Double Eagle II Airport

MASTER PLAN

April 2018

Double Eagle II Airport

AIRPORT MASTER PLAN

FINAL REPORT
November 2019

Prepared for:

City of Albuquerque
220 Sunport SE
Albuquerque, NM 87106

Prepared by:

KSA
A·DYNAMIC·PERSPECTIVE
McKinney, Texas

In Collaboration with:

C&S COMPANIES®
Syracuse, NY

MOLZENCORBIN
ENGINEERS | ARCHITECTS | PLANNERS
Albuquerque, NM

This document was funded by the Federal Aviation Administration (FAA), New Mexico Department of Transportation (NMDOT), and the City of Albuquerque. The contents do not necessarily reflect the official views or policies of NMDOT or the FAA. Acceptance of this report by NMDOT or FAA does not in any way constitute a commitment to fund or 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.

Table of Contents

Chapter 1 – Inventory

1.0 Inventory ... 1-1
1.1 Background Studies ... 1-1
Albuquerque Metropolitan Transportation Plan ... 1-1
Albuquerque Comprehensive Plan ... 1-2
1.2 Airport Background ... 1-3
Airport Location ... 1-4
Airport History ... 1-5
Airport Management and Ownership ... 1-5
Aeronautical Role ... 1-5
Airport Activity ... 1-8
1.3 Existing Facilities ... 1-8
Runways ... 1-8
Taxiways ... 1-9
Fixed Base Operator ... 1-11
Aircraft Parking and Automobile Parking ... 1-11
Automobile Access ... 1-11
Fuel Facilities ... 1-12
1.4 Airspace and NAVAIDS ... 1-12
Navigational Aids (NAVAIDS) ... 1-15
Part 77 Surfaces ... 1-17
Air Traffic Control Tower ... 1-18

Chapter 2 – Forecast of Aviation Activity

2.0 Forecast of Aviation Activity ... 2-1
2.1 Overview Airport Market Area ... 2-2
Definition of AEG Airport Market Area ... 2-2
Paseo Del Volcan Freeway (Proposed) ... 2-2
2.2 National Aviation Trends ... 2-4
General Aviation (GA) Trends ... 2-4

Business Use of General Aviation 2-5
Anticipated General Aviation Trends 2-7
2.3 Regional Trends 2-9
Population 2-10
Employment and Personal Income 2-10
Albuquerque International Sunport Master Plan 2-12
2.4 Historical and Existing Aviation Activity 2-12
Based Aircraft 2-12
Aircraft Operations 2-13
2.5 Projections of Aviation Activity 2-14
Based Aircraft Projections 2-15
Based Aircraft Fleet Mix 2-17
Aircraft Operations Projections 2-18
Projected Local/Itinerant Split 2-19
2.6 Critical Aircraft 2-20
2.7 Summary 2-21

Chapter 3 – Facility Requirements

3.0 Facility Requirements 3-1
3.1 Demand/Capacity Analysis 3-1
Operational Fleet Mix 3-1
Annual Service Volume (ASV) 3-2
3.2 Airfield Requirements 3-3
Airport Design 3-3
Airport Reference Code (ARC) 3-3
Runway and Taxiway Safety Area (RSA) 3-6
Runway and Taxiway Object Free Area (OFA) 3-6
Runway Protection Zone (RPZ) 3-6
Precision Object Free Zone (POFZ) 3-6
ILS Critical Area 3-6
20:1 Visual Approach Area Surface 3-7
Precision Instrument Approach/Departure Area Surfaces 3-7
Taxiway Design 3-7
End Around Taxiway 3-7

Runway Width ... 3-10
Runway Strength and Condition ... 3-10
Taxiways ... 3-10
Runway Length Requirements ... 3-11
3.3 Wind Analysis ... 3-12
3.4 Lighting and NAVAIDS ... 3-15
Instrument NAVAIDs ... 3-15
Automated Weather ... 3-16
3.5 Landside Capacity and Facility Requirements ... 3-16
T-Hangars ... 3-16
Conventional Box Hangars ... 3-17
Apron ... 3-17
Parking ... 3-17
Existing Airport Landside Facilities ... 3-17
Itinerant Aircraft Parking Apron ... 3-18
Based Aircraft Parking Apron ... 3-19
Aircraft Storage Facilities ... 3-19
Support Area Requirements ... 3-22
Fuel Facility ... 3-24
Automobile Parking ... 3-24
Summary of Landside Requirements ... 3-25
3.6 Rotorcraft / Helicopter Requirements ... 3-26
Design Considerations ... 3-28
3.7 Facility Requirements Summary ... 3-31

Chapter 4 – Airport Development Alternatives
4.1 Facility Requirements Summary ... 4-1
Airside Requirements ... 4-1
Landside Requirements ... 4-4
4.2 Evaluation Criteria ... 4-4
4.3 Airside Development Alternatives ... 4-5
Description of Airside Alternatives ... 4-5
Airside Alternative 1 ... 4-6
Airside Alternative 1 – Analysis ... 4-8

Airside Alternative 2 ... 4-9
Airside Alternative 2 – Analysis ... 4-11
Airside Alternative 3 ... 4-12
Airside Alternative 3 – Analysis ... 4-14
Airside Alternative 4 ... 4-15
Airside Alternative 4 – Analysis ... 4-17
Helicopter Operations Facility ... 4-18
4.4 Landside Development Alternatives ... 4-20
Description of Landside Alternatives ... 4-21
Landside Alternative 1 ... 4-22
Landside Alternative 1 – Analysis ... 4-24
Landside Alternative 2 ... 4-25
Landside Alternative 2 – Analysis ... 4-27
Landside Alternative 3 ... 4-28
Landside Alternative 3 – Analysis ... 4-30

Chapter 5 – Implementation Plan

5.0 Implementation Plan ... 5-1
5.1 Recommended Development ... 5-1
5.2 Cost Estimates ... 5-3
5.3 Financial Plan and Schedule ... 5-5
Funding Sources ... 5-6
Federal Aviation Administration Airport Improvement Program (AIP) ... 5-6
New Mexico Department of Transportation (NMDOT) Aviation Division ... 5-7
Alternative Funding Sources ... 5-8
New Mexico Economic Development Department ... 5-8
Local and Private Funding ... 5-8
5.4 Project Schedule and Phasing ... 5-9
Short Term – (Current to 5 years) ... 5-11
Mid-Term – (6 to 10 years) ... 5-11
Long-Term – (11 to 20 years) ... 5-12
Routine Maintenance Projects ... 5-12
5.5 Capital Improvement Program Summary ... 5-13

Chapter 6 – Airport Layout Plan

Glossary of Terms

Appendix A – SWOT Analysis and Economic Development Strategy

Appendix B – Airport Traffic Counts

Appendix C – Planning Advisory Committee Roster

Appendix D – Public Outreach Materials

Figures and Tables

Tables

Table 1.1 Socio-Economic Data ... 1-3
Table 1.2 Major Employers ... 1-3
Table 1.3 NPIAS General Aviation Airport Categories ... 1-6
Table 1.4 NMASP Airport Service Levels ... 1-7
Table 1.5 Airport Activity ... 1-8
Table 1.6 Existing Conditions ... 1-8
Table 1.7 Runway Information ... 1-9
Table 1.8 Taxiways Evaluation ... 1-11
Table 1.9 Existing Aviation Services ... 1-11
Table 1.10 Airport Hangars and Parking Facilities ... 1-12
Table 1.11 Airspace Class Definition ... 1-14
Table 1.12 Approach Procedures ... 1-17
Table 2.1 Local, State, and National Population ... 2-10
Table 2.2 Employment and Per Capita Personal Income ... 2-10
Table 2.3 Market Area Demographic and Socioeconomic Projections ... 2-11
Table 2.4 AEG Based Aircraft ... 2-13
Table 2.5 AEG Aircraft Operations ... 2-13
Table 2.6 Based Aircraft Projections ... 2-15
Table 2.7 Based Aircraft Fleet Mix ... 2-17
Table 2.8 Aircraft Operations Projections ... 2-18
Table 2.9 Local / Itinerant Operations Projections ... 2-20
Table 2.10 Airport Reference Code ... 2-20
Table 2.11 Projection of Activity Summary and TAF Comparison ... 2-22
Table 3.1 Operations Fleet Mix by Use ... 3-1
Table 3.2 Operations Fleet Mix by Aircraft Type ... 3-2
Table 3.3 Airport Reference Codes ... 3-4
Table 3.4 FAA Runway Design Standards Matrix ... 3-9
Table 3.5 Runway Pavement Strength (Published) ... 3-10
Table 3.6 AEG Wind Coverage ... 3-14

Table 3.7 General Hangar Space Guidelines ... 3-16
Table 3.8 Existing Landside Facilities ... 3-17
Table 3.9 General Aviation Itinerant Apron Demand ... 3-18
Table 3.10 General Aviation Based Aircraft Apron Demand ... 3-19
Table 3.11 General Aviation Based Aircraft and Itinerant Apron Demand ... 3-19
Table 3.12 Aircraft Storage Types ... 3-20
Table 3.13 Hangar Area Demand ... 3-22
Table 3.14 General Aviation Building Area Requirements ... 3-23
Table 3.15 General Aviation Terminal Building Requirements ... 3-23
Table 3.16 Fuel Storage Requirements ... 3-24
Table 3.17 Auto Parking Area Requirements ... 3-25
Table 3.18 Landside Facilities Requirements Summary ... 3-25
Table 3.19 Summary of Facility Requirements ... 3-31
Table 4.1 Based Aircraft Projections ... 4-2
Table 4.2 Aircraft Operations Projections ... 4-2
Table 4.3 Summary Requirements ... 4-3
Table 4.4 Airside Alternative 1 Evaluation Criteria ... 4-8
Table 4.5 Airside Alternative 2 Evaluation Criteria ... 4-11
Table 4.6 Airside Alternative 3 Evaluation Criteria ... 4-14
Table 4.7 Airside Alternative 4 Evaluation Criteria ... 4-17
Table 5.1 Cost Estimates Project Descriptions ... 5-4
Table 5.2 Phasing Plan ... 5-9
Table 5.3 Project Cost Summary ... 5-13

Figures

Figure 1.1 Airport Location ... 1-4
Figure 1.2 Airspace Classification ... 1-13
Figure 1.3 Albuquerque Sectional Chart ... 1-15
Figure 1.4 AEG Approach Plates ... 1-16
Figure 1.5 Part 77 Surfaces ... 1-18
Figure 2.1 AEG Market Area ... 2-2
Figure 2.2 Paseo del Volcan Alignment ... 2-3
Figure 2.3 General Aviation Turbine Aircraft Growth 2000-2014 ... 2-6
Figure 2.4 Historical / Projected General Aviation and Air Taxi Hours Flown ... 2-9

Figure 2.5 Based Aircraft Projections Comparison 2-16
Figure 2.6 Aircraft Projections Comparison 2-18
Figure 3.1 Runway Capacity by Configuration 3-2
Figure 3.2 Common Aircraft by Airport Reference Code 3-5
Figure 3.3 Runway Length Requirements – 75% of Fleet at 60% Load 3-12
Figure 3.4 Wind Rose 3-14
Figure 3.5 Wind Coverage by Runway Orientation 3-15
Figure 3.6 Existing Corporate Hangars 3-21
Figure 3.7 Example Rotorcraft at Double Eagle II 3-27
Figure 3.8 Basic Features at a General Aviation Heliport 3-29
Figure 3.9 Sample Helipad Lighting Configuration 3-29
Figure 3.10 FAA Recommended Heliport Protection Zone 3-30

Chapter One: Inventory

Chapter 1 - Inventory

This inventory chapter contains comprehensive airport data that will be used to complete the remaining chapters of the Double Eagle II Airport (AEG) Master Plan. The purpose of this chapter is to provide a framework of essential data regarding the physical, operational, and functional characteristics of the airport and surrounding environs. The contents of this chapter will define the following unique and pertinent characteristics to maximize the usefulness of this Master Plan.

Information in this chapter was compiled using a variety of sources, including data collection and research, site visits, airport management, airport surveys, federal and state aviation documents, and meetings with airport management, tenants and users.

Note: Given the duration of this study, information found in this initial section is current as of February 2016 and subsequent chapters may include updated information.

1.1 Background Studies

The following studies were examined in the preparation of this planning study to gain a comprehensive understanding of the role Double Eagle II Airport plays locally and nationally. These studies are also important in order to streamline this document with existing plans for the both the City of Albuquerque and Double Eagle II Airport:

- *Airport Master Plan: Double Eagle II Airport* - City of Albuquerque, 2002
- *General Aviation Airports: A National Asset* - Federal Aviation Administration, 2012
- *Report to Congress: National Plan of Integrated Airport Systems (NPIAS)* Federal Aviation Administration, (2015-2019)
- *New Mexico Airport System Plan Update* - New Mexico Department of Transportation, 2014
- *Albuquerque the Plan* - City of Albuquerque, 2014
- *Futures 2040: Metropolitan Transportation Plan (MTP)* - Mid-Region Metropolitan Planning Organization, 2015.

Albuquerque Metropolitan Transportation Plan

The Futures 2040 Metropolitan Transportation Plan (MTP) is a planning document that addresses the regional transportation challenges in the MTP area, including Bernalillo County, Valencia County, and parts of Sandoval County. The MTP identifies infrastructure needs as well as the recommendations for how to distribute federal funds based on project significance. Improving livability, environmental sustainability, and economic activity through a solid foundation of transportation planning initiatives are the intended outcomes of the MTP. In September of 2017, administrative approval was granted for the use of a 2040 Revised Forecast for socioeconomic and travel demand projections throughout the Albuquerque Metropolitan Planning Area. The revised forecast integrates a reduction in future growth assumptions per updated population projections. These projections, completed in 2016 anticipate 253,876 fewer people in the MRCOG counties by 2040 than was initially projected in 2012. There are three major themes that the MTP addresses. First, infrastructure improvements are needed at a time when funding is decreasing and unpredictable. In response to this problem, the MTP emphasizes the need to maintain and preserve existing infrastructure. Building new roads will decrease the already limited budget for maintenance. Over the long-term, this will result in roadway capacity challenges, especially at river crossings, where no new bridges have been proposed in Bernalillo County.

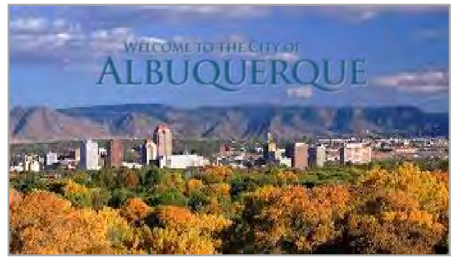
The second challenge is related to the forecasted increase in population and how to best manage land use to accommodate the growth without overloading the transportation system. The plan calls for sustainable strategies to maximize the existing transportation structure, minimize future maintenance costs, and ensure adequate transportation for residents in the Albuquerque Metropolitan Area.

The third theme addresses changing demographics and market preference in Albuquerque. The state of New Mexico is undergoing a shift in the desire for urban centers that are walkable, mixed-use communities, and housing in close proximity to jobs and amenities. The MTP reports that the millennial generation is the least satisfied with the transportation system in the Albuquerque area. The MTP identified Double Eagle II Airport as a preferred location for a future business park or large single employer. This plan will be addressed in later chapters.

Albuquerque Comprehensive Plan

"Improving Place from Planning to Zoning" is the mission of the Albuquerque & Bernalillo County Comprehensive Plan. Adopted by City Council in March 2017, this plan describes the community's vision for the future of the built and natural environmental and provides goals, policies, and implementing actions to achieve this goal. The Comprehensive Plan is closely coordinated with the Metropolitan Transportation Plan (MTP). Notable transportation projects include the Pasco Del Norte and I-25 Interchange reconstruction, Albuquerque Rapid Transit (ART) projects, and Historic Route 66 revitalization.

1.2 Airport Background



The City of Albuquerque is located in Bernalillo County near the central part of New Mexico. Located within the northern areas of the Chihuahuan Desert, the elevation of Albuquerque reaches over one mile high in the foothill areas of Sandia Heights and Glenwood Hills. Albuquerque is nestled between the Sandia Mountains to the northeast and the Rio Grande River flowing through the western part of the city. Home to over 557,000 residents, Albuquerque is the most populous city in New Mexico and ranks among the largest 35 cities in the Unites States. The Albuquerque Metropolitan Statistical Area (MSA) has a population of just under one million people and includes the City of Rio Rancho, Bernalillo, Placitas, Corrales, Lost Lunas, Belen, and Bosque Farms. Table 1.1 provides socio-economic date for the City of Albuquerque, Bernalillo County, and State of New Mexico.

Table 1.1
Socio-Economic Data

	City of Albuquerque	Bernalillo County	State
Population (Est.), 2014	557,169	675,551	2,085,572
Bachelor's or Higher, 2010-'14	33.2%	32.3%	25.8%
In Labor Force, 2010-'14	65.1%	63.7%	-
PCI, 2010-'14	$26,876	$26,916	$23,763
Median Household Income 2010-'14	$47,413	$48,390	$44,927

Source: U.S. Census Bureau

The city of Albuquerque offers a variety of business incentives to attract employers. These include bonds and funding sources, training programs, and tax credits. Table 1.2 lists several of the city's largest employers.

Table 1.2
Major Employers

Company	Description
Intel Corporation	Semiconductors
Honeywell Aerospace	Aircraft Avionics
Hewlett-Packard	Customer, Technical and Sales Support
Kirtland Air Force Base	Military
Sandia National Laboratories	National Security, Nuclear Science

Source: Albuquerque Economic Development

Source: USA Today

The Albuquerque International Balloon Festival started in 1972 and has become the largest balloon convention in the world. As many as 600 balloons can be seen flying during the convention displaying a variety of logos, paintings, and shapes. The convention has become a staple of Albuquerque culture attracting as many as 100,000 spectators on any given day of the event. The City and local businesses benefit financially from the influx of travelers during the convention. Sponsorships from companies like Canon also provide income for the City. The festival is estimated to draw approximately 100 million dollars annually.

Airport Location

Double Eagle II Airport, as shown in **Figure 1.1**, is located within the northwest quadrant of Bernalillo County. Situated between Shooting Range State Park and Petroglyph National Monument, AEG is 20 miles from downtown Albuquerque and 23 miles from Albuquerque International Sunport (ABQ). Double Eagle II Airport is located 70 miles from Santa Fe, New Mexico; 275 miles from El Paso, Texas and Mexico; and 300 miles from Amarillo, Texas.

Figure 1.1 Airport Location

Source: KSA

Airport History

The results of a planning study performed for the City of Albuquerque in 1969 supported the need for additional aviation facilities to accommodate long-term aviation growth. Again in 1972, a statewide Airport System Plan proposed the need for additional general aviation facilities throughout the Albuquerque area. The culmination of these planning studies led to construction of what is now named Double Eagle II Airport.

In 1972, a Master Plan study was conducted for the new Double Eagle II Airport. The mission stated in the plan was to serve as a reliever airport for Albuquerque International Sunport and offer commercial service. Initial construction of AEG was completed in 1983. In 1991, the New Mexico State Highway and Transportation Department (NMSHTD) Aviation Division, New Mexico State University, and Leedshill-Herkenhoff Engineers completed a draft revision of the Albuquerque Metropolitan Airport System Plan. The plan predicted that Double Eagle II Airport "will become the center of general aviation activity in the state." In 2000, Eclipse Aviation announced that Albuquerque and Double Eagle II Airport were selected as a proposed site to manufacture their very light twin engine Eclipse 500 jet aircraft. However, plans to build a manufacturing plant were stalled and never came to fruition.

The current Double Eagle II Airport Master Plan document was completed in 2002. This robust plan was undertaken at the height of a long period of national growth, advancements in technology, and increased private investment. This resulted in suggested planning improvements including the construction of the midfield hangar area, reconstruction of Runways 4-22 and 17-35, Taxiways A and B; construction and equipping of an Air Traffic Control Tower, replacement of the airfield electrical control vault establishment and infrastructure improvements for the Aerospace Technology Park and reconstruction of Atrisco Vista Blvd., extension of Taxiway B, and relocation of the T-hangar taxilane. Since the completion of the 2002 Master Plan, improvement at AEP include a connector taxiway from Runway 4/22 to Runway 17/35 and construction of general aircraft storage hangars along Runway 4/22.

Airport Management and Ownership

The City of Albuquerque Aviation Department owns and operates Double Eagle II Airport and Albuquerque International Sunport. The airport has staff located on site including an Airport Manager and operations and maintenance staff.

Aeronautical Role

General aviation airports serve a variety of roles and at many distinct levels. The following overview will categorize and define the role of the Double Eagle II as seen at a national, state, and local level. Depending on the perspective, the needs for the airport may change based on the defined role.

National Role-National Plan of Integrated Airport Systems (NPIAS): The National Plan of Integrated Airport Systems (NPIAS) identifies airports with a significant role in the national aviation system.

Airports in the NPIAS are eligible for AIP funding so long as specific requirements in the NPIAS are met. Airports in the NPIAS are defined as primary or non-primary based on the prevalent type of service at the airport. There are different categories and service levels that further classify the specific role the airport serves within the greater national airspace system defined in Table 1.3. The 2015-2019 Federal Aviation Administration NPIAS classifies Double Eagle II Airport as a Reliever Airport for the Albuquerque International Sunport. The purpose of a reliever airport is to provide an alternative to congested hub airport for general aviation activity. Airports must have 100 or more based aircraft, or have 25,000 to be eligible for reliever designation.

Table 1.3
NPIAS General Aviation Airport Categories

National	Regional	Local	Basic
Supports the national airport system by providing communities with access to national and global markets. These airports have very high levels of activity with many jets and multiengine propeller aircraft. These airports average about 200 total based aircraft, including 30 jets.	Supports regional economies by connecting communities to regional and national markets. These airports have high levels of activity with some jets and multiengine propeller aircraft. These airports average about 90 total based aircraft, including 3 jets.	Supplements local communities by providing access to local and regional markets. These airports have moderate levels of activity with some multiengine propeller aircraft. These airports average about 33-based propeller-driven aircraft and no jets.	Supports general aviation activities, often serving aeronautical functions within the local community such as emergency response and access to remote communities. These airports have moderate levels of activity with an average of 10 propeller-driven aircraft and no jets.

NPIAS Commercial Services Airport Categories

Large Hub	Medium Hub	Small Hub	Non-Primary
1 Percent or more of total U.S. annual enplanements	Between 0.25 percent & 1 percent of total U.S. annual enplanements	Between 0.05 percent and 0.25 percent of total U.S. annual enplanements	Less than 0.05 percent of U.S. annual enplanements but more than 10,000 total annual enplanements

Source: FAA

National Role-General Aviation Airport Asset Study: The 2012 Asset study identifies 2,952 general aviation airports, selected to part of the NPIAS, which contribute to U.S. economy and support activity that is not feasible at most commercial service airport due to capacity constraints. Double Eagle II Airport is categorized as a Reliever-Regional Airport defined in the Asset Study as, "supporting regional economies by connecting communities to statewide and interstate markets."

State Role-New Mexico Airport System Plan (NMASP): *New Mexico Airport System Plan Update 2014* identifies airports and heliports that are a necessity to the economic and social development of New Mexico. These facilities provide critical services, such as air ambulance services, firefighting, agricultural spraying, law enforcement, military training, business travel, air cargo services, pilot training, and tourism. As shown in **Table 1.4**, there are six main service levels defined in the NMASP. Double Eagle II Airport is classified as a Regional General Aviation Airport.

Table 1.4
NMASP Airport Service levels

Service Level	Description
Primary Commercial Service Airports	Airports that have scheduled passenger service and more than 10,000 enplanements per year are classified both by the FAA and the NMASP.
Non-Primary Commercial Service Airports	Airports that have scheduled passenger service and 2,500 to 10,000 enplanements per year are classified by the FAA and the NMASP.
Limited Commercial Service Airports	Airports that have scheduled commercial service but enplane less than 2,500 annual enplanements.
Regional General Aviation Airports	Airports that primarily serve general aviation activity, with a focus on business activity including jet and turboprop aircraft. This is measured by more than 300 annual jet /turboprop aircraft operations. These airports support the system of Commercial Service are within a 30-minute drive of more than three percent of the state's population and have more than 33 based aircraft, including at least one jet.
Community General Aviation Airports	Community General Aviation airports serve a supplemental contributing role for the local economy. Community airports focus on providing aviation access for small business, recreational, and personal flying activities throughout New Mexico.
Low Activity General Aviation Airports	These airports provide emergency or remote access, primarily serving recreational and personal flying activities. Low Activity General Aviation airports within the New Mexico Airport System Plan have 10 or less based Aircraft.

Source: NMDOT

Airport Activity

Table 1.5 describes the level of aviation activity and based aircraft at Double Eagle II Airport.

Table 1.5 Airport Activity			
Based Aircraft		**Airport Activity Type**	
Single-engine	127	Commercial Airlines	0%
Multi-engine	9	Air Taxi	1.5%
Jet	1	Military	1.5%
Total Based Aircraft	137	General Aviation-Local	66%
Ultra-Light	4	General Aviation-Itinerant	31%
Helicopters	10	Total	100%

Source: Form 5010

**Operations for 12 Months Ending: 12/31/2014*

1.3 Existing Facilities

Table 1.6 below provides a summary of important primary data for Double Eagle II Airport.

Table 1.6 Existing Conditions	
Airport Name:	Double Eagle II Airport
FAA Designation:	AEG
Associated Town:	Albuquerque, NM
Airport Owner:	City of Albuquerque, NM
Airport Sponsor:	City of Albuquerque, NM
Airport Roles:	FAA NPIAS: General Aviation
	FAA Asset Study: Regional
	New Mexico Airport System Plan: Regional General Aviation Airport
Commercial Air Service:	N/A
Airport Acreage:	4,257
Airport Elevation:	5837.4

Source: Airport Layout Plan (ALP), FAA Airport Master Record (Form 5010), FAA National Plan of Integrated Airport Systems (NPIAS), and FAA General Aviation Asset Study

Runways

Runways are given an identifier number that is determined based on its magnetic compass orientation. Each runway end is named accordingly. For example, Runway 4 has a magnetic heading of 40 degrees. The opposite end of Runway 4 is 22, which has a magnetic heading of 220 degrees. These numbers represent the direction the aircraft in approaching or departing the runway. Runway headings are important so pilots can identify which runway aligns with the prevailing winds. When possible, pilots takeoff and land with the nose of the aircraft facing the wind in order to maximize lift and limit the amount of runway length used for either operation.

As shown in **Figure 1.3**, there are two active runways at Double Eagle II Airport. Important informational about each runway is listed in **Table 1.7**.

Table 1.7
Runway Information

	Primary Runway	Secondary
Orientation (RWY No.'s)	04/22	17/35
Asphalt, Concrete, Turf	Asphalt-Excellent Condition	Asphalt-Excellent Condition
Length and Width	7,398' x 100'	5,993' x 100'
Pavement Strength	Single Wheel (S): 30.0	Single Wheel (S): 30.0
Runway Lighting[1]	MIRL	MIRL
Runway Marking Type	Precision	Non-Precision
Taxiway Type[2]	Full Parallel	Full Parallel
Taxiway Width	40 Feet	35 Feet
PAPI (which end(s))	RWY 4	RWY 17
VASI (which end(s))	-	-
REIL (which end(s))	-	Both
ILS (which end(s))	RWY 22	-
MALSR (which end(s))	RWY 22	-
Approach Type (ILS, LPV, GPS, etc.)	ILS, RNAV	-

Notes: [1] HIRL, MIRL or LIRL for runways, please note if lighting is non-standard
[2] Full parallel, partial parallel, or turnaround
[3] MITL, LITL, or reflectors for taxiways, please note if lighting is non-standard

Taxiways

Taxiways allow access between the runways and landside areas and are named using letters in the phonetic alphabet, for example, Taxiway Alpha (A) or Bravo (B). There are three main types of taxiways: full parallel, partial parallel, and stub or connector taxiways. Each type is named after its relative location to a runway. A full parallel taxiway runs the entire length of a runway from end to end. A stub taxiway runs perpendicular or angular to a runway creating intersections for access from another taxiway. A partial parallel taxiway runs part of the runway length.

As described in **Table 1.8**, there are several taxiways that are part of the existing facilities at Double Eagle II Airport. All the taxiways at AEG have medium intensity lighting. Taxiway A is a full parallel for Runway 4/22. There are five Taxiways (A1-A5) that connect Runway 4/22 with Taxiway A. Access to the main ramp and the south ramp is provided by Taxiway A1 and A3, respectively.

Taxiway B is a full parallel for Runway 17/35 and also provides access to the main ramp. There are three stub Taxiways (B1-B3) that connect Runway 17/35 with Taxiway Bravo. Taxiway B2 turns into Taxiway C after the Bravo intersection. Taxiway C crosses the airfield providing access to both runways.

KSA

Double Eagle II Airport Master Plan

Figure 1.3 Existing Facilities

Table 1.8 Taxiways Evaluation				
Taxiways	Size	Design Strength	Pavement Type	Lighting
A	7,400' x 40'	30S/45D	Asphalt	MITL
A1	1,000 x 40	30S/45D	Asphalt	MITL
A2	335' x 40'	30S/45D	Asphalt	MITL
A3	335' x 40'	30S/45D	Asphalt	MITL
A4	335' x 40'	30S/45D	Asphalt	MITL
A5	335' x 40'	30S/45D	Asphalt	MITL
A6	335' x 40'	30S/45D	Asphalt	MITL
B	7,594' x 35'	30S/45D	Asphalt	MITL
B1	315' x 35'	30S/45D	Asphalt	MITL
B2	315' x 35'	30S/45D	Asphalt	MITL
B3	315' x 35'	30S/45D	Asphalt	MITL
C	3,000' x 35'	30S/45D	Asphalt	MITL

Source: Airport Records, Form 5010

Fixed Base Operator (FBO)

Every airport provides an array of aviation services depending on individual characteristics of their location and operational demand. These services usually have a direct correlation between the surrounding markets and needs of the aviation community. Table 1.9 provides a broad list of Double Eagle II Airport's current services. The majority of these services are provided by Bode Aero and Bode Aviation, Inc., the privately owned FBO at AEG.

Table 1.9 Existing Aviation Services	
Aviation Fuel (100LL, Jet-A, Jet-A1)	Oxygen (High)
Part 145 Aircraft Maintenance and Repair (Major)	Passenger and Pilot Lounge
Aircraft Parking Transient (Hangars, Tie-Downs)	Automated Weather (AWOS)
Charter, Air Ambulance, Aircraft Rentals, Aerial Tours	Flight Instruction (Part 141)
Courtesy Car	On-Airport Rental Cars (Enterprise)

Source: Form 50101, AirNav

Aircraft Parking and Automobile Parking

Double Eagle II Airport has nine t-hangars, four conventional box hangars and one shade hangar for aircraft parking. Automobile parking is located just south of Bode Aviation and provides approximately 85 spaces. Other aircraft and automobile facilities at AEG are presented below in Table 1.10.

Automobile Access

Interstate 40, along the historic Route 66 corridor, provides access to Albuquerque and is located 7 miles south of AEG. Atrisco Vista Boulevard runs north and south connecting AEG with Interstate 40 and the north and south entrances of the airport. Paseo del Volcan is the main airport road connecting Atrisco Vista Boulevard with airside and landside facilities at the north side of the airport. Shooting Range Access Road provides access to Southwest Aeronautics, Mathematics and Science Academy at the south end of the airport.

Table 1.10
Airport Hangars and Parking Facilities

Facility	Approx. Area (sq. ft.)	Units
FBO Conventional Box Hangar	16,670	1
Helicopter Hangar	4,800	1
Helipads	7,500	3 (50’ x 50’)
Auto Parking Lot	37,000	85
T-Hangars	46,360	156
Conventional Box Hangars	52,600	4
Shade Hangar	7,900	1
Tie Downs	115,000	50

Source: Airport Documents, Google Earth

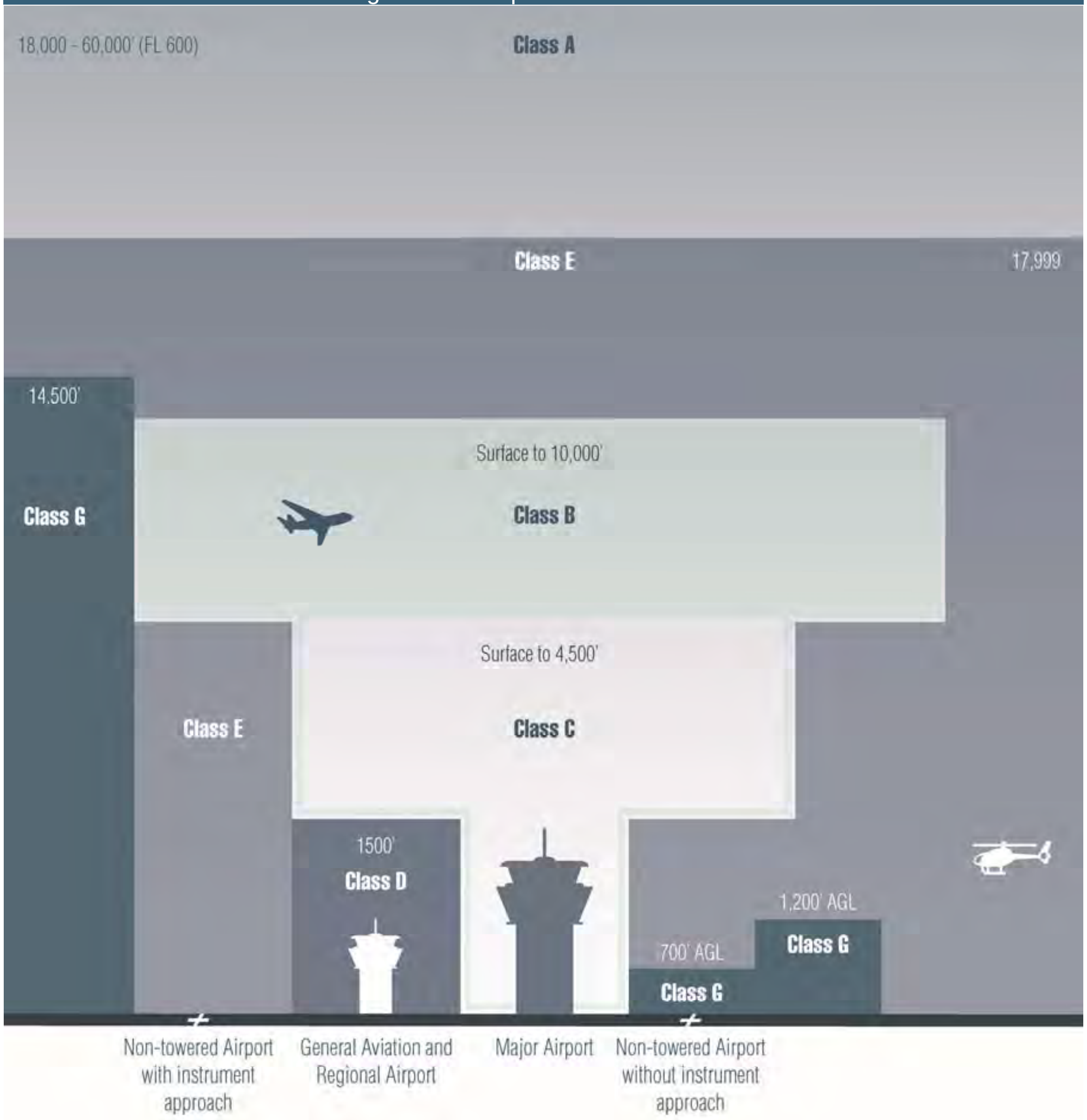
Fuel Facilities

Bode Aviation, Inc. owns two 20,000-gallon storage tanks containing Jet A and two 20,000-gallon storage tanks containing 100LL. They also operate one Av-gas truck containing 1,200 gallons of 100LL and two jet fuel trucks containing 8,000 gallons of jet fuel.

1.4 Airspace and NAVAIDS

Airspace defines the operating environment for the airport. There are two categories of airspace: regulatory and non-regulatory. Within these two categories there are four types: controlled, uncontrolled, special use, and other airspace. Furthermore, classes of such types of airspace are defined for specific airports based on their operating characteristics and location to other facilities. Figure 1.2 shows a profile view of the dimensions of various classes of airspace while Table 1.11 helps define these classes.

Figure 1.2 Airspace Classification



Source: KSA

Double Eagle II Airport is located within Class D airspace as depicted in **Figure 1.3.** Class D airspace is controlled and pilots must establish two-way radio communication with air traffic control prior to entering the airspace. During night operations when the air traffic control tower is closed, entry into class D airspace does not require communication as the airspace is then considered uncontrolled. During this time it is advised that pilots communicate their intentions through the common traffic advisory frequency (CTAF) to maintain separation with other aircraft operating in the same airspace or on the ground at the same airport.

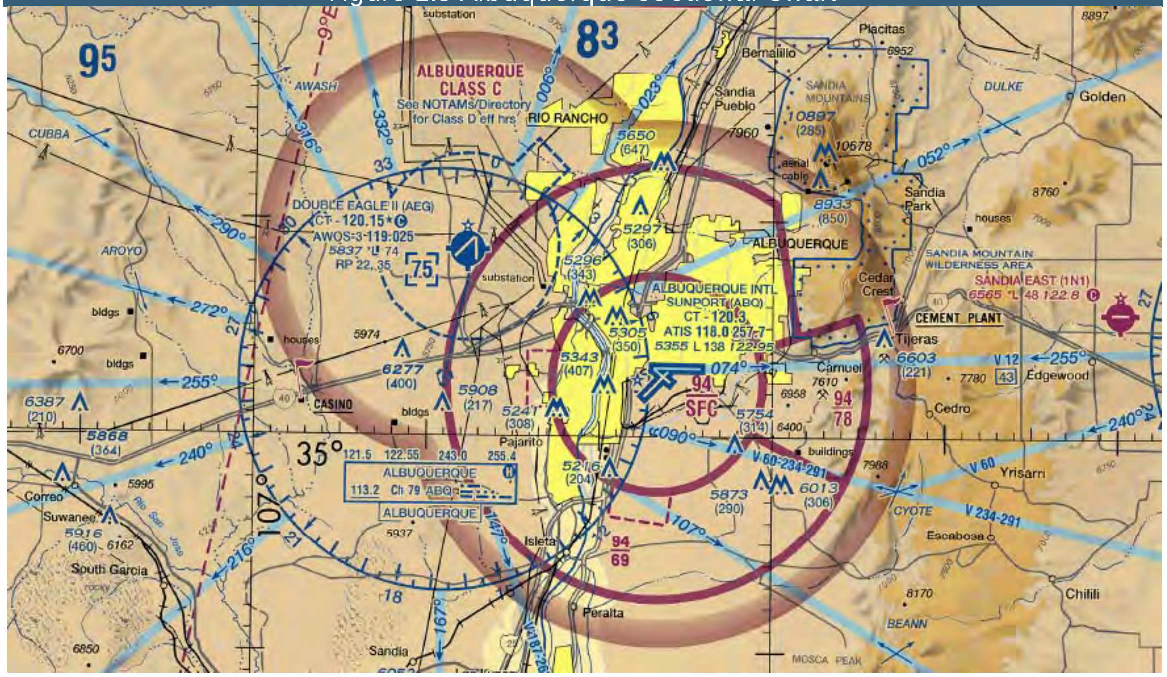
Table 1.11
Airspace Class Definitions

Class	Definition
A	Generally the airspace from 18,000 feet mean sea level (MSL) up to Flight Level 600 (approximately 60,000 feet MSL). Unless otherwise authorized, all operation in Class A airspace is conducted under instrument flight rules (IFR).
B	Generally airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. An ATC clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace.
C	Generally airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower are serviced by a radar approach control and have a certain number of IFR operations or passenger enplanements. Each aircraft must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and, thereafter, maintain those communications while within the airspace.
D	Generally airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower. Unless otherwise authorized, each aircraft must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while in the airspace.
E	If the airspace is not Class A, B, C, or D, and is controlled airspace, then it is Class E airspace. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. Only aircraft operating under IFR are required to be in contact with air traffic control when operating within Class E airspace.
G	Uncontrolled airspace is the portion of the airspace that has not been designated with any of the above classifications. It extends from the surface to the base of the overlying Class E airspace. Although ATC has no authority or responsibility to control air traffic, pilots must still abide by visual flight rules (VFR) minimums in Class G airspace.

Source: FAA

As depicted in **Figure 1.3**, Double Eagle's Class D airspace is indicated by a blue dashed circle on the FAA sectional, and is surrounded by an area of class E controlled airspace with a base of 700 feet above ground level (AGL) which contains all of the instrument approach procedures configured at AEG. The class E airspace surrounding AEG is indicated by a shaded magenta area on the sectional chart. Part of the Albuqerque Class C airspace overlaps the AEG's Class D airspace. The northwestern area of Albuquerque Internationa Sunport's Class C airspace intersects the easter portion of of AEG's Class D airspace from 6,900 to 7,500 feet above sea.

Figure 1.3 Albuquerque Sectional Chart



Source: FAA

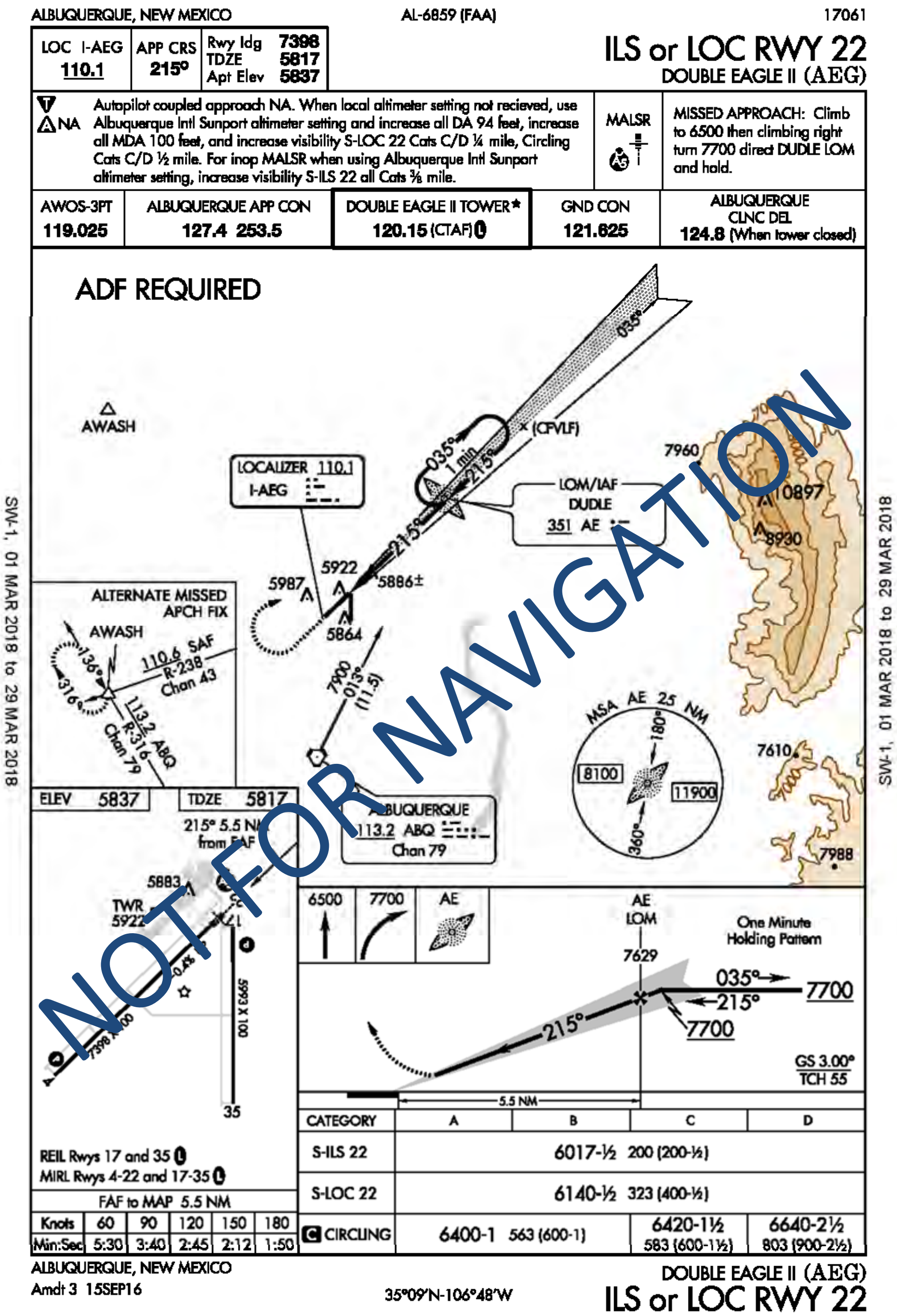
Navigational Aids (NAVAIDS)

A variety of navigational facilities are currently available to pilots around Double Eagle II Airport, whether based at the field or at other locations in the region. Many of these NAVAIDS are available to en route air traffic as well. The NAVAIDS available for use by pilots in the vicinity of AEG include VOR/DME and ILS facilities.

A VOR/DME (VHF Omni-directional Range and Distance Measuring Equipment) is a ground-based electronic navigation aid, transmitting very high frequency signals, 360 degrees in azimuth oriented from magnetic north, with equipment used to measure, in miles, the slant range distance of an aircraft from the navigation aid. This can also be called a VORTAC as most VORs are co-located with a TACAN (military use) that provides the distance measurement. The Albuquerque VOR is located just south AEG's Class D airspace.

An Instrument Landing System (ILS) provides electronic vertical and horizontal guidance to a runway. There are two components of an ILS: the glide slope antenna emitting vertical signals and localizer emitting horizontal signals. At AEG, the glide slope is located near the approach end of Runway 22 and the localizer is located at the end of the runway. Table 1.12 and Figure 1.4 detail the published approach procedures at AEG.

Figure 1.4 AEG Approach Plates



Source: FAA, AirNav

Table 1.12
Approach Procedures

Instrument Approach	Lowest straight-in Minimums		Lowest circling minimums	
	Ceiling	Visibility	Ceiling	Visibility
ILS RWY 22	200'	1/2 mile	600'	1 mile
RNAV (GPS) RWY 22	400'	1/2 mile	600'	1 mile

Part 77 Surfaces

Federal Aviation Regulations (FAR) Part 77, Objects Affecting Navigable Airspace, is a tool used to protect the airspace over/around a given airport and each of its runway approaches from potential obstructions to air navigation. It is important to note that as a federal regulation, all airports included in the National Airspace System (NAS) are subject to the requirements of Part 77. To determine whether an object is an obstruction to air navigation, Part 77 establishes several imaginary airspace surfaces in relation to an airport and each runway end. The dimensions and slopes of these surfaces depend on the configuration and approach categories of each airport's runway system. The size of the imaginary surfaces depends largely upon the type of approach to the runway in question. The principal imaginary surfaces are generally described below and are illustrated in **Figure 1.5**.

<u>Primary Surface</u>: Longitudinally centered on the runway at the same elevation as the nearest point on the runway centerline.

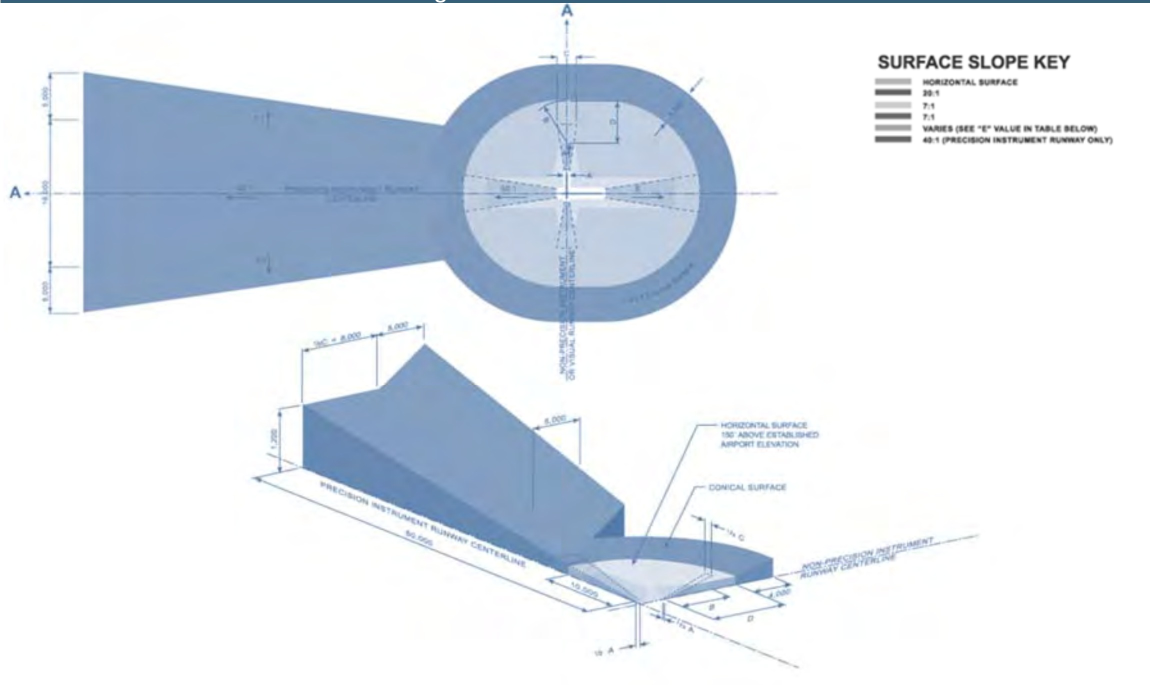
<u>Horizontal Surface</u>: Located 150 feet above the established airport elevation, the perimeter of which is established by swinging arcs of specified radii from the center of each the primary surface end and connected via tangent lines.

<u>Conical Surface</u>: 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.

<u>Approach Surface</u>: Longitudinally centered on the extended centerline, and extending outward and upward from each runway end at a designated slope (e.g. 20:1, 34:1, 40:1, and 50:1) based on the runway approach.

<u>Transitional Surface</u>: Extends outward and upward at a right angle to the runway centerline at a slope of 7:1 up to the horizontal surface.

Figure 1.5 Part 77 Surfaces



Source: FAA, WSDOT Department of Aviation

Known obstructions to the Part 77 surfaces described above will be illustrated on the ALP set being prepared with this master plan. It is important to note, however, that updated obstruction information for the Airport and its surroundings should be collected through an aerial photogrammetric/survey effort prior to any physical changes to the runway or modifications to approaches serving either runway end.

Air Traffic Control Tower

As part of the FAA's Contract Tower Program, the Air Traffic Control Tower (ATCT) opened in 2008 to increase the safety and efficiency of operations at AEG. At AEG, the variety of airport activity and aircraft types operating in the close confines of an airport environment creates a hazard for collision in the air or on the ground. Air traffic control plays a vital role in separating these aircraft and mitigating the risk for such safety hazards. Due to FAA budget cuts for the Contract Tower Program, funding ability has been threatened for hundreds of air traffic control towers, including AEG. It is important to note the future of air traffic control services at AEG is not certain when undergoing planning initiatives.

Chapter Two: Forecast

Chapter 2 - Forecast of Aviation Activity

Projecting future aviation demand is a critical element in the overall master planning process since many of the ultimate proposals and recommendations of the master plan are principally based on aviation activity demand forecasts. The forecasts of aviation activity developed in this chapter will be used in subsequent tasks to analyze Double Eagle II Airport's (AEG) ability to accommodate future activity and to determine the type, size, and timing of future airside and landside developments. This aspect of the master planning process, in essence, acts as the hub for the remainder of the plan. In many cases, the decision to proceed with projects is based on the anticipated levels of demand, including numbers as well as types of aircraft activity.

This chapter discusses the findings and methodologies used to project aviation demand at AEG for the next 20 years. Forecasting should consider the most accurate information available at the time the projections are completed, but it is not an exact discipline. It must be recognized that there are always likely to be some divergences of an airport's activity from a prepared forecast due to any number of factors that simply cannot be anticipated. However, when soundly established, the forecasts developed in a master plan will provide a sound, defensible and defined rationale to guide the analysis of future airport development needs and alternatives.

While the amount and type of aviation activity occurring at an airport are dependent upon many factors, they also usually reflect the services available to aircraft operators, the businesses located on the airport or within the host community, and the prevailing general economic conditions within the surrounding area. The AEG forecast analysis includes methodologies that considered historical aviation trends at the Airport, the surrounding region, and throughout the nation. Projections of aviation activity for AEG were prepared for the near-term (2020), intermediate-term (2025), and long-term (2035) timeframes. Specifically, the aviation demand forecasts developed for AEG in this study are documented in the following sections:

- Overview of the Airport Market Area
- National Aviation Trends
- Regional Trends
- Historical and Existing Aviation Activity
- Projections of Aviation Activity
- Critical Aircraft
- Summary

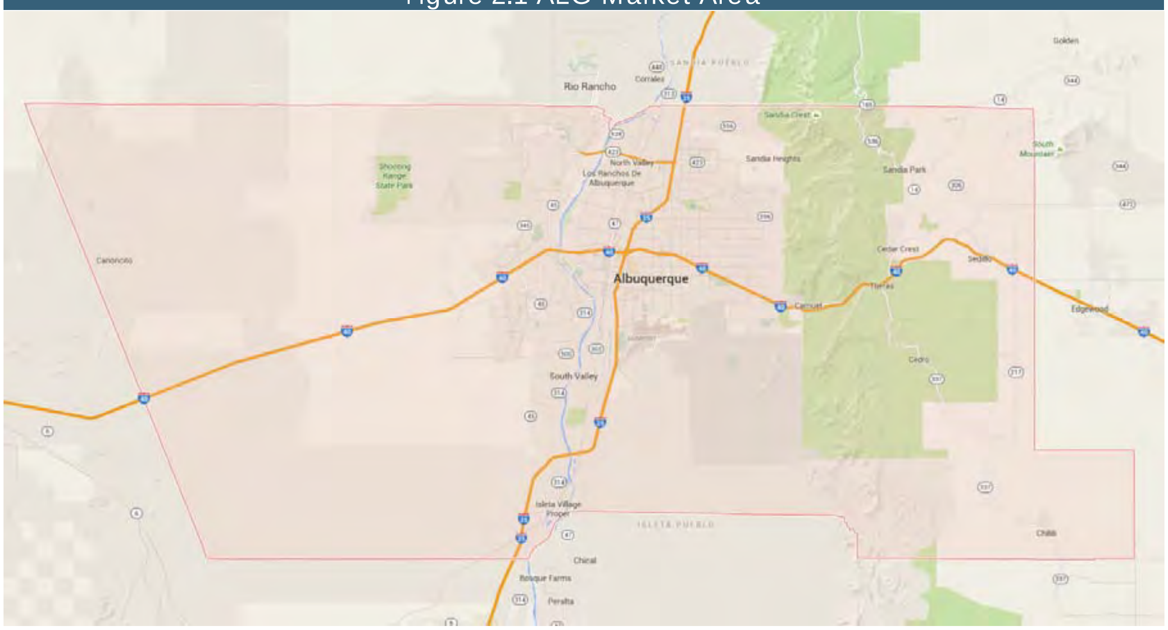
2.1 Overview Airport Market Area

There is a strong correlation between a region's demographic and economic factors and aviation demand within that region. This section will define the AEG market area and the factors that often impact the projections of aviation activity.

Definition of the AEG Airport Market Area

An airport market area is defined as the actual geographic region served by a particular airport. For AEG, the airport market area has been identified as Bernalillo County, New Mexico. Bernalillo County is the most populous county in New Mexico. The city of Albuquerque and Albuquerque International Sunport (ABQ) at its center, the county has a major U.S. city within its borders, but it also contains suburban and rural areas. The population for the market area is just over 675,000.

Figure 2.1 AEG Market Area



Source: Google Earth

Paseo Del Volcan Freeway (Proposed)

There has been interest in adding additional tourism destinations such as Casinos in the market area. The State of New Mexico has granted a future Casino license on I-40 approximately five miles west of the future alignment of the Paseo Del Volcan freeway. It is anticipated that this establishment may be opened by 2021 and may create additional market area demand. Additionally, there has been discussion in the region about aeronautical needs to the north of Double Eagle II in Sandoval County and Rio Rancho. During the master plan process, input was received that rather than try to add additional aviation facilities to serve this market, the PDV alignment may provide easier transportation access to AEG and thus enhance the market from Rio Rancho. With a population of nearly 100,000, Rio Rancho is the third-largest and also one of the fastest expanding cities in New Mexico providing a substantial increase in market area that would allow for a more regional approach to using AEG for corporate and general aviation activity. PDV freeway is planned to extend south of I-40 and connect to I-25 close to Los Lunas, which may allow even greater accessibility to multiple counties. Implementation of this corridor is project to occur beyond the 2040 horizon of the Metropolitan Transportation Plan. This is an important future development that will impact demand and accommodate economic development and improvements to the Aerospace Technology Park.

Figure 2.2 Paseo del Volcan Alignment

Source: NMDOT

2.2 National Aviation Trends

In preparing a forecast for AEG, it is important to have a general understanding of recent and anticipated trends in the overall aviation industry. National trends can provide important insights that can be leveraged for the development of aviation activity projections for an airport. Various data sources were utilized and examined to identify these trends. The sources utilized in this effort included the following:

- Federal Aviation Administration (FAA), FAA Aerospace Forecasts, 2015-2035
- General Aviation Manufacturers Association (GAMA), 2014 General Aviation Statistical Databook & 2015 Industry Outlook
- National Business Aircraft Association (NBAA), Aviation Fact Book, 2015
- Honeywell, Global Business Aviation Outlook, 2015

General Aviation (GA) Trends

At the national level, fluctuating trends related to general aviation usage and economic uncertainty resulting from the nation's and international business cycles all have significant impacts on general aviation demand levels. This section provides an overview of those general aviation trends, as well as some of the various factors that have influenced those trends in the U.S. and New Mexico. These are important considerations in the development of projections of aviation demand for AEG.

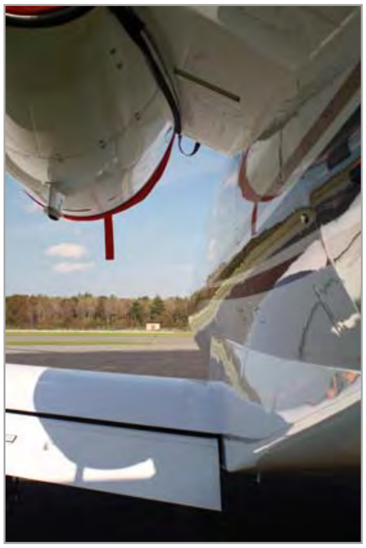
General aviation aircraft are classified as all aircraft not flown by commercial airlines or the military. This includes an incredibly diverse array of flying that ranges from a personal vacation trip in a small single engine plane to an overnight package delivery to an emergency medical evacuation to a morning sightseeing flight to flight instruction that trains new pilots to helicopter traffic reports that keep drivers informed of rush-hour delays. Simply stated, general aviation encapsulates all of those individual unscheduled aviation activities that enrich, enhance, preserve, and protect our lives.

As defined by the FAA, general aviation activities are divided into six use categories:

- Personal - About a third of all private flying in the United States is for personal reasons, which may include practicing flight skills, personal or family travel, personal enjoyment, or personal business.
- Instructional - All private flight instruction for purposes ranging from private pilot to airline pilot is conducted through general aviation.
- Corporate - About 12 percent of the total private flying in the U.S. is done in aircraft owned by a business and piloted by a professional. The majority of these flights are in jets and cover long distances, with some flying to intercontinental and international destinations. Businesses elect to fly these trips to save time and expand their geographic and operational networks.
- Business - About 11 percent of the total private flying in the U.S. is done by business persons flying themselves to meetings or other events, primarily in piston or turboprop aircraft. Most of the pilots own or work for relatively small businesses and use the aircraft to accomplish missions that would otherwise take more time or would be infeasible.
- Air Taxi - When scheduled air service either is not available or inconvenient, businesses and individuals use charter aircraft from air taxis service providers. These flights save time and make it possible to fly directly to places that cannot be reached by scheduled service. (Note that "air taxi" is also utilized as a commercial air service classification.)
- Other - All other activities are classified as being "other." Given the diverse nature general aviation, this includes disaster relief, search and rescue, police operations, news reporting, border patrol, forest firefighting, aerial photography and surveying, crop dusting, and tourism activities, among many others.

Business Use of General Aviation

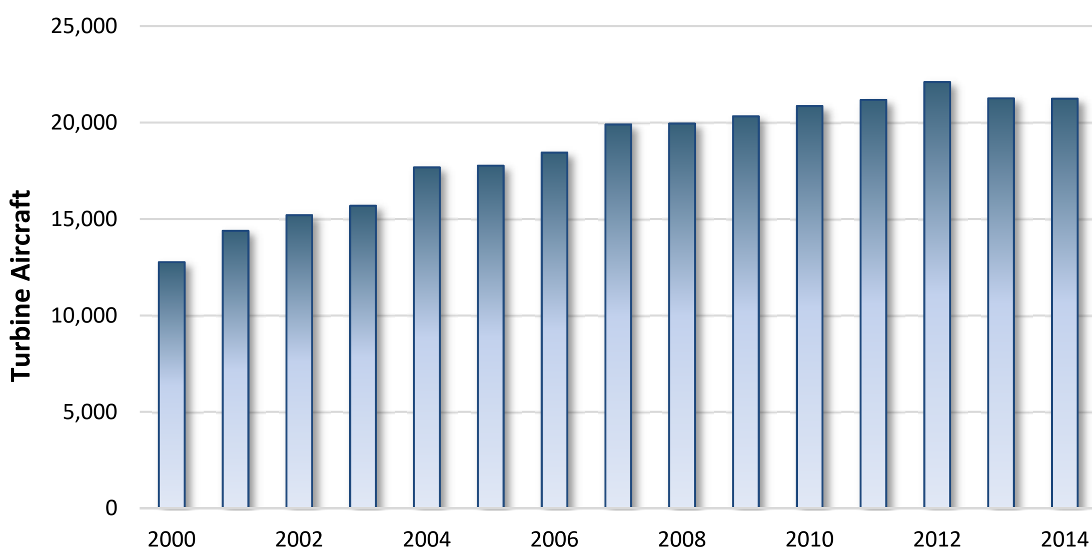
Business and corporate aviation are the fastest growing facets of general aviation. Companies and individuals use aircraft as a tool to improve the efficiency and productivity of their business and personnel. Use of general aviation aircraft afford businesses direct control of their travel itineraries, destinations and significantly reduce travel times and inconveniences often associated with scheduled airline service.



Corporate general aviation is not the exclusive concern of Fortune 500 companies. In fact, according to the NBAA's Business Aviation Fact Book 2015, only 3 percent of the approximately 15,000 business aircraft registered in the U.S. are flown by these companies. The remaining 97 percent are actually operated by a broad cross-section of organizations, including government, universities, charitable organizations and businesses of all sizes. The vast majority of the U.S. companies that utilize business aircraft (85 percent) are small and mid-size businesses, many of which are based in the dozens of communities across the country where the airlines have reduced or eliminated service. The benefits of corporate general aviation are evidenced by the significant growth that business/corporate general aviation has recently experienced.

Business use of general aviation aircraft ranges from small, single-engine aircraft rentals to multiple aircraft corporate fleets supported by dedicated flight crews and mechanics. Business aircraft usage by smaller companies has also escalated dramatically as various chartering, leasing, fractional ownership, interchange agreements, partnerships, and management contracts have emerged. FAA statistics depicted in **Figure 2.2** show the growth in the number of general aviation turbine aircraft used predominantly for business use.

Figure 2.3 General Aviation Turbine Aircraft Growth 2000 - 2014



Source: FAA

Of note is the immense popularity of fractional ownership operations, which began in 1986 with the creation of a program that offered aircraft owners increased flexibility in the ownership and operation of aircraft. The program uses current aircraft acquisition concepts, including shared or joint aircraft ownership, and provides for the management of the aircraft by an aircraft management company. The aircraft owners participating in the program agree not only to share their own aircraft with others having a shared interest in that aircraft, but also to lease their aircraft to other owners in the program. The aircraft owners use a common management company to provide aviation management services including maintenance of the aircraft, pilot training and assignment, and leasing management of the aircraft.

Even in an unsteady economy, fractional operators say business has continued to improve as existing customers re-enter the market or increase their fractional aircraft usage. In addition, they say an increasing number of new prospects are making the move to fractional ownership as an alternative to flying commercially or owning a business jet outright. In the U.S., fractional-share ownership makes up 15% of business-aviation flights.

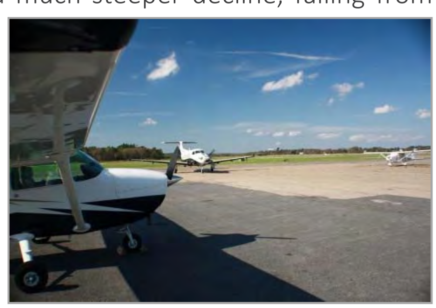
Growing segments of the business aircraft fleet mix include business liners and very light jets (VLJ). Business liners are large business jets, such as the Boeing Business Jet and Airbus ACJ, which are reconfigured versions of passenger aircraft flown by large commercial airlines. Labeled as "personal jets," VLJs are small, six-seat jets costing substantially less than typical business jet aircraft. Popular aircraft models in this category include the Eclipse 500 and 550, Embraer Phenom 100 and 300, Cessna Mustang and HondaJet.

Eclipse 550 Very Light Jet (VLJ)

Anticipated General Aviation Trends

Examples of measures of national general aviation activity that are monitored and forecasted by the FAA on an annual basis in the *FAA Aerospace Forecasts* include active aircraft fleet and active hours flown.

Single and multi-engine piston aircraft experienced a decline in the number of aircraft between 2000 and 2014. Although still the largest portion of aircraft in the active fleet, the number of single engine aircraft fell from 149,000 in 2000 to 123,000 in 2014, a 1.2 percent average annual decline. During that same period, multi-engine piston aircraft had a much steeper decline, falling from 21,000 aircraft to 13,200, a 2.4 percent annual decrease. In total, active piston aircraft decreased at 1.4 percent annually over the last fourteen years. In its annual aviation forecast, the FAA indicates that it expects the number of active piston general aviation aircraft to continue to decline, but by a lower rate than in the past decade. Over the next decade, the decrease in the number of piston aircraft is



expected to be 0.7 percent per year and 0.6 percent over the next two decades. The result of these predictions show total piston aircraft (combined single and multi-engine) falling from 136,700 in 2014 to 121,000 in 2035.

Cessna Citation X Jet

As indicated above, turboprop and jet aircraft experienced substantial growth between 2000 and 2014, increasing from approximately 13,000 to over 21,000 aircraft, a 3.0 percent average annual increase over that period. Between 2003 and 2004, heavily influenced by economic recession and pressures on companies to reduce controllable costs, the overall production of jet aircraft declined slightly. Since that time, however, the numbers of jet aircraft have reassumed their growth pattern with minor declines in the recent years. One of the most important trends identified by the FAA in their forecasts is the growth anticipated in active general aviation jet aircraft. The active general aviation turboprop and jet aircraft fleet is anticipated to continue to increase dramatically over the projection period, to over 24,000 aircraft in 2024, with jet aircraft almost doubling in numbers by 2035.

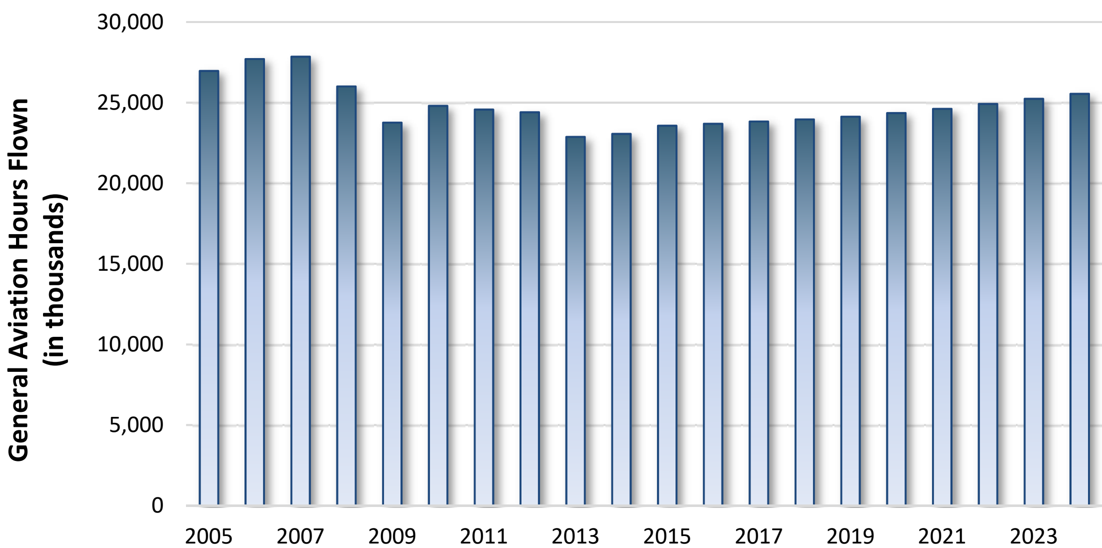
As a whole, business aviation is expected to grow faster than private or recreational aviation, driven by a growing U.S. and world economy, and as discussed above, turboprops and jets will fare better than piston aircraft, with continuing growth of about 2 percent per year. Even with the anticipated decline of piston aircraft during the 20-year planning period, growth in jet aircraft is expected to more than make up for the decline, resulting in a gain of total general aviation aircraft of 0.4 percent per year. This trend illustrates a movement in the general aviation community toward higher-performing, more demanding aircraft.

The FAA has also established a relatively new category of aircraft, light sport aircraft. These aircraft are very small aircraft (usually holding only one or two people). With over 2,200 aircraft currently flying, the FAA predicts this category to grow 4.3 percent per year to 5,360 aircraft by the end of the planning period.

Remos GX Light Sport Aircraft

The FAA also tracks and projects a valuable metric known as active general aviation and air taxi hours flown. This metric captures a number of activity-related data including aircraft utilization, frequency of use, and duration of use. Hours flown in general aviation piston aircraft experienced a significant decrease of 3.4 percent annually, from 2000 to 2014. However, hours flown within this category are expected to improve over the 20-year planning period with an annual decrease rate of 0.5 percent. For turboprop and jet aircraft, hours flown are expected to continue to grow at a relative high rate of 2.9 percent per year from 2014 to 2035. Figure 2.3 depicts general aviation hours flown from 2005 through 2014 as well as projected hours flown through 2024. As shown by the graph, hours flown during the period from 2007 to 2009 experienced dramatic decline spurred by the economic recession, impacting piston aircraft owners the most. The FAA predicts annual growth of hours flown over the 20-year period will be 1.4 percent. Compared to the projected 0.4 percent average annual growth rate of the general aviation aircraft, the difference from hours flown represents anticipated increases in utilization. Total hours flown by general aviation aircraft are estimated to reach 30.6 million by 2035, compared to 23 million in 2014.

Figure 2.4 Historical/Projected General Aviation and Air Taxi Hours Flown



Source: FAA Aerospace Forecasts 2015 - 2035

2.3 Regional Trends

As noted previously, not all national trends are experienced on a regional level. Therefore, additional data was collected and reviewed to illustrate the potential growth areas in aviation demand for AEG. This focused heavily on socioeconomic development potential in and surrounding the AEG airport market area.

Aviation activity has traditionally been linked to various demographic and socioeconomic factors, such as population, employment and earnings. The link is related to the discretionary nature of personal and business travel as well as the recreational component of general aviation activity. The data presented below was taken from the 2014 Complete Economic and Demographic Data Source prepared by Woods and Poole Economics, Inc. In most cases, the Woods and Poole data provides a conservative estimate of growth. Additional data sources included the U.S. Census Bureau and the U.S. Bureau of Economic Analysis (BEA). This analysis examined the historical trends and future projections of the area's population, employment, and earnings.

Population

Table 2.1 summarizes population growth trends experienced between 1990 and 2014 for Bernalillo County. Trends impacting cities and towns within the region may impact Double Eagle II Airport. These trends are compared to population trends in New Mexico and the United States.

Table 2.1
Local, State and National Population

Area	1990	2000	2014	AAGR
Bernalillo County, NM	482,700	557,600	675,600	1.4%
State of New Mexico	1,521,500	1,821,200	2,085,600	1.3%
United States	249,623,000	282,162,000	318,857,000	1.0%

Source: Woods & Pool Economics, Inc.
AAGR = Average Annual Growth Rate

Employment and Personal Income

There are a number of socioeconomic factors that impact, to varying degrees, the demand for general aviation in any particular region. In addition to population trends, regional economic trends can also significantly impact aviation demand.

Per capita personal income reflects the average wages and salaries of workers within a defined geographic area as well as other sources of income. This is reflective of how positive the business climate is in a region. The growth in employment and personal income relates to aviation activity in that corporate and private use of general aviation services is sometimes discretionary in nature. As with other demographic indicators, current employment and per capita personal income for Bernalillo County was compiled from the Woods and Poole data and presented below in Table 2.2.

Table 2.2
Employment and Per Capita Personal Income

Year	Bernalillo County Employment	Bernalillo County Per Capita Personal Income
1990	310,750	26,280
2000	390,490	33,360
2015E	443,760	40,870
Bernalillo County AAGR	1.4%	3.4%
New Mexico AAGR	1.6%	3.9%
United States AAGR	0.7%	3.6%

Source: Woods & Pool Economics, Inc.
2015E – Estimated, AAGR = Average Annual Growth Rate, Personal Income reflected in current year $

For both employment and personal income, the socioeconomic indicators for Bernalillo County show slightly lower annual growth than that of the overall state, but show mixed results when compared to national growth rates.

Projections of population, employment, and per capita personal income for the market area were identified and compiled. Table 2.3 summarizes the projections of population, employment, and personal income. The data indicate continued growth in these three key indicators.

Table 2.3
Market Area Demographic and Socioeconomic Projections

Year	Population	Employment	Per Capita Person Income
2015E	711,460	443,760	40,870
Projected			
2020	764,600	483,620	50,352
2025	819,610	526,230	64,544
2035	932,640	621,630	113,214
AAGR	1.4%	1.7%	5.2%

Source: Woods & Pool Economics, Inc.
2015E – Estimated, AAGR = Average Annual Growth Rate, Personal Income reflected in current/estimated year $

Note that the projected employment and personal income growth rates are higher than historical trends, reflecting an important gain in regional demographic growth over the projection period. The projected growth in population is expected to be near historical levels. All categories show positive average annual growth rates, indicating the potential for growth in aviation activity.

Albuquerque International Sunport Master Plan

An important consideration in the development of this forecast is the on-going development of the airport master plan for the Albuquerque International Sunport (ABQ). ABQ is the primary commercial service airport in the region and is classified as a medium hub airport in the FAA's National Plan of Integrated Airport Systems (NPIAS). In 2014, the Sunport accommodated almost 2.5 million enplaned passengers. In prior years, however, the Airport had well over 3 million annual enplaned passengers. A large portion of the forecast prepared for the ABQ master plan focuses on commercial service passenger activity. And even though ABQ can accommodate general aviation activity, its primary role is to serve commercial airlines and their passengers.

Over the past eight years, ABQ has seen a reduction of over 100 based aircraft. In 2014, with 165 based aircraft, ABQ accounted for 27.3 percent of the registered aircraft in the county. The philosophy behind the general aviation forecast for ABQ is to maintain its current market share of based aircraft, meaning that when there is growth in the number of aircraft in the region, ABQ will accommodate some of them.

There are currently 19 business jets based at the Sunport which are forecast to increase to 36 by 2035. Turboprops are forecast to increase from 30 currently to 41 by 2035. Helicopters based at the Sunport are forecast to grow from seven currently to 18 by the long term. Single and multi-engine piston aircraft are forecast to increase slightly over the 20-year forecast period.

The Sunport is well-positioned to accommodate business jets in the future; nevertheless, smaller piston-powered aircraft will continue to have a presence at the Sunport. AEG's location, convenient access, room for growth and a priority to accommodate general aviation are all factors that may lead users to AEG. With the Sunport's emphasis on commercial passenger service, AEG should take advantage of opportunities that increase based aircraft and operations.

2.4 Historical and Existing Aviation Activity

Historical aircraft and operations data for AEG provides the baseline from which future activity at the Airport can be projected. While historical trends are not always reflective of future periods, historical data can provide insight into how local, regional, and national demographic and aviation-related trends may be tied to a given airport. The following sections include historical overviews of AEG's aircraft operations (generally defined as either an aircraft landing or departure – hence a takeoff and a landing would count as two operations) and based aircraft (generally defined as an aircraft that is permanently stored at an airport).

Based Aircraft

As shown in **Table 2.4**, based aircraft data is from the FAA Terminal Area Forecast (TAF). Note the decline of based aircraft shown in 2008 is suspected to be the result of more stringent FAA reporting requirements that were enacted for this dataset at the time. This master plan is attempting to update the airport records with the FAA 5010 Airport Master Record to more accurately reflect current based aircraft at the airport. It is estimated, with coordination with airport staff, FBO, and basedaircraft.com, that the current based aircraft is approximately 196.

Table 2.4
AEG Based Aircraft

Year	Aircraft	Year	Aircraft
2004	228	2010	134
2005	252	2011	134
2006	254	2012	125
2007	254	2013	125
2008	135	2014	125
2009	138	*2015**	*196**

Source: FAA Terminal Area Forecast, January 2016
**TAF has be determined to be low based on data collected from the airport during this plan. A higher baseline will be used in the forecast.*

Aircraft Operations

Annual aircraft operations represent the number of aircraft takeoffs and landings occurring at an airport during a calendar year. The historical operations data includes operations conducted by both based aircraft as well as operations conducted by itinerant aircraft, which are those based at other airports that arrive at AEG for a variety of reasons, including business, recreation, or flight training purposes. Historical aircraft operations data for AEG are summarized below in Table 2.5.

Aircraft operations are organized into two categories: itinerant operations and local operations. The FAA defines a local operation as any operation performed by an aircraft operating in the local traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.

Table 2.5
AEG Aircraft Operations

	Itinerant			Local		
Year	Commuter & Air Taxi	GA	Military	Civil	Military	Total
2004	0	39,561	1,825	6,112	0	47,498
2005	0	40,255	1,825	87,624	0	129,704
2006	0	40,872	18,25	88,967	0	131,664
2007	0	41,498	1,825	90,331	0	133,654
2008	2,000	41,217	1,966	86,214	0	131,397
2009	1,819	24,519	695	35,542	480	63,055
2010	2,255	27,168	1,194	38,070	909	69,596
2011	2,229	27,705	1,366	37,881	755	69,937
2012	1,983	26,314	1,889	35,860	1,854	67,901
2013	1,334	25,037	1,477	35,088	2,306	65,242
2014	609	25,384	1,096	38,257	1,817	67,163
2015	778	23,602	968	40,362	1,759	67,469

Source: FAA Terminal Area Forecast, January 2016

Perhaps the most notable aspect in the data above is that operations reported in 2009 dropped by about 50 percent when compared to 2008. The aircraft control tower at AEG opened in 2008. Part of the air traffic control responsibilities at AEG is to record and report operations when the tower is open. The records from the tower may present a more realistic tally of operations than in previous years. Data from the FAA's Air Traffic Activity System (ATADS) and actual operational counts taken on-site by Patriot Technologies confirms that the recent data (2009 – 2015) presented in the table above is valid.

2.5 Projections of Aviation Activity

Projections of aviation activity are generated by employing historical data and incorporating assumptions, conditions, and trends. In truth, forecasting of any type is as much an art as science, and no matter how sophisticated, represents an "educated guess" of a particular point in time. Therefore, forecasts must be updated periodically and revised as necessary to reflect new conditions and developments.

During a master planning effort, aviation activity forecasts are typically established by using a wide variety of assumptions that result in a wide range of outcomes. This is intentionally done in order to provide a broad view of future airport utilization potentials. Once that broad view has been established, then a careful examination of those assumptions is undertaken to determine which could be reasonably applied given that particular airport's current situation.

For AEG, existing forecasts and different types of forecast methodologies were considered the key master plan forecast metrics for assessment. These forecasts and methodologies included the following:

1. FAA Terminal Area Forecast (2016)
2. AEG Airport Master Plan Forecast (2002)
3. New Mexico Airport System Plan Forecasts (2014)
4. FAA Aerospace Forecast (2015-2035)
    a. Active General Aviation and Air Taxi Aircraft
    b. Active General Aviation and Air Taxi Hours Flown
    c. Active General Aviation Pilots
5. Airport Market Area Demographic and Socioeconomic Projections
    a. Population Growth
    b. Employment Growth
    c. Per Capita Personal Income Growth
6. Operations Per Based Aircraft (OPBA)

The projected growth rates associated with these forecasts and metrics will be applied to the 2015 level of based aircraft and operations at AEG to produce a range of estimated levels of activity for the 20-year planning period.

Based Aircraft Projections

Based aircraft are defined as those aircraft that are permanently stored at an airport. Estimating the number and types of aircraft expected to be based at AEG over the 20-year study period will impact the planning for its future facility and infrastructure requirements. Generally speaking, as the number of aircraft based at an airport increases, so too does the aircraft storage required at the facility.

During the master plan, stakeholder input identified that the current published based aircraft number for the airport was low. With additional data collection and assistance from airport staff, the baseline projections for AEG were established using data collected from the airport and FBO to and applied to forecasts and methodologies discussed above as primary growth rate drivers. Two contributing factors driving the projected growth of based aircraft is the anticipated addition of a flight school on the field. It is expected that an operation similar to US Aviation would begin large scale flight training operations at Double Eagle. This would significantly increase the number of based aircraft on the field. US Aviation currently operates approximately 67 single engine, 20 multi-engine, and 3 helicopters at their Denton, Texas training location. Double Eagle II Airport has also seen a rise in helicopter training, from both military user and the Albuquerque Police Department. The APD is considering additions to their current fleet which could also result in an increase to the current based aircraft numbers. Correlating the predicted growth of these methods and forecast approaches, the resulting low, mid, and high-growth forecasts of total based aircraft at AEG can be developed. Table 2.6 and Figure 2.4 summarize the results of the three based aircraft projection range scenarios created through this analysis.

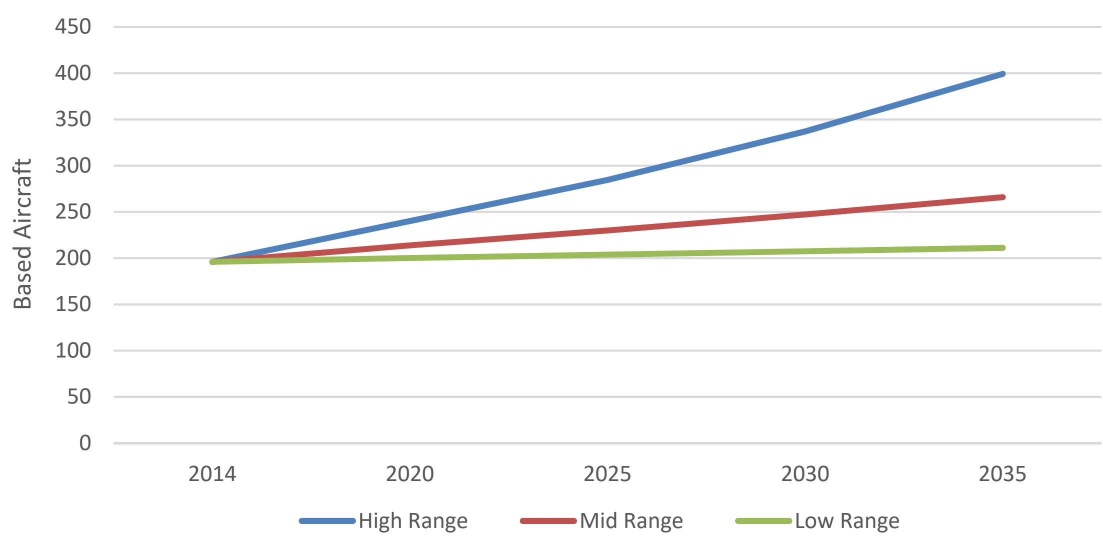
Table 2.6
Based Aircraft Projections

Year	Low	Mid	High
2015	196	196	196
Projected			
2020	200	214	240
2025	204	230	285
2030	207	247	337
2035	211	266	399
AAGR	0.4%	1.5%	3.4%

Source: KSA
AAGR = Average Annual Growth Rate

Note: This is significantly different than the TAF indicates. Projections for operations activity at airports are sometimes estimated from the number of based aircraft. This report has been updated to reference the current verified based aircraft count approved by FAA. The TAF will be updated in the next cycle to reflect this change as well.

Figure 2.5 Based Aircraft Projections Comparison



Source: KSA

As shown, the three projection methodologies resulted in based aircraft forecasts ranging from 245 to 462 total based aircraft for the out-year of the planning period, 2035. Based aircraft growth rates represented by these forecasts ranged from an AAGR of 0.4 percent to 3.4 percent. While other scenarios predicting the future number of based aircraft could have been presented in this exercise, the range of the growth rates shown above represent the most realistic growth patterns considering the Airport's history and predicted regional, state and national growth estimates. A summary of each methodology is provided below.

- Low Growth – This range is representative of the growth estimated in the FAA's projections for active general aviation aircraft and pilots.

- Mid Growth – Many of the methodologies and activity drivers analyzed in this forecast fall within this growth range. Represented by population and employment growth projections for the region as well as FAA estimates for general aviation hours flown, TAF, and the NM Airport System Plan, all measures in this group range from 1.4 to 1.9 percent average annual growth.

- High Growth – This range is a carry-over from the 2002 AEG Airport Master Plan which considered significant growth in based aircraft as driven by the prospect of a large, active flight school or aircraft maintenance/manufacturing operation at AEG. This growth rate is also consistent with historical trends in market area per capita personal income.

Since many of the demographic, socioeconomic, and forecasting methodologies studied in this analysis fall within the **mid growth range**, it is recommended that facility requirements be established using this growth rate.

Based Aircraft Fleet Mix

Through use of the mid growth based aircraft projection, the total based aircraft for AEG over the planning period were allocated to five distinct aircraft categories – single- engine, multi-engine, jet, helicopter, and ultralight aircraft. The fleet mix projections were developed based on the fleet mix percentages exhibited at the Airport in 2015 with consideration given to aircraft ownership trends throughout the region and nation. The existing based aircraft fleet mix at AEG is summarized as follows:

- Single engine piston aircraft – 88 percent of total based aircraft
- Multi-engine piston aircraft – 5 percent of total based aircraft
- Jet aircraft – 0.5 percent of total based aircraft
- Helicopter aircraft – 4.5 percent of total based aircraft
- Ultralights – 2 percent of total based aircraft

The preferred based aircraft fleet mix projections are presented in Table 2.7. With expected growth in jet aircraft throughout the country, it is reasonable to expect a greater share of based jet aircraft at AEG in future years. Local trends also indicate additional rotorcraft growth at the airport. As such, jet and rotorcraft gained shares of the forecast while the share of single-engine aircraft was reduced slightly. Ultralight aircraft are expected to remain constant.

Table 2.7
Based Aircraft Fleet Mix

Year	Single Engine	Multi-engine	Jet	Helicopter	Ultralight	Total
2015	172	10	1	9	4	196
2020	188	11	1	10	4	214
2025	202	12	1	10	5	230
2030	217	12	2	11	5	247
2035	234	13	2	12	5	266

Source: KSA

Aircraft Operations Projections

Annual operations represent the number of aircraft takeoffs and landings occurring at an airport during a calendar year. Historic operations data for AEG includes operations conducted by based aircraft as well as those conducted by itinerant aircraft stored at other airports arriving at AEG for a variety of reasons including maintenance, business, recreation, or flight training purposes. Over the past 7 years, a small share have operations have been in the commuter and air taxi category, representing non-scheduled charter service. This type of activity is expected to continue to represent a small share of operations.

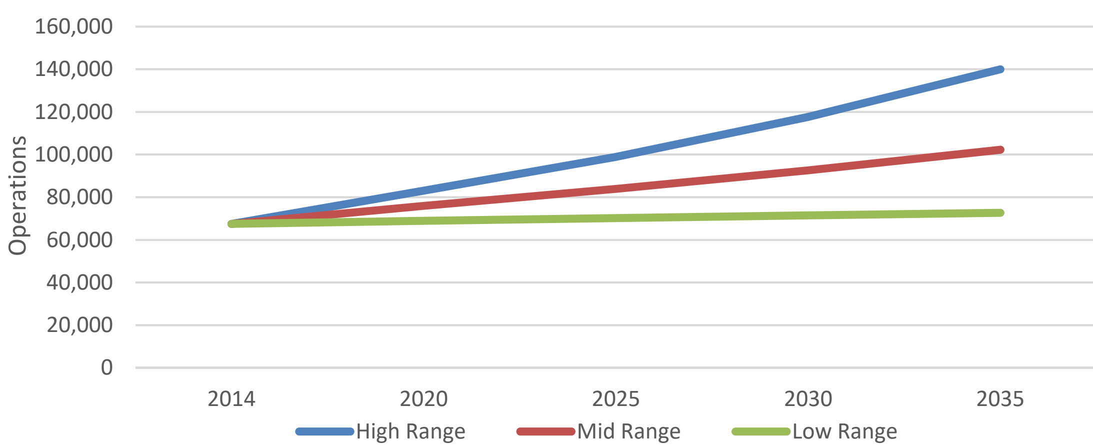
Many different factors can influence the number of aircraft operations at an airport, including, but not limited to, total based aircraft, area demographics, activity and policies at neighboring airports, and national aviation trends. These factors are considered in the application of three methodologies used to develop projections of future aircraft operations at AEG through the planning period. The results of the different aircraft operations projection scenarios examined in this analysis are presented in **Table 2.8** and compared to one another in **Figure 2.5**.

Table 2.8
Aircraft Operations Projections

Year	Low	Mid	High
2015	67,469	67,469	67,469
Projected			
2020	68,922	75,981	83,113
2025	70,157	83,889	98,888
2030	71,414	92,620	117,656
2035	72,694	102,260	139,986
AAGR	0.4%	2.0%	3.5%

Source: KSA, AAGR = Average Annual Growth Rate

Figure 2.6 Aircraft Projections Comparison



Source: KSA

As shown, the three projection methodologies resulted in operations forecasts ranging from about 72,000 to 140,000 aircraft operations by the end of the 20-year planning period. Growth rates represented by these forecasts ranged from an AAGR of 0.4 percent to 3.5 percent. While other scenarios predicting operations could have been presented, the range of the growth rates shown above represent the most realistic growth patterns considering the Airport's history and predicted regional, state and national growth estimates. Similar to based aircraft projections, a summary of each methodology for operations has been provided.

- Low Growth – This range is representative of the growth estimated in the FAA's projections for active general aviation aircraft and pilots as well as the TAF.

- Mid Growth – Several methodologies and activity drivers analyzed in this forecast fall within this growth range. Represented by population and employment growth projections for the region as well as FAA estimates for general aviation hours flown, OPBA (currently 553 operations per based aircraft), and the NM Airport System Plan, all measures in this group range from 1.4 to 1.7 percent average annual growth This growth scenario was increased to 2.0 percent to account for projected area per capita personal income growth in the market area, anticipated national trends in turboprop and jet aircraft growth, and planned state and Department of Public Safety helicopter and fixed wing units relocating to Double Eagle. Additionally, the presence of the market area expansion with the PDV alignment may greatly influence the demand at the facility.

- High Growth – This range is a carry-over from the 2002 AEG Airport Master Plan which considered significant growth in based aircraft as driven by the prospect of a large, active flight school or aircraft maintenance/manufacturing operation at AEG. This growth rate is also consistent with historical trends in market area per capita personal income.

It is recommended that facility requirements be established using the **mid growth rate**. The recommended forecast it is consistent with many demographic and socioeconomic trends and forecasts presented earlier and allows for a reasonable amount of growth, given planned increases in based aircraft. If development of a large training facility or aircraft maintenance/ manufacturing operation become a reality, the high range growth scenario would be applicable.

Projected Local/Itinerant Split

An important consideration when examining historic and projected airport operations at an airport is whether they are local or itinerant. Local operations are those operations conducted by aircraft remaining in the airport's traffic pattern, many of which are training related. Itinerant operations are those conducted by aircraft coming from outside the traffic pattern or nearby airports. In the past, operations have averaged 34 percent itinerant and 66 percent local. These percentages have remained relatively steady over the past 10 years. Because the nature of operations at AEG are not expected to change in the coming years, these percentages will be used to project the itinerant/local split of operations in future planning years. Table 2.9 shows the projected split of itinerant and local operations for the planning period.

Table 2.9
Local/Itinerant Operations Projections

Year	Local	Itinerant	Total
2020	50,147	25,834	75,981
2025	55,367	28,522	83,889
2030	61,130	31,491	92,620
2035	67,492	34,769	102,260
Percent of Total	66%	34%	100%

Source: KSA

2.6 Critical Aircraft

The development of airport facilities is impacted by both the demand for those facilities, typically represented by total based aircraft and operations at an airport, and the type of aircraft that will use those facilities. In general, airport infrastructure components are designed to accommodate the most demanding aircraft, referred to as the critical aircraft, which will utilize the infrastructure on a regular basis. The factors used to determine an airport's critical aircraft are the approach speed and wing span/tail height of the most demanding class of aircraft that is anticipated to perform at least 500 annual operations at the airport during the planning period. The criteria for these categories are presented in Table 2.10.

Table 2.10
Airport Reference Code

Aircraft Approach Category	
Approach Category	Approach Speed
A	< 91 knots
B	91 knots to < 121 knots
C	121 knots to < 141 knots
D	141 knots to < 166 knots
E	166 knots or more

Aircraft Design Group		
Approach Category	Tail Height	Wing Span
I	<20 feet	< 49 feet
II	20 feet to < 30 feet	49 feet to < 79 feet
III	30 feet to < 45 feet	79 feet to < 118 feet
IV	45 feet to < 60 feet	118 feet to < 171 feet
V	60 feet to < 66 feet	171 feet to < 214 feet
VI	66 feet to < 80 feet	214 feet to < 262 feet

Source: FAA Advisory Circular 150/5300-13A Change 1

After identifying an airport's critical aircraft it is then possible to determine the facility's Airport Reference Code (ARC). The ARC is a coding system that relates airport design criteria to the operational and physical characteristics of the airplanes that are intended to operate at an airport. An airport's ARC is a composite designation based on the Aircraft Category and Airplane Design Group of that airport's critical aircraft.

The current Airport Layout Plan (ALP) for AEG shows the Airport having an ARC of D-II which represents a design aircraft with an approach speed between 141 and 166 knots and having a wingspan between 49 and 79 feet as well as a tail height between 20 and 45 feet. This ARC encompasses almost all business and corporate jet aircraft.

Operations data from the FAA's Traffic Flow Management System Counts (TFMSC) database was used to evaluate historical operations at AEG and can be used to help validate the appropriate ARC. In 2014, the Airport had over 1,100 recorded jet operations. These operations were conducted by a wide range of corporate jet aircraft including: Beechjet 400, Citation CJ1-3, Citation Excel, Citation Sovereign, Citation II, V, X; Cessna XLS, Challenger 300 & 600, Phenom 100 & 300, Eclipse 500, (Falcon 50, 900, 2000), Gulfstream II-V, Hawker 800, Lear 31-60, Raytheon Premier I. Almost all of these are over 12,500 lbs. maximum take-off weight (MTOW).

It is recommended that the airport continue to maintain its D-II ARC designation throughout the planning period. This will allow the Airport to continue to attract and accommodate the full range of general aviation piston, turbine and jet aircraft.

2.7 Summary

It is anticipated that AEG will continue to grow during the 20-year planning period. Market area demographic trends indicate that the Airport will slightly outpace national growth trends in general aviation and exceed trends in New Mexico growth. One reason for this growth is the robust demographic and socioeconomic trends within the region and city of Albuquerque. Based aircraft are expected to increase from 196 to 266 aircraft by 2035. The Airport will also see an increase in the number of operations. By the end of the planning period, over 100,000 operations could be expected. It is important to note that this is an unconstrained projection, which stipulates that all facilities necessary to accommodate growth will be constructed and that nothing will limit it.

To secure approval for these projections, the FAA requires a comparison of master plan forecasts to the annually produced TAF, which are completed for each airport in the NPIAS and updated each year. The FAA prefers that airport planning forecasts not vary significantly from the TAF. The FAA looks for forecasts to be within 10 percent of their five-year forecasts and 15 percent of their ten-year forecasts. If they are not within these tolerances, explanation must be provided. A comparison between the projections for AEG developed as a part of this master plan and the TAF is shown in Table 2.11.

Table 2.11
Projection of Activity Summary and TAF Comparison

	Actual 2015	2020	2025	2030	2035	AAG Rate
Based Aircraft						
Master Plan Forecast	196	214	230	247	266	1.5%
TAF	*125**	137	147	157	167	1.4%
Percent Variance	*82%*	*81%*	*81%*	*82%*	*84%*	
Operations						
Master Plan Forecast	67,469	75,981	83,889	92,620	102,260	2.0%
TAF	*65,226**	65,054	67,212	69,457	71,790	0.3%
Percent Variance	*3%*	*17%*	*25%*	*33%*	*42%*	

Source: KSA
** TAF baseline data is inconsistent with Master Plan creating artificially high variance*

As shown, it is impossible to meet the requirement to maintain proximity to the TAF due to inconsistent baseline data. With the based aircraft data for the current 5010 Airport Master Record (basedaircraft.com) and master plan showing an additional 71 aircraft, immediately the forecasts vary by over 80%. This must be rectified in the FAA data to become consistent with the TAF. At such point as the FAA TAF is updated, the forecast will become consistent.

The recommended operations projection in this forecast exceeds the FAA TAF by 17 percent in the five-year period and 25 percent within the 10-year period. This is caused by two factors; a small baseline discrepancy, and a higher overall growth rate. The master plan utilizes the most current full year of ATADS airport operations data for 2015 which is 3 percent higher than the TAF. This creates an artificially high variance within the five-year period. In addition, the growth rate is 1.7 percent higher throughout the forecast period. Although the recommended forecast growth exceeds the FAA prescribed tolerances compared to the TAF, it is consistent with many demographic and socioeconomic trends and forecasts presented earlier and allows for a reasonable amount of growth, given planned increases in based aircraft. The master plan projections for aircraft operations and based aircraft are recommended for consideration in the continued analysis for this plan. The projections included in the forecast could be viewed as reasonable considering industry trends, future views of national general aviation activity and projected growth within the region.

The projections of operational activity presented in this chapter will be referenced in later chapters to help identify areas of the Airport that are or may be constrained in future years and assist in the recommendation of future facility requirements. Additional sections of the master plan will explore the facility implications of accommodating the projected demand as well as possible scenarios for accommodating activity projected in higher growth scenarios included in this chapter.

Chapter Three: Facility Requirements

Chapter 3 - Facility Requirements

The purpose of this chapter is to determine and summarize capacity metrics for the existing airport facilities and support facilities while analyzing their ability to meet forecast demand for the planning horizon. A variety of facilities will be benchmarked to assess capacity with measures including:

- Airport Annual Service Volume (ASV)
- Runway Length Requirements
- Wind and Instrument Approach Analysis
- Apron and Hangar space requirements
- Terminal space and other landside facility needs such as parking and access
- Navigational Aid (NAVAID) and lighting requirements

The FAA specifically states the requirements for airports in FAA Advisory Circular (AC) 150/5300-13A, Change 1, *Airport Design*. Although recommendations can be driven by FAA safety and design standards, demand will also dictate what needs to be built to address suggested facility requirements in this section. The findings presented here will be the foundation for putting together alternatives and selecting a recommended development plan for the airport.

3.1 Demand/Capacity Analysis

Upon evaluating the ability of the existing airport facilities to meet the needs of the future aviation demand presented in the forecast, a capacity analysis must be conducted to identify areas of deficiency (if present). This will include airside and landside facilities.

Operational Fleet Mix

When projecting aircraft operations, it is important to evaluate fleet mix. This is categorization of the type and use of each operation. Given the changing characteristics of certain aircraft and uses, the requirements for each may be different. By pulling and analyzing more detailed operational data, airport planners can more accurately reflect the needs of the airport in the future. **Table 3.1** and **Table 3.2** describe the operations fleet at Double Eagle II Airport.

Table 3.1
Operations Fleet Mix By Use

YEAR	Air Carrier	Air Taxi	General Aviation	Military	Other	TOTAL
2015	0%	1.5%	97%	1.5%	0%	100%

Sources: FAA Form 5010

Table 3.2
Operations Fleet Mix By Aircraft Type

YEAR	Jet	Turbine	Piston	Helo/Other
2015	16%	33%	49%	2%

Sources: FAA TFMSC

During 2015, 97 percent of operations were categorized as general aviation. According to airport documents, over half of those operations were classified as local flights within the vicinity of the airport. These numbers are indicative of substantial flight training activity at AEG.

Annual Service Volume (ASV)

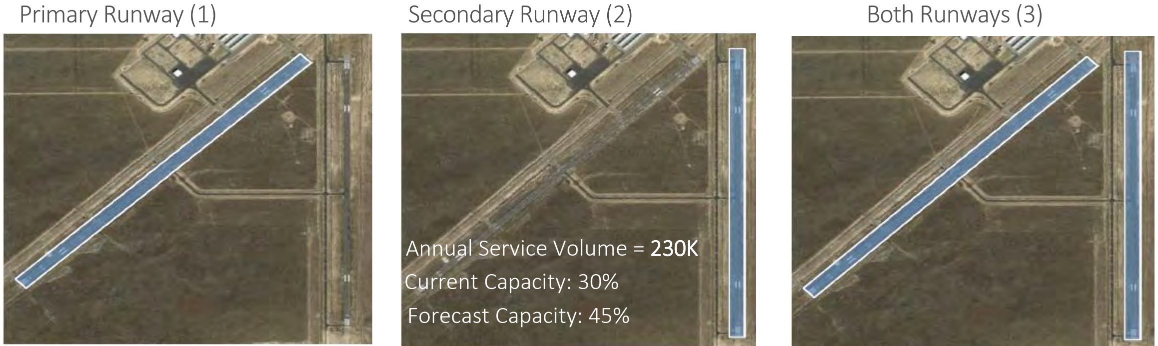
The FAA uses *Advisory Circular AC: 150/5060-5 Airport Capacity and Delay* for planning and design. This methodology is used for long range planning to determine whether anticipated demand will outpace capacity for a given airport. Results will dictate and justify further airport capacity enhancement projects. Annual Service Volume (ASV) is commonly used in master planning exercises to measure runway and airport capacity. This volume describes the total number of operations a particular runway alignment (or group of runways) can handle on an annual basis. By using this measure, it is easy to compare to current and projected annual operations numbers and analyze capacity. Although not always viable for hourly capacity or delay peak periods, this guideline is helpful for long range 20 year planning horizons. Assumptions under the following analysis include:

- IFR Weather conditions are present approximately 10% of the time
- Roughly 80% of the time the airport is operated with the runway-use configuration which produces the greatest hourly capacity
- The percentage of aircraft classes C and D using, or expected to use, the airport is 0-20% of the annual operations.

Given these assumptions, the following runway-use configurations and corresponding ASV are listed in **Figure 3.1.**

Figure 3.1 Runway Capacity by Configuration

Primary Runway (1) | Secondary Runway (2) | Both Runways (3)



Source: KSA/FAA AC 150/5060-5

Planning guidelines typically assume that when an airport meets 60% capacity, planning for capacity enhancements should begin. At 80% capacity, construction for those projects should begin. If 100% capacity is reached, serious impacts to airport operations may occur resulting in increased delay. This analysis shows that the airport will adequately support demand in the planning period for all runway configurations, with the highest demand capacity being 45% in 2035 with a single runway.

3.2 Airfield Requirements

When determining the requirements at the airport, the highest focus is the airfield/airside facilities that are required to accommodate the operation of aircraft. Safety, capacity, and design standards are extremely important as they directly relate to the operation of the airport for its sole purpose; the take-off and landing of aircraft. Planning for the future of the airport requires this foundation of airfield configuration to be the basis for additional landside development concepts. Fundamentally, the aircraft that use the airport (or are projected to use the airport) dictate the requirements for which the facilities should be designed. Aircraft are unique and have a set of characteristics that determine thresholds for pavement strength, design, and capacity.

Airport Design

There are many considerations in airport design that impact where and why portions are the airport are planned. Most criteria is based on safety and operational efficiency and can include many boundaries that are not clearly visible by simply looking at the airfield. These boundaries are necessary to establish capacity, alignments, and sizing of certain airport infrastructure.

Airport Reference Code (ARC)

The ARC is 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. The ARC has two components relating to the airport design aircraft. The first component, depicted by a letter, is the aircraft approach category and relates to aircraft approach speed. The second component, depicted by a Roman numeral, is the airplane design group and relates to airplane wingspan. Another distinction within groups can be the designation of the term *small aircraft* which relates to aircraft with gross weights of 12,500 pounds or less.

Generally, aircraft approach speed applies to runways and runway length related features. Airplane wingspan primarily relates to separation criteria and width-related features. Airports expected to accommodate single-engine airplanes normally fall into Airport Reference Code A-I or B-I. Airports serving larger general aviation and commuter-type planes are usually Airport Reference Code B-II or B-III. Small to medium-sized airports serving air carriers are usually Airport Reference Code C-III, while larger air carrier airports are usually Airport Reference Code D-VI or D-V. As established in the forecast chapter of this study, the ARC at Double Eagle II Airport is D-II. See **Table 3.3** for FAA ARC's and **Figure 3.2** for common aircraft by ARC.

Table 3.3
Airport Reference Codes

AIRCRAFT APPROACH CATEGORY

Approach Category	Approach Speed
A	< 91 knots
B	91 knots to < 121 knots
C	121 knots to < 141 knots
D	141 knots to < 166 knots
E	166 knots or more

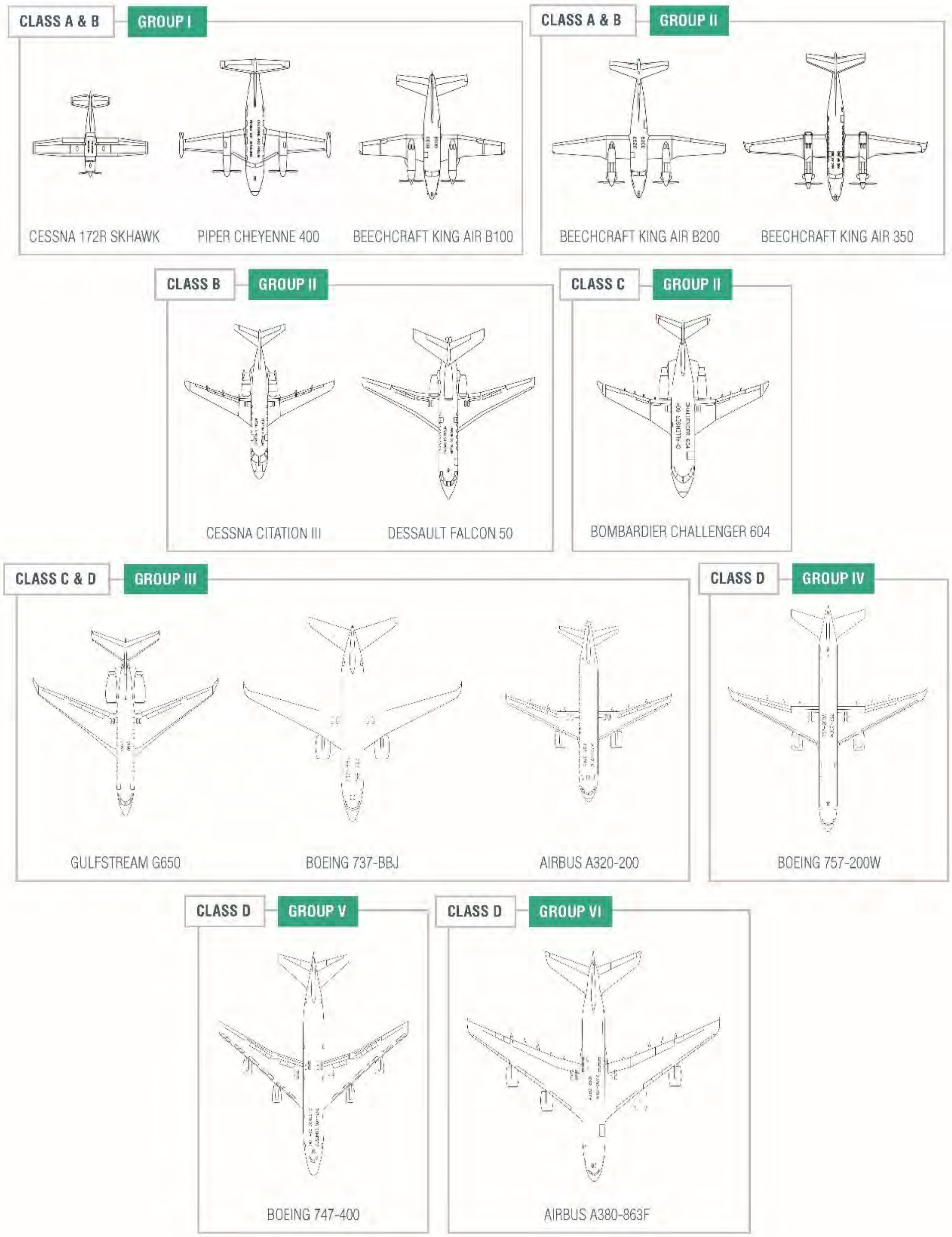
AIRCRAFT DESIGN GROUP

Design Group	Tail Height	Wingspan
I	<20 feet	< 49 feet
II	20 feet to < 30 feet	49 feet to < 79 feet
III	30 feet to < 45 feet	79 feet to < 118 feet
IV	45 feet to < 60 feet	118 feet to < 171 feet
V	60 feet to < 66 feet	171 feet to < 214 feet
VI	66 feet to < 80 feet	214 feet to < 262 feet

Source: FAA AC 150/5300 -13A

This Space Left Blank Intentionally

Figure 3.2 Common Aircraft by Airport Reference Code



Source: FAA AC 150/5300-13A, KSA

Runway and Taxiway Safety Area (RSA)

The runway safety area is an imaginary planning boundary that extends in a rectangular shape around the runway infrastructure. The area is prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway. Typically, this boundary should be flat, clear or any objects or hazards around the immediate vicinity of the runway in case of aircraft overruns. The specific size of the RSA will be shown in the Airport Layout Plan. A taxiway safety area is centered on a taxiway centerline and is designed to limit the encroachment of objects onto aircraft movement areas and to allow airport emergency vehicles to readily access aircraft on a taxiway.

Runway and Taxiway Object Free Area (OFA)

The runway object free area (ROFA) is centered on the runway or taxiway centerline. The OFA clearing standard requires clearing the OFA of above ground objects protruding above the runway safety area edge elevation. Except where precluded by other clearing standards, it is acceptable to place objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes and to taxi and hold aircraft in the OFA. To the extent practicable, objects in the OFA should meet the same frangibility requirements as the RSA. Objects non-essential for air navigation or aircraft ground maneuvering purposes must not be placed in the OFA. This includes parked aircraft.

Runway Protection Zone (RPZ)

The RPZ's function is to enhance the protection of people and property on the ground. This is best achieved through airport owner control over RPZs. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ and includes clearing RPZ areas (and maintaining them clear) of incompatible objects and activities.

Precision Object Free Zone (POFZ)

The precision object free zone (POFZ) is centered on the extended runway centerline and includes a volume of airspace located above and area extending from the runway threshold. The POFZ measures 200 feet long and 800 feet width. It must be kept clear when an aircraft utilizing a vertically guided instrument approach and the reported ceiling is lower than 250 feet or visibility minimums drop below ¾ mile (SM).

ILS Critical Area

The ILS critical area is comprised of the glideslope and localizer critical areas which must remain clear of all vehicles, aircraft, and other obstruction when an aircraft is between the Instrument Landing System (ILS) final approach fix and the runway threshold. Taxiways are equipped with ILS hold bars that are used to hold aircraft outside the critical area when instrument approach procedures are in use. Should an obstruction inadvertently enter the critical area while active, it could cause interference that could affect the accuracy of the glideslope and/or the localizer.

20:1 Visual Approach Area Surface

As described in Section 3.3.2c of FAA order 8260.3B the 20:1 visual approach surface is aligned with and centered on the runway centerline. It has a vertical slope of 20:1 or 2.87 degrees, beginning from the runway threshold elevation. The surface begins 200 feet prior to the runway threshold and continues until reaching the decision altitude of the specified approach.

Precision Instrument Approach/Departure Area Surfaces

As described in FAR Part 77, the precision instrument approach surface is aligned with and centered on the runway centerline. It has a vertical slope of 50:1 (2.0 degrees) for a horizontal distance of 10,000 feet and at a slope of 40:1 (2.5 degrees) for an additional 40,000 feet.

Taxiway Design

The FAA has updated their taxiway design requirements. Taxiway Design Groups are now used to help design appropriate spacing and size of taxiways. It is important to note that the FAA lists seven conditions which should be addressed to reduce the potential for runway incursions:

1. *Increase Pilot Situational Awareness.* Keep taxiways simple - “three-node” concept.
2. *Avoid wide expanses of pavement*. Requires signage placed away from pilot’s line of sight.
3. *Limit runway crossings*. Reduces the number of occurrences and ATC workload.
4. *Avoid “high energy” intersections*. Intersections in the middle third of the runways create the potential for a high speed/energy collision.
5. *Increase visibility*. Using right angle intersections, both between taxiways and between taxiways and runways, provides the best visibility for pilots.
6. *Avoid “dual purpose” pavements*. Dual purpose runways/taxiways can lead to confusion.
7. *Indirect Access*. Taxiways leading directly from an apron to a runway without requiring a turn increase the possibility for incursions.

End Around Taxiway

FAA Advisory Circular (AC) 150/5300-13A, *Airport Design* outlines end around taxiway (EAT) design and their ability to afford the airfield improved operational capacity, decreased delays and runway occupancy times by providing an efficient and safe method of movement from one side of a runway to the other. The EAT allows aircraft to cross the extended centerline of the runway without specific clearance from ATC. However, the construction and implementation of end around taxiways can impose some risks that must be mitigated to ensure safe and efficient operation.

End around taxiways must be designed so their centerline is a minimum of 1,500 feet from the stop end of the runway including a minimum of 500 feet each side of the extended runway centerline. These minimum dimensions are in place to ensure aircraft tails remain clear and do not penetrate the 40:1 departure surface, or any other surface defined in Order 8260.3*, Terminal Instrument Procedures* (TERPS), The EAT must remain clear of the runway safety area (RSA) as well as all Instrument Landing System (or ILS) critical areas.

A visual screen may also be required following the construction of an end around taxiway. Dependent upon the elevation of the EAT in relation to the runway, the visual screen may be required to avoid a potential situation where pilots departing the runway could mistake an aircraft taxiing on the EAT for one crossing the stop end of the runway. The visual screen must also remain clear of any RSA, taxiway OFA, or ILS critical area. The screen must also remain clear of the inner approach object free zone (OFZ), the approach light plane, or any Terminal Instrument Procedure surfaces.

The size and space requirements runway design by ARC is included in Table 3.4.

This Space Left Blank Intentionally

Table 3.4 FAA Runway Design Standards Matrix

Aircraft Approach Category (AAC) and Airplane Design Group (ADG):	C/D - II			
Item	**Visibility Minimums**			
Runway Design	Visual	Not Lower than 1 mile	Not Lower than 3/4 mile	Lower than 3/4 mile
Runway Length	*See AC Guidance on Runway Length (paragraphs 302 and 304)*			
Runway Width	100 ft	100 ft	100 ft	100 ft
Shoulder Width	10 ft	10 ft	10 ft	10 ft
Blast Pad Width	120 ft	120 ft	120 ft	120 ft
Blast Pad Length	150 ft	150 ft	150 ft	150 ft
Crosswind Component	16 knots	16 knots	16 knots	16 knots
Runway Protection				
Runway Safety Area (RSA)				
Length beyond departure end	1000 ft	1000 ft	1000 ft	1000 ft
Length prior to threshold	600 ft	600 ft	600 ft	600 ft
Width	500 ft	500 ft	500 ft	500 ft
Runway Object Free Area (ROFA)				
Length beyond runway end	1000 ft	1000 ft	1000 ft	1000 ft
Length prior to threshold	600 ft	600 ft	600 ft	600 ft
Width	800 ft	800 ft	800 ft	800 ft
Runway Obstacle Free Zone (ROFZ)				
Length	*Refer to AC paragraph 308*			
Width				
Precision Obstacle Free Zone (POFZ)				
Length	NA	NA	NA	200 ft
Width	NA	NA	NA	800 ft
Approach Runway Protection Zone (RPZ)				
Length	1700 ft	1700 ft	1700 ft	2500 ft
Inner Width	500 ft	500 ft	1000 ft	1000 ft
Outer Width	1010 ft	1010 ft	1510 ft	1750 ft
Acres	29.465	29.465	48.978	78.914
Departure Runway Protection Zone				
Length	1700 ft	1700 ft	1700 ft	1700 ft
Inner Width	500 ft	500 ft	500 ft	500 ft
Outer Width	1010 ft	1010 ft	1010 ft	1010 ft
Acres	29.465	29.465	29.465	29.465
Runway Separation				
Runway centerline to:				
Parallel runway centerline	*Refer to AC paragraph 316*			
Holding position	250 ft	250 ft	250 ft	250 ft
Parallel Taxiway/Taxilane centerline	300 ft	300 ft	300 ft	400 ft
Aircraft parking area	400 ft	400 ft	400 ft	500 ft
Helicopter touchdown pad	*Refer to AC 150/5390-2*			

Source: FAA AC 150/5300-13A

Runway Width

The required width of a runway is determined by the critical aircraft and the instrumentation available for the approach. Runway 22 is equipped with a precision instrument (ILS) approach as well as a non-precision RNAV (GPS) approach.

According to FAA AC 150/5300-13A, the minimum width for an ARC C/D-II runway with a precision instrument approach is 100 feet. Runway 4/22 and 17/35 are 100 feet wide and therefore, meet the design standards for ARC C/D-II group aircraft.

Runway Strength and Condition

There are several factors which influence pavement required to provide satisfactory service. These factors include, but are not limited to aircraft loads, frequency and concentration of operations, and the condition of sub-grade soils. Runway pavement strength is typically expressed by common landing gear configurations. Example aircraft for each type of gear configuration are as follows:

- Single-wheel – each landing gear unit has a single tire, example aircraft include light aircraft and some business jet aircraft.
- Dual-wheel – each landing gear unit has two tires, example aircraft are the Boeing 737, Boeing 727, MD-80, CRJ 200, and the Dash 8.
- Dual-tandem – main landing gear unit has four tires arranged in the shape of a square, example aircraft are the Boeing 707 and KC135.

The aircraft gear type and configuration dictates how aircraft weight is distributed to the pavement and determines pavement response to loading. The published pavement strengths and other attributes of the runways at AEG are presented in **Table 3.5**. At present, the pavement conditional of both runways is classified as *excellent.*

Table 3.5
Runway Pavement Strength (Published)

Pavement	Runway 4/22	Runway 17/35
Length & Width (surface type)	7398'x100' (Asphalt)	5993'x100' (Asphalt)
Surface Condition	Excellent	Excellent
Pavement Strength	SW 30,000 lbs	SW 30,000 lbs

Taxiways

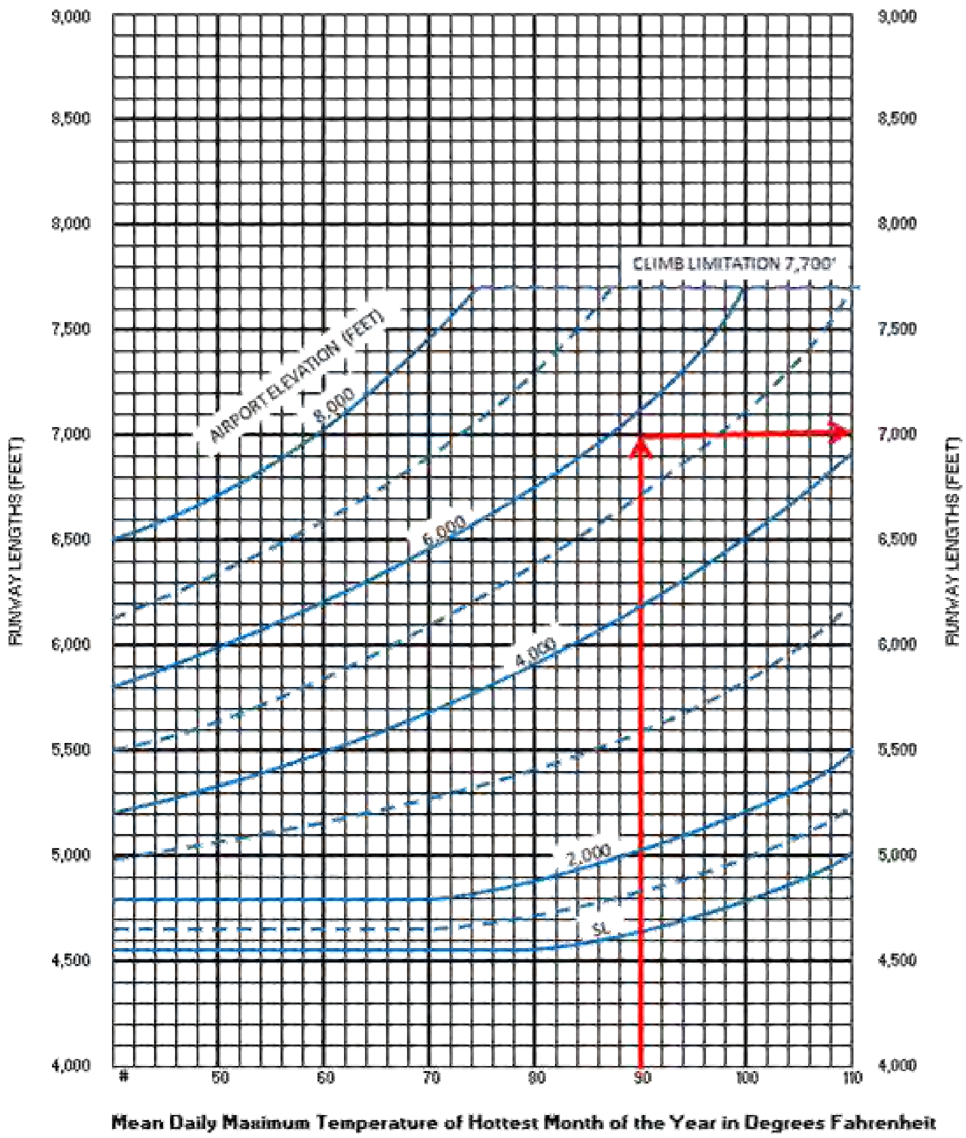
The taxiway system at Double Eagle II Airport is based on three main taxiways: Taxiway A runs full parallel to Runway 4/22, Taxiway B runs full parallel to Runway 17/35, and Taxiway C connects both Runways at the midpoint of each runway. Taxiway A has six associated runway connectors and Taxiway B has three associated runway connectors. In order to meet FAA recommended design standards found in FAA Advisory Circular 150/5300-13A, several taxiways need to be reconfigured at AEG. Taxiways A3 and A1 present a safety hazard to pilots because of their direct access from the apron areas to Runway 4/22. In addition, Taxiway B currently crosses into the RPZ for Runway 4/22 which represents a safety hazard for aircraft landing on the Runway 22. Taxiway Bravo also violates end-around taxiway (EAT) standards presented in FAA AC 150/5300-13A. The taxiway runs through the Runway 4/22 Safety Area and adequate tail clearance for landing and departing aircraft is not met. Other potential safety hazards can occur with EAT if pilots departing from Runway 4 mistake an aircraft on Taxiway Bravo for taxiing across the active runway causing an aborted takeoff or landing. Reconfigured taxiway layouts will be described and presented In the Alternatives Chapter of this study.

Runway Length Requirements

A common method for calculating runway length requirements, explained in FAA AC 150/5325-4B, is based on performance curves developed from FAA-approved airplane flight manuals from aircraft. The variables included in this method include the airport's 5,837 feet elevation and a mean daily maximum temperature of 90 degree Fahrenheit. Based on this analysis, a runway length of at least 7,000 feet is recommended to accommodate 75 percent of the fleet at 60 percent useful load presented in **Figure 3.3.**

This Space Left Blank Intentionally

Figure 3.3 Runway Length Requirements - 75% of Fleet at 60% Load



Source: FAA AC FAA AC 150/5325-4B

The length requirement presented In the FAA charts is only met by Runway 4/22. However, according to the FAA Traffic Flow Management System Counts (TFMSC) 99 percent of aircraft operations at AEG fall under Approach Category B or below. The runway length requirement for this ADG is met by Runway 17/35.

3.5 Wind Analysis

Figure 3.4 and Figure 3.5 shows the all-weather wind rose diagram and **Table 3.6** shows analysis results for Double Eagle II Airport taken from the FAA's Airports Geographic Information System (Airports GIS) wind analysis tool. The wind rose indicates that the Airport's current runway configuration is adequate to meet the wind coverage demands. The FAA recommends that an airport's runway configuration provides wind coverage during 95 percent of all possible weather conditions based on the airport's design aircraft. The wind coverage provided by the runway ranges from 95.3 percent to 99.03 percent, depending on the wind speed and direction. The FAA calculates the allowable crosswind component based on runway design code (RDC) which considers aircraft approach category, design group and visibility minimums.

Due to the large mix of airport activity, it is important to have proper wind coverage. Most aircraft operating at AEG fall within the A-I through D-II aircraft approach category and design group, whereby the 10.5, 13, and 16 knot crosswind components are considered in the wind analysis. These aircraft represent almost all general aviation aircraft, ranging from small single engine piston to large multi-engine jet aircraft. Aircraft that fall into the lower categories, such as light single engine aircraft have a lower allowable crosswind component. As the size and speed of aircraft increase, so too does the allowable crosswind component.

It is important to note that at the 10.5 crosswind component, the current runway configuration supports wind coverage barely over the FAA standard of 95 percent. As wind patterns change over time the current configuration may not support adequate levels of wind coverage in the future.

With the current runway configuration, both runways need to be readily available for use to meet the crosswind component standards. In the event of a single runway conditions, both Runway 4/22 and Runway 17/35 would not meet FAA standards at the 10.5 or 13 knot crosswind component.

This Space Left Blank Intentionally

Figure 3.4 Wind Rose

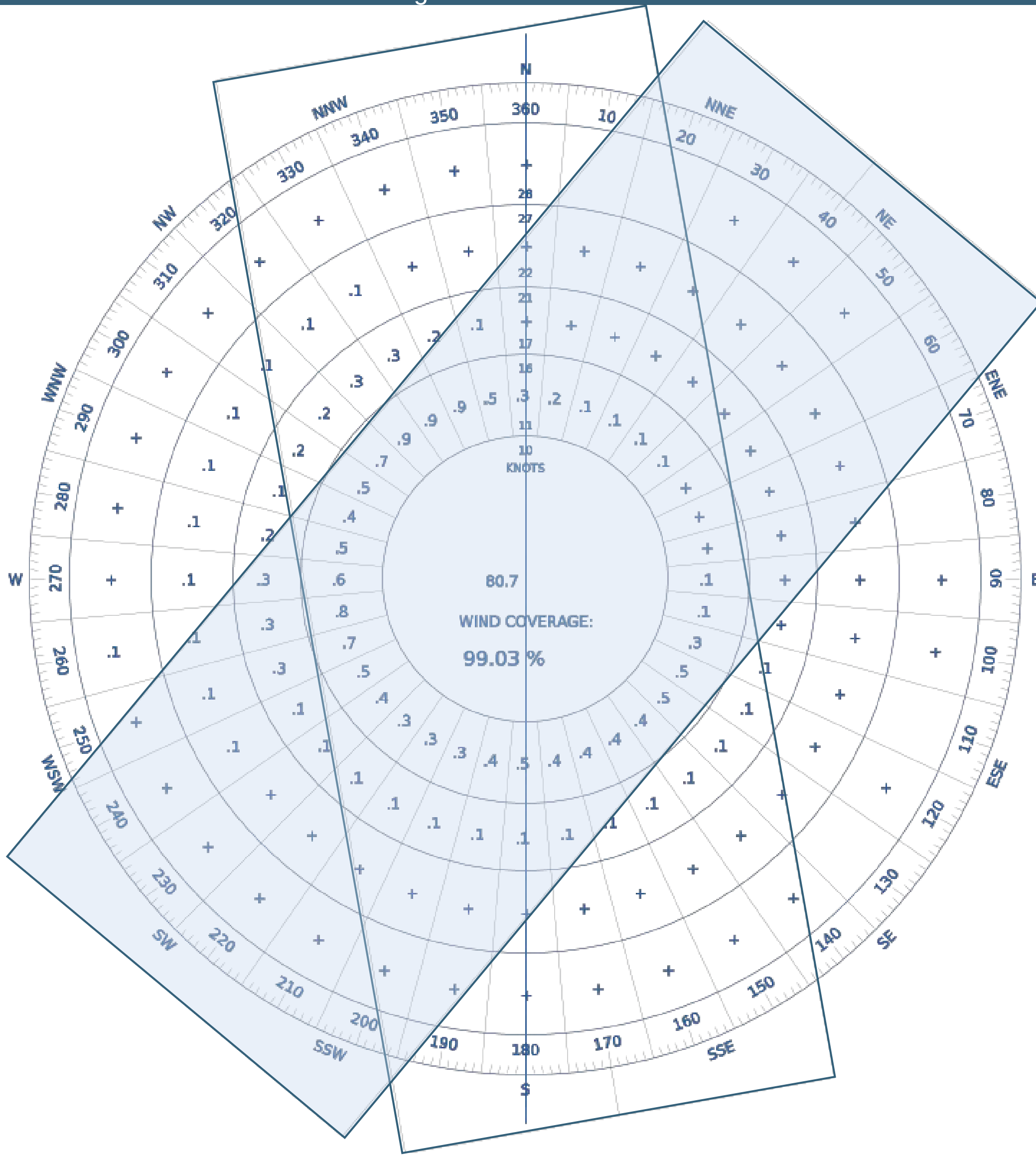


Table 3.6
AEG Wind Coverage

10.5 Knots	13 Knots	16 Knots
95.3%	97.67%	99.03%

Source: FAA

Figure 3.5 Wind Coverage by Runway Orientation

Primary Runway (4/22) | Secondary Runway 17/35 | Both Runways

Primary Runway (4/22)	Secondary Runway 17/35	Both Runways
10.5 knots = 88.13%	10.5 knots = 91.43%	10.5 knots = 95.3%
13 knots =92.61%	13 knots = 94.59%	13 knots = 97.67%
16 knots =96.92%	16 knots = 97.38%	16 knots = 99.03%
20 knots =98.96%	20 knots = 98.92%	20 knots = 99.71%

3.4 Lighting and NAVAIDS

Navigational aids (NAVAIDs) are any visual or electronic devices, airborne or on the ground, that provide point-to-point guidance information or position data to aircraft in flight. Airport NAVAIDs provide guidance to a specific runway end or to an airport. An airport is equipped with precision, non-precision, or visual capabilities in accordance with design standards that are based on safety considerations and airport operational needs. The type, mission, and volume of activity used in association with meteorological, airspace, and capacity considerations determine an airport's eligibility and need for various NAVAIDs.

Instrument NAVAIDs

This category of NAVAID provides assistance to aircraft performing instrument approach procedures to an airport. An instrument approach procedure is defined as a series of predetermined maneuvers for guiding 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.

Runway 22 is equipped with an Instrument Landing System (ILS) which provides precision (vertical and lateral) guidance to the runway to allow pilots to attempt a landing with visibility of at least one-half mile. This runway is also served by an additional a RNAV (GPS) approach. This approach provides non-precision guidance and requires a visibility minimum of one-half mile. It is supported by a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) which is installed on the north side of the airport in the runway approach zones along the extended centerline of the runway.

Currently, there are no approaches published for Runway 17. In order to increase capacity and safety during IFR conditions, it is recommended that a GPS (RNAV) approach be established for Runway 17 with visibility minimums not less than ¾ miles.

Automated Weather

Double Eagle II Airport has an onsite Automated weather Observing System (AWOS) which can be tuned on frequency 119.025 or by phone at (505) 842–2009. An AWOS provides pilots with a computer-generated voice message which is broadcast via radio frequency in the vicinity of an airport. The message contains pertinent weather information including wind speed and direction, visibility, temperature, dew point, and cloud ceiling heights. However, an AWOS is limited in that the system cannot detect and report a variety of meteorological conditions such as fog, dust, smoke, ash, tornadoes, and unconventional precipitation. For this reason, it is recommended that AEG replace the current AWOS with an Automated Surface Observation System (ASOS). An ASOS is a complex computer based observation system designed to replicate human observations of the weather. ASOS systems are more complex than AWOS systems and this system is considered adequate for the role and level of service at the airport.

3.5 Landside Capacity and Facility Requirements

With projected demand increasing the number of based aircraft in the planning period, consideration should be given to increasing aircraft storage and apron space. Hangars on the airport need to accommodate nearly all based aircraft on the field. Many owners require hangar space as a way to keep their aircraft secure, out of the weather, and allow for maintenance of the aircraft. The size and type of hangar largely depends on the type of aircraft and its use.

Table 3.7
General Hangar Space Guidelines

Aircraft Type	Required Hangar Space
Single Engine Piston	1,200 square feet
Multi Engine (Piston and Small Turbo)	1,200 to 3,000 square feet (avg. 2,100 square feet)
Jet	3,000+ square feet
Rotor (Helo)	2,500

Source: FAA AC150/1300-13A, ACRP 113 Guidebook for General Aviation Facility Planning, KSA

T-Hangars – these hangars are predominately for single engine piston aircraft. Although light twins can be accommodated in these hangars, for the purpose of the forecast and facility requirements, twin engine aircraft are anticipated to be larger turboprop aircraft that would most likely be located in box hangars. For this reason, T-hangars are only calculated based on the forecast single engine aircraft. Requirements for these hangars are shown in total square footage, but helpful is the unit size. It was assumed that similar to existing hangars at the airport, a 10 unit nested T-Hangar is recommended to accommodate new aircraft.

Conventional Box Hangars – these hangars come in a variety of sizes and can accommodate a mix of larger aircraft. The size and amenities for these hangars are based on the aircraft use and size. Some will need dedicated maintenance space, others will require office and crew space. Often, these hangars are shared with multiple owners. For the purpose of facility requirements, the projected multi engine, jet, and rotor are included in the square footage requirements. However, multiple unit sizes are shown based on square footage.

Apron

The main apron is located in the FBO and T-hangar area at Double Eagle II Airport. This apron is approximately 500,000 square feet and contains adequate tie-down space for based and transient aircraft. Another apron is located to the southwest of the main ramp and is approximately 200,000 square feet. This apron is located in front of a newly built 15,000 square foot conventional hangar.

Parking

The parking area at AEG is located between Bode aviation and West Mesa Aviation. It contains 85 parking spots within a 37,000 square foot area. Additional parking is available for airport and tenant employees. The current AEG parking facilities should be adequate throughout the planning period.

Existing Airport Landside Facilities

The landside facilities at Double Eagle II Airport include a paved aircraft parking apron for transient and based aircraft, nine T-hangar buildings that house 158 units, conventional hangars, a helicopter hangar, and two automobile parking areas. These facilities are listed in **Table 3.8**.

Table 3.8
Existing Landside Facilities

Facility	Approx. Area (sq. ft.)	Units
FBO Conventional Box Hangar	71,550	6
Helicopter Hangar	4,800	1
Helipads	7,500	3 (50’ x 50’)
Auto Parking Lot	37,000	85
T-Hangars	186,150	158
Conventional Box Hangars (Executive)	24,990	2
Shade Hangar	7,900	1
Tie-Downs Apron	683,320	50 Tie-Downs

Source: KSA (2016)

The planning of landside facilities should be based upon a balance of airside and landside capacity. The determination for terminal and support area facilities has been accomplished for the future planning periods. The principle operating elements covered under these analyses for general aviation requirements include:

- Itinerant and Based Aircraft Parking Aprons
- Aircraft Storage Facilities
- Support Area Requirements
- Automobile Parking

Itinerant Aircraft Parking Apron

Areas designated for the parking of transient (visiting) aircraft are called "itinerant aprons." The itinerant apron areas are also used by based aircraft for loading, fuel, and other activities. There are currently 50 tie-down spaces for the combined based and itinerant general aviation aircraft with just under 76,000 square yards of apron for both. The size of such an apron required to meet itinerant demand was estimated using the following methodology:

- Calculate the average daily itinerant operations for the most active month.
- Assume the average busy itinerant day is ten percent more active than the average day of the peak month.
- Assume that a certain portion of the itinerant airplanes will be on the apron during the busy day (for this report, we will use 34 percent based on the Airport's itinerant activity). Since 50 percent of the itinerant operations are departures, only 25 percent of the daily itinerant operations will represent aircraft on the ground in need of parking area.

- Calculate the apron needed using 400 square yards per itinerant aircraft. Applying this approach to the general aviation operations forecast yields the demand for apron area shown in **Table 3.9.**

Table 3.9
General Aviation Itinerant Apron Demand

Year	Busy Day Itinerant Operations	Itinerant Aircraft on Apron	Total Required Apron (SY)
Existing 2015			*75,924*
2020	262	45	18,000
2025	288	49	19,600
2030	317	54	21,600
2035	348	59	23,600

Source: ATADS 2015, C&S Engineers, Inc.

Based Aircraft Parking Apron

The based aircraft parking area is planned to ensure adequate tie-down space for those based aircraft that do not require hangar storage.

Apron space for based aircraft was determined using guidelines suggested in manufacturers' literature for the critical aircraft, as well as FAA Advisory Circular 150/5300-13A guidance for tie-down layout. With jet aircraft and helicopters stored in hangars, the required apron space for based single-engine and multi-engine aircraft is in **Table 3.10**. Apron demand for both itinerant and based aircraft is in **Table 3.11**.

Table 3.10
General Aviation Based Aircraft Apron Demand

	Existing 2015	2020	2025	2030	2035
Based Aircraft Apron (SY)					
Single-Engine*		678	678	1,357	1,357
Multi-Engine		24,513	26,184	28,413	30,641

**Includes ultralights*

Source: KSA, C&S Engineers, Inc.

Table 3.11
General Aviation Based Aircraft and Itinerant Apron Demand

	Existing 2015	2020	2025	2030	2035
Based Aircraft Apron Required (SY)		25,191	26,863	29,769	31,998
Itinerant Apron Required (SY)		18,000	19,600	21,600	23,600
Total Apron Demand (SY)	***75,924***	**43,191**	**46,463**	**51,369**	**55,598**

Source: KSA, C&S Engineers, Inc.

Based on the forecasted itinerant operations and the forecasted based aircraft, the Airport will not require additional apron area through the planning period.

Aircraft Storage Facilities

Hangar requirements for a general aviation facility are a function of the number of based aircraft, the type of aircraft to be accommodated, owner preferences, and area climate. For planning purposes, 5% of based aircraft at Double Eagle II are multi-engine piston and 88% are single-engine piston aircraft. Helicopter and ultralights make up 4.5% and 2% respectively, while jet aircraft represents less than 1% of the based aircraft.

Prefabricated conventional and T-hangar units are available from a variety of manufacturers throughout the nation. Storage space for based aircraft was determined using guidelines suggested in manufacturers' literature for the critical aircraft. Typical aircraft sizes were also reviewed in light of the evolution of business aircraft size. Conventional hangar space was based upon a standard of 1,200 square-feet for single engine aircraft and 1,800 square-feet for multi engine as well as helicopter aircraft. T-hangar space was based upon a mix of both single-engine and multi-engine aircraft dimensions. For jet activity, 9,000 square-feet was used to calculate hangar demand based on the dimensions of the Gulfstream IV. The hangar areas were then applied to the based aircraft forecasts to determine the actual hangar area requirements. Tie-down space was allocated as part of the itinerant airport apron area and was addressed previously in this chapter. Based on information from the Airport and collected inventory, the following assumptions in **Table 3.12** were made regarding the type of hangar needed.

Table 3.12
Aircraft Storage Types

Type of Aircraft	Percent in Conventional Hangars	Percent in T-Hangars	Percent on Apron
Single-Engine	20%	60%	20%
Multi-Engine	55%	35%	10%
Jet	100%	0%	0%
Helicopter	100%	0%	0%
Ultralight	20%	60%	20%

Using the above assumptions combined with the forecast fleet mix (shown previously in the Forecast chapter), **Table 3.13** sets forth the demand requirements for hangar space at Double Eagle II Airport. It should be noted that these requirements are not rigid. For example, the shifting of space requirements between conventional and T-hangars is left to local preference.

This Space Left Blank Intentionally

Figure 3.6 Existing Corporate Hangars

Table 3.13
Hangar Area Demand

	2015	2020	2025	2030	2035
Based Aircraft Forecast					
Single-Engine*	204	221	236	254	273
Multi-Engine	12	13	14	15	16
Jet	1	2	3	4	5
Helicopter	10	12	13	13	14
Conventional Hangars					
Single-Engine*		52,800	56,400	61,200	66,000
Multi-Engine		12,600	14,400	14,400	16,200
Jet		18,000	27,000	36,000	45,000
Helicopter		21,600	23,400	23,400	25,200
Total Conventional Hangar Demand (SF)	*96,540*	105,000	121,200	135,000	152,400
Net Conventional Hangar Demand (SF)		(8,460)	(24,660)	(38,460)	(55,860)
T-Hangars (SF)					
Single-Engine*		159,600	170,400	182,400	196,800
Multi-Engine		9,000	9,000	9,000	10,800
Total T-Hangar Demand (SF)	*186,150*	168,600	179,400	191,400	207,600
Net T-Hangar Demand (SF)				(5,250)	(21,450)

**Includes ultralights*
Source: C&S Engineers, Inc.

There is currently just over 96,000 square-feet of conventional hangar space and 186,000 square-feet of T-hangar space at the Airport. Additionally, the Airport has helicopter hangars and shade hangars to accommodate just under 13,000 square-feet of hangar demand. According to Table 5.6, there is not sufficient space for hangars during the entire forecast period.

Support Area Requirements

A general aviation terminal is needed to provide space for lounge areas, restrooms, food services, and other areas for the needs of pilots and passengers. **Table 3.14** shows the standard square footage requirement per general aviation passenger.

Table 3.14
General Aviation Building Area Requirements

Functional Area	Area Per Peak Hour Pilot/Passenger
Waiting Lounge	15.0 SF
Public Convenience	2.0 SF
Concession Area	5.0 SF
Circulation, Storage, HVAC	25.0 SF
TOTAL	47.0 SF

Source: FAA, Aviation Demand and Airport Facility Requirement Forecast for Medium Air Transportation Hubs (Washington, D.C., 1969)

The FAA's approach for calculating general aviation terminal requirements uses operational peaking characteristics to determine size of terminal areas. The method relates general aviation peak hour pilots and passengers to the functional areas within the terminal to produce overall building size. Using the standards in Table 5.5, the recommended general aviation terminal function size for each design year is presented in **Table 3.15**. The number of peak hour passengers shown in the table was derived by assuming 2.5 passengers and pilots per general aviation design hour operations.

Table 3.15
General Aviation Terminal Building Requirements

Year	Design Hour Operations	Peak Hour Pilots and Passengers	Terminal Function Size (SF)
Existing 2015			*16,000*
2020	10	25	1,175
2025	11	27	1,316
2030	12	30	1,410
2035	13	33	1,551

Source: C&S Engineers, Inc.

Approximately twenty-five percent of the existing FBO Conventional Box Hangar is utilized for general aviation terminal use. With roughly 4,000 square feet available, the current hangar meets the needs for the anticipated demand. If additional needs are required, this facility will be reevaluated for adequacy. With the excess space available in the building based on the terminal building use requirements, it is assumed that the facility will accommodate the Airport's future equipment storage needs.

Fuel Facility

The size of the fuel storage tanks is a function of aircraft operations. The fuel requirements were estimated using the following methodology:

- Calculate the average day peak month (ADPM) operations
- Calculate the amount of fuel used by those operations by assuming 2.5 gallons per operation
- Calculate the amount of fuel used in a two-week period

The fuel requirements at the Airport are shown in **Table 3.16.**

Table 3.16
Fuel Storage Requirements

Year	ADPM Operations	ADPM Fuel Used	Two Week Fuel Requirement
Existing 2015			*48,000 gal Jet A* *41,200 gal AvGas*
2020	238	594 gal	8,316 gal
2025	261	653 gal	9,148 gal
2030	287	719 gal	10,062 gal
2035	316	791 gal	11,069 gal

Source: ATADS 2015, KSA

Bode Aviation, Inc. – Double Eagle II Airport's fixed base operator – owns two 20,000-gallon storage tanks containing Jet A and two 20,000-gallon storage tanks containing AvGas 100LL. They also operate three fuel trucks with a capacity totaling approximately 9,200 gallons (8,000 gallons Jet A and 1,200 gallons AvGas). The current fuel facilities are able to accommodate the demand throughout the forecast period.

Automobile Parking

The number of auto spaces required at an airport is also dependent upon the level of general aviation aircraft activity at the facility. The methodology for determining parking needs relates peak hour pilots, passengers, and airport employees to the number of parking spaces required. Numbers of peak hour pilots and passengers were previously derived for the general aviation terminal building requirements. The number of employees currently working at the airport is four. This number was held steady for the forecast period. The number of auto parking spaces equaled the sum of the peak hour pilots/passengers and employees at the Airport. This number was converted into paved area by using a standard of 22 square yards per vehicle space (**Table 3.17**).

Table 3.17
Auto Parking Area Requirements

Year	Peak Hour Pilots & Passengers	Airport Employees	Total Parking Spaces	Area (SY)
Existing 2015			*85*	*4,111*
2020	25	4	29	638
2025	27	4	31	682
2030	30	4	34	748
2035	33	4	37	814

Source: C&S Engineers, Inc.

Based on the existing parking area of over 4,000 square-yards, which includes 85 parking spaces, the forecasted operations indicate that there is an adequate amount of parking spaces to meet demand throughout the planning period.

Summary of Landside Requirements

The preceding sections have identified the general aviation landside facility requirements for Double Eagle II Airport. **Table 3.18** summarizes the requirements by planning phase and area of need by comparing existing facilities to total airport demand for each period.

Table 3.18
Landside Facilities Requirements Summary

Item	Existing (2015)	Phase 1 (2016- 2020)	Phase 2 (2021-2025)	Phase 3 (2026-2030)	Phase 4 (2031-2035)
Conventional Hangars	***96,540 SF*** ***Net Demand***	105,000 SF (8,460) SF	121,200 SF (24,660) SF	135,000 SF (38,460) SF	152,400 SF (55,860) SF
T-Hangars	***186,150 SF*** ***158 units***	168,600 SF 137 units	179,400 SF 147 units	191,400 SF 158 units	207,600 SF 169 units
GA Apron	***75,924 SY***	25,191 SY	26,863 SY	29,769 SY	31,998 SY
Fuel Facility	***48,000 gal JetA*** ***41,200 gal AvGas***	8,316 gal	9,148 gal	10,062 gal	11,069 gal
GA Terminal	***16,000 SF*** ***4,000 SF GA use***	1,175 SF	1,316 SF	1,410 SF	1,551 SF
Auto Parking	***85 spaces***	29 spaces	31 spaces	34 spaces	37 spaces

Source: C&S Engineers, Inc.

3.6 Rotorcraft/Helicopter Requirements

Double Eagle II is home to a variety of rotorcraft operators and can be quite active during periods of helicopter usage. As identified in the forecast, the demand for additional based helicopters and operations is projected to grow and outpace other operations during the planning period and will require special design considerations. Given the nature of helicopter operations (i.e. vertical lift capabilities) they are quite different than a fixed wing aircraft. Inherently, these operations do not always have the same flight patterns, landing areas, and parking requirements as traditional aircraft. Additionally, rotor wash from helicopters can present challenges for other aircraft parked on the apron areas at airports. For this reason, it is recommended that the airport plan for a dedicated area specifically for helicopter/rotorcraft operations. Typical helicopter operators at Double Eagle II include (aircraft types shown in **Figure 3.7**):

- *Public Safety*: The City of Albuquerque Police Department operates EC-130 helicopters out of the airport and currently use a hangar located on the north end of the terminal area for operations.

- *Military*: U.S. Army Military training operations are routine at AEG including the CH-47 Chinook Helicopter. The airport provides an ideal desert location for operations. These are usually transient aircraft but do utilize large amounts of apron space and fueling.

- *Civilian*: Vertical Limit is a tenant at AEG and operate Robinson R-22 and R-44 aircraft for high altitude training and serve for aerial photography and local news outlets. This type of user typically has smaller aircraft but can be very active.

Operations are very specific to the type of user at the airport and they may require different facilities. Training can encompass large areas that sometimes include using the skids of the helicopter to land on concrete and pavement areas. Due to this fact, it is ideal to provide a separate location as to not interfere with taxiways and runways for fixed wing aircraft. Maneuvers may include:

- Run-on landing and Run-on takeoff
- Autorotation
- Hover Taxi
- Normal landing

Figure 3.7 Example Rotorcraft at Double Eagle II

Robinson R-22

Eurocopter EC-130

Boeing V-22 Osprey

CH-47 Chinook

Design Considerations

As with airports, helicopter areas should consider both airside and landside components. This will include the design of a Heliport/Helipad for the landing and takeoff of aircraft as well as apron and taxiway areas for parking and storage.

Planning for helicopter parking areas and is separate from a helipad or landing and takeoff areas. A helipad is used by rotorcraft for takeoff and landing operations only. Parking areas are not used for takeoff and is ideal for temporary parking for based or transient aircraft. This also is an ideal location for fueling operations.

To the extent practicable, helipad locations should consider the following:

- Multiple (two) approach/departure paths for landing and takeoff
- Alignment with the predominant wind direction
- Clearance from obstructions, in particular, those likely to be a hazard to air navigation
- Separation from fixed wing instrument and visual approach paths including the pattern
- Avoidance of other fixed wing aircraft parking areas - rule of thumb for helicopters landing and taking off should be at least 100' away from aircraft parking locations. This is particularly true for smaller airplanes that are typically 12,500lbs or less.

VFR approach/departure paths - The purpose of approach/departure airspace, shown in Figure 3. is to provide sufficient airspace clear of hazards to allow safe approaches to and departures from the TLOF.

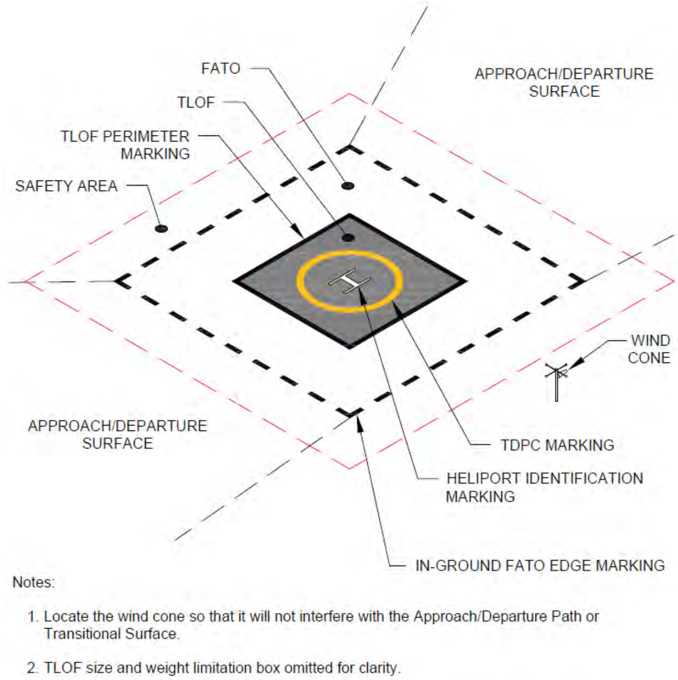
Touchdown and liftoff area (TLOF) - This is the area where aircraft physically land and takeoff and is the basis for the pavement areas of operation. These areas are depicted in **Figure 3.8**.

Heliport protection zone (HPZ) - The FAA recommends the establishment of an HPZ for each approach/departure surface. The HPZ is the area under the 8:1 approach/departure surface starting at the FATO perimeter and extending out for a distance of 280 feet. This is shown in **Figure 3.10.**

Vertiport - A facility designed to accommodate powered-lift aircraft such as tiltrotors. A vertiport would normally have a short runway to facilitate rolling takeoffs in a quieter and more fuel-efficient mode than true vertical takeoffs.

The configurations for these areas can vary greatly. For additional information on heliports, see AC 150/5390-2C Heliport Design.

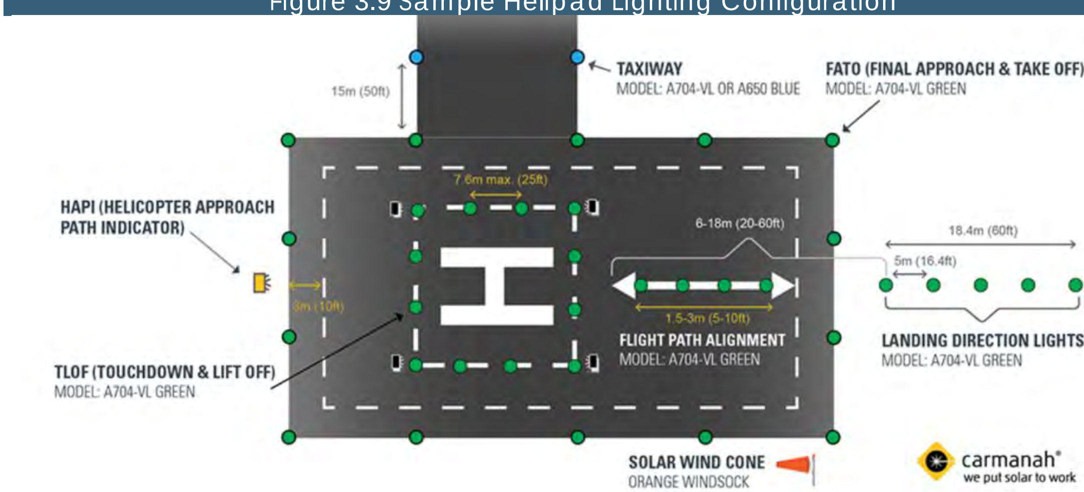
Figure 3.8 Basic Features of a General Aviation Heliport



Source: FAA AC AC 150/5390-2C Heliport Design

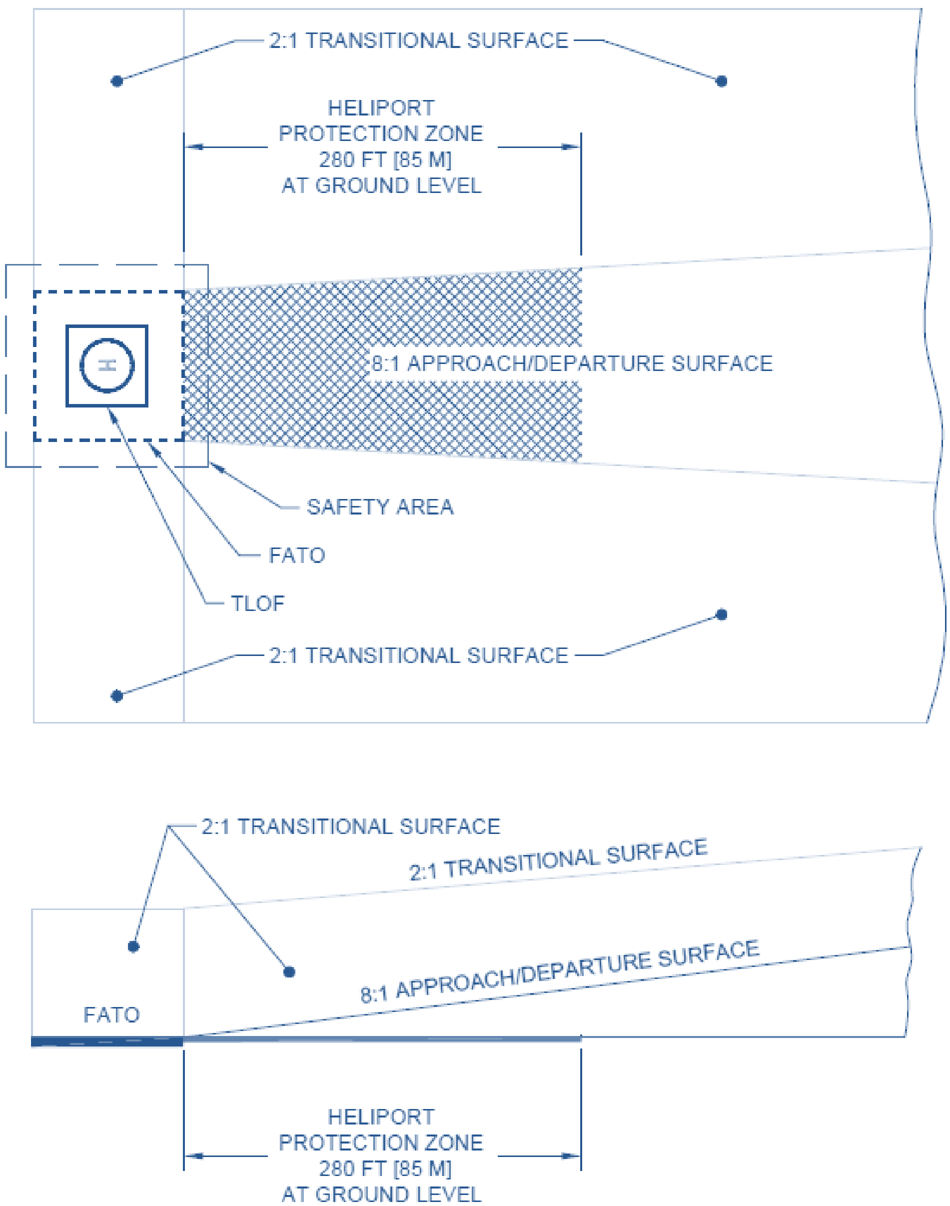
Given the remote location of the airport, it is recommended that the helipad area be light in accordance with FAA standards. This will allow for enchanced access at night and reduced confusion with ruwnays and other parking areas. Figure 3.9 provides ideal lighting configurations for heliports.

Figure 3.9 Sample Helipad Lighting Configuration



Source: Carmanah Lighting Systems

Figure 3.10 FAA Recommended Heliport Protection Zone



Source: FAA AC No: 150/5390-2C Heliport Design

3.7 Facility Requirements Summary

As identified in this chapter, the following needs should be addressed in the Alternatives Chapter of this plan. These will be the foundation for improvements to the airport and should be addressed in the planning period.

Table 3.19 provides a summary of facility requirements throughout the planning period.

Table 3.19
Summary of Facility Requirements

Facility	Planning Period Requirements	Justification
Runway 4/22	This runway needs to be maintained in order to meet wind requirements.	Runway length and width are adequate and is needed for wind coverage.
Runway 17/35	This runway needs to be maintained in order to meet wind requirements.	
Apron	Current apron areas are adequate	
Taxiways	Taxiways should be redesigned to meet standards including connector taxiways. Further evaluation of new taxiway alignments will be discussed in the alternatives portion of this plan.	Current design standards describe criteria that are currently not being met for the taxiway system. This includes direct access from aprons to runways and perpendicular taxiway connectors on full length parallels.
Conventional Hangars	A variety of conventional hangars may be necessary during the period. This will vary in size by aircraft but will need to accommodate new based jet, turbine, and single-engine aircraft.	Hangars should be built as needed for future tenants.
T-Hangars	More than one additional 10 unit T-Hangar will be needed in the forecast period.	Forecast period will need to accommodate new single engine aircraft.
Parking	Parking is adequate	As new conventional hangars are built, parking should be accommodated for the new tenant.
NAVAIDS	ASOS upgrade recommended	Provides more detailed weather and safety information to pilots
Helicopter Operations	Separate Helipad and associated apron/parking areas. Hangar facilities should be considered for storage.	Allows for dedicated operating area that will not impact fixed wing operations while providing safety enhancements.

Chapter Four:

Airport Development Alternatives

Chapter 4 - Airport Development Alternatives

The previous chapter identified the airside and landside facility requirements needed to satisfy the forecast demand throughout the entirety of the planning period. Using the identified requirements, the following recommendations have been made to address how those requirements will be met using four development alternatives. This chapter will analyze the benefits and weaknesses associated with each alternative and provide a strategy for selecting a preferred airport development plan. Once selected, the preferred alternative will be implemented into the Airport Layout Plan (ALP) drawings.

The objective of this effort is to develop a balanced airside infrastructure and appropriate landside aircraft storage infrastructure to best serve the forecast aviation demands. Assessment of each alternative is grounded primarily in local, state, and federal planning standards, however, technical judgment must also be applied in order to determine the appropriate course of action, factors surrounding development and evaluation of design options should be assessed. Alternatives to be considered will include options for both airside and landside development that include:

- Develop a safety oriented and efficient aviation facility through compliance with Federal Aviation Administration (FAA) airport design standards and airspace criteria as defined in FAA Advisory Circular (AC) 150/5300-13A.
- Compatibility with the short and long-term development cost of the defined alternatives.
- Compatibility with the short and long-range goals of the City of Albuquerque, City of Albuquerque Aviation Department, and the New Mexico Department of Transportation.
- Mitigation of environmental impacts on and off-airport.

4.1 Facility Requirements Summary

Facility requirements are intended to compare existing facilities with current safety standards as well as the demand for new or expanded facilities. The facilities previously outline in Chapter 3 have provided the baseline to determine the feasibility to accommodate various alternatives. In addition, airfield demand/capacity, airside facility requirements, and landside capacity have all been evaluated during the selection of alternatives. Furthermore, two main standards are taken into account when evaluating facility requirements. First, alternatives must meet the design requirements established by the current and future Airport Reference Code (ARC) and second, standards identified in FAA Advisory Circular 150/5300-13A, *Airport Design* must be met.

To meet future facility requirements, Double Eagle II Airport must make provisions to accommodate future operations. The demand for additional facilities was calculated in the previous chapter and can be summarized by examining forecast based aircraft and operations.

1. Based Aircraft – AEG currently accommodates 227 based aircraft; this number is expected to increase to as much as 462 by 2035. **(Table 4.1)**
2. Operations – In 2015, AEG had 67,469 aircraft operations; this is expected to rise to as much as 139,986 by 2035. **(Table 4.2)**

Table 4.1:
Based Aircraft Projections

Year	Low	Mid	High
2015	227	227	227
Projected			
2020	232	248	278
2025	236	266	330
2030	240	286	390
2035	245	308	462
AAGR	0.4%	1.5%	3.4%

Source: KSA
AAGR = Average Annual Growth Rate

Table 4.2:
Aircraft Operations Projections

Year	Low	Mid	High
2015	67,469	67,469	67,469
Projected			
2020	68,922	75,981	83,113
2025	70,157	83,889	98,888
2030	71,414	92,620	117,656
2035	72,694	102,260	139,986
AAGR	0.4%	2.0%	3.5%

Source: KSA, AAGR = Average Annual Growth Rate

Airside Requirements

Airfield facilities include infrastructure that interacts with the arrival and departure of aircraft as well as their subsequent movement around the airfield to parking and storage areas. Areas of focus include runway/taxiway dimensions, aprons, navigational aids (NAVAIDS), landing aids, and dimensional standards. These criteria are taken into account during the development of the airside alternatives.

The following airside improvements outlined in **Table 4.3** were recommended in the previous chapter and are intended to meet future design requirements as well as enhance the efficiency of the airfield. Each of the proposed alternatives will incorporate these improvements while ensuring compliance with FAA Airport Design standards.

Table 4.3:
Summary Requirements

Facility	Planning Period Requirements	Justification
Runway 4/22	This runway needs to be maintained in order to meet wind requirements.	Runway length and width are adequate and is needed for wind coverage.
Runway 17/35	This runway needs to be maintained in order to meet wind requirements.	
Apron	Current apron areas are adequate	
Taxiways	Taxiways should be redesigned to meet standards including connector taxiways. Further evaluation of new taxiway alignments will be discussed in the alternatives portion of this plan.	Current design standards describe criteria that are currently not being met for the taxiway system. This includes direct access from aprons to runways and perpendicular taxiway connectors on full length parallels.
Conventional Hangars	A variety of conventional hangars may be necessary during the period. This will vary in size by aircraft but will need to accommodate new based jet, turbine, and single-engine aircraft.	Hangars should be built as needed for future tenants.
T-Hangars	More than one additional 10 unit T-Hangars will be needed in the forecast period.	Forecast period will need to accommodate new single engine aircraft.
Parking	Parking is adequate	As new conventional hangars are built, parking should be accommodated for the new tenant.
NAVAIDS	ASOS upgrade recommended	Provides more detailed weather and safety information to pilots

Landside Requirements

Various landside improvements are recommended to accommodate current and forecast aviation activity throughout the planning period at AEG. As stated in Chapter 3, areas of particular focus include the addition of T-Hangars and conventional hangars. These facility requirements are developed from the analysis of the demand and capacity requirements, and based on standards established by the FAA Advisory Circular 150/5300-13A, *Airport Design*.

The following landside improvements were recommended in the previous chapter and are intended to meet future demands for aircraft storage, safety/security and functionality. Each of these proposed alternatives will incorporate these improvements while following compliance with FAA Airport Design Standards with regards to the following landside development.

1. Provide 10 additional T-Hangars
2. Provide additional conventional hangars

4.2 Evaluation Criteria

The following evaluation criteria have been developed to determine which of the following alternatives appropriately meet the future requirements of the Double Eagle II Airport. These criteria were based on, but not limited to, FAA Airport Design Standards, facility requirements, implementation feasibility, operational efficiency, preliminary cost of development, and preliminary potential environmental impacts.

- Safety and operational efficiency
- Ability to address aviation demand/capacity considerations
- Location, size and configuration of available on and off-airport land for development
- Viability and ease of airside access to property
- Current use of designated use of on-airport property
- Current or planned use of off-airport property adjacent to the airport
- Environmental conditions on and off-airport (noise, topography, wetlands, etc.)
- FAA imaginary airspace surfaces and height restrictions
- Land use plans of local agencies
- Development costs and financial feasibility
- Airport operational factors and design related standards criteria
- Existing and programmed roadway network
- Phasing and constructability considerations
- Benefit/Cost considerations
- Available funding
- Other factors to be determined in conjunction with the Sponsor and PAC

These design concepts represent the range of possibilities to reasonably improve certain design and operational characteristics at the airport. Following a review of these alternatives based on performance standards of future airport operational activity (individual or combination of strategies), a preferred alternative design will be selected and will be carried throughout the remainder of the study and ultimately used to update the Double Eagle II Airport layout plan.

4.3 Airside Development Alternatives

Following the inventory and forecast completed in the previous chapters, four alternatives will be evaluated to reconfigure several taxiways to comply with AC 150/5300-13A. As outlined in the inventory, Double Eagle II Airport is based on three main taxiways. Taxiway A runs full parallel to Runway 4/22, Taxiway B runs full parallel to Runway 17/35, and Taxiway C connects both runways at their midpoint. Taxiway A has six associated runway connectors and Taxiway B has three associated runway connectors.

Advisory Circular 150/5300-13A outlines the correct method for the layout of taxiways leading to a runway entrance. Taxiways should be designed to mitigate runway incursion by limiting direct access from the apron to a runway by implementing a turn prior to the runway entrance. Taxiways A1 and A3 currently present a safety hazard with their direct access to Runway 4/22 from the apron area.

Additionally, Taxiway B currently crosses into the RPZ for Runway 4/22 which represents a safety hazard for arriving aircraft. Per AC 150/5300-13A, Taxiway B currently violates the end-around taxiway (EAT) standards. Tail clearance for aircraft arriving/departing runway 4/22 is not adequate for the safe and efficient operation of Taxiway B.

The runway extension alternatives for this analysis were prepared in accordance with FAA Advisory Circular 150/5300-13A, *Airport Design*.

Description of Airside Alternatives

The following alternatives have been assembled to provide a full range of design options. These alternatives are based on the forecasts and potential future expansions at the airport. These airfield alternative options are listed below.

- **Airside Alternative 1** – Runway extension on Runways 4/22 & 17/35. Taxiway reconfiguration of Taxiways A1, A3 & B to conform to FAA AC 150/5300-13A design standards.
- **Airside Alternative 2** – Construction of Runway 17 end-around taxiway (EAT) and partial length parallel taxiway. Reconfiguration of Taxiways A & B to conform to FAA AC 150/5300-13A design standards.

- **Airside Alternative 3** – Construction of Runway 17 end-around taxiway (EAT) and full length parallel taxiway. Runway 4/22 extension and partial length parallel taxiway. Reconfiguration of Taxiways A & B to conform to FAA AC 150/5300-13A design standards.
- **Airside Alternative 4** – Runway 17/35 extension and full length parallel taxiway. Reconfiguration of Taxiways A & B to conform to FAA AC 150/5300-13A design standards.

Airside Alternative 1

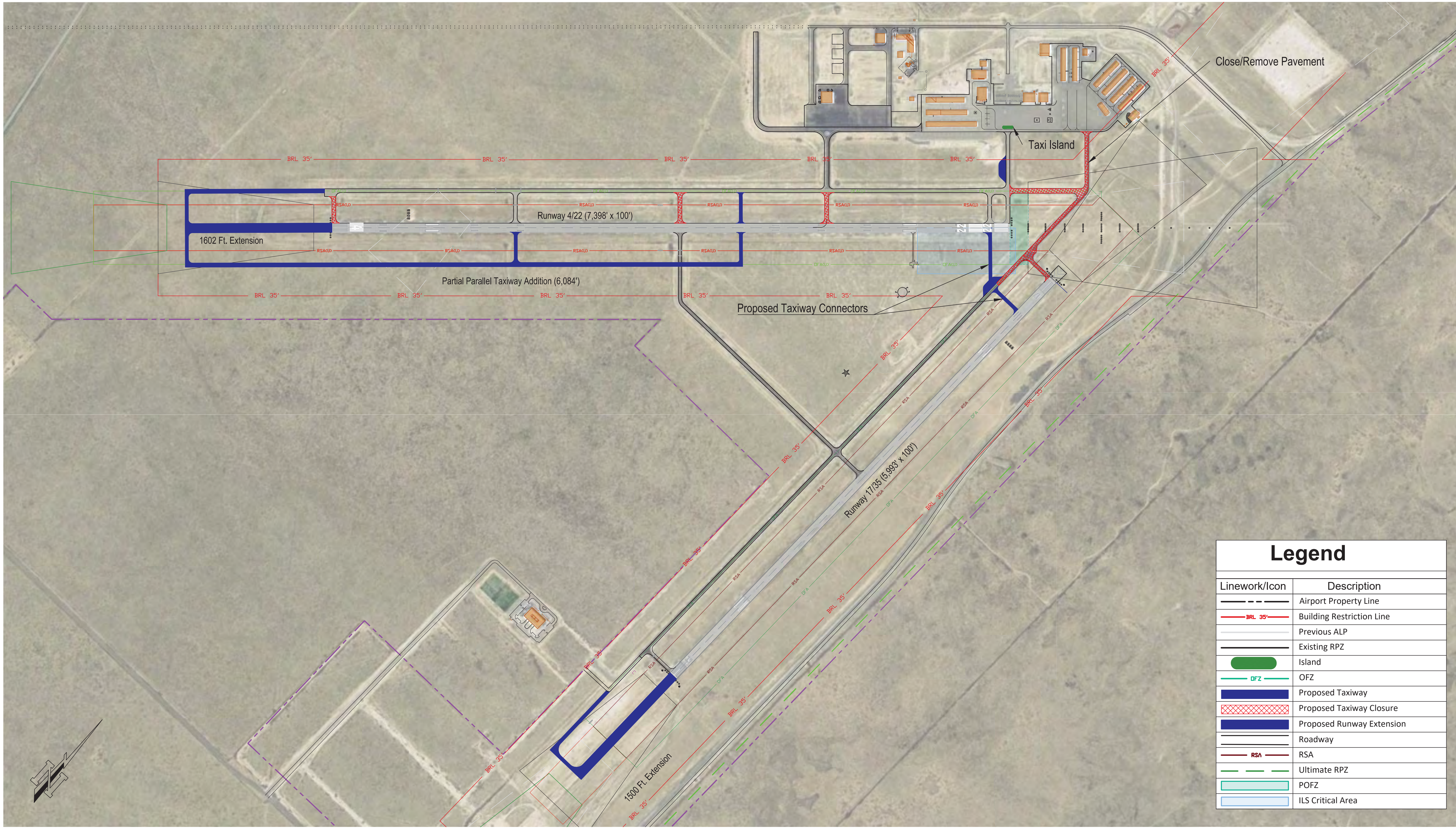
Alternative 1 involves the following airfield modifications, enhancements and design considerations:

- Runway 35 extended 1,500 feet
- Runway 4 extended 1,000 feet
- Construction of a partial length parallel taxiway southeast of runway 4/22
- Reconfiguration of Taxiways A, A1, & B

Alternative 1 will feature modifications and improvements with the goal of satisfying future demand and the design standards outlined in FAA AC 150/5300-13A. It is recommended that Runway 4/22 include a 1,000-ft. extension, bringing the total length to 8,398 feet. Due to the high elevation (5837.4 ft.) above sea level, the extension is required to ensure the airport can continue to accommodate the design aircraft (ADG-II) efficiently and safely. This runway extension will include a partial length parallel taxiway that will increase the ability for aircraft to move about the airport efficiently, subsequently reducing taxi times and runway occupancy times. It is recommended that Runway 17/35 also include an extension of 1,500 feet, bringing the total length to 7,493 feet.

Also, included in Alternative 1 is the recommended demolition of the portions of Taxiway A and B located north of Runway 4/22. This demolition will allow for the construction of a new taxiway that will mitigate the current violation of the end-around taxiway (EAT) standards. These modifications will improve the safety and efficiency of the airfield.

Airside Alternative 1 is depicted in **Exhibit 4.1**.



Double Eagle II Airport Master Plan

Figure 4.1: Airside Alternative 1

Airside Alternative 1 - Analysis

Airside Alternative 1 provides additional expansion potential by implementing runway extensions on Runways 4 and 35. Taxi times and runway occupancy are also reduced with the construction of a partial length parallel taxiway southeast of Runway 4/22. The evaluation criteria results are presented in **Table 4.4**.

Pros:

- Provides increased capacity to meet forecast demand.
- Mitigates safety issues that currently exist in relation to taxiway configuration north of Runway 4/22.

Cons:

- Requires demolition of existing taxiway infrastructure.
- Shortens the takeoff/landing distance available on Runway 17/35 with the required displaced threshold.

Table 4.4
Airside Alternative 1 Evaluation Criteria

Criteria	Score
Safety and efficiency of aviation operations	2
Ability to accommodate expected general aviation demand	3
Acceptability to users, FAA, and the community	2
Land availability and ownership	3
Environmental Factors	2
Airspace/obstruction requirements	2
Political, jurisdictional, and implementation factors	3
Economic Feasibility	2
Phasing and constructability considerations	3
Accessibility	3
Total	25/30

Airside Alternative 2

Airside Alternative 2 involves the following airfield modifications, enhancements and design considerations:

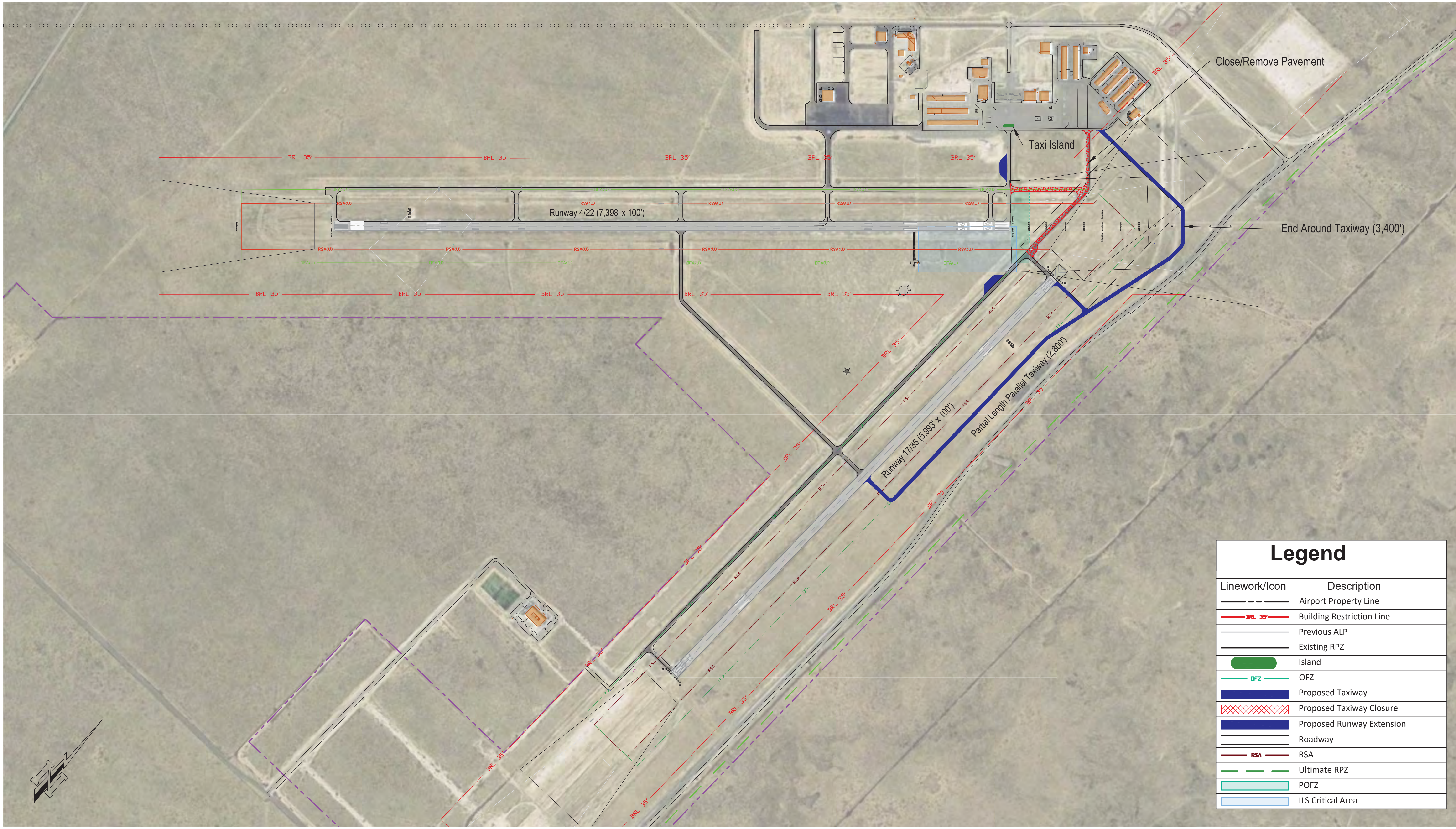
- Construction of an end-around taxiway (EAT) serving Runway 17
- Construction of a partial length parallel taxiway to the east of runway 17/35
- Reconfiguration of Taxiways A, A1, & B

Airside Alternative 2 will feature the construction of an end-around taxiway serving Runway 17. This taxiway will satisfy the design standards outlines in FAA AC 150/5300-13A. It is recommended that the EAT be constructed to provide adequate separation between taxiing aircraft and aircraft arriving Runways 17 & 22.

Additionally, the construction of a partial length parallel taxiway will connect the new EAT to existing Taxiway B2, providing access to the west side of the airfield.

Also, included in Airside Alternative 2 is the recommended demolition of the portions of Taxiway A & B located north of Runway 4/22. This demolition will allow for the construction of a new taxiway that will mitigate the current violation of the end-around taxiway standards. These modifications will improve the safety and efficiency of the airfield.

Airside Alternative 2 is depicted in **Exhibit 4.2**.



Double Eagle II Airport Master Plan

Figure 4.2: Airside Alternative 2

Airside Alternative 2 - Analysis

Airside Alternative 2 provides an end-around taxiway for Runway 17, mitigating safety issues and allowing the Airport to meet the requirements outlined in FAA AC 150/5300-13A. Taxi times and runway occupancy are also reduced with the construction of a partial length parallel taxiway east of Runway 17/35. The evaluation criteria results are presented in **Table 4.5**.

Pros:

- Mitigates safety issues that currently exist in relation to taxiway configuration north of Runway 4/22.
- Low cost as compared to subsequent alternatives

Cons:

- Requires demolition of existing taxiway infrastructure.
- Does not provide increased airport capacity to meet forecast demand.

Table 4.5
Airside Alternative 2 Evaluation Criteria

Criteria	Score
Safety and efficiency of aviation operations	3
Ability to accommodate expected general aviation demand	1
Acceptability to users, FAA, and the community	2
Land availability and ownership	3
Environmental Factors	2
Airspace/obstruction requirements	2
Political, jurisdictional, and implementation factors	2
Economic Feasibility	2
Phasing and constructability considerations	3
Accessibility	2
Total	22/30

Airside Alternative 3

Alternative 3 involves the following airfield modifications, enhancements and design considerations:

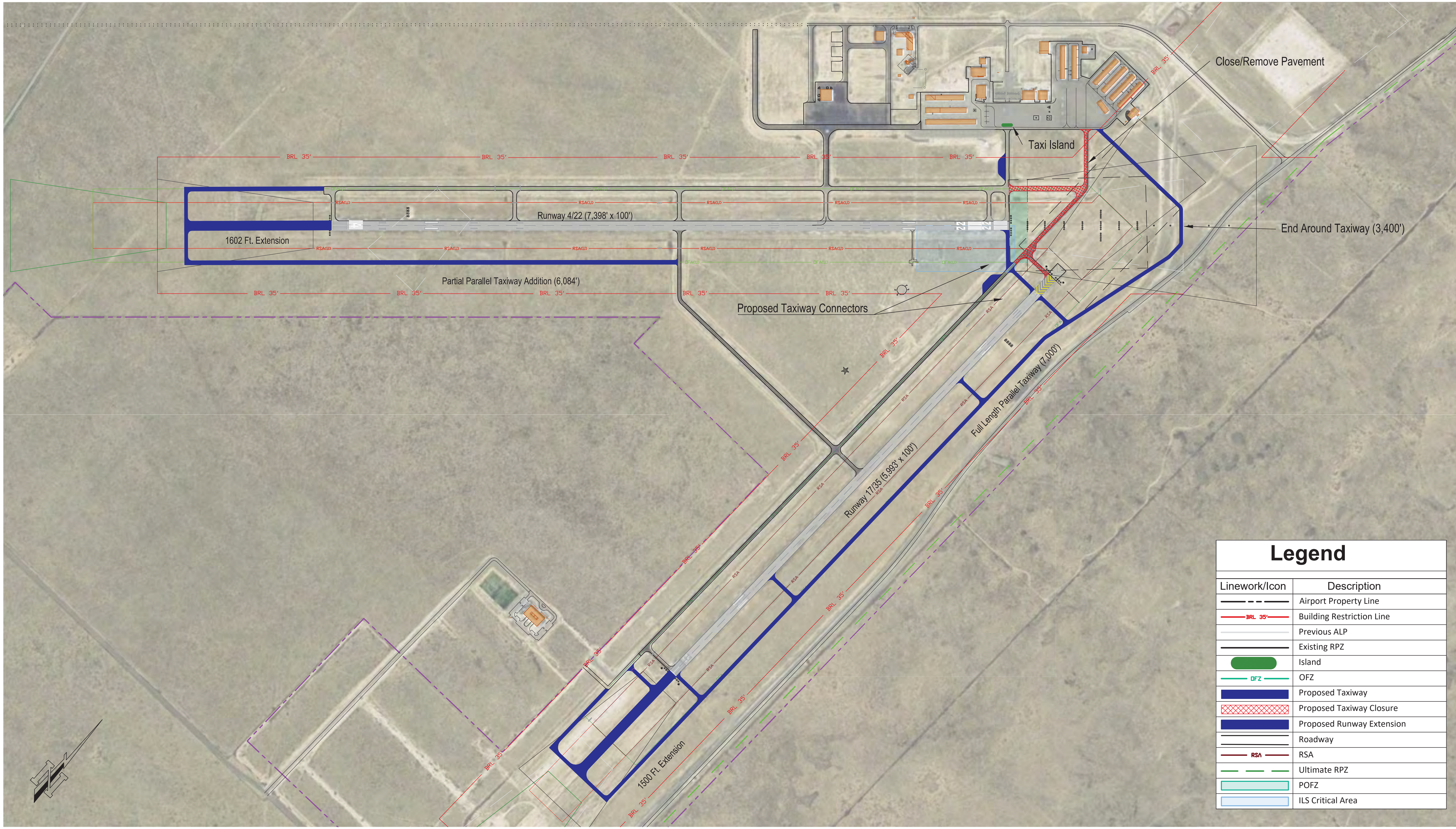
- Construction of an end-around taxiway (EAT) serving Runway 17
- Construction of a full length parallel taxiway to the east of runway 17/35
- Runway 35 extended 1,500 feet
- Runway 4 extended 1,000 feet
- Reconfiguration of Taxiways A, A1, & B

Airside Alternative 3 will feature the construction of an end-around taxiway serving Runway 17. This taxiway will satisfy the design standards outlines in FAA AC 150/5300-13A. It is recommended that the EAT be constructed to provide adequate separation between taxiing aircraft and aircraft arriving Runways 17 & 22.

Additionally, it is recommended that Runway 4/22 include a 1,000-ft. extension, bringing the total length to 8,398 feet. Due to the high elevation (5837.4 ft.) above sea level, the extension is required to ensure airport can continue to accommodate the design aircraft (ADG-II) efficiently and safely. This runway extension will include a full length parallel taxiway that will increase the ability for aircraft to move about the airport efficiently, subsequently reducing taxi times and runway occupancy times. It is recommended that Runway 17/35 also include an extension of 1,500 feet, bringing the total length to 7,493 feet.

Also, included in Airside Alternative 3 is the recommended demolition of the portions of Taxiway A & B located north of Runway 4/22. This demolition will allow for the construction of a new taxiway that will mitigate the current violation of the end-around taxiway standards. These modifications will improve the safety and efficiency of the airfield.

Airside Alternative 3 is depicted in **Exhibit 4.3**.



Double Eagle II Airport Master Plan

Figure 4.3: Airside Alternative 3

Airside Alternative 3 - Analysis

Airside Alternative 3 provides additional expansion potential by implementing runway extensions on Runways 4 and 35. The construction of an end-around taxiway mitigates safety issues and allows the Airport to meet the requirements outlined in FAA AC 150/5300-13A. Taxi times and runway occupancy are also reduced with the construction of a partial length parallel taxiway southeast of Runway 4/22. The evaluation criteria results are presented in **Table 4.6**.

Pros:

- Provides increased capacity to meet forecast demand.
- Mitigates safety issues that currently exist in relation to taxiway configuration north of Runway 4/22.

Cons:

- Requires demolition of existing taxiway infrastructure.
- Shortens the takeoff/landing distance available on Runway 17/35 with the required displaced threshold.
- Costly development alternative

Table 4.6
Airside Alternative 3 Evaluation Criteria

Criteria	Score
Safety and efficiency of aviation operations	3
Ability to accommodate expected general aviation demand	3
Acceptability to users, FAA, and the community	2
Land availability and ownership	3
Environmental Factors	2
Airspace/obstruction requirements	3
Political, jurisdictional, and implementation factors	2
Economic Feasibility	1
Phasing and constructability considerations	2
Accessibility	2
Total	17/30

Airside Alternative 4

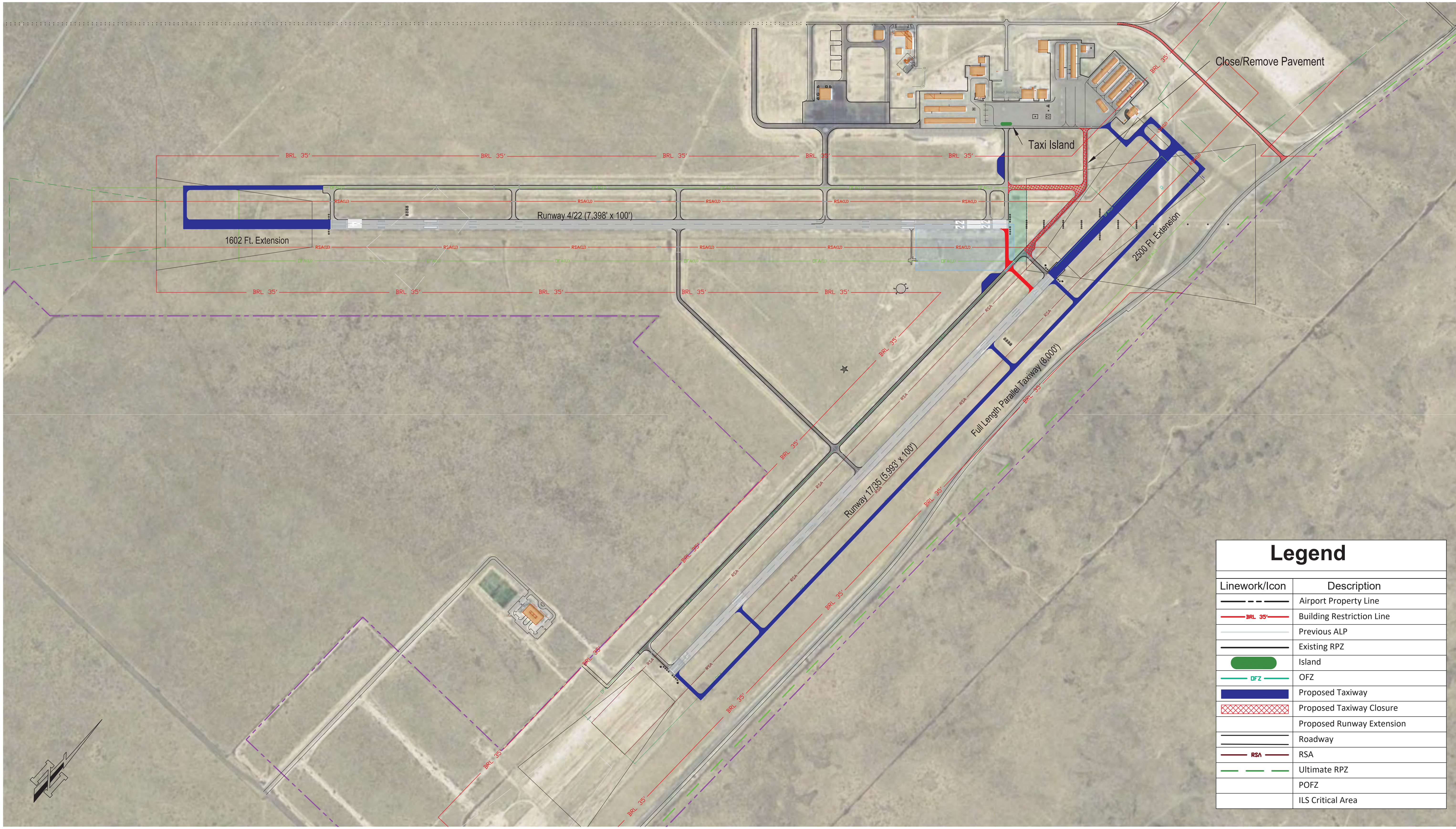
Airside Alternative 4 involves the following airfield modifications, enhancements and design considerations:

- Runway 17 extended 2,000 feet
- Construction of a full length parallel taxiway to the east of runway 17/35
- Reconfiguration of Taxiways A, A1, & B

Airside Alternative 4 will feature modifications and improvements with the goal of satisfying future demand and the design standards outlines in FAA AC 150/5300-13A. It is recommended that Runway 17-35 include a 2,000-ft. extension (to the north), bringing the total length to 7,993 feet. Due to the high elevation (5,837 ft.) above sea level, the extension is required to ensure airport can continue to accommodate the design aircraft (ADG-II) efficiently and safely. This runway extension will include a full length parallel taxiway that will increase the ability for aircraft to move about the airport efficiently, subsequently reducing taxi times and runway occupancy times.

Also, included in Airside Alternative 4 is the recommended demolition of the portions of Taxiway A & B located north of Runway 4/22. This demolition will allow for the construction of a new taxiway that will mitigate the current violation of the end-around taxiway standards. These modifications will improve the safety and efficiency of the airfield.

Airside Alternative 4 is depicted in **Exhibit 4.4**.



Double Eagle II Airport Master Plan

Figure 4.4: Airside Alternative 4

Airside Alternative 4 - Analysis

Airside Alternative 4 provides additional expansion potential by implementing a 2,000-foot runway extension on Runway 17 and 1,000 foot extension of Runway 4. The reconfiguration of taxiways helps to mitigate safety issues and allows the Airport to meet the requirements outlined in FAA AC 150/5300-13A. Taxi times and runway occupancy are also reduced with the construction of a full length parallel taxiway east of Runway 17/35. The evaluation criteria results are presented in **Table 4.7**.

Pros:

- Provides increased capacity to meet forecast demand.
- Mitigates safety issues that currently exist in relation to taxiway configuration north of Runway 4/22.

Cons:

- Requires demolition of existing taxiway infrastructure.
- Costly development alternative
- Introduces new concerns with approach surfaces for Runway 4/22

Table 4.7
Airside Alternative 4 Evaluation Criteria

Criteria	Score
Safety and efficiency of aviation operations	1
Ability to accommodate expected general aviation demand	2
Acceptability to users, FAA, and the community	1
Land availability and ownership	2
Environmental Factors	2
Airspace/obstruction requirements	1
Political, jurisdictional, and implementation factors	2
Economic Feasibility	2
Phasing and constructability considerations	2
Accessibility	2
Total	17/30

Helicopter Operations Facility

Due to an increase in rotorcraft demand, it is recommended that the Double Eagle II Airport develop an alternate operations facility that will solely function as a rotorcraft facility, allowing these specialized tenants to remain separate from other air traffic. Currently, the airport is a frequent training and operations destination for U.S. Army Boeing CH-47 Chinook Helicopter. Given their size and special handling requirements, a dedicated facility would provide a more efficient operating environment.

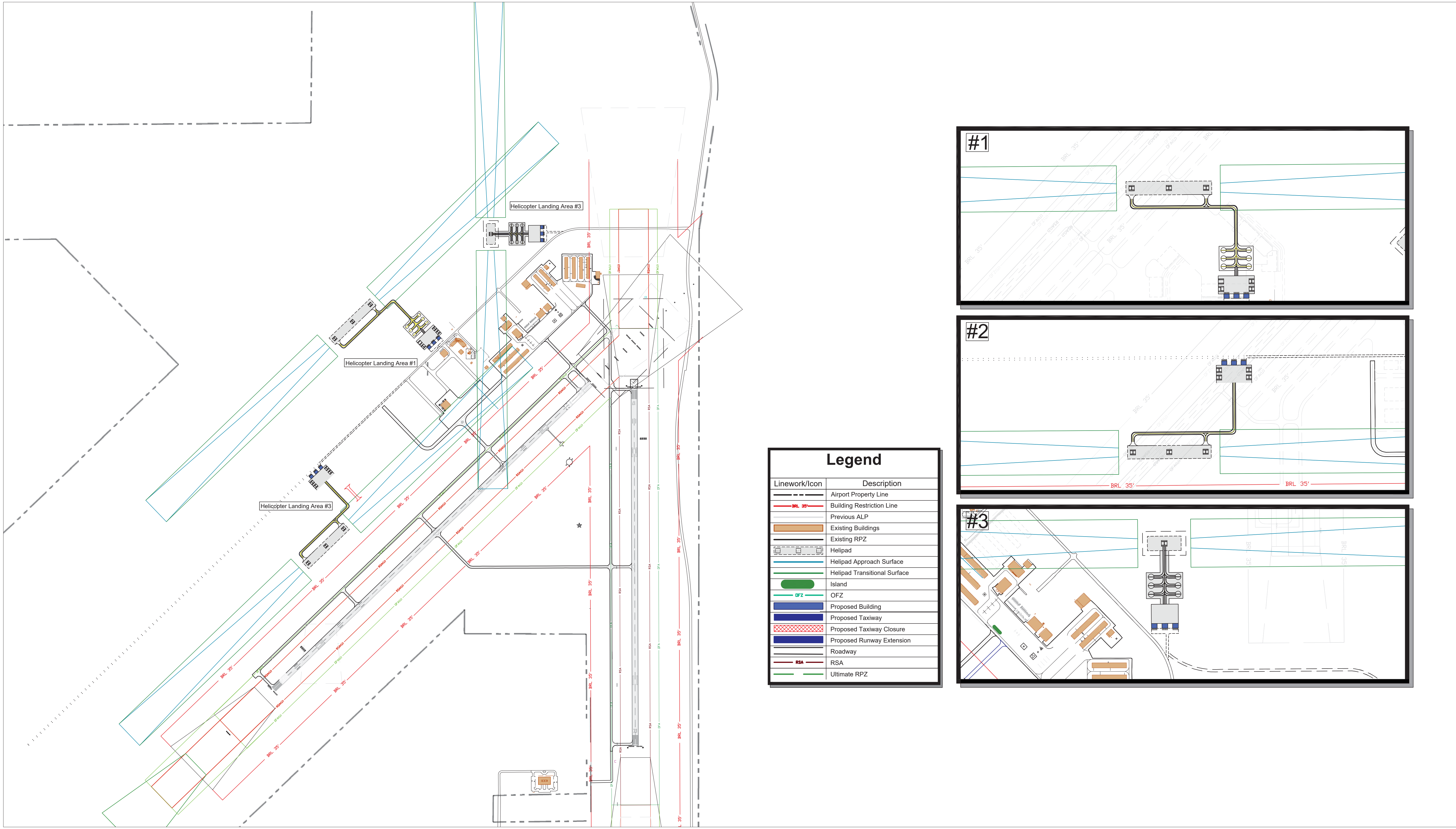
Additionally, the Albuquerque Police Department has expressed interest in moving operations to Double Eagle II Airport. They currently operate the Euro copter EC-120B helicopter. This facility would give rotorcraft the necessary amenities that guarantee safety and efficiency.

Exhibit 4.5 shows the three proposed alternatives for the development of a helicopter operations facility.

Helipad Alternative 1 (preferred) shows the facility located directly northwest of the airport with a layout parallel to Runway 4/22. This layout would allow the helicopters to approach the airport without impacting fixed wing traffic landing/departing both Runway 4/22 and 17/35.

Helipad Alternative 2 shows the facility located on the southwest end of Runway 4/22. This facility offers the same capacity as Alternative 1, however, the approach paths are set up in such a way that will require coordination with aircraft arriving/departing Runway 4/22.

Helipad Alternative 3 shows the facility located at the far northwest corner of the airfield with a layout parallel to Runway 17/35. This layout would allow helicopter traffic to approach the airport without impacting fixed wing traffic landing/departing Runway 17/35. Coordination would be required with all traffic utilizing Runway 4/22.



Double Eagle II Airport Master Plan

Figure 4.5: Heliport Alternatives

4.4 Landside Development Alternatives

With the completion of the Landside Facilities Requirements based on the inventory and forecast in previous chapters, alternatives will be presented for landside development evaluation.

To help determine terminal and support area facilities for the future planning periods, landside capacity and future demand were evaluated for itinerant and based aircraft parking aprons, aircraft storage facilities, automobile parking, and support area requirements. Findings for Double Eagle II Airport were generally sufficient in these areas, with the exception of hangar space. Apron space, general aviation terminal space, fuel storage and automobile parking all have sufficient capacity at the Airport. Conventional hangars are needed from the beginning of our planning period (2016-2020) and t-hangar space will be needed halfway through the planning period by 2026.

Development strategies were explored for Double Eagle II Airport based on the following criteria:

- Market position
- Regional economic development opportunities and incentives
- SWOT analysis results from stakeholders
- New Mexico Aviation Goals
- Property attributes

A review of the criteria resulted in these objectives:

- To the extent feasible, fund enabling projects to make development opportunities more attractive
- Focus on helicopter MRO and flight training opportunities
- Track aviation maintenance and training sectors for trends
- Develop and market airport infrastructure to commercial, business, and aircraft industry sectors

By analyzing the landside facility needs as well as the development strategies presented through the Master Plan process, three alternatives were selected to be evaluated for development. The alternatives for this analysis were prepared in accordance with FAA Advisory Circular 150/5300-13A, *Airport Design*.

Description of Landside Alternatives

The following alternatives have been assembled to provide development options. These alternatives are based on the facilities requirements and potential future expansions at the airport. Largely, the landside alternatives can be implemented independently of the airside alternatives. This provides flexibility in adding hangars, apron, and additional support facilities. The landside alternative options are listed below.

The alternatives include options for the addition of helicopter hangars and a helicopter maintenance and repair operator (MRO) facility (*see section 4.4.3 for Helicopter Operations detail.*) The addition of a pilot farm/pilot school. Acquisition or exchange property to accommodate the addition of the pilot farm/pilot school. The addition of conventional hangars and additional t-hangars based on demand. The relocation of existing t-hangars and three facilities to conform to FAA AC 150/5300-13A design standards.

Landside Alternative 1 – This alternative includes the addition of helicopter hangars and a helicopter maintenance and repair operator (MRO) facility on the west side of the existing terminal. The addition of a pilot farm/pilot school is provided in the middle of the existing runways and Taxiway C. This provides access to both runway ends for flight training activity. Additionally, this alternative provides infill hangar development near the terminal building while relocating T-Hangars near the Building Restriction Line on the north end.

Landside Alternative 2 – Alternative 2 requires the addition of helicopter hangars and a helicopter maintenance and repair operator (MRO) facility along the existing flight line on the south end of the terminal area. The addition of a pilot farm/pilot school is provided on the south east perimeter of runway 4/22 and would require additional taxiway infrastructure as provided in Airside Alternative 3. The alternative provides additional of conventional hangars and additional t-hangars in the infill areas.

Landside Alternative 3 – This alternative moves the helicopter hangars and a helicopter maintenance and repair operator (MRO) facility to the far north end of the airport while adding space for the pilot farm/pilot school the south end of the terminal area. Infill hangars are provided in the existing terminal area the T-Hangars on the north end remain in place.

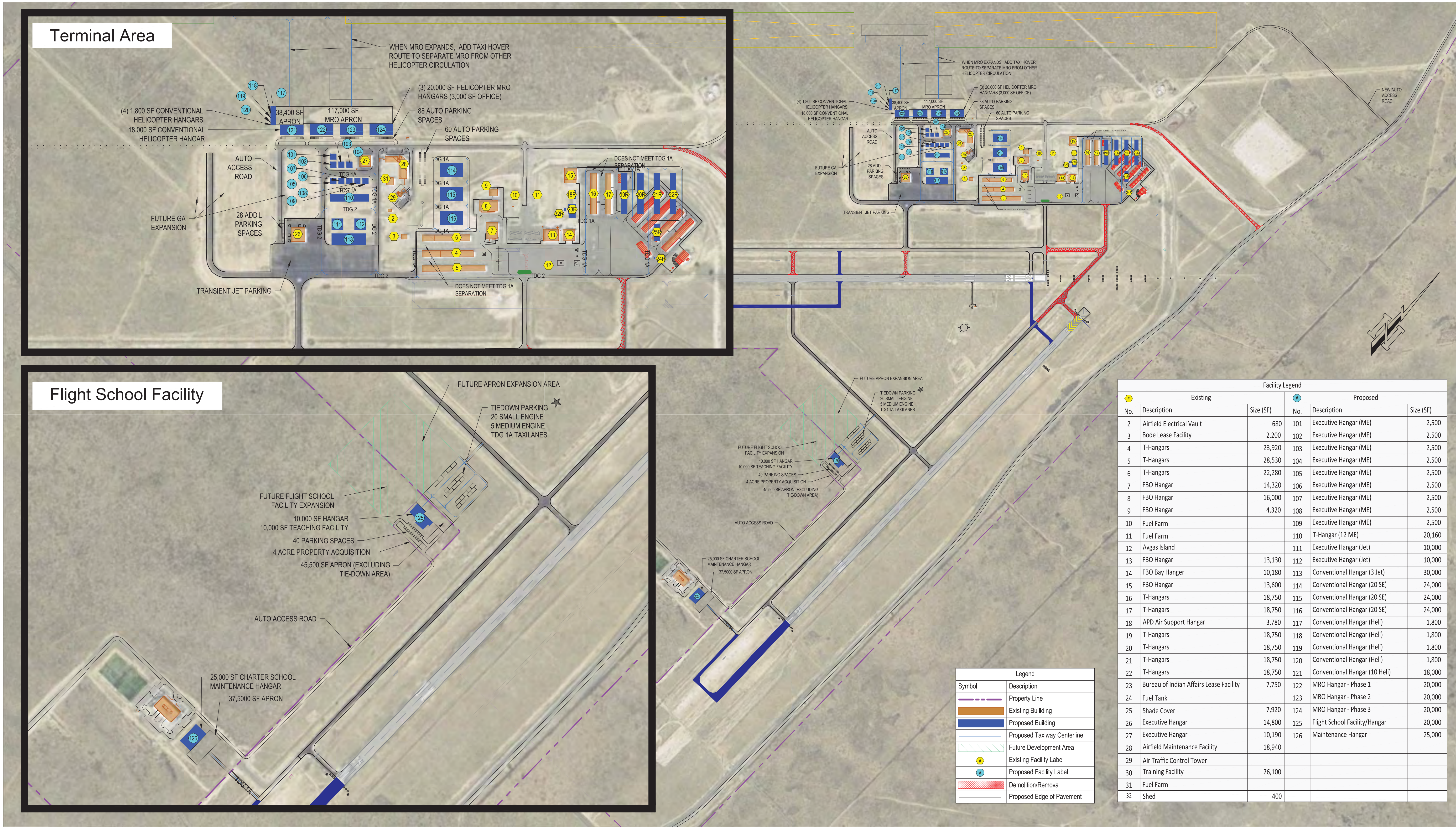
Landside Alternative 1

Landside Alternative 1 involves the following landside modifications and additions:

- Addition of four 1,800 square feet conventional helicopter hangars
- Addition of one 18,000 square feet conventional helicopter hangar
- Addition of three 20,000 square feet helicopter MRO hangars (3,000 square feet of office space)
- Addition of 117,000 square feet of helicopter MRO apron
- Addition of 38,400 square feet of helicopter apron
- Extension of access road
- Additional parking spaces for helicopter operations facility area
- Addition of 10,000 square feet hangar for pilot farm/pilot school
- Addition of 10,000 square feet teaching facility for pilot farm/pilot school
- Addition of 45,500 square feet apron for pilot farm/pilot school
- Addition of tie-down parking for 20 SE and 5 ME aircraft for pilot farm/pilot school
- Additional parking spaces for pilot farm/pilot school
- Acquisition/Exchange of 4 acres of property for pilot farm/pilot school
- Relocate APD Air Support Hangar
- Relocate Bureau of Indian Affairs Lease Facility
- Relocate shed
- Relocate four t-hangars to comply with 35 feet building restriction line per FAA AC 150/5300-13A design standards

Landside Alternative 1 is depicted in **Exhibit 4.6**.

This Space Left Blank Intentionally



Facility Legend

Existing			Proposed		
No.	Description	Size (SF)	No.	Description	Size (SF)
2	Airfield Electrical Vault	680	101	Executive Hangar (ME)	2,500
3	Bode Lease Facility	2,200	102	Executive Hangar (ME)	2,500
4	T-Hangars	23,920	103	Executive Hangar (ME)	2,500
5	T-Hangars	28,530	104	Executive Hangar (ME)	2,500
6	T-Hangars	22,280	105	Executive Hangar (ME)	2,500
7	FBO Hangar	14,320	106	Executive Hangar (ME)	2,500
8	FBO Hangar	16,000	107	Executive Hangar (ME)	2,500
9	FBO Hangar	4,320	108	Executive Hangar (ME)	2,500
10	Fuel Farm		109	Executive Hangar (ME)	2,500
11	Fuel Farm		110	T-Hangar (12 ME)	20,160
12	Avgas Island		111	Executive Hangar (Jet)	10,000
13	FBO Hangar	13,130	112	Executive Hangar (Jet)	10,000
14	FBO Bay Hanger	10,180	113	Conventional Hangar (3 Jet)	30,000
15	FBO Hangar	13,600	114	Conventional Hangar (20 SE)	24,000
16	T-Hangars	18,750	115	Conventional Hangar (20 SE)	24,000
17	T-Hangars	18,750	116	Conventional Hangar (20 SE)	24,000
18	APD Air Support Hangar	3,780	117	Conventional Hangar (Heli)	1,800
19	T-Hangars	18,750	118	Conventional Hangar (Heli)	1,800
20	T-Hangars	18,750	119	Conventional Hangar (Heli)	1,800
21	T-Hangars	18,750	120	Conventional Hangar (Heli)	1,800
22	T-Hangars	18,750	121	Conventional Hangar (10 Heli)	18,000
23	Bureau of Indian Affairs Lease Facility	7,750	122	MRO Hangar - Phase 1	20,000
24	Fuel Tank		123	MRO Hangar - Phase 2	20,000
25	Shade Cover	7,920	124	MRO Hangar - Phase 3	20,000
26	Executive Hangar	14,800	125	Flight School Facility/Hangar	20,000
27	Executive Hangar	10,190	126	Maintenance Hangar	25,000
28	Airfield Maintenance Facility	18,940			
29	Air Traffic Control Tower				
30	Training Facility	26,100			
31	Fuel Farm				
32	Shed	400			

Double Eagle II Airport Master Plan

Figure 4.6: Landside Alternative 1

Landside Alternative 1 - Analysis

Landside Alternative 1 provides additional development potential by adding helicopter hangar space as well as MRO space for additional rotorcraft activity. The addition of a pilot farm/pilot school creates opportunities for economic development as well as an increase in operations at Double Eagle II Airport.

Pros:

- Good location, expandable east and west, meets demand
- Ability to utilize existing ILS approach
- In view of air traffic control tower (ATCT)
- Close to existing infrastructure and fueling
- Separates helicopter traffic from fixed wing traffic
- Central access to both runways
- Separates flight training activity from other airport operations

Cons:

- Separated from other facilities on airport
- May require a land acquisition/exchange
- Remote location from existing infrastructure
- No infrastructure near development
- Requires access road extension

This Space Left Blank Intentionally

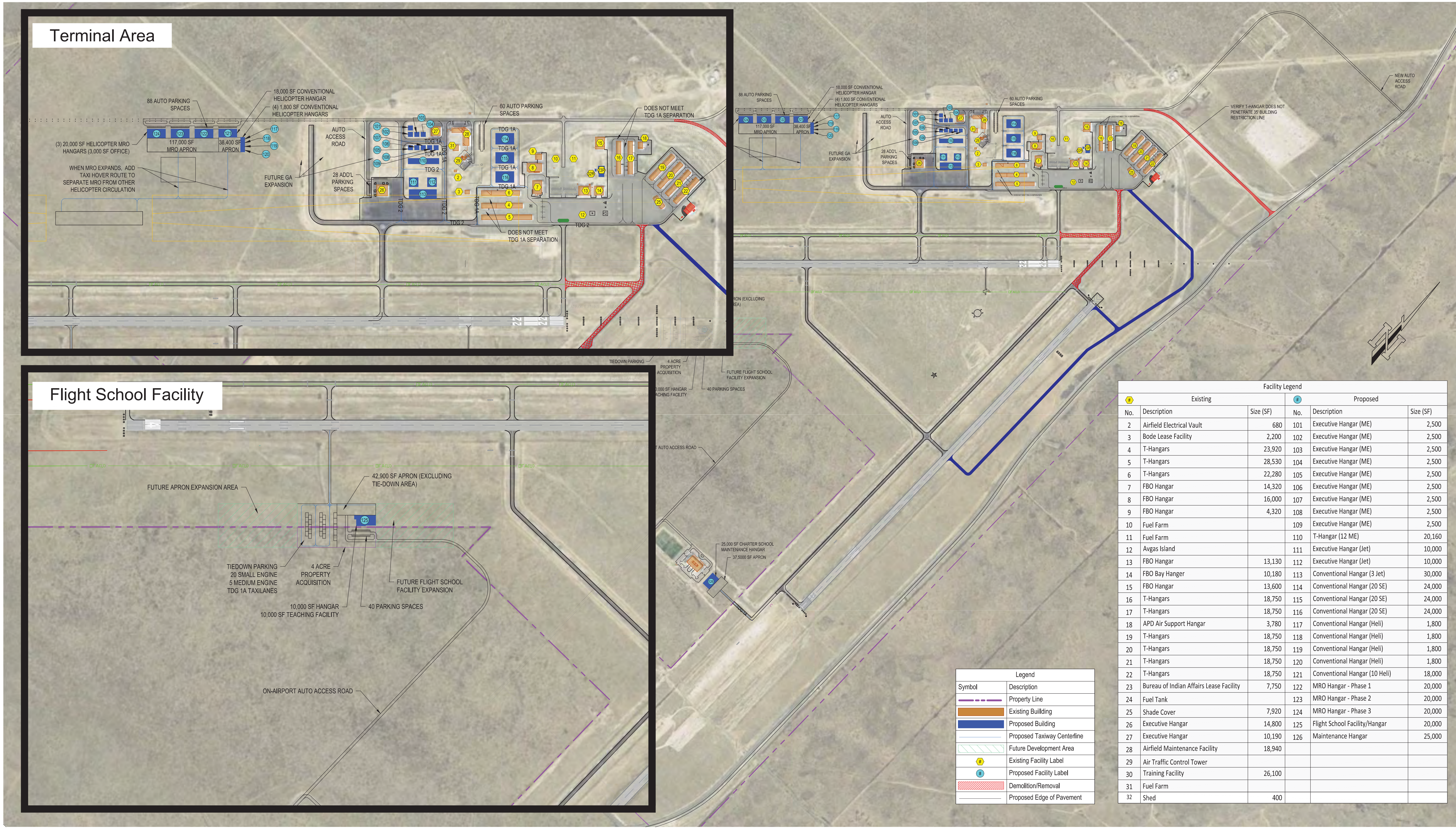
Landside Alternative 2

Landside Alternative 2 involves the following landside modifications and additions:

- Addition of four 1,800 square feet conventional helicopter hangars
- Addition of one 18,000 square feet conventional helicopter hangar
- Addition of three 20,000 square feet helicopter MRO hangars (3,000 square feet of office space)
- Addition of 117,000 square feet of helicopter MRO apron
- Addition of 38,400 square feet of helicopter apron
- Extension of access road
- Additional parking spaces for helicopter operations facility area
- Addition of 10,000 square feet hangar for pilot farm/pilot school
- Addition of 10,000 square feet teaching facility for pilot farm/pilot school
- Addition of 42,900 square feet apron for pilot farm/pilot school
- Addition of tie-down parking for 20 SE and 5 ME aircraft for pilot farm/pilot school
- Additional parking spaces for pilot farm/pilot school
- Acquisition/Exchange of 4 acres of property for pilot farm/pilot school
- Relocate Bureau of Indian Affairs Lease Facility
- Relocate shed

Landside Alternative 2 is depicted in **Exhibit 4.7**.

This Space Left Blank Intentionally



Legend	
Symbol	Description
	Property Line
	Existing Buillding
	Proposed Building
	Proposed Taxiway Centerline
	Future Development Area
	Existing Facility Label
	Proposed Facility Label
	Demolition/Removal
	Proposed Edge of Pavement

Facility Legend

Existing			Proposed		
No.	Description	Size (SF)	No.	Description	Size (SF)
2	Airfield Electrical Vault	680	101	Executive Hangar (ME)	2,500
3	Bode Lease Facility	2,200	102	Executive Hangar (ME)	2,500
4	T-Hangars	23,920	103	Executive Hangar (ME)	2,500
5	T-Hangars	28,530	104	Executive Hangar (ME)	2,500
6	T-Hangars	22,280	105	Executive Hangar (ME)	2,500
7	FBO Hangar	14,320	106	Executive Hangar (ME)	2,500
8	FBO Hangar	16,000	107	Executive Hangar (ME)	2,500
9	FBO Hangar	4,320	108	Executive Hangar (ME)	2,500
10	Fuel Farm		109	Executive Hangar (ME)	2,500
11	Fuel Farm		110	T-Hangar (12 ME)	20,160
12	Avgas Island		111	Executive Hangar (Jet)	10,000
13	FBO Hangar	13,130	112	Executive Hangar (Jet)	10,000
14	FBO Bay Hanger	10,180	113	Conventional Hangar (3 Jet)	30,000
15	FBO Hangar	13,600	114	Conventional Hangar (20 SE)	24,000
16	T-Hangars	18,750	115	Conventional Hangar (20 SE)	24,000
17	T-Hangars	18,750	116	Conventional Hangar (20 SE)	24,000
18	APD Air Support Hangar	3,780	117	Conventional Hangar (Heli)	1,800
19	T-Hangars	18,750	118	Conventional Hangar (Heli)	1,800
20	T-Hangars	18,750	119	Conventional Hangar (Heli)	1,800
21	T-Hangars	18,750	120	Conventional Hangar (Heli)	1,800
22	T-Hangars	18,750	121	Conventional Hangar (10 Heli)	18,000
23	Bureau of Indian Affairs Lease Facility	7,750	122	MRO Hangar - Phase 1	20,000
24	Fuel Tank		123	MRO Hangar - Phase 2	20,000
25	Shade Cover	7,920	124	MRO Hangar - Phase 3	20,000
26	Executive Hangar	14,800	125	Flight School Facility/Hangar	20,000
27	Executive Hangar	10,190	126	Maintenance Hangar	25,000
28	Airfield Maintenance Facility	18,940			
29	Air Traffic Control Tower				
30	Training Facility	26,100			
31	Fuel Farm				
32	Shed	400			

Double Eagle II Airport Master Plan

Figure 4.7: Landside Alternative 2

Landside Alternative 2 - Analysis

Landside Alternative 2 also provides additional development potential by adding helicopter hangar space as well as MRO space for additional rotorcraft activity. The addition of a pilot farm/pilot school creates opportunities for economic development as well as an increase in operations at Double Eagle II Airport. Differing locations make the new facilities in Alternative 2 slightly more remote than Alternative 1.

Pros:

- Location is expandable, meets demand
- Close to existing infrastructure and fueling, but farther than Alternative 1
- Good visibility of the flight school by the Air Traffic Control Tower
- Separates flight training activity from other airport operations

Cons:

- Approach from north will fly over existing hangar facilities and national park
- Could impact long-term hangar expansion
- Could impact long-term aeronautical manufacturing development
- May require a land acquisition/exchange
- Remote location from existing infrastructure
- No infrastructure near development
- Requires access road extension
- Potential need for new partial parallel taxiway

This Space Left Blank Intentionally

Landside Alternative 3

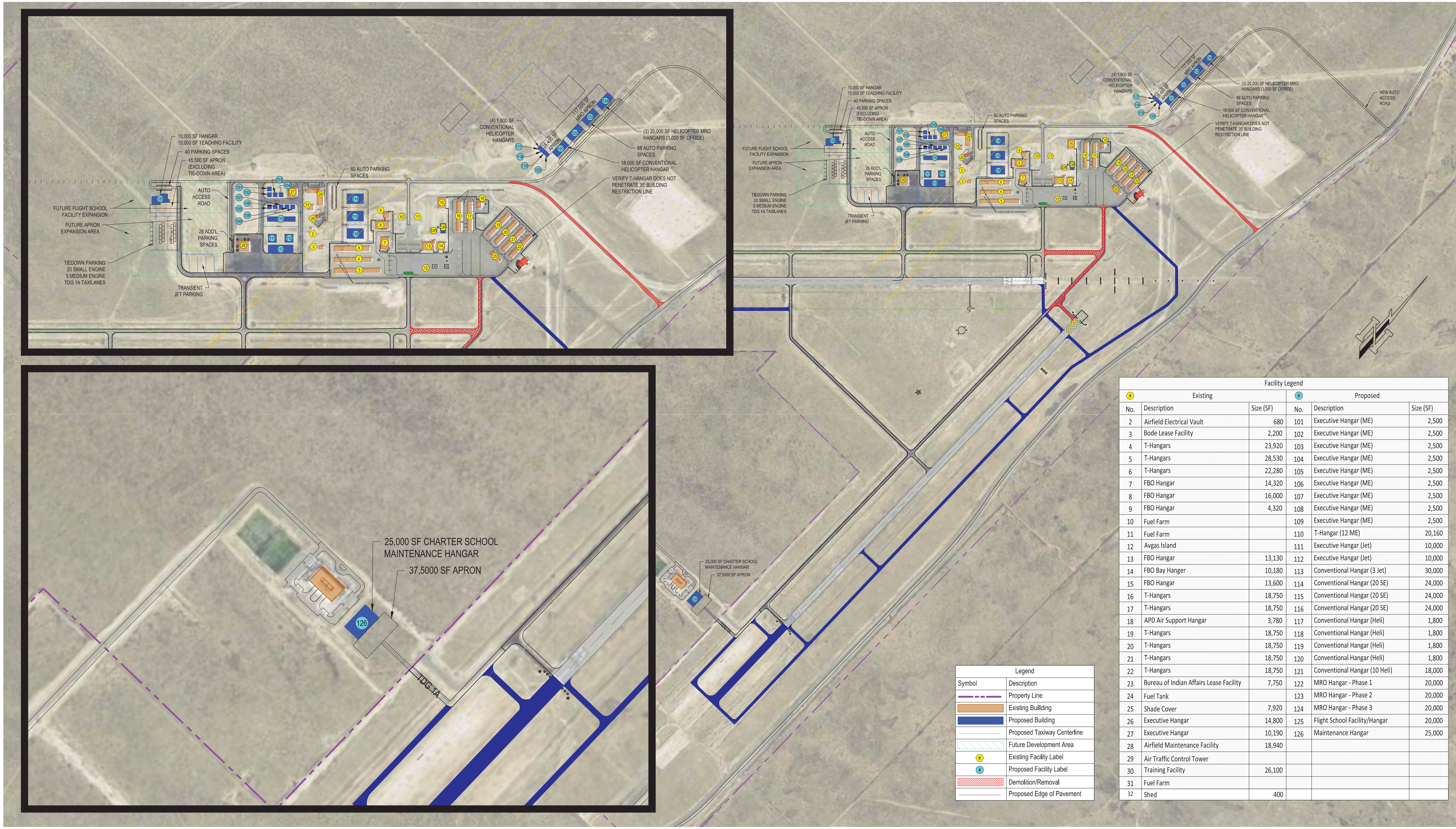
Landside Alternative 3 involves the following landside modifications and enhancements:

- Addition of four 1,800 square feet conventional helicopter hangars
- Addition of one 18,000 square feet conventional helicopter hangar
- Addition of three 20,000 square feet helicopter MRO hangars (3,000 square feet of office space)
- Addition of 117,000 square feet of helicopter MRO apron
- Addition of 38,400 square feet of helicopter apron
- Extension of access road
- Additional parking spaces for helicopter operations facility area
- Addition of 10,000 square feet hangar for pilot farm/pilot school
- Addition of 10,000 square feet teaching facility for pilot farm/pilot school
- Addition of 45,500 square feet apron for pilot farm/pilot school
- Addition of tie-down parking for 20 SE and 5 ME aircraft for pilot farm/pilot school
- Additional parking spaces for pilot farm/pilot school
- Acquisition/Exchange of 4 acres of property for pilot farm/pilot school
- Relocate Bureau of Indian Affairs Lease Facility
- Relocate shed

Landside Alternative 3 is depicted in **Exhibit 4.8**.

This Space Left Blank Intentionally

KSA



Legend	
Symbol	Description
	Property Line
	Existing Building
	Proposed Building
	Proposed Taxiway Centerline
	Future Development Area
	Existing Facility Label
	Proposed Facility Label
	Demolition/Removal
	Proposed Edge of Pavement

Facility Legend

Existing			Proposed		
No.	Description	Size (SF)	No.	Description	Size (SF)
2	Airfield Electrical Vault	680	101	Executive Hangar (ME)	2,500
3	Bode Lease Facility	2,200	102	Executive Hangar (ME)	2,500
4	T-Hangars	23,920	103	Executive Hangar (ME)	2,500
5	T-Hangars	28,530	104	Executive Hangar (ME)	2,500
6	T-Hangars	22,280	105	Executive Hangar (ME)	2,500
7	FBO Hangar	14,320	106	Executive Hangar (ME)	2,500
8	FBO Hangar	16,000	107	Executive Hangar (ME)	2,500
9	FBO Hangar	4,320	108	Executive Hangar (ME)	2,500
10	Fuel Farm		109	Executive Hangar (ME)	2,500
11	Fuel Farm		110	T-Hangar (12 ME)	20,160
12	Avgas Island		111	Executive Hangar (Jet)	10,000
13	FBO Hangar	13,130	112	Executive Hangar (Jet)	10,000
14	FBO Bay Hanger	10,180	113	Conventional Hangar (3 Jet)	30,000
15	FBO Hangar	13,600	114	Conventional Hangar (20 SE)	24,000
16	T-Hangars	18,750	115	Conventional Hangar (20 SE)	24,000
17	T-Hangars	18,750	116	Conventional Hangar (20 SE)	24,000
18	APD Air Support Hangar	3,780	117	Conventional Hangar (Heli)	1,800
19	T-Hangars	18,750	118	Conventional Hangar (Heli)	1,800
20	T-Hangars	18,750	119	Conventional Hangar (Heli)	1,800
21	T-Hangars	18,750	120	Conventional Hangar (Heli)	1,800
22	T-Hangars	18,750	121	Conventional Hangar (10 Heli)	18,000
23	Bureau of Indian Affairs Lease Facility	7,750	122	MRO Hangar - Phase 1	20,000
24	Fuel Tank		123	MRO Hangar - Phase 2	20,000
25	Shade Cover	7,920	124	MRO Hangar - Phase 3	20,000
26	Executive Hangar	14,800	125	Flight School Facility/Hangar	20,000
27	Executive Hangar	10,190	126	Maintenance Hangar	25,000
28	Airfield Maintenance Facility	18,940			
29	Air Traffic Control Tower				
30	Training Facility	26,100			
31	Fuel Farm				
32	Shed	400			

Double Eagle II Airport Master Plan

Figure 4.8: Landside Alternative 3

Landside Alternative 3 - Analysis

Landside Alternative 3 provides the addition of helicopter hangar space and helicopter MRO space, as well as the addition of a pilot farm/pilot school. With both of these facilities being planned north and west of the airport, there is no need for land acquisition/exchange.

Pros:

- Location is expandable, meets demand
- Close to existing fueling, but farther than Alternative 1 and Alternative 2
- Good vehicle access near airport main entrance
- Close to existing fueling and infrastructure
- Close proximity to airport restaurant for flight students

Cons:

- Approach from south will fly over existing hangar facilities
- More remote from existing facilities
- Close to existing Runway 17 approach area
- Mixes flight training traffic with other airport operations
- May limit future hangar expansion

This Space Left Blank Intentionally

Chapter Five:
Implementation Plan

Chapter 5 - Implementation Plan

The Master Plan has previously evaluated the facility requirements and alternatives required for future development of the Airport. These requirements were the foundation of alternatives composed to address deficiencies and other improvements required at Double Eagle II Airport. With the selection of a recommended development alternative for future development of the Airport, an implementation plan with cost estimates for each improvement will be developed to guide future actions at the Airport. Like any planning exercise, there must be a clear implementation plan, schedule and cost estimates to ensure the goals of this chapter are defined in order to assist the community of Albuquerque in enacting the recommendations of this plan.

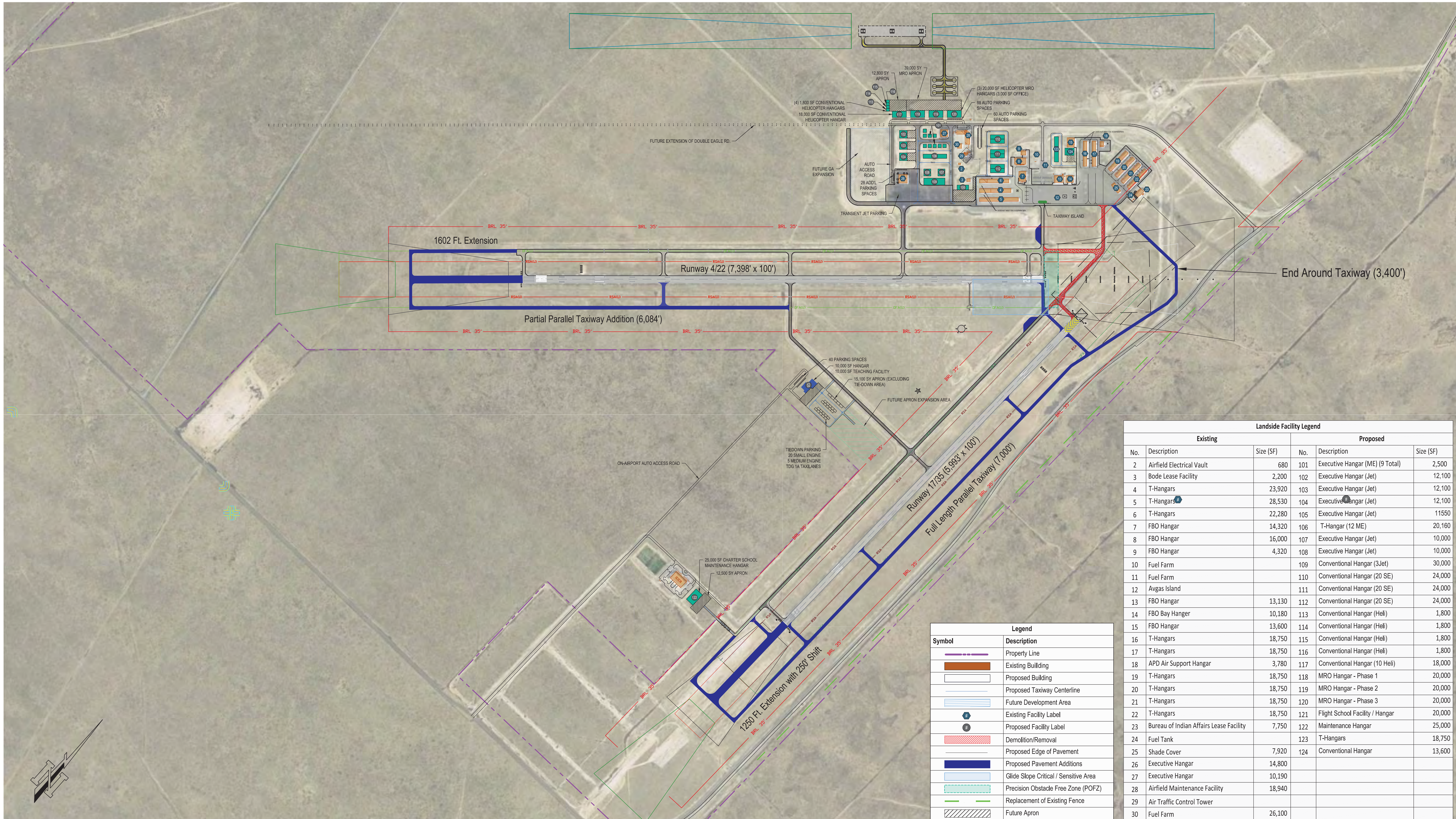
Additionally, the phasing and timing for future projects is important and will be subject to funding availability, sponsor contributions, and the needs of the users of the Airport. Projects may be chosen from this plan and implemented accordingly based on dynamic market conditions and needs. The chapter is intended to be a guide for implementing the recommended development and may be flexible based on real world factors and conditions.

5.1 Recommended Development

During this planning exercise, conceptual concepts were created to present options for redevelopment at Double Eagle II Airport. These concepts evaluated various improvements including runway/taxiway improvements, aircraft storage, and apron expansion. Using input from stakeholders, a recommended development plan was selected. This concept will ultimately be incorporated into the Airport Layout Plan (ALP).

The recommended development plan (**Figure 5.1**) incorporates the following improvements:

- Taxiway A1 Extension
- Taxiway B1 Relocation
- Taxiway A and B Run-up Pads
- Dedicated Helicopter Facilities.
- Runway 17 End Around Taxiway
- Runway 35 Extension (1,500 ft.)
- Runway 17/35 Parallel Taxiway
- Runway 22 Extension (1,612 ft.)
- Runway 4/22 Parallel Taxiway



Legend	
Symbol	Description
	Property Line
	Existing Building
	Proposed Building
	Proposed Taxiway Centerline
	Future Development Area
	Existing Facility Label
	Proposed Facility Label
	Demolition/Removal
	Proposed Edge of Pavement
	Proposed Pavement Additions
	Glide Slope Critical / Sensitive Area
	Precision Obstacle Free Zone (POFZ)
	Replacement of Existing Fence
	Future Apron

Landside Facility Legend					
Existing			Proposed		
No.	Description	Size (SF)	No.	Description	Size (SF)
2	Airfield Electrical Vault	680	101	Executive Hangar (ME) (9 Total)	2,500
3	Bode Lease Facility	2,200	102	Executive Hangar (Jet)	12,100
4	T-Hangars	23,920	103	Executive Hangar (Jet)	12,100
5	T-Hangars	28,530	104	Executive Hangar (Jet)	12,100
6	T-Hangars	22,280	105	Executive Hangar (Jet)	11550
7	FBO Hangar	14,320	106	T-Hangar (12 ME)	20,160
8	FBO Hangar	16,000	107	Executive Hangar (Jet)	10,000
9	FBO Hangar	4,320	108	Executive Hangar (Jet)	10,000
10	Fuel Farm		109	Conventional Hangar (3Jet)	30,000
11	Fuel Farm		110	Conventional Hangar (20 SE)	24,000
12	Avgas Island		111	Conventional Hangar (20 SE)	24,000
13	FBO Hangar	13,130	112	Conventional Hangar (20 SE)	24,000
14	FBO Bay Hanger	10,180	113	Conventional Hangar (Heli)	1,800
15	FBO Hangar	13,600	114	Conventional Hangar (Heli)	1,800
16	T-Hangars	18,750	115	Conventional Hangar (Heli)	1,800
17	T-Hangars	18,750	116	Conventional Hangar (Heli)	1,800
18	APD Air Support Hangar	3,780	117	Conventional Hangar (10 Heli)	18,000
19	T-Hangars	18,750	118	MRO Hangar - Phase 1	20,000
20	T-Hangars	18,750	119	MRO Hangar - Phase 2	20,000
21	T-Hangars	18,750	120	MRO Hangar - Phase 3	20,000
22	T-Hangars	18,750	121	Flight School Facility / Hangar	20,000
23	Bureau of Indian Affairs Lease Facility	7,750	122	Maintenance Hangar	25,000
24	Fuel Tank		123	T-Hangars	18,750
25	Shade Cover	7,920	124	Conventional Hangar	13,600
26	Executive Hangar	14,800			
27	Executive Hangar	10,190			
28	Airfield Maintenance Facility	18,940			
29	Air Traffic Control Tower				
30	Fuel Farm	26,100			

Double Eagle II Airport Master Plan

Figure 5.1: Recommended Development Concept

5.2 Cost Estimates

Obtaining accurate cost estimates is vital to the completion of the recommended development plan. The following estimates will impact the timing and feasibility for implementing these recommendations. Costs can often be prohibitive for airports when evaluating the feasibility of development. Many of these concerns can be mitigated with support from federal and state grants which allow modest matching funds to be used by the local airport sponsor.

Cost estimates can vary greatly and without full detailed inspection and design of each project. These numbers are only for planning and budgeting purposes given the information uncovered in the plan of similar projects at other airports. When projects are approved, a competitive bidding or proposal process will be necessary to reach more accurate cost projections.

Cost estimates for individual projects have been prepared for improvements that have been identified as necessary during the 20-year planning period. Facility costs have been formulated using unit prices extended by the size of the particular facility and tempered with specific considerations related to the region, the airport, and the development site. These estimates are identified for planning purposes only and should not be construed as construction cost estimates, which can only be compiled following the preparation of detailed engineering plans and specifications. All costs estimates presented in this report are based on the most recent 2017 costs.

These estimates are presented by the total cost for each development project that is part of the total cost anticipated to receive FAA or State of New Mexico funding, and that part to be borne by the Double Eagle II Airport, as well as private individuals or businesses. In addition to the airport funds, the local share can include sources such as state or local economic development funds, regional commission and organizations, and other units of local government.

The cost estimates provided below outline the suggested phasing plan for the completion of projects throughout the duration of the planning period. These schedules are suggested and deviation from them will be likely, especially during the long-term planning period. “Trigger” events will drive the progression of the phasing plan and adjustments will be necessary as the planning period continues. Care must be taken to provide for adequate lead-time for detailed planning and construction of facilities in an effort to meet aviation demands.

Table 5.1 quantifies estimated costs associated with the recommended improvements over the planning period.

Table 5.1 – Cost Estimates Project Description	Design Engineering	Construction Engineering	Construction	Total Project
Construct Taxiway A1 Extension including Lighting, Signage and Markings and Closure of Taxiway A north of TWY A1	$31,238.74	$48,290.63	$323,413.91	$402,943.27
Construct Taxiway B1 Relocation including Lighting, Signage and Markings and Closure of Taxiway B north of TWY A	$23,332.59	$42,925.00	$224,587.09	$290,844.68
250 ft. Shift of Runway 17 Threshold including Relocation of PAPI, REILS and Threshold Lights	$60,081.52	$64,387.50	$727,999.42	$852,468.44
Runway 4/22 and TWY A Rehab	$22,500.00	$27,000.00	$175,500.00	$225,000.00
Runway 17/35 and TWB B Rehab	$22,500.00	$27,000.00	$175,500.00	$225,000.00
Construct A1 and B Run-up Pads	$26,255.17	$24,375.27	$301,361.56	$351,992.01
New Taxiway Lighting (Both Parallels)	$62,041.97	$85,083.48	$747,866.18	$894,991.63
Security Fencing Upgrade (10,000x8 ft.)	$31,962.46	$18,204.80	$399,530.72	$449,697.97
Construct Helicopter Apron	$29,163.62	$46,987.54	$297,474.97	$373,626.14
Construct Hangars (102-104, 113)	$546,684.22	$57,028.92	$8,641,982.94	$9,245,696.08
Runway Lighting Rehab/Upgrade (17/35 & 4/22)	$68,903.93	$56,492.37	$766,428.56	$891,824.85
Construct EAT to Runway 17 including Lighting, Signage and Marking	$132,900.68	$72,435.94	$1,724,453.93	$1,929,790.54
Runway 4/22 and TWY A Rehab	$30,000.00	$36,000.00	$234,000.00	$300,000.00
Runway 17/35 and TWY B Rehab	$30,000.00	$36,000.00	$234,000.00	$300,000.00
Construct Helicopter Facility Taxiway	$76,598.61	$72,435.94	$787,658.73	$936,693.27
Construct Helicopter Landing Pad	$73,183.41	$61,812.00	$680,046.50	$815,041.91
Removal of Old Taxiway A & B	$13,352.08	$45,715.13	$133,365.83	$192,433.03
Construct Helicopter Hangars (114-116)	$71,019.41	$28,514.46	$792,073.56	$891,607.44
Construct Corporate Hangars (101,107-109,123-124)	$607,844.83	$116,204.11	$12,829,584.97	$13,533,633.90
Construct Runway 35 Extension including TWY B Extension, Lighting, Signage and Marking	$151,683.78	$120,726.56	$1,723,219.19	$1,995,629.53
Construct Runway 17/35 Parallel Taxiway including Lighting, Signage and Marking	$242,048.30	$115,603.13	$3,229,294.54	$3,626,945.96
Construct Runway 22 Extension including TWY A Extension, Lighting, Signage and Marking, PAPI	$219,901.50	$194,235.63	$2,860,181.18	$3,274,318.30
Construct Runway 4/22 Parallel Taxiway including Lighting, Signage and Marking	$252,643.34	$155,603.13	$3,405,878.54	$3,814,125.01
Runway 4/22 and TWY A Rehab	$100,000.00	$120,000.00	$780,000.00	$1,000,000.00
Runway 17/35 and TWY B Rehab	$100,000.00	$120,000.00	$780,000.00	$1,000,000.00
Construct Hangars (110-112) and Associated Taxilane and Apron	$478,721.06	$124,482.50	$10,083,297.13	$10,686,500.69
Construct Helicopter Hangars (117-120)	$88,511.35	$124,482.50	$1,248,902.88	$1,461,896.73
			TOTAL :	$59,962,701.38

Airports can often become a misunderstood resource to the communities they serve throughout the United States. Their economic impact can be hard to quantify given their unique operational and industry characteristics. Many residents in communities with General Aviation airports do not utilize the airport regularly and find it difficult to see the benefits and impacts to their community. However, in New Mexico, these airports create significant benefits that positively influence growth and quality of life for their users and communities.

Projects presented in the Recommended Development Plan involve many variables and phases. Costs associated with these projects usually include preliminary engineering, design, construction, and administration oversight. The lifecycle of each project will be determined by the type and associated complexity of each project. For instance, runway projects may involve many phases and detailed engineering plans will be scoped and estimated at the time of project implementation. Due to these variables, most estimates or costs are on a scale comparable to airports with similar types of projects and requirements. However, for planning purposes, these estimates are usually conservative to allow for adequate budgeting in future years.

In addition to raw material costs, other factors are usually included in each project to give a total estimated cost to include the following:

- Preliminary Engineering Reports
- Design (usually estimated at 10% of construction costs)
- Construction including mobilization costs for contractors
- Construction Administration (usually estimated at 12% of construction cost)

Given the uncertainty of future material cost and other variables, most estimates include a 15% contingency buffer. When planning for projects as far as 20 years in the future, this will help offset any errors or changes in pricing.

The majority of projects previously listed follow the typical funding share guidelines established by the FAA, with 90 percent of the funding from the FAA and remaining share funded by NMDOT. Although taxi lanes may be eligible for funding assistance, hangars are not eligible for federal funding, therefore, a greater funding burden falls on the airport or hangar developer, depending on the ownership arrangement established for the hangars.

5.3 Financial Plan and Schedule

Although this development plan is a short term look into the future of the Airport, scheduling development and planning for project funding is necessary. Often, thresholds are used in place of annual project timelines to more accurately predict when a project should begin.

This section describes sources and eligibility criteria for funding programs at the airport may take advantage of to aid in the funding of future development projects. It is not guaranteed all funding sources will be available and used on airport projects, however lists the general options and funding criteria. During financial implementation of the projects at the Airport, all funding sources should be evaluated and coordinated with the appropriate funding source for eligibility.

Funding Sources

The projects listed above will need to be accounted for in a financial plan in order to secure funding and resources needed to make improvements. Summaries of available funding sources are presented below for considerations when planning funding for these projects. This list is a library of options and is not absolute. Discussion with local FAA and NMDOT staff should occur to discuss eligibility guidelines.

Federal Aviation Administration Airport Improvement Program (AIP)

The Airport Improvement Program (AIP) 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). Double Eagle II Airport is included in the NPIAS which identifies nearly 3,400 existing and proposed airports that are significant to national air transportation and thus eligible to receive Federal grants under the AIP. It also includes estimates of the amount of AIP money needed to fund infrastructure development projects that will bring these airports up to current design standards and add capacity to congested airports. The FAA is required to provide Congress with a 5-year estimate of AIP eligible development every two years.

The Airport and Airway Trust Fund provides the revenues used to fund AIP projects. The Trust Fund concept guarantees a stable funding source whereby users pay for the services they receive. This fund is largely user fee based by fuel and passenger ticket taxes paid by the industry. The FAA NPIAS Report lists the 2013-2017 development costs for Double Eagle II Airport to be $4,870,996.

AIP funding is allocated in a few ways for airports. Non-primary airports receive entitlements and may also receive state apportionments. FAA State Apportionment funds for New Mexico in Fiscal Year 2016 were $27,192,780. The total amount of non-primary entitlements is computed from the needs list for the particular airport in the published NPIAS. Funding costs exceeding entitlements depends on available state apportionment and discretionary funding ranked by the relative priority of a project.

Non-Primary Entitlement funds are specifically for general aviation airports listed in the latest published National Plan of Integrated Airport (NPIAS), that show needed airfield development. General aviation airports with an identified need are eligible to receive $150,000 annually.

Non-primary entitlement is available to use in the fiscal year it becomes available and the following three fiscal years. Sponsors may choose to delay using their entitlement the first, second or third year and use all of the money in the final year in order to fund a larger project. Unused funds expire after four years unless the sponsor obligates the funds under a grant or transfers the funds to another NPIAS.

In general, Sponsors can use AIP funds on most airfield capital improvements and limited maintenance work. Vision 100 established the allowable use of non-primary entitlement for limited revenue-generating areas such as terminals, hangars and fuel farms. Eligible maintenance projects include airfield pavement maintenance.

Examples of eligible and ineligible NPE projects include:

Eligible Projects	Ineligible Projects
Runways, Taxiways & Aprons	Mowers
Airfield lighting	Debris sweepers
Airport layout plans Environmental Studies	Landscaping
Access roads located on Airport Property	Airport Vehicles (Trucks, cars)
Removing hazards to aviation	Salaries
Drainage Improvements	Office equipment
Weather observation stations (AWOS)	Automobile parking lots
Land acquisition for eligible development	Industrial park infrastructure
Tree clearing in runway approaches	Business & marketing plans
Maintenance hangars	Training
T-hangars, Terminals	Exclusive Use Improvements
Fuel farms	Supplies

Source: FAA AIP Sponsor Guide

Federal Aviation Facilities and Equipment Fund (F&E) – Funding provided by the FAA's Airways Facilities Division to purchase and/or install navigational aids (NAVAIDs) and other equipment for air navigation. Each project is evaluated individually.

New Mexico Department of Transportation (NMDOT) Aviation Division

The Aviation Division coordinates and administers state grants for construction, development and maintenance of public use airport facilities. It also issues grants to promote air service.

The Division provides planning and technical support in developing and maintaining the State's airports and other elements of the aviation system. The Division engages in planning for the development of a system of public use airports within the state. This includes the development and continuous enhancements of the State's Airport System. Often times, the state will assist local sponsors in covering a portion of their local match to grants.

Alternative Funding Sources

As financial resources for airports are increasingly competitive with limited funding, airport sponsors must become creative with financing certain projects. Collaboration with grant agencies, local partners, and even public-private partnerships can be very valuable in gaining project support. The following list is not comprehensive, but is designed to show some examples of non-traditional airport funding strategies. There is no guarantee these sources will be eligible for certain projects, however by approaching certain agencies with support from local leaders, there may be opportunities to collaborate.

New Mexico Economic Development Department

The mission of the New Mexico Economic Development Department (EDD) is to Enhance and leverage a competitive environment to create jobs, develop the tax base and provide incentives for business development. There may be opportunity to seek funding through programs that look to invigorate communities with economic development. Often, airport development can be funded through means of local and state EDC's. EDD's Community, Business & Rural Development Team (CBRDT) or "regional representatives" are located in the regions they serve in every corner of the state. They assist communities in a broad variety of economic development needs.

In fiscal year 2016, the Certified Communities Initiative (CCI) evolved into the LEADS Program. LEADS is a funding program for economic development projects that produce sustainable outcomes. The funding provided through LEADS is intended to create jobs through recruitment, retention/expansion and startup activities; develop the tax base; and provide incentives for business development. Projects may be awarded $5,000 to $15,000 per year and funding is awarded through a cost reimbursement contract. EDD will reimburse the project applicant for work performed and/or costs incurred by the applicant up to the total amount specified in the grant.

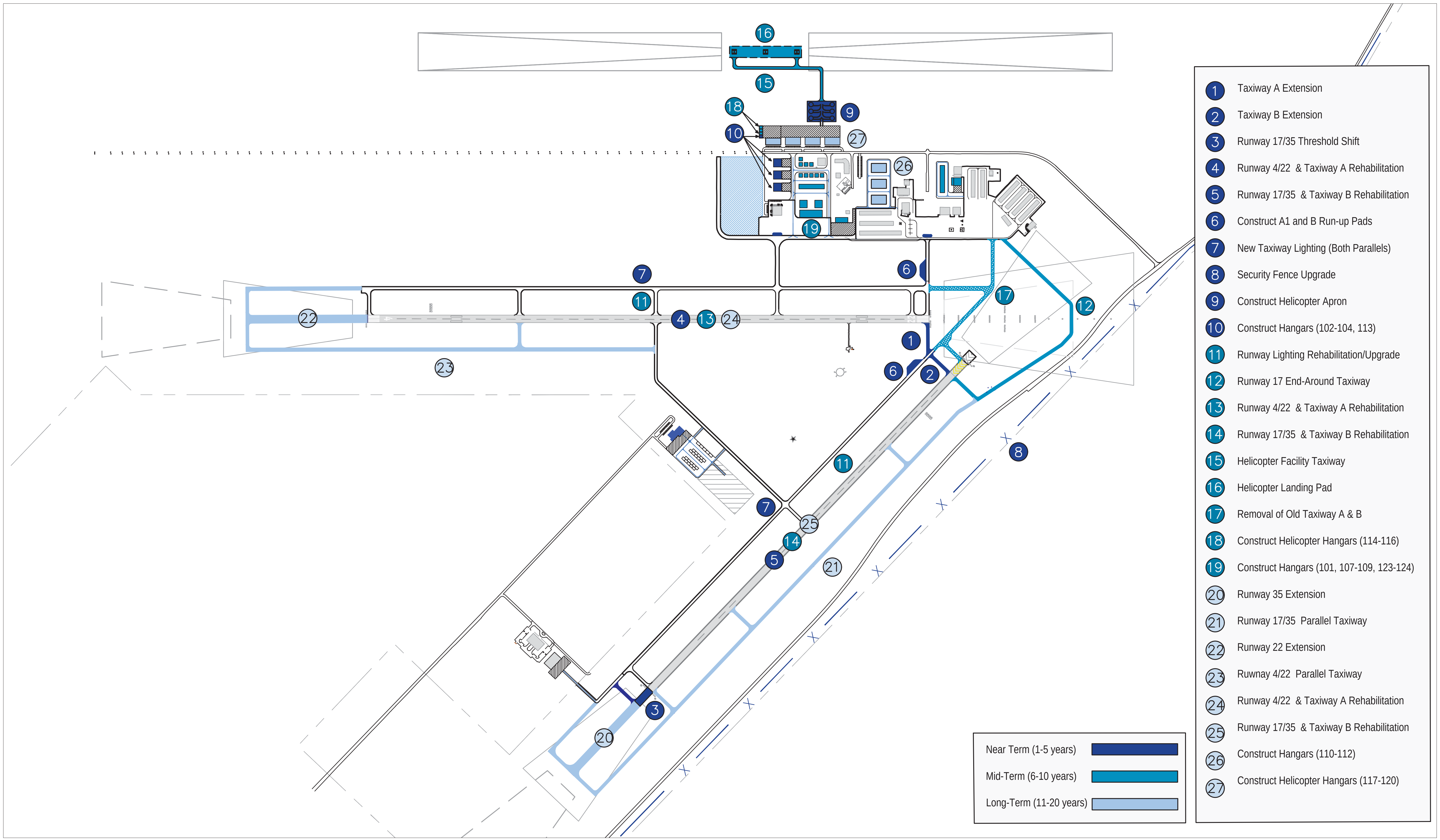
Local and Private Funding

Although local funding resources may be scarce, it is important to note that certain projects and local matching funds to grants must be accounted for by local sources. This will be important to plan for with local funds through the country. Local support should be solicited when investing in the Airport. Private investment can also be evaluated by either local airport users and potential tenants, or even financial institutions willing to finance projects.

5.4 Project Schedule and Phasing

As detailed in the cost estimate, the anticipated funding needed to enact the Airport Master Plan Development will be substantial. This is not expected to be completed in a singular time frame and is included in a schedule and phased implementation. With a total of approximately $57 million in improvements, projects must be completed incrementally to remain financially feasible. Projects are broken into phases below to help airport and municipal staff prioritize projects and plan accordingly. Certain projects may be shifted into other phases as needed depending on funding priority and user needs over the duration of the planning period. The Airport will need to be aware of certain "trigger" events that will signal the need to begin the subsequent phases(s) of development. **Table 5.2** presents the phasing plan for the complete duration of the planning period. A graphic depiction of the phasing plan is shown in **Figure 5.2**.

Table 5.2 PHASING PLAN		PROJECT	JUSTIFICATION	TOTAL COST
SHORT-TERM (0-5 YEARS)	1	Construct Taxiway A1 Extension including Lighting, Signage and Markings and Closure of Taxiway A north of A1	Safety/Standards	$402,943
	2	Construct Taxiway B1 Relocation including Lighting, Signage and Markings and Closure of Taxiway B north of A	Safety/Standards	$290,844
	3	250 ft. Shift of Runway 17 Threshold including Relocation of PAPI, REILs and Threshold Lights	Safety/Standards	$852,468
	4	Runway 4/22 and Taxiway A Rehabilitation	Safety	$225,000
	5	Runway 17/35 and Taxiway B Rehabilitation	Safety	$225,000
	6	Construct A1 and B Run-up Pads	Safety/Standards	$351,992
	7	New Taxiway Lighting (Both Parallels)	Safety/Standards	$894,991
	8	Security Fencing Upgrade (10,000 x 8 ft.)	Safety	$449,697
	9	Construct Helicopter Apron	Capacity	$373,626
	10	Construct Hangars (102-104, 113)	Capacity	$9,245,696
MID-TERM (6-10 YEARS)	11	Runway Lighting Rehab/Upgrade (17/35 & 4/22)	Safety	$891,824
	12	Construct End-Around Taxiway to Runway 17 including Lighting, Signage and Marking	Safety/Standards	$1,929,790
	13	Runway 4/22 and Taxiway A Rehabilitation	Safety	$300,000
	14	Runway 17/35 and Taxiway B Rehabilitation	Safety	$300,000
	15	Construct Helicopter Facility Taxiway	Capacity	$936,693
	16	Construct Helicopter Landing Pad	Capacity	$815,041
	17	Removal of Old Taxiway A & B	Safety/Standards	$192,433
	18	Construct Helicopter Hangars (114-116)	Capacity	$891,607
	19	Construct Corporate Hangars (101, 107-109m 123-124)	Capacity	$13,553,633
LONG-TERM (11-20 YEARS)	20	Construct Runway 35 Extension (1,500 ft.)	Capacity	$1,995,629
	21	Construct Runway 17/35 Parallel Taxiway	Capacity	$3,626,945
	22	Construct Runway 22 Extension	Capacity	$3,274,318
	23	Construct Runway 4/22 Parallel Taxiway including Lighting, Signage and Marking	Capacity	$3,814,125
	24	Runway 4/22 and Taxiway A Rehabilitation	Safety	$1,000,000
	25	Runway 17/35 and Taxiway B Rehabilitation	Safety	$1,000,000
	26	Construct Hangars (110-112) and Taxilane & Apron	Capacity	$10,686,500
	27	Construct Helicopter Hangars (117-120)	Capacity	$1,461,896



Double Eagle II Airport Master Plan

Figure 5.2: Phasing Plan

Short Term – (Current to 5 years):

Projects listed in this phase are considered high priority and will need to be addressed soon after the adoption of this plan. As previously mentioned, this is dependent on funding levels. The Taxiway A1 extension, B1 relocation, run-up pads, and displacement of the Runway 17 threshold should be a priority for the Airport in the near term. The proposed airfield infrastructure updates are required for the Airport to meet FAA design standards as defined in Advisory Circular (AC) 150/5300-13A, Airport Design.

As the Airport continues to grow, new hangar development will be required to meet the needs of the Airport and its users.

The following projects are expected to occur in this planning period:

- Taxiway A1 Extension
- Taxiway B1 Relocation
- 250' shift of Runway 17 Threshold
- New Taxiway Marking and Signage Including Main Apron Taxiway Island
- New Taxiway Lighting
- Security Fence Upgrade along Altrista Blvd. (10,000' x 8')
- Relocation of PAPI, REILs and Threshold Lights
- Closure of Taxiway B North of B1
- Closure of Taxiway A North of A1
- One 12 Unit T-Hangar
- Construct Helicopter Apron
- Construct Helicopter Hangar
- Construct Hangars (113,102-104)

Mid-Term – (6 to 10 years)

This phase of the plan is usually the most difficult to project. Projects that do not get funded as planned in the first phase can fall into this timeline quite often. However, it is important to keep these in mind as development progresses on the Airport to ensure proper sequential development. As operations demand, the Airport will be required to continue apron expansion and hangar development to meet the forecast demand through the planning period.

The following projects are expected to occur in the Mid-Term planning period:

- Runway Lighting Rehabilitation/Upgrade (17/35 and 4/22)
- End-Around Taxiway to Runway 17
- Helicopter Facility Taxiway
- Helicopter Facility Landing Pad (15,850 sy.)
- New Taxiway Marking and Signage
- New Taxiway Lighting
- Removal of Old Taxiway A and B
- Construct Helicopter Facility Hangars (114-116)
- Construct Corporate Hangars (101, 107-109, 123-124)

Long-Term – (11 to 20 years)

These projects are lumped into a ten-year period in the last portion of the master plan horizon. These projects tend to be large scale and will include more development given the expected timeline. However, inherently, these projects also provide for the most flexibility as they are far into the future of the Airport. Long-term capacity enhancements and development are shown and will be dependent on the forecasted demand in the future.

The following projects are expected to occur in this planning period:

- Runway 35 Extension (1,500 ft.)
- Runway 17/35 Parallel Taxiway
- Runway 22 Extension (1,612 ft.)
- Runway 4/22 Parallel Taxiway
- New Taxiway Marking and Signage
- New Taxiway Lighting
- Three Conventional Hangars and Taxi Lane/Apron (24,000 sf.)
- Charter School Maintenance Hangar (25,000 sf.)
- Charter School Apron (37,000 sf.)

Routine Maintenance Projects

As airport infrastructure ages, routine maintenance will be required throughout the 20-year planning period including on-going pavement, lighting, NAVAID, and other projects. For runway, taxiway, and apron areas this includes pavement crack sealing or rehabilitation projects necessary to maintain a safe environment for aircraft operations. The Airport will need to routinely assess the conditions of the pavement and airside operational requirements such as marking and lighting to ensure sound operations condition.

5.5 Capital Improvement Program Summary

This program will not be solely funded by the airport sponsor. The cost estimates previously presented are broken down by phase and given an estimated cost share based on eligibility. As identified in Table 5.3, the federal share includes expenditures of $3.6 million during the short-term period, $4.8 million during the intermediate time period, and $13.2 million during the long-term period. This equates to an average annual expenditure of approximately $1.08 million in federal monies to fund the 20-year development plan.

Table 5.3 Project Cost Summary	Total	Federal Share (90 %)	State Share (5%)	Local/Private Share (5%)
Taxiway A Extension	$402,943	$362,648	$20,147	$20,147
Taxiway B Relocation	$290,844	$261,760	$14,542	$14,542
Runway 17/35 Threshold Shift	$852,468	$767,221	$42,623	$42,623
Runway 4/22 & TWY A Rehab	$225,000	$202,500	$11,250	$11,250
Runway 17/35 & TWY B Rehab	$225,000	$202,500	$11,250	$11,250
Construct A1 and B Run-up Pads	$351,992	$316,792	$17,599	$17,599
New Taxiway Lighting (Both Parallels)	$894,991	$805,492	$44,749	$44,749
Security Fencing Upgrade	$449,697	$404,728	$22,484	$22,484
Construct Helicopter Apron	$373,626	$336,263	$18,681	$18,681
Construct Hangars (102-104,113)	$9,245,696	$0	$0	$9,245,696
Short-Term Subtotal	**$13,312,260**	**$3,659,907**	**$203,328**	**$9,449,024**
Runway Lighting Rehabilitation/Upgrade	$891,824	$802,642	$44,591	$44,591
Runway 17 End-Around Taxiway	$1,929,790	$1,736,811	$96,489	$96,489
Runway 4/22 & TWY A Rehab	$300,000	$270,000	$15,000	$15,000
Runway 17/35 & TWY B Rehab	$300,000	$270,000	$15,000	$15,000
Helicopter Facility Taxiway	$936,693	$843,023	$46,834	$46,834
Helicopter Landing Pad	$815,041	$733,537	$40,752	$40,752
Removal of Old Taxiway A & B	$192,433	$173,189	$9,621	$9,621
Construct Hangars (114-116)	$891,607	$0	$0	$891,607
Construct Hangars (101,107-109, 123-124)	$13,533,633	$0	$0	$13,533,633
Mid-Term Subtotal	**$19,791,024**	**$4,829,205**	**$268,289**	**$14,693,530**
Runway 35 Extension	$1,995,629	$1,796,066	$99,781	$99,781
Runway 17/35 Parallel Taxiway	$3,626,945	$3,264,251	$181,347	$181,347
Runway 22 Extension	$3,274,318	$2,946,886	$163,715	$163,715
Runway 4/22 Parallel Taxiway	$3,814,125	$3,432,712	$190,706	$190,706
Runway 4/22 & TWY A Rehab	$1,000,000	$900,000	$50,000	$50,000
Runway 17/35 & TWY B Rehab	$1,000,000	$900,000	$50,000	$50,000
Construct Hangars (110-112)	$10,686,500	$0	$0	$10,686,500
Construct Hangars (117-120)	$1,461,896	$0	$0	$1,461,896.73
Long-Term Subtotal	**$26,859,416**	**$13,239,916**	**$735,550**	**$12,883,948**
Total	**$59,962,701**	**$21,729,029**	**$1,207,168**	**$37,026,503**

Of the local share, approximately $9.4 million is required during the short-term period, $14.6 million during the intermediate period, and $12.8 million during the long-term period.

During the 20-year planning period, an estimated $60,358 per year will be required from local funding mechanisms exclusively for the airside improvements to meet the previously defined facility requirements at Double Eagle II Airport. As shown in the table above, the local share includes the cost of hangar development estimated at a total of $35.8 million throughout the duration of the planning period.

It is recognized that maintenance and operation expenses will increase as an airport develops and additional facilities are completed. Revenues generated by additional airport facilities should also increase and help offset the rise and increase in such expenses. It is a worthy goal that operational expenses and revenues balance at an airport as to decrease the amount of subsidization from the local municipality. The relationship between revenues and expenses should be monitored often to minimize imbalances and provide for budgeting and capital improvements.

Chapter Six:

Airport Layout Plan

CITY OF ALBUQUERQUE AVIATION DEPARTMENT
PLANNING AND DEVELOPMENT
ALBUQUERQUE, NEW MEXICO

JULY 2017

DOUBLE EAGLE II AIRPORT (AEG)
AIRPORT LAYOUT PLANS

7401 Paseo Del Volcan N.W.
City of Albuquerque, New Mexico 87121

DRAWING INDEX

1 COVER SHEET
2 DATA SHEET
3 AIRPORT LAYOUT PLAN
4 TERMINAL AREA DRAWING
5 AIRPORT AIRSPACE DRAWING I
6 AIRPORT AIRSPACE DRAWING II
7 APPROACH SURFACE DRAWING, RUNWAY 4
8 APPROACH SURFACE DRAWING, RUNWAY 22
9 APPROACH SURFACE DRAWING, RUNWAY 35
10 APPROACH SURFACE DRAWING, RUNWAY 17
11 AIRPORT PROPERTY MAP

APPROVAL

AVIATION DEPARTMENT DATE

REV.	SHEETS	CITY ENGINEER	DATE	USER DEPARTMENT	DATE	USER DEPARTMENT	DATE

DRAFT

APPROVALS		DATE
DRC Chairman		
Transportation		
Water/Wastewater		
Hydrology		
Constr. Mngnt.		

City Project No.

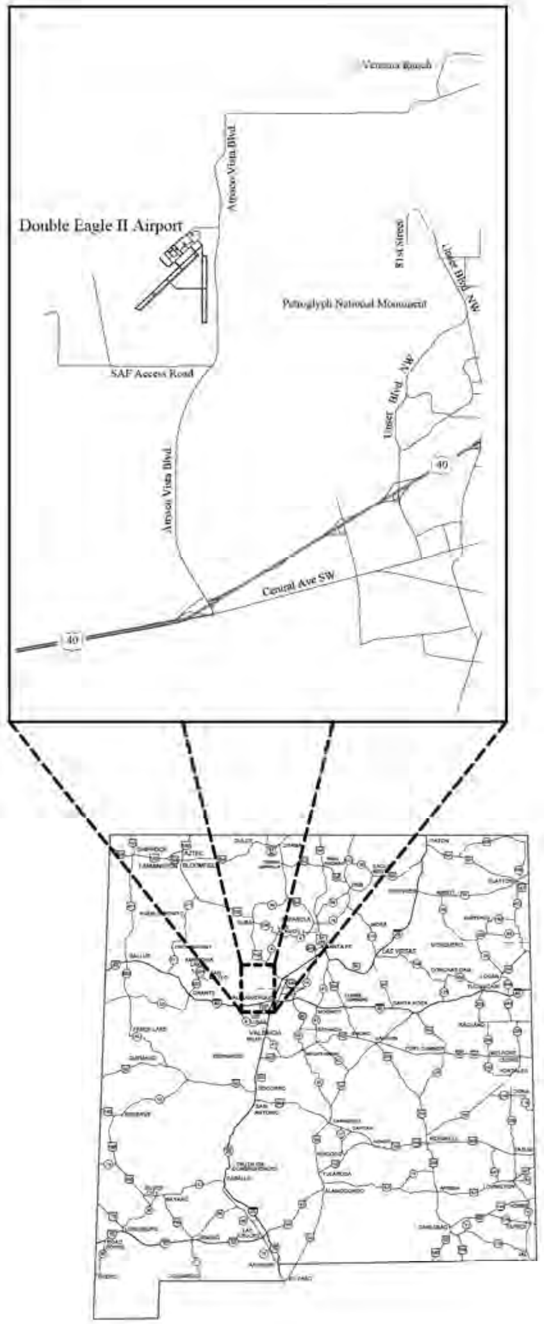
****

APPROVED FOR CONSTRUCTION

City Engineer Date

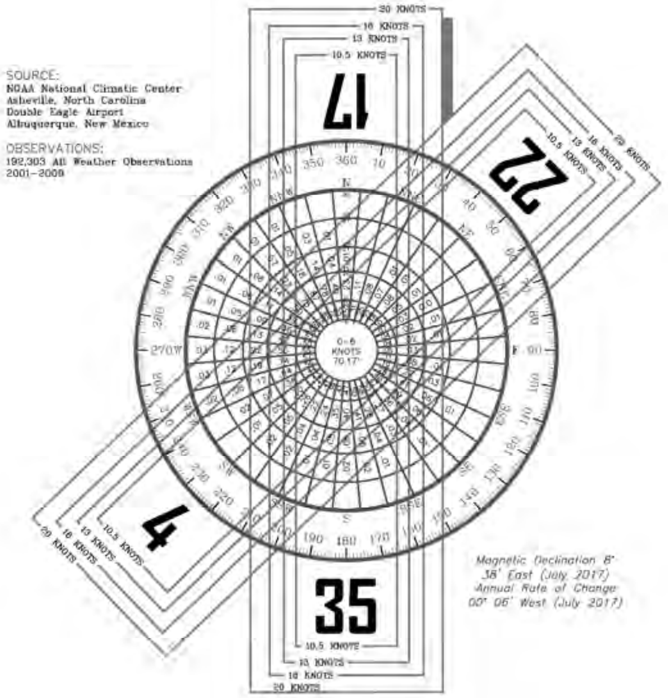
Sheet of

MOLZEN CORBIN PROJECT #



SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Double Eagle Airport
Albuquerque, New Mexico

OBSERVATIONS:
192,303 All Weather Observations
2001-2009



Magnetic Declination 8° 38' East (July 2017)
Annual Rate of Change
00° 06' West (July 2017)

ALL WEATHER WIND ROSE

RUNWAY DATA	RUNWAY 4-22				RUNWAY 17-35			
	EXISTING		ULTIMATE		EXISTING		ULTIMATE	
	4	22	4	22	17	35	17	35
AIRPORT REFERENCE CODE (ARC)	C-I		C-II		C-II		D-II	
DESIGN AIRCRAFT	Cessna Citation VII		Challenger 600		Cessna Citation VII		Gulfstream G450	
EFFECTIVE RUNWAY GRADIENT	0.36%		0.36%		0.1%		0.1%	
WIND COVERAGE	10.5 / 13	16 / 20	10.5 / 13	16 / 20	10.5 / 13	16 / 20	10.5 / 13	16 / 20
	85.19% / 91.03%	96.76% / 98.91%	85.19% / 91.03%	96.76% / 98.91%	88.37% / 93.02%	96.98% / 98.91%	88.37% / 93.02%	96.96% / 98.91%
MAXIMUM ELEVATION AMSL	5842.7'		5842.7'		5806.1'		5806.1'	
RUNWAY LENGTH	7396'		8998'		5991'		7278'	
RUNWAY WIDTH	100'		100'		100'		100'	
RUNWAY SURFACE TYPE	Asphalt		Asphalt		Asphalt		Asphalt	
RUNWAY PAVEMENT STRENGTH (in thousand lbs.)	30 (SW)		80 (DW)		30 (SW)		75 (DW)	
FAR PART 77 CATEGORY	Visual	Precision	Nonprecision	Nonprecision	Visual	Visual	Precision	Nonprecision
INSTRUMENT APPROACH TYPE	NA	ILS	GPS	GPS	NA	NA	ILS	GPS
RUNWAY APPROACH SLOPE	20:1	50:1/40:1	34:1	34:1	20:1	20:1	50:1/40:1	34:1
RUNWAY LIGHTING	MIRL	MIRL	MIRL	MIRL	MIRL	MIRL	MIRL	MIRL
RUNWAY MARKING	Precision	Precison	Nonprecision	Nonprecision	Nonprecision	Nonprecision	Precision	Nonprecision
RUNWAY NAVIGATIONAL AIDS	NA	RNAV GPS ILS	RNAV GPS	RNAV GPS	NA	NA	ILS GPS	GPS
RUNWAY VISUAL AIDS	PAPI-4	MALSR PAPI-4	PAPI-4 REIL	PAPI-4 REIL	REIL	REIL	MALSR PAPI-4	PAPI-4 REIL
RUNWAY SAFETY AREA DIMENSIONS	9396' x 500'		10998' x 500'		8002' x 500'		8778' x 500'	
APPROACH VISIBILITY MINIMUMS	≥ 3 Miles	1/2 Mile	1 Mile	Mile	≥ 3 Miles	≥ 3 Miles	1/2 Mile	1 Mile
RUNWAY BEARING (TRUE)	46.18°	226.19°	46.18°	226.19°	179.94°	359.94°	179.94°	359.94°

HORIZONTAL DATUM: NORTH AMERICAN DATUM 1983 – NAD83;VERTICAL DATUM: NORTH AMERICAN DATUM 1988 – NAV

ALL WEATHER WIND COVERAGE

RUNWAYS	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
RUNWAY 4-22	85.19%	91.03%	96.76%	98.91%
RUNWAY 17-35	88.37%	93.02%	96.98%	99.71%

SURVEY CONTROL STATIONS

DESIGNATION	PERMANENT IDENTIFIER	LATITUDE	LONGITUDE
EAGLEAIR	FO1669	35° 08' 42.415" N	106° 47' 10.600" W
N93 A	AC7036	35° 08' 59.771" N	106° 47' 12.647" W
N93 B	AC7037	35° 08' 17.285" N	106° 48' 30.647" W

EAGLEAIR SETTING: STAINLESS STEEL ROD ENCASED IN PVC PIPE IN GROUND
N93 A SETTING: SET IN ROCK OUTCROP
N93 B SETTING: SET IN TOP OF CONTRETE MONUMENT

AS BUILT INFORMATION
CONTRACTOR / WORK STAKED BY / INSPECTOR'S ACCEPTANCE BY / FIELD VERIFICATION BY / DRAWINGS CORRECTED BY — DATE
MICRO-FILM INFORMATION
RECORDED BY — DATE — NO.

BENCH MARKS

SURVEY INFORMATION
FIELD NOTES
NO. BY DATE

ENGINEER'S SEAL

REVISIONS
NO. DATE REMARKS BY

DESIGN
DESIGNED BY — DATE
DRAWN BY — DATE
CHECKED BY — DATE

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

TITLE: **DOUBLE EAGLE II (AEG) AIRPORT LAYOUT PLANS**

AIRPORT DATA SHEET

DRAFT

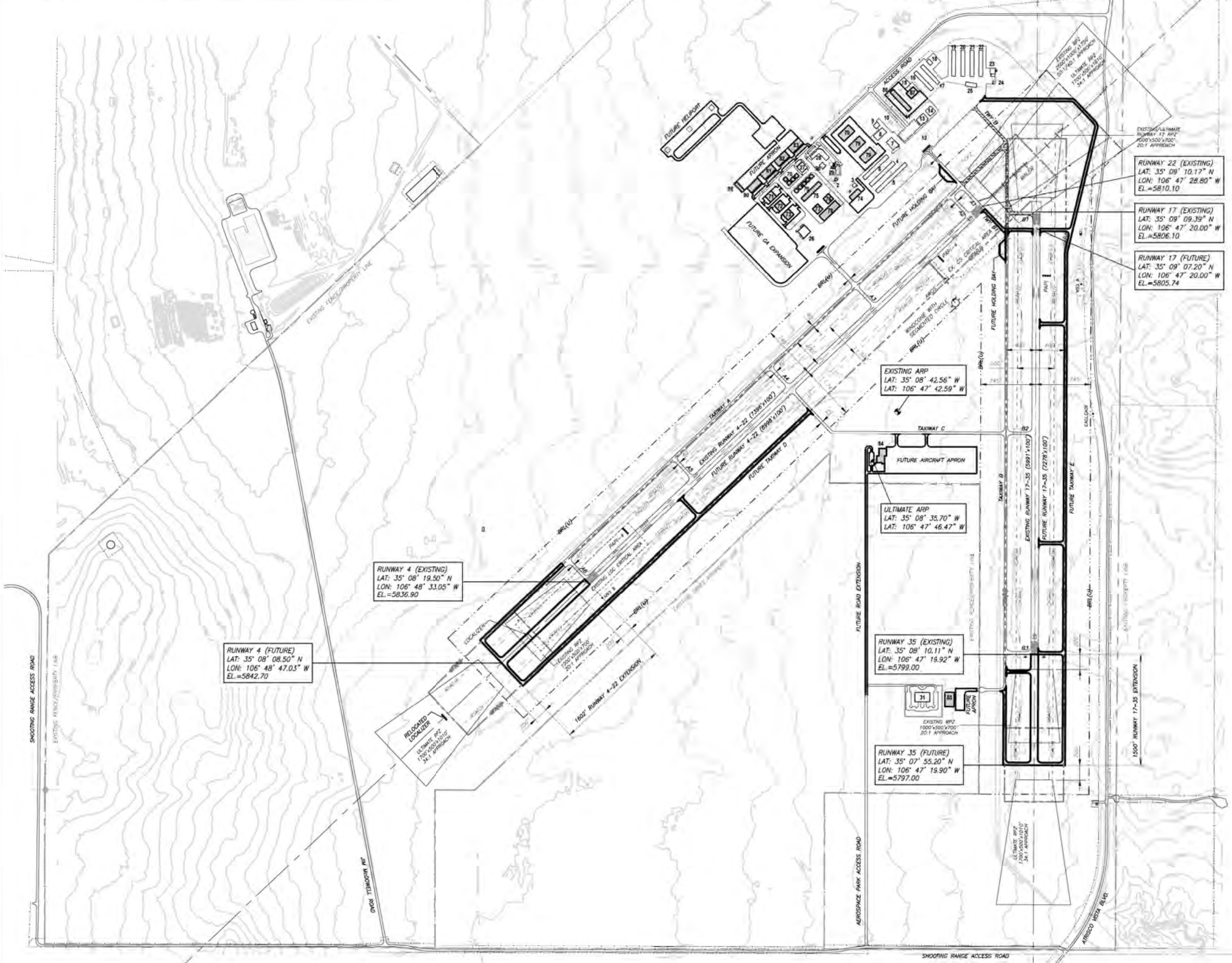
Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.
City Project No.	Zone Map No. M-16	Sheet C-102	Of	

© COPYRIGHT MCA JOB NUMBER: K5A151-11

CAB-102 7/21/17 1:1

GENERAL NOTES:

1. HORIZONTAL DATUM: NORTH AMERICAN DATUM 1983 — NAD83; VERTICAL DATUM: NORTH AMERICAN DATUM 1988 — NAVD88.
2. NO OFZ PENETRATIONS.
3. SEE INNER PORTION OF THE APPROACH SURFACE DRAWINGS FOR THRESHOLD SITING SURFACE PENETRATIONS.
4. TAXIWAY HOLDING POSITION MARKING DISTANCE FROM RUNWAY CENTERLINE FOR AIRCRAFT APPROACH CATEGORY D INCREASED 1 FOOT FOR EACH 100 FEET ABOVE SEA LEVEL PER AC 150/5340-18D.
5. SEE AIRPORT PROPERTY MAP, SHEET 20 OF 20, FOR FULL PROPERTY OWNERSHIP.
6. EXISTING ILS PRECISION APPROACH TO RUNWAY 22 TO BE DOWNGRADED TO A RNAV GPS NONPRECISION APPROACH. ULTIMATE APPROACH TO RUNWAY 17 TO BE UPGRADE TO AN ILS PRECISION APPROACH.



AIRPORT DATA

OWNER: CITY OF ALBUQUERQUE		AIRPORT NPIAS CODE: R	
CITY: ALBUQUERQUE, NEW MEXICO, USA		COUNTY: BERNALILLO	
RANGE: R 1 E		TOWNSHIP: T 11 N	
DOUBLE EAGLE II (AEG)		EXISTING	ULTIMATE
AIRPORT SERVICE LEVEL		RELIEVER	RELIEVER
AIRPORT REFERENCE CODE		B-II	D-II
AIRPORT ELEVATION		5837.0' MSL	5843.0' MSL
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		92.5° July	92.5° July
AIRPORT REFERENCE POINT (NAD 83)	LATITUDE	35° 08' 42.56" N	35° 08' 35.70" N
	LONGITUDE	106° 47' 42.59" W	106° 47' 46.47" W
AIRPORT INSTRUMENT APPROACH		RNAV GPS (22) ILS (22)	RNAV GPS (4,22) ILS (17L) GPS (35R)
NAVAIDS		Airport Beacon GPS (22); ILS (22) MALSR (22) REIL (17,35) PAPI-4L, AWOS Lighted Wind Cone Segmented Circle	Airport Beacon GPS (4,22), ILS MALSR (17L) REILs (ALL) PAPI-4 (ALL) Lighted Wind Cone Segmented Circle

BUILDING / FACILITY

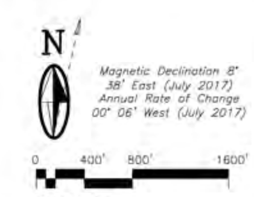
EXISTING BUILDING/FACILITY			FUTURE BUILDING/FACILITY		
#	DESCRIPTION	ELEVATION	#	DESCRIPTION	ELEVATION
1	AIRPORT BEACON	5853.73	70	PRIVATE HANGAR	
2	AIRFIELD ELECTRICAL VAULT		71	EXECUTIVE HANGAR	
3	FBO OFFICE FACILITY	5833.87	72	EXECUTIVE HANGAR	
4	T-HANGARS	5832.22	73	STATE POLICE HANGAR	
5	T-HANGARS	582839	74	EXECUTIVE HANGAR	
6	T-HANGARS	5834.50	75	T-HANGARS	
7	FBO HANGAR	5840.87	76	EXECUTIVE HANGAR	
8	FBO HANGAR	5841.28	77	EXECUTIVE HANGAR	
9	FBO HANGAR	5832.78	78	CONVENTIONAL HANGAR GROUP	
10	FUEL FARM	NA	79	CONVENTIONAL HANGAR	
11	FUEL FARM	NA	80	HELICOPTER HANGAR	
12	AVGAS ISLAND	NA	81	HELICOPTER MRO HANGAR	
13	FBO HANGAR	5840.24	82	HELICOPTER MRO HANGAR	
14	FBO BAY HANGAR	5840.24	83	HELICOPTER MRO HANGAR	
15	FBO HANGAR	5838.63	84	FLIGHT SCHOOL/HANGAR	
16	T-HANGARS	5826.12	85	MAINTENANCE HANGAR	
17	T-HANGARS	NA	86	T-HANGARS	
18	APD AIR SUPPORT HANGAR	5831.62	87	CONVENTIONAL HANGAR	
19	T-HANGARS	5825.17			
20	T-HANGARS	5825.29			
21	T-HANGARS	5825.13			
22	T-HANGARS	5825.28			
23	BUREAU OF INDIAN AFFAIRS FACILITY	5831.68			
24	FUEL TANK	NA			
25	SHADE COVER	5823.34			
26	EXECUTIVE HANGAR	5853.50			
27	EXECUTIVE HANGAR	5844.34			
28	AIRFIELD MAINTENANCE FACILITY	5846.82			
29	AIR TRAFFIC CONTROL TOWER	5925.41			
30	TRAINING FACILITY	5845.33			

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		SECTION CORNERS
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
BRL(U)		BUILDING RESTRICTION LINE
		STRUCTURES ON AIRPORT
		CRITICAL AREA
		AIRPORT PAVEMENT
		ABANDON PAVEMENT
		FENCING
		HOLD MARKING
EAGLEAIR		SURVEY MONUMENT WITH IDENTIFIER
		OBJECT FREE AREA
		RUNWAY SAFETY AREA
		OBSTACLE FREE ZONE
		RUNWAY PROTECTION ZONE
		PAPI
		RUNWAY END IDENTIFIER LIGHTS (REILS)
		LIGHTED WINDSOCK
		TOPOGRAPHY

FAA APPROVAL

CITY OF ALBUQUERQUE



CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

TITLE: DOUBLE EAGLE II (AEG) AIRPORT LAYOUT PLANS

AIRPORT LAYOUT DRAWING

DRAFT

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
	M-16	C-103	

AS BUILT INFORMATION — CONTRACTOR / WORK STAKED BY / INSPECTOR'S ACCEPTANCE BY / FIELD VERIFICATION BY / DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION — RECORDED BY / NO. — DATE

BENCH MARKS

SURVEY INFORMATION — FIELD NOTES — NO. / BY / DATE

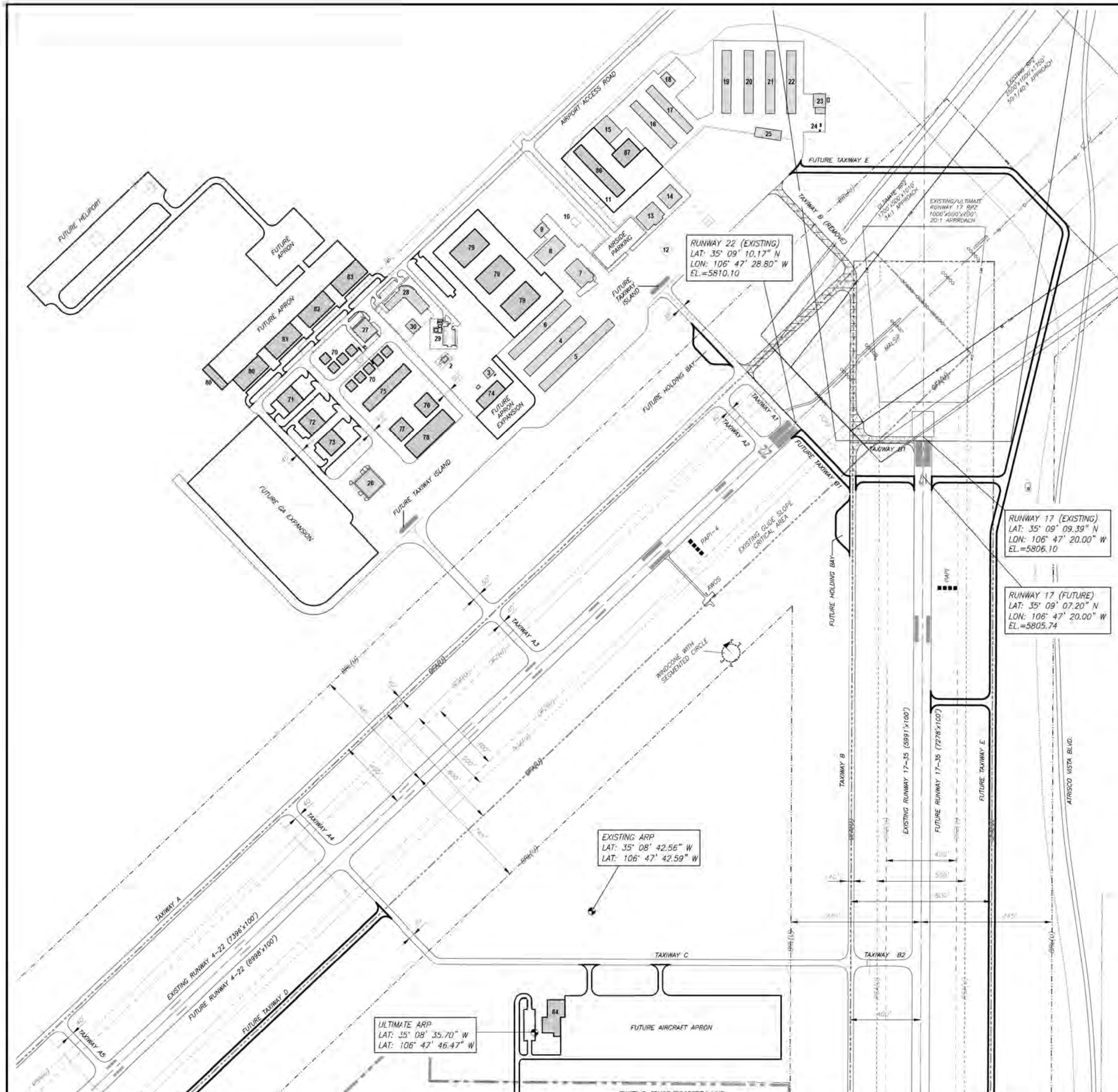
ENGINEER'S SEAL

REVISIONS — NO. / DATE / REMARKS / BY

DESIGN — DESIGNED BY / DRAWN BY / CHECKED BY — DATE

DAB-103 7/24/17 1:1

 MOA JOB NUMBER: KSA151-11



BUILDING/FACILITY

EXISTING BUILDING/FACILITY			FUTURE BUILDING/FACILITY		
#	DESCRIPTION	ELEVATION	#	DESCRIPTION	ELEVATION
1	AIRPORT BEACON	5853.73	70	PRIVATE HANGAR	
2	AIRFIELD ELECTRICAL VAULT		71	EXECUTIVE HANGAR	
3	FBO OFFICE FACILITY	5833.87	72	EXECUTIVE HANGAR	
4	T-HANGARS	5832.22	73	STATE POLICE HANGAR	
5	T-HANGARS	582839	74	EXECUTIVE HANGAR	
6	T-HANGARS	5834.50	75	T-HANGARS	
7	FBO HANGAR	5840.87	76	EXECUTIVE HANGAR	
8	FBO HANGAR	5841.28	77	EXECUTIVE HANGAR	
9	FBO HANGAR	5832.78	78	CONVENTIONAL HANGAR GROUP	
10	FUEL FARM	NA	79	CONVENTIONAL HANGAR	
11	FUEL FARM	NA	80	HELICOPTER HANGAR	
12	AVGAS ISLAND	NA	81	HELICOPTER MRO HANGAR	
13	FBO HANGAR	5840.24	82	HELICOPTER MRO HANGAR	
14	FBO BAY HANGAR	5840.24	83	HELICOPTER MRO HANGAR	
15	FBO HANGAR	5838.63	84	FLIGHT SCHOOL/HANGAR	
16	T-HANGARS	5826.12	85	MAINTENANCE HANGAR	
17	T-HANGARS	NA	86	T-HANGARS	
18	APD AIR SUPPORT HANGAR	5831.62	87	CONVENTIONAL HANGAR	
19	T-HANGARS	5825.17			
20	T-HANGARS	5825.29			
21	T-HANGARS	5825.13			
22	T-HANGARS	5825.28			
23	BUREAU OF INDIAN AFFAIRS FACILITY	5831.68			
24	FUEL TANK	NA			
25	SHADE COVER	5823.34			
26	EXECUTIVE HANGAR	5853.60			
27	EXECUTIVE HANGAR	5844.34			
28	AIRFIELD MAINTENANCE FACILITY	5846.82			
29	AIR TRAFFIC CONTROL TOWER	5925.41			
30	TRAINING FACILITY	5845.33			

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		SECTION CORNERS
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
BRL(U)		BUILDING RESTRICTION LINE
		STRUCTURES ON AIRPORT
		CRITICAL AREA
		AIRPORT PAVEMENT
		ABANDON PAVEMENT
		FENCING
		HOLD MARKING
EAGLEAIR		SURVEY MONUMENT WITH IDENTIFIER
OFA(U)	OFA(U)	OBJECT FREE AREA
RSA(U)	RSA(U)	RUNWAY SAFETY AREA
OFZ(U)	OFZ(U)	OBSTACLE FREE ZONE
		RUNWAY PROTECTION ZONE
		PAPI
		RUNWAY END IDENTIFIER LIGHTS (REILS)
		LIGHTED WINDSOCK
		TOPOGRAPHY

GENERAL NOTES:

1. HORIZONTAL DATUM: NORTH AMERICAN DATUM 1983 – NAD83; VERTICAL DATUM: NORTH AMERICAN DATUM 1988 – NAVD88.
2. NO OFZ PENETRATIONS.
3. SEE INNER PORTION OF THE APPROACH SURFACE DRAWINGS FOR THRESHOLD SITING SURFACE PENETRATIONS.
4. TAXIWAY HOLDING POSITION MARKING DISTANCE FROM RUNWAY CENTERLINE FOR AIRCRAFT APPROACH CATEGORY D INCREASED 1 FOOT FOR EACH 100 FEET ABOVE SEA LEVEL PER AC 150/5340-18D.
5. SEE AIRPORT PROPERTY MAP, SHEET 20 OF 20, FOR FULL PROPERTY OWNERSHIP.
6. EXISTING ILS PRECISION APPROACH TO RUNWAY 22 TO BE DOWNGRADED TO A RNAV GPS NONPRECISION APPROACH. ULTIMATE APPROACH TO RUNWAY 17 TO BE UPGRADE TO AN ILS PRECISION APPROACH.

N

Magnetic Declination 8° 38' East (July 2017)
Annual Rate of Change 00° 06' West (July 2017)

0 150' 300' 600'
1"=300'-0"

AS BUILT INFORMATION
CONTRACTOR
WORK STAKED BY
INSPECTOR'S ACCEPTANCE BY
FIELD VERIFICATION BY
DRAWINGS CORRECTED BY
DATE: DATE: DATE: DATE:

MICRO-FILM INFORMATION
RECORDED BY DATE:
NO.

BENCH MARKS

SURVEY INFORMATION
FIELD NOTES
NO. BY DATE

ENGINEER'S SEAL

NO.	DATE	REMARKS	BY

REVISIONS

DESIGN
DESIGNED BY: DATE
DRAWN BY: DATE
CHECKED BY: DATE

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

TITLE: DOUBLE EAGLE II (AEG) AIRPORT LAYOUT PLANS

TERMINAL AREA DRAWING

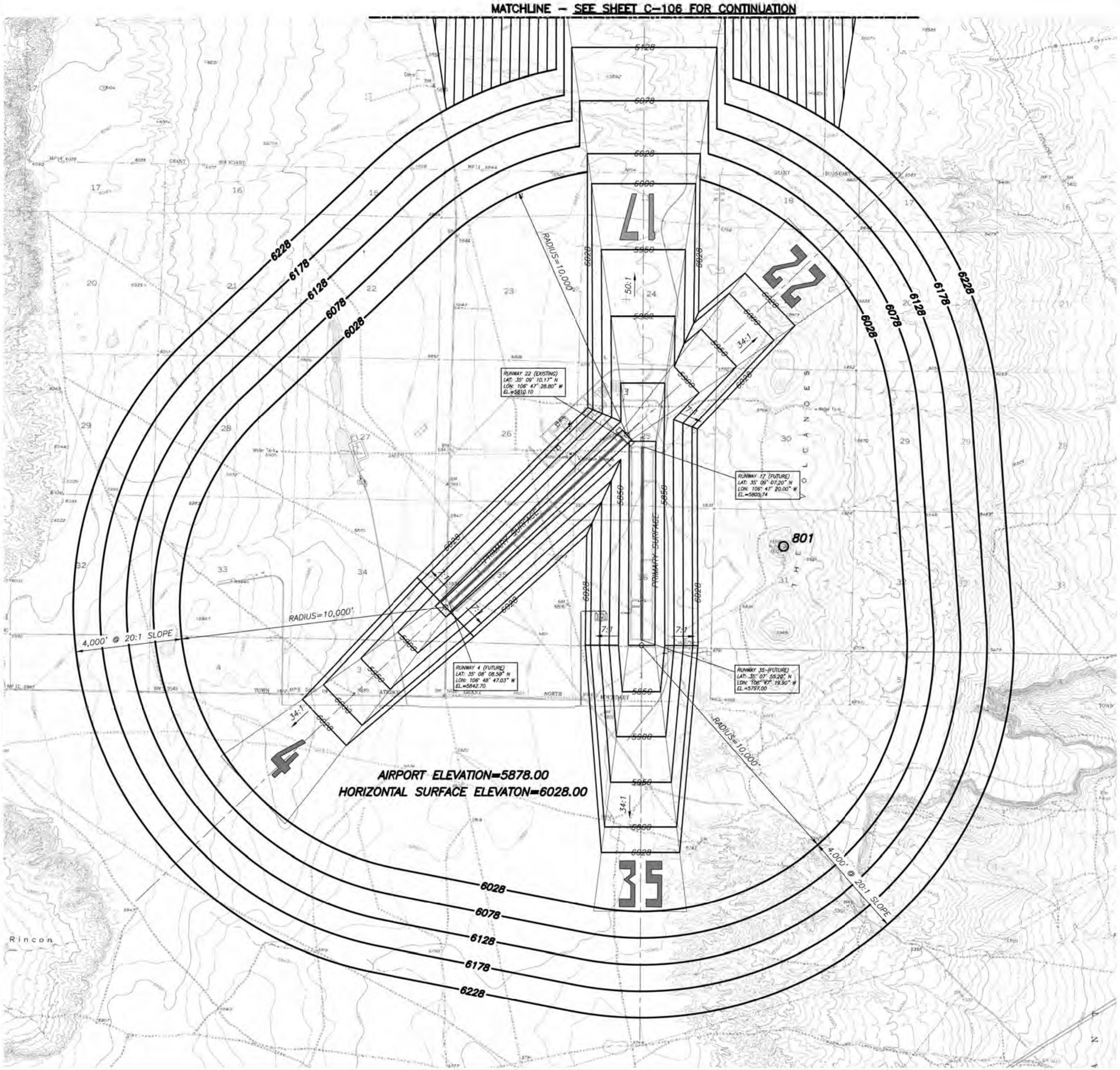
Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

DRAFT

City Project No.	Zone Map No.	Sheet	Of
	M-16	C-104	

MCA JOB NUMBER: KSA151-11

DAB-104 7/24/17 1:1

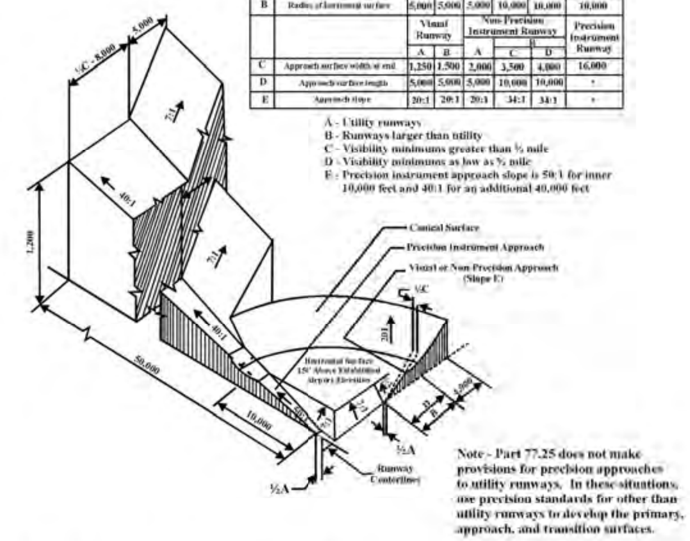


OBSTRUCTION TABLE

#	DESCRIPTION	TOP ELEVATION	LATITUDE	LONGITUDE	SURFACE PENETRATED	PENETRATION (FT)
801	VULCAN VOLCANO	6039.9	35°-08'-29.45"	106°-46'-17.64"	HORIZONTAL	12'

GENERAL NOTES:

1. HORIZONTAL DATUM: NORTH AMERICAN DATUM 1983 – NAD83; VERTICAL DATUM: NORTH AMERICAN DATUM 1988 – NAVD88.
2. OBSTRUCTIONS IDENTIFIED FROM AGIS DATA PREPARED BY MARTINEZ GEOSPATIAL, MINNEAPOLIS, MN.
3. SUPPLEMENTAL OBSTRUCTION DATA EXAMINED FROM THE DOUBLE EAGLE II AIRPORT OBSTRUCTION DATA SHEET, OC 6859, 2ND EDITION, SURVEY DATE 1991. PREPARED AND DISTRIBUTED BY THE NATIONAL OCEAN SERVICE, US DEPARTMENT OF COMMERCE FOR THE FEDERAL AVIATION ADMINISTRATION.
4. EXISTING ILS PRECISION APPROACH TO RUNWAY 22 TO BE DOWNGRADED TO A RNAV GPS NONPRECISION APPROACH. ULTIMATE APPROACH TO RUNWAY 17 TO BE UPGRADE TO AN ILS PRECISION APPROACH.



DIM	ITEM	Dimensional Standards (Feet)					
		Visual Runway		Non-Precision Instrument Runway			Precision Instrument Runway
		A	B	A	B: C	B: 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 Runway		Non-Precision Instrument Runway			Precision Instrument Runway
		A	B	A	B: C	B: 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 ¾ mile
D - Visibility minimums as low as ¾ mile
* - Precision instrument approach slope is 50:1 for inner 10,000 feet and 40:1 for an additional 40,000 feet

PART 77 AIRSPACE - ISOMETRIC VIEW

N

Magnetic Declination 8° 38' East (July 2017)
Annual Rate of Change 00° 06' West (July 2017)

0 1000' 2000' 4000'
1"=2000'

AS BUILT INFORMATION
CONTRACTOR / WORK STARTED / WORK COMPLETED / INSPECTOR'S ACCEPTANCE BY / FIELD VERIFICATION BY / DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION
RECORDED BY — DATE
NO.

BENCH MARKS

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

ENGINEER'S SEAL

NO. | DATE | REMARKS | BY
REVISIONS
DESIGN
DESIGNED BY — DATE
DRAWN BY — DATE
CHECKED BY — DATE

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

TITLE: DOUBLE EAGLE II (AEG) AIRPORT LAYOUT PLANS

AIRPORT AIRSPACE DRAWING I

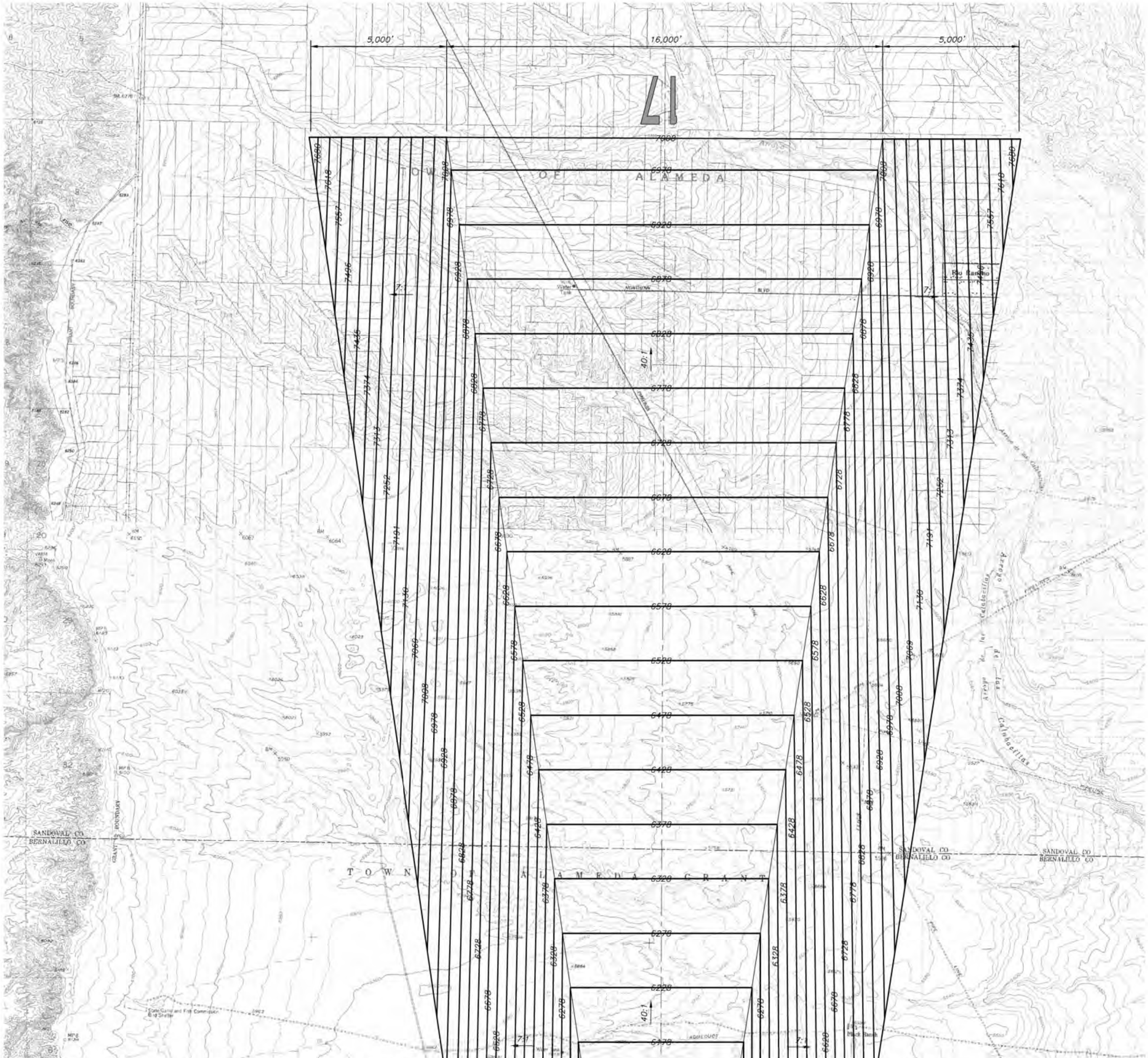
DRAFT

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
..	M-16	C-105	

CAB-105 7/21/17 1:1

 MOA JOB NUMBER: KSA151-11



MATCHLINE – SEE SHEET C–105 FOR CONTINUATION

OBSTRUCTION TABLE

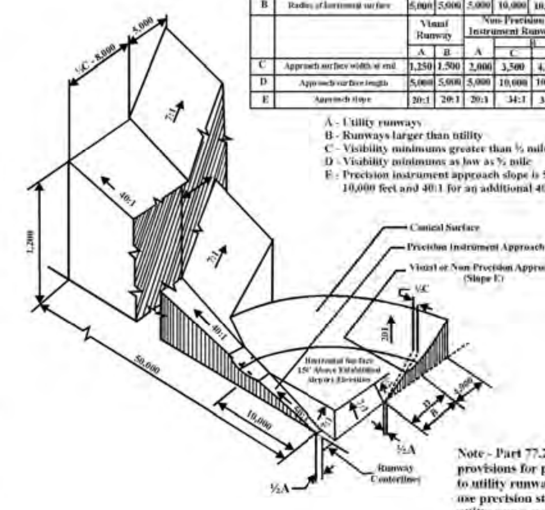
#	DESCRIPTION	TOP ELEVATION	LATITUDE	LONGITUDE	SURFACE PENETRATED	PENETRATION (FT)
NONE						

GENERAL NOTES:

1. HORIZONTAL DATUM: NORTH AMERICAN DATUM 1983 – NAD83; VERTICAL DATUM: NORTH AMERICAN DATUM 1988 – NAVD88.
2. OBSTRUCTIONS IDENTIFIED FROM AGIS DATA PREPARED BY MARTINEZ GEOSPATIAL, MINNEAPOLIS, MN.
3. SUPPLEMENTAL OBSTRUCTION DATA EXAMINED FROM THE DOUBLE EAGLE II AIRPORT OBSTRUCTION DATA SHEET, OC 6859, 2ND EDITION, SURVEY DATE 1991. PREPARED AND DISTRIBUTED BY THE NATIONAL OCEAN SERVICE, US DEPARTMENT OF COMMERCE FOR THE FEDERAL AVIATION ADMINISTRATION.
4. EXISTING ILS PRECISION APPROACH TO RUNWAY 22 TO BE DOWNGRADED TO A RNAV GPS NONPRECISION APPROACH. ULTIMATE APPROACH TO RUNWAY 17 TO BE UPGRADE TO AN ILS PRECISION APPROACH.

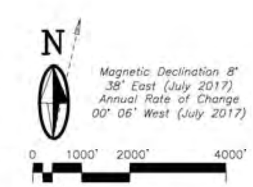
DIM	ITEM	Dimensional Standards (Feet) Visual Runway A	B	Non-Precision Instrument Runway A	B C	B D	Precision Instrument Runway
A	Width of primary surface and approach surface width at inner end	250	500	500	500	1,000	1,000
B	Radius of horizontal surface	5,000	5,000	5,000	10,000	10,000	10,000
		Visual Runway A	B	Non-Precision Instrument Runway A	B C	B D	Precision Instrument Runway
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 ¾ mile
D - Visibility minimums as low as ¾ mile
* - Precision instrument approach slope is 50:1 for inner 10,000 feet and 40:1 for an additional 40,000 feet



Note - Part 77.25 does not make provisions for precision approaches to utility runways. In these situations, use precision standards for other than utility runways to develop the primary, approach, and transition surfaces.

PART 77 AIRSPACE - ISOMETRIC VIEW



AS BUILT INFORMATION	
CONTRACTOR	
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE
MICRO-FILM INFORMATION	
RECORDED BY	DATE
NO.	

BENCH MARKS

SURVEY INFORMATION

FIELD NOTES		
NO.	BY	DATE

ENGINEER'S SEAL

REMARKS		
NO.	DATE	BY

REVISIONS DESIGN	
DESIGNED BY	DATE
DRAWN BY	DATE
CHECKED BY	DATE

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

TITLE: **DOUBLE EAGLE II (AEG) AIRPORT LAYOUT PLANS**

AIRPORT AIRSPACE DRAWING II

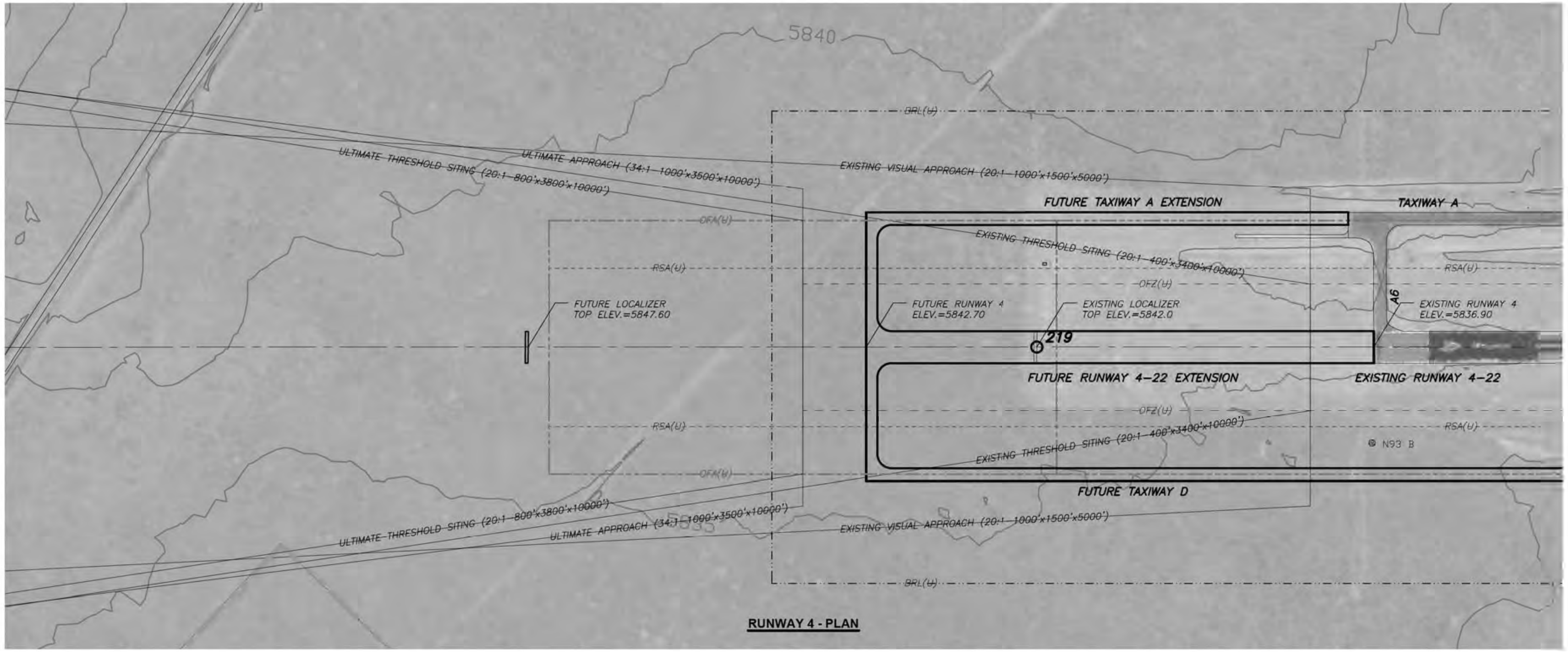
DRAFT

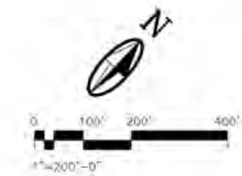
Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

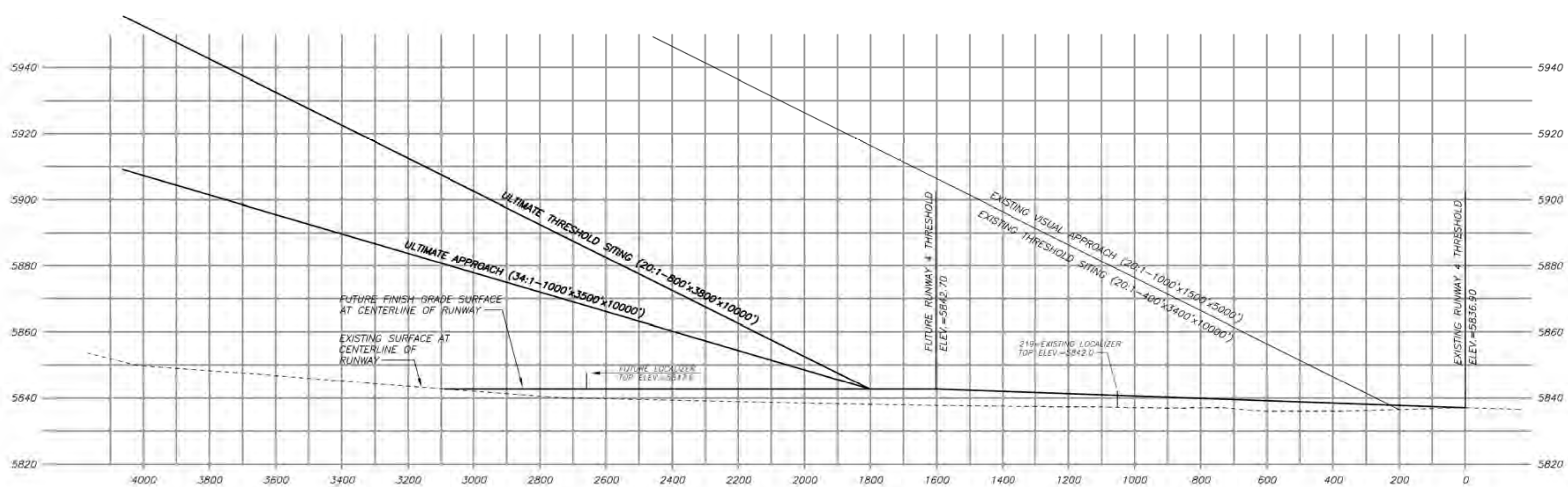
City Project No.	Zone Map No.	Sheet	Of
..	M-16	C-106	

DAB-106 7/21/17 1:1

 MOA JOB NUMBER: KSA151-11







RUNWAY 4 - PROFILE

HORIZ. SCALE: 1"=200'
VERT. SCALE: 1"=20'

AS BUILT INFORMATION

CONTRACTOR
WORK STAKED BY — DATE
INSPECTOR'S ACCEPTANCE BY — DATE
FIELD VERIFICATION BY — DATE
DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION

RECORDED BY — DATE
NO.

BENCH MARKS

SURVEY INFORMATION

FIELD NOTES		
NO.	BY	DATE

ENGINEER'S SEAL

REVISIONS			
NO.	DATE	REMARKS	BY

DESIGN

DESIGNED BY — DATE
DRAWN BY — DATE
CHECKED BY — DATE

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

TITLE: DOUBLE EAGLE II (AEG) AIRPORT LAYOUT PLANS

APPROACH SURFACE DRAWING
RUNWAY 4

DRAFT

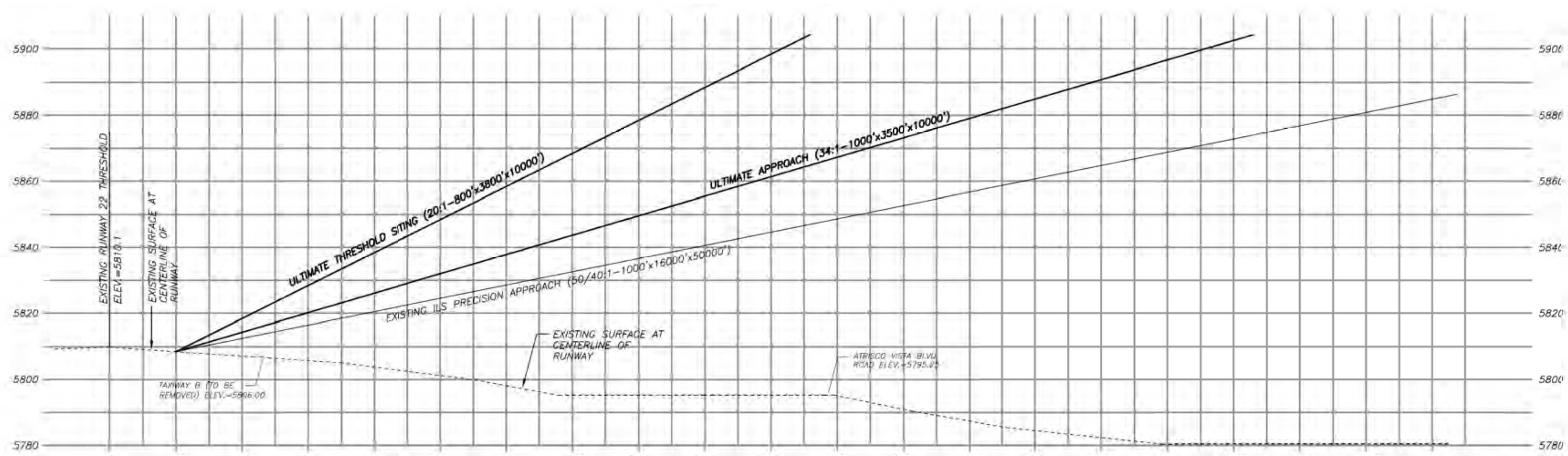
Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
..	M-16	C-107	

C4B-107 7/21/11

MOA JOB NUMBER: KSA151-11

RUNWAY 22 - PLAN



RUNWAY 22 - PROFILE

HORIZ. SCALE: 1"=200'
VERT. SCALE: 1"=20'

AS BUILT INFORMATION

CONTRACTOR / WORK STAKED BY / DATE / INSPECTOR'S ACCEPTANCE BY / DATE / FIELD VERIFICATION BY / DATE / DRAWINGS CORRECTED BY / DATE

MICRO-FILM INFORMATION

RECORDED BY / DATE / NO.

BENCH MARKS

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

NO.	DATE	REMARKS	BY

REVISIONS

DESIGN

DESIGNED BY / DATE
DRAWN BY / DATE
CHECKED BY / DATE

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

TITLE: DOUBLE EAGLE II (AEG) AIRPORT LAYOUT PLANS

APPROACH SURFACE DRAWING
RUNWAY 22

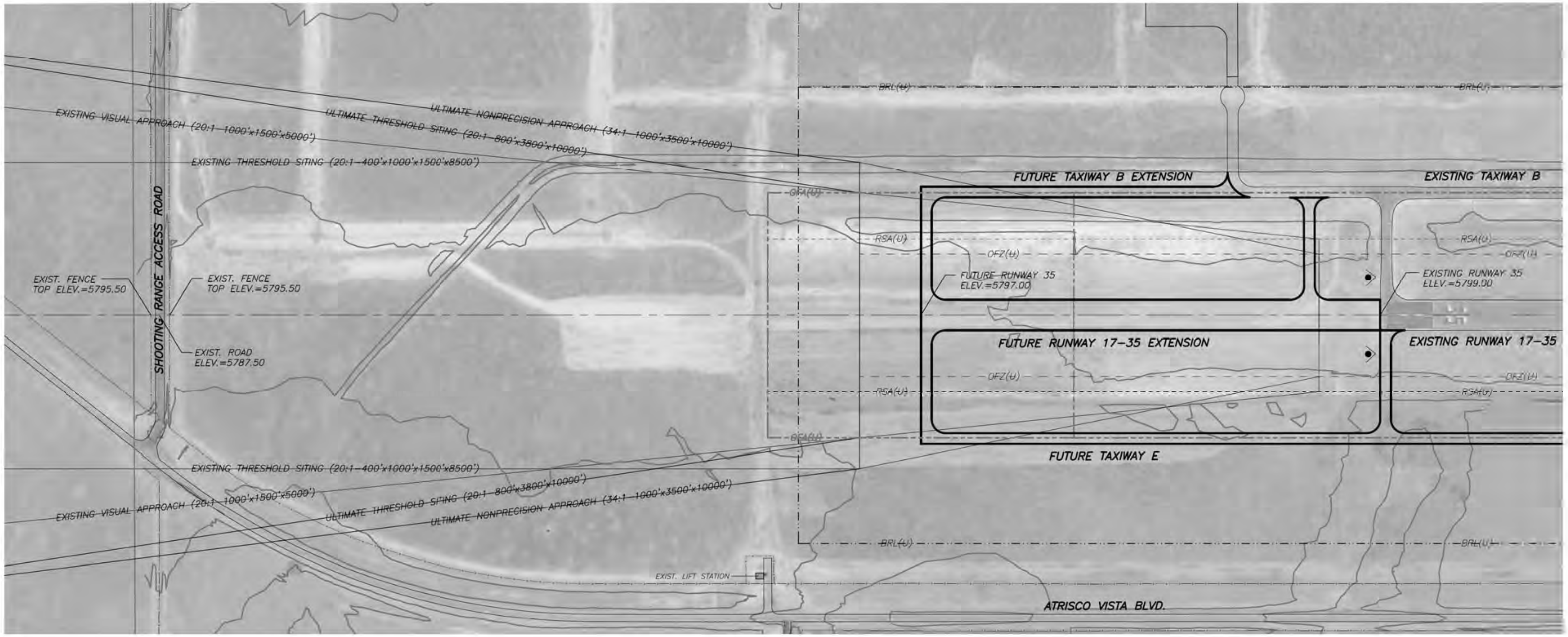
DRAFT

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

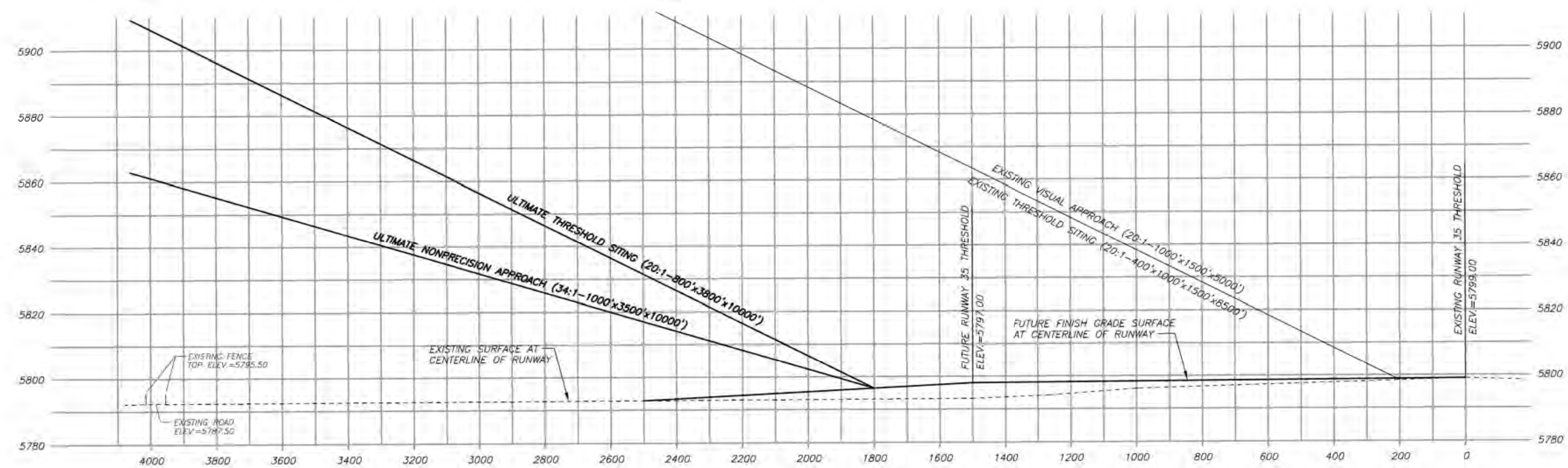
City Project No.	Zone Map No.	Sheet	Of
..	M-16	C-108	

MOA JOB NUMBER: KSA151-11

CAB-108 7/21/11



RUNWAY 35 - PLAN



RUNWAY 35 - PROFILE

HORIZ. SCALE: 1"=200'
VERT. SCALE: 1"=20'

AS BUILT INFORMATION

BENCH MARKS

SURVEY INFORMATION FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

NO.	DATE	REMARKS	BY

REVISIONS

DESIGN

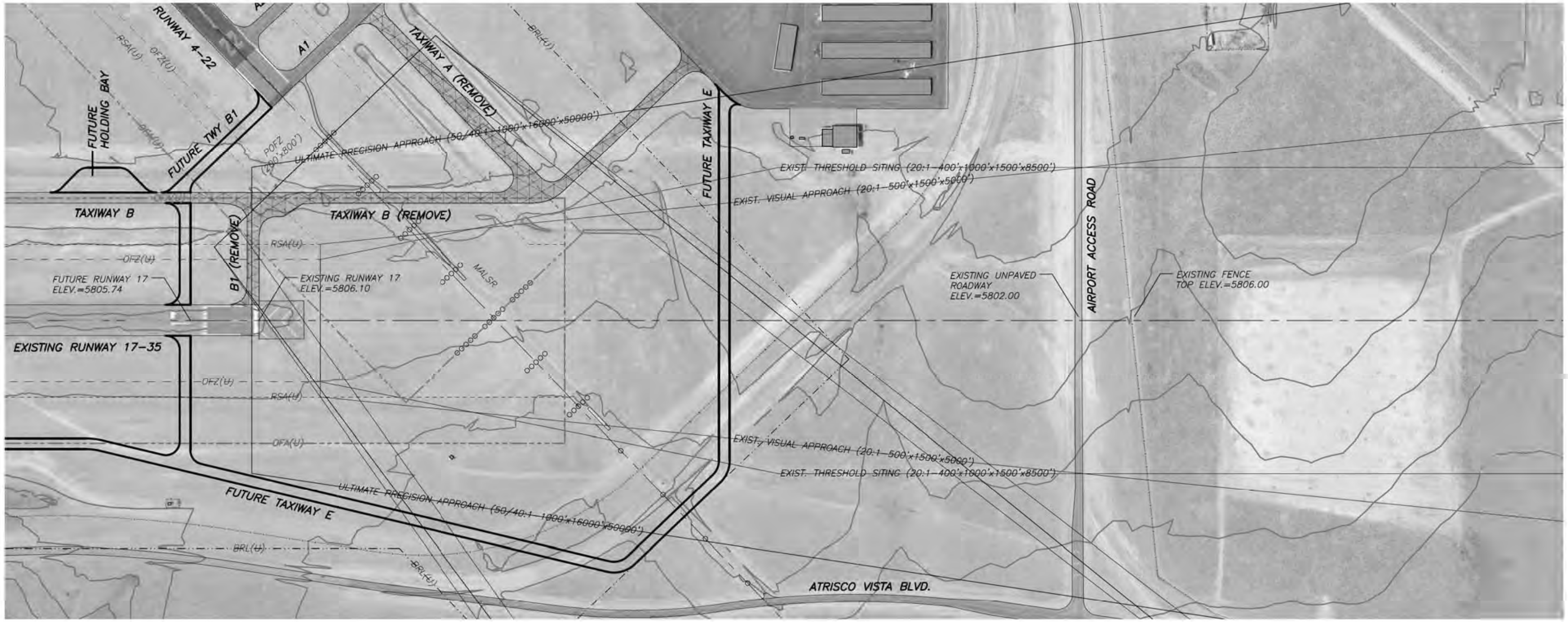
CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

TITLE: DOUBLE EAGLE II (AEG) AIRPORT LAYOUT PLANS

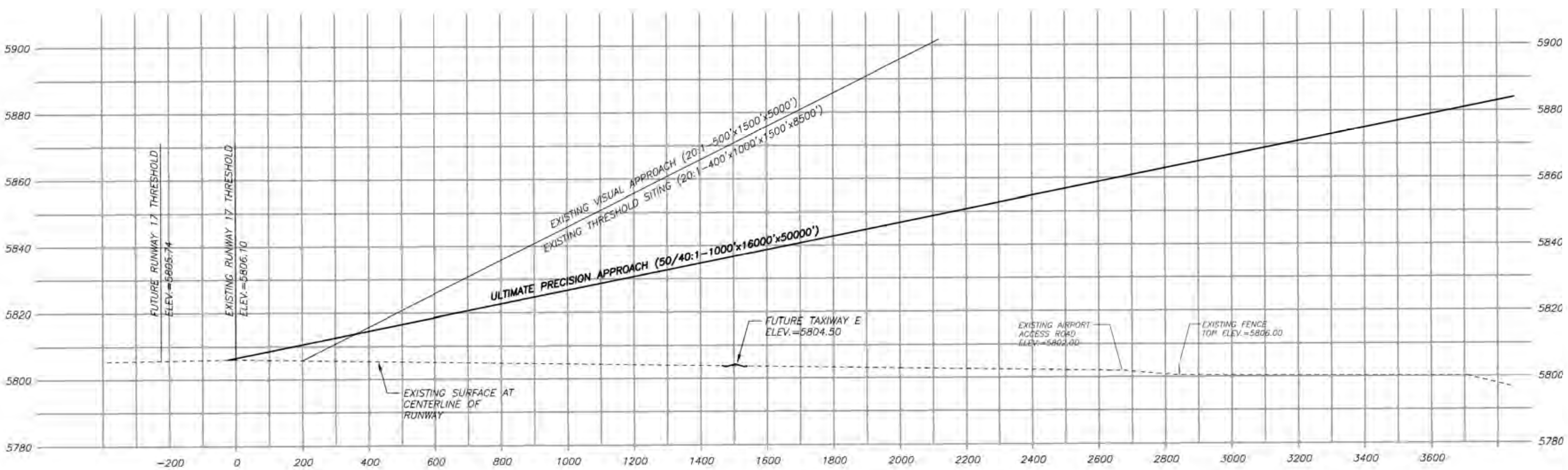
APPROACH SURFACE DRAWING
RUNWAY 35

Design Review Committee | City Engineer Approval | DRAFT | Last Design Update

City Project No. | Zone Map No. M-16 | Sheet C-109 Of



RUNWAY 17 - PLAN



RUNWAY 17 - PROFILE

HORIZ. SCALE: 1"=200'
VERT. SCALE: 1"=20'

AS BUILT INFORMATION

MICRO-FILM INFORMATION

BENCH MARKS

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

NO.	DATE	REMARKS	BY

REVISIONS

DESIGN

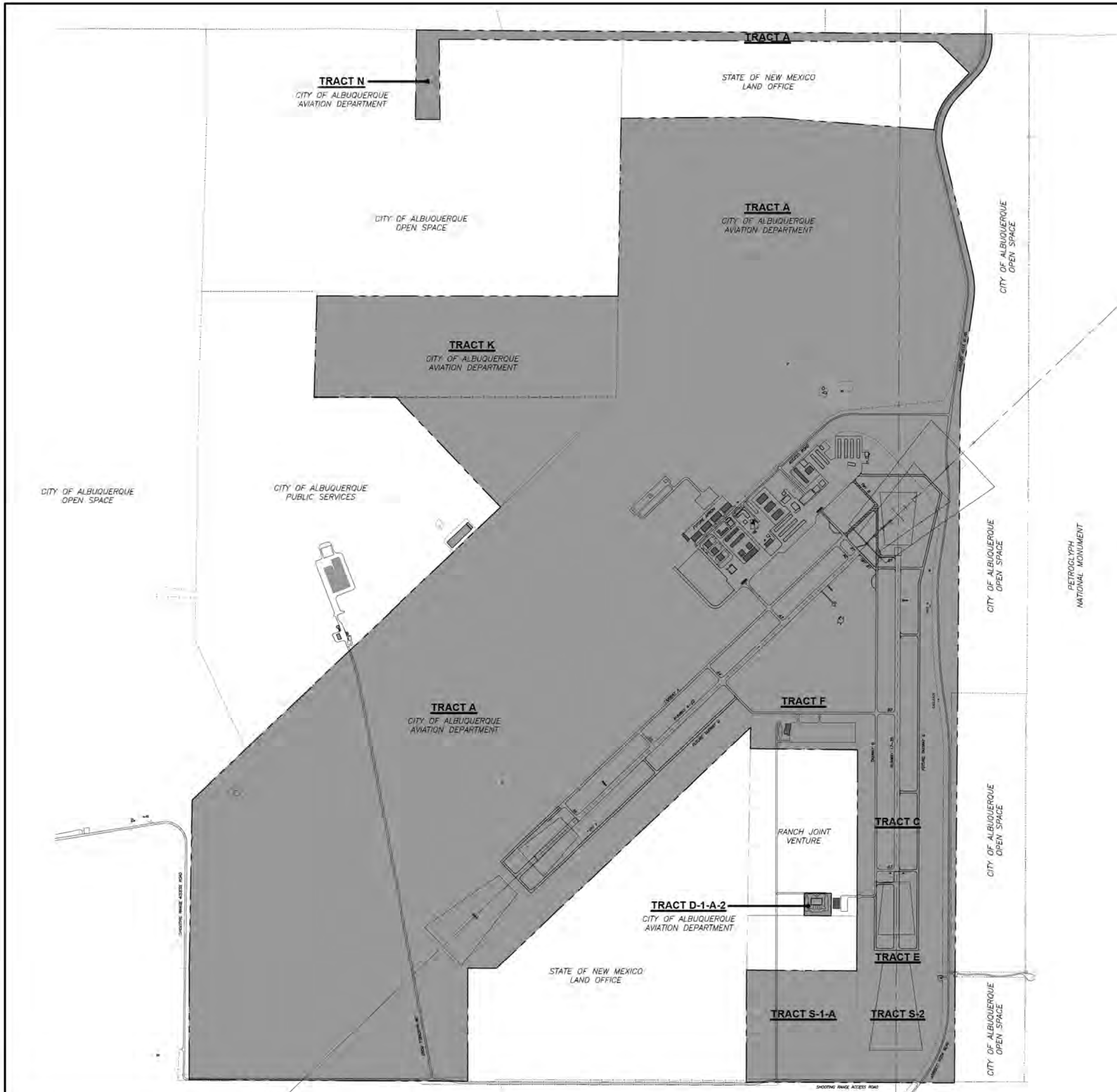
CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

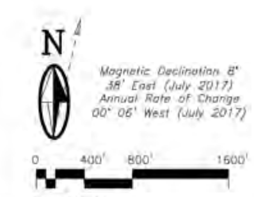
TITLE: DOUBLE EAGLE II (AEG) AIRPORT LAYOUT PLANS

APPROACH SURFACE DRAWING
RUNWAY 17

Design Review Committee	City Engineer Approval	Last Design Update
	DRAFT	

City Project No.	Zone Map No.	Sheet	Of
	M-16	C-110	





GENERAL NOTES:

1. HORIZONTAL DATUM: NORTH AMERICAN DATUM 1983 – NAD83; VERTICAL DATUM: NORTH AMERICAN DATUM 1988 – NAVD88.
2. THE URS BULK LAND PLAT OF DOUBLE EAGLE II AIRPORT AND ADJACENT LANDS, DATED APRIL 2002, AND AN AMENDED BULK LAND PLAT OF D-1-A-1-A AND D-1-A-1-B, DATED DECEMBER 2011 WERE USED TO DEVELOP THIS PROPERTY MAP.

LEGEND:

- EXISTING AIRPORT PROPERTY/BOUNDARY LINE
- TRACT BOUNDARY LINE
- AIRPORT PROPERTY

AS BUILT INFORMATION: CONTRACTOR / WORK STAKED BY / INSPECTOR'S ACCEPTANCE BY / FIELD VERIFICATION BY / DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION: RECORDED BY — DATE; NO.

BENCH MARKS

SURVEY INFORMATION: FIELD NOTES — NO. | BY | DATE

ENGINEER'S SEAL

REVISIONS: NO. | DATE | REMARKS | BY

DESIGN: DESIGNED BY — DATE; DRAWN BY — DATE; CHECKED BY — DATE

CITY OF ALBUQUERQUE
DEPARTMENT OF MUNICIPAL DEVELOPMENT
ENGINEERING DIVISION

TITLE: **DOUBLE EAGLE II (AEG) AIRPORT LAYOUT PLANS**

AIRPORT PROPERTY MAP

DRAFT

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
--	M-16	C-111	

 MCA JOB NUMBER: KSA151-11

C-111 7/31/17

Glossary of Terms:

Glossary of Terms

AGENCIES

FAA	Federal Aviation Administration
NMDOT	New Mexico Department of Transportation
AEG	Double Eagle II Airport

GENERAL TERMS

AC	Advisory Circular
ADG	Airplane Design Group
AGL	Above Ground Level
AIP	Airport Improvement Program
ALD	Airport Layout Drawing
ALP	Airport Layout Plan
AOA	Aircraft Operations Area
AOPA	Aircraft Owners and Pilots Association
ARC	Airport Reference Code
ARFF	Aircraft Rescue and Fire Fighting
ARTCC	Air Route Traffic Control Center
ASOS	Automated Surface Observation Station
ASV	Annual Service Volume
ATC	Air Traffic Control
ATCT	Air Traffic Control Tower
ATIS	Automated Terminal Information System
AVGAS	Aviation Gasoline - Typically 100 Low Lead (100LL)
AWOS	Automated Weather Observation Station
BRL	Building Restriction Line
CFR	Code of Federal Regulations
CIP	Capital Improvement Plan
DME	Distance Measuring Equipment
EA	Environmental Assessment
EIS	Environmental Impact Statement
FAA	Federal Aviation Administration

FAR	Federal Aviation Regulations
FBO	Fixed Base Operator
FONSI	Finding of No Significant Impact
FY	Fiscal Year
GA	General Aviation
GIS	Geographical Information Systems
GPS	Global Positioning System
HIRL	High Intensity Runway Edge Lighting
IFR	Instrument Flight Rules
ILS	Instrument Landing System
Jet A	Jet Fuel
LIRL	Low Intensity Runway Edge Lighting
LP	Localizer Performance
LPV	Localizer Performance with Vertical Guidance
MIRL	Medium Intensity Runway Edge Lighting
MITL	Medium Intensity Taxiway Edge Lighting
MOA	Military Operations Area
MRO	Maintenance, Repair, and Overhaul
MSL	Mean Sea Level
MTP	Metropolitan Transportation Plan
NAFTA	North American Free Trade Agreement
NAS	National Airspace System
NAVAIDS	Navigational Aid
NDB	Non-Directional Beacon
NM	Nautical Mile (6,076.1 Feet)
NPIAS	National Plan of Integrated Airport Systems
OFA	Object Free Area
OFZ	Obstacle Free Zone
PAC	Planning Advisory Committee
PAPI	Precision Approach Path Indicator
RDC	Runway Design Code
REIL	Runway End Identifier Lighting
RGV	Rio Grande Valley
RNAV	Area Navigation

RPZ	Runway Protection Zone
RSA	Runway Safety Area
RVR	Runway Visibility Range
RVZ	Runway Visibility Zone
RWY	Runway
SASP	State Aviation System Plan
SM	Statute Mile (5,280)
SWOT	Analysis
TAF	Federal Aviation Administration (FAA) Terminal Area Forecast
TODA	Takeoff Distance Available
TORA	Takeoff Runway Available
TRACON	Terminal Radar Approach Control
TRSA	Terminal Radar Service Area
TWY	Taxiway
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules (FAR Part 91)
VOR	Very High Frequency Omni-Directional Range
VORTAC	VOR and TACAN collocated
WAAS	Wide Area Augmentation Systems

Appendix A:

SWOT Analysis and Economic Development Strategy

Appendix A - Airport Master Plan SWOT and Development Strategy

July 21, 2016

Table of Contents

Introduction
Background
Market Position
SWOT Analysis
Market Opportunity
New Mexico Aviation Goals
Available Incentives
Airport Property
Development Opportunity
Summary

KSA

C&S COMPANIES®

Introduction

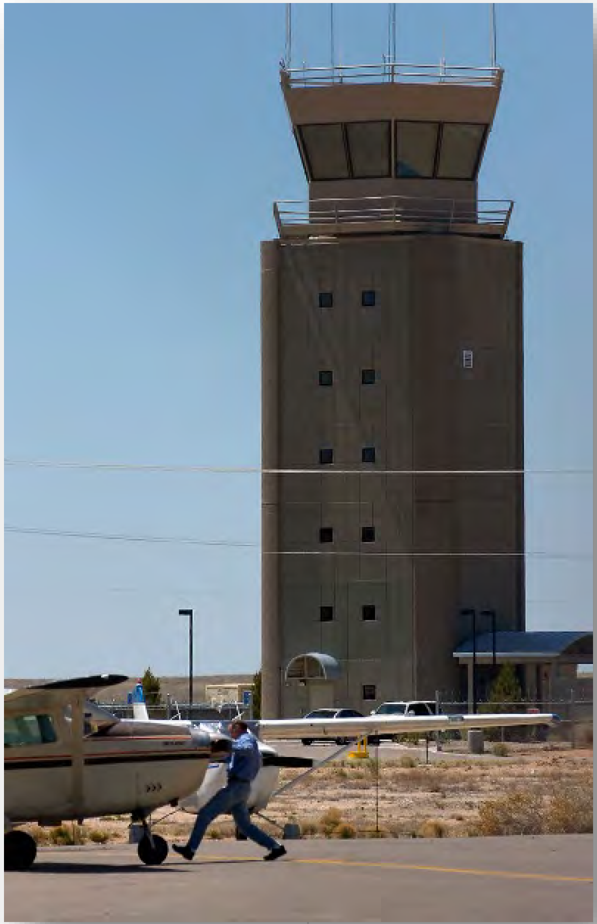
Primary Goals

As part of the 2016 Airport Master Plan Update, this report is the result of facilitation and preparation of a development strategy for the Double Eagle II Airport (AEG). The primary goals of the effort looked to:

- Identify features that make AEG unique
- Capitalize on opportunities that such features provide
- Uncover untapped prospects
- Provide guidance and recommendations to inform alternative development scenarios in the Master Plan
- Strategically position AEG for long-term growth

Background

Double Eagle II Features & Services



Runway 4-22

7,398 feet x 100 feet

Full ILS

MALSR on the runway 22 end

PAPI visual

Runway 17-35

5,999 feet x 100 feet

REIL on each end

PAPI visual

Traffic pattern altitude is 6,800 feet mean sea level

Right hand traffic patterns for runways 22 and 35

FBO – Bode Aero Services

Flight training, aircraft rental, airframe and powerplant repair, avionics and charter service

Airfield maintenance facility is LEED Gold certified (2011)

Background

2015 Based Aircraft by Type

TOTAL = 227
Single-Engine = 200
Multi-Engine = 12
Jet = 1
Helicopter = 10
Ultralight = 4

2015 Aircraft Operations

TOTAL = 78,860
GA Itinerant = 24,730
GA Local = 51,730
Military = 1,200
Air Taxi = 1,200

Market Position: *National Aviation*

National Plan of Integrated Airports (NPIAS)

Contains 3,345 airports – including 3,331 existing and 14 proposed

Two major categories:

- Primary (divided into hubs)
- Nonprimary (divided into asset categories)

PRIMARY
389 Airports

- Large hub = 29
- Medium hub = 33
- Small hub = 76
- Nonhub = 251

NONPRIMARY
3,331 Airports
(+ 14 Proposed)

- National = 84
- **Regional = 459**
- Local = 1268
- Basic = 880
- Unclassified = 251

Source: NPIAS 2015-2019

Market Position: *Aviation in New Mexico*

Aviation in New Mexico[1]

Public Use Airports

Total = 62

Included in SASP = 61

NPIAS Airports

Total = 51

Primary = 5

Non-Primary = 46

ASSET Categories

National = 0

Regional = 8

Local = 11

Basic = 21

Unclassified = 6

Square Miles = 121, 697

Population = 2,085,572

[1]NPIAS 2015-2019 and New Mexico Airport System Plan Update 2014

[2]The Economic Impact of Commercial Aviation in 2013 by CDM Smith

Market Position: *Aviation in New Mexico*

Economic Impact of Aviation in New Mexico[2]

Number of Commercial Airports: 5

Jobs Created: 31,060

Payroll: $1,125,079,000

Output: $3,558,479,000

34th among all other U.S. states for total outputs of economic impacts of commercial airports

[1]NPIAS 2015-2019 and New Mexico Airport System Plan Update 2014
[2]The Economic Impact of Commercial Aviation in 2013 by CDM Smith

Market Position: *Albuquerque Airport System & New Mexico*

Direct Impacts + Indirect and Induced Impacts = Total Economic Impact

- Employment, payroll and spending by CAAD & other airport-dependent businesses
- Commercial service visitors' spending
- General Aviation service visitors' spending
- Spending on Capital Improvement Projects

Total Economic Impact of the Albuquerque Airport System

- Employment Total: 20,062
  (2.6% of all jobs in New Mexico)
- Labor Income: $700,871,585
  (2% of total wage and salary income in New Mexico)
- Output: $1,948,830,051
  (2.4% of the total gross state product in Fiscal Year 2012)
- State and Local Tax Revenue: >$82.4 million

Source: Economic Impacts of Albuquerque Airport System on the New Mexico Economy August 2013

Market Position: *Albuquerque Airport System & New Mexico*

Albuquerque International Sunport

2015-2019 Dev Estimate
$71,004,662

Double Eagle II

2015-2019 Dev Estimate
$6,361,034

Source: Economic Impacts of Albuquerque Airport System on the New Mexico Economy August 2013

KSA

C&S COMPANIES®

SWOT Analysis : *Process*

S — **Strengths – Competitive Advantage**
capabilities, competitive advantages, marketing, quality, qualifications, processes/systems

W — **Weaknesses – Barrier/Limitation**
disadvantages, lack of competitive strength, reputation, morale/leadership, processes/systems

O — **Opportunities – A Favorable External Situation**
market developments, industry trends, partnerships, competitor vulnerabilities

T — **Threats – Potentially Damaging External Force**
economic downturn, demographic shifts, new regulations

KSA

C&S COMPANIES®

SWOT Analysis : *Process*

In January 2016, two SWOT Workshops were held at Double Eagle II Airport's administrative offices. These workshops were represented by three groups:

1. The Airport staff and tenants;
2. Local and regional businesses; and
3. State and economic development agencies in the Albuquerque region.

The workshops attracted over 25 attendees with a strong level of dialogue regarding Double Eagle II's strengths, weaknesses, opportunities and threats.

A summary matrix of the SWOT workshops can be found on the next page.

SWOT Analysis: *Strengths Summary*

S

- Utility infrastructure
- **Proximity to I-40 and PDV**
- Lot of developable property
- Build ready sites
- **Surrounding land Master Planned – Recognized Airport**
- Zoned for airport related facilities – **including school & training**
- Existing runway/taxiway infrastructure
- VFR/Good Wx for training
- Remoteness
- Petroglyph National Monument (buffer)
- AEG designated in Comp Plan
- AEG is reverse commute
- **Favorable training environment**
- ATCT
- Established Aviation Industry
- Kirkland AFB labor pool – 500 annual separation (2 other bases in NM)
- Ability to do design/build
- Geography/beauty of area/cultural diversity/perspective
- Cultural resource/biological resources completed
- Corps cleaned old
- Airport at hangar capacity

KSA

C&S COMPANIES®

SWOT Analysis: *Weaknesses Summary*

W

- Remoteness
- Petroglyph National Monument
- **Airfield access in south area**
- Pavement strength -75k dual wheel
- Fire protection limited/emergency services
- Lack of parallel runway for training
- Hotels in proximity
- Ability to sell property
- Vastness/expansiveness
- **AEG at hangar capacity**
- Limited food and rental car availability
- **No radar in ATCT (on request list)**
- Runway 4 approach/GPS (underdevelopment)

KSA

C&S COMPANIES®

SWOT Analysis: *Opportunities Summary*

O

- **PDV implementation** – if expedited, 5 years: if not, 10 years – environmental compliance
- Trainable workforce
- Education institutes
- Available labor pool from eclipse
- Regional characteristics – lifestyle; geography attractive
- Good crossroads – rail/aviation
- **Impending alternative site framework – subset of FTZ**
- City planning working to simplify codes and policies
- Utility infrastructure (specifically water) – south/zone 7 - $40M investment
- Housing availability nearby
- Bring jobs to westside/relieve river crossing
- **State incentives/credit – based on type of operation**
- **Opportunities through aviation department**
- **New Mexico partnership**
- More civic opportunities at AEG
- Attractiveness to pilot retirement community
- Large supply of natural gas near AEG
- Increase of 65+ is 12% in 2015; growth to 20% by 2040 (Dept. of State Affairs – growth of retirement community)
- Air Ambulance

KSA

C&S COMPANIES®

SWOT Analysis: *Threats (Constraints) Summary*

T

- **PDV funding**
- Fuel prices
- Tax code/state biz environment – some improvements, need more
- Substation would be needed for power capacity (18-24 months) timeframe to receive
- Limited funding to communicate and market state and region need continuity (compared to peers/other states)
- Limited public knowledge of AEG
- **Funding (federal, state, city)**
- Regulations (FAA)
- **Airport competition (Roswell, other)**
- Speed limit of AEG access road

Market Opportunity: *Helicopter MRO*

Total of 9 MRO's reviewed

Average acres: 11

Average building square footage: 74,500

Most located at Reliever classified airports

Most located near a large city

½ of MRO's have more than one location

KSA

C&S COMPANIES®

Market Opportunity : *Flight School/Training Farms*

Total of 9 flight schools reviewed

Average acres: 8

Average building square footage: 22,800

All schools are airside and have ramp access

Most schools offered classes to international students

Schools are located at general aviation or reliever classified airports

Student housing offered in all cases (on or off site)

Student transportation provided in most cases

New Mexico Aviation Goals

Airport System Plan

Goal 1: Increase/Enhance Safety & Security

Goal 2: Preserve/Protect Investment in Airports

Goal 3: Accommodate Existing & Projected Aviation Demand

Goal 4: Support Economic Growth of the Community

Source: New Mexico Airport System Plan Update 2014

Available Incentives

Major Incentives

Industrial Revenue Bond (IRB)

Job Training Incentive Program (JTIP)

High Wage Jobs Tax Credit (HWJTC)

Technology Jobs Tax Credit

Manufacturing Investment Tax Credit

Rural Jobs Tax Credit

Gross Receipts Tax Deduction for Manufacturing Consumables

Single Sales Factor Apportionment

Source: Albuquerque Economic Development, Inc.

Available Incentives

Renewable Energy Incentives

Alternative Energy Product Manufacturer's Tax Credit

Energy Generator Tax Credits

Aviation/MRO Incentives

Aircraft Manufacturing Tax Credit

Aircraft Maintenance or Remodeling Tax Credit

Military Acquisition Program Tax Deduction

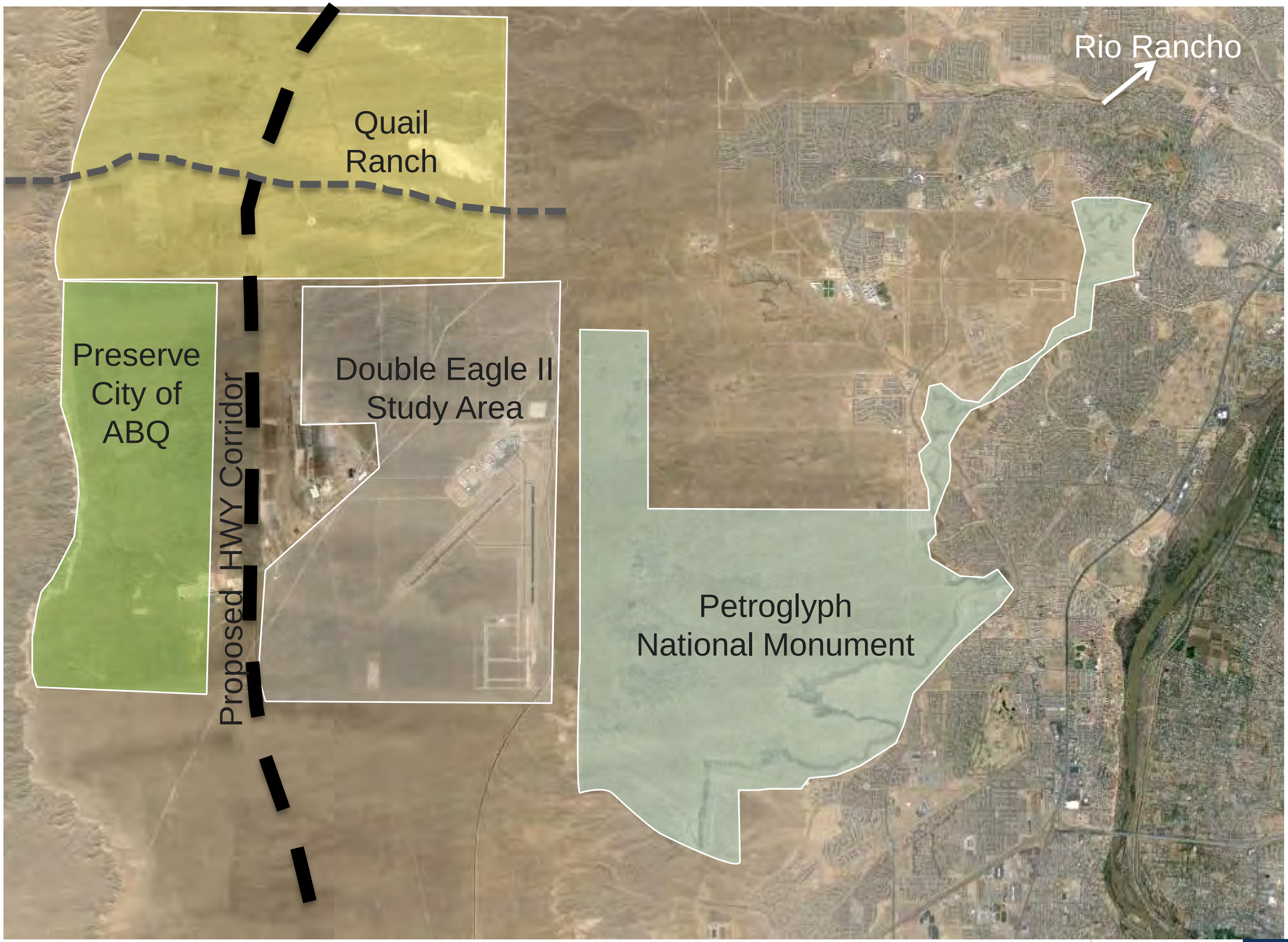
Space Gross Receipts Tax Deduction

Other Incentives

Directed Energy Systems Gross Receipts Tax Deduction

Source: Albuquerque Economic Development, Inc.

Airport Property



Development Opportunity: *Cooperation with Sunport*

APPLIED
(market-driven)

Retail / Restaurant / Services
- Gas Station/C-Store
- Convenience Strip Center

Hotel
- Limited service, midscale/upscale

INFLUENCED
(via economic development)

Aviation / Aviation-related
- Aircraft Component, Composite & Engine Manufacturing
- Regional/Business Jet MRO & Supply Cluster
- Aviation-focused Education & Training Center

Office/Industrial/ Flex
- Call Center
- Data Center
- Shared Services

Development Opportunity: *Metrics for Development*

NATIONAL MIDDLE-OF-THE-MARKET METRICS FOR AVIATION & AVIATION-RELATED DEVELOPMENT		
Use	**Acreage**	**Economic Incentive Threshold Range** (estimated NPV of incentive package)
Aircraft Manufacturing	60 – 240	$13 MM - $450 MM
Aircraft Components Manufacturing	4 – 90	Up to $2 MM
MRO Commercial	23 – 89	$250,000 - $65 MM
MRO Business/Regional Jet	6 – 20	$1 MM - $10 MM
MRO Components	2 – 20	<$1 - $22 MM
MRO Helicopters	1 – 15	not available
JIT Fulfillment, Distribution & Logistics Centers	15 – 127	$500,000 - $33 MM
Education/Training Centers	1 – 30	$0 - $57 MM
Specialty Uses	13 – 116	$7.5 MM - $100 MM
Energy Production	5 – 42	up to $6 MM
Agriculture	Up to ±3,000	not available

Source: C&S Companies

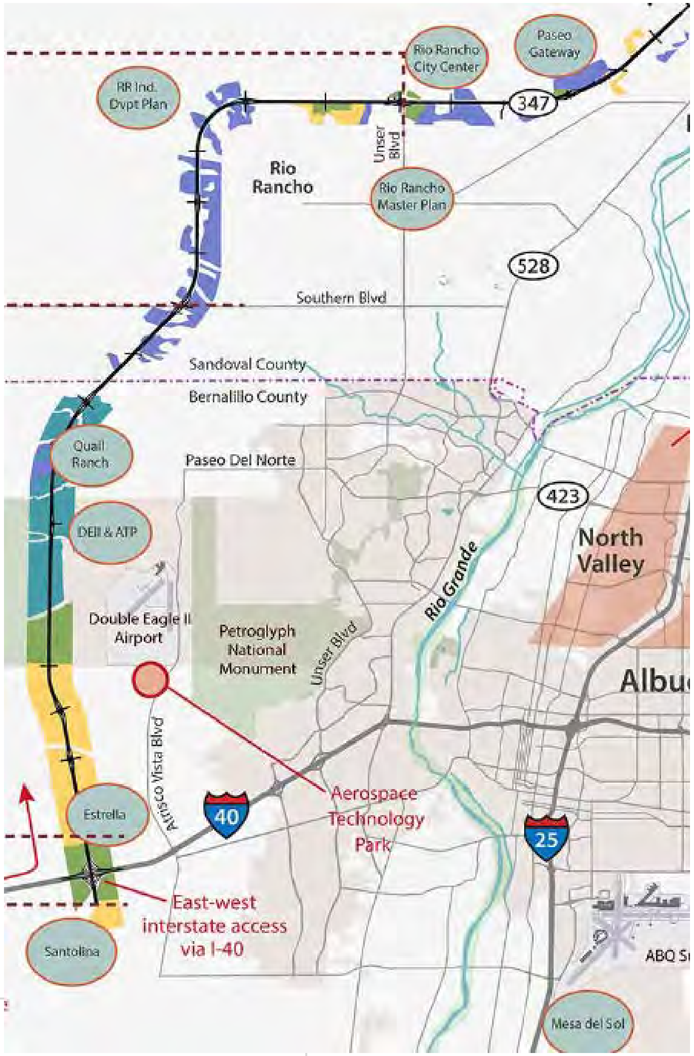
Development Opportunity: *Paseo del Volcan*

Opportunities for Double Eagle II

- Transportation Access
- Large scale distribution facility potential
- Open Space for recreation
- Skilled labor

Target Industries for Economic Growth

- Distribution
- Logistics
- Warehousing/Storage
- Hotel
- Fuel



Source: Paseo del Volcan Corridor Analysis of Economic Development Opportunities, September 2014 (Parsons Brinckerhoff)
http://www.cabq.gov/council/documents/paseo-del-volcan-documents/PaseodelVolcanSteeringCommitteePresentation11714.pdf

Summary

- Incorporate development strategies into master plan
- To the extent feasible, fund enabling projects to make development opportunities more attractive
- Focus on helicopter MRO and flight training opportunities
- Track aviation maintenance and training sectors for trends
- Develop and market airport infrastructure to commercial, business, and aircraft industry sectors

Appendix B:

Airport Traffic Counts

Double Eagle II Airport (AEG) Traffic Counting

14 Week Summary Tables - January to April, 2016

Note: Data includes 13 each of Sun/Mon/Tues/Wed, and 14 each of Thur/Fri/Sat - due to the shorter first week. The table with weekly averages takes that discrepancy into account in the average

AirportTrafficCounter.com — Airport Code: AEG — January 3, 2016 to April 9, 2016

Weekly Averages	Daily Averages		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
	Sunday	98	RWY 04	37	Departures	161	Single	460	Piston	472	High Wing - I	324	Cessna	248
	Monday	63	RWY 22	320	Arrivals	171	Twin	51	Turbo Prop	25	Low Wing - I	162	Beechcraft	35
	Tuesday	61	RWY 17	90	Touch & Go	285	Triple	0	Jet	16	II	16	Piper	61
	Wednesday	77	RWY 35	137	Runway Inspection	12	Helicopter	102	Helicopter	80	III	1	Cirrus	11
	Thursday	103									Helicopter	102	Helicopter	93
	Friday	109											Osprey	10
	Saturday	114			Other	1	Other	3	Other	0	Other	1	Other	150
			Unknown	0	Unknown	0	Unknown	3	Unknown	2	Unknown	10	Unknown	15
			N/A	45	N/A	0	N/A	11	N/A	34	N/A	14	N/A	8
TOTALS		630		630		630		630		630		630		630

AirportTrafficCounter.com — Airport Code: AEG — January 3, 2016 to April 9, 2016

14-Week Totals	Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
	Sunday	1273	RWY 04	500	Departures	2088	Single	6055	Piston	6212	High Wing - I	4260	Cessna	3240
	Monday	820	RWY 22	4189	Arrivals	2250	Twin	679	Turbo Prop	327	Low Wing - I	2142	Beechcraft	453
	Tuesday	797	RWY 17	1157	Touch & Go	3755	Triple	0	Jet	212	II	212	Piper	809
	Wednesday	1002	RWY 35	1833	Runway Inspection	159	Helicopter	1310	Helicopter	1081	III	7	Cirrus	145
	Thursday	1360									Helicopter	1314	Helicopter	1192
	Friday	1484											Osprey	132
	Saturday	1536			Other	11	Other	41	Other	6	Other	20	Other	2001
			Unknown	3	Unknown	5	Unknown	39	Unknown	30	Unknown	130	Unknown	199
			N/A	590	N/A	4	N/A	148	N/A	404	N/A	187	N/A	101
TOTALS		8272		8272		8272		8272		8272		8272		8272

Double Eagle II Airport (AEG) Traffic Counting

14 Week Summary Tables - January to April, 2016

AEG Traffic Counting - Week-by-Week Summaries

AirportTrafficCounter.com | Week 1 | Airport Code: AEG | January 3, 2016 to January 9, 2016

Weekly Summary Table

Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
Sunday	-	RWY 04	1	Departures	68	Single	119	Piston	123	High Wing - I	89	Cessna	90
Monday	-	RWY 22	111	Arrivals	51	Twin	10	Turbo Prop	3	Low Wing - I	37	Beechcraft	14
Tuesday	-	RWY 17	54	Touch & Go	67	Triple	0	Jet	3	II	3	Piper	15
Wednesday	3	RWY 35	5	Runway Inspection	1	Helicopter	57	Helicopter	0	III	0	Cirrus	0
Thursday	81									Helicopter	57	Helicopter	51
Friday	41											Osprey	6
Saturday	63			Other	0	Other	1	Other	0	Other	0	Other	10
		Unknown	0	Unknown	1	Unknown	1	Unknown	1	Unknown	1	Unknown	1
		N/A	17	N/A	0	N/A	0	N/A	58	N/A	1	N/A	1
TOTALS	188		188		188		188		188		188		188

Week 1 is a partial week. Data recording did not begin until Wednesday, January 6.

AirportTrafficCounter.com | Week 2 | Airport Code: AEG | January 10, 2016 to January 16, 2016

Weekly Summary Table

Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
Sunday	137	RWY 04	16	Departures	174	Single	464	Piston	485	High Wing - I	315	Cessna	287
Monday	43	RWY 22	314	Arrivals	164	Twin	51	Turbo Prop	26	Low Wing - I	157	Beechcraft	36
Tuesday	86	RWY 17	36	Touch & Go	267	Triple	0	Jet	4	II	17	Piper	78
Wednesday	102	RWY 35	210	Runway Inspection	7	Helicopter	84	Helicopter	0	III	0	Cirrus	14
Thursday	98									Helicopter	85	Helicopter	67
Friday	101											Osprey	28
Saturday	47			Other	0	Other	15	Other	0	Other	0	Other	83
		Unknown	0	Unknown	2	Unknown	0	Unknown	3	Unknown	12	Unknown	21
		N/A	38	N/A	0	N/A	0	N/A	96	N/A	28	N/A	0
TOTALS	614		614		614		614		614		614		614

Double Eagle II Airport (AEG) Traffic Counting
14 Week Summary Tables - January to April, 2016

AirportTrafficCounter.com — Week 3 — Airport Code: AEG — January 17, 2016 to January 23, 2016

Weekly Summary Table

Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
Sunday	54	RWY 04	60	Departures	200	Single	654	Piston	669	High Wing - I	491	Cessna	383
Monday	95	RWY 22	448	Arrivals	205	Twin	55	Turbo Prop	26	Low Wing - I	202	Beechcraft	22
Tuesday	78	RWY 17	89	Touch & Go	375	Triple	0	Jet	15	II	14	Piper	83
Wednesday	87	RWY 35	153	Runway Inspection	5	Helicopter	70	Helicopter	0	III	0	Cirrus	12
Thursday	84									Helicopter	70	Helicopter	56
Friday	172											Osprey	14
Saturday	215			Other	0	Other	6	Other	1	Other	8	Other	197
		Unknown	0	Unknown	0	Unknown	0	Unknown	0	Unknown	0	Unknown	18
		N/A	35	N/A	0	N/A	0	N/A	74	N/A	0	N/A	0
TOTALS	785		785		785		785		785		785		785

AirportTrafficCounter.com — Week 4 — Airport Code: AEG — January 24, 2016 to January 30, 2016

Weekly Summary Table

Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
Sunday	71	RWY 04	25	Departures	157	Single	510	Piston	515	High Wing - I	409	Cessna	275
Monday	44	RWY 22	392	Arrivals	156	Twin	25	Turbo Prop	13	Low Wing - I	121	Beechcraft	19
Tuesday	58	RWY 17	53	Touch & Go	301	Triple	0	Jet	7	II	5	Piper	44
Wednesday	66	RWY 35	115	Runway Inspection	11	Helicopter	76	Helicopter	0	III	0	Cirrus	18
Thursday	102									Helicopter	76	Helicopter	76
Friday	160											Osprey	0
Saturday	124			Other	0	Other	14	Other	4	Other	3	Other	181
		Unknown	0	Unknown	0	Unknown	0	Unknown	0	Unknown	0	Unknown	4
		N/A	40	N/A	0	N/A	0	N/A	86	N/A	11	N/A	8
TOTALS	625		625		625		625		625		625		625

Double Eagle II Airport (AEG) Traffic Counting
14 Week Summary Tables - January to April, 2016

AirportTrafficCounter.com Week 5 Airport Code: AEG January 31, 2016 to February 6, 2016

Weekly Summary Table	Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
	Sunday	41	RWY 04	9	Departures	137	Single	292	Piston	287	High Wing - I	157	Cessna	152
	Monday	16	RWY 22	173	Arrivals	142	Twin	58	Turbo Prop	39	Low Wing - I	156	Beechcraft	42
	Tuesday	30	RWY 17	8	Touch & Go	172	Triple	0	Jet	23	II	32	Piper	76
	Wednesday	50	RWY 35	237	Runway Inspection	13	Helicopter	91	Helicopter	91	III	0	Cirrus	16
	Thursday	110									Helicopter	89	Helicopter	82
	Friday	95											Osprey	9
	Saturday	125			Other	2	Other	0	Other	0	Other	0	Other	58
			Unknown	0	Unknown	1	Unknown	13	Unknown	14	Unknown	20	Unknown	24
			N/A	40	N/A	0	N/A	13	N/A	13	N/A	13	N/A	8
TOTALS		467		467		467		467		467		467		467

AirportTrafficCounter.com Week 6 Airport Code: AEG February 7, 2016 to February 13, 2016

Weekly Summary Table	Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
	Sunday	57	RWY 04	58	Departures	181	Single	641	Piston	651	High Wing - I	472	Cessna	301
	Monday	78	RWY 22	393	Arrivals	223	Twin	49	Turbo Prop	18	Low Wing - I	191	Beechcraft	38
	Tuesday	115	RWY 17	89	Touch & Go	364	Triple	0	Jet	21	II	10	Piper	76
	Wednesday	116	RWY 35	198	Runway Inspection	16	Helicopter	72	Helicopter	73	III	0	Cirrus	14
	Thursday	87									Helicopter	74	Helicopter	72
	Friday	142											Osprey	0
	Saturday	189			Other	0	Other	1	Other	0	Other	3	Other	253
			Unknown	1	Unknown	0	Unknown	5	Unknown	5	Unknown	18	Unknown	21
			N/A	45	N/A	0	N/A	16	N/A	16	N/A	16	N/A	9
TOTALS		784		784		784		784		784		784		784

Double Eagle II Airport (AEG) Traffic Counting
14 Week Summary Tables - January to April, 2016

AirportTrafficCounter.com Week 7 Airport Code: AEG February 14, 2016 to February 20, 2016

Weekly Summary Table

Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
Sunday	113	RWY 04	26	Departures	135	Single	611	Piston	614	High Wing - I	474	Cessna	262
Monday	77	RWY 22	359	Arrivals	174	Twin	30	Turbo Prop	18	Low Wing - I	159	Beechcraft	21
Tuesday	86	RWY 17	94	Touch & Go	467	Triple	0	Jet	9	II	7	Piper	68
Wednesday	124	RWY 35	259	Runway Inspection	14	Helicopter	136	Helicopter	136	III	0	Cirrus	11
Thursday	58									Helicopter	137	Helicopter	119
Friday	157											Osprey	17
Saturday	176			Other	1	Other	0	Other	0	Other	0	Other	270
		Unknown	0	Unknown	0	Unknown	0	Unknown	0	Unknown	0	Unknown	12
		N/A	53	N/A	0	N/A	14	N/A	14	N/A	14	N/A	11
TOTALS	791		791		791		791		791		791		791

AirportTrafficCounter.com Week 8 Airport Code: AEG February 21, 2016 to February 27, 2016

Weekly Summary Table

Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
Sunday	129	RWY 04	93	Departures	200	Single	608	Piston	604	High Wing - I	412	Cessna	321
Monday	83	RWY 22	408	Arrivals	224	Twin	52	Turbo Prop	34	Low Wing - I	199	Beechcraft	25
Tuesday	34	RWY 17	150	Touch & Go	392	Triple	0	Jet	22	II	21	Piper	79
Wednesday	77	RWY 35	115	Runway Inspection	12	Helicopter	155	Helicopter	155	III	0	Cirrus	8
Thursday	182									Helicopter	156	Helicopter	151
Friday	198											Osprey	5
Saturday	126			Other	0	Other	0	Other	0	Other	0	Other	199
		Unknown	0	Unknown	0	Unknown	1	Unknown	1	Unknown	28	Unknown	30
		N/A	63	N/A	1	N/A	13	N/A	13	N/A	13	N/A	11
TOTALS	829		829		829		829		829		829		829

Double Eagle II Airport (AEG) Traffic Counting
14 Week Summary Tables - January to April, 2016

AirportTrafficCounter.com Week 9 Airport Code: AEG February 28, 2016 to March 5, 2016

Weekly Summary Table

PATRIOT TECHNOLOGIES LLC

Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
Sunday	123	RWY 04	77	Departures	182	Single	490	Piston	512	High Wing - I	317	Cessna	283
Monday	41	RWY 22	296	Arrivals	195	Twin	77	Turbo Prop	21	Low Wing - I	220	Beechcraft	49
Tuesday	110	RWY 17	196	Touch & Go	302	Triple	0	Jet	35	II	18	Piper	64
Wednesday	55	RWY 35	86	Runway Inspection	15	Helicopter	110	Helicopter	110	III	0	Cirrus	18
Thursday	147									Helicopter	110	Helicopter	74
Friday	112											Osprey	36
Saturday	107			Other	0	Other	1	Other	0	Other	1	Other	146
		Unknown	0	Unknown	1	Unknown	2	Unknown	3	Unknown	14	Unknown	16
		N/A	40	N/A	0	N/A	15	N/A	14	N/A	15	N/A	9
TOTALS	695		695		695		695		695		695		695

AirportTrafficCounter.com Week 10 Airport Code: AEG March 6, 2016 to March 12, 2016

Weekly Summary Table

PATRIOT TECHNOLOGIES LLC

Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
Sunday	88	RWY 04	77	Departures	140	Single	352	Piston	351	High Wing - I	209	Cessna	146
Monday	44	RWY 22	253	Arrivals	146	Twin	50	Turbo Prop	26	Low Wing - I	163	Beechcraft	39
Tuesday	48	RWY 17	93	Touch & Go	238	Triple	0	Jet	26	II	22	Piper	43
Wednesday	109	RWY 35	60	Runway Inspection	13	Helicopter	120	Helicopter	120	III	0	Cirrus	10
Thursday	83									Helicopter	120	Helicopter	102
Friday	100											Osprey	19
Saturday	66			Other	0	Other	0	Other	0	Other	1	Other	158
		Unknown	1	Unknown	0	Unknown	3	Unknown	1	Unknown	9	Unknown	13
		N/A	54	N/A	1	N/A	13	N/A	14	N/A	14	N/A	8
TOTALS	538		538		538		538		538		538		538

AirportTrafficCounter.com Week 11 Airport Code: AEG March 13, 2016 to March 19, 2016

Weekly Summary Table	Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
	Sunday	141	RWY 04	3	Departures	151	Single	410	Piston	421	High Wing - I	290	Cessna	242
	Monday	68	RWY 22	339	Arrivals	172	Twin	50	Turbo Prop	29	Low Wing - I	149	Beechcraft	38
	Tuesday	37	RWY 17	104	Touch & Go	304	Triple	0	Jet	19	II	17	Piper	50
	Wednesday	78	RWY 35	154	Runway Inspection	16	Helicopter	158	Helicopter	158	III	0	Cirrus	7
	Thursday	123									Helicopter	158	Helicopter	154
	Friday	65											Osprey	4
	Saturday	132			Other	1	Other	0	Other	0	Other	2	Other	118
			Unknown	0	Unknown	0	Unknown	9	Unknown	0	Unknown	11	Unknown	20
			N/A	44	N/A	0	N/A	17	N/A	17	N/A	17	N/A	11
TOTALS		644		644		644		644		644		644		644

AirportTrafficCounter.com Week 12 Airport Code: AEG March 20, 2016 to March 26, 2016

Weekly Summary Table	Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
	Sunday	78	RWY 04	5	Departures	119	Single	232	Piston	254	High Wing - I	150	Cessna	94
	Monday	82	RWY 22	219	Arrivals	112	Twin	56	Turbo Prop	28	Low Wing - I	113	Beechcraft	39
	Tuesday	33	RWY 17	89	Touch & Go	137	Triple	0	Jet	9	II	18	Piper	47
	Wednesday	5	RWY 35	32	Runway Inspection	6	Helicopter	76	Helicopter	76	III	4	Cirrus	3
	Thursday	68									Helicopter	76	Helicopter	76
	Friday	74											Osprey	0
	Saturday	39			Other	3	Other	3	Other	0	Other	1	Other	105
			Unknown	0	Unknown	0	Unknown	1	Unknown	1	Unknown	6	Unknown	6
			N/A	34	N/A	2	N/A	11	N/A	11	N/A	11	N/A	9
TOTALS		379		379		379		379		379		379		379

Double Eagle II Airport (AEG) Traffic Counting
14 Week Summary Tables - January to April, 2016

AirportTrafficCounter.com — Week 13 — Airport Code: AEG — March 27, 2016 to April 2, 2016

Weekly Summary Table

Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
Sunday	158	RWY 04	15	Departures	171	Single	454	Piston	509	High Wing - I	320	Cessna	293
Monday	90	RWY 22	381	Arrivals	177	Twin	82	Turbo Prop	19	Low Wing - I	200	Beechcraft	51
Tuesday	39	RWY 17	88	Touch & Go	252	Triple	0	Jet	8	II	14	Piper	66
Wednesday	65	RWY 35	91	Runway Inspection	16	Helicopter	63	Helicopter	63	III	0	Cirrus	11
Thursday	83									Helicopter	63	Helicopter	63
Friday	66	SEE NOTE										Osprey	0
Saturday	120	SEE NOTE		Other	4	Other	1	Other	1	Other	1	Other	126
		Unknown	0	Unknown	1	Unknown	0	Unknown	0	Unknown	3	Unknown	3
		N/A	46	N/A	0	N/A	21	N/A	21	N/A	20	N/A	8
TOTALS	621		621		621		621		621		621		621

NOTE: Runway 17-35 down for maintenance beginning at 18:15 on Friday, April 1 and continuing through Saturday, April 2.

AirportTrafficCounter.com — Week 14 — Airport Code: AEG — April 3, 2016 to April 9, 2016

Weekly Summary Table

Daily Totals		Runway		Operation		Number of Engines		Aircraft Engine Type		Aircraft Design Group		Make/Model	
Sunday*	83	RWY 04	36	Departures	141	Single	337	Piston	340	High Wing - I	244	Cessna	201
Monday**	59	RWY 22	214	Arrivals	160	Twin	44	Turbo Prop	30	Low Wing - I	112	Beechcraft	34
Tuesday	43	RWY 17	68	Touch & Go	184	Triple	0	Jet	14	II	17	Piper	35
Wednesday	68	RWY 35	123	Runway Inspection	15	Helicopter	99	Helicopter	99	III	3	Cirrus	3
Thursday	135									Helicopter	100	Helicopter	100
Friday	42											Osprey	0
Saturday	70			Other	0	Other	0	Other	0	Other	0	Other	107
		Unknown	1	Unknown	0	Unknown	5	Unknown	2	Unknown	9	Unknown	11
		N/A	58	N/A	0	N/A	15	N/A	15	N/A	15	N/A	9
TOTALS	500		500		500		500		500		500		500

**Due to maintenance on 4/3/16, Sunday data combines 0422 data recorded 4/3/16 and 1735 data recorded 4/10/16.*

***Due to maintenance on 4/4/16, Monday was recorded 4/11/16 for both runways.*

Appendix C:

Planning Advisory Committee Roster

Planning Advisory Committee

Members

John Black
Westwood Realty

Russell Brito
City of Albuquerque
Planning Department

John Bode, Jr.
Bode Aviation, Inc.
Fixed Base Operator

Daren Gallacher
SAMS Academy

Ted Garrett
Western Alb. Land Holding Group

Tim Gorman
Bode Aviation, Inc.
Fixed Base Operator

Stacy Howard
National Business Aviation Administration
Regional Representative

Debra Inman
Albuquerque Economic Development

Ian Reese
58th Special Operations Wing
Kirtland Air Force Base

Laura Rife
Kirkland Air Force Base
Planning

Matt Schmader
City of Albuquerque
Open Space Division

Diane Souder
Petroglyph National Monument
National Park Service

Jim Strozier
Consensus Planning

Sgt. Will Taylor
Albuquerque Police Department
Air Support Unit

Joyce Woods
Experimental Aviation Association
Volunteer

Airport Staff

Jim Hinde
Director of Aviation
Albuequeque Sunport

Mike Medley
Airport Manager
Double Eagle II Airport

State Representative

Jane Lucero
Airport Development Administrator
New Mexico Department of Transportation

Consultant Staff

Molly Waller
Project Manager
KSA

Michael Mallonee
Airport Planner
KSA

Mike Provine
Consultant
Molzen Corbin

Marc Champigny
Consultant
C&S Companies

Appendix D:

Public Outreach Materials

Double Eagle II Airport
Airport Master Plan

SHARE YOUR INPUT

You are invited to attend a workshop on the future of the Double Eagle II Airport in Albuquerque, NM.

For the past 30+ years, Double Eagle II Airport has evolved into the busiest general aviation airport in the State of New Mexico. As the only reliever airport to the Albuquerque Sunport, a medium hub airport, it is a critical asset and economic generator.

The Double Eagle II Airport Master Plan will focus on a 20-year development vision for the Airport including analysis of market opportunities and present realistic development plans to take advantage of the airport strengths, while meeting the aviation needs of the region.

OPEN HOUSE:
APRIL 6TH, 2016

5:30 PM

AIRPORT ADMINISTRATION BLDG.
DOUBLE EAGLE II AIRPORT
7401 ATRISCO VISTA BLVD
ALBUQUERQUE, NM

PRESENTED ON BEHALF OF:
The City of Albuquerque Department of Aviation

The **Master Plan** Process

The **Double Eagle II Airport Master Plan** will focus on a 20-year vision for the Airport and present a realistic development plan to take advantage of market opportunities and capitalize on airport strengths, while meeting the aviation needs of the region.

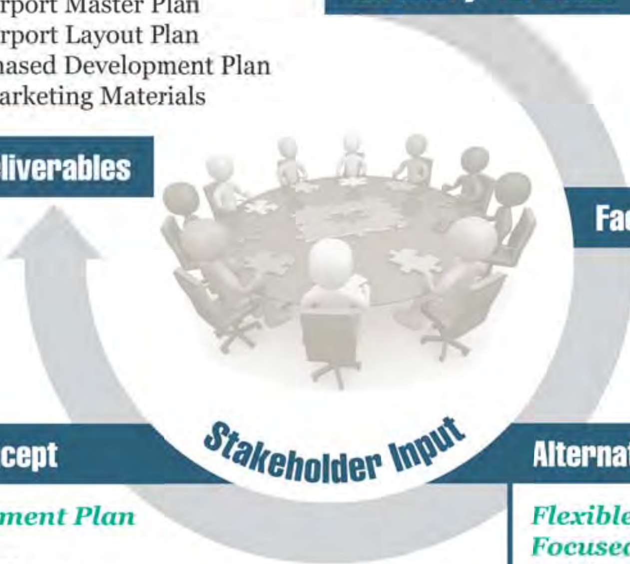
Inventory/ Forecast

Airport
Operations
Airside/Landside Facilities
Utilities/GIS
Improvements since last MP

Economic
Land Use
City/Region Target Market
Region/National Aviation
Trends

Facility Requirements

Runway and Taxiway Requirements
Airspace/Geometrics
Apron and Hangars
Land Use Plan



Alternatives

Flexible Scenario-based Options Focused on Functional Areas
Aviation
Business Park Campus
Aviation Technology Park
Industrial Opportunities

Development Concept

Capital Improvement Plan
Immediate/Short/
Intermediate/Long Term
Funding Sources/Opportunities

Business/Economic Plan
Strategic Planning
Return on Investment
Economic Enhancement

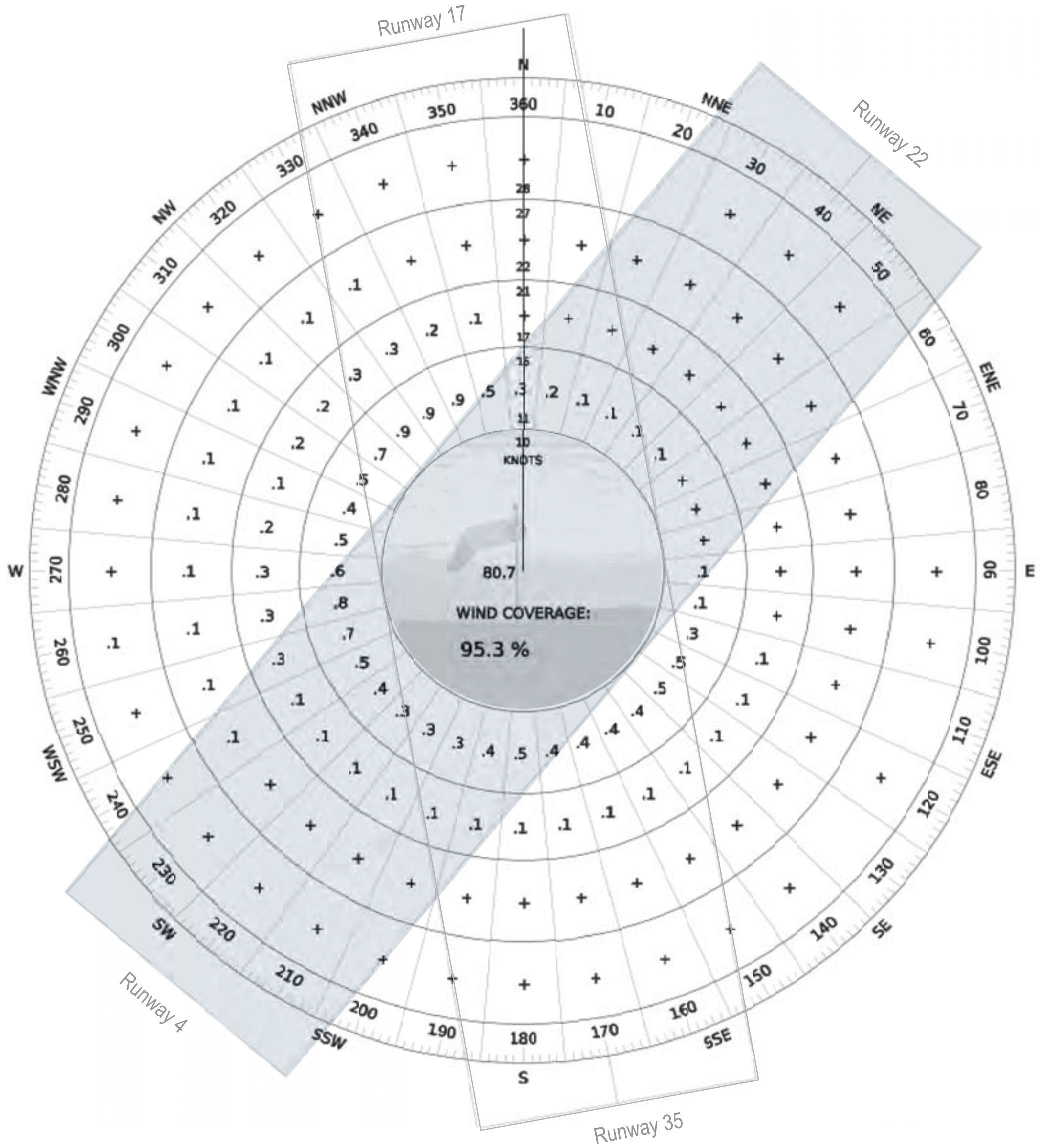
Land Use
Aviation
Aviation Support/Uses
Non-aviation

Deliverables

Airport Master Plan
Airport Layout Plan
Phased Development Plan
Marketing Materials

Airport **Wind Analysis**

The FAA requires airport runway configurations provide wind coverage during 95 percent of weather conditions based on the airport's design aircraft. The wind coverage provided by Double Eagle II Airport ranges from 95.30 percent to 99.03 percent, depending on the wind speed and direction. It is important to note that the airport must keep both runways in order to meet FAA requirements.



Combined Runway Wind Coverage		
10.5 Knots	13 Knots	16 Knots
95.3%	97.67%	99.03%

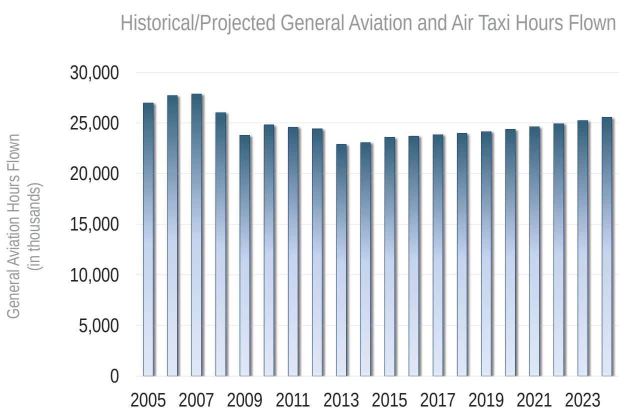
Source: FAA

Airport **Demand Forecast**

It is anticipated that the Double Eagle II Airport will continue to grow during the 20-year planning period. Market area demographic trends indicate that the Airport will slightly outpace national growth trends in general aviation and exceed trends in New Mexico growth. One reason for this growth is due to the robust demographic and socioeconomic trends within the region and city of Albuquerque.

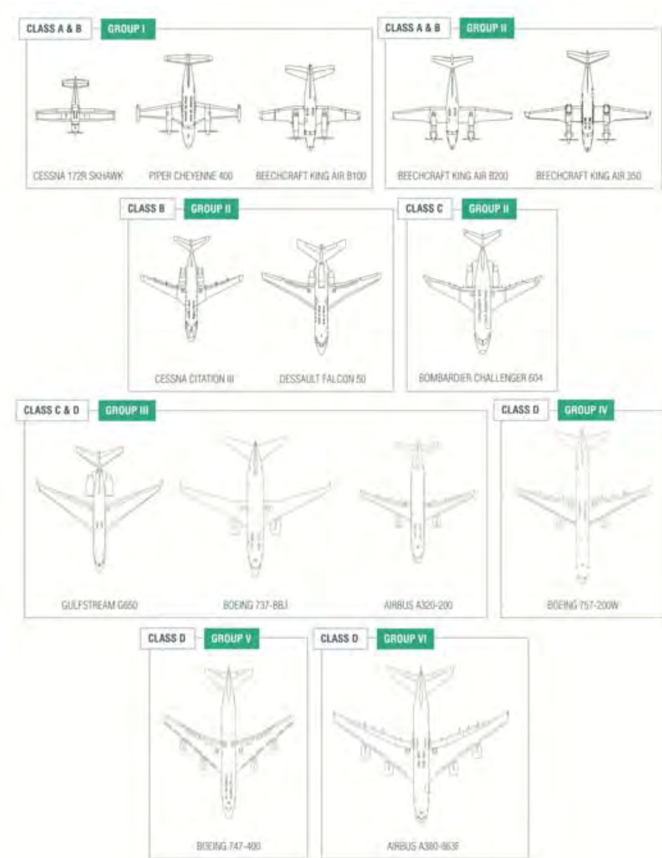
National Aviation Trends

Source: FAA



Source: FAA Aerospace Forecasts 2015 - 2035

Critical Aircraft



A Critical Aircraft is defined as the most demanding aircraft to regularly use the airport. Planners use Aircraft Design Group and Approach Categories that relate airport design criteria to the operational and physical characteristics of the airplanes that are intended to operate at an airport. The Critical Aircraft for Double Eagle II Airport falls within the C/D-II range.

Double Eagle II Forecast Scenarios

Total Aircraft Operations

Year	Low	Mid	High
2014	69,178	69,178	69,178
Projected			
2020	70,668	75,481	85,218
2025	71,934	81,170	101,392
2035	74,535	93,868	143,532
AAGR	0.4%	1.5%	3.5%

Total Based Aircraft

Year	Low	Mid	High
2014	125	125	125
Projected			
2020	128	136	153
2025	130	158	215
2035	135	170	255
AAGR	0.4%	1.5%	3.4%

Scenario Methodology :
Low – Represents FAA's projections for active general aviation aircraft and pilots.
Mid – Represented by population and employment growth projections for the region and FAA estimates for general aviation hours flown, TAF, and the NM Airport System Plan.
High –2002 AEG Airport Master Plan with significant growth driven by the prospect of a large, active flight school or aircraft maintenance/manufacturing.

Airport **Location**

There are five general aviation airports and one primary commercial service airport (Albuquerque International Sunport) in the greater Albuquerque area. The Double Eagle II Airport, as shown on the map, is located within the northwest quadrant of Bernalillo County. Situated between the Shooting Range State Park and Petroglyph National Monument.

The 30 Nautical Mile ring is largely considered to be the market area (along with Bernalillo County) for Double Eagle II Airport. With little competition for general aviation traffic, the airport is situation in an ideal location.

The planned Paseo Del Volcan highway corridor will potentially enhance the accessibility to the airport from surrounding areas to the north including Rio Rancho, Bernalillo, and the I-25 and U.S. 550 corridors.

Facts:

- 20 miles from downtown
- 70 miles from Santa Fe, New Mexico
- 275 miles from El Paso, Texas
- 275 miles from Mexico
- 300 miles from Amarillo, Texas.

KSA

ksaeng.com · 877.572.3647