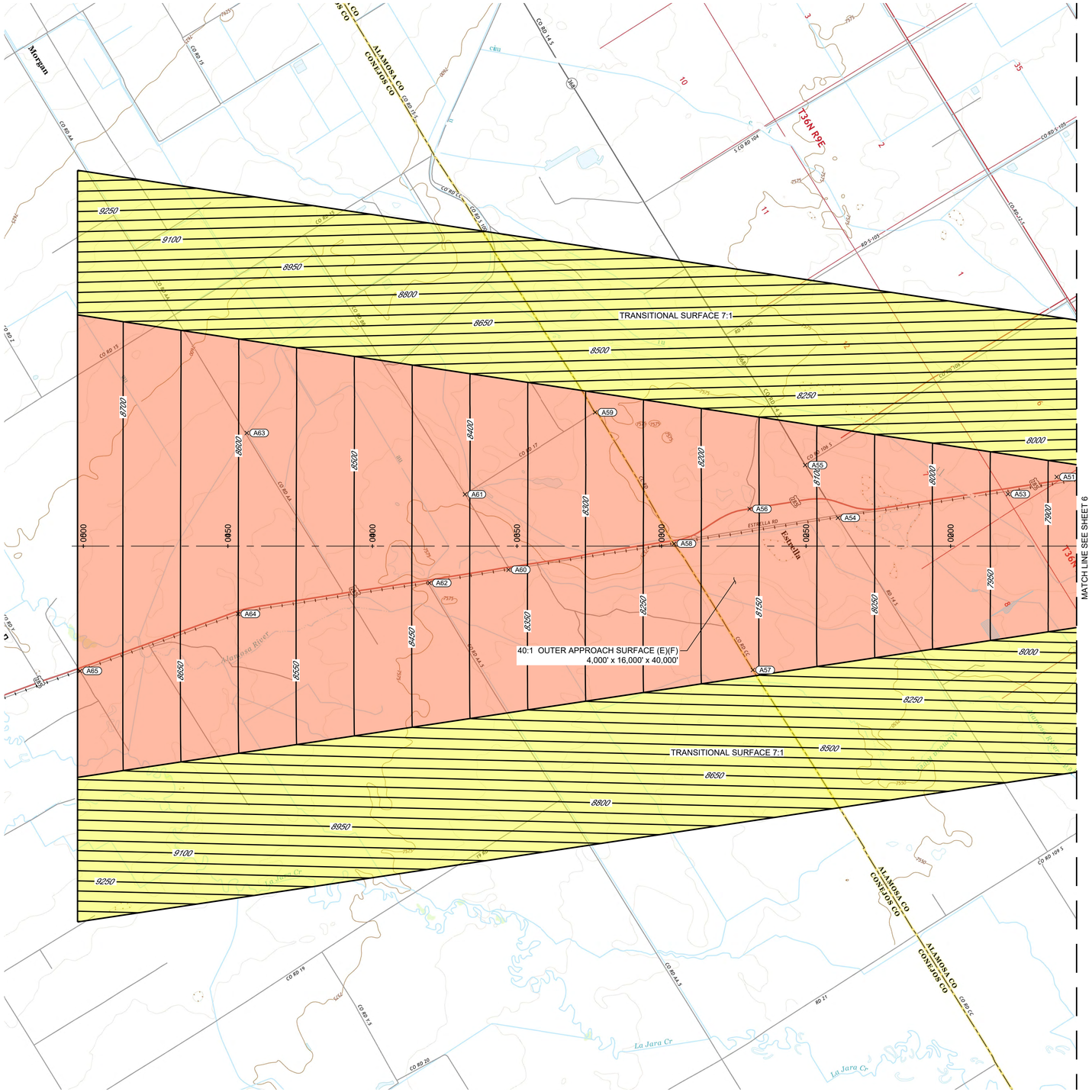
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0	196593	05/2022	ORIGINAL ISSUE	6593504	LKB	MJT	JZP

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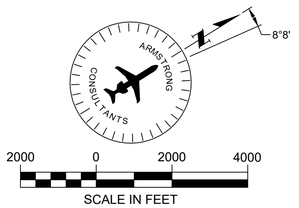
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PLAN (E)(F)

SCALE: PER BARSCALE



LEGEND

- HORIZONTAL SURFACE
- TRANSITIONAL SURFACE
- CONICAL SURFACE
- APPROACH SURFACE
- PRIMARY SURFACE
- WATERWAY

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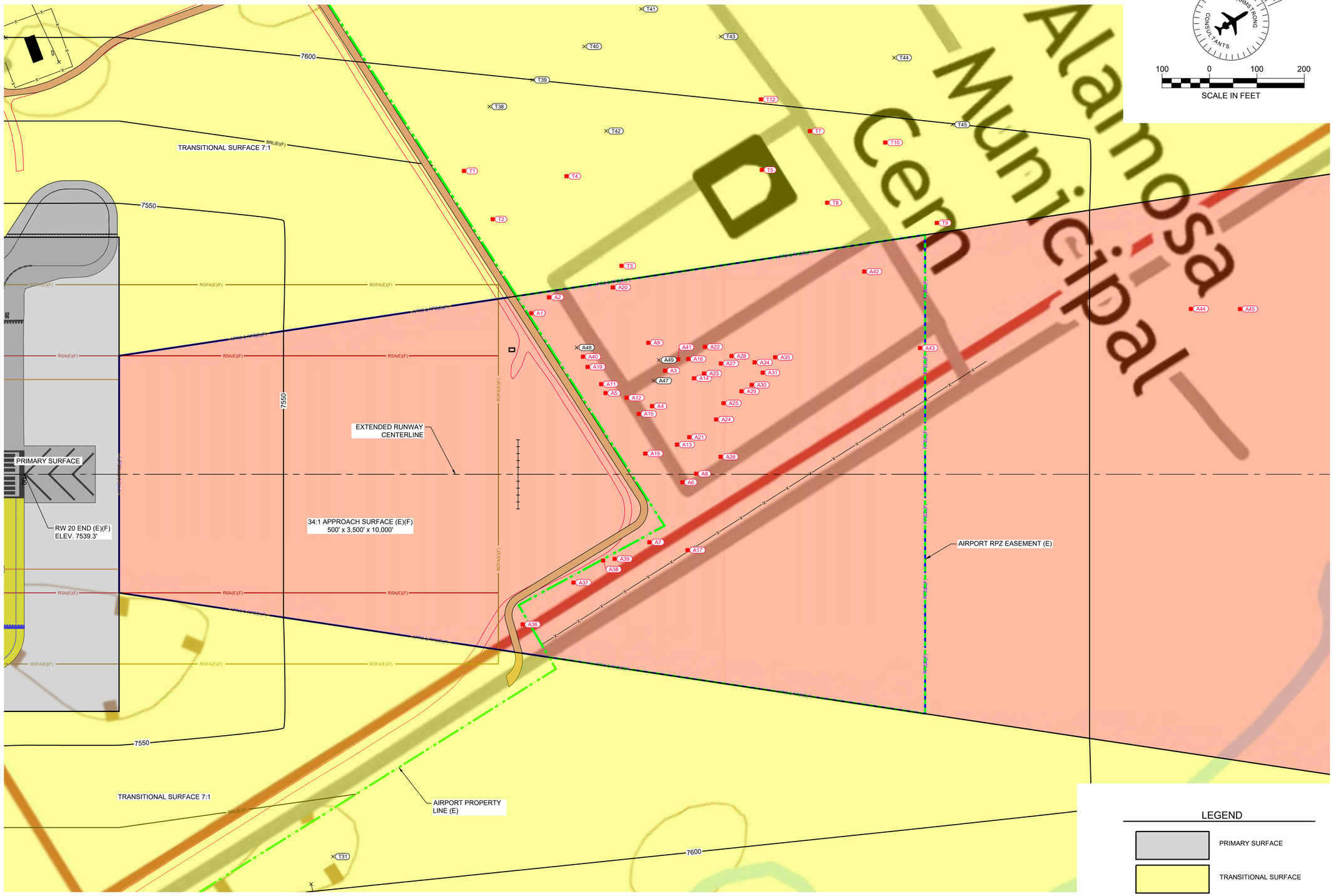
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(INSET) RUNWAY 20 END PLAN (E)(F)

SCALE: PER BARSCALE

8°8'

100 0 100 200

SCALE IN FEET

LEGEND

- PRIMARY SURFACE
- TRANSITIONAL SURFACE
- APPROACH SURFACE

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OBSTRUCTION CHART

	ITEM NO.	DESCRIPTION	GROUND ELEVATION (MSL FEET)	TOP ELEVATION (AGIS FEET)	PENETRATION (FEET)	REMARKS
APPROACH	A1	TREE	7537	7577	+12	SEE NOTE 1
	A2	TREE	7537	7595	+29	SEE NOTE 1
	A3	TREE	7538	7592	+18	SEE NOTE 1
	A4	TREE	7538	7583	+10	SEE NOTE 1
	A5	TREE	7538	7585	+15	SEE NOTE 1
	A6	TREE	7537	7576	+1	SEE NOTE 1
	A7	TREE	7538	7574	+1	SEE NOTE 1
	A8	TREE	7537	7581	+5	SEE NOTE 1
	A9	TREE	7537	7583	+10	SEE NOTE 1
	A10	TREE	7538	7587	+15	SEE NOTE 1
	A11	TREE	7538	7585	+15	SEE NOTE 1
	A12	TREE	7538	7586	+15	SEE NOTE 1
	A13	TREE	7537	7577	+3	SEE NOTE 1
	A14	TREE	7538	7592	+17	SEE NOTE 1
	A15	TREE	7538	7584	+12	SEE NOTE 1
	A16	TREE	7537	7595	+20	SEE NOTE 1
	A17	TREE	7538	7579	+4	SEE NOTE 1
	A19	TREE	7537	7570	+1	SEE NOTE 1
	A20	TREE	7537	7606	+36	SEE NOTE 1
	A21	TREE	7537	7583	+8	SEE NOTE 1
	A22	TREE	7538	7597	+21	SEE NOTE 1
	A23	TREE	7538	7597	+21	SEE NOTE 1
	A24	TREE	7537	7586	+9	SEE NOTE 1
	A25	TREE	7537	7592	+15	SEE NOTE 1
	A26	TREE	7537	7579	+2	SEE NOTE 1
	A27	TREE	7537	7600	+23	SEE NOTE 1
	A28	TREE	7537	7588	+10	SEE NOTE 1
	A29	TREE	7537	7585	+7	SEE NOTE 1
	A30	TREE	7537	7585	+6	SEE NOTE 1
	A31	TREE	7537	7587	+7	SEE NOTE 1
	A34	TREE	7537	7595	+16	SEE NOTE 1
	A35	TREE	7537	7592	+12	SEE NOTE 1
	A36	TREE	7537	7572	+7	SEE NOTE 1
	A37	TREE	7538	7577	+9	SEE NOTE 1
	A38	TREE	7537	7574	+4	SEE NOTE 1
	A39	TREE	7538	7573	+2	SEE NOTE 1
	A40	TREE	7537	7585	+16	SEE NOTE 1
	A41	TREE	7538	7590	+16	SEE NOTE 1
	A42	TREE	7538	7612	+26	SEE NOTE 1
	A43	TREE	7537	7595	+6	SEE NOTE 1
	A44	TREE	7537	7607	+1	SEE NOTE 1
	A45	TREE	7537	7612	+3	SEE NOTE 1
	A46	SIGN	7537	7545	+3	SEE NOTE 1
	A47	TREE	7538	7592	+19	SEE NOTE 1
	A48	TREE	7537	7583	+15	SEE NOTE 1
	A49	TREE	7538	7592	+19	SEE NOTE 1
	A50	*RAILROAD	7559	7581	-354	
	A51	TREE	7561	7640	-253	
	A52	TRANSMISSION_LINE	7551	7618	-253	
	A53	TRANSMISSION_LINE	7559	7644	-291	
	A54	*RAILROAD	7559	7586	-349	
	A55	*TRAVERSE_WAY	7559	7584	-351	
	A56	*TRAVERSE_WAY	7559	7584	-351	
	A57	*TRAVERSE_WAY	7559	7573	-362	
	A58	*RAILROAD	7559	7590	-345	
	A59	*TRAVERSE_WAY	7559	7594	-341	
	A60	*RAILROAD	7559	7598	-337	
	A61	*TRAVERSE_WAY	7559	7596	-339	
	A62	*RAILROAD	7559	7599	-336	
	A63	*TRAVERSE_WAY	7559	7607	-328	
	A64	*RAILROAD	7559	7606	-329	
	A65	*RAILROAD	7559	7619	-316	
	A66	BUILDING	7540	7564	-67	
	A67	BUILDING	7541	7564	-70	
	A68	VEGETATION	7540	7549	-80	
	A69	TRAVERSE_WAY	7540	7552	-77	
	A70	TREE	7534	7547	-66	
	A71	TREE	7537	7550	-75	
	A72	TREE	7535	7547	-68	
	A73	TRAVERSE_WAY	7541	7552	-71	
	A74	BUILDING	7536	7550	-14	
	A75	TREE	7538	7565	-6	
	A76	TREE	7537	7560	-7	
	A77	TREE	7537	7559	-9	
	A78	TREE	7538	7569	-1	
	A79	TREE	7538	7569	-1	SEE NOTE 1

OBSTRUCTION CHART

	ITEM NO.	DESCRIPTION	GROUND ELEVATION (MSL FEET)	TOP ELEVATION (AGIS FEET)	PENETRATION (FEET)	REMARKS
APPROACH	A80	TREE	7538	7570	-1	SEE NOTE 1
	A81	TREE	7538	7561	-10	
	A82	TREE	7538	7568	-3	
	A83	TREE	7538	7563	-9	
	A84	TREE	7538	7566	-7	
	A85	TREE	7538	7571	-2	
	A86	TREE	7538	7572	-2	
	A87	TREE	7538	7576	-1	
	A88	TREE	7538	7565	-13	
	A89	TREE	7538	7564	-8	
	A90	TREE	7538	7566	-6	
	A91	TREE	7538	7567	-5	
	A92	TREE	7538	7567	-7	
	A93	TREE	7537	7565	-8	
	A94	TREE	7537	7564	-10	
	A95	TREE	7537	7563	-12	
	A96	TREE	7537	7573	-3	
	A97	TREE	7537	7567	-11	
	A98	TREE	7537	7569	-9	
	A99	TREE	7537	7572	-7	
	A100	BUILDING	7536	7558	-26	
	A101	POLE	7536	7566	-21	
	A102	TREE	7537	7570	-11	
	A103	TREE	7537	7566	-15	
	A104	TREE	7537	7572	-11	
	A105	TREE	7537	7577	-9	
	A106	TREE	7537	7577	-10	
	A107	TREE	7537	7576	-12	
	A108	TREE	7537	7582	-6	
	A109	TREE	7538	7576	-15	
	A110	TREE	7538	7583	-9	
	A111	POLE	7537	7576	-28	
	A112	TREE	7537	7577	-19	
	A113	TREE	7537	7587	-10	
	A114	TREE	7537	7590	-8	
	A115	POLE	7537	7575	-34	
	A116	TREE	7537	7585	-22	
	A117	TREE	7537	7589	-19	
	A118	TREE	7537	7597	-11	
	A119	TREE	7537	7603	-4	
	A120	TREE	7537	7583	-26	
	A121	TREE	7537	7607	-2	
	A122	TREE	7537	7585	-25	
	A123	ANTENNA	7537	7641	-27	
	A124	TREE	7537	7600	-77	
	A125	TRANSMISSION_LINE	7537	7589	-89	
	A126	TRANSMISSION_LINE	7537	7594	-80	
	A127	TRANSMISSION_LINE	7537	7595	-72	
	A128	BUILDING	7537	7554	-4	
	A129	TREE	7537	7601	-88	
	A130	**SOLAR_PANEL	7559	7568	-367	
	A131	**SOLAR_PANEL	7559	7566	-369	
	A132	**SOLAR_PANEL	7559	7567	-368	
	A133	**SOLAR_PANEL	7559	7567	-368	
	A134	**SOLAR_PANEL	7559	7564	-371	
	A135	**SOLAR_PANEL	7559	7566	-369	
	A136	TRAVERSE_WAY	7540	7555	-74	
	A137	TRAVERSE_WAY	7540	7556	-73	
	A138	TRAVERSE_WAY	7540	7556	-73	
CONICAL	C1	GRAIN_ELEVATOR	7538	7586	-136	
	C2	ANTENNA	7540	7699	-10	
	C3	POLE	7540	7573	-146	
	C4	ANTENNA	7549	7711	-28	
	C5	POLE	7534	7592	-129	
	C6	TREE	7551	7623	-194	
	C7	WATER_TOWER	7552	7709	-105	
	C8	TOWER	7540	7698	-11	
	C9	TREE	7540	7632	-156	
	C10	TREE	7535	7619	-257	
HORIZONATAL	H1	ANTENNA	7540	7712	+22	SEE NOTE 1
	H2	WATER_TOWER	7545	7718	+28	SEE NOTE 1
	H3	ANTENNA	7546	7680	-10	
	H4	ANTENNA	7543	7671	-19	
	H5	ANTENNA	7539	7646	-44	
	H6	BLDG_TWR	7541	7672	-18	
	H7	ANTENNA	7541	7663	-27	SEE NOTE 1

OBSTRUCTION CHART

	ITEM NO.	DESCRIPTION	GROUND ELEVATION (MSL FEET)	TOP ELEVATION (AGIS FEET)	PENETRATION (FEET)	REMARKS
HORIZONATAL	H8	POLE	7548	7582	-108	
	H9	POLE	7548	7587	-103	
	H10	POLE	7543	7593	-97	
	H11	POLE	7540	7573	-117	
	H12	TOWER	7540	7631	-59	
	H13	TOWER	7543	7597	-93	
	H14	TRANSMISSION_LINE	7535	7599	-91	
	H15	TREE	7542	7616	-74	
	H16	TREE	7535	7620	-70	
	H17	TREE	7539	7593	-97	
	H18	TREE	7541	7605	-85	
	H19	TREE	7530	7579	-111	
	H20	TREE	7549	7629	-61	
	H21	TREE	7533	7603	-87	
	H22	TREE	7546	7606	-84	
	H23	TREE	7540	7629	-61	
	H24	TREE	7534	7602	-88	
	H25	TREE	7547	7598	-92	
	H26	TREE	7543	7625	-65	
	H27	TREE	7543	7631	-59	
	H28	TREE	7528	7581	-109	
	H29	TREE	7535	7622	-68	
PRIMARY	P1	VEGETATION	7537	7543	+3	SEE NOTE 1
	P2	VEGETATION	7534	7542	+2	SEE NOTE 1
	P3	POLE	7537	7542	+2	SEE NOTE 1
	P4	VEGETATION	7536	7543	+4	SEE NOTE 1
	P5	VEGETATION	7538	7544	+4	SEE NOTE 1
	P6	VEGETATION	7536	7543	+3	SEE NOTE 1
	P7	VEGETATION	7538	7543	+3	SEE NOTE 1
	P8	VEGETATION	7538	7544	+4	SEE NOTE 1
	P9	VEGETATION	7534	7546	+6	SEE NOTE 1
TRANSITIONAL	T1	TREE	7538	7573	+2	SEE NOTE 1
	T2	TREE	7537	7572	+9	SEE NOTE 1
	T3	TREE	7538	7591	+20	SEE NOTE 1
	T4	TREE	7537	7601	+29	SEE NOTE 1
	T5	TREE	7538	7604	+24	SEE NOTE 1
	T7	TREE	7538	7603	+9	SEE NOTE 1
	T8	TREE	7538	7604	+20	SEE NOTE 1
	T9	TREE	7538	7601	+10	SEE NOTE 1
	T10	TREE	7538	7612	+19	SEE NOTE 1
	T11	TREE	7536	7560	+8	SEE NOTE 1
	T12	TREE	7538	7605	+3	SEE NOTE 1
	T13	FENCE	7534	7542	-35	
	T14	FENCE	7536	7540	-25	
	T15	FENCE	7534	7540	-35	
	T16	FENCE	7538	7544	-20	
	T17	FENCE	7537	7541	-24	
	T18	GENERAL_UTILITY	7534	7537	-14	
	T19	SIGN	7536	7543	-10	
	T20	TRAVERSE_WAY	7537	7547	-65	
	T21	TREE	7536	7558	-13	
	T22	ANTENNA	7540	7582	-18	
	T23	ANTENNA	7541	7579	-14	
	T24	BUILDING	7539	7571	-19	
	T25	BUILDING	7540	7555	-32	
	T26	POLE	7539	7570	-5	
	T27	POLE	7538	7582	-2	
	T28	TREE	7538	7572	-9	
	T29	TREE	7538	7560	-48	
	T30	ANTENNA	7535	7581	-86	
	T31	POLE	7534	7565	-25	
	T32	POLE	7534	7560	-63	
	T33	TREE	7534	7562	-36	
	T34	POLE	7536	7570	-42	
	T35	POLE	7536	7573	-65	
	T36	TRANSMISSION_LINE	7547	7612	-516	
	T38	TREE	7537	7588	-3	
	T39	TREE	7538	7584	-16	
	T40	TREE	7538	7586	-26	
	T41	TREE	7538	7582	-43	
	T42	TREE	7538	7577	-10	
	T43	TREE	7538	7601	-18	
	T44	TREE	7538	7589	-29	
	T45	TREE	7538	7597	-3	SEE NOTE 1

NOTES:

1. SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, REMOVE OR TAKE APPROPRIATE ACTION PER FAA FLIGHT PROCEDURES OFFICE DETERMINATIONS.
2. TOP ELEVATIONS AND OBJECT LOCATIONS OBTAINED FROM IFPA / OAS OBSTACLE DATA DOWNLOADED 09/01/2020.
3. * TOP ELEVATIONS ESTIMATED FROM 30m DEM.
4. ** TOP ELEVATIONS FROM OE/AAA DATA BASE.
5. AIRPORT ELEVATION: 7539.5'

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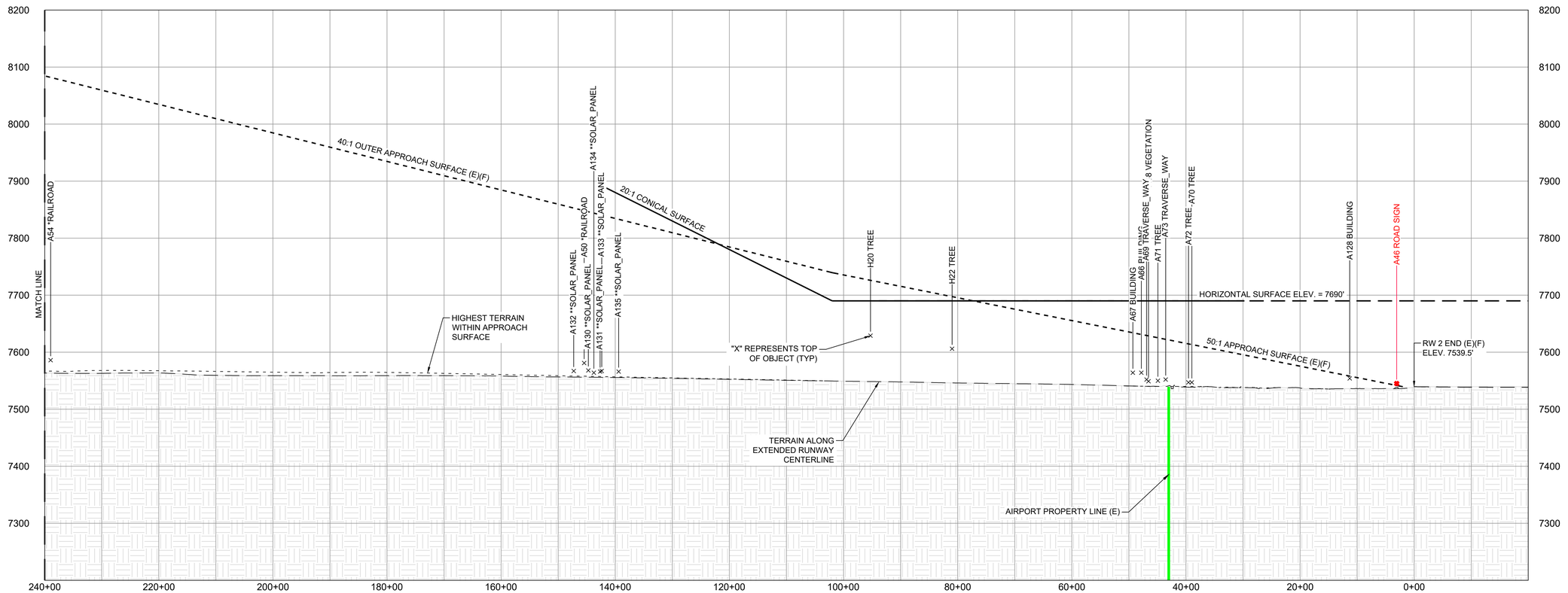
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14 CFR PART "77" OBSTRUCTION TABLE

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RUNWAY 2 END PROFILE (E)(F)

SCALE: PER GRID

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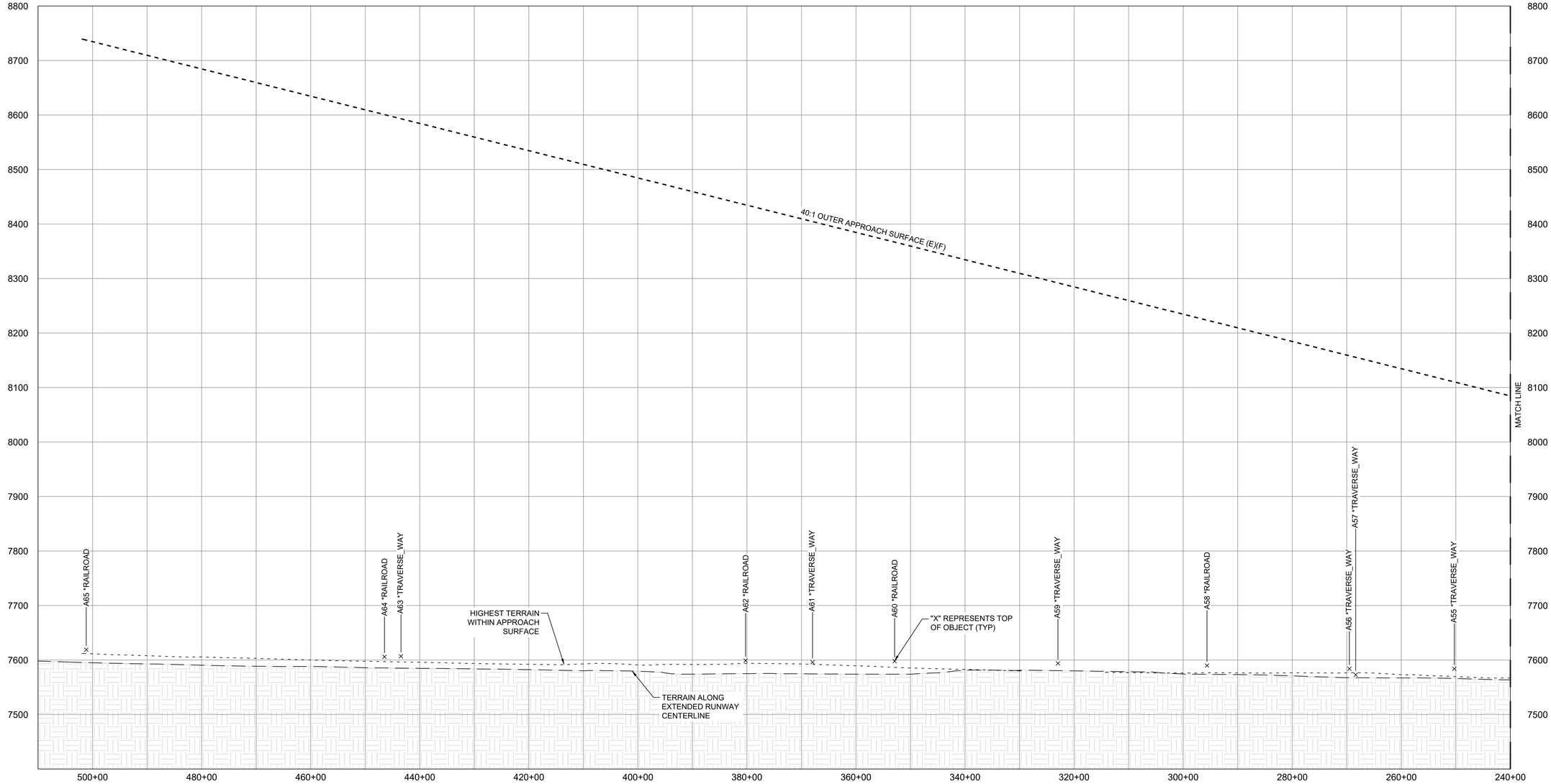
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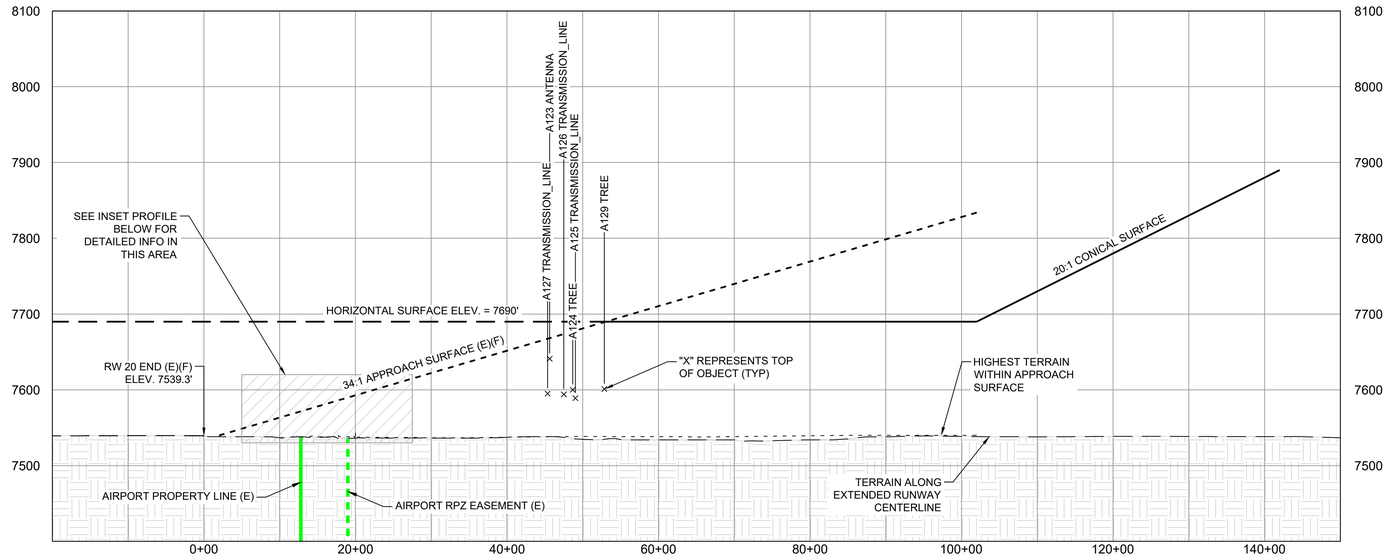
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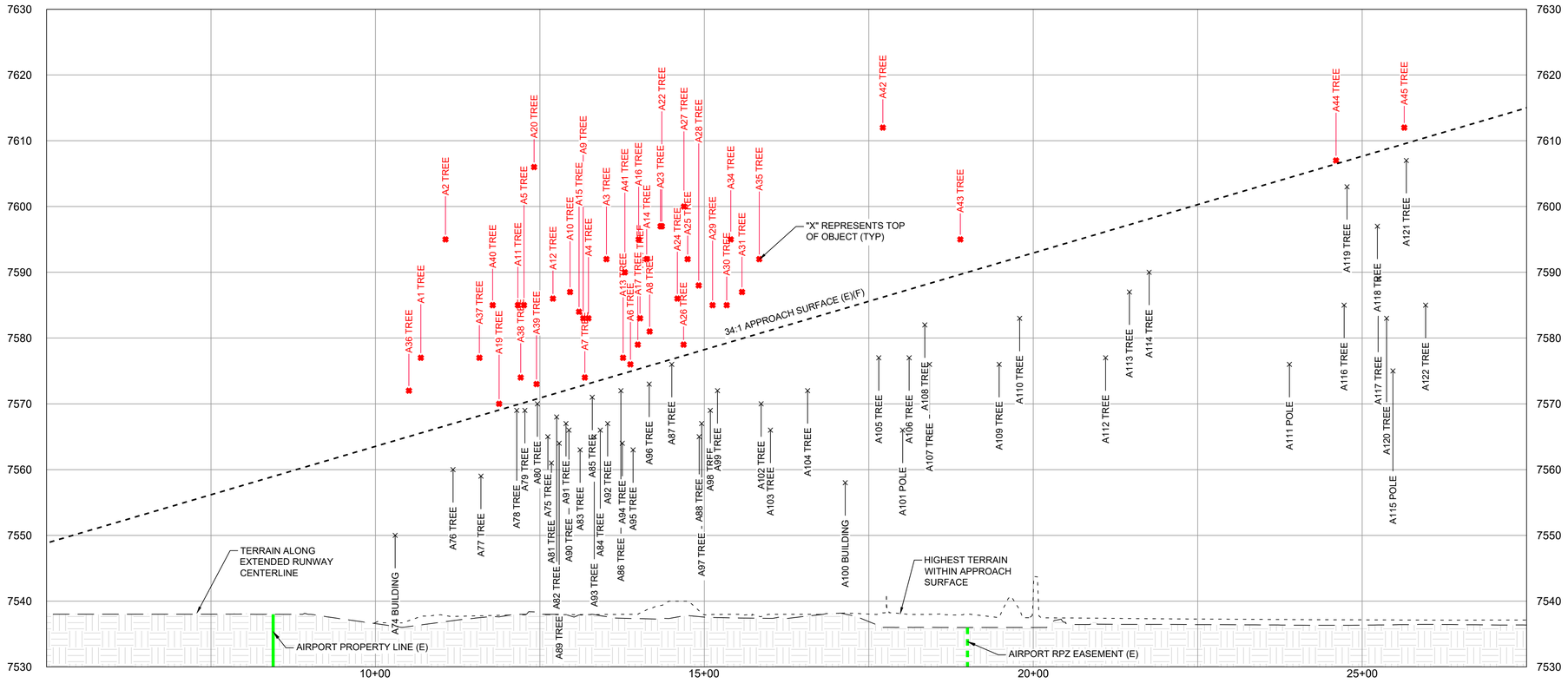
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RUNWAY 20 END PROFILE (E)(F)

SCALE: 1" = 1,000'



(INSET) RUNWAY 20 END PROFILE (E)(F)

SCALE: 1" = 100'

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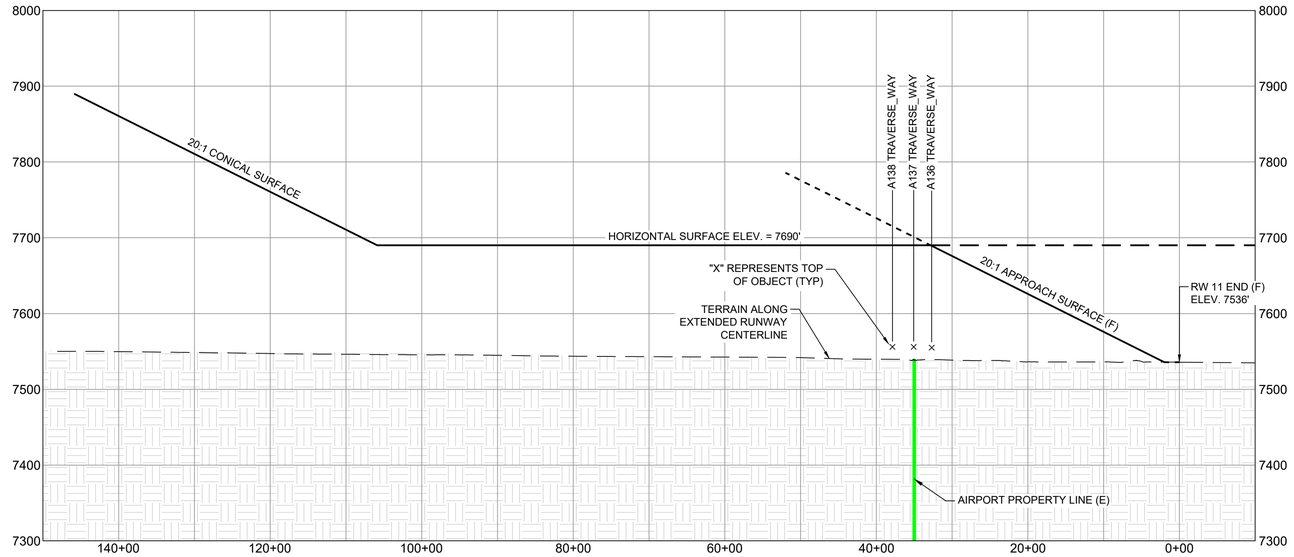
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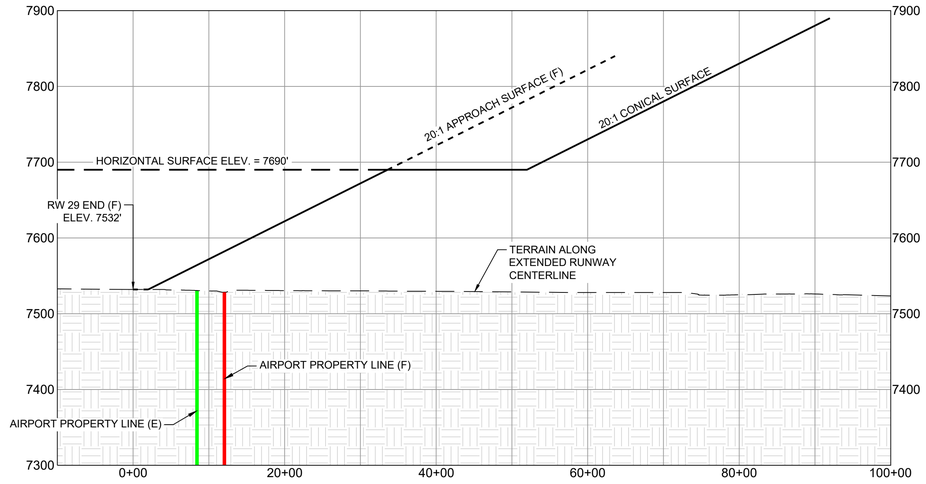
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RUNWAY 11 END PROFILE (F)

SCALE: 1" = 1,000'



RUNWAY 29 END PROFILE (F)

SCALE: 1" = 1,000'

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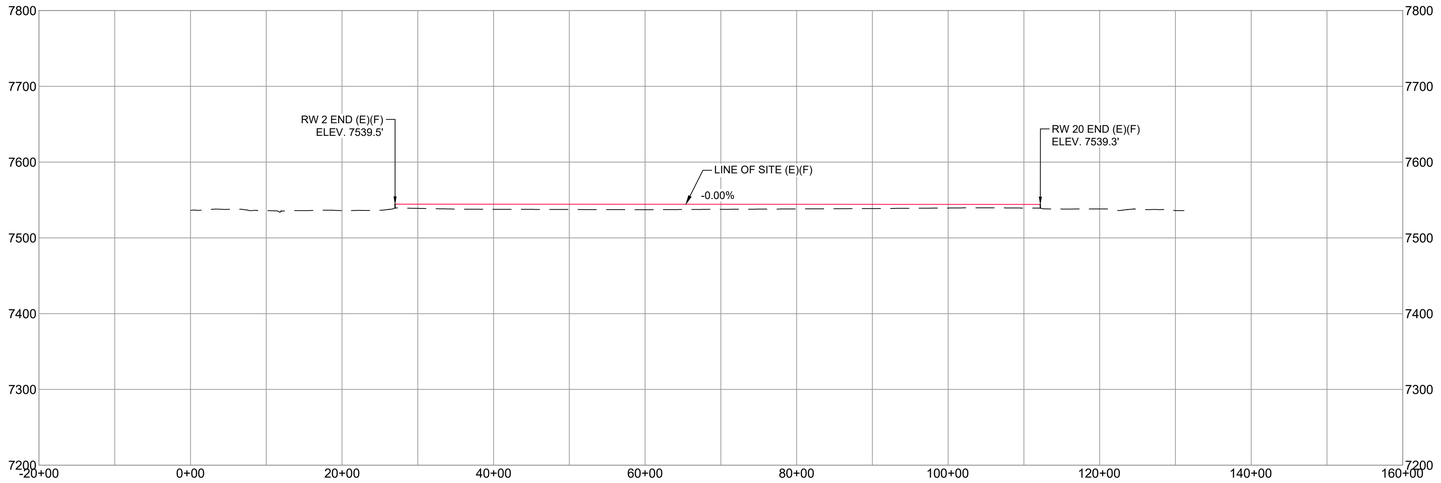
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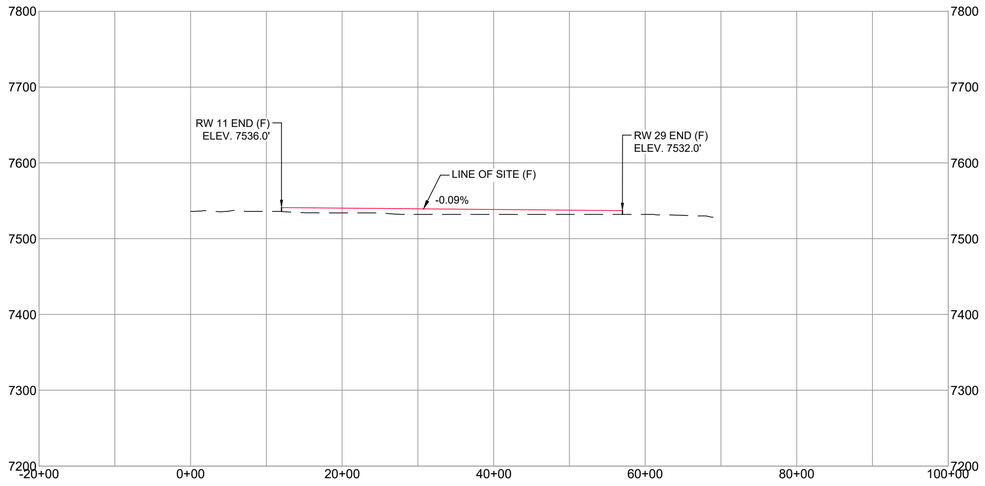
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RUNWAY 2/20 LINE OF SITE PROFILE (E)(F)

SCALE: 1" = 1,000'



RUNWAY 11/29 LINE OF SITE PROFILE (F)

SCALE: 1" = 1,000'

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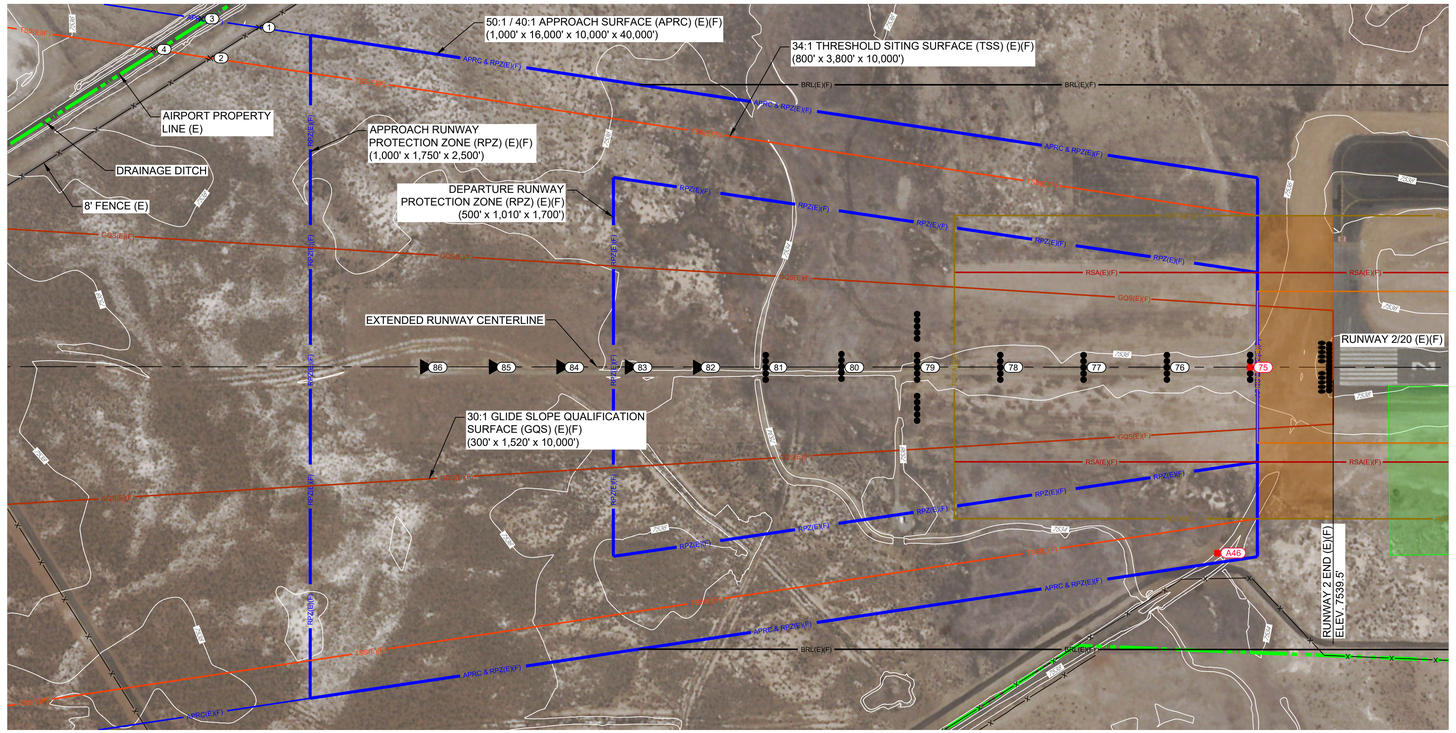
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RUNWAY
LINE OF
SITE
DRAWING

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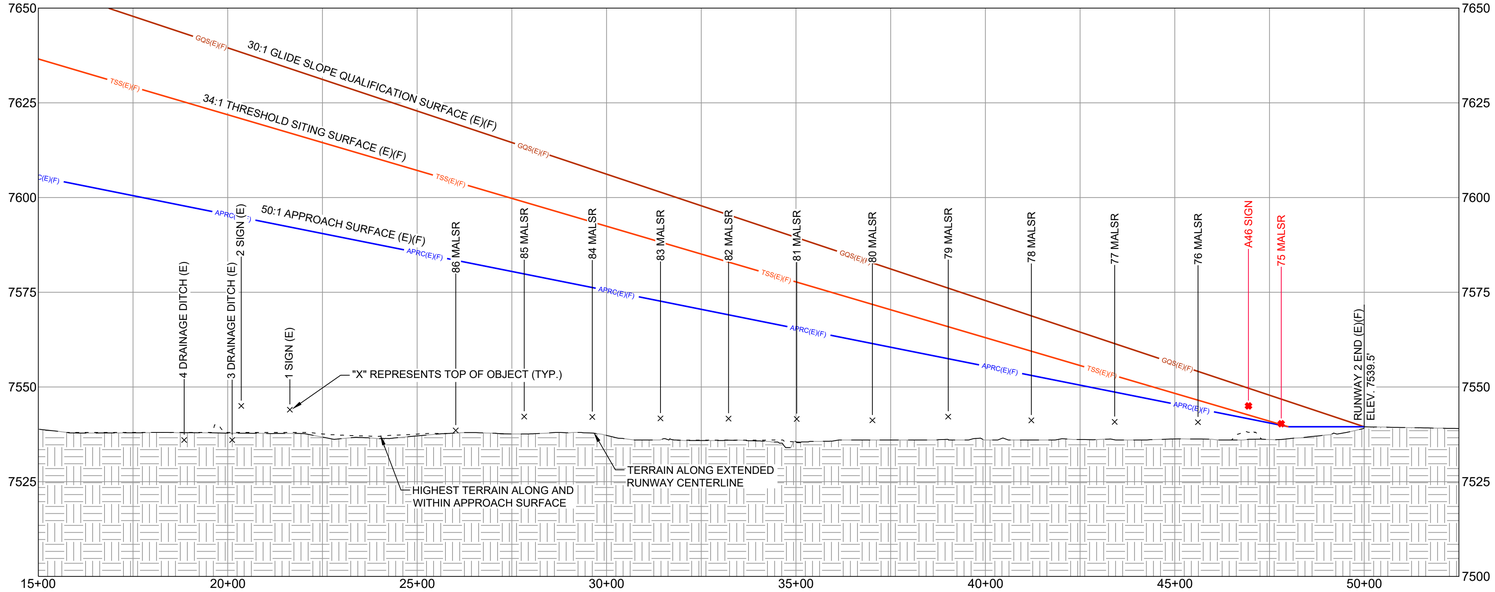
RUNWAY 2 END PLAN (E)(F)

SCALE: PER BAR SCALE

200 0 200 400

SCALE IN FEET

8°8'



RUNWAY 2 END PROFILE (E)(F)

SCALE: PER GRID

OBJECTS WITHIN RUNWAY 2 GQS, APRC AND TSS SURFACES (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL) (FEET)	30:1 GQS PEN.	34:1 TSS PEN.	50:1 APRC SURFACE PEN.	REMARKS
A46	** SIGN (E)	8'	7545'	NWS	NWS	+3'	SEE NOTE 1
1	* FENCE (E)	8'	7544'	NWS	NWS	-	N/A
2	* FENCE (E)	8'	7545'	NWS	-	-	N/A
3	* DRAINAGE DITCH (E)	-	7536'	NWS	NWS	-	N/A
4	* DRAINAGE DITCH (E)	-	7536'	NWS	-	-	N/A
75	** MALSR	4'	7540'	-	-	+1'	SEE NOTE 1
76	** MALSR	4'	7541'	-	-	-	N/A
77	** MALSR	5'	7541'	-	-	-	N/A
78	** MALSR	5'	7541'	-	-	-	N/A
79	** MALSR	6'	7542'	-	-	-	N/A
80	** MALSR	5'	7541'	-	-	-	N/A
81	** MALSR	6'	7542'	-	-	-	N/A
82	** MALSR	6'	7542'	-	-	-	N/A
83	** MALSR	6'	7542'	-	-	-	N/A
84	** MALSR	4'	7542'	-	-	-	N/A
85	** MALSR	5'	7542'	-	-	-	N/A
86	** MALSR	1'	7539'	-	-	-	N/A

NOTES: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).

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NWS = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.

× = OBJECT PENETRATION LOCATION

EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE

NOTE:

1. SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, REMOVE OR TAKE APPROPRIATE ACTION PER FAA FLIGHT PROCEDURES OFFICE DETERMINATIONS.

LEGEND

EXISTING	FUTURE	DESCRIPTION
	ASPHALT CONCRETE	AIRFIELD DEVELOPMENT
		STRUCTURE/FACILITIES (BUILDING)
		AIRPORT PROPERTY LINE (APL)
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)
APRC(E)	APRC(F)	APPROACH SURFACE
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
GQS(E)	GQS(F)	GLIDE PATH QUALIFICATION SURFACE
	N/A	PRECISION OBSTACLE FREE ZONE
	N/A	GLIDE SLOPE CRITICAL AREA
		THRESHOLD LIGHTS
		REIL
	N/A	MALSR
7539	N/A	CONTOURS
		MARKINGS
X	XX	FENCING

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ALAMOSA, COLORADO
AIP No. 3-08-0002-024-2019
AIRPORT LAYOUT PLAN

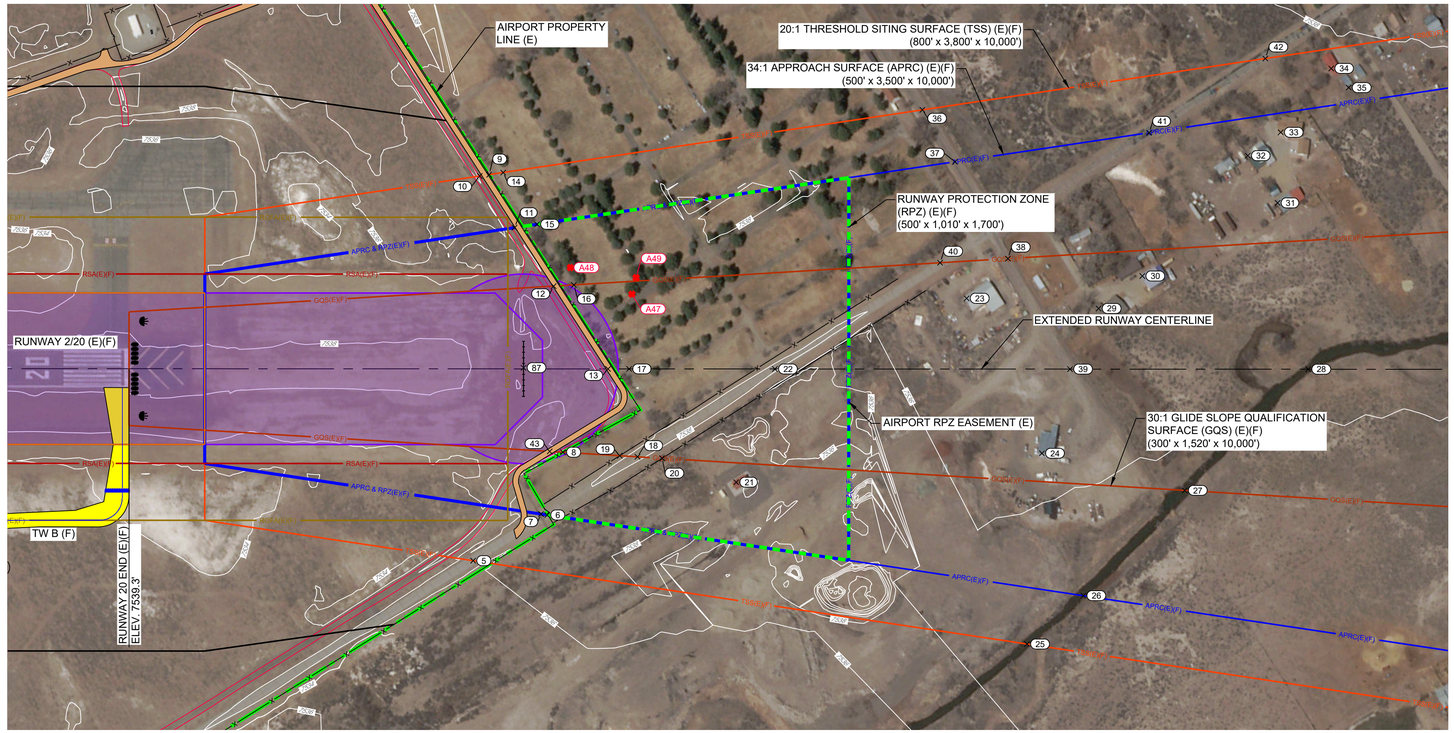
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0	196593	05/2022	ORIGINAL ISSUE	6593505	LKB	MJT	JZP

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RUNWAY 2 INNER APPROACH (E)(F)

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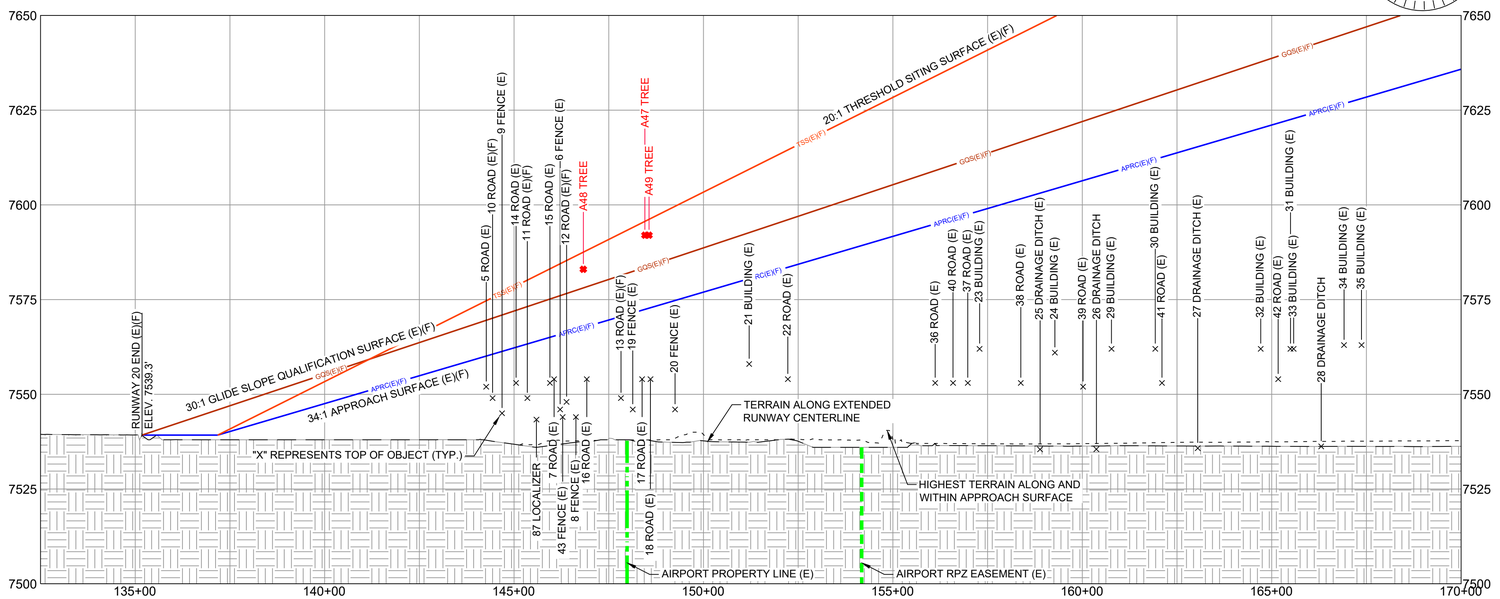
RUNWAY 20 END PLAN (E)(F)

SCALE: PER BAR SCALE

200 0 200 400

SCALE IN FEET

8°8'



RUNWAY 20 END PROFILE (E)(F)

SCALE: PER GRID

OBJECTS WITHIN RUNWAY 20 GQS, APRC AND TSS SURFACES (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL) (FEET)	30:1 GQS PEN.	20:1 TSS PEN.	34:1 APRC SURFACE PEN.	REMARKS
A47	** TREE	54'	7592'	-8'	NONE	+20'	SEE NOTE 1
A48	** TREE	46'	7583'	NWS	NONE	+15'	SEE NOTE 1
A49	** TREE	54'	7592'	NWS	NONE	+19'	SEE NOTE 1
5	* ROAD (E)	16'	7552'	NWS	NONE	NWS	N/A
6	* FENCE (E)	8'	7546'	NWS	NONE	NONE	N/A
7	* ROAD (E)	16'	7554'	NWS	NONE	NONE	N/A
8	* FENCE (E)	8'	7544'	NONE	NONE	NONE	N/A
9	* FENCE (E)	8'	7545'	NWS	NONE	NWS	N/A
10	* ROAD (E)(F)	11'	7549'	NWS	NONE	NWS	N/A
11	* ROAD (E)(F)	11'	7549'	NWS	NONE	NONE	N/A
12	* ROAD (E)(F)	11'	7548'	NONE	NONE	NONE	N/A
13	* ROAD (E)(F)	11'	7549'	NONE	NONE	NONE	N/A
14	* ROAD (E)	16'	7553'	NWS	NONE	NWS	N/A
15	* ROAD (E)	16'	7553'	NWS	NONE	NONE	N/A
16	* ROAD (E)	16'	7554'	NONE	NONE	NONE	N/A
17	* ROAD (E)	16'	7554'	NONE	NONE	NONE	N/A
18	* ROAD (E)	16'	7554'	NONE	NONE	NONE	N/A
19	* FENCE (E)	8'	7546'	NONE	NONE	NONE	N/A
20	* FENCE (E)	8'	7546'	NONE	NONE	NONE	N/A
21	* BUILDING (E)	22'	7558'	NWS	NONE	NONE	N/A
22	* ROAD (E)	8'	7554'	NONE	NONE	NONE	N/A
23	* BUILDING (E)	25'	7562'	NONE	NONE	NONE	N/A
24	* BUILDING (E)	25'	7561'	NONE	NONE	NONE	N/A
25	* DRAINAGE DITCH	-	7535'	NWS	NONE	NWS	N/A
26	* DRAINAGE DITCH	-	7536'	NWS	NONE	NONE	N/A
27	* DRAINAGE DITCH	-	7536'	NONE	NONE	NONE	N/A
28	* DRAINAGE DITCH	-	7536'	NONE	NONE	NONE	N/A
29	* BUILDING (E)	25'	7562'	NONE	NONE	NONE	N/A
30	* BUILDING (E)	25'	7562'	NONE	NONE	NONE	N/A
31	* BUILDING (E)	25'	7562'	NWS	NONE	NONE	N/A
32	* BUILDING (E)	25'	7562'	NWS	NONE	NONE	N/A
33	* BUILDING (E)	25'	7562'	NWS	NONE	NONE	N/A
34	* BUILDING (E)	25'	7563'	NWS	NONE	NWS	N/A
35	* BUILDING (E)	25'	7563'	NWS	NONE	NWS	N/A
36	* ROAD (E)	16'	7553'	NWS	NONE	NWS	N/A
37	* ROAD (E)	16'	7553'	NWS	NONE	NONE	N/A
38	* ROAD (E)	16'	7553'	NONE	NONE	NONE	N/A
39	* ROAD (E)	16'	7552'	NONE	NONE	NONE	N/A
40	* ROAD (E)	16'	7553'	NONE	NONE	NONE	N/A
41	* ROAD (E)	16'	7553'	NONE	NONE	NONE	N/A
42	* ROAD (E)	16'	7554'	NONE	NONE	NONE	N/A
43	* FENCE (E)	8'	7544'	NONE	NONE	NONE	N/A
87	** LOCALIZER	7'	7543'	NONE	NONE	NONE	N/A

NOTES: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
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× = OBJECT PENETRATION LOCATION
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NOTE:

1. SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, REMOVE OR TAKE APPROPRIATE ACTION PER FAA FLIGHT PROCEDURES OFFICE DETERMINATIONS.

LEGEND

EXISTING	FUTURE	DESCRIPTION
	ASPHALT CONCRETE	AIRFIELD DEVELOPMENT
		STRUCTURE/FACILITIES (BUILDING)
		AIRPORT PROPERTY LINE (APL)
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)
APRC(E)	APRC(F)	APPROACH SURFACE
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
GQS(E)	GQS(F)	GLIDE PATH QUALIFICATION SURFACE
	N/A	LOCALIZER CRITICAL AREA
		THRESHOLD LIGHTS
		REIL
	N/A	LOCALIZER
7539	N/A	CONTOURS
		ROADS
		MARKINGS
X	XX	FENCING

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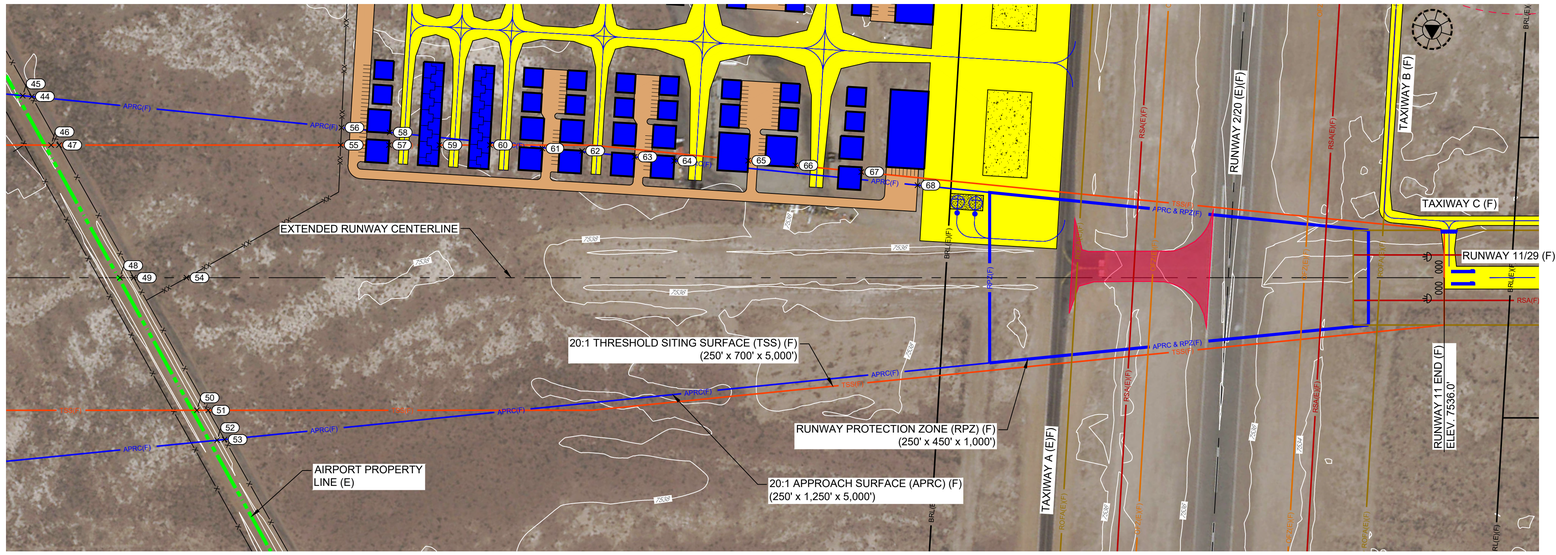
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RUNWAY 20 INNER APPROACH (E)(F)

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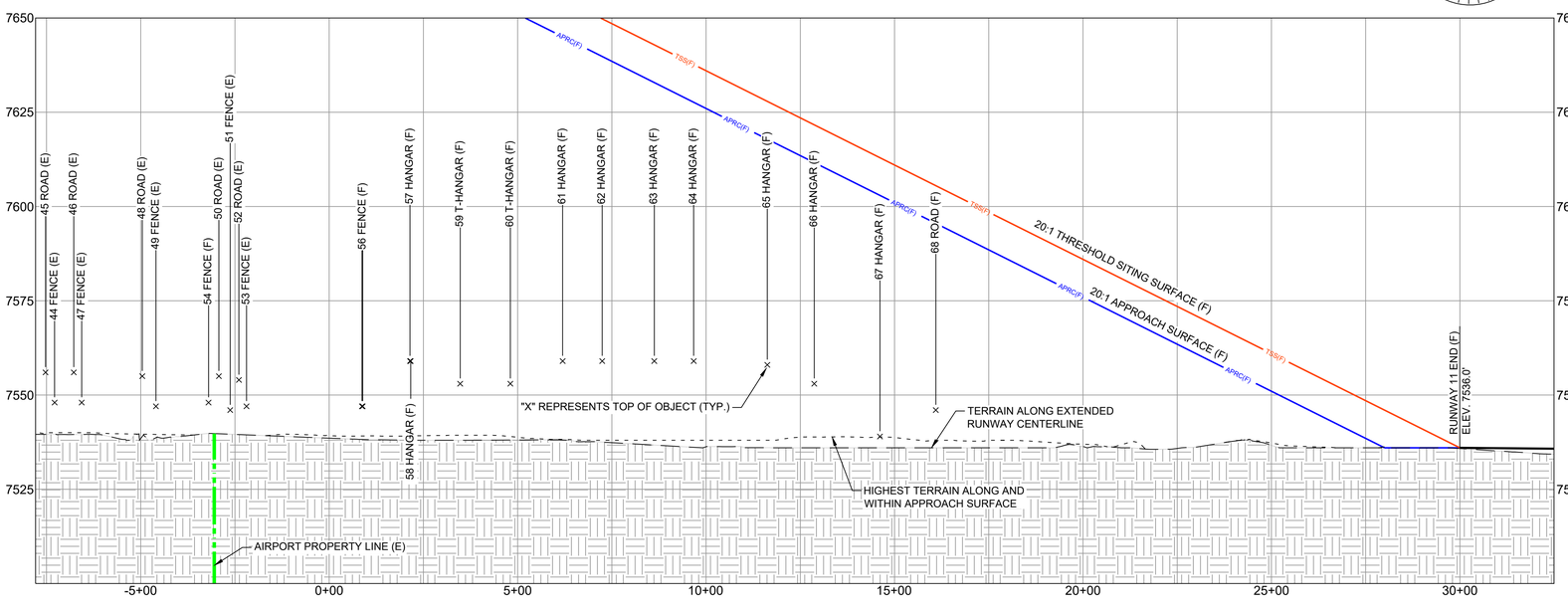
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RUNWAY 11 END PLAN (F)

SCALE: PER BAR SCALE

SCALE IN FEET



RUNWAY 11 END PROFILE (F)

SCALE: PER GRID

OBJECTS WITHIN RUNWAY 11 APRC AND TSS SURFACES (F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL) (FEET)	20:1 TSS PEN.	20:1 APRC SURFACE PEN.	REMARKS
44	* FENCE (E)	8'	7548'	NWS	NONE	N/A
45	* ROAD (E)	16'	7556'	NWS	NONE	N/A
46	* ROAD (E)	16'	7556'	NONE	NONE	N/A
47	* FENCE (E)	8'	7548'	NONE	NONE	N/A
48	* ROAD (E)	16'	7555'	NONE	NONE	N/A
49	* FENCE (E)	8'	7547'	NONE	NONE	N/A
50	* ROAD (E)	16'	7555'	NONE	NONE	N/A
51	* FENCE (E)	8'	7546'	NONE	NONE	N/A
52	* ROAD (E)	16'	7554'	NONE	NONE	N/A
53	* FENCE (E)	8'	7547'	NWS	NONE	N/A
54	* FENCE (E)	8'	7548'	NWS	NONE	N/A
55	* FENCE (E)	8'	7547'	NONE	NONE	N/A
56	* FENCE (E)	8'	7547'	NONE	NONE	N/A
57	* HANGAR (F)	21'	7559'	NONE	NONE	N/A
58	* HANGAR (F)	21'	7559'	NONE	NONE	N/A
59	* T-HANGAR (F)	15'	7553'	NONE	NONE	N/A
60	* T-HANGAR (F)	15'	7559'	NONE	NONE	N/A
61	* HANGAR (F)	21'	7559'	NONE	NONE	N/A
62	* HANGAR (F)	21'	7559'	NONE	NONE	N/A
63	* HANGAR (F)	21'	7559'	NONE	NONE	N/A
64	* HANGAR (F)	21'	7558'	NONE	NONE	N/A
65	* HANGAR (F)	35'	7558'	NONE	NONE	N/A
66	* HANGAR (F)	35'	7553'	NONE	NONE	N/A
67	* HANGAR (F)	21'	7539'	NONE	NONE	N/A
68	* ROAD (F)	16'	7546'	NONE	NONE	N/A

NOTES: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).

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× = OBJECT PENETRATION LOCATION

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NOTE:

1. SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, REMOVE OR TAKE APPROPRIATE ACTION PER FAA FLIGHT PROCEDURES OFFICE DETERMINATIONS.

LEGEND

EXISTING	FUTURE	DESCRIPTION
	ASPHALT / CONCRETE	AIRFIELD DEVELOPMENT
		STRUCTURE/FACILITIES (BUILDING)
		AIRPORT PROPERTY LINE (APL)
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)
APRC(E)	APRC(F)	APPROACH SURFACE
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
		THRESHOLD LIGHTS
		REIL
N/A		HELICOPTER PARKING
7539	N/A	CONTOURS
		ROADS
		MARKINGS
X	XX	FENCING

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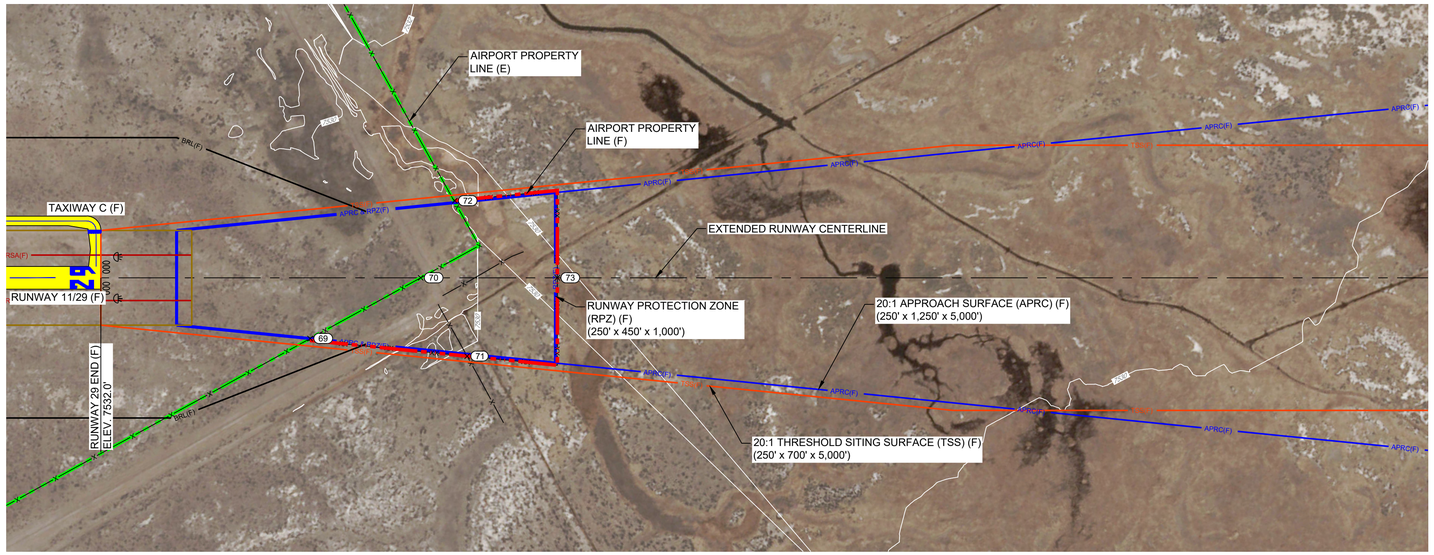
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RUNWAY 11 INNER APPROACH (F)

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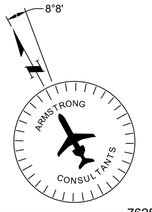


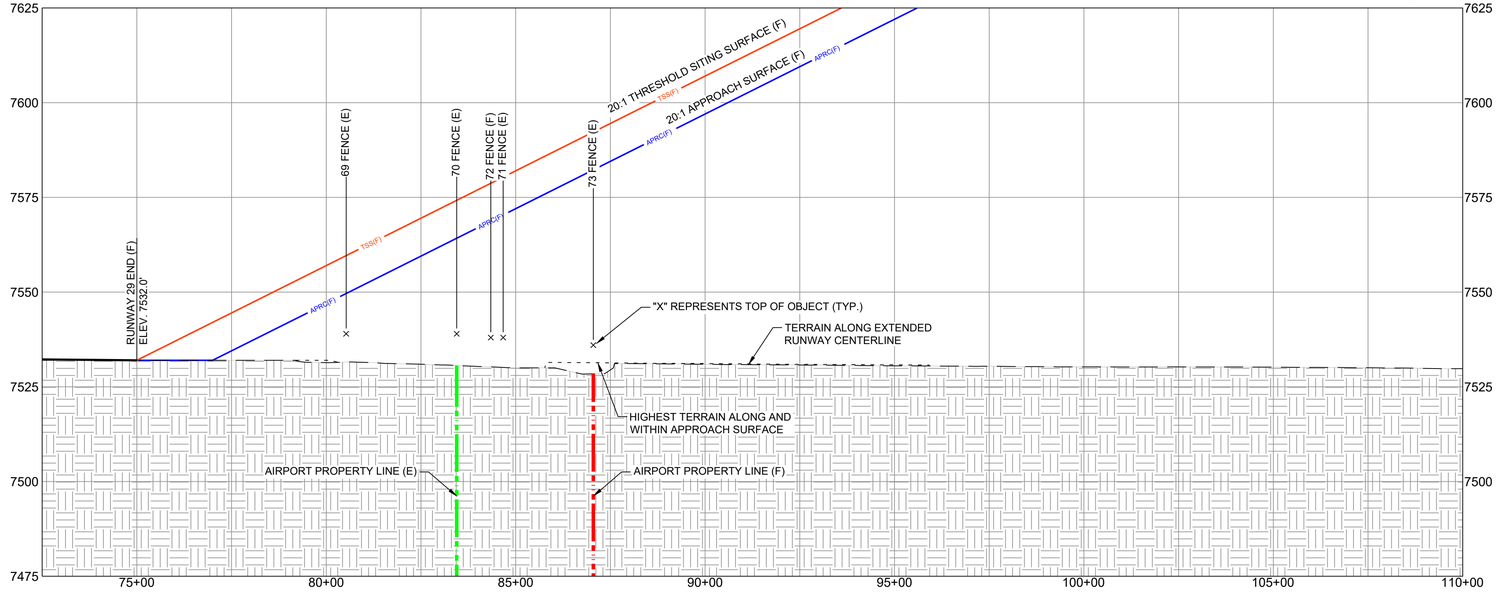
RUNWAY 29 END PLAN (F)

SCALE: PER BAR SCALE

200 0 200 400

SCALE IN FEET





RUNWAY 29 END PROFILE (F)

SCALE: PER GRID

OBJECTS WITHIN RUNWAY 29 APRC AND TSS SURFACES (F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL) (FEET)	20:1 TSS PEN.	20:1 APRC SURFACE PEN.	REMARKS
69	* FENCE (E)	8'	7539'	NONE	NONE	N/A
70	* FENCE (E)	8'	7539'	NONE	NONE	N/A
71	* FENCE (E)	8'	7538'	NONE	NONE	N/A
72	* FENCE (E)	8'	7538'	NONE	NONE	N/A
73	* FENCE (F)	8'	7536'	NONE	NONE	N/A

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NOTE:

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LEGEND

EXISTING	FUTURE	DESCRIPTION
	ASPHALT CONCRETE	AIRFIELD DEVELOPMENT
		STRUCTURE/FACILITIES (BUILDING)
		AIRPORT PROPERTY LINE (APL)
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)
APRC(E)	APRC(F)	APPROACH SURFACE
TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
		THRESHOLD LIGHTS
		REIL
7539	N/A	CONTOURS
		ROADS
		MARKINGS
X	XX	FENCING

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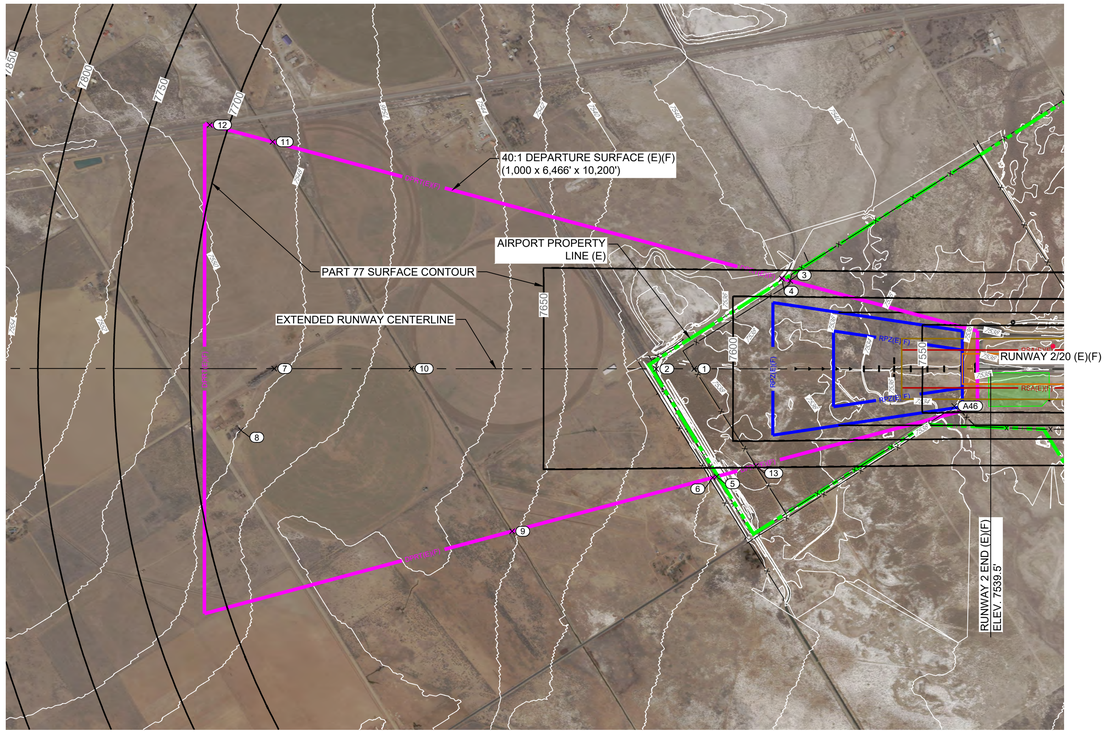
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0	196593	05/2022	ORIGINAL ISSUE	6593505	LKB	MJT	J2P

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RUNWAY 29 INNER APPROACH (F)

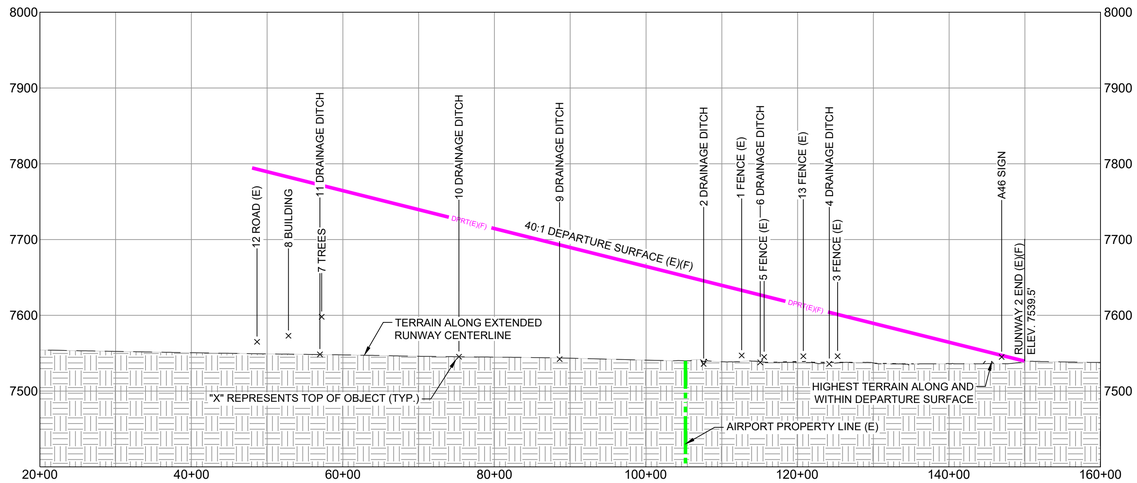
Sheet: 18 of: 24

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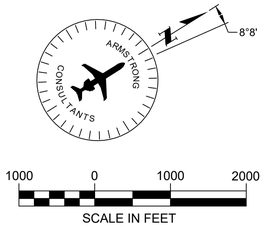
RUNWAY 2 END PLAN (E)(F)

SCALE: PER BAR SCALE



RUNWAY 2 END PROFILE (E)(F)

SCALE: PER GRID



OBJECTS WITHIN RUNWAY 2 DEPARTURE SURFACE (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL) (FEET)	40:1 DPRT SURFACE PEN.	REMARKS
A46	** SIGN (E)	8'	7545'	-	N/A
1	* FENCE (E)	8'	7547'	-	N/A
2	* DRAINAGE DITCH (E)	-	7536'	-	N/A
3	* FENCE (E)	8'	7546'	-	N/A
4	* DRAINAGE DITCH (E)	-	7536'	-	N/A
5	* FENCE (E)	8'	7545'	-	N/A
6	* DRAINAGE DITCH (E)	-	7538'	-	N/A
7	* TREES	50'	7598'	-	N/A
8	* BUILDING	25'	7573'	-	N/A
9	* DRAINAGE DITCH (E)	-	7542'	-	N/A
10	* DRAINAGE DITCH (E)	-	7545'	-	N/A
11	* DRAINAGE DITCH (E)	-	7548'	-	N/A
12	ROAD (E)	16'	7565'	-	N/A
13	FENCE (E)	8'	7545'	-	N/A

NOTES: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
** = OBJECT TOP ELEVATIONS AND LOCATIONS ARE BASED ON A AGIS SURVEY, DATED: 12/19/18.
NWS = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
× = OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE

NOTE:

1. SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, REMOVE OR TAKE APPROPRIATE ACTION PER FAA FLIGHT PROCEDURES OFFICE DETERMINATIONS.

LEGEND

EXISTING	FUTURE	DESCRIPTION
	ASPHALT / CONCRETE	AIRFIELD DEVELOPMENT
		STRUCTURE/FACILITIES (BUILDING)
		AIRPORT PROPERTY LINE (APL)
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)
DPRT(E)	DPRT(F)	DEPARTURE SURFACE (DPRT)
	N/A	PRECISION OBSTACLE FREE ZONE
	N/A	GLIDE SLOPE CRITICAL AREA
7539	N/A	EXISTING GROUND CONTOURS
7700	N/A	PART 77 CONTOURS
		MARKINGS
X	XX	FENCING

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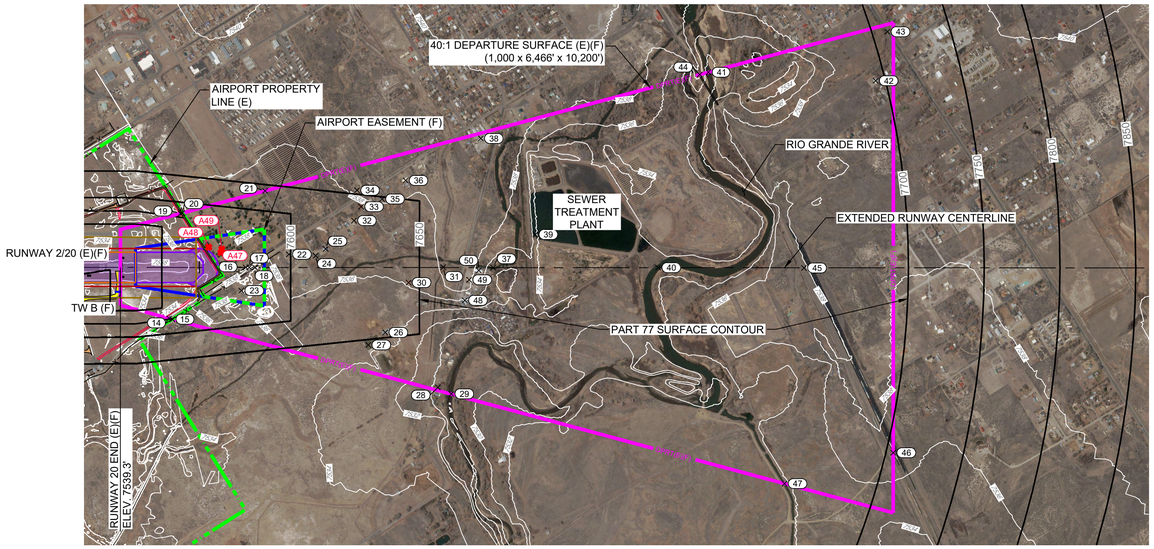
No.	ACI No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	196593	05/2022	ORIGINAL ISSUE	65935050	LKB	MJT	JZP

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RUNWAY 2 DEPARTURE SURFACE (E)(F)

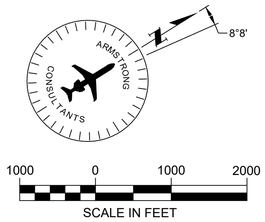
Sheet: 19 of: 24

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RUNWAY 20 END PLAN (E)(F)

SCALE: PER BAR SCALE



RUNWAY 20 END PROFILE (E)(F)

SCALE: PER GRID

OBJECTS WITHIN RUNWAY 20 DEPARTURE SURFACE (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL) (FEET)	40:1 DPRT SURFACE PEN.	REMARKS
A47	** TREE	54'	7592'	+20	SEE NOTE 1
A48	** TREE	46'	7583'	+15	SEE NOTE 1
A49	** TREE	54'	7592'	+20	SEE NOTE 1
14	* ROAD (E)	16'	7552'	NONE	N/A
15	* FENCE (E)	8'	7543'	NONE	N/A
16	* FENCE (E)	8'	7546'	NONE	N/A
17	* ROAD (E)	16'	7554'	NONE	N/A
18	* FENCE (E)	8'	7544'	NONE	N/A
19	* ROAD (E)(F)	16'	7554'	NONE	N/A
20	* FENCE (E)	8'	7546'	NONE	N/A
21	* ROAD (E)	16'	7554'	NONE	N/A
22	* BUILDING (E)	25'	7562'	NONE	N/A
23	* BUILDING (E)	25'	7558'	NONE	N/A
24	* BUILDING (E)	25'	7562'	NONE	N/A
25	* BUILDING (E)	25'	7562'	NONE	N/A
26	* BUILDING (E)	25'	7559'	NONE	N/A
27	* POND	-	7534'	NONE	N/A
28	* BUILDING (E)	25'	7555'	NONE	N/A
29	* RIVER	-	7528'	NONE	N/A
30	* BUILDING (E)	25'	7561'	NONE	N/A
31	* DRAINAGE DITCH	-	7538'	NONE	N/A
32	* BUILDING (E)	25'	7562'	NONE	N/A
33	* BUILDING (E)	25'	7563'	NONE	N/A
34	* BUILDING (E)	25'	7563'	NONE	N/A
35	* BUILDING (E)	25'	7563'	NONE	N/A
36	* BUILDING (E)	25'	8563'	NONE	N/A
37	* DRAINAGE DITCH	-	7535'	NONE	N/A
38	* BUILDING (E)	25'	7564'	NONE	N/A
39	* POND	-	7535'	NONE	N/A
40	* RIVER	-	7532'	NONE	N/A
41	* RIVER	-	7534'	NONE	N/A
42	* BUILDING (E)	25'	7564'	NONE	N/A
43	* ROAD (E)	16'	7555'	NONE	N/A
44	* RAILROAD	23'	7560'	NONE	N/A
45	* RAILROAD	23'	7561'	NONE	N/A
46	* RAILROAD	23'	7561'	NONE	N/A
47	* DRAINAGE DITCH	-	7534'	NONE	N/A
48	* BUILDING (E)	25'	7561'	NONE	N/A
49	* BUILDING (E)	25'	7563'	NONE	N/A
50	* BUILDING (E)	25'	7562'	NONE	N/A

NOTES: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
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NOTE:

1. SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, REMOVE OR TAKE APPROPRIATE ACTION PER FAA FLIGHT PROCEDURES OFFICE DETERMINATIONS.

LEGEND

EXISTING	FUTURE	DESCRIPTION
	ASPHALT / CONCRETE	AIRFIELD DEVELOPMENT
		STRUCTURE/FACILITIES (BUILDING)
		AIRPORT PROPERTY LINE (APL)
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)
DPRT(E)	DPRT(F)	DEPARTURE SURFACE (DPRT)
	N/A	PRECISION OBSTACLE FREE ZONE
	N/A	GLIDE SLOPE CRITICAL AREA
7539	N/A	EXISTING GROUND CONTOURS
7700	N/A	PART 77 CONTOURS
		MARKINGS
X	XX	FENCING

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AIRPORT LAYOUT PLAN

No.	ACI No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	196593	05/2022	ORIGINAL ISSUE	6593505D	LKB	MJT	JZP

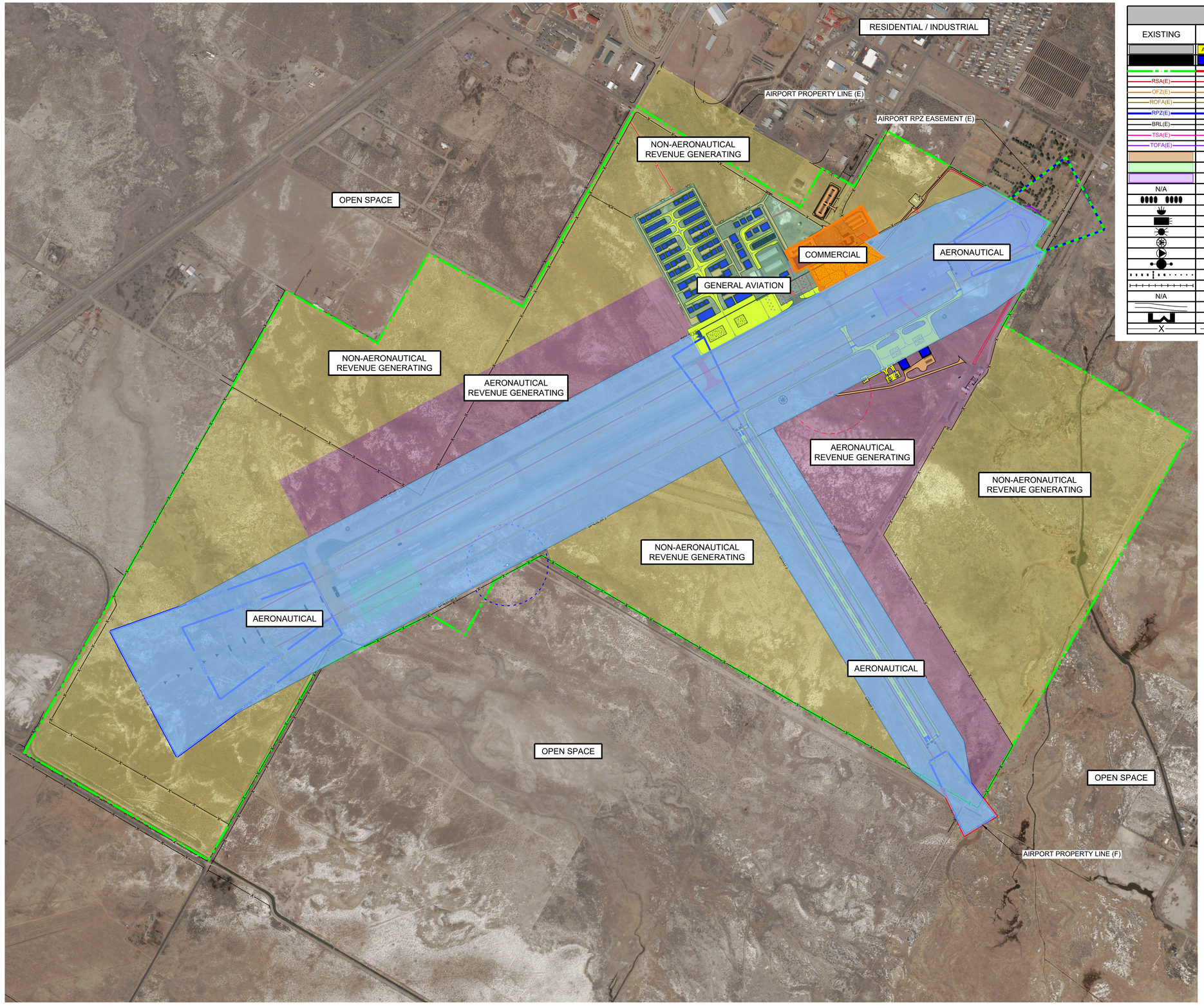
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RUNWAY 20 DEPARTURE SURFACE (E)(F)

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LEGEND		
EXISTING	FUTURE	DESCRIPTION
	ASPHALT CONCRETE	AIRFIELD DEVELOPMENT
		STRUCTURE/FACILITIES (BUILDING)
		AIRPORT PROPERTY LINE (APL)
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)
	N/A	PRECISION OBSTACLE FREE ZONE
	N/A	GLIDE SLOPE CRITICAL AREA
	N/A	LOCALIZER CRITICAL AREA
N/A		TO BE REMOVED
	0000 0000	THRESHOLD LIGHTS
		REIL
		VASI/PAPI
		AIRPORT BEACON
		WIND CONE & SEGMENTED CIRCLE
		SUPPLEMENTAL WIND CONE
		AWOS
	N/A	MALSR
	N/A	LOCALIZER
N/A		HELICOPTER PARKING
		ROADS
		MARKINGS
X	XX	FENCING

LEGEND

- AERONAUTICAL
- GENERAL AVIATION
- COMMERCIAL SERVICE
- AERONAUTICAL REVENUE GENERATING
- NON-AERONAUTICAL REVENUE GENERATING

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SCALE IN FEET

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AIP No. 3-08-0002-024-2019
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No.	ACI No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	196593	05/2022	ORIGINAL ISSUE	6593506	LKB	MJT	JZP

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ON AIRPORT LAND USE

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ORDINANCES IN EFFECT

NONE

NOTICE OF PROPOSED CONSTRUCTION

An FAA Form 7460-1, "Notice of Proposed Construction or Alteration" must be submitted for any construction or alteration (including hangars and other on-airport and off-airport structures, towers, etc.) within 20,000 horizontal feet of the airport greater in height than an imaginary surface extending outward and upward from the runway at a slope of 100 to 1 or greater in height than 200 feet above ground level.

NOTES

No land fills within 5 miles of the airport.

No Section 4(F) land affected by the airport.

Legend

- City Limits
- TOWER
- Ditch
- Railroad
- Township
- Parcels
- A= AGRICULTURAL
- CA=CAMPUS
- CB=COMMERCIAL BUSINESS
- CBD=CENTRAL BUSINESS DISTRICT
- MU=MIXED USE
- RL=RESIDENTIAL LOW
- RM=RESIDENTIAL MEDIUM
- RH=RESIDENTIAL HIGH
- EN=ESTABLISHED NEIGHBORHOOD
- RE= RESIDENTIAL ESTATE
- I=INDUSTRIAL

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8°8'

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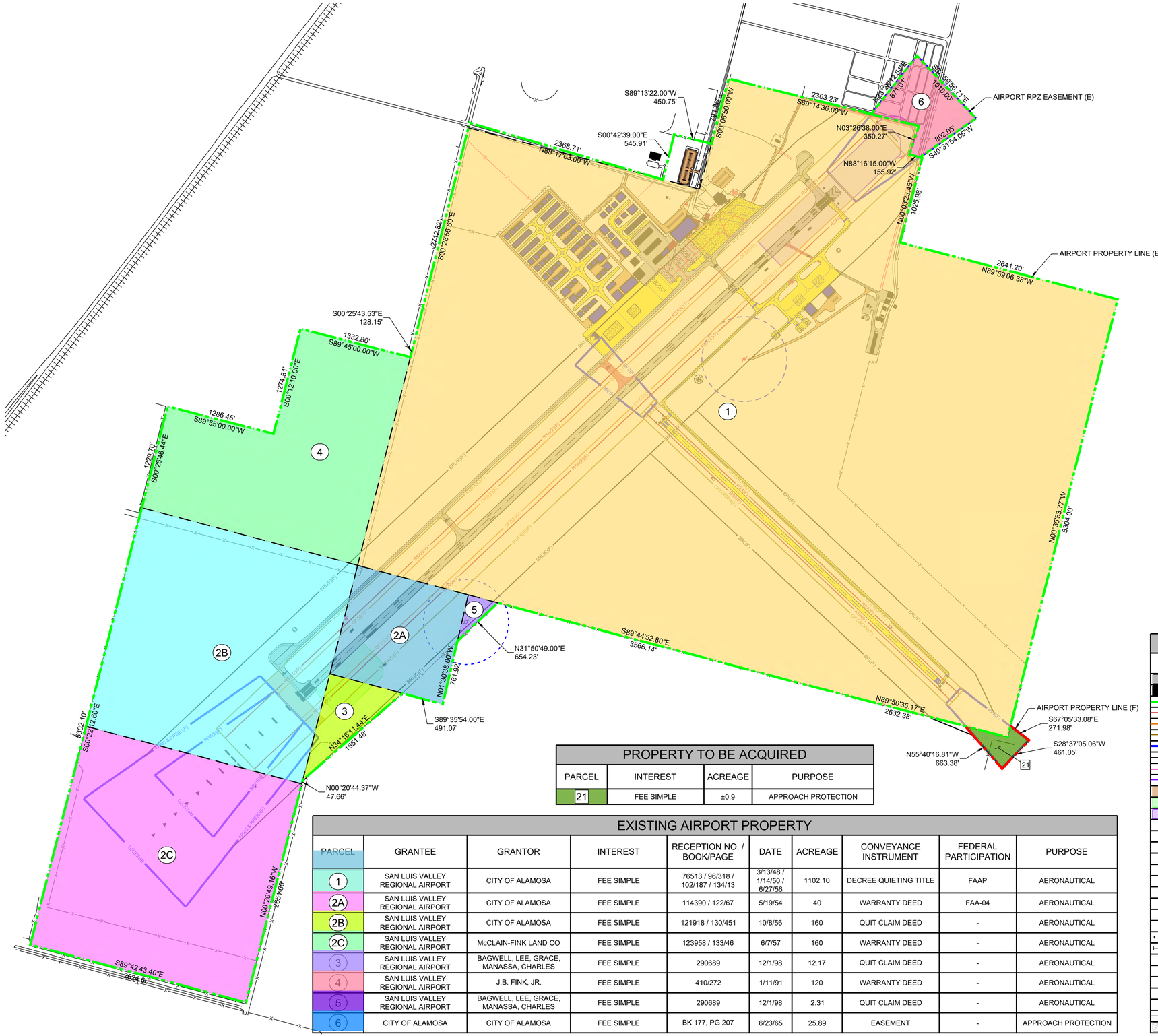
No.	ACI No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
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OFF AIRPORT LAND USE

Sheet: 22 of: 24

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PROPERTY TO BE ACQUIRED

PARCEL	INTEREST	ACREAGE	PURPOSE
21	FEE SIMPLE	±0.9	APPROACH PROTECTION

EXISTING AIRPORT PROPERTY

PARCEL	GRANTEE	GRANTOR	INTEREST	RECEPTION NO. / BOOK/PAGE	DATE	ACREAGE	CONVEYANCE INSTRUMENT	FEDERAL PARTICIPATION	PURPOSE
1	SAN LUIS VALLEY REGIONAL AIRPORT	CITY OF ALAMOSA	FEE SIMPLE	76513 / 96/318 / 102/187 / 134/13	3/13/48 / 1/14/50 / 6/27/56	1102.10	DECREE QUIETING TITLE	FAAP	AERONAUTICAL
2A	SAN LUIS VALLEY REGIONAL AIRPORT	CITY OF ALAMOSA	FEE SIMPLE	114390 / 122/67	5/19/54	40	WARRANTY DEED	FAA-04	AERONAUTICAL
2B	SAN LUIS VALLEY REGIONAL AIRPORT	CITY OF ALAMOSA	FEE SIMPLE	121918 / 130/451	10/8/56	160	QUIT CLAIM DEED	-	AERONAUTICAL
2C	SAN LUIS VALLEY REGIONAL AIRPORT	McCLAIN-FINK LAND CO	FEE SIMPLE	123958 / 133/46	6/7/57	160	WARRANTY DEED	-	AERONAUTICAL
3	SAN LUIS VALLEY REGIONAL AIRPORT	BAGWELL, LEE, GRACE, MANASSA, CHARLES	FEE SIMPLE	290689	12/1/98	12.17	QUIT CLAIM DEED	-	AERONAUTICAL
4	SAN LUIS VALLEY REGIONAL AIRPORT	J.B. FINK, JR.	FEE SIMPLE	410/272	1/11/91	120	WARRANTY DEED	-	AERONAUTICAL
5	SAN LUIS VALLEY REGIONAL AIRPORT	BAGWELL, LEE, GRACE, MANASSA, CHARLES	FEE SIMPLE	290689	12/1/98	2.31	QUIT CLAIM DEED	-	AERONAUTICAL
6	CITY OF ALAMOSA	CITY OF ALAMOSA	FEE SIMPLE	BK 177, PG 207	6/23/65	25.89	EASEMENT	-	APPROACH PROTECTION

LEGEND

EXISTING	FUTURE	DESCRIPTION
	ASPHALT CONCRETE	AIRFIELD DEVELOPMENT
		STRUCTURE/FACILITIES (BUILDING)
		AIRPORT PROPERTY LINE (APL)
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)
	N/A	PRECISION OBSTACLE FREE ZONE
	N/A	GLIDE SLOPE CRITICAL AREA
	N/A	LOCALIZER CRITICAL AREA
		AIRPORT REFERENCE POINT (ARP)
	N/A	PACS/SACS MONUMENT
N/A		TO BE REMOVED
	0000 0000	THRESHOLD LIGHTS
		REIL
		VASI/PAPI
		AIRPORT BEACON
		WIND CONE & SEGMENTED CIRCLE
		SUPPLEMENTAL WIND CONE
		AWOS
	N/A	MALSR
	N/A	LOCALIZER
N/A		HELICOPTER PARKING
	N/A	SECTION CORNER
4125	N/A	CONTOURS
		ROADS
		MARKINGS
X	XX	FENCING
	N/A	WATERWAY/WETLAND

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EXHIBIT "A"
AIRPORT PROPERTY INVENTORY MAP

Sheet: 23 of: 24

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600 0 600 1200

SCALE IN FEET

SATELLITE AERIAL PHOTOGRAPH OBTAINED FROM PLANET DATED 4/9/2021

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AIP No. 3-08-0002-024-2019

AIRPORT LAYOUT PLAN

No.	ACI No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
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AERIAL PHOTOGRAPH

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Chapter Seven

Implementation and Financial Plan

Chapter 7 – Implementation and Financial Plan

7.1 Introduction

A program of recommended airport development has been formulated to guide the systematic development of San Luis Valley Regional Airport and to aid the Federal Aviation Administration, Colorado Department of Transportation Aeronautics Division and the Airport in allocating funding over the planning period. The recommended airport development plan is based on the facility requirements, as well as the development alternatives, identified earlier in this report.

7.2 Implantation Plan

Future development at San Luis Valley Regional Airport, as included in this study, covers a 20-year planning period. Development items are grouped into three phases:

- Phase I is short-term (1-5 years)
- Phase II is intermediate-term (6-10 years)
- Phase III is long-term (11-20 years)

The phasing of projects (shown on the airport layout plan) assists the airport sponsor in budgetary planning for construction projects. A drawing showing the phasing of each project is included at the end of this Chapter. The sequence in which the projects are completed is important as the ultimate configuration of the airport will require numerous projects. Estimated development costs are included in **Table 7-1** for each of the recommended improvements. **Exhibit 7-1** depicts the projects listed below.

Phase I (1-5 Years) Short-Term Development Items

- A1: Drainage Study / Improvements
- A2: Pavement Maintenance – Runway 2-20 (Fog Seal)
- A3: Acquire Snow Removal Equipment
- A4: Construct ARFF/SRE Storage Building and Operations Offices
- A5: Rehabilitate Commercial Apron
- A6: Pavement Maintenance – Taxiway A (Fog Seal)
- A7: LED Lighting Upgrade – Runway Edge Lighting, VASI, REILs, RDRs, PAPI, Beacon and Runway Electrical Regulator
- A8: Reconstruct General Aviation Apron
- A9: Relocate Supplemental Wind Cone
- A10: Acquire Index B ARFF Truck
- A11: Expand Automobile Parking (Phase 1)

Phase II (6-10 Years) Intermediate-Term Development Items

- B1: Pavement Maintenance – Runway 2-20 (Fog Seal)
- B2: Construct Hangar Development Area (Phase 1)
- B3: Remove Hangar Facility / Replace with asphalt apron

- B4: Relocate ASOS
- B5: Reconstruct and Expand Commercial Apron (Concrete)
- B6: Expand Passenger Terminal Building (Include Automobile Parking Expansion – Phase 2)
- B7: Airfield Pavement Maintenance

Phase III (11-20 Years) Long-Term Development Items

- C1: Expand Aircraft Parking Apron (Phase 1)
- C2: Construct Runway 11-29 (Dirt) / Construct Taxiway B (Phase 1) / Realign Taxiway A3 / Acquire land for Runway 29 end RPZ
- C3: Construct Air Tanker Base / Taxiway B (Phase 2)
- C4: Pave Airport Perimeter Road
- C5: Construct Helicopter Testing Development Area
- C6: Construct Hangar Development Area (Phase 2)
- C7: Expand Aircraft Parking Apron (Phase 2)
- C8: Construct Hangar Development Area (Phase 3)
- C9: Pave Runway 11-29
- C10: Construct Taxiway C
- C11: Replace ILS
- C12: Airfield Pavement Maintenance

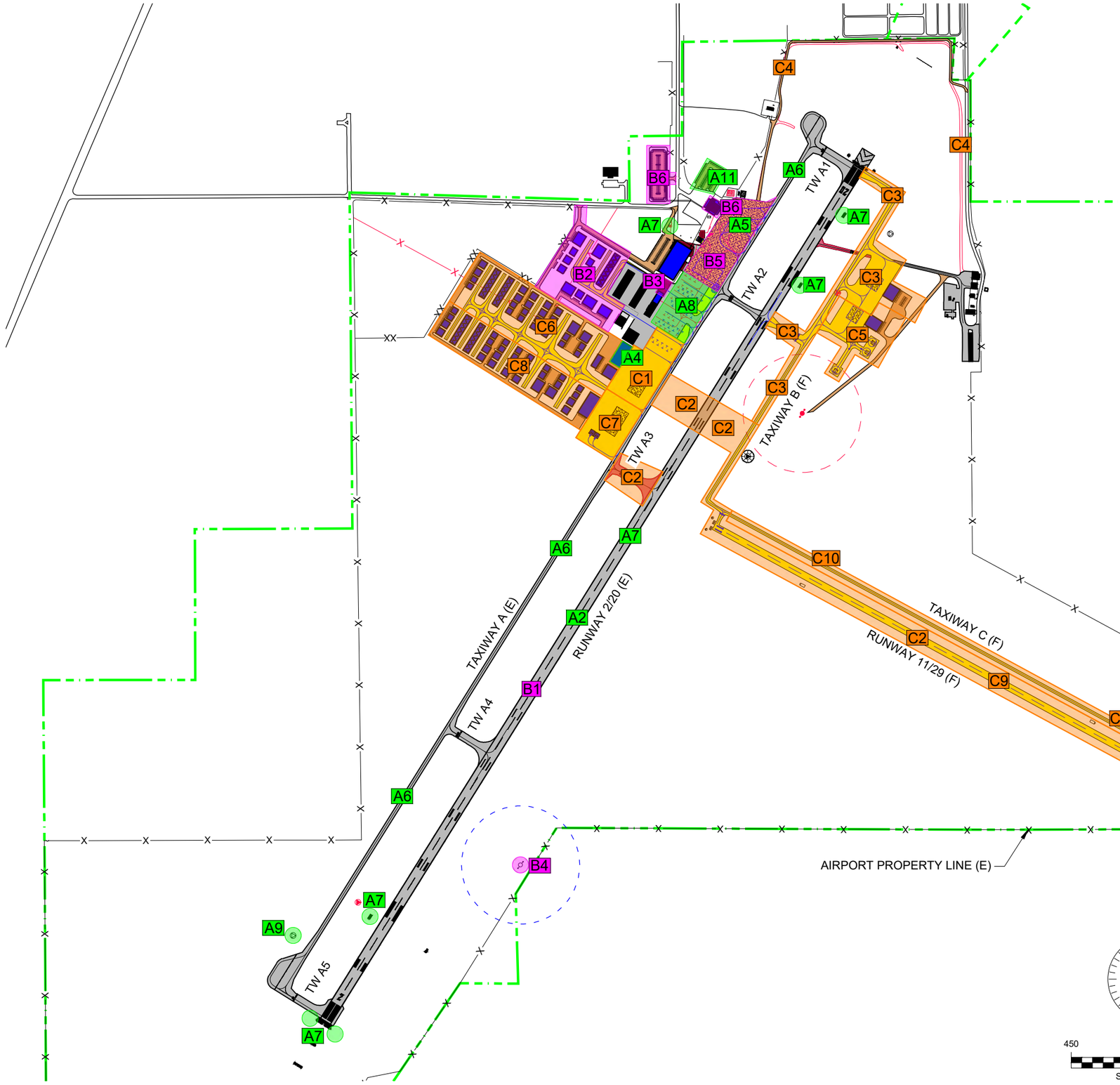
Table 7-1 Twenty Year Development Plan

Development Items	FAA Portion 95%[6]	CDOT Portion 2.5%	Local Portion 2.5%	Total Cost 100%
A1: Drainage Study/Improvements	$459,800	$12,100	$12,100	$484,000
A2: Pavement Maintenance – Runway 2-20	$494,000	$13,000	$13,000	$520,000
A3: Acquire Snow Removal Equipment	$665,000	$17,500	$17,500	$700,000
A4: Construct ARFF/SRE Storage Building and Ops Offices	$1,900,000	$50,000	$50,000	$2,000,000
A5: Rehabilitate Commercial Apron	$893,000	$23,500	$23,500	$940,000
A6: Pavement Maintenance – Taxiway A	$285,000	$7,500	$7,500	$300,000
A7: LED Lighting Upgrade	$570,000	$15,000	$15,000	$600,000
A8: Reconstruct General Aviation Apron	$4,845,000	$127,500	$127,500	$5,100,000
A9: Relocate Supplemental Wind Cone	$9,500	$250	$250	$10,000
A10: Acquire Index B ARFF Truck	$807,500	$21,250	$21,250	$850,000
A11: Expand Automobile Parking (Phase 1)	$285,000	$7,500	$7,500	$300,000
Short-Term Subtotal	**$11,213,800**	**$295,100**	**$295,100**	**$11,804,000**
B1: Pavement Maintenance – Runway 2-20 (Fog Seal)	$494,000	$13,000	$13,000	$520,000
B2: Construct Hangar Development Area (Phase 1)[1]	$0	$0	$1,500,000	$1,500,000
B3: Remove Hangar Facility (Replace area with Aircraft Apron)	$394,250	$10,375	$10,375	$415,000
B4: Relocate ASOS	$285,000	$7,500	$7,500	$300,000
B5: Reconstruct and Expand Commercial Apron (Concrete)	$7,980,000	$210,000	$210,000	$8,400,000
B6: Expand Passenger Terminal Building / Expand Automobile Parking (Phase 2)	$2,945,000	$77,500	$77,500	$3,100,000
B7: Airfield Pavement Maintenance[2]	$950,000	$25,000	$25,000	$1,000,000
Intermediate-Term Subtotal	**$13,048,250**	**$343,375**	**$1,843,375**	**$15,235,000**
C1: Expand Aircraft Parking Apron (Phase 1)	$2,470,000	$65,000	$65,000	$2,600,000
C2: Construct Runway 11-29 (Dirt) / Construct Taxiway B (Phase 1) / Realign Taxiway A3 / Acquire Land (RPZ)	$0	$0	$1,100,000	$1,100,000
C3: Construct Air Tanker Base / Taxiway B (Phase 2)[3]	$5,000,000[3]	$0	$0	$5,000,000
C4: Pave Airport Perimeter Road	$760,000	$20,000	$20,000	$800,000
C5: Construct Helicopter Testing Development Area[4]	$0	$0	$1,300,000	$1,300,000
C6: Construct Hangar Development Area (Phase 2)[1]	$0	$0	$3,000,000	$3,000,000
C7: Expand Aircraft Parking Apron (Phase 2)	$1,995,000	$52,500	$52,500	$2,100,000
C9: Construct Hangar Development Area (Phase 3)[1]	$0	$0	$2,100,000	$2,100,000
C10: Pave Runway 11-29	$3,420,000	$90,000	$90,000	$3,600,000
C11: Construct Taxiway C	$1,710,000	$45,000	$45,000	$1,800,000
C12: Replace ILS[5]	$0	$0	$1,000,000	$1,000,000
C13: Pavement Maintenance	$950,000	$25,000	$25,000	$1,000,000
Long-Term Subtotal	**$16,305,000**	**$297,500**	**$8,797,500**	**$25,400,000**
20-Year Improvement Plan Total	**$40,567,050**	**$935,975**	**$10,935,975**	**$51,739,000**

Source: Armstrong Consultants, Inc., 2021

Notes: All cost estimates are in 2021 dollars; **Note[1]** Cost estimates for hangar development areas do not include hangar structures, which are typically funded via a private source. Hangar development area costs identified in in the Master Plan include site grading/drainage, taxilane development and associated infrastructure; **Note[2]** Denotes primary commercial airport entitlement funding budget for preventative maintenance of airfield pavements. These projects would likely be phased and occur as warranted by pavement condition; **Note[3]** Air Tanker Base development is typically funded by the federal agency that will be operating out of the airport (e.g. U.S. Forrest Service, Bureau of Land Management…) The estimated cost shown under the FAA portion would be anticipated to be reimbursed by the operating federal agency; **Note[4]** Helicopter Testing Development Area would not be FAA AIP grant eligible. The costs would typically be privately funded by the developer; **Note[5]** Although replacement of the ILS is considered AIP grant eligible, FAA has stated it is not likely to be replaced with AIP funding. The project would likely have to be locally funded; **Note[6]** Assumes San Luis Valley Regional Airport remains Economically Distressed funded at 95 percent FAA portion.

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Phase I (1-5 Years) Short-Term Development Items

- A1: Drainage Study/Improvements (Not Shown)
- A2: Pavement Maintenance - Runway 2-20 (Fog Seal)
- A3: Acquire Snow Removal Equipment (Not Shown)
- A4: Construct ARFF/SRE Storage Building and Operations Offices
- A5: Rehabilitate Commercial Apron
- A6: Pavement Maintenance - Taxiway A (Fog Seal)
- A7: LED Lighting Upgrade - Runway Edge Lighting, VASI, REILs, RDRs, PAPI, Beacon and Runway Electrical Regulator
- A8: Reconstruct General Aviation Apron
- A9: Relocate Supplemental Wind Cone
- A10: Acquire Index B ARFF Truck (Not Shown)
- A11: Expand Automobile Parking (Phase 1)

Phase II (6-10 Years) Medium-Term Development Items

- B1: Pavement Maintenance - Runway 2-20 (Fog Seal)
- B2: Construct Hangar Development Area (Phase 1)
- B3: Remove Hangar Facility / Replace with asphalt apron
- B4: Relocate ASOS
- B5: Reconstruct and Expand Commercial Apron (Concrete)
- B6: Expand Passenger Terminal Building (Include Automobile Parking Expansion - Phase 2)
- B7: Pavement Maintenance (Not Shown)

Phase III (11-20 Years) Long-Term Development Items

- C1: Expand Aircraft Parking Apron (Phase 1)
- C2: Construct Runway 11-29 (Dirt) / Construct Taxiway B (Phase 1) / Realign Taxiway A3 / Acquire land for Runway 29 end RPZ
- C3: Construct Air Tanker Base / Taxiway B (Phase 2)
- C4: Pave Airport Perimeter Road
- C5: Construct Helicopter Testing Development Area
- C6: Construct Hangar Development Area (Phase 2)
- C7: Expand Aircraft Parking Apron (Phase 2)
- C8: Construct Hangar Development (Phase 3)
- C9: Pave Runway 11-29
- C10: Construct Taxiway C
- C11: Replace ILS (Not Shown)
- C12: Airfield Pavement Maintenance (Not Shown)

SAN LUIS VALLEY REGIONAL AIRPORT
ALAMOSA, COLORADO
EXHIBIT 7-1 CAPITAL IMPROVEMENT PHASING PLAN

ARMSTRONG
PLANNING ENGINEERING CONSTRUCTION
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7.3 Capital Development

Primary funding sources come from the FAA, the State of Colorado and Local contribution. This section will identify and quantify the expected sources of capital funds. As previously indicated, FAA funds represent the majority of expected capital; however, a number of sources are identified and described below.

7.3.1 Federal Aviation Administration

The Airport and Airways Act of 1982 created and authorized the Airport Improvement Program (AIP) to assist in the development of a nationwide system of public-use airports adequate to meet the current projected growth of civil aviation. The Act provides funding for airport planning and development projects at airports included in the National Plan of Integrated Airport Systems (NPIAS).

The FAA Modernization and Reform Act of 2012 includes a federal/local matching ratio of 90 percent/ten percent for AIP approved projects in the State of Colorado. CDOT may participate in up to five percent of the local match. However, in 2021, San Luis Valley Regional airport was designated as a commercial service airport serving an Economically Distressed Community (EDC) and is therefore eligible for 95 percent portion for federal funding. If San Luis Valley Regional Airport is not listed as an EDC, the funding match ratio would revert to a 90/5/5 split. The FAA levies user charges on aviation that are returned to airports to pay for eligible projects. There are three types of FAA funding that may be used for recommended Airport Master Plan projects as described below:

- **Entitlement** – For commercial service airports, FAA entitlement funds are "earned" based on the number of annual enplanements. Non-primary commercial service airports with below 8,000 annual passenger enplanements are eligible for a minimum $150,000 of annual entitlements. Non-primary commercial service airports with annual passenger enplanements between 8,000 and 10,000 are eligible for a minimum $600,000 of annual entitlements. A commercial service airport with over 10,000 annual passenger enplanements is considered a Primary commercial service airport, and is therefore eligible for a minimum $1,000,000 of annual entitlements. San Luis Valley Regional Airport has surpassed 10,000 annual enplanements and is therefore considered a Primary commercial service airport eligible for $1,000,000 of annual AIP entitlement funds.

- **Discretionary** – The discretionary fund consists of the remaining AIP funds left over from entitlement distribution. The discretionary funds can be utilized to fund AIP grant eligible projects and are distributed according to a national prioritization formula.

- **State Apportionment** – The FAA also sets aside a certain amount of money per year to be distributed amongst the airports within each state. The state apportionment for Colorado in 2021 was approximately $5 million.

Additionally, the Aviation Safety and Capacity Expansion Act of 1990 authorized the Secretary of Transportation to grant public agencies the authority to impose a Passenger Facility Charge (PFC) to fund eligible airport projects. The initial legislation set the maximum PFC level at $3.00 per enplaned passenger. AIR-21 increased the maximum PFC level from $3.00 to $4.50. In 2018, the FAA Reauthorization Act retained the PFC cap at $4.50. Although the FAA is required to approve 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.

Grant eligible items typically include airfield and aeronautical related facilities such as runways, taxiways, aprons, lighting, visual aids, and equipment as well as land acquisition, planning and environmental tasks needed to accomplish the improvements. Public use (non-revenue generating) portions of passenger terminals are also grant eligible. In addition, fuel systems and hangars are also grant eligible; however, these items are considered a low priority for FAA funding.

7.3.2 State of Colorado

The Colorado Department of Transportation Aeronautics Division participates in funding airport capital improvement projects in the State of Colorado. CDOT provides funding of up to a five percent match on AIP funded projects through the Colorado Discretionary Aviation Grant (CDAG) program.

CDOT obtains their funds through user generated methods such as aviation fuel sales taxes. General funds are not used to support Colorado airports. A tax on all aviation fuel sold in the State of Colorado is then placed into the Colorado Aviation Fund. The fund is used to support the States aviation system through fuel tax reimbursements to airports, the CDAG program and statewide aviation system projects and programs. CDOT disperses 65% of the sales tax revenue collected back to eligible airports at which the fuel was sold via fuel tax reimbursements. Up to 5% of the fuel sales tax collected is used to fund and administer the Aeronautics Division. The remaining 30% of sales tax revenue funding is used to assist eligible public-use airports through the CDAG program.

CDOT also offers airports low interest rate loans through the State Infrastructure Bank (SIB). These loans can be utilized for various airport improvement and land acquisition projects.

7.3.3 Local Funding

Airport sponsors have several methods available for funding the capital required to meet the local share of development costs. The most common methods involve debt financing (which amortize the debt over the useful life of the project), force accounts, in-kind service, third-party support and donations.

Bank Financing: Some airport sponsors use bank financing as a means of funding airport development. Generally, two conditions are required. First, the sponsor must show the ability to repay the loan plus interest and second, capital improvements must be less than the value of the present facility or some other collateral used to secure the loan. These are standard conditions which are applied to almost all bank loan transactions.

General Obligation Bonds: General Obligation bonds (GO) are a common form of municipal bonds whose payment is secured by the full faith credit and taxing authority of the issuing agency. GO bonds are instruments of credit and because of the community guarantee, reduce the available debt level of the sponsoring community. This type of bond uses tax revenues to retire debt and the key element becomes the approval of the voters to a tax levy to support airport development. If approved, GO bonds are typically issued at a lower interest rate than other types of bonds.

Self-liquidating General Obligation Bonds: As with General Obligation bonds, Self-liquidating General Obligation Bonds are secured by the issuing government agency. They are retired, however, by cash flow from the operation of the facility. Providing the state court determines that the project is self-sustaining, the debt may be legally excluded from the community's debt limit. Since the credit of the local government bears the ultimate risk of default, the bond issue is still considered, for the purpose of financial analysis, as part of the debt burden of the community. Therefore, this method of financing may mean a higher rate of interest on all bonds sold by the community. The amount of increase in the interest rate depends, in part, upon the degree of risk of the bond. Exposure risk occurs when there is insufficient net airport operating income to cover the level of service plus coverage requirements, thus forcing the community to absorb the residual.

Revenue Bonds: Revenue Bonds are payable solely from the revenues of a particular project or from operating income of the borrowing agency, such as an airport commission which lacks taxing power. Generally, they fall outside of constitutional and statutory limitations and in many cases do not require voter approval. Because of the limitations on the other public bonds, airport sponsors are increasingly turning to revenue bonds whenever possible. However, revenue bonds normally carry a higher rate of interest because they lack the guarantees of municipal bonds. It should also be noted that the general public would usually be wary of the risk involved with a revenue bond issue for a general aviation airport. Therefore, the sale of such bonds could be more difficult than other types of bonds.

Combined Revenue/General Obligation Bonds: These bonds, also known as "Double-Barrel Bonds", are secured by a pledge of back-up tax revenues to cover principal and interest payments in cases where airport revenues are insufficient. The combined Revenue/General Obligation Bond interest rates are usually lower than Revenue Bonds, due to their back-up tax provisions.

Force Accounts, In-kind Service, Donations: Depending on the capabilities of the Sponsor, the use of force accounts, in-kind service, or donations may be approved by the FAA for the Sponsor to provide their share of the eligible project costs. An example of force accounts would be the use of heavy machinery and operators for earthmoving and site preparation of runways or taxiways; the installation of fencing; or the construction of improvements to access roads. In-kind service may include surveying, engineering or other services. Donations may include land or materials such as gravel or water needed for the project. The values of these items must be verified and approved by the FAA prior to initiation of the project.

Third-Party Support: Several types of funding fall into this category. For example, individuals or interested organizations may contribute portions of the required development funds (Pilot Associations, Economic Development Associations, Chambers of Commerce, etc.). Although not a common means of airport financing, the role of private financial contributions not only increases the financial support of the project, but also stimulates moral support to airport development from local communities. Because of the potential for hangar development, private developers may be persuaded to invest in hangar development. A suggestion would be that the Airport authorize long-term leases to individuals interested in constructing a hangar on airport property. This arrangement generates revenue from the airport, stimulates airport activity, and minimizes the sponsor's capital investment requirements. Another method of third-party support involves permitting a fixed base operator (FBO) to construct and monitor facilities on property leased from the airport. Terms of the lease generally include a fixed amount plus a percentage of revenues and a fuel flowage fee. The advantage to this

arrangement is that it lowers the sponsor's development costs, a large portion of which is building construction and maintenance.

The Airport funds all of the cost of capital projects by generating revenue from tenants, users and other sources. These airport funds can come from annual surplus, reserves, or borrowing. While capital projects are usually funded from variety of sources, in the end, Airport contributed funds have a role in almost all projects, particularly as seed money to initiate projects and to provide the match of FAA funds.

Other methods outside the traditional methods mentioned in the above paragraph are potential suppliers of money to construct capital improvements. These include users, tenants, investors, and other sources. Tenants often construct their own facilities particularly hangar facilities. Airport users such as corporate flight departments sometimes contribute funds for projects and agree to increased rents to recover the costs of improvements. Private capital can also be used for facilities such as general aviation and corporate hangar facilities.

7.4 Financial Plan

The ultimate goal of any airport should be to support its own operation and development through airport generated revenues. Facilities that are self-sustaining can provide services with minimal outside funding and reciprocal influence.

7.4.1 Projected Revenues and Expenditures

Airport operating expenditures typically include insurance, utilities, maintenance, and management costs. Insurance costs include liability insurance for the airport and property insurance for any real property on the airport owned by the airport. Utility expenses primarily consist of power costs to operate airfield lighting and visual aids and water for public use areas. Pavement maintenance consists of crack sealing on an annual basis and seal coating and remarking the pavements every five years. Facility maintenance consists of mowing, snow removal and repair and replacement of parts and equipment such as light bulbs, light fixtures, fences, etc. Management costs include an airport manager and airport support staff including ARFF.

Airport revenues generally consist of land leases, user fees, fuel flowage fees, and property taxes generated from on-airport improvements. Other revenue generating options include:

Land Leases: Property on the airport that is not devoted to airfield use, vehicle parking or contained within areas required to be cleared of structures may be leased to individual airport users or aviation related businesses. Typically, the individual is provided a long-term lease on which to construct a hangar, business or other facility. At the termination of the lease, the lessee has the option to renew the lease, sell, or to remove the buildings.

Hangar Leases: Hangars on the airport owned by the airport sponsor can be leased to private aircraft operators or businesses. Typically, as with land leases, the individual or business is provided a long-term lease of the hangar. At the termination of the lease, the lessee has the option to renew the lease or cease use of the hangar.

Hangar Rental: The fees are usually established on a monthly basis for based aircraft and on an overnight basis for transient aircraft.

Fuel Flowage Fee: This fee is typically imposed on all aircraft fuels delivered to the airport and would include all fuels used by aircraft including AvGas and Jet-A. The fee would apply to FBO's and operators who conduct self-fueling.

Fuel Markup Fee: This fee is typically charged by the on-airport fuel provider. The fee is applied to each gallon of fuel sold on the airport and covers the costs associated with providing fuel. The fuel markup fee is imposed on both Jet-A and Avgas.

Commercial Activity Fee: This fee is imposed on commercial activities operating "for profit" at the airport. Typical commercial activities may include FBO's, maintenance services, air taxi or charter services, automobile rental, restaurants, retail or other goods and services which may be provided at the airport. This fee would be in addition to any applicable land lease.

Non-Aeronautical Revenue Generating Land Lease: The lease is for land that is located on airport property but that is not required for existing or future airport development. The lease for these areas must be setup at fair market value and all revenue generated from these leases must remain within the airport fund.

San Luis Valley Regional Airport generates revenues through hangar leases, land leases and fuel flowage fees. All revenues generated by the airport must be expended by the airport for capital or operating costs of the airport.

7.4.2 Recommendations

The most effective means of increasing revenue at the San Luis Valley Regional Airport is to accommodate existing unmet demand and to continue to attract new and additional users. Several potential strategies for increasing revenues are listed below:

- Continue the development of commercial passenger service;
- Increase the number of ground leases for aircraft storage hangars;
- Focus on attracting business/corporate aviation tenants;
- Develop non-aeronautical land lease areas;
- Support development of an Air Tanker Base on the airport;
- Support development of helicopter testing facilities on the airport.

Continuing to develop commercial passenger service will both directly and indirectly increase revenues with an increase in passenger enplanements and aircraft operations. It is recommended to develop Passenger Facility Charges to fund improvements and development projects at the airport. Increasing aircraft storage hangars at the airport would result in not only in increased direct revenues generated through property leases, but would also produce indirect revenue through increased use of airport services and facilities, such as fuel purchases. Locations for additional box hangars have been identified on the Terminal Area Drawing (TAD) of the Airport Layout Plan. Business/corporate tenants are typically flight departments for local businesses and provide employment in the local community. They

generally operate multi-engine turboprop or business jet aircraft. Their land lease parcels are usually large, the aircraft are typically operated two to three times per week and fuel purchases are typically larger than other general aviation users (several hundred gallons per fueling). Development of an Air Tanker Base on the Airport would likely directly increase revenues through fuel sales.

7.5 Community Support

While it is certainly advantageous for an airport to support itself, the indirect and intangible benefits of the airport to the community's economy and growth must be considered. People are directly or indirectly employed by the Airport or by businesses that utilize the Airport. As airport activity increases, it is probable that employment on the airport will also grow throughout the planning period. The local construction industry will also benefit directly from implementation of the development programs. Other community benefits involve business growth and development that is enhanced by the availability of air transportation including commercial service, corporate and private aviation. Clients and suppliers of local businesses will also benefit from the future improvement to the airport.

The use of corporate and business aircraft is an increasing trend throughout the United States. The movement of American industry from large metropolitan areas to smaller communities which offer lower taxes and labor costs and a better working environment has influenced this trend. The community's ability to provide convenient access to corporate aircraft will be reflected not only in benefits to existing businesses and industries but will be a strong factor in attracting new industry. The effects of the COVID-19 pandemic have had a significant impact on the San Luis Valley Regional Airport and the air travel industry as a whole, however, indicators show a future increase in passenger activity. With the continual growth of the surrounding community, it is anticipated demand for commercial passenger service at the Airport will continue to rise. These factors place the San Luis Valley Regional Airport in a prime position to capitalize on the trends in the general aviation and commercial passenger service industries to maximize the benefits the airport provides to the community.

7.6 Continuous Planning Process

Airport planning is a continuous process that does not end with the completion of a major project. The fundamental issues upon which this master plan is based are expected to remain valid for several years; however, several variables, such as enplanements, based aircraft, annual aircraft operations and socioeconomic conditions are likely to change over time. The continuous planning process necessitates that the sponsor consistently monitors the progress of the airport in terms of growth in enplanements, based aircraft and annual operations as this growth is critical to the timing and need for new airport facilities. The information obtained from this monitoring process will provide the data necessary to determine if the development schedule should be accelerated, decelerated or maintained as scheduled.

Periodic updates of the Airport Layout Plan, Capital Improvement Plan and Airport Master Plan are recommended to document physical changes to the airport, review changes in aviation activity and to update improvement plans for the airport. The primary goal of this Airport Master Planning effort is to develop a safe and efficient airport that will meet the demands of aviation users and stimulate economic development in the community. The continuous airport planning process is a valuable tool in achieving that goal.

APPENDICES

Appendix A

Environmental Overview and Documentation

U.S. Fish and Wildlife Service
National Wetlands Inventory

ALS Wetlands

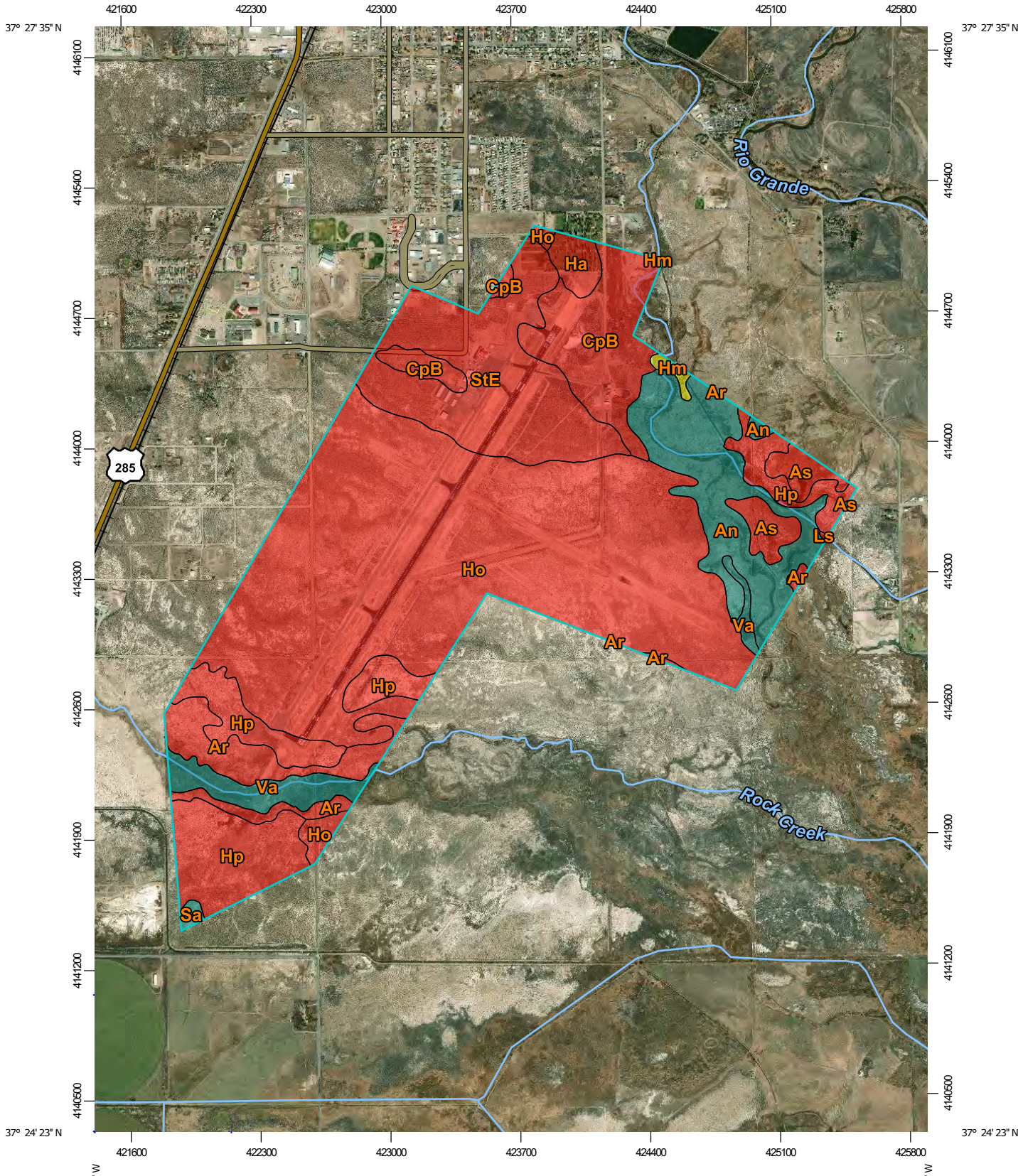


November 12, 2019

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.



Map Scale: 1:28,900 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 400 800 1600 2400

Feet: 0 1000 2000 4000 6000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

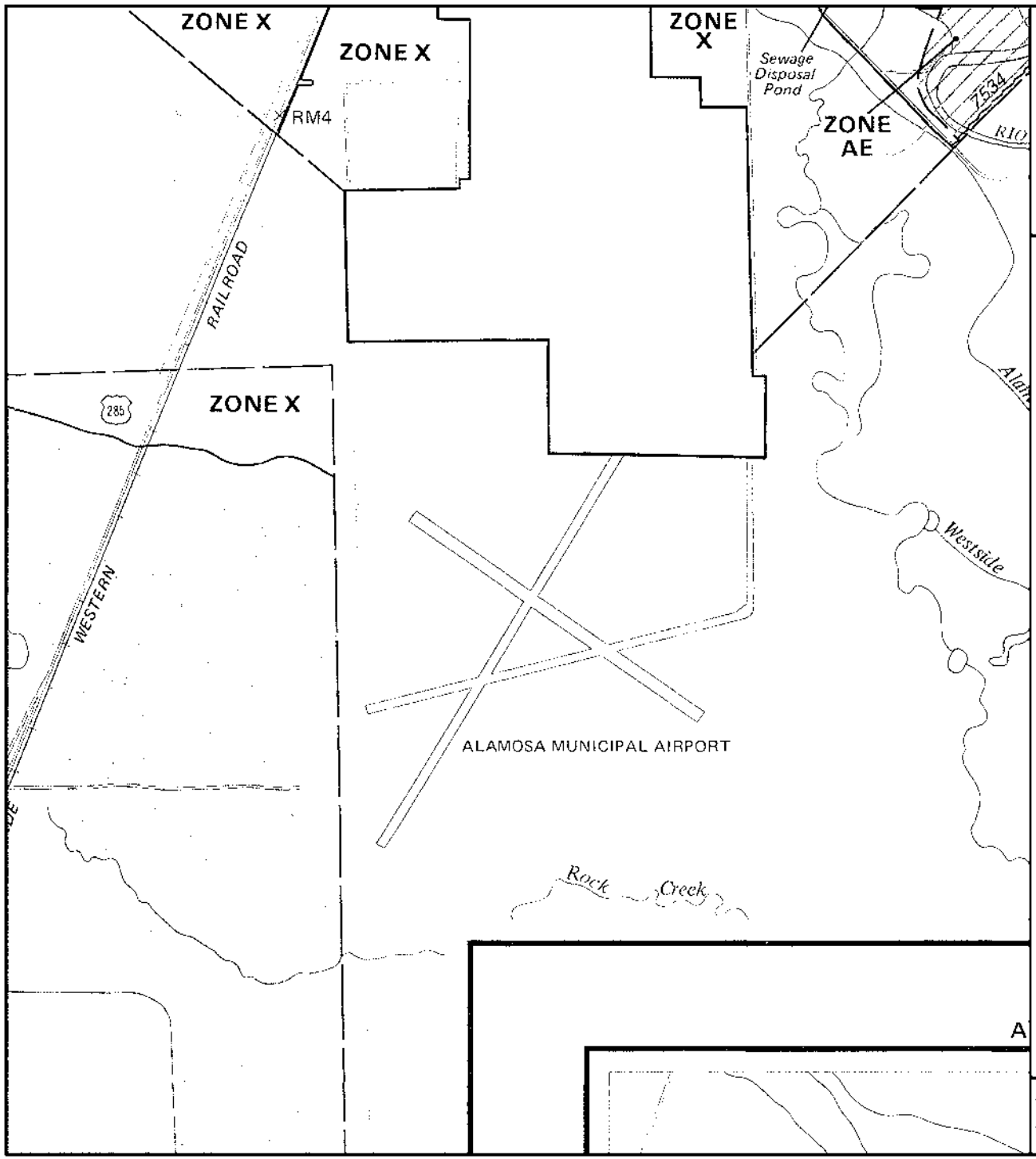
Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of statewide importance, if drained
- Farmland of statewide importance, if protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated
- Farmland of statewide importance, if drained and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if irrigated and drained
- Farmland of statewide importance, if irrigated and either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if subsoiled, completely removing the root inhibiting soil layer
- Farmland of statewide importance, if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Farmland of statewide importance, if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance, if drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough, and either drained or either protected from flooding or not frequently flooded during the growing season
- Farmland of statewide importance, if warm enough
- Farmland of statewide importance, if thawed
- Farmland of local importance
- Farmland of local importance, if irrigated
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season



N

APPROXIMATE SCALE IN FEET

2000 0 2000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

ALAMOSA COUNTY, COLORADO

(UNINCORPORATED AREAS)

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER

080009 0045 B

MAP REVISED:

APRIL 21, 1999

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Colorado Ecological Services Field Office
Denver Federal Center
P.O. Box 25486
Denver, CO 80225-0486
Phone: (303) 236-4773 Fax: (303) 236-4005
http://www.fws.gov/coloradoES
http://www.fws.gov/platteriver

In Reply Refer To: November 12, 2019
Consultation Code: 06E24000-2020-SLI-0266
Event Code: 06E24000-2020-E-00629
Project Name: ALS AMP

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered

species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Colorado Ecological Services Field Office
Denver Federal Center
P.O. Box 25486
Denver, CO 80225-0486
(303) 236-4773

Project Summary

Consultation Code: 06E24000-2020-SLI-0266

Event Code: 06E24000-2020-E-00629

Project Name: ALS AMP

Project Type: DEVELOPMENT

Project Description: AMP

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.43537266492227N105.86579950141466W



Counties: Alamosa, CO

Endangered Species Act Species

There is a total of 5 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Canada Lynx *Lynx canadensis* Population: Wherever Found in Contiguous U.S. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3652	Threatened
North American Wolverine *Gulo gulo luscus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5123	Proposed Threatened

Birds

NAME	STATUS
Mexican Spotted Owl *Strix occidentalis lucida* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8196	Threatened
Southwestern Willow Flycatcher *Empidonax traillii extimus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6749	Endangered
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **proposed** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

MIGRATORY BIRD INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.
Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the “no data” indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ “Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds” at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

- PEM1C
- PEM1A
- PEM1Cx
- PEM1F

FRESHWATER POND

- PABF

RIVERINE

- R2UBF

Appendix B

FAA Forecast Approval Letter

From:	Sweeney, John (FAA)
To:	John Rostas
Subject:	RE: Forecast Approval
Date:	Monday, April 27, 2020 9:20:22 AM
Attachments:	image001.png image002.png image004.png image005.png

---

John,

Noted, but because the they are both C-II like you mentioned and the operation of the 700 is driven by the retirement of the 200. I don't think it is necessary for a new approval letter to be issued.

Thanks,

John

From: John Rostas <jrostas@armstrongconsultants.com>
Sent: Monday, April 27, 2020 9:02 AM
To: Sweeney, John (FAA) <John.Sweeney@faa.gov>
Subject: RE: Forecast Approval

Good Morning John,

We appreciate the approval of the forecast section for Alamosa. One thing I noticed on this letter is that it approves the CRJ-200 as the future design aircraft. Our future design proposed is actually the CRJ-700. Would we need to reissue the approval letter for the aircraft? I'm not sure if it makes much of a difference for the intent of this project as they're both C-II aircraft.

Thanks for all your help!

John

ARMSTRONG
JOHN ROSTAS, C.M. | Airport Planning Project Manager
6855 S. Havana Street, Suite 635 | Centennial, CO 80112
O: 303.296.4949 **D:** 303.309.8037
www.armstrongconsultants.com

From: Sweeney, John (FAA) <John.Sweeney@faa.gov>
Sent: Friday, April 24, 2020 2:11 PM
To: Will Hickman <whickman@alamosacounty.org>

Cc: John Rostas <jrostas@armstrongconsultants.com>; Kaitlyn Westendorf - CDOT <kaitlyn.westendorf@state.co.us>
Subject: Forecast Approval

U.S. Department of Transportation
Federal Aviation Administration

Northwest Mountain Region
Colorado · Idaho · Montana · Oregon · Utah
Washington · Wyoming

Denver Airports District Office
26805 E. 68th Ave., Suite 224
Denver, CO 80249

April 24, 2020

Will Hickman
San Luis Valley Regional Airport
2490 State Avenue
Alamosa, CO 81101

San Luis Valley Regional Airport
Alamosa, CO
AIP: 3-08-0002-024-2019
Forecast Approval

Dear Mr. Hickman:

The Federal Aviation Administration (FAA) reviewed forecast information for the subject airport. The forecast was received April 14, 2020. FAA approves the attached forecast. The FAA also approves the CRJ-200, C-II, for the existing and future critical aircraft. We found the forecast to be supported by reasonable planning assumptions and current data. Your forecast appears to be developed using acceptable forecasting methodologies.

The approval of the forecast and critical aircraft does not automatically constitute a commitment on the part of the United States to participate in any development recommended in the master plan or shown on the ALP. All future development will need to be justified by current activity levels at the time of proposed implementation. [*See FAA Order 5100.38D, Airport Improvement Program, Paragraph 3-12, for ADO options.*] Further, the approved forecasts may be subject to additional analysis or the FAA may request a sensitivity analysis if this data is to be used for environmental or Part 150 noise planning purposes.

If you have questions, please call me at 303-342-1263.

Sincerely,

John Sweeney,
Community Planner
Denver ADO

Appendix C

Public Involvement

Meeting Sign-In Sheet

San Luis Valley Regional Airport Master Plan Update Kick-Off Meeting	**Meeting Date:** September 19, 2019 (8:30 AM)

Name	Affiliation/Company	Phone	E-mail
Justin Pietz	Armstrong Consultants	970-242-0101	jpietz@armstrongconsultants.com
John Rostas	Armstrong Consultants	303-296-4949	jrostas@armstrongconsultants.com
Matt Tomasson	Armstrong Consultants	602-903-5028	mtomasson@armstrongconsultants.com
Kevin Wilkins	SLVDRG	719-589-6099	Kwilkins@slvdrg.org
Will Hickman	SLV Airport	719-580-1986	whickman@alamosacounty.org
Jessica Taylor	SLV Airport	719-298-7268	jtaylor@alamosacounty.org
Gigi Dennis	Alamosa County	719-587-5169	gdennis@alamosacounty.org
Peter Strutton	Eagle Air Med/Guardian Flt	720-854-5887	pastrut@gmail.com

ARMSTRONG

SAN LUIS VALLEY REGIONAL AIRPORT
AIRPORT MASTER PLAN

KICK-OFF MEETING

September 19, 2019

MEETING SUMMARY

Purpose: Present an overview of the Airport Master Plan's (AMP) objectives and project status to the Technical Advisory Committee (TAC) and receive feedback pertaining to the Airport Master Plan process.

An Airport Master Plan kick-off meeting was held on September 19, 2019 to provide the TAC with overview of the AMP process, objectives, and current project status. Attendance at the meeting comprised of representatives from Alamosa County, Airport Management, Airport tenants and operators, and Armstrong Consultants, Inc (ACI). The meeting attendee sign-in sheet is attached at the end of this summary.

The purpose of the meeting was to discuss the following:

- **AMP Overview**
  A brief overview of what an AMP consists of and its objectives was provided. These topics were discussed to give the attendees an understanding of the AMP project scope and process. The AMP consists of a narrative document which includes a 20-year plan of development along with an Airport Layout Plan (ALP) drawing set, which would serve as a graphical depiction of the existing and future layout of the San Luis Valley Regional Airport (the Airport). Additionally, the document discusses the overall goals of the Airport for the community. Among these objectives are: evaluate future demand, determine compliance with FAA design standards, provide a graphic representation of the ultimate development, prioritize future airside and landside development and ensure the airport complements local/regional development.

- **TAC Role**
  An overview of the role the TAC will contribute to the AMP process was provided. The TAC will perform multiple functions throughout the AMP update which are: assisting the Consultant Team with plan development, communicating issues and concerns, acting as a liaison to the community, providing feedback on Working Papers and, input for the overall planning process.

- **AMP Process and Project Status**
  A breakdown of the AMP process was presented to provide an understanding of the progression of the project from start to finish. The Airport Master Plan project is currently in the investigation phase. Data and information are currently being collected to develop the Draft Working Paper 1 (WP1). When the Draft WP1 is complete, it will be distributed to the TAC, Colorado Department of Transportation (CDOT), and the FAA for review and input.

- **Runway Design Code/Airport Reference Code and Other Planning Considerations**
  An overview of the factors that determine Runway Design Code (RDC) and Airport Reference Code (ARC) were discussed at the meeting. The presentation further detailed runway design standards that are prescribed by the FAA and are driven by the designated RDC's at the Airport. Other planning considerations that will be detailed during the AMP process include: future RDC/ARC, aircraft operations, factors influencing aviation demand, future landside configuration and needs, future hangar location and sizes, and potential environmental impacts.

- **Next Steps**
  The Draft WP1 is currently underway and will be distributed to the TAC, CDOT, and FAA for review and comment.

- **Questions/Discussion**
  Throughout the presentation, further questions/discussions were addressed for clarification and guidance. The following are the topics that were discussed:

  - Options for public involvement.
  - TAC review process of Working Papers and providing executive summaries.
  - Recent Instrument Approach Procedure (IAP) changes.
  - Impacts of the Airport being located within an "Opportunity Zone".
  - How changes to Essential Air Service (EAS) or Medevac operations may affect the Airport.
  - Updated operational characteristics of the Airport to reflect existing conditions.
  - Fuel farm/storage relocation and upgrades.

SAN LUIS VALLEY REGIONAL AIRPORT
AIRPORT MASTER PLAN

DEVELOPMENT ALTERNATIVES MEETING

March 23, 2021
9:00 A.M. – 11:00 A.M.
San Luis Valley Regional Airport

MEETING SUMMARY

Purpose: Present the Airport Master Plan's (AMP) development alternatives to San Luis Valley Regional Airport Technical Advisory Committee and garner feedback pertaining to the recommended development.

A Technical Advisory Committee (TAC) development alternatives meeting was held on March 23, 2021 to determine the recommended development to be carried forward onto the Airport Layout Plan (ALP). Attendance at the meeting comprised of representatives from the County of Alamosa, Airport management, local stakeholders, Airport users, Federal Aviation Administration and Armstrong Consultants, Inc (ACI).

The purpose of the meeting was to discuss the following:

- **AMP Overview**
  A brief overview of the AMP objectives was provided. These topics were discussed at length in the September 2019 TAC meeting. The objectives of an AMP and the purpose the document serves for the airport's future development was discussed. The AMP is shown to be a document which provides a twenty-year plan of development and ALP drawings which would serve as a graphical depiction of the existing and future layout of the airport. Additionally, the document discusses the overall goals of the San Luis Valley Regional Airport and the overall community. Among these objectives are: determination of future aviation demand, evaluation of complying with Federal Aviation Administration (FAA) design standards, prioritizing future airside and landside development and ensuring the airport complements local/regional development.

- **AMP Project Status**
  The analysis and evaluation of the existing and future airport facility needs has been completed. As a result of the discussions from this meeting, the ALP can be developed utilizing input from the TAC. Refined cost estimates and a phasing plan are being developed for the selected preferred alternatives and presented in the Draft AMP Report. All comments on the previous working papers have been revised. Additional comments will be solicited for the Draft AMP Report and ALP and will be revised into the Final Report.

- **Runway Design Standards**
  A brief overview of the existing Runway Design Standards, which provide various areas and zones surrounding each runway and must be protected in order to safely accommodate airport operations, was provided.

- **Recommended Development and Options for Development**
  The recommended development proposed as a part of the AMP is done to accomplish the following: (1) update airfield configuration to meet current FAA design guidelines; (2) provide an efficient airfield layout; (3) avoid or minimize impacts to surrounding communities; and (4) protects for recommended airside/landside improvements. It was noted that the recommended development does not require development to occur or provide environmental clearance for the proposed development. It was reiterated that the recommended development shown in the final ALP is not absolute, would only occur if documented demand exists and is flexible to meet the needs and desires of the community.

  The following recommendations and proposed development at the San Luis Valley Regional Airport were discussed:

  - Airside:

    - Runway 2-20

      The option to extend Runway 2-20 to a total length of 10,000' to the south was evaluated. The estimated cost, impacts to airport operations and aviation safety, required land acquisition and potential environmental impacts for the runway extension was discussed. It was also noted that this project would be considered a low priority for FAA funding and a cost/benefit analysis would be required to justify if an extension was warranted. Additionally, it was discussed that the existing Runway 2-20 length is expected to be adequate for the existing and forecasted operations throughout the planning period. The TAC elected to carry forward the option of maintaining the existing Runway 2-20 length throughout the planning period. A post planning exhibit will be provided to depict a layout with a Runway 2-20 overall length of 10,000' for beyond the planning period.

    - Crosswind Runway

      Four options related to the development of a crosswind runway were evaluated to meet the recommended 95 percent crosswind coverage for A-I and B-I aircraft (10.5 knot crosswind component) including: (1) develop Runway 7-25 (5,000 x 60') intersecting Runway 2-20 near midfield, (2) develop Runway 11-29 (4,500' x 60') to the east of Runway 2-20, (3) develop Runway 11-29 (6,850' x 60') intersecting Runway 2-20 near midfield, (4) do not develop a crosswind runway at the Airport. Each of the proposed runways would improve crosswind coverage of the runway system and enhance the utility of the Airport to users. The estimated cost, impacts to airport operations and aviation safety, and potential environmental impacts for each option was discussed. Constructing the crosswind runway in phases, and initially as a dirt runway, was also discussed as an option. It was also noted that this project would be a low priority item for FAA funding and would require documented existing demand. The TAC elected to carry forward option two of protecting for the development of Runway 11-29 (4,500' x 60').

    - Aircraft Parking Apron / Special Use Areas

      The TAC elected to show the following items on the ALP:

      - Expand Aircraft Parking Apron to the south of existing apron areas;

- Protect for future air tanker base to the east of Runway 2-20;
- Maintain the ILS;
- Protect for ultimate design aircraft: CRJ-700;
- Protect for future helicopter testing area to the east of Runway 2-20.

- Terminal Area/Landside:

  - Protect for expanded Passenger Terminal development;
  - Protect for expanded SRE/ARFF facilities;
  - Protect for additional automobile parking;
  - Protect for expanded concrete commercial aircraft apron;
  - Protect for De-Ice/Wash pad;
  - Protect for expanded/additional FBO facilities;
  - Protect for expanded jet/itinerant aircraft hardstands and helicopter parking pads;
  - Protect for additional Taxilane and Hangar Development;
  - Relocate ASOS near Runway 2 end;
  - Protect for air cargo facility;
  - Relocate supplemental wind cones.

  The terminal area/landside development shown will be adjusted based on feedback received from the TAC.

  The TAC also elected to show the following items on the ALP:

  - Paved airport perimeter road;
  - Identification of future aeronautical and non-aeronautical land use areas on Airport property;
  - Removal of existing hangar facility to enhance safety/circulation of aircraft;
  - Protect for expanded Terminal Building facilities for vendors;
  - Expand vehicle parking to the west of the Terminal Building;
  - Depict existing non-aeronautical developments that are on Airport property;
  - Include the relocated fuel system on layout exhibits;

- **Next Steps**
  The FAA/CDOT/TAC will review and comment on the Development Alternatives, the Draft AMP and ALP, as they are released. Final comments regarding the Draft AMP and ALP will be solicited and included into the Final Report.

Appendix D

Acronyms

Acronyms/Abbreviations

14 CFR PART 77	Title 14 Code of Federal Regulations Part 77 Safe, Efficient Use, and Preservation of the Navigable Airspace
AAC	Aircraft Approach Category
AC	Advisory Circular
ACIP	Airport Capital Improvement Plan
ADG	Airplane Design Group
AFFF	Aqueous Film Forming Foam
AGIS	Airports Geographic Information Systems
AGL	Above ground level
AHPA	Archeological and Historic Preservation Act of 1974
AIP	Airport Improvement Program
ALP	Airport layout plan
AMP	Airport master plan
AOPA	Aircraft Owners and Pilots Association
APMS	Airport Pavement Management System
ARC	Airport Reference Code
ARFF	Aircraft rescue and fire fighting
ARP	Airport reference point
ARTCC	Air route traffic control center
ASDA	Accelerate-stop distance available
ASOS	Automated surface observing system
ASV	Annual service volume
ATC	Air traffic control
ATIS	Automatic Terminal Information Service
AWOS	Automated Weather Observing System
AWSS	Automated Weather Sensor System
CAA	Clean Air Act
CAGR	Compound annual growth rate
CATEX	Categorical exclusion
CDOT	Colorado Department of Transportation
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIP	Capital Improvement Plan
CMG	Cockpit-to-Main Gear
Db	Decibel
DES	Department of Economic Security
DNL	Day-Night Average Sound Level
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency

ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FBO	Fixed Base Operator
FEMA	Federal Emergency Management Agency
FSS	Flight Service Station
GA	General Aviation
GPS	Global Positioning System
IAP	Instrument Approach Procedure
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
ILS	Instrument Landing System
LDA	Landing Distance Available
LED	Light Emitting Diode
LPV	Localizer/Lateral Performance with Vertical Guidance
Medevac	Air Medical Evacuation
MGW	Main Gear Width
MIRL	Medium Intensity Runway Lights
MITL	Medium Intensity Taxiway Lights
MOA	Military Operations Area
MSL	Mean Sea Level
MTOW	Maximum Takeoff Weight
MTR	Military Training Route
NAAQS	National Ambient Air Quality Standards
NAS	National Airspace System
NAVAIDS	Navigational Aids
NDB	Non-Directional Beacon
NextGen	Next Generation Air Transportation System
nm	Nautical Miles
NOAA	National Oceanic and Atmospheric Administration
NOTAM	Notice to Airmen
NPIAS	National Plan of Integrated Airport Systems
NRCS	National Resources Conservation Services
NRHP	National Register of Historic Places
OFA	Object Free Area
OFZ	Obstacle Free Zone
OPBA	Operations Per Based Aircraft
PAPI	Precision Approach Path Indicator
PCI	Pavement Condition Index
PM	Particulate Matter

RDC	Runway Design Code
REIL	Runway End Identifier Lights
RIASP	Regional Integrated Airport System Planning
RNAV	Area Navigation
ROFA	Runway Object Free Area
RPZ	Runway Protection Zone
RSA	Runway Safety Area
RVR	Runway Visual Range
SHPO	State Historic Preservation Office
SIASP	Statewide Integrated Airport System Planning
SIP	State Implementation Plan
SPCC	Spill Prevention, Control and Countermeasure
SWPPP	Storm Water Pollution Prevention Plan
TAC	Technical Advisory Committee
TACAN	Tactical Air Navigation
TAD	Terminal Area Drawing
TAF	Terminal Area Forecast
TDG	Taxiway Design Group
TESM	Taxiway Edge Safety Margin
TODA	Takeoff Distance Available
TOFA	Taxiway Object Free Area
TORA	Takeoff Run Available
TSA	Taxiway Safety Area
TSA	Transportation Security Administration
TSS	Threshold Siting Surface
U.S.	United States
UAS	Unmanned Aerial System
USDA-NCRS	U.S. Department of Agriculture - Natural Conservation Resource Service
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
VFR	Visual Flight Rules
VHF	Very High Frequency
VOR/DME	VHF Omnidirectional Range/Distance Measuring Equipment
VORTAC	VHF Omnidirectional Range/Tactical Area Navigation
WAAS	Wide Area Augmentation System
WHA	Wildlife Hazard Assessment

Appendix E

Glossary of Terms

Glossary of Terms

100-year flood - A term used to simplify the definition of a flood that statistically has a 1-percent chance of occurring in any given year.

100LL AvGas - A common form of aviation gasoline used in spark-ignited internal combustion engines to propel aircraft.

Above ground level (AGL) - A height measured with respect to the underlying ground surface.

Accelerate-Stop Distance Available (ASDA) - The distance required to accelerate with all engines operating, have an engine failure or other event at least one second before V_1, reconfigure for stopping and bring the airplane to a stop using maximum wheel braking with speed brakes extended.

Advisory Circular 150/5060-5, *Airport Capacity and Delay* - A Federal Aviation Administration Advisory Circular explaining how to compute capacity and aircraft delay for airport planning and design.

Advisory Circular 150/5070-6B, *Airport Master Plans* - A Federal Aviation Administration Advisory Circular providing guidance for the preparation of airport master plans that range in size and function from small general aviation to large commercial service facilities.

Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports* - A Federal Aviation Administration Advisory Circular providing guidance on certain land uses that have the potential to attract hazardous wildlife on or near public use airports.

Advisory Circular 150/5210-6D, *Aircraft Fire and Rescue Facilities and Extinguisher Agents* - A Federal Aviation Administration Advisory Circular providing guidance on aircraft fire extinguishing agents and provides an acceptable methodology for complying with Title 14, Code of Federal Regulations, Part 139, Certification of Airports.

Advisory Circular 150/5300-13A, *Airport Design* - A Federal Aviation Administration Advisory Circular providing standards and recommendations for the geometric layout and engineering design of runways, taxiways, aprons, and other facilities at civil airports.

Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design* - A Federal Aviation Administration Advisory Circular providing design standards and guidelines for determining recommended runway lengths.

Advisory Circular 150/5370-10F, *Standards for Specifying Construction of Airports* - A Federal Aviation Administration Advisory Circular providing standards for the construction of airports.

Advisory Circular 150/5380-6B, *Guidelines and Procedures for Maintenance of Airport Pavements* - A Federal Aviation Administration Advisory Circular providing guidelines and procedures for maintaining rigid and flexible airport pavements.

Air medevac (medevac) - Transportation or evacuation of a person by an aircraft for medical treatment.

Air Traffic Control (ATC) - Personnel and equipment concerned with monitoring and controlling air traffic within a particular area.

Air traffic control tower - A terminal facility which, through the use of air/ground communications, visual signaling, and other devices, provides air traffic control services to airborne aircraft operating in the vicinity of an airport and to aircraft operating on the movement area.

Aircraft Approach Category (AAC) - A system for differentiating aircraft based on the speed at which the aircraft is flown during the approach phase of flight.

Aircraft apron - A surface in the AOA where aircraft park and are serviced (Refueled, loaded with cargo, and/or boarded by passengers).

Aircraft Classification Number-Pavement Classification Number (ACN-PCN) - A method to report airport runway, taxiway, and apron pavement strength.

Aircraft hangar - A closed structure used to hold aircraft or spacecraft in protective storage. Most hangars are built of metal, but other materials such as wood and concrete are also used.

Aircraft Owners and Pilots Association (AOPA) - An American non-profit political organization that advocates for general aviation.

Aircraft Rescue and Fire Fighting (ARFF) - A special category of firefighting that involves the response, hazard mitigation, evacuation and possible rescue of passengers and crew of an aircraft involved in (typically) an airport ground emergency.

Airfield capacity analysis - An analysis to assess the capability of the airfield facilities to accommodate projected levels of aircraft operations.

Airfield destination sign - An airfield sign identifying the taxi route to the destination depicted.

Airplane Design Group (ADG) - A classification of aircraft based on wingspan and tail height.

Airport - An area of land or water used or intended for landing or takeoff of aircraft including appurtenant area used or intended for airport buildings, facilities, as well as rights of way together with the buildings and facilities.

Airport access road - A road providing a means of entry and exit to the airport from another roadway.

Airport and Airway Improvement Act of 1982 - An Act approved by Congress to authorize appropriations for the Federal Aviation Administration for research, engineering, and development to increase the efficiency and safety of air transport.

Airport Capital Improvement Plan (ACIP) - A planning tool for systematically identifying, prioritizing, and assigning funds to critical airport development.

Airport Improvement Program (AIP) - A United States federal grant program that provides funds to airports to help improve safety and efficiency.

Airport layout plan (ALP) - A set of scale drawings of current and future airport facilities that provides a graphic representation of the long-term development plan for the airport and demonstrates the preservation and continuity of safety, utility, and efficiency of the airport to the satisfaction of the FAA.

Airport master plan (AMP) - A planning tool that helps airport owners, regulating agencies, and public officials meet the needs of the traveling public and guide the continued improvement of aviation facilities. Master Plans are developed according to FAA guidance provided in Advisory Circular 150/5070-6B, *Airport Master Plans*, and they evaluate facility needs of the airfield (runways and taxiways), landside (auto parking and access), terminal building, and overall airport land use.

Airport Pavement Management System (APMS) - A system that provides a consistent, objective, and systematic procedure for establishing facility policies, setting priorities and schedules, allocating resources, and budgeting for pavement maintenance and rehabilitation.

Airport planning - A systematic process used to establish guidelines for the efficient development of airports that is consistent with local, state, and national goals.

Airport Reference Code (ARC) - A coding system developed by the FAA to relate airport design criteria to the operational and physical characteristics of the airplane types that will operate at a particular airport.

Airport Reference Point (ARP) - The latitude and longitude of the approximate center of the airport.

Airport service area - The geographic area an airport serves, usually within 20 miles or 30 minutes of another airport.

Airport usage fee - A general fee, or tax, imposed by the airport operator for the passage through an airport.

Airports Geographic Information Systems (AGIS) - A system that helps the Federal Aviation Administration collect airport and aeronautical data to meet the demands of the Next Generation National Airspace System.

Airside - The portion of an airport that encompasses all facilities that support aircraft and aircraft-related activities.

Airspace - The portion of the atmosphere directly above the land or water, used by aircraft or by earth-based structures such as skyscrapers; airspace can be classified as either controlled or uncontrolled.

Annual operations - The total sum of aircraft landings and takeoffs in a given year.

Annual service volume (ASV) - A term used in airport capacity analysis defined by the FAA as a function of the hourly capacity of the airfield and the annual, daily, and hourly demands placed upon it. ASV is estimated by multiplying the daily and hourly operation ratios by a weighted hourly capacity.

Approach surface - An imaginary surface that exists primarily to prevent existing or proposed manmade objects, objects of natural growth, or terrain from extending upward into navigable airspace. Approach surfaces dimensions vary depending on the type of approach to a runway, i.e. precision instrument, non-precision instrument, or visual.

Aqueous film forming foam (AFFF) - A highly efficient type of fire suppressant agent, used by itself to attack flammable liquid pool fires; used by airport firefighters mainly for aviation fuel fires.

Archeological and Historic Preservation Act (AHPA) of 1974 - Amended the 1960 Reservoir Salvage Act by providing for the preservation of significant scientific, prehistoric, historic, and archaeological materials and data that might be lost or destroyed as a result of flooding, the construction of access roads, relocation of railroads and highways, or any other federally funded activity.

Area Navigation (RNAV) - A method of navigation that permits aircraft operation on any desired course within the coverage of station-referenced navigation signals or within the limits of a self-contained system capability.

Armstrong Consultants, Inc. - A professional consulting engineering and planning firm specializing exclusively in airports based out of Grand Junction, Colorado.

Attainment area - An area considered to have air quality as good as or better than the national ambient air quality standards as defined in the Clean Air Act.

Automated Surface Observing System (ASOS) - A type of automated weather station that provides hourly updates on the weather conditions in an area. Mostly operated, maintained, and controlled by the National Weather Service (NWS), Department of Defense (DOD), or the FAA.

Automated Weather Observing System (AWOS) - A type of automated weather station that provides hourly updates on the weather conditions in an area. Mostly operated, maintained, and controlled by the FAA, but sometimes state or local governments or private agencies as well.

Automated Weather Sensor System (AWSS) - A type of automated weather station that provides hourly updates on the weather conditions in an area. Mostly operated, maintained, and controlled by the FAA.

Automatic Terminal Information Service (ATIS) - The continuous broadcast of recorded non-control information in selected terminal areas. Its purpose is to improve controller effectiveness and relieve frequency congestion by automating repetitive transmission of essential but routine information.

Aviation forecast - A report that serves to provide future estimated airport usage to allow for planning development.

Avigation easement - A property right acquired from a landowner which protects the use of airspace above a specified height, and imposes limitations on use of the land subject to the easement.

Based aircraft - An aircraft permanently stationed at an airport, usually by agreement between the aircraft owner and airport management.

Based aircraft operations - The number of annual operations conducted by based aircraft at the airport.

Best management practices (BPM) - A set of guidelines, ethics or ideas that represent the most efficient or prudent course of action.

Busy day - The Busy Day of a typical week in the peak month.

Capital Improvement Plan (CIP) - A community planning and fiscal management tool used to coordinate the location, timing, and financing of capital improvements over a multi-year period.

Categorical exclusion (CATEX) - A category of actions which do not individually or cumulatively have a significant effect on the human environment, and therefore, neither an environmental assessment nor an environmental impact statement is required. They are actions which: do not induce significant impacts to planned growth or land use for the area, do not require the relocation of significant numbers of people; do not have a significant impact on any natural, cultural, recreational, historic or other resource; do not involve significant air, noise, or water quality impacts; and do not have significant impacts on travel patterns.

Certificated airmen - An individual who is certified to act as a pilot of an aircraft.

Class A airspace - Airspace which extends from 18,000 feet mean sea level (MSL) to approximately 60,000 feet MSL throughout the United States. Unless otherwise authorized by air traffic control (ATC), all flight operations in Class A airspace must be under ATC control, and must be operating IFR, under a clearance received prior to entry.

Class B airspace - Airspace which normally begins at the surface in the immediate area of the airport; successive shelves of greater and greater radius begin at higher and higher altitudes at greater distances from the airport. The upper limit of Class B airspace is normally 10,000 feet MSL. Class B airspace has the most stringent rules of all the airspaces in the United States.

Class C airspace - Airspace similar in structure to Class B airspace, but on a smaller scale; the vertical boundary is usually 4,000 feet above the airport surface. The core surface area has a radius of five nautical miles, and goes from the surface to the ceiling of the Class C airspace. The upper "shelf" area has a radius of ten nautical miles, and extends from as low as 1,200 feet up to the ceiling of the airspace. All aircraft entering Class C airspace must establish radio communication with ATC prior to entry.

Class D airspace - Airspace that is generally cylindrical in form and normally extends from the surface to 2,500 feet above the ground. The outer radius of the airspace is variable, but is generally 4 nautical miles. Two-way communication with ATC must be established before entering Class D airspace, but no transponder is required.

Class E airspace - Airspace which extends from 1,200 feet above ground level (AGL) up to but not including 18,000 feet MSL, the lower limit of Class A airspace. There are areas where Class E airspace begins at either the surface or 700 AGL; these areas are used to transition between the terminal and en-route environments (around non-towered airports). The airspace above 60,000 feet MSL (FL600) is also Class E. No ATC clearance or radio communication is required for VFR flight in Class E airspace. Most airspace in the United States is Class E.

Class G airspace - Airspace which includes all airspace below Flight Level 600 (60,000 feet MSL), not otherwise classified as controlled. There are no entry or clearance requirements for Class G airspace, even for IFR operations. Class G airspace is typically the airspace very near the ground (1200 feet or less), beneath Class E airspace. Class G is completely uncontrolled.

Clean Air Act (CAA) - A United States federal law designed to control air pollution on a national level.

Clean Water Act (CWA) - The primary federal law in the United States governing water pollution.

Cloud ceiling - A measurement of the cloud base height relative to the ground. Ceiling is reported as part of the METAR (Meteorological Aviation Report) used for flight planning by pilots worldwide.

Cockpit-to-main gear (CMG) - The distance measured between the center of the cockpit to the center of the main undercarriage of the.

Code of Federal Regulations (CFR) - An annual codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government.

Commercial activity fee - A fee that is imposed on commercial activities operating "for profit" at an airport.

Commercial service airport - Publicly owned airports that have at least 2,500 passenger boardings each calendar year and receive scheduled passenger service.

Compatible land use - Land uses which are deemed safe and acceptable around airports; examples of compatible land use around airports include aviation, industrial/commercial, and agricultural activities or businesses.

Compound Annual Growth Rate (CAGR) - A measure of growth over multiple time periods.

Conical surface - An imaginary surface found within 14 CFR Part 77 describing the surface which extends outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

Connector taxiway - A portion of taxiway between a runway and a parallel taxiway.

Construction impacts - Impacts that may potentially occur due to construction operations.

Controlled airspace - Airspace in which some or all aircraft may be subject to air traffic control to promote the safe and expeditious flow of air traffic.

Conventional hangar - An aircraft storage hangar, often also referred to as a box hangar, which is square or rectangular in shape and can be built in various sizes.

Council on Environmental Quality (CEQ) - A division of the Executive Office of the President that coordinates federal environmental efforts in the United States and works closely with agencies and other White House offices on the development of environmental and energy policies and initiatives.

Crosswind component - The component of wind that is at a right angle to the runway centerline or the intended flight path of an aircraft.

Crosswind runway - The designated runway on an airfield which is used when the crosswind component becomes too great on the primary runway for an aircraft to takeoff or land.

Day-night average sound level (DNL) - The average noise level over a 24-hour period.

Decibel (dB) - A unit used to measure the intensity of a sound.

Department of Defense (DOD) - A department of the federal executive branch entrusted with formulating military policies and maintaining American military forces.

Department of Transportation Act, Section 4(f) - A special provision which stipulates that FHWA and other DOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites.

Design aircraft - An aircraft with characteristics that determine the application of airport design standards for a specific runway and associated taxiway, taxilane, and apron.

Design day - In forecasting methodology, an average day of the peak month.

Dual-tandem wheel landing gear - A configuration of landing gear for a large aircraft where two wheels are located side by side, followed by another set of wheels located in the same way on a landing strut.

Dual-wheel landing gear - A configuration of landing gear for aircraft with two wheels located side by side on a landing strut.

Easement - A right or limitation on someone else's property or land for a specified purpose.

Eligible applicants - Applicants that are eligible for AIP funding which include public-use airport that is included in the NPIAS.

Eligible projects - Projects that include enhancing airport safety, capacity, security, and environmental concerns.

Endangered Species Act (ESA) - A United States Act that provides for the conservation of species that are endangered or threatened throughout all or a significant portion of their range, and the conservation of the ecosystems on which they depend.

Endangered/threatened species - A species of animal or plant that is seriously at risk, or threatening to be at risk of extinction.

Enplane - To board an aircraft.

Environmental Assessment (EA) - A concise public document that provides sufficient evidence and analysis for determining whether a Finding of No Significant Impact should be issued or an Environmental Impact Statement be prepared.

Environmental clearance document - Official document, such as a CATEX, EA, or EIS, usually issued by a federal agency which provides a determination as to whether a proposed project has an impact on the environment or community.

Environmental impact - Adverse effects to the surrounding environment caused by an activity or action.

Environmental Impact Statement (EIS) - A document prepared to describe the effects for proposed activities on the environment.

Environmental justice - The pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, and /or socioeconomic status.

Environmental Protection Agency (EPA) - A United States federal agency tasked with protecting and preserving the environment.

FAA Advisory Circular (AC) - A publication offered by the Federal Aviation Administration to provide guidance for compliance with directives.

FAA Aerospace Forecast, Fiscal Years 2017-2037 - A document prepared by the FAA that develops a set of assumptions and forecasts consistent with the emerging trends and structural changes taking place within the aviation industry from the Fiscal Years 2017-2037.

FAA Environmental Desk Reference for Airport Actions - Summarizes applicable special purpose laws in one location for convenience and quick reference. Its function is to help FAA integrate the compliance of NEPA and applicable special purpose laws to the fullest extent possible.

FAA Equation #15, *Model for Estimating General Aviation Operations at Non-Towered Airports* - An equation developed for the FAA Statistics and Forecast Branch in July 2001 which uses independent variables such as airport characteristics, population totals, and geographic location to assist in determining an airport's annual operations due to the lack of an air traffic control tower on the airfield.

FAA Form 5010-1, Airport Master Record - An FAA form which contains aeronautical data describing the physical and operational characteristics of civil public-use airports, joint-use military airports, and private-use military airports that are active and in the NAS. This form contains airport data derived from the National Airspace System Resources (NASR) database as of the Airport Facility Data effective date shown on the form.

FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures* - This Order provides Federal Aviation Administration (FAA) policy and procedures to ensure agency compliance with the requirements set forth in the Council on Environmental Quality (CEQ) regulations for implementing the provisions of the National Environmental Policy Act of 1969 (NEPA), 40 Code of Federal Regulations (CFR) parts 1500- 1508; Department of Transportation Order DOT 5610.1C, Procedures for Considering Environmental Impacts; and other related statutes and directives.

FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions* - This Order provides information to the FAA's Office of Airports personnel and others interested in fulfilling National Environmental Policy Act (NEPA) requirements for airport actions under FAA's authority. This Order is part of FAA's effort to ensure its personnel have clear instructions to address potential environmental effects resulting from major airport actions.

FAA Order 5190.6B, *FAA Airport Compliance Manual* - This Order sets forth policies and procedures for the FAA Airport Compliance Program. It provides basic guidance for FAA personnel in interpreting and administering the various continuing commitments airport owners make to the United States as a condition for the grant of federal funds or the conveyance of federal property for airport purposes.

FAA Reform and Modernization Act of 2012 - Authorization of appropriations to the Federal Aviation Administration from Fiscal Year 2012 through Fiscal Year 2015 to seek to improve aviation safety and capacity of the national airspace system, provide a framework for integrating new technology safely into our airspace, provide a stable funding system, and advance the implementation of the Next Generation Air Transportation System.

FAR Part 139 *Airport Certification* - Federal Regulation outlining airport certification standards.

FAR Part 150 *Airport Noise Compatibility Planning Program* - Federal Regulation outlining airport noise compatibility planning.

FAR Part 71, *Designation of Class A, Class B, Class C, Class D, and Class E Airspace Areas; Airways; Routes; and Reporting Points* - Federal Regulation outlining designation of airspace, airways, routes, and reporting points.

FAR Part 91, *General Operating and Flight Rules* - Federal Regulation outlining general operating and flight rules.

Farmland Protection Policy Act - Act intended to minimize the extent to which federal activities contribute to the unnecessary and irreversible conversion of agricultural land to nonagricultural uses, and also seeks to ensure that federal policies are administered in a manner that will be compatible with state, local, and private policies that protect farmland.

Federal Aviation Administration (FAA) - An agency of the United States Department of Transportation which has authority to regulate and oversee all aspects of American civil aviation.

Federal Aviation Regulations (FAR) - The general and permanent rules established by the executive departments and agencies of the federal government for aviation, which are published in the Federal Register. These are the aviation subset of the Code of Federal Regulations (14 CFR).

Federal Emergency management Agency (FEMA) – A federal agency responsible for coordinating emergency planning, preparedness, risk reduction, response, and recovery.

Federal Highway Administration (FHWA) - A division of the United States Department of Transportation that specializes in highway transportation.

Fee simple ownership - The greatest possible estate in land, wherein the owner has the right to use it and exclusively possess it.

FEMA National Flood Insurance Rate Map - A visual representation of flood hazard information.

Field elevation - The highest point of an airport's usable runways measured in height above mean sea level.

Fillet - A round joint between two parts connected at an angle; usually used when designing taxiways.

Fixed base operator (FBO) - Business located on an airport that provides essential services for servicing aircraft and pilots.

Fixed-wing aircraft - An aircraft in which its wings are attached to the fuselage and are not intended to move independently in a fashion that results in the creation of lift.

Fleet mix - The number and types of aircraft operating at an airport during all hours of the day and night.

Flight level (FL) - The nominal altitude, or pressure altitude, in feet, divided by 100; designated in writing as FLxxx, where xxx is a one- to three-digit number indicating the pressure altitude in units of 100 feet, e.g. FL180.

Flight Service Station (FSS) - An operations facility in the national flight advisory system which utilizes data interchange facilities for the collection and dissemination of Notices to Airmen, weather, and administrative data and which provides pre-flight and in-flight advisory services to pilots through air and ground based communication facilities.

Floodplain - An area of land adjacent to a stream or river that stretches from the banks of its channel to the base of the enclosing valley walls and experiences flooding during periods of high water discharge.

Frangible - Retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.

General aviation (GA) - All civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire.

General aviation airport - Either a publicly or privately owned airport that does not serve certificated air carriers who enplane more than 2,500 passengers annually; the largest single group of airports in the U.S. system.

General aviation regional airport - Airports that support regional economies by connecting communities to statewide and interstate markets.

General obligation bonds (GO) - A common type of municipal bond in the United States that is secured by a state or local government's pledge to use legally available resources, including tax revenues, to repay bond holders.

Global Positioning System (GPS) - A space based navigation system which has the capability to provide highly accurate three-dimensional position, velocity, and time to an infinite number of equipped users anywhere on or near the Earth.

Hangar lease - Hangars that are leased to aircraft operators or owners for use over an agreed amount of time.

Hazardous materials - Waste that is dangerous or potentially harmful to our health or the environment. Hazardous waste can be liquid, solid, gas, or sludge.

Helicopter - A type of aircraft in which lift and thrust are supplied by rotors.

Horizontal surface - An imaginary obstruction- limiting surface defined in 14 CFR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.

Imaginary surfaces - Surfaces established in relation to the end of each runway or designated takeoff and landing areas, as defined in paragraphs 77.25, 77.28, and 77.29 of 14 CFR Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace. Such surfaces include the approach, horizontal, conical, transitional, primary, and other surfaces.

Incompatible land use - Land surrounding airports which is deemed incompatible with the airport; examples include residential development, schools, community centers and libraries, hospitals, buildings used for religious services and tall structures, smoke and electrical signal generators, landfills and other bird/wildlife attractants.

Instrument approach procedure (IAP) - A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

Instrument Flight Rules (IFR) - Procedures for the conduct of flight in weather conditions below Visual Flight Rules weather minimums. The term IFR is often also used to define weather conditions and the type of flight plan under which an aircraft is operating.

Instrument Landing System (ILS) - A precision instrument approach system which normally consists of the following electronic components and visual aids: e.g. a localizer, glide slope, outer marker, middle marker, and approach lights.

Inter-government agreement (IGA) - Any agreement that involves or is made between two or more governments to cooperate in some specific way.

International Civil Aviation Organization (ICAO) - A specialized United Nations organization that develops and suggests air transportation safety standards and practices.

Interstate 10 (I-10) - The southernmost transcontinental highway in the American Interstate Highway System. It stretches from the Pacific Ocean at State Route 1 (SR 1) (Pacific Coast Highway) in Santa Monica, California to I-95 in Jacksonville, Florida.

Itinerant aircraft operations - Operations by aircraft that are not based at a specified airport.

Jet A - A type of aviation fuel designed for use in aircraft powered by gas-turbine engines. The most commonly used fuels for commercial aviation are Jet A and Jet A-1, which are produced to a standardized international specification.

Joint-use facility - An airport which is utilized for both civil and military aviation purposes.

Knots - A unit of speed that equals one nautical mile per hour. This is the most common unit of measure for the airspeed of an aircraft, and is equal to 6,080 feet or about 1.15 miles.

Land lease - A lease agreement that permits the tenant to use a piece of land owned by the landlord in exchange for rent.

Landing Distance Available (LDA) - The length of the runway declared available for landing.

Landside - The portion of an airport that provides the facilities necessary for the processing of passengers, cargo, freight, and ground transportation vehicles.

Large aircraft (FAA) - An airplane of more than 12,500 pounds (5,670 kg) maximum certificated takeoff weight.

Larger than utility runway - A runway that is constructed for, and intended to be used by, any aircraft of greater than 12,500 pounds maximum gross weight.

Light emissions - The byproduct of artificial light sources; the amount of light released into the surrounding environment.

Light emitting diode (LED) - A semiconductor device that emits visible light when an electric current passes through it.

Local aircraft operations - Aircraft operations performed by aircraft that are based at the airport and that operate in the local traffic pattern or within sight of the airport, that are known to be departing for or arriving from flights in local practice areas within a prescribed distance from the airport, or that execute simulated instrument approaches at the airport.

Localizer/Lateral Performance with Vertical Guidance (LPV) - A navigational aid that provides both lateral and vertical guidance to aircraft typically used during instrument approach procedures.

Main gear width (MGW) - The distance measured between the tires of the main landing gear on an aircraft.

Maximum takeoff weight (MTOW) - The maximum weight at which the pilot is allowed to attempt to take off, due to structural or other limits.

Mean seal level (MSL) - The sea level halfway between the mean levels of high and low water.

Medium Intensity Runway Lights (MIRL) - Navigational lighting aids for use on VFR runways or runways with a non-precision instrument flight rule (IFR) procedure for either circling or straight-in approach to help pilots identify the edge of the runway at night or in inclement weather.

Medium Intensity Taxiway Lights (MITL) - Navigational lighting aids for use on taxiways to help pilots identify the edge of the taxiway at night or in inclement weather.

Meteorological Terminal Aviation Routine Weather Report (METAR) - A format for reporting weather information that is predominantly used by pilots in pre-flight weather briefings.

Military Operations Area (MOA) - Airspace established outside Class A airspace to separate or segregate certain nonhazardous military activities from IFR Traffic and to identify for VFR traffic where these activities are conducted.

Military Training Route (MTR) - Aerial corridors across the United States which military aircraft can operate at low levels and high speeds.

National Airspace System (NAS) - The airspace, navigation facilities and airports of the United States along with their associated information, services, rules, regulations, policies, procedures, personnel and equipment.

National Ambient Air Quality Standards (NAAQS) - Standards set by the EPA for pollutants considered harmful to public health and the environment.

National Historic Preservation Act (NHPA) of 1966 - An Act that established a program for the preservation of additional historic properties throughout the Nation, and for other purposes.

National Marine Fisheries Service (NMFS) - An agency within the National Oceanic and Atmospheric Administration responsible for management, conservation, and protection of the nation's marine resources.

National Oceanic and Atmospheric Administration (NOAA) - An agency within the United States Department of Commerce focused on the conditions of the oceans and the atmosphere.

National Plan of Integrated Airport Systems (NPIAS) - A system that identifies nearly 3,400 existing and proposed airports that are significant to national air transportation and thus eligible to receive Federal grants under the Airport Improvement Program.

National Pollution Discharge Elimination System (NPDES) - A system that controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

National Register of Historic Places (NRHP) - The official list of the Nation's historic places worthy of preservation, Authorized by the National Historic Preservation Act of 1966.

National Resources Conservation Services (NRCS) - The primary federal agency that works with private landowners to help them conserve, maintain and improve their natural resources.

Natural resources - Materials or substances such as minerals, forests, water, and fertile land that occur in nature and can be used for economic gain.

Nautical miles (nm) - A unit of length used in navigation which is equivalent to the distance spanned by one minute of arc in latitude; that is 1,852 meters or 6,076 feet. It is equivalent to approximately 1.15 statute miles.

Navigational Aids (NAVAIDS) - Electronic and Visual air navigation aids, lights, signs, and associated supporting equipment.

Next Generation Air Transportation System (NextGen) - A new National Airspace System due for implementation across the United States in stages between 2012 and 2025. NextGen proposes to transform America's air traffic control system from a ground-based system to a satellite-based system.

No-action alternative - Reflects the conditions expected should no actions be conducted.

Noise Compatibility Program (NCP) - That program reflected in documents (and revised documents) developed in accordance with Appendix B of Part 150, including the measures proposed or taken by the airport operator to reduce existing incompatible land uses and to prevent the introduction of additional incompatible land uses within the area.

Noise contour - Lines drawn about a noise source (such as an airport) indicating constant energy levels of noise exposure.

Non-aeronautical revenue - Revenue that is generated on airport property but is not from use of aeronautical activities.

Non-aeronautical use - Any activity or land use at an airport that is not directly related to aviation in some way or form.

Nonattainment area - An area considered to have air quality worse than the National Ambient Air Quality Standards as defined in the *Clean Air Act Amendments of* 1970.

Non-directional beacon (NDB) - A beacon transmitting non-directional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his or her bearing to and from the radio beacon and home on, or track to, the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a Compass Locator.

Non-precision instrument approach - A standard instrument approach procedure in which no electronic glide slope is provided.

Non-precision instrument runway - A runway having an existing instrument approach procedure utilizing air navigation facilities with only lateral guidance.

Non-primary commercial service airport - Commercial Service Airports that have at least 2,500 and no more than 10,000 passenger boardings each year.

Notice to Airmen (NOTAM) - A notice containing information (not known sufficiently in advance to publicize by other means) concerning the establishment, condition or change in any component (facility, service, or procedure) of or hazard in the National Airspace System; the timely knowledge of which is essential to personnel concerned with flight operations.

Object Free Area (OFA) - An area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

Obstacle Free Zone (OFZ) - The airspace defined by the runway OFZ and, as appropriate, the inner-approach OFZ and the inner-transitional OFZ, which is clear of object penetrations other than frangible NAVAIDs.

Obstruction (aeronautical) - An object which penetrates an imaginary surface described in the FAA's 14 CFR Part 77.

Operations per based aircraft (OPBA) - A term used in aviation forecasting to determine the total amount of aircraft operations per the number of aircraft based on the airport.

Parallel taxiway - A taxiway that is parallel to a runway that is the same length as the runway it is parallel to.

Partial parallel taxiway - A taxiway that is parallel to a runway that is only partially the same length as the runway it is parallel to.

Particulate matter (PM) - The sum of all solid and liquid particles suspended in air many of which are hazardous.

Pavement condition index (PCI) - A numerical index between 0 and 100 which is used to indicate the general condition of a pavement.

Peak month - The calendar month when peak enplanements or operations occur.

Piston aircraft - An aircraft powered by one or more piston engines (regardless of fuel type).

Planning Advisory Committee (PAC) - An advisory committee that provides general and strategic advice for planning purposes.

Precision Approach Path Indicator (PAPI) - An approach system that assists in providing visual glide slope guidance.

Precision Approach Path Indicator (PAPI-2) - A precision approach path indicator that utilizes a two lighted system to provide visual glide slope guidance.

Precision Approach Path Indicator (PAPI-4) - A precision approach path indicator that utilizes a four lighted system to provide visual glide slope guidance.

Precision instrument approach - An instrument approach that provides both lateral and vertical guidance.

Previously disturbed land - Land that has previously been disturbed by humans to the extent that there is a material difference in the physical, chemical or biological characteristics of the land.

Primary commercial service airport - Publicly owned airports that have more than 10,000 passenger boardings each year and receive scheduled passenger service.

Primary runway - A runway which provides the best wind coverage and receives the most usage at the airport.

Primary surface - An imaginary surface as defined in 14 CFR Part 77 that is centered on top of the runway and extends 200 feet beyond each end. The width varies from 250' to 1,000' wide depending upon the design aircraft for the runway.

Public use airport - An airport that is open to the general public with or without a prior request to use the airport.

Radar - A system that uses electromagnetic waves to identify the range, altitude, direction, or speed of both moving and fixed objects such as aircraft, weather formations, and terrain. The term RADAR was coined in 1941 as an acronym for Radio Detection and Ranging.

Regional Integrated Airport System Planning (RIASP) - Identifies airport needs for a large regional or metropolitan area.

Reliever airport - Airports designated by the FAA to relieve congestion at commercial service airports and to provide improved general aviation access to the overall community; these may be publicly or privately-owned.

Resource Conservation and Recovery Act (RCRA) - The principal federal law in the United States governing the disposal of solid waste and hazardous waste enacted in 1976.

Retro-reflective - Of or relating to a surface, material, or device (retro-reflector) that reflects light or other radiation back to its source; reflective.

Rotating beacon - A lighting system used to assist pilots in finding an airport, particularly those flying in IMC or VFR at night. Additionally, the rotating beacon provides information about the type of airport through the use of a particular set of color filters; beacons for civil land airports emit a white and green light that appears as a flash.

Rotorcraft - An aircraft whose lift is derived principally from rotating airfoils.

Runway - A defined area intended to accommodate aircraft takeoff and landing; may be paved (asphalt or concrete) or unpaved (gravel, turf, dirt, etc.), depending on use.

Runway centerline - A line of uniformly spaced strips and gaps identifying the center of the runway which provides alignment guidance during aircraft takeoff and landing.

Runway Design Code (RDC) - A designation used by the FAA to describe certain design standards which apply to a runway; the RDC is composed of the Airplane Design Group (ADG), Aircraft Approach Category (AAC), and the visibility minimums (RVR) for a specific runway.

Runway Edge Light - Lights having a prescribed angle of emission used to define the lateral limits of a runway.

Runway end identifier lights (REIL) - Two synchronized flashing lights, one on each side of the runway threshold, which provide a pilot with a rapid and positive visual identification of the approach end of a particular runway.

Runway incursion - Any occurrence at an airport involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft.

Runway Object Free Area (ROFA) - A defined area surrounding a runway that should be free of any obstructions that could in interfere with aircraft operations. The dimensions for the OFA increase for runways accommodating larger or faster aircraft.

Runway orientation - The physical layout of a runway ideally orientated in the direction of the prevailing winds in order to minimize the crosswind components.

Runway Protection Zone (RPZ) - A trapezoidal area starting 200 feet beyond the runway end and centered on the extended runway centerline. Airport control (ownership or easement) over land within the RPZ is emphasized to protect people and property on the ground.

Runway safety are (RSA) - A defined surface surrounding the runway that shall be free of objects and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

Runway threshold - The beginning of usable runway for landing.

Runway threshold lights - Lighting used to define the beginning of the runway pavement suitable for aircraft operations.

Runway visual range (RVR) - An instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

Seasonal use trend - A term used in aviation forecasting to describe the times of year in which an airport is utilized the most.

Sectional chart - A type of aeronautical chart designed for navigation under visual flight rules; it shows topographical features that are important to aviators, such as terrain elevations, ground features identifiable from altitude (rivers, dams, bridges, buildings, etc.), and ground features useful to pilots (airports, beacons, landmarks, etc.). The chart also shows information on airspace classes, ground-based navigation aids, radio frequencies, longitude and latitude, navigation waypoints, and navigation routes.

Segmented circle - A system of visual indicators designed to show a pilot in the air the direction of the traffic pattern at that airport.

Self-service fueling - Fueling conducted at an airport directly by an aircraft owner/operator.

Single-wheel landing gear - An aircraft landing gear system composed of a single wheel at each location on the landing strut.

Small aircraft (FAA) - An aircraft with a certified maximum takeoff weight of less than 12, 500 pounds.

Solid waste - Solid or semisolid, non-soluble material (including gases and liquids in containers) such as agricultural refuse, demolition waste, industrial waste, mining residues, municipal garbage, and sewage sludge.

Special Conservation Area airspace - Airspace which surrounds many national parks, wildlife refuges, etc.; pilots are requested to avoid flight below 2,000 feet AGL in these areas.

Spill Prevention, Control and Countermeasure (SPCC) - Specific steps for preventing, controlling, and mitigating oil spills. SPCC plans are required for facilities that store oil and oil-containing products exceeding certain capacity thresholds where there is a possibility that an oil spill would reach a navigable water way.

State Apportionment - State level funding for airports.

State Historic Preservation Office (SHPO) - A state governmental function created by the United States federal government in 1966 under Section 101 of the National Historic Preservation Act (NHPA).

Statewide Integrated Airport System Planning (SIASP) - Identifies the general location and characteristics of new airports and the general expansion needs of existing facilities to meet statewide air transportation goals. This planning is performed by state transportation or aviation planning agencies.

Statute mile - A unit of linear measure equal to 5,280 feet or 1,760 yards.

Storm Water pollution prevention plan (SWPPP) - A plan that details procedures to be followed during various phases of construction for sediment and erosion control that is required by a federal regulation of the United States governing storm water runoff from active construction sites that are more than one acre in area.

Tactical Air Navigation (TACAN) - An ultrahigh frequency electronic air navigation system which provides suitably-equipped aircraft a continuous indication of bearing and distance to the TACAN station.

Takeoff Distance Available (TODA) - The TORA plus the length of any remaining runway or clearway beyond the far end of the TORA.

Takeoff Run Available (TORA) - The runway length declared available and suitable for the ground run of an aircraft taking off.

Taxilane - The portion of the aircraft parking area used for access between taxiways, aircraft parking positions, hangars, storage facilities, etc.

Taxiway Design Group (TDG) - A classification of airplanes based on outer to outer main gear width (MGW) and cockpit to main gear (CMG) distance.

Taxiway Edge Light - Lights that define the edge of the taxiway.

Taxiway Edge Safety Margin (TESM) - The minimum acceptable distance between the outside of the airplane's main gear wheels and the pavement edge.

Taxiway Object Free Area (TOFA) - An area on the ground centered on a taxiway centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the TOFA for air navigation or aircraft ground maneuvering purposes.

Taxiway Safety Area (TSA) - A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft deviating from the taxiway.

Technical Advisory Committee (TAC) - A committee composed of representatives from industry and government representing diverse points of view on the concerns of the community.

Terminal Area Forecast (TAF) - The official forecast of aviation activity at FAA facilities. These forecasts are prepared to meet the budget and planning needs of the FAA and provide information for use by state and local authorities, the aviation industry, and the public.

Terminal building - A facility on the airport where passengers transfer between ground transportation and the facilities that allow them to board and disembark from aircraft. Within the terminal, passengers purchase tickets, transfer their luggage, and go through security.

T-hangar - A rectangular aircraft storage hangar with several interlocking "T" units that minimizes the need to build individual units; they are usually two-sided with either bi-fold or sliding doors.

Threshold of Significance (TOS) - The noise level at which aircraft creates a significant impact on noise sensitive uses and persons exposed to it or higher levels. The FAA has selected 65 db of DNL to be the default threshold of significance for aircraft noise.

Threshold Siting Surface (TSS) - An imaginary surface to ensure compatibility between nearby objects and the runway's threshold, which is defined as the first part of pavement available and suitable for landing.

Tie-down - A place where an aircraft is parked and "tied down." Surface can be grass, gravel or paved.

Tie-down fee - A fee that an airport may charge in order to utilize a specified tie-down parking spot on the airfield.

Title 14 Code of Federal Regulations Part 77 Safe, Efficient Use, and Preservation of the Navigable Airspace (14 CFR Part 77) - A federal regulation that ensures safe, efficient use, and preservation of the navigable airspace.

Touch-and-go - An aircraft operation involving a landing followed by a takeoff without the aircraft coming to a full stop or exiting the runway.

Traffic pattern altitude (TPA) - The designated altitude which aircraft must comply with while in the traffic pattern at an airport, usually during landing.

Transient aircraft - Any aircraft which utilizes the airport for occasional temporary purposes, generally no longer than seven days, and which is based at another airport and is not assigned a reserved tie-down or hangar at the airport.

Transitional surface - One of the 14 CFR Part 77 imaginary surfaces; it extends outward and upward at right angles to the runway centerline and the extended runway centerline at a slope of 7:1 from the sides of the primary surface and from the sides of the approach surfaces.

Transportation Security Administration (TSA) - An agency of the U.S. Department of Homeland Security that has authority over security of the traveling public in the United States.

Turbojet aircraft - An aircraft having a jet engine in which the energy of the jet operates a turbine which in turn operates the air compressor.

Turboprop aircraft - An aircraft having a jet engine in which the energy of the jet operates a turbine which drives the propeller.

U.S. Census Bureau - A principal agency of the U.S. Federal Statistical System responsible for producing data about the American people and economy.

U.S. Department of Agriculture - Natural Conservation Resource Service (USDA - NCRS) - The primary federal agency that works with private landowners to help them conserve, maintain and improve their natural resources.

U.S. Department of the Interior (DOI) - A federal executive department of the U.S. government responsible for the management and conservation of most federal land and natural resources, and the administration of programs relating to American Indians, Alaska Natives, Native Hawaiians, territorial affairs, and insular areas of the United States.

U.S. Department of Transportation (USDOT) - A federal Cabinet department of the U.S. government concerned with transportation. It was established by an act of Congress on October 15, 1966, and began operation on April 1, 1967. It is governed by the United States Secretary of Transportation.

U.S. Fish and Wildlife Service (USFWS) - A federal government agency within the U.S. Department of the Interior dedicated to the management of fish, wildlife, and natural habitats.

Uncontrolled airspace - Airspace within which aircraft are not subject to air traffic control.

United States (U.S.) - A federal republic consisting of 50 states and a federal district.

Unmanned aerial system (UAS) - The unmanned aircraft (UA) and all of the associated support equipment, control station, data links, telemetry, communications and navigation equipment, etc., necessary to operate the unmanned aircraft.

Useful load - The weight of the pilot, copilot, passengers, baggage, usable fuel, and drainable oil. It is the basic empty weight subtracted from the maximum allowable gross weight. This term applies to general aviation aircraft only.

Utility runway - A runway that is constructed for, and intended to be used by, propeller driven aircraft of 12,500 pounds maximum gross weight and less.

Very high frequency (VHF) - A band of radio frequencies falling between 30 and 300 MHz.

VHF Omnidirectional Range/Distance Measuring Equipment (VOR/DME) - A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north; it is used as the basis for navigation in the national airspace system.

VHF Omnidirectional Range/Tactical Area Navigation (VORTAC) - The standard navigational aid used throughout the airway system to provide bearing information to aircraft. When combined with Tactical Air Navigation (TACAN), the facility, called VORTAC, provides distance as well as bearing information.

Victor Airways - Straight-line, low altitude airway segments between either two VOR stations, or a VOR and a VOR intersection.

Visual Flight Rules (VFR) - Rules that govern the procedures for conducting flight under visual conditions; a set of regulations under which a pilot operates an aircraft in weather conditions generally clear enough to allow the pilot to see where the aircraft is going.

Visual runway - A runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA-approved airport layout plan.

Volatile Organic Compounds (VOC) - Organic compounds that easily become vapors or gases.

Water quality - Refers to the chemical, physical, biological, and radiological characteristics of water.

Wetland(s) - Lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. Executive Order 11990, Protection of Wetlands, sets the standard for a Federal agency action involving any wetland.

Wide Area Augmentation System (WAAS) - A differential global positioning system (DGPS) that improves the accuracy of the system by determining position error from the GPS satellites, then transmitting the error, or corrective factors, to the airborne GPS receiver.

Wild and scenic river - Rivers having remarkable scenic, recreational, geologic, fish, wildlife, historic, or cultural values. Federal land management agencies in the Departments of the Interior and Agriculture manage the Wild and Scenic Rivers Act (Act).

Wildlife Hazard Assessment (WHA) - An ecological study that examines the potential for wildlife strikes at an airport.

Wind cone - A conical textile tube designed to indicate wind direction and relative wind speed. Wind direction is the opposite of the direction in which the wind cone is pointing.

Wingspan - The maximum horizontal distance from one wingtip to the other wingtip, including the horizontal component of any extensions such as winglets or raked wingtips.

Appendix F

Terminal Analysis Study

July, 2020

SAN LUIS VALLEY REGIONAL AIRPORT (ALS)

Terminal Master Plan Evaluation



Gensler

ARMSTRONG

Image By Jeffrey Beall

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01 INVENTORY

INVENTORY

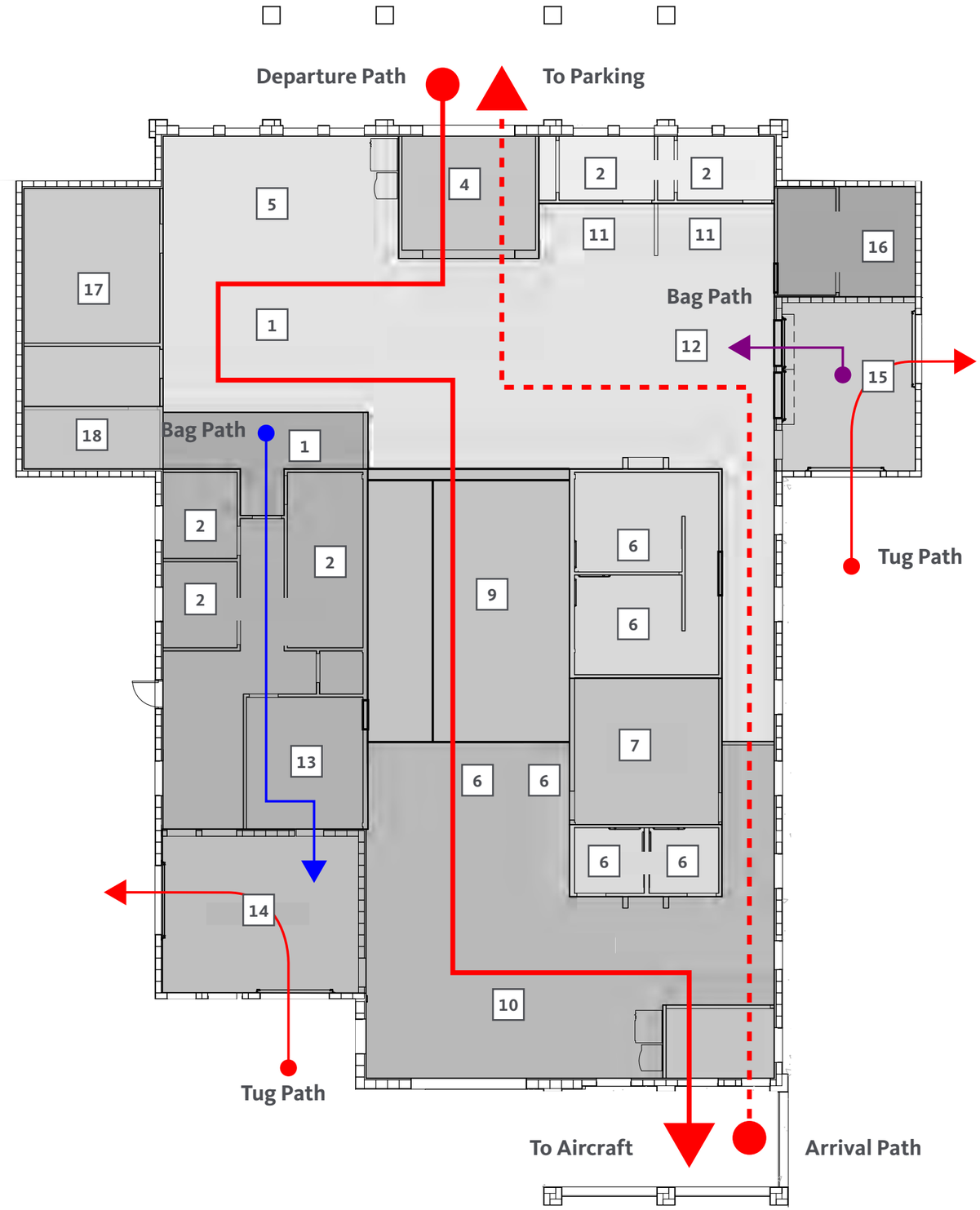
Vicinity Map



INVENTORY

Site Map





INVENTORY

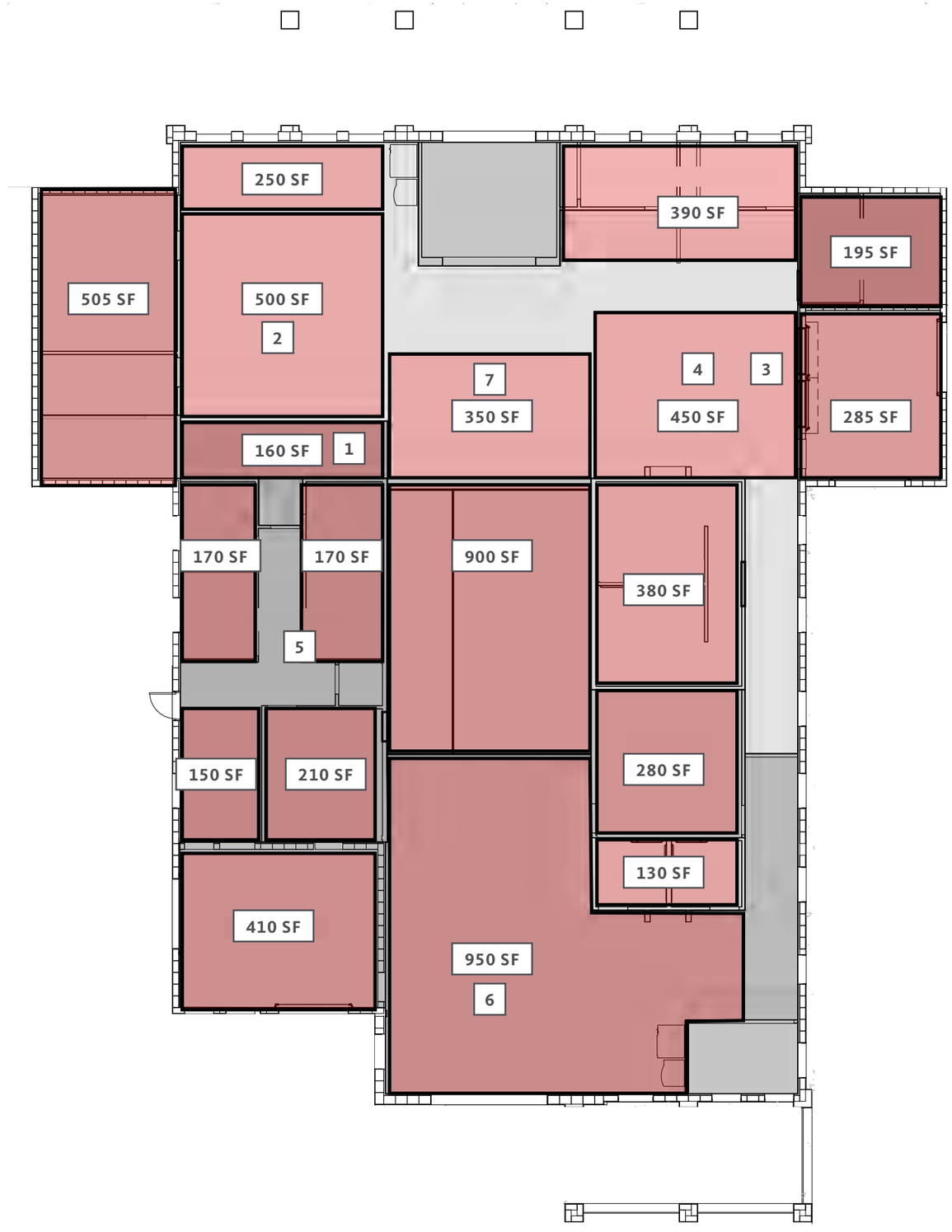
Functional Diagram

PROGRAM

1. Ticketing
2. Office
3. Bag Screening
4. Entry
5. Concessions
6. Restrooms
7. TSA Office
8. Waiting / Queuing
9. SSCP
10. Gate Lounge
11. Rental Cars
12. Baggage Claim
13. Bag Screening
14. Bag Make Up
15. Baggage Claim Garage
16. Janitorial
17. Mechanical
18. IT

LEGEND

- Departing Passengers
- Arriving Passengers
- Outbound Bag Flow
- Inbound Bag Flow



INVENTORY

Key Existing Program Limits

1. Ticketing Counter: Designed to accommodate two ticket agents
2. +/- 500 sf of queue for ticketing, can accommodate 8-12 passengers
3. Baggage claim frontage for bag shelf is +/= 10 ft, accommodates 6-10 passengers
4. Baggage Claim area +/- 450 sf
5. Bag Screen Room, manual screening, +/- 200 sf
6. Hold Room +/-950 sf
7. TSA/SSCP queue +/- 350 sf

02 TERMINAL CAPACITY ALTERNATIVES

PLANNING HOLD ROOM ANALYSIS

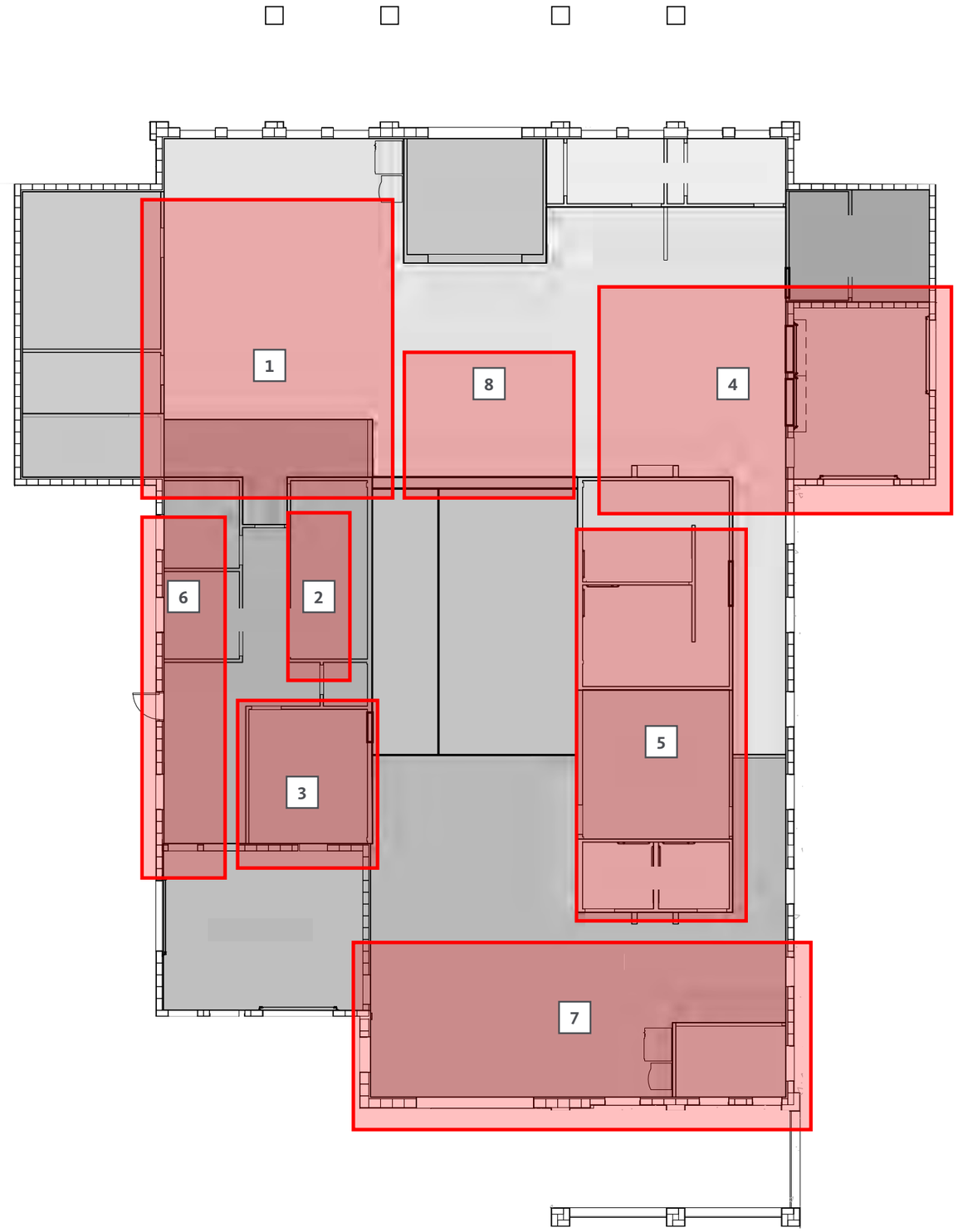
Aircraft Basis of Design: CRJ-700, 67 seat configuration

HOLDROOM MODEL - **TERMINAL EXPANSION**			
Planning Criteria		**CRJ-200**	**CRJ-700**
Aircraft Design Seats	Seats	50	67
Airline/Airport Load Factor (LF)	%	54.2%	74.2%
HR Maximum Occupancy Rate[1]	%	100%	100%
Design Passenger Load	Pax	27	50
Holdroom Sharing Factor (decrease)	0%	27	50
Level of Service (LoS)		High C	High C
Seated	70%	19	35
Standing	30%	8	15
Seating Area @ ___ sf/pax (sf)	15.0	285	522
Standing Area @ ___ sf/pax (sf)	10.0	81	149
Gate Podium Area (sf)	9.5' length	247	247
Boarding/Egress Aisle	6' length	156	156
Holdroom Depth	ft	26	26
Subtotal	**sf**	**769**	**1,074**
Circulation (20%)	%	154	215
Structure (2%)	%	15	21
Total Holdroom Area	**sf**	**938**	**1,310**

Hold Room:

Existing hold room is +/- 950 sf and has the capacity to accommodate 27-30 passengers to a low to high C level of service .

At peak passenger count with a 74.2% load factor (per forecast year 2039), existing hold room size would be undersized for level of service, high C, 1,310sf. Therefore, as the end of the forecast window approaches, or if the load factor increases faster then projected, the need for additional hold room space will become critical.



PLANNING IMPACTS

Key Program Impacts, Aircraft Basis of Design: CRJ-700, 67 seat configuration

1 Ticketing Counter:

Counter can accommodate two ticketing agents, therefore gate capacity should be sufficient for single carrier commercial service with no over-lapping flight schedules

Ticketing queue can accommodate 8-12 passengers, depending on queue density, peak passenger count with a 74% load factor (per forecast year 2039, would need to accommodate for 50 passengers (spread over peak).

2 Baggage Path to Screening

Current bags are carried by hand to bag screening room, Peak passenger count with a 74% load factor (per forecast year 2039), would necessitate an alternative means to move bags from ticketing to the bag screening room.

3 Bag Screen Room

Peak hour load with a 74% load factor (per forecast year 2039), would need to accommodate for screening of 50 bags, therefore may necessitate additional room for automated screening equipment.

4 Bag Claim

Current frontage along sloped claim slide is +/- 10 ft, Level of Service C, accommodate 1 to 1.5 ft per person. Peak bag count with a 74% load factor (per forecast year 2039), would necessitate an increase in frontage at the bag slide as well as waiting space in the baggage claim.

5 Restrooms/BOH:

Restrooms are sized to accommodate current building occupancy, if square footage expansions occur in future phases, additional restroom and MEP capacity and SF will need to be considered.

6 Office Space

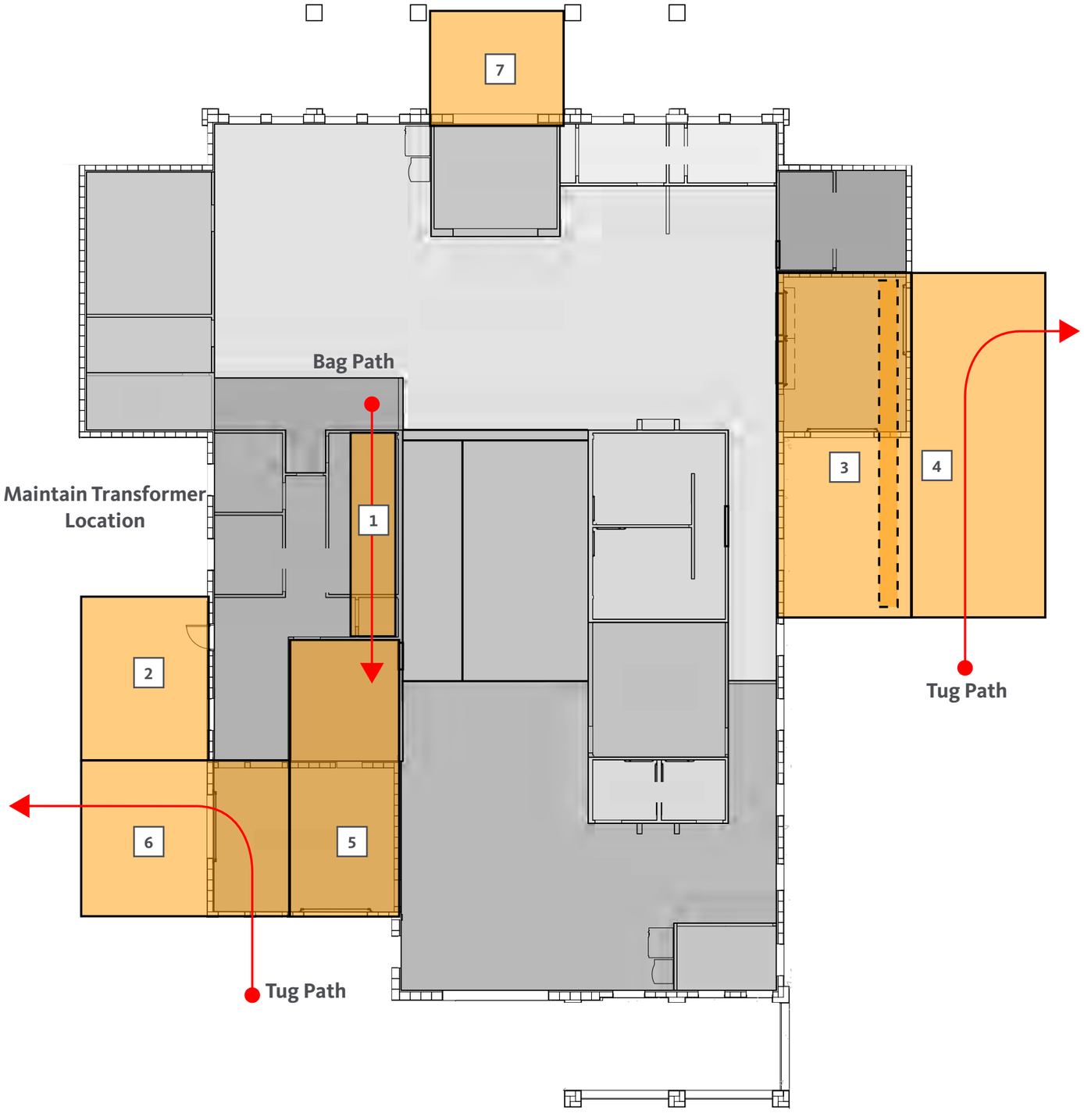
Office space needs to be continually evaluated based on airport and airline staff increases due to increased passenger load and/or expanded flight schedules.

7 Hold Room

Existing hold room of +/- 950 sf can accommodate approximately 27 passengers with a high level of service C. As load factor increases, and the CRJ-200 is replaced by the CRJ-700 aircraft and more seats are available, the hold room SF will become taxed and level of service and seated passenger numbers will decrease.

8 SSCP Queue

Existing queue of +/- 350 sf should be sufficient for forecast demands, however this is directly linked with TSA operation of the SSCP and when checkpoint it opened for processing prior to departure. The closer the checkpoint opening aligns with the departure time, the greater possibility for more congestion on the non-secure side and need for additional queue area.



PLANNING OPTIONS

PHASE 1

Key Program Options, Aircraft Basis of Design: CRJ-200/700

*Phase 1 plan begins to accommodate day 2 forecast needs with CRJ-200 aircraft transitioning to CRJ-700,, therefore resulting in +/- 30-40 passengers.

1 Checked Baggage Path:

In order to more efficiently process checked baggage, an automated baggage belt may be required to accommodate Peak passenger count with a 74% load factor (per forecast year 2039), +/- 50 bags, assuming 100% of passengers check a bag. Bag belt path would lead to relocation of existing office space.

2 Office

Due to new right-of-way for baggage belt, office space relocated into new expansion, replace existing SF in kind, +/- 400 sf.

3 Bag Claim

Expansion of baggage claim into current baggage garage, would allow for approximate additional 12 ft of bag slide frontage (20ft total) and 700 sf of additional space for the baggage claim area.

4 Baggage Garage

Due to the relocation of the expansion of the baggage claim, a new baggage garage for unloading of the bag tugs may be required, +/- 700 sf.

5 Baggage Screening

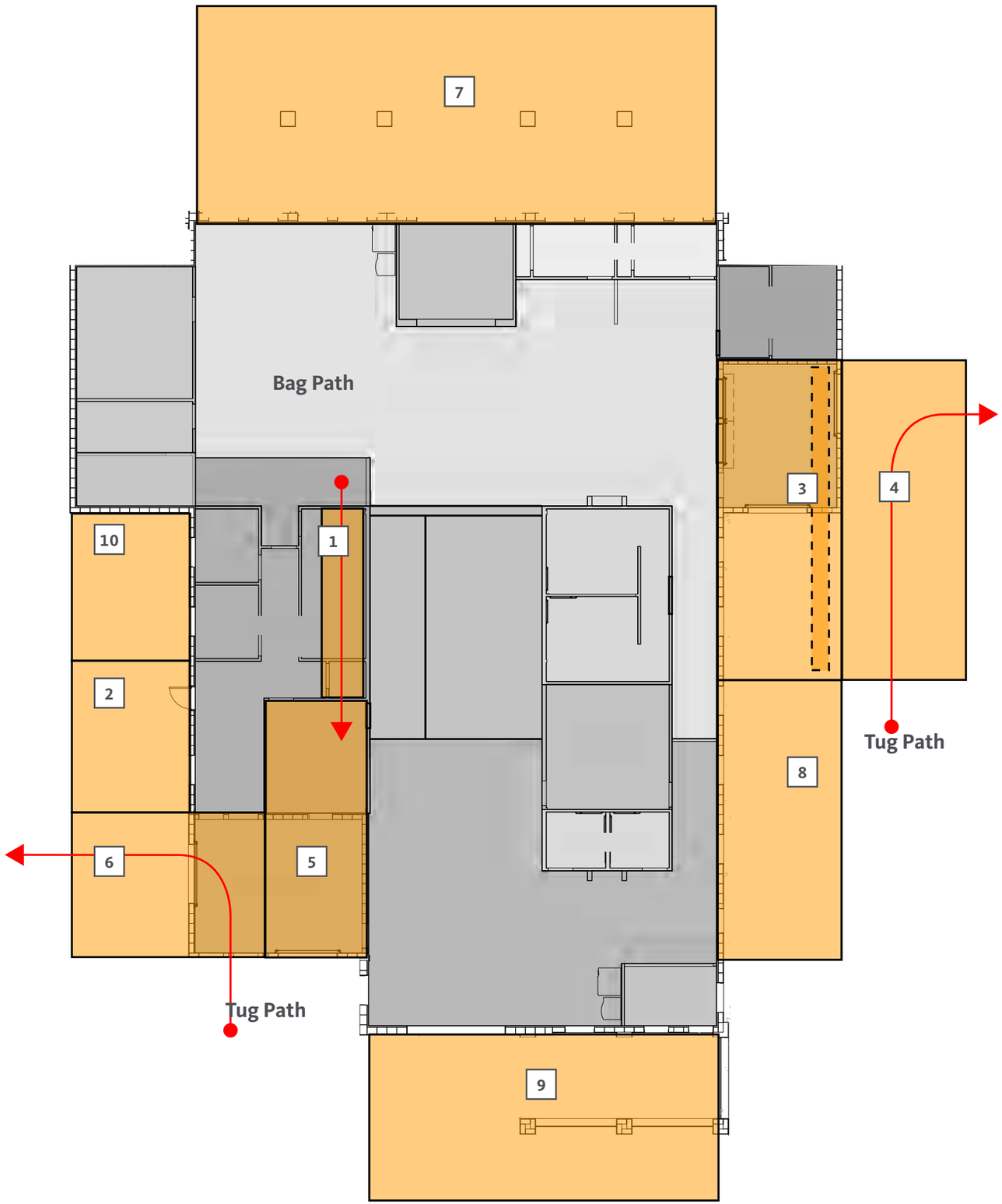
Due to the increased processing capacity, an enlarged baggage screening room may be required. Conversion of existing baggage make-up garage is +/- 240 sf.

6 Baggage Make-Up

Relocation of baggage make-up garage, +/- 425 sf

7 Entry Vestibule

Possible relocation of entry vestibule to provide additional circulation space within the ticketing and security queue. +/- 230 sf



PLANNING OPTIONS

PHASE 2

Key Program Options, Aircraft Basis of Design: CRJ-700

*Phase 2 plan begins to accommodate for end years of forecast needs with CRJ-700, therefore resulting in +/- 50 passengers, with a 74% load factor.

1 Checked Baggage Path:

In order to more efficiently process checked baggage, an automated baggage belt may be required to accommodate Peak passenger count with a 74% load factor (per forecast year 2039), +/- 50 bags, assuming 100% of passengers pack a bag. Bag belt path would lead to relocation of existing office space.

2 Office

Due to new right-of-way for baggage belt, office space relocated into new expansion, replace existing SF in kind, +/- 400 sf.

3 Bag Claim

Expansion of baggage claim into current baggage garage, would allow for approximate additional 12 ft of bag slide frontage (20ft total) and 700 sf of additional space for the baggage claim area.

4 Baggage Garage

Due to the relocation of the expansion of the baggage claim, a new baggage garage for unloading of the bag tugs may be required, +/- 700 sf.

5 Baggage Screening

Due to the increased processing capacity, an enlarged baggage screening room may be required. Conversion of existing baggage make-up garage is +/- 240 sf.

6 Baggage Make-Up

Relocation of baggage make-up garage, +/- 425 sf

7 Non-sterile Side Expansion

+/- 1,600 sf expansion of vendors, ticketing queue, and SSCP queue

8 Restrooms/BOH

+/- 550 sf to accommodate for additional restroom and MEP needs

9 Hold Room Expansion

+/- 850 sf expansion of hold room and vendors

10 Additional Of ice Expansion

Additional office expansion of +/- 320 sf, would require re-location of transformer

Appendix G

ILS Analysis Study

ILS Summary and Recommendations for Alamosa, CO

The ILS operating at San Luis Valley Regional Airport/Bergman Field in Alamosa, CO is a Mark 1F system, acquired as FAA surplus property following closure of Denver Stapleton International Airport in 1995.

The existing Mark 1F Localizer consists of a single equipment, single frequency (SESF) electronics subsystem with a 14 element, single frequency log periodic dipole (LPD) antenna array. The system was installed and commissioned on Runway 02 at Bergstrom Field in 1997.

The existing Glideslope is a Mark 1F single equipment, dual frequency (SEDF) electronics subsystem with a Capture Effect antenna array. This system was installed and commissioned on Runway 02 in 1998.

Mark 1F equipment was manufactured by Thales for the FAA under national contract in the 1970s and 1980s. While some Mark 1F systems remain in service today, Thales product support including spares and repairs availability for Mark 1F equipment ended in 1997. The FAA purchased all remaining Thales parts inventory for exclusive support of FAA owned Mark 1F systems.

Although Thales is no longer involved in Mark 1F support, we understand from customers still operating these systems that component availability on the second-hand market is becoming increasingly scarce. Component obsolescence issues are significant. Difficulty in keeping Mark 1F equipment in service is compounded because repair and recertification of failed circuit cards is no longer available. A Mark 1F system is at risk of remaining off the air should a failure occur for which a spare component cannot be found.

With scheduled air carrier service relying on availability of ILS approach capability to Alamosa, it is strongly recommended that the airport plan for replacement of the obsolete Mark 1F ILS system. If the existing system were to have a failure that could not be resolved, the airport could be without an ILS approach for a minimum of six months. ILS systems are not commodity items, but are custom built on demand with a manufacturing lead time of approximately six months. However, it should be noted that the airport does have a GPS (RNAV) approach with visibility minimums as low as 1/2 statute mile should the ILS system fail.

It is understood that future development plans for San Luis Valley Regional Airport include development of additional hangars. While the existing ILS configuration provides adequate performance in the current environment, proposed development could negatively impact ILS performance by causing reflections of the radiated signal in space. In particular, performance of the single frequency Localizer signal should be evaluated in the future planned environment to understand whether planned structures might impact performance of a single frequency localizer system.

Thales manufactures a 14 element dual frequency Localizer antenna array that has become the current FAA standard for its ability to provide better performance in a greater variety of operational environments. Math modeling to simulate ILS performance in a future planned environment is available to aid in selection of the appropriate ILS configuration to ensure proper performance.

Thales recommends the Mark 1F ILS be upgraded to the model 420 ILS, the new FAA standard. The 420 ILS is in current production, and was selected by FAA following competitive procurement for supply under FAA national contract. While ideal to upgrade a full ILS system in a single project to realize cost savings of contractor mobilizations and FAA commissioning flight checks, a phased approach is possible.

If a phased approach is used, it is suggested the Mark 1F Localizer first be upgraded to the appropriate 420 Localizer configuration that will provide optimal performance in the future planned environment. A 420 Localizer can operate in conjunction with the existing Mark 1F Glideslope to provide full ILS capability in until the Mark 1F Glideslope equipment can be upgraded to match the 420 Localizer.

If funding is further limited, equipment shelters housing existing Localizer and Glideslope equipment can be reutilized for new equipment if they are in good condition. A new Localizer antenna array will require a new foundation because antenna spacing differs from that of the Mark 1F system. If the existing Mark 1F Glideslope antenna foundation and antenna tower are in good condition they can be reused. All other components should be replaced. Unless test equipment used for support of the Mark 1F system has been upgraded since installation and commissioning in the late 1990s, it should be replaced.

Appendix H

Alternative Development Cost Estimates

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-year Development Plan Cost Estimates

Cost Summary

Project	Cost
B3: Relocate Supplemental Wind Cone	$ 9,488
B4: Construct Hangar Development Area (Phase 1)	$ 1,490,366
B5: Remove Hangar Facility	$ 411,746
B6: Relocate ASOS	$ 288,750
B7: Reconstruct and Expand Commercial Apron	$ 8,347,548
B8: Expand Passenger Terminal Building	$ 3,128,496
C1: Expand Aircraft Parking Apron (Phase 1)	$ 2,585,563
C3: Construct Runway 11-29 (Dirt) / Construct Taxiway B (Phase 1) (Asphalt) / Realign Taxiway A3 / Acquire Land	$ 1,096,865
C4: Construct Air Tanker Base / Taxiway B (Phase 2)	$ 4,983,934
C5: Pave Airport Perimeter Road	$ 779,084
C6: Construct Helicopter Testing Development Area	$ 1,301,758
C7: Construct Hangar Development Area (Phase 2)	$ 2,965,152
C8: Expand Aircraft Parking Apron (Phase 2)	$ 2,029,506
C9: Expand Automobile Parking (Phase 2)	$ 314,191
C10: Construct Hangar Development Area (Phase 3)	$ 2,115,596
C11: Pave Runway 11/29	$ 3,615,944
C12: Construct Taxiway C	$ 1,774,924
C14: Pavement Maintenance on all Airfield Pavement	$ 1,208,135

Assumptions

1	Pavement section for new pavement areas will consist of 3 inches HMA surface course and 6 inches of crushed aggregate base course
2	In the absence of survey data of new development areas, earthwork quantities based on an average 2 feet of excavation within the entire ROFA and TOFA areas
3	Unit prices based on past bidding at the airport. Prices are in 2021 dollars
4	Retroreflective taxiway edge markers will be installed in lieu of taxiway edge lighting on the Crosswind Runway layout
5	Assumed that land acquisition $15,000 per acre

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

B3: Relocate Supplemental Wind Cone

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-105	Mobilization	1	LS	$ 575.00	$ 575
2	L-108	No 12 AWG Cable, Installed in Conduit	450	LF	$ 2.50	$ 1,125
3	L-110	2-inch PVC Duct, Direct Earth Buried	150	LF	$ 7.50	$ 1,125
4	L-115	Splice Base	1	EA	$ 500.00	$ 500
5	Special	Reset Existing Windcone	1	EA	$ 3,000.00	$ 3,000
		Construction Contingency (20%)				$ 1,265
					Total Construction Cost	**$ 7,590**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 1,518
Misc Administrative Expenses (5%)						$ 380
					Total Project Cost	**$ 9,488**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

B4: Construct Hangar Development Area (Phase 1)

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-100	Contractor Quality Control Program (CQCP)	1	LS	$ 10,411.33	$ 10,411
2	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	LS	$ 23,305.56	$ 23,306
3	C-105	Mobilization	1	LS	$ 90,326.00	$ 90,326
4	P-151	Clearing and Grubbing	9.6	AC	$ 2,000.00	$ 19,261
5	P-152	Earthwork	31,074	CY	$ 7.50	$ 233,056
6	P-152	Taxilane Shoulder Grading	2,111	SY	$ 5.00	$ 10,556
7	P-208	Taxilane Crushed Aggregate Base Course (6 inches thick)	6,556	SY	$ 15.00	$ 98,333
8	P-401	Taxilane Asphalt Mix Pavement (3 inches thick)	1,131	TON	$ 80.00	$ 90,467
9	P-401	Taxilane Bituminous Material	79	TON	$ 800.00	$ 63,327
10	P-602	Taxilane Emulsified Asphalt Prime Coat	1,639	GAL	$ 5.00	$ 8,194
11	P-603	Taxilane Emulsified Asphalt Tack Coat	983	GAL	$ 3.50	$ 3,442
12	P-620	Taxilane Marking	700	SF	$ 2.00	$ 1,400
13	D-701	18-inch HDPE Culvert Pipe	200	LF	$ 50.00	$ 10,000
14	D-701	18-inch Flared End Section	4	EA	$ 500.00	$ 2,000
15	L-125	Retroreflective Taxiway Edge Markers	20	EA	$ 200.00	$ 4,000
16	P-208	Road & Parking Crushed Aggregate Base Course (4 inches thick)	8,533	SY	$ 10.00	$ 85,333
17	P-401	Road & Parking Asphalt Mix Pavement (3 inches thick)	1,472	TON	$ 80.00	$ 117,760
18	P-401	Road & Parking Bituminous Material	103	TON	$ 800.00	$ 82,432
19	P-602	Road & Parking Emulsified Asphalt Prime Coat	2,133	GAL	$ 5.00	$ 10,667
20	P-901	Seeding	6.5	AC	$ 4,500.00	$ 29,308
		Construction Contingency (20%)				$ 198,715
					Total Construction Cost	**$ 1,192,293**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 238,459
Misc Administrative Expenses (5%)						$ 59,615
					Total Project Cost	**$ 1,490,366**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

B5: Remove Hangar Facility

(replace area with asphalt apron)

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-100	Contractor Quality Control Program (CQCP)	1	LS	$ 766.67	$ 767
2	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	LS	$ 277.78	$ 278
3	C-105	Mobilization	1	LS	$ 24,955.00	$ 24,955
4	Special	Demolish Existing Hangar	1.0	LS	$ 200,000.00	$ 200,000
5	P-151	Clearing and Grubbing	0.2	AC	$ 2,000.00	$ 459
6	P-152	Earthwork	370	CY	$ 7.50	$ 2,778
7	P-152	Shoulder Grading	111	SY	$ 5.00	$ 556
8	P-208	Crushed Aggregate Base Course (6 inches thick)	1,111	SY	$ 15.00	$ 16,667
9	P-401	Asphalt Mix Pavement (3 inches thick)	192	TON	$ 80.00	$ 15,333
10	P-401	Bituminous Material	13	TON	$ 800.00	$ 10,733
11	P-602	Emulsified Asphalt Prime Coat	278	GAL	$ 5.00	$ 1,389
12	P-603	Emulsified Asphalt Tack Coat	167	GAL	$ 3.50	$ 583
		Construction Contingency (20%)				$ 54,899
					Total Construction Cost	**$ 329,397**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 65,879
Misc Administrative Expenses (5%)						$ 16,470
					Total Project Cost	**$ 411,746**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

B6: Relocate ASOS

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-105	Mobilization	1	LS	$ 17,500.00	$ 17,500
2		Relocate Equipment and Construct New Foundation	1	LS	$ 85,000.00	$ 85,000
3		Install New Power Service (conduit, cabling, trenching)	3,250	LF	$ 20.00	$ 65,000
4		New Electrical and Communication Requirements	1	LS	$ 25,000.00	$ 25,000
		Construction Contingency (20%)				$ 38,500
					Total Construction Cost	**$ 231,000**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 46,200
Misc Administrative Expenses (5%)						$ 11,550
					Total Project Cost	**$ 288,750**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

B7: Reconstruct and Expand Commercial Apron

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-100	Contractor Quality Control Program (CQCP)	1	LS	$ 181,597.22	$ 181,597
2	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	LS	$ 14,527.78	$ 14,528
3	C-105	Mobilization	1	LS	$ 505,912.00	$ 505,912
4	P-101	Pavement Removal (Full-Depth)	23,444	SY	$ 5.00	$ 117,222
5	P-151	Clearing and Grubbing	1.2	AC	$ 4,500.00	$ 5,217
6	P-152	Earthwork	19,370	CY	$ 7.50	$ 145,278
7	P-154	Subbase Course (6 inches thick)	29,056	SY	$ 15.00	$ 435,833
8	P-208	Aggregate Base Course (6 inches thick)	29,056	SY	$ 18.00	$ 523,000
9	P-501	PCC Pavement (6 inches thick)	29,056	SY	$ 125.00	$ 3,631,944
10	P-620	Apron Marking (existing and new Aprons)	1,000	SF	$ 4.50	$ 4,500
		Construction Contingency (20%)				$ 1,113,006
					Total Construction Cost	**$ 6,678,038**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 1,335,608
Misc Administrative Expenses (5%)						$ 333,902
					Total Project Cost	**$ 8,347,548**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

B8: Expand Passenger Terminal Building

includes automobile parking expansion phase 1

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-105	Mobilization	1	LS	$ 191,864.00	$ 191,864
2	Special	Remodel Existing Terminal Space	600	SF	$ 250.00	$ 150,000
3	Special	Expand Existing Terminal	4,645	SF	$ 325.00	$ 1,509,625
4	Special	Automated Baggage Belt	1	LS	$ 100,000.00	$ 100,000
5	Special	Relocate Transformer	1	LS	$ 10,000.00	$ 10,000
6	P-151	Parking Clearing and Grubbing	1.2	AC	$ 2,000.00	$ 2,456
7	P-208	Parking Crushed Aggregate Base Course (4 inches thick)	4,222	SY	$ 10.00	$ 42,222
8	P-401	Parking Asphalt Mix Pavement (3 inches thick)	728	TON	$ 80.00	$ 58,267
9	P-401	Parking Bituminous Material	51	TON	$ 800.00	$ 40,787
10	P-602	Parking Emulsified Asphalt Prime Coat	1,056	GAL	$ 5.00	$ 5,278
		Construction Contingency (20%)				$ 392,298
					Total Construction Cost	**$ 2,502,797**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 500,559
Misc Administrative Expenses (5%)						$ 125,140
					Total Project Cost	**$ 3,128,496**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

C1: Expand Aircraft Parking Apron (Phase 1)

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-100	Contractor Quality Control Program (CQCP)	1	LS	$ 38,984.00	$ 38,984
2	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	LS	$ 12,133.33	$ 12,133
3	C-105	Mobilization	1	LS	$ 156,701.00	$ 156,701
4	P-151	Clearing and Grubbing	5.0	AC	$ 2,000.00	$ 10,028
5	P-152	Earthwork	16,178	CY	$ 7.50	$ 121,333
6	P-208	Crushed Aggregate Base Course (6 inches thick)	24,267	SY	$ 15.00	$ 364,000
7	P-401	Asphalt Mix Pavement (3 inches thick)	3,496	TON	$ 80.00	$ 279,680
8	P-401	Bituminous Material (PG76-22)	245	TON	$ 800.00	$ 195,776
9	P-501	Concrete Pavement (6-inches thick)	4,000	SY	$ 125.00	$ 500,000
10	P-602	Emulsified Asphalt Prime Coat	6,067	GAL	$ 5.00	$ 30,333
11	P-603	Emulsified Asphalt Tack Coat	3,640	GAL	$ 3.50	$ 12,740
12	P-620	Apron Marking	1,000	SF	$ 2.00	$ 2,000
		Construction Contingency (20%)				$ 344,742
					Total Construction Cost	**$ 2,068,450**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 413,690
Misc Administrative Expenses (5%)						$ 103,423
					Total Project Cost	**$ 2,585,563**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

C3: Construct Runway 11-29 (Dirt) / Construct Taxiway B (Phase 1) (Asphalt) / Realign Taxiway A3 / Acquire Land

Runway 4,500' x 60'

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-100	Contractor Quality Control Program (CQCP)	1	LS	$ 6,325.00	$ 6,325
2	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	LS	$ 4,583.33	$ 4,583
3	C-105	Mobilization	1	LS	$ 63,189.00	$ 63,189
4	P-101	Pavement Removal (Full-Depth)	4,722	SY	$ 5.00	$ 23,611
5	P-152	Shoulder Grading (paved areas)	3,778	SY	$ 5.00	$ 18,889
6	P-152	Earthwork (excavation for paved areas)	6,111	CY	$ 7.50	$ 45,833
7	P-152	Surface Preparation (previously compacted dirt area on runway)	30,000	SY	$ 4.00	$ 120,000
8	P-208	Crushed Aggregate Base Course (6 inches thick)	9,167	SY	$ 15.00	$ 137,500
9	P-401	Asphalt Mix Pavement (3 inches thick)	1,581	TON	$ 80.00	$ 126,500
10	P-401	Bituminous Material	111	TON	$ 800.00	$ 88,550
11	P-602	Emulsified Asphalt Prime Coat	2,292	GAL	$ 5.00	$ 11,458
12	P-603	Emulsified Asphalt Tack Coat	1,375	GAL	$ 3.50	$ 4,813
13	F-161	Wire Fence with Steel Posts (Class C and D Fence)	1,400	LF	$ 15.00	$ 21,000
14	F-161	Remove Existing Wire Fence	665	LF	$ 5.00	$ 3,325
15	D-701	18-inch HDPE Culvert Pipe	250	LF	$ 50.00	$ 12,500
16	D-701	18-inch Flared End Section	4	EA	$ 500.00	$ 2,000
17	Special	Runway End Markers (concrete)	2	EA	$ 2,500.00	$ 5,000
		Construction Contingency (20%)				$ 138,015
					Total Construction Cost	**$ 833,092**
Other Project Expenses						
Property to Acquire (3.7 Acres)						$ 55,500
Design and Construction Engineering Services (20%)						$ 166,618
Misc Administrative Expenses (5%)						$ 41,655
					Total Project Cost	**$ 1,096,865**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

C4: Construct Air Tanker Base / Taxiway B (Phase 2)

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-100	Contractor Quality Control Program (CQCP)	1	LS	$ 42,859.22	$ 42,859
2	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	LS	$ 35,277.78	$ 35,278
3	C-105	Mobilization	1	LS	$ 314,351.00	$ 314,351
4	P-101	Pavement Removal (Full-Depth)	2,111	SY	$ 5.00	$ 10,556
5	P-151	Clearing and Grubbing	14.6	AC	$ 2,000.00	$ 29,155
6	P-152	Earthwork	47,037	CY	$ 7.50	$ 352,778
7	P-208	Crushed Aggregate Base Course (6 inches thick)	39,667	SY	$ 15.00	$ 595,000
8	P-401	Asphalt Mix Pavement (3 inches thick)	6,402	TON	$ 80.00	$ 512,133
9	P-401	Bituminous Material (PG76-22)	448	TON	$ 800.00	$ 358,493
10	P-501	Concrete Pavement (6-inches thick)	2,556	SY	$ 125.00	$ 319,444
11	P-602	Emulsified Asphalt Prime Coat	9,917	GAL	$ 5.00	$ 49,583
12	P-603	Emulsified Asphalt Tack Coat	5,950	GAL	$ 3.50	$ 20,825
13	P-620	Taxiway and Apron Marking	3,000	SF	$ 2.00	$ 6,000
14	P-208	Parking Crushed Aggregate Base Course (4 inches thick)	1,856	SY	$ 10.00	$ 18,556
15	P-401	Parking Asphalt Mix Pavement (3 inches thick)	320	TON	$ 80.00	$ 25,607
16	P-401	Parking Bituminous Material	22	TON	$ 800.00	$ 17,925
17	P-602	Parking Emulsified Asphalt Prime Coat	464	GAL	$ 5.00	$ 2,319
18		Pumping and Pipe System	1	LS	$ 60,000.00	$ 60,000
19	P-610	Concrete Secondary Containment (50'x50' with 2' high walls)	1,500	CY	$ 90.00	$ 135,000
20		Trench Drain across Hardstands	250	LF	$ 100.00	$ 25,000
21		Hangar	1.0	LS	$ 500,000.00	$ 500,000
22	P-901	Seeding	6.0	AC	$ 4,500.00	$ 26,994
		Construction Contingency (20%)				$ 529,291
					Total Construction Cost	**$ 3,987,147**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 797,429
Misc Administrative Expenses (5%)						$ 199,357
					Total Project Cost	**$ 4,983,934**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

C5: Pave Airport Perimeter Road

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	LS	$ 12,666.67	$ 12,667
2	C-105	Mobilization	1	LS	$ 47,218.00	$ 47,218
3	P-152	Shoulder/Ditch Grading	5,278	SY	$ 2.50	$ 13,194
4	P-208	Crushed Aggregate Base Course (4 inches thick)	12,667	SY	$ 10.00	$ 126,667
5	P-401	Asphalt Mix Pavement (3 inches thick)	2,185	TON	$ 80.00	$ 174,800
6	P-401	Bituminous Material	153	TON	$ 800.00	$ 122,360
7	P-602	Emulsified Asphalt Prime Coat	3,167	GAL	$ 5.00	$ 15,833
8	P-603	Emulsified Asphalt Tack Coat	1,900	GAL	$ 3.50	$ 6,650
		Construction Contingency (20%)				$ 103,878
					Total Construction Cost	**$ 623,267**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 124,653
Misc Administrative Expenses (5%)						$ 31,163
					Total Project Cost	**$ 779,084**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

C6: Construct Helicopter Testing Development Area

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-100	Contractor Quality Control Program (CQCP)	1	LS	$ 6,444.33	$ 6,444
2	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	LS	$ 5,555.56	$ 5,556
3	C-105	Mobilization	1	LS	$ 87,599.00	$ 87,599
4	P-151	Clearing and Grubbing	2.3	AC	$ 2,000.00	$ 4,591
5	P-152	Earthwork	7,407	CY	$ 7.50	$ 55,556
6	P-208	Crushed Aggregate Base Course (6 inches thick)	4,889	SY	$ 15.00	$ 73,333
7	P-401	Asphalt Mix Pavement (3 inches thick)	792	TON	$ 80.00	$ 63,327
8	P-401	Bituminous Material (PG76-22)	55	TON	$ 800.00	$ 44,329
9	P-501	Concrete Pavement (6-inches thick)	300	SY	$ 125.00	$ 37,500
10	P-602	Emulsified Asphalt Prime Coat	1,222	GAL	$ 5.00	$ 6,111
11	P-603	Emulsified Asphalt Tack Coat	733	GAL	$ 3.50	$ 2,567
12	P-620	Taxiway and Apron Marking	1,100	SF	$ 2.00	$ 2,200
13	P-208	Parking Crushed Aggregate Base Course (4 inches thick)	2,033	SY	$ 10.00	$ 20,333
14	P-401	Parking Asphalt Mix Pavement (3 inches thick)	351	TON	$ 80.00	$ 28,060
15	P-401	Parking Bituminous Material	25	TON	$ 800.00	$ 19,642
16	P-602	Parking Emulsified Asphalt Prime Coat	508	GAL	$ 5.00	$ 2,542
17		Hangar	1.0	LS	$ 500,000.00	$ 500,000
18	P-901	Seeding	0.9	AC	$ 4,500.00	$ 3,895
		Construction Contingency (20%)				$ 77,822
					Total Construction Cost	**$ 1,041,406**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 208,281
Misc Administrative Expenses (5%)						$ 52,070
					Total Project Cost	**$ 1,301,758**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
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C7: Construct Hangar Development Area (Phase 2)

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-100	Contractor Quality Control Program (CQCP)	1	LS	$ 20,776.67	$ 20,777
2	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	LS	$ 41,700.00	$ 41,700
3	C-105	Mobilization	1	LS	$ 179,707.00	$ 179,707
4	P-151	Clearing and Grubbing	17.2	AC	$ 2,000.00	$ 34,463
5	P-152	Earthwork	55,600	CY	$ 7.50	$ 417,000
6	P-152	Taxilane Shoulder Grading	7,556	SY	$ 5.00	$ 37,778
7	P-208	Taxilane Crushed Aggregate Base Course (6 inches thick)	16,333	SY	$ 15.00	$ 245,000
8	P-401	Taxilane Asphalt Mix Pavement (3 inches thick)	2,818	TON	$ 80.00	$ 225,400
9	P-401	Taxilane Bituminous Material	197	TON	$ 800.00	$ 157,780
10	P-602	Taxilane Emulsified Asphalt Prime Coat	4,083	GAL	$ 5.00	$ 20,417
11	P-603	Taxilane Emulsified Asphalt Tack Coat	2,450	GAL	$ 3.50	$ 8,575
12	P-620	Taxilane Marking	2,200	SF	$ 2.00	$ 4,400
13	D-701	18-inch HDPE Culvert Pipe	600	LF	$ 50.00	$ 30,000
14	D-701	18-inch Flared End Section	12	EA	$ 500.00	$ 6,000
15	L-125	Retroreflective Taxiway Edge Markers	100	EA	$ 200.00	$ 20,000
16	P-208	Road & Parking Crushed Aggregate Base Course (4 inches thick)	13,778	SY	$ 10.00	$ 137,778
17	P-401	Road & Parking Asphalt Mix Pavement (3 inches thick)	2,377	TON	$ 80.00	$ 190,133
18	P-401	Road & Parking Bituminous Material	166	TON	$ 800.00	$ 133,093
19	P-602	Road & Parking Emulsified Asphalt Prime Coat	3,444	GAL	$ 5.00	$ 17,222
20	P-901	Seeding	11.0	AC	$ 4,500.00	$ 49,545
		Construction Contingency (20%)				$ 395,354
					Total Construction Cost	**$ 2,372,122**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 474,424
Misc Administrative Expenses (5%)						$ 118,606
					Total Project Cost	**$ 2,965,152**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

C8: Expand Aircraft Parking Apron (Phase 2)

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-100	Contractor Quality Control Program (CQCP)	1	LS	$ 28,594.67	$ 28,595
2	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	LS	$ 10,111.11	$ 10,111
3	C-105	Mobilization	1	LS	$ 123,001.00	$ 123,001
4	P-151	Clearing and Grubbing	4.2	AC	$ 2,000.00	$ 8,356
5	P-152	Earthwork	13,481	CY	$ 7.50	$ 101,111
6	P-208	Crushed Aggregate Base Course (6 inches thick)	20,222	SY	$ 15.00	$ 303,333
7	P-401	Asphalt Mix Pavement (3 inches thick)	3,034	TON	$ 80.00	$ 242,727
8	P-401	Bituminous Material (PG76-22)	212	TON	$ 800.00	$ 169,909
9	P-501	Concrete Pavement (6-inches thick)	2,633	SY	$ 125.00	$ 329,167
10	P-602	Emulsified Asphalt Prime Coat	5,056	GAL	$ 5.00	$ 25,278
11	P-603	Emulsified Asphalt Tack Coat	3,033	GAL	$ 3.50	$ 10,617
12	P-620	Apron Marking	400	SF	$ 2.00	$ 800
		Construction Contingency (20%)				$ 270,601
					Total Construction Cost	**$ 1,623,605**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 324,721
Misc Administrative Expenses (5%)						$ 81,180
					Total Project Cost	**$ 2,029,506**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

C9: Expand Automobile Parking (Phase 2)

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-105	Mobilization	1	LS	$ 22,443.00	$ 22,443
2	P-151	Parking Clearing and Grubbing	2.3	AC	$ 2,000.00	$ 4,591
3	P-208	Parking Crushed Aggregate Base Course (4 inches thick)	6,333	SY	$ 10.00	$ 63,333
4	P-401	Parking Asphalt Mix Pavement (3 inches thick)	1,093	TON	$ 80.00	$ 87,400
5	P-401	Parking Bituminous Material	76	TON	$ 800.00	$ 61,180
6	P-602	Parking Emulsified Asphalt Prime Coat	1,583	GAL	$ 5.00	$ 7,917
		Construction Contingency (20%)				$ 4,489
					Total Construction Cost	**$ 251,353**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 50,271
Misc Administrative Expenses (5%)						$ 12,568
					Total Project Cost	**$ 314,191**

Airport:	San Luis Valley Regional Airport
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Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

C10: Construct Hangar Development Area (Phase 3)

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-100	Contractor Quality Control Program (CQCP)	1	LS	$ 15,065.00	$ 15,065
2	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	LS	$ 28,888.89	$ 28,889
3	C-105	Mobilization	1	LS	$ 128,218.00	$ 128,218
4	P-151	Clearing and Grubbing	11.9	AC	$ 2,000.00	$ 23,875
5	P-152	Earthwork	38,519	CY	$ 7.50	$ 288,889
6	P-152	Taxilane Shoulder Grading	4,667	SY	$ 5.00	$ 23,333
7	P-208	Taxilane Crushed Aggregate Base Course (6 inches thick)	9,389	SY	$ 15.00	$ 140,833
8	P-401	Taxilane Asphalt Mix Pavement (3 inches thick)	1,620	TON	$ 80.00	$ 129,567
9	P-401	Taxilane Bituminous Material	113	TON	$ 800.00	$ 90,697
10	P-602	Taxilane Emulsified Asphalt Prime Coat	2,347	GAL	$ 5.00	$ 11,736
11	P-603	Taxilane Emulsified Asphalt Tack Coat	1,408	GAL	$ 3.50	$ 4,929
12	P-620	Taxilane Marking	1,500	SF	$ 2.00	$ 3,000
13	D-701	18-inch HDPE Culvert Pipe	600	LF	$ 50.00	$ 30,000
14	D-701	18-inch Flared End Section	12	EA	$ 500.00	$ 6,000
15	L-125	Retroreflective Taxiway Edge Markers	100	EA	$ 200.00	$ 20,000
16	P-208	Road & Parking Crushed Aggregate Base Course (4 inches thick)	12,444	SY	$ 10.00	$ 124,444
17	P-401	Road & Parking Asphalt Mix Pavement (3 inches thick)	2,147	TON	$ 80.00	$ 171,733
18	P-401	Road & Parking Bituminous Material	150	TON	$ 800.00	$ 120,213
19	P-602	Road & Parking Emulsified Asphalt Prime Coat	3,111	GAL	$ 5.00	$ 15,556
20	P-901	Seeding	7.4	AC	$ 4,500.00	$ 33,419
		Construction Contingency (20%)				$ 282,079
					Total Construction Cost	**$ 1,692,477**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 338,495
Misc Administrative Expenses (5%)						$ 84,624
					Total Project Cost	**$ 2,115,596**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	Development Alternatives Cost Estimates

C11: Pave Runway 11/29

4,500 x 60

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-100	Contractor Quality Control Program (CQCP)	1	LS	$ 20,700.00	$ 20,700
2	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	LS	$ 39,166.67	$ 39,167
3	C-105	Mobilization	1	LS	$ 219,149.00	$ 219,149
4	P-151	Clearing and Grubbing	16	AC	$ 2,000.00	$ 32,369
5	P-152	Earthwork	52,222	CY	$ 7.50	$ 391,667
6	P-152	Shoulder Grading	15,200	SY	$ 5.00	$ 76,000
7	P-208	Crushed Aggregate Base Course (6 inches thick)	30,000	SY	$ 15.00	$ 450,000
8	P-401	Asphalt Mix Pavement (3 inches thick)	5,175	TON	$ 80.00	$ 414,000
9	P-401	Bituminous Material	362	TON	$ 800.00	$ 289,800
10	P-602	Emulsified Asphalt Prime Coat	7,500	GAL	$ 5.00	$ 37,500
11	P-603	Emulsified Asphalt Tack Coat	4,500	GAL	$ 3.50	$ 15,750
12	P-620	Runway Marking (non-precision markings)	20,000	SF	$ 2.00	$ 40,000
13	L-108	L-824C Cable, Installed in Conduit	10,676	LF	$ 2.50	$ 26,690
14	L-108	Counterpoise Wire	9,600	LF	$ 1.50	$ 14,400
15	L-110	2-inch PVC Duct, Direct Earth Buried	9,600	LF	$ 7.50	$ 72,000
16	L-110	Concrete Encased Duct Bank	140	LF	$ 75.00	$ 10,500
17	L-115	Splice Base	8	EA	$ 500.00	$ 4,000
18	L-125	Runway Edge and Threshold Lights	52	EA	$ 1,000.00	$ 52,000
19	L-125	Runway End Identifier Lights (REIL) System	2	EA	$ 25,000.00	$ 50,000
20	L-125	Lighted Guidance Signs	10	EA	$ 5,000.00	$ 50,000
21	L-125	Precision Approach Path Indicator (PAPI-2) System	2	EA	$ 30,000.00	$ 60,000
22	T-901	Seeding	10	AC	$ 4,500.00	$ 44,938
		Construction Contingency (20%)				$ 482,126
					Total Construction Cost	**$ 2,892,755**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 578,551
Misc Administrative Expenses (5%)						$ 144,638
					Total Project Cost	**$ 3,615,944**

Airport:	San Luis Valley Regional Airport
Location:	Alamosa, Colorado
Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	Development Alternatives Cost Estimates

C12: Construct Taxiway C

4,500 x 35

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-100	Contractor Quality Control Program (CQCP)	1	LS	$ 13,953.33	$ 13,953
2	C-102	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	1	LS	$ 12,500.00	$ 12,500
3	C-105	Mobilization	1	LS	$ 107,572.00	$ 107,572
4	P-151	Clearing and Grubbing	5	AC	$ 2,000.00	$ 10,331
5	P-152	Earthwork	16,667	CY	$ 7.50	$ 125,000
6	P-152	Shoulder Grading	15,117	SY	$ 5.00	$ 75,583
7	P-208	Crushed Aggregate Base Course (6 inches thick)	20,222	SY	$ 15.00	$ 303,333
8	P-401	Asphalt Mix Pavement (3 inches thick)	3,488	TON	$ 80.00	$ 279,067
9	P-401	Bituminous Material	244	TON	$ 800.00	$ 195,347
10	P-602	Emulsified Asphalt Prime Coat	5,056	GAL	$ 5.00	$ 25,278
11	P-603	Emulsified Asphalt Tack Coat	3,033	GAL	$ 3.50	$ 10,617
12	P-620	Taxiway Marking	2,880	SF	$ 2.00	$ 5,760
13	D-701	18-inch HDPE Culvert Pipe	250	LF	$ 50.00	$ 12,500
14	D-701	18-inch Flared End Section	4	EA	$ 500.00	$ 2,000
15	T-901	Seeding	1	AC	$ 4,500.00	$ 4,442
		Construction Contingency (20%)				$ 236,657
					Total Construction Cost	**$ 1,419,939**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 283,988
Misc Administrative Expenses (5%)						$ 70,997
					Total Project Cost	**$ 1,774,924**

Airport:	San Luis Valley Regional Airport
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Project:	Airport Master Plan Update
AIP No:	3-08-0002-024-2019
Subject:	20-Year Development Plan Cost Estimates

C14: Pavement Maintenance on all Airfield Pavement

Item	FAA Spec	Description	Qty	Unit	Unit Price	Extension
1	C-105	Mobilization	1	LS	$ 54,312.00	$ 54,312
2	P-605	Concrete Joint Resealing	52,000	LF	$ 4.00	$ 208,000
3	P-101	Crack Sealing	12	TON	$ 3,500.00	$ 42,000
4	P-608	Emulsified Asphalt Seal Coat with Polymer and Sand	134,889	SY	$ 1.25	$ 168,611
5	P-608	Emulsified Asphalt Seal Coat with Polymer	130,000	SY	$ 1.15	$ 149,500
6	P-608	Runway Friction Testing	1	LS	$ 5,000.00	$ 5,000
7	P-620	Runway and Taxiway Marking	88,000	SF	$ 2.00	$ 176,000
8	P-620	Reflectivity Readings	1	EA	$ 2,000.00	$ 2,000
		Construction Contingency (20%)				$ 161,085
					Total Construction Cost	**$ 966,508**
Other Project Expenses						
Design and Construction Engineering Services (20%)						$ 193,302
Misc Administrative Expenses (5%)						$ 48,325
					Total Project Cost	**$ 1,208,135**