ROSWELL INTERNATIONAL AIR CENTER
Roswell, New Mexico

Airport Master Plan Update
Final Report

December 2012

ARMSTRONG
CONSULTANTS, INC.

Table of Contents

INTRODUCTION

CHAPTER ONE: INVENTORY

CHAPTER TWO: FORECAST OF AVIATION ACTIVITY

CHAPTER THREE: FACILITY REQUIREMENTS

CHAPTER FOUR: DEVELOPMENT ALTERNATIVES

CHAPTER FIVE: AIRPORT LAYOUT PLAN (ALP) UPDATE

CHAPTER SIX: ENVIRONMENTAL OVERVIEW

CHAPTER SEVEN: AIRPORT DEVELOPMENT AND FINANCIAL PLAN

LIST OF TABLES

List of Figures

APPENDICES

INTRODUCTION

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

INTRODUCTION

The City of Roswell, as the Airport Sponsor, is continuing its effort to plan for future development of the Roswell International Air Center. Armstrong Consultants, Inc. was tasked to undertake the Airport Master Plan (AMP) update at Roswell International Air Center in Roswell, New Mexico. The overall study will follow the process outlined in the Federal Aviation Administration's (FAA) Advisory Circular 150/5070-6B, *Airport Master Plans*. The future development showing in the AMP is designed to: enhance air and ground operations and safety; provide improved airport services; and, stimulate the local economy through potential business growth. The preparation of this AMP is evidence that the City of Roswell recognizes the significance of air transportation to the community as well as the requirement for a systematic approach to evaluating the Airport's unique operating and improvement needs.

An AMP is intended to be a proactive document which identifies and plans for future facility needs well in advance of the actual need for the facilities. This is done to ensure that the City of Roswell can coordinate project approvals, design, financing and construction to avoid experiencing unfavorable effects due to inadequate or constrained airport facilities. With a sound and realistic AMP, Roswell International Air Center can maintain its role as an important link to the national air transportation system for the community.

PURPOSE

The purpose of the AMP is to provide a framework to guide future airport development that cost-effectively satisfies local and regional aviation demand, while producing an efficient, economical and environmentally compliant facility and mitigating potential impacts. The AMP considers the possible environmental and socioeconomic costs associated with alternative development concepts as well as the possible means of avoiding, minimizing, or mitigating impacts to sensitive resources at the appropriate level of detail for facilities planning.

The document describes and depicts the overall concept for long-term development of an airport. It presents the concepts graphically in the Airport Layout Plan (ALP) drawing set and reports the data and logic upon on which the concept is based in the AMP report.

OBJECTIVES

The primary objectives of the AMP are to produce an attainable phased development plan concept that will satisfy the airport's needs in a safe, efficient, economical and environmentally sound manner. Goals and objectives are integral to the definition and validity of any plan and serve to frame and direct the definition of options, and more importantly, to establish evaluation criteria to be used in assessing the viability and benefits of such options. The plan serves as a guide to decision makers, airport users and the general public for implementing airport development actions while considering both airport and community concerns and objectives. There are a number of objectives that the Airport would like to achieve as a result of this AMP.

Objectives of the Airport Master Plan include:

- Document the issues that the proposed development will address.
- Justify the proposed development through the technical, economic and environmental investigation of concepts and alternatives.
- Provide an effective graphic presentation of the development of the airport and anticipated land uses in the vicinity of the airport.
- Establish a realistic schedule for the implementation of the development proposed in the plan, particularly the short-term Capital Improvement Program (CIP).
- Propose an achievable financial plan to support the implementation schedule.
- Provide sufficient project definition and detail for subsequent environmental evaluations that may be required before the project is approved.
- Present a plan that adequately addresses the issues and satisfies local, state and Federal regulations.
- Document policies and future aeronautical demand to support municipal or local deliberations on spending, debt, land use controls and other policies necessary to preserve the integrity of the airport and its surroundings.
- Set the stage and establish the framework for a continuing planning process that will monitor key conditions and permit changes in plan recommendations as required.

AIRPORT MASTER PLAN PROCESS AND SCHEDULE

Airport planning takes place at a national, state, regional and local level. These plans are formulated on the basis of overall transportation demands and are coordinated with other transportation planning and comprehensive land use planning agencies. The National Plan of Integrated Airport Systems (NPIAS) is a ten-year plan continually updated and published by the FAA. The NPIAS lists developments at public use airports that are considered to be of national interest and thus eligible for financial assistance for airport planning and development under the Airport and Airway Improvement Act of 1982. Statewide Integrated Airport Systems Planning identifies the general location and characteristics of new airports and the general expansion needs of existing airports to meet statewide air transportation goals. This planning is performed by state transportation or aviation planning agencies. Regional Integrated Airport Systems Planning identifies airport needs for a large regional or metropolitan area. Needs are stated in general terms and incorporated into statewide systems plans. The Airport Master Planning process involves collecting data, forecasting demand, determining facility requirements, studying various alternatives and developing plans and schedules. The flow chart in **Figure I-1** depicts the steps in the master planning process. This process will take into consideration the needs and concerns of the airport sponsor, airport tenants and users, as well as the general public. The AMP is prepared by the operators of individual airports and is usually completed with the assistance of consultants. The City of Roswell is completing this master plan with the assistance of Armstrong Consultants, Inc.

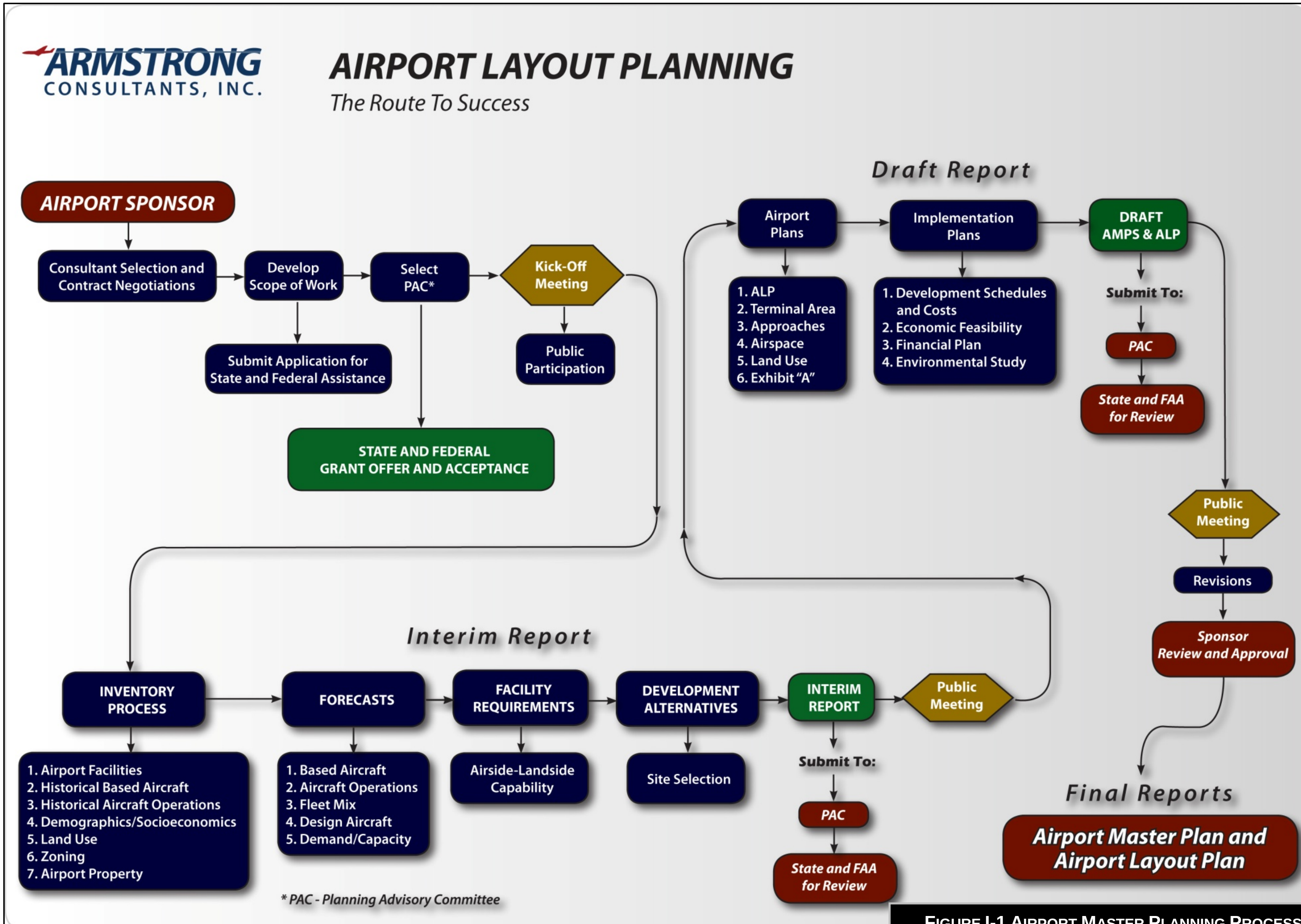


FIGURE I-1 AIRPORT MASTER PLANNING PROCESS

PLANNING ADVISORY COMMITTEE

The Roswell International Air Center Planning Advisory Committee (PAC) for this Master Plan consists of members representing varied interests in the Airport and the community. Their involvement throughout the Master Plan process will aid in keeping interested parties informed and will foster consensus for future development actions.

PAC REPRESENTATIVES

- Jennifer Brady, Airport Manager
- Kevin Sykes, Airport Superintendent
- Charlie Creek, Air Traffic Control Tower Manager
- Larry Jessen, Great Southwest Aviation President
- Jimmy Craig, Airport Committee Chairman
- Larry Fry, Roswell City Manager
- Bob Donnell, Roswell-Chaves County Economic Development Corporation
- Jane Lucero, New Mexico Department of Transporation, Aviation Division
- Mike Saupp, Federal Aviation Administration (FAA) Fort Worth Airport Districts Office

CHAPTER 1
INVENTORY

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

Chapter One
Inventory

1.1 AIRPORT HISTORY AND INTRODUCTION

Roswell International Air Center (ROW) is a publically owned and operated commercial service airport located in Roswell, New Mexico. The Airport is owned and operated by the City of Roswell and located within incorporated city limits. The Airport Director manages the long-term strategic plan of the Airport and provides oversight and recommendations to the City regarding airport operations, maintenance and future development.

Roswell's first non-indigenous settlers were from Missouri who attempted to settle the land in 1865, but were forced to abandon the site due to lack of water. Four years later, in 1869, two settlers from Omaha, Nebraska constructed two adobe buildings that began what is now Roswell. Roswell slowly grew in the 1800s adding a general store, post office and quarters for paying guests. In 1893 a railroad was built through the town providing the first intermodal transportation system.

During World War II, a prisoner of war camp was located in nearby Orchard Park. The German prisoners were used to do major infrastructure work in Roswell. However, the City is also most notably known for an event that took place in July, 1947. It has been rumored that a "flying disk" crashed during a severe thunderstorm near the Roswell International Air Center in Corona, New Mexico. The Roswell UFO incident placed Roswell on the map and to date serves as one of the most widely spread conspiracy theories and controversial alleged UFO incidents. After the initial press release in 1947, the notion of a "flying disk" was almost completely forgotten until 1978 when physicist and ufologist, Stanton T. Friedman interviewed an Air Force Major who was involved in the 1947 recovery; it was expressed that the military had covered up the recovery of an alien spacecraft. From the inception of this event, Roswell has been known as the unofficial "Alien Capital of the World."[1]

At the start of World War II, the Federal Government developed military bases throughout the United States. One of the bases was Roswell Army Airfield which opened in 1941. This facility changed its name to Walker Air Force Base in 1948 in honor of General Kenneth Newton Walker, a native of Los Cerrillos, New Mexico (see **Figure 1-1**). General Walker was killed during a bombing mission over Rabual, New Britain, Papua, New Guinea on January 5, 1943. Even though

FIGURE 1-1 WALKER AIR FORCE BASE

[1] Reference – City of Roswell, New Mexico website (roswell-nm.gov)

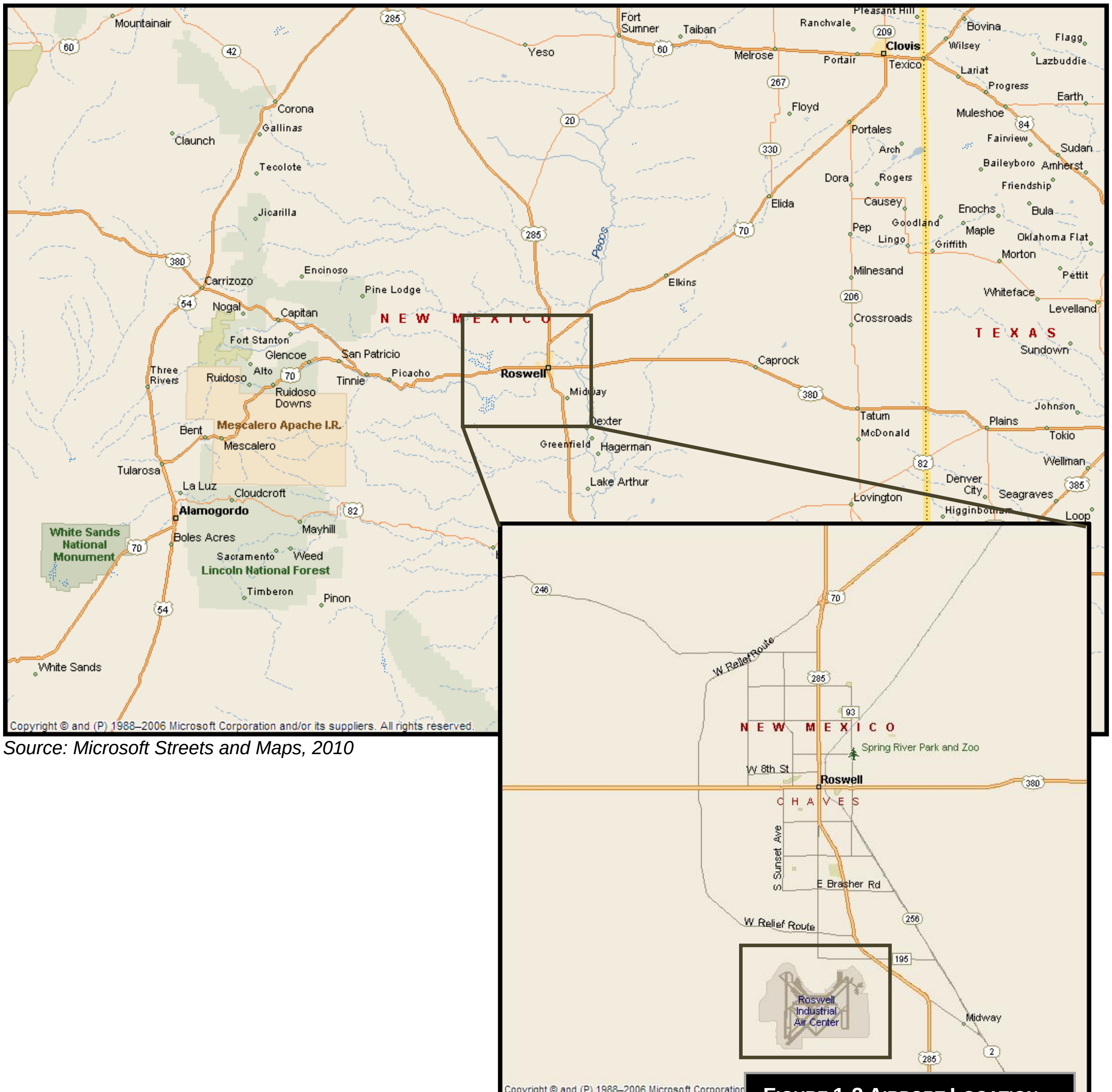
General Walker was intercepted by enemy fighters, his group scored direct hits on nine Japanese ships. For his actions, General Walker was awarded the Medal of Honor posthumously by President Franklin D. Roosevelt in 1943.

In 1966, the Air Force announced that Walker Air Force Base (AFB) would be closed. Walker AFB was one of several bases that were closed during this period due to the skyrocketing costs associated with the Vietnam War. At the time of its closure, Walker AFB was the largest base of the United States Air Force Strategic Air Command and the airfield was subsequently turned over to the City of Roswell following the AFB closure. Since 1968, Roswell International Air Center has been providing general aviation and commercial airline service to southeast New Mexico and western communities in Texas. Today Roswell International Air Center is a unique Airport that serves a wide variety of users including commercial air service, general aviation, U.S. and international military training, aerial firefighting, aircraft testing and development and wide body aircraft dry storage and salvage. The Airport is also home to the U.S Department of Interior Bureau of Land Management's Air Tanker Base and the MATRIX International Security Training and Intelligence Center (MISTIC) facility. On any given day one can see aircraft ranging from Cessna's, Learjet's and Regional Jets to F-117 stealth fighters, Boeing 787s and C-5 Galaxies.

Chapter 1 - Inventory documents the airport's facilities and degree to which standards and regulations are met at the airport today. Deficiencies in the existing conditions are evaluated and improvement alternatives are presented in later chapters within the report. The preparation and collection of meaningful data on the airport usage and the condition of its components are basic to developing a sound master plan. The development of this Master Plan requires the collection and evaluation of baseline information relating to the airport's property, facilities, services and local vicinity. The information presented in this chapter combined with aviation activity forecasts and the demand/capacity analysis will serve as the basis in determining any necessary airport improvements, maintenance or expansions. Inventory information was obtained during field visits and interviews with Airport Management, City of Roswell staff, tenants and users.

1.2 AIRPORT LOCATION

Roswell International Air Center is located in the southeast portion of New Mexico within the central portion of Chaves County. The Airport is situated in portions of Sections 31, 32, 33 and 34 of Township11 South and Range 24 East as well as Sections 1, 2, 3, 10, 11, 12 and 15 of Township 12 South and Range 24 East of the Principal Meridian. **Figure 1-2** provides a graphic depiction of the location of the Airport in relation to the City of Roswell. The Airport is designated by the Federal Aviation Administration (FAA) as Site Number 14719.*A with the three-letter identifier ROW and is a public-use airport. The Airport Reference Point (ARP) location is Latitude 33° 18' 05.60" North and Longitude 104° 31' 50.00" West according to AVN. A survey was recently completed by Olympus Incorporated in May 2011 and show very similar coordinate data. The Airport's elevation is 3,671-feet Mean Sea Level (MSL) and has a D-IV Airport Reference Code (ARC). The existing Airport property line encompasses approximately 4,679 acres which is owned and operated by the City of Roswell.



Source: Microsoft Streets and Maps, 2010

FIGURE 1-2 AIRPORT LOCATION

1.3 AIRPORT GRANT HISTORY

The Airport Improvement Program (AIP) is the FAA grant program that provides grants to public agencies for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS). For small primary, reliever and general aviation airports, the grant covers up to 95 percent of eligible costs. Eligible projects include improvements related to enhancing airport safety, capacity, security and environmental concerns. Airports can use AIP funds on most airfield capital improvements or repairs and in some specific situations, for terminals and hangars. Professional services necessary for eligible projects such as planning, surveying and design are eligible; however, aviation demand at the airport must justify the projects and also meet federal environmental and procurement requirements.[2] A federal and state grant history for the capital improvements at the Roswell International Air Center is provided in **Table 1-1**.

In New Mexico, under the most recent FAA Airport Improvement Program legislation, capital improvement projects are typically funded at 90 percent by the Federal Aviation Administration (FAA), five percent by the state of New Mexico and five percent by the Airport Sponsor. The New Mexico Aviation Division is providing 95 percent of the funding for the Airport Master Plan project and the Airport Sponsor is contributing the remaining five percent.

TABLE 1-1 AIRPORT FAA AND STATE GRANT HISTORY

FAA GRANT NO.	YEAR	DESCRIPTION OF WORK		FEDERAL AMOUNT
001-1982	1982	Runway Rehabilitation		$199,659
		Land Acquisition for Noise Compatibility		$31,500
			TOTAL:	**$231,159**
002-1983	1983	Runway Rehabilitation		39,146
		Runway Lighting Installation		99,750
			TOTAL:	**$138,896**
003-1988	1988	Runway Rehabilitation		$458,518
			TOTAL:	**$458,518**
004-1991	1991	Acquire Aircraft Rescue & Fire Fighting Vehicle		$285,732
		Install Guidance Signs		$129,340
		Install Runway Lighting		$90,091
			TOTAL:	**$505,163**
005-1992	1992	Rehabilitate Apron		$576,109
			TOTAL:	**$576,109**
006-1993	1993	Rehabilitate Apron		$267,813
			TOTAL:	**$267,813**
007-1994	1994	Install Guidance Signs		$275,384
			TOTAL:	**$275,384**
008-1994	1994	Install Apron Lighting		$170,855
		Install Runway Vertical/Visual Guidance System		$9,000
			TOTAL:	**$179,855**
009-1995	1995	Install Guidance Signs		$84,921
		Acquire Snow Removal Equipment		$237,109
			TOTAL:	**$322,030**
010-1996	1996	Rehabilitate Runway		$447,059
			TOTAL:	**$447,059**
011-1997	1997	Rehabilitate Runway Lighting		$154,598
		Install Apron Lighting		$105,480
		Acquire Handicap Passenger Lift Device		$40,674
		Extend Taxiway		$127,128
			TOTAL:	**$427,880**
012-1998	1998	Acquire Aircraft Rescue & Fire Fighting Safety Equipment		$4,500
		Install Apron Lighting		$4,500
		Conduct Miscellaneous Study		$30,618
		Acquire Snow Removal Equipment		$161,406
		Install Taxiway Lighting		$4,500
			TOTAL	**$205,524**
013-2000	2000	Rehabilitate Runway		$4,202,795
			TOTAL:	**$4,202,795**

[2] Reference - Federal Aviation Administration - *Airport Improvement Program Overview* (faa.com website)

014-2002	2002	Rehabilitate Runway		$312,864
		Rehabilitate Taxiway		$150,000
		Construct Service Road		$255,791
		Improve Terminal Building		$208,635
			TOTAL:	**$927,290**
015-2003	2003	Improve Terminal Building		$543,253
			TOTAL:	**$543,253**
016-2005	2005	Improve Service Road		$359,123
		Rehabilitate Taxiway		$148,584
			TOTAL:	**$507,707**
017-2006	2006	Acquire Aircraft Rescue & Fire Fighting Vehicle		$737,992
		Improve Terminal Building		$26,942
			TOTAL:	**$764,934**
018-2007	2007	Acquire Equipment		$142,500
		Improve Terminal Building		$334,652
		Install Airfield Guidance Signs		$331,680
			TOTAL:	**$808,832**
020-2008	2008	Expand Terminal Building		$982,273
		Acquire Aircraft Deicing Equipment		$116,051
			TOTAL:	**$1,098,324**
021-2008	2008	Improve Terminal Building		$49,823
			TOTAL:	**$49,823**
022-2009	2009	Improve Terminal Building		$972,268
			TOTAL:	**$972,268**
023-2009	2009	Rehabilitate Taxiway		$972,268
			TOTAL:	**$972,268**
024-2010	2010	Wildlife Hazard Assessments		$90,258
		Install Airport Beacon		$131,600
		Rehabilitate Taxiway		$489,078
		Improve Terminal Building		$140,175
			TOTAL:	**$851,111**
			TOTAL FAA AMOUNTS	**$15,733,995**

STATE GRANT NO.	YEAR		STATE AMOUNT
	2000	Purchase of Maintenance Vehicles and Supplies	$69,512
	2001	Partial Reconstruction of Runway 12/30	$82,000
	2001	Paved Surface Improvements, Purchase of a Maintenance Vehicle and Updating Master Plan	$102,500
	2003	Facility Improvements and Developmental Studies	$169,579
	2003	Runway 17/35 Improvements	$55,550
	2004	Repair Tarmac at Air Terminal	$25,000
	2005	Construction of the East Service Road	$67,146
	2005	Purchase Vacuum Sweeper, Terminal Elevator, Taxiway Reconstruction	$16,985
	2005	Purchase Maintenance, Safety and Security Equipment	$10,500
	2006	ARFF Vehicle, Replace Terminal Elevator, Update Master Plan	$27,107
ROW-06-002	2006	Air Service	$200,000
	2007	Replace Airfield Guidance Signs and Electrical Rehabilitation	$10,750
ROW-07-003	2007	Airline Service II	$0
	2007	Terminal Restroom Remodel, Rubber Removal, Pavement Maintenance.	$25,000
ROW-08-001	2008	Terminal Expansion (TSA), Rehab Parking Lot	$27,000
ROW-09-001	2009	West Wing Terminal Exterior Door	$1,090
ROW-09-002	2009	Terminal Fire Alarm Update	$1,709
ROW-09-003	2009	Install Airport Terminal Fire Suppression System	$8,292
ROW-09-004	2009	Airfield Maintenance	$5,000

ROW-10-001	2010	Rehabilitate Taxiway C & H (Design)	$3,624
ROW-10-002	2010	Rehabilitate Taxiway C & H (Construction)	$36,751
ROW-10-003	2010	Airfield Maintenance	$15,000
ROW-10-004	2010	Front End Loader	$62,500
ROW-10-005	2010	Repair Terminal Ramp	$50,000
ROW-10-006	2010	Air Service	$0
ROW-10-007	2010	Mowers	$20,000
ROW-10-008	2010	Beacon & Tower, Rehabilitate Taxiway G, Surface Painted Holding Position Signs, Wildlife Hazard Assessment	$25,000
	2011	AGIS	$10,000
	2011	Expand Public Parking – Non Revenue Parking Lot	$31,631
ROW-11-001	2011	Maintenance Grant	$4,500
ROW-11-002	2011	Snow Removal Tractor	$35,000
ROW-11-004	2011	Airport Master Plan Update	$237,500
		TOTAL STATE AMOUNTS:	**$1,436,226**

Source: FAA & NM-DOT 2011
Prepared by: Armstrong Consultants, Inc., April 2011.

1.4 AIRPORT CLASSIFICATION

New Mexico has a variety of aviation facilities ranging from small rural unpaved airstrips serving isolated portions of the State to busy rooftop heliports and large, long-haul commercial service airports. Because of this diversity of facilities with broad ranges of operating parameters and design standards, a means of facility classification is necessary.

The FAA and New Mexico Airport System Plan (NMASP) use three basic aviation facility classifications. The FAA first classifies the 50 New Mexico airports within the NPIAS that consist of general aviation and commercial service airports. The second is the Airport Reference Code (ARC) which is a coding system used by the FAA to relate airport design criteria to the operational and physical characteristics of the aircraft operating at the airport. The third is a hierarchical classification created by the NMASP. This supplements the FAA's classification by providing a further detailed division of airport types based on activities served, economic factors, facilities, accessibility to the users and surrounding demographics.

1.4.1 SERVICE LEVEL (NPIAS)

The airport's NPIAS service level reflects the type of public use an airport provides to the community. The service level also reflects the funding categories established by Congress to assist in airport development. The following list identifies the different types of airport service levels[3] (see **Table 1-2**).

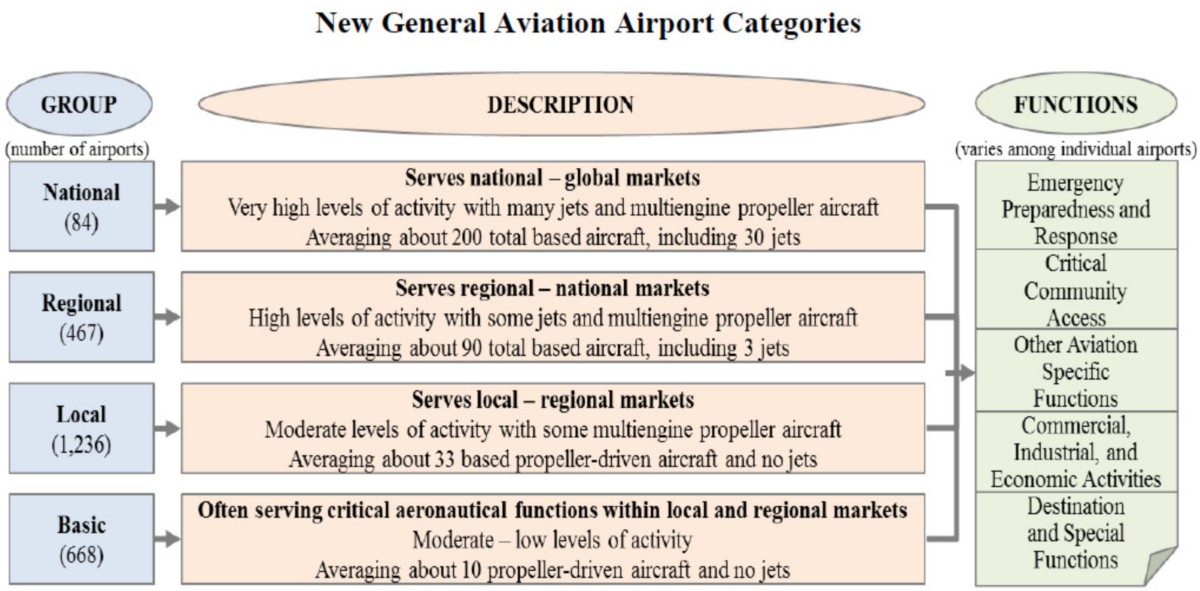
- **Commercial Service Airports** are public airports that enplane 2,500 or more passengers annually and receive aircraft offering scheduled passenger service. Commercial service airports are either:

    - Primary – an airport that enplanes more than 10,000 passengers annually; or
    - Nonprimary – an airport that enplanes at least 2,500 and no more than 10,000 passengers annually.

- **Cargo Service Airport** are airports that, in addition to any other air transportation services that may be available, are served by aircraft providing air transportation of only cargo with a total annual landed weight of more than 100 million pounds.

[3] Reference – Federal Aviation Administration, NPIAS Airport Categories (*faa.gov* website), May 2011

General Aviation Airports (GA). The FAA has recently developed classifications for General Aviation Airports, these include National, Regional, Local and Basic. The criteria used to create these new categories reflects the markets and aeronautical functions served by the various general aviation airports in the National Plan of Integrated Airport Systems (NPIAS) and currently eligible for Federal funding. Figure 1-2 shows the four new categories, provides a general description of each, and lists examples of the aeronautical functions served by our nation's general aviation airports (as shown in **Figure 1-3**).



Source: FAA General Aviation Airports: A National Asset

FIGURE 1-3 GENERAL AVIATION AIRPORT CATEGORIES

Roswell International Air Center is listed in the NPIAS as a primary commercial service airport and meets all the service criteria for this service level.

TABLE 1-2 NPIAS CRITERIA

Airport Classifications		Hub Type: Percentage of Annual Passenger Boardings	Common Name
Commercial Service: Publically owned airports that have at least 2,500 passenger boardings each calendar year and receive scheduled passenger service **§47102(7)**	**Primary:** Have more than 10,000 passenger boardings each year **§47102(11)**	**Large:** 1% or more	**Large Hub**
		Medium: At least 0.25%, but less than 1%	**Medium Hub**
		Small: At least 0.05%, but less than 0.25%	**Small Hub**
	Nonprimary	**Nonhub:** More than 10,000, but less than 0.05%	**Nonprimary Commercial Service**
Nonprimary (Except Commercial Service)		Not Applicable	**Reliever §47102(18)**

Source: Federal Aviation Administration, May 2011.
Prepared by: Armstrong Consultants, Inc., June 2011.

1.4.2 AIRPORT REFERENCE CODE (ARC)

The Airport Reference Code (ARC) is a coding system established by the FAA and used to relate airport design criteria to the operational and physical characteristics of the aircraft intended to operate at the airport. The ARC has two components relating to the airport design aircraft.

The first component, depicted by a letter (e.g. A, B, C, D, or E), is the aircraft approach category and relates to the aircraft approach speed based upon operational characteristics. An aircraft fits into a category based on 1.3 times the stall speed of that aircraft at maximum gross weight in the landing configuration.

The second component of the ARC is the aircraft design group and is depicted by a Roman numeral (e.g. I, II, III, IV V or VI). The aircraft design group is based on an aircraft's physical characteristics (wingspan or tail height, whichever is most demanding). **Table 1-3** provides a breakdown of both Aircraft Approach Categories and Aircraft Design Groups (ADG).

TABLE 1-3 AIRPORT REFERENCE CODE

Approach Category	Approach Speed (knots)
Category A	Less than 91
Category B	91 to 120 knots
Category C	121 to 140 knots
Category D	141 to 165
Category E	166 or more

Design Group	Wingspan (feet)	Tail Height (feet)
Group I	Less than 49	Less than 20
Group II	49 to 78	20 to 29
Group III	79 to 117	30 to 44
Group IV	118 to 170	45 to 59
Group V	171 to 213	60 to 65
Group VI	214 to 261	66 to 79

Source: FAA AC 150/5300, Airport Design.
Prepared by: Armstrong Consultants, Inc., April, 2011.

Currently, Runway 3/21 at Roswell International Air Center has an ARC of D-IV and Runway 17/35 has an ARC of C-III.

1.5 AIRPORT ROLE (NEW MEXICO AIRPORT SYSTEM PLAN)

Roswell International Air Center provides aviation access to the City of Roswell and surrounding areas including southeastern New Mexico and west Texas. The geographic location of Roswell International Air Center allows easy access to users throughout the entire area and region.

In 2009, the New Mexico airport system was comprised of 51 public-use airports (50 are NPIAS airports). The FAA NPIAS categorizes airports based on availability of commercial service and are categorized as commercial or general aviation; however, while these service levels are useful to the FAA in making funding decisions, they do not adequately describe the function or role of each airport in the New Mexico system.

The NMASP used a quantitative and deliberate process to evaluate how each New Mexico airport contributes to the overall system. The NMASP is divided into two sub-categories: (1)

Commercial Service Airports and (2) General Aviation Airports. Airports are classified into these two categories by size and usage (see **Table 1-4**).[4]

The NMASP includes two types of classifications of Commercial Service airports:

- Primary Commercial Service – this type of airport provides scheduled passenger service and has more than 10,000 enplanements per year and classified by the FAA and this plan as Primary Commercial Service Airports. These airports serve the highest levels of aviation activity in New Mexico, including commercial service and general aviation, and are located in the largest population areas of the State.
- Non-Primary Commercial Service – these types of airports have scheduled passenger service and 2,500 to 10,000 enplanements per year and are classified by the FAA and this plan as a Non-Primary Commercial Service Airport. These airports serve a high level of New Mexico's aviation activity, including commercial service and general aviation, and serve some of New Mexico's larger communities.

The NMASP includes four classifications of General Aviation airports:

- Limited Commercial Service – Airports that have commercial service but enplane less than 2,500 annual enplanements and are included in the FAA's Essential Air Service (EAS) program are classified as Limited Commercial Service for purposes of the NMASP. These airports still have a commercial role in serving passengers, but have high levels of general aviation activity and also serve larger populated communities in New Mexico.

- Regional General Aviation – These airports serve primarily general aviation activity with a focus on serving business activity including jet and multi-engine aircraft. These airports support the system of Commercial Service airports and provide significant coverage to the State's population.

- Community General Aviation – These 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. These airports are located throughout the State to serve rural needs and provide another connection to the State's transportation infrastructure.

- Low Activity General Aviation – These airports play a limited role in contributing to the local economy due to the lower levels of activity. These airports are considered to provide emergency or remote access services, primarily serving recreational and personal flying activities.

Roswell International Air Center is categorized by the NMASP as a Non-Primary Commercial Service airport; however it has been upgraded to a Primary Commercial Service Airport based on the total number of annual enplanements.

[4] New Mexico Airport System Plan, Technical Report, Page 4-9, 2009

Table 1-4 New Mexico Airports by Classification

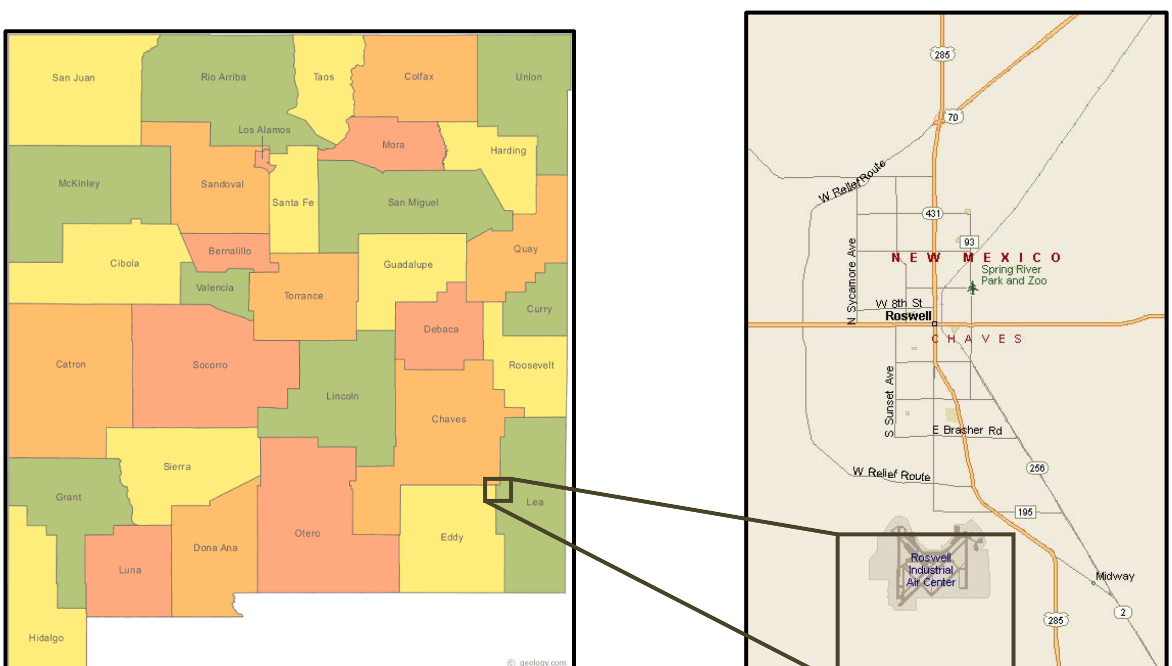
NMASP Classification	Total
Primary Commercial Service Airport	3
Non-Primary Commercial Service Airport	2
Limited Commercial Service Airport	4
Regional General Aviation Airport	13
Community General Aviation Airport	18
Low Activity General Aviation Airport	11
Total	**51**

Source: NMASP, 2009.
Prepared by: Armstrong Consultants, Inc., May 2011.

1.6 REGIONAL SETTING AND LAND USE

The City of Roswell is located at an elevation of approximately 3,573-feet MSL at the confluence of three rivers – the Spring, the Hondo and the Pecos, which are considered premier for outdoor activities. Bottomless Lakes State Park is twelve miles west of Roswell and offers such amenities as camping, swimming, fishing, boating and hiking. Roswell is also home to Cahoon Park Swimming Pool which serves as the largest outdoor pool (540,000 gallons) in a park setting with picnic and lighted facilities in the area. Roswell serves as the regional center for healthcare, shopping and entertainment for the entire area. The region has been continuously attracting businesses small and large with its high quality of life and opportunity for continuous growth. **Figure 1-4** shows the regional setting of Roswell. Today, much of Roswell's economy relies on six business clusters:

- Agriculture
- Aviation
- Medical
- Government
- Education
- Retail/Service



Source: Geology.Com & Microsoft Streets and Trips, 2010.

FIGURE 1-4 REGIONAL SETTING

1.7 SOCIOECONOMIC CHARACTERISTICS

Examining the specific socioeconomic characteristics of Chaves County, the City of Roswell and the airport service area will help determine the factors that influence aviation activity and the extent to which aviation facility developments are needed at Roswell International Air Center. Characteristics, such as employment, demographic patterns and income, will help in establishing the potential growth rate of aviation within the City and the County. By analyzing the information in this chapter, forecasts and projections of aviation activity can be developed and are provided in Chapter 2 – Forecasts of Aviation Activity.

1.7.1 LOCAL PROFILE

The City of Roswell is a large commercial/industrial center for southeast New Mexico. The City's location between US 70 and US 285; the Bitter Lake National Wildlife Refuge and the Bottomless Lakes State Park make tourism important to the local economy. According to the U.S. Census Bureau, between 2000 and 2009 the largest single industries in the City of Roswell were education, health and manufacturing, followed by government, commercial and retail and finance. Roswell is also the center for irrigation, farming, dairying, ranching, distribution and petroleum production.

Agriculture plays a significant economic role in Roswell and Chaves County. In 2007, Chaves County was ranked third highest for New Mexico counties in total market value of agricultural products sold.[5] In terms of oil, Chaves County ranks third out of the top five oil producing counties in New Mexico. Between 2009 and 2010, Chaves County experienced the highest rate of growth, in terms of oil (within the state of New Mexico) at 112.1 percent.[6]

1.7.2 POPULATION

There were 48,366 people residing in Roswell as indicated by the 2010 U.S Census Bureau. According to recent population estimates from the U.S. Census Bureau, the population for Roswell grew to 48,546 in 2011. Historical and future population projection growth is shown on **Table 1-5** and **Figure 1-5**.

Projections pertaining to population data were obtained for Chaves County through the New Mexico Economic Development organization, and the Bureau of Business and Economic Research for the state of New Mexico. Population projections, as shown in **Table 1-5,** indicates a 0.2 percent annual average growth (AAG) for Roswell; a 0.55 percent annual average growth for Chaves County; and, a 1.4 percent population increase for the state of New Mexico from 2015 to 2030. **Figure 1-4** shows the historical and projected population outlook for the State, Chaves County and the City of Roswell.

[5] Reference – United States Department of Agriculture - Census of Agriculture, 2007

[6] Reference – Mainstreet Roswell Master Plan, 2009

TABLE 1-5 HISTORICAL AND PROJECTED POPULATION DATA

	New Mexico	Chaves County	City of Roswell
Historical			
2000	1,819,046	61,382	45,193
2001	1,839,046	60,824	44,798
2002	1,859,781	60,484	44,328
2003	1,880,489	60,757	44,407
2004	1,901,428	60,822	44,470
2005	1,922,600	61,321	44,797
2006	1,944,007	61,456	44,878
2007	1,965,653	62,429	49,298
2008	1,987,540	62,998	49,721
2009	2,009,671	63,622	49,945
2010	2,059,179	65,645	50,095
Forecast			
2015	2,207,414	67,470	50,851
2020	2,366,321	69,346	51,618
2025	2,536,667	71,274	52,397
2030	2,719,275	73,256	53,188
AAG	**1.1%**	**0.55%**	**0.3%**

Source: Bureau of Business and Economics Research (BBER), 2005 & U.S. Census Bureau, 2009.
Prepared by: Armstrong Consultants, Inc., April 2011.

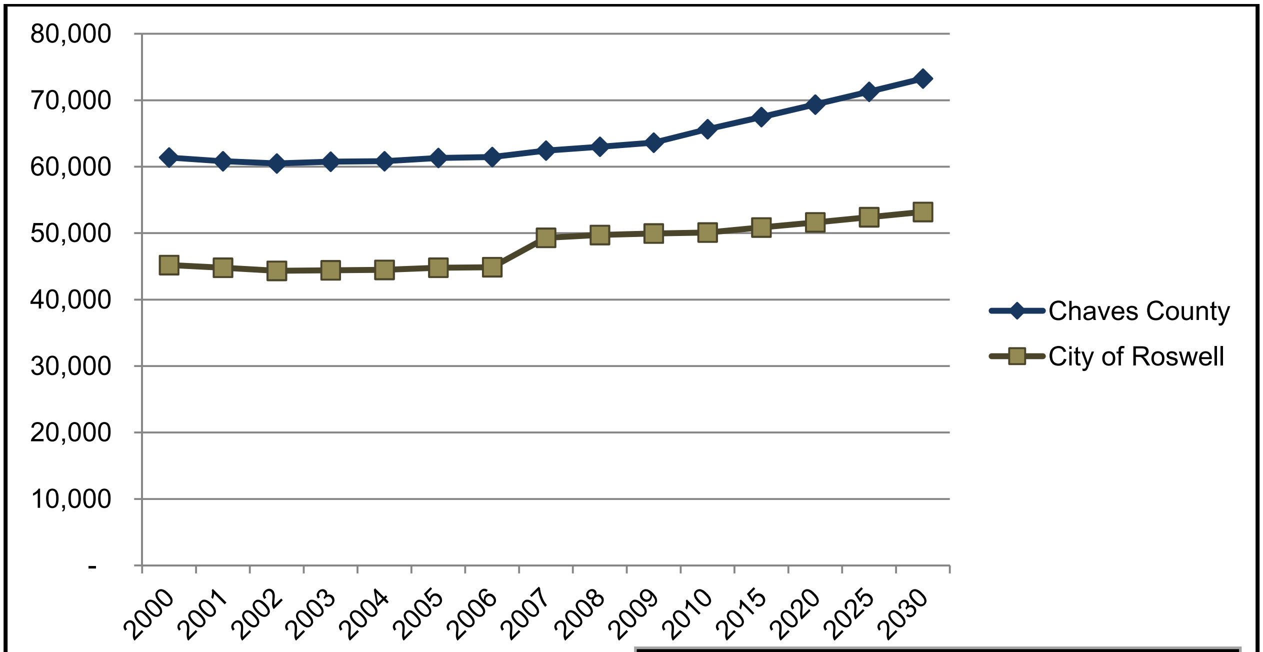


FIGURE 1-5 HISTORICAL AND PROJECTED POPULATION

Source: U.S. Bureau of Census, 2009 & Bureau of Business and Economic Research (BBER), 2005.
Prepared by: Armstrong Consultants, Inc., April 2011

1.7.3 EMPLOYMENT

As previously noted, according to the 2009 U.S. Census Bureau, the largest industry in Roswell is education/health followed by manufacturing, construction and finance. According to the 2009 U.S. Census, there are 1,483 businesses in Chaves County. The types of jobs within the Airport's service area affect aviation demand and generally careers in manufacturing and service industries tend to generate more aviation activity than resource industries such as agricultural or mining.

According to the 2009 U.S. Census Bureau, the unemployment rate for Roswell was 7.7 percent in 2009 – less than that of the United States but slightly higher than the unemployment rate in Chaves County. Employment distribution by industry for Roswell is shown in **Table 1-6** and **Figure 1-6**.

TABLE 1-6 CITY OF ROSWELL EMPLOYMENT DISTRIBUTION

	2009	Percent of Total
Agriculture, forestry , fishing, hunting & mining	858	4.5%
Construction	1,339	7.0%
Manufacturing	1,114	5.8%
Wholesale Trade	514	2.7%
Retail Trade	2,597	13.6%
Transportation, warehousing and Utilities	939	4.9%
Information	223	1.2%
Finance, insurance, real estate, rental and leasing	1,183	6.2%
Professional, scientific, management, administration	1,012	5.3%
Education, health and social services	4,849	25.4%
Arts, entertainment, recreation, accommodation and food services	2,361	12.4%
Other Services	2,098	11.0%
Total	**19,087**	**100%**

Source: 2009 U.S. Census Bureau.
Prepared by: Armstrong Consultants, Inc., April, 2011.

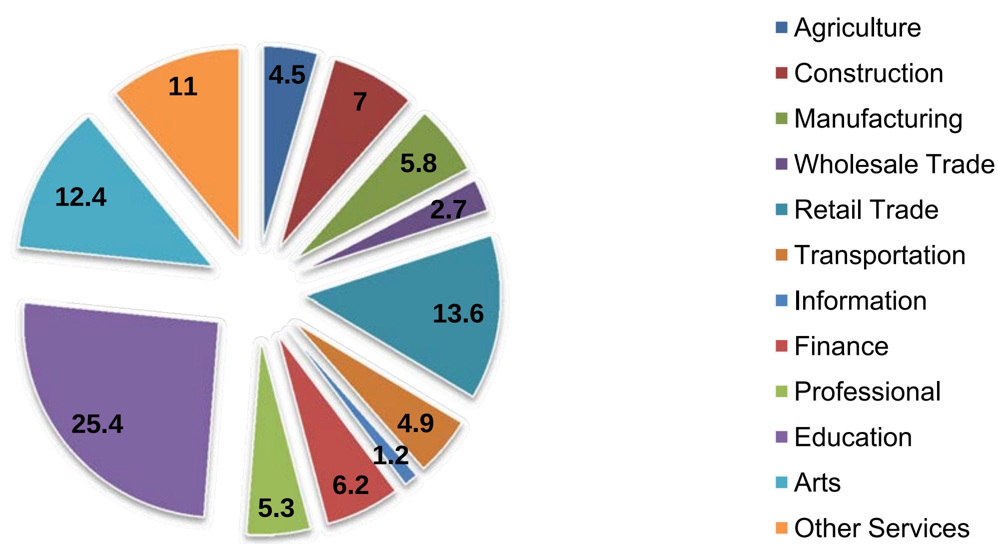


FIGURE 1-6 CITY OF ROSWELL EMPLOYMENT DISTRIBUTION

Source: U.S. Bureau of the Census, 2009.
Prepared by: Armstrong Consultants, Inc., April 2011

1.7.4 INCOME

Historical and future projections for per capita personal income (PCPI) are shown in **Table 1-7**. In 2009, the PCPI for Roswell was $18,141 and increased approximately 24 percent from 2000 to 2008. This represents an average annual growth (AAG) rate of approximately 2.6 percent. It is assumed the PCPI will continue to grow at the same average annual rate of approximately 2.6 percent through the 20 year planning period. [7]

According to the 2009 U.S. Census Bureau, the median income for a household in the City of Roswell was $35,099. The median household income for the state of New Mexico was $42,742. The percentage of families living below the poverty line in 2009 was 18.3 percent within the City and 13.7 percent for the state of New Mexico.

TABLE 1-7 PER CAPITA PERSONAL INCOME (PCPI) GROWTH

Year	Roswell
Historical	
2000	$14,589
2001	$14,984
2002	$15,389
2003	$15,805
2004	$16,233
2005	$16,672
2006	$17,123
2007	$17,586
2008	$18,141
2009	$18,632
2010	$19,136
Forecast	
2015	$21,868
2020	$24,990
2025	$28,558
2030	$32,636
Average Annual Growth (AAG)	**2.70%**

Source: U.S. Bureau of Census 2009.
Prepared by: Armstrong Consultants, Inc., June 2011.

1.7.5 GROWTH INDICATORS

Additional growth indicators include building permits, taxable sales and net assessed valuation. According to the City's Planning office, there were 42 commercial and residential building permits issued in 2010. There were 66 building permits issued in 2009 and 120 building permits issued in 2008 (within the City limits).

1.8 CERTIFICATED PILOTS AND REGISTERED AIRCRAFT

The FAA Aircraft Registration Inquiry database and database of certificated airman were reviewed to determine current distribution of pilots and registered aircraft in the Roswell and Chaves County area. This data indicates that there are 108 certificated pilots and 131 registered aircraft in Chaves County; however, aircraft are not always based where they are registered. **Table 1-8** shows the number of certificated pilots and registered aircraft in Chaves County in comparison to bordering counties.

[7] Reference – 2000 U.S. Census PCPI for Roswell - $14,589 (census.gov), May 2011.

TABLE 1-8 CERTIFICATED PILOTS AND REGISTERED AIRCRAFT

County	Registered Aircraft	Certificated Pilots
Chaves	131	108
Eddy	97	105
Lea	117	82
Otero	161	372
Lincoln	107	78
Debaca	6	1
Roosevelt	24	49

Source: FAA Aircraft Registry, June 2011 & FAA Active Airman, June 2011.
Prepared by: Armstrong Consultants, Inc., April 2011

1.9 BASED AIRCRAFT AND OPERATIONS

The number of based aircraft, operations and fleet mix baseline was based on the information provided by Airport Management in April, 2011 (see **Table 1-9**). According to 2010 Airport Management records there were 46 based aircraft at the Airport. The Air Traffic Control Tower provided an aircraft activity report indicating 51,588 total annual operations in 2010. These totals result in approximately 1,121 operations per based aircraft (OBPA).

TABLE 1-9 BASELINE BASED AIRCRAFT AND OPERATIONS

Type of Aircraft	2010
Based Aircraft	**46**
Fixed Wing Single-Engine Aircraft	42
Fixed Wing Multi-Engine Aircraft	2
Jet	1
Rotorcraft	1
Ultralight	0
Weight-shift Control	0
Experimental/Other	0
Total Operations Annual Operations	**51,588**

Source: FAA ATC Aircraft Activity, 2010.
Prepared by: Armstrong Consultants, Inc., April 2011.

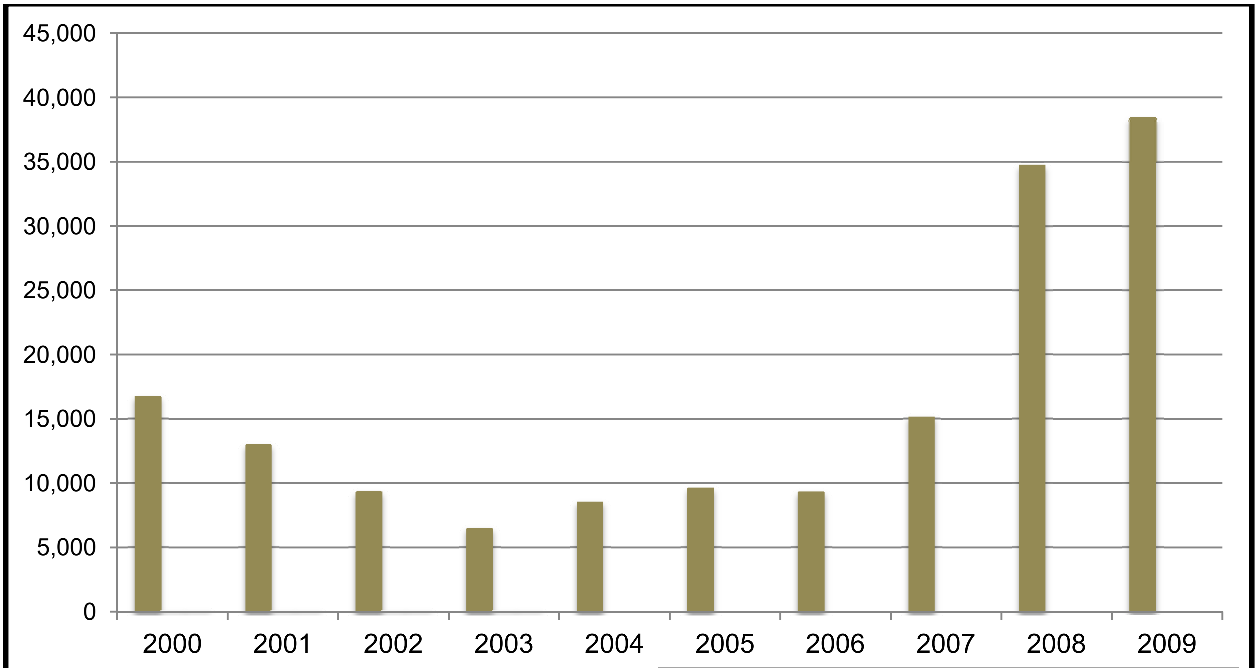
1.10 ENPLANEMENTS

Roswell International Air Center receives both scheduled and unscheduled passenger service. The Airport is served by American Eagle (dba American Airlines) with four daily roundtrip flights to Dallas/Ft. Worth International Airport (DFW). Flights are operated on a 50-seat Embraer Regional Jet ERJ-145 aircraft. In 2009, the Airport served 38,391 total enplanements, an increase from 2000's total of 16,706 enplanements and was ranked 285th in the nation in terms of total enplanements (2009). Airline passenger enplanements are defined as the total number of revenue passengers boarding aircraft, including originating, stopover and transfer passengers, in scheduled and nonscheduled service and are recorded by service providers and reported to the FAA. The number of enplanements depends on several factors including socioeconomic, aviation trends and ticket prices amongst other things. **Table 1-10** and **Figure 1-7** show the Airport's historical enplanement data. Chapter 2 – Forecasts of Aviation Activity, includes the enplanement forecast for the 20 year planning period.

TABLE 1-10 HISTORICAL ENPLANEMENTS

Year	Enplanements	Annual Percent Change	National Ranking
2000	16,706	-	-
2001	12,941	-22.54%	379
2002	9,296	-28.20%	398
2003	6,447	-30.65%	N/A
2004	8,482	7.76%	417
2005	9,570	12.83%	403
2006	9,298	-2.84%	404
2007	15,112	62.50%	363
2008	34,712	129.70%	295
2009	38,391	10.60%	285
2010*	39,933	4.01%	N/A

Source: FAA Airports Planning and Capacity - Passenger Boarding data for U.S. Airports, May 2011.
Prepared by: Armstrong Consultants, Inc., May 2011.
** 2010 Enplanement data will be released in July as a draft and final data will be released in Fall, 2011.*



Source: FAA, 2011.
Prepared by: Armstrong Consultants, Inc., April 2011

FIGURE 1-7 HISTORICAL PASSENGER ENPLANEMENTS

1.11 CARGO

Cargo operations are conducted at the Airport by Federal Express (FedEx). FedEx operates a Cessna 208 aircraft (turbo-prop caravan), as shown in **Figure 1-8**. Historical cargo data pertaining to enplaned and deplaned tonnage is not available.

FIGURE 1-8 FEDEX CARGO AIRCRAFT

1.12 AIRPORT SERVICE AREA

1.12.1 AIRLINE PASSENGER SERVICE AREA

An airport service area is defined by the communities and surrounding areas served by the airport facility. For example, factors such as the airport's surrounding topographical features (mountains, rivers, etc.); proximity to its users; quality of ground access; required driving time to the airport; and, the proximity of the facility to other airports that offer the same or similar services can all affect the size of a particular airport's service area. To define the service area for Roswell International Air Center, the airports in the area and their specific services and facilities were reviewed. The Primary Service Area includes the area within half the distance of the nearest airport from Roswell International Air Center that provides comparable services.

The nearest airline passenger service to ROW is located in Lubbock, Texas approximately 173 miles east of Roswell. The Preston Smith (Lubbock) International Airport is served by: American Eagle to Dallas/Fort-Worth, Texas; Continental Airlines to Houston, Texas; Delta Airlines to Memphis, Tennessee; and, Southwest Airlines to Dallas/Love Field, Texas. Preston Smith (Lubbock) International Airport is not included within the Roswell International Air Carrier primary or secondary service area.

The passenger service area depicts passengers who will more than likely chose Roswell International Air Center over Lubbock, Texas (173 miles); Albuquerque, New Mexico (200 miles); Midland, Texas (200 miles) El Paso, Texas (202 miles), or Amarillo, Texas (215 miles) in terms of airport of choice. **Figure 1-9** shows the airline passenger service area

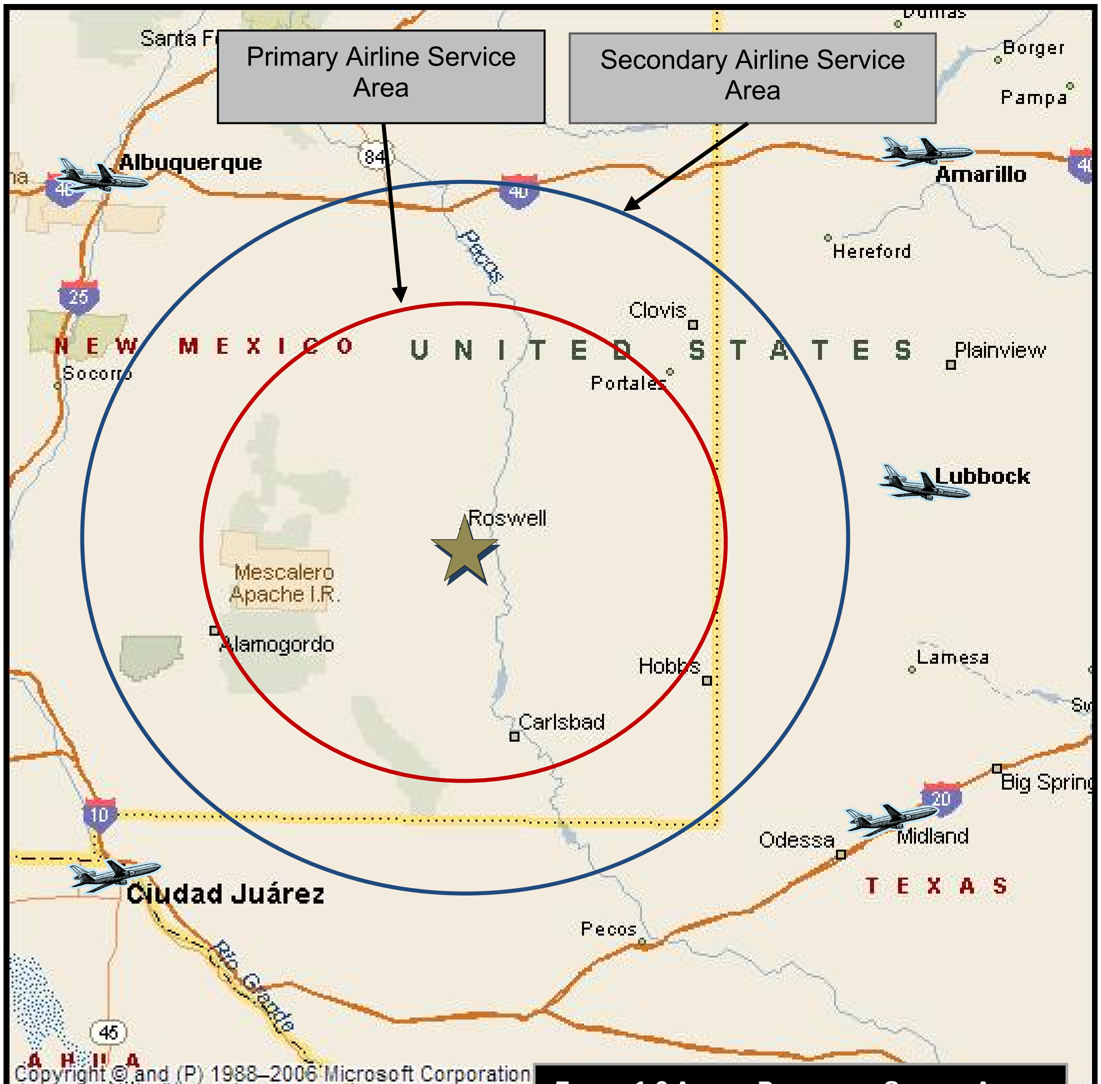


FIGURE 1-9 AIRLINE PASSENGER SERVICE AREA

Source: Microsoft Streets and Trips, 2006.
Prepared by: Armstrong Consultants, Inc., April 2011

1.12.2 GENERAL AVIATION SERVICE AREA

The general aviation service area much like the airline passenger service area is defined by the communities and surrounding areas served by the airport facility. To define the general aviation service area for ROW, the airports in the area and their specific services and facilities were reviewed.

The nearest public use general aviation airport with a paved surface and an instrument approach (ILS) is located approximately 27 nautical miles southwest in Artesia, New Mexico. The primary ILS Runway 12/30 at Artesia Municipal Airport is 5,390 feet long and 150 feet wide. The primary service area includes the area within half the distance of the nearest airport with an instrument approach from Roswell International Air Center. **Table 1-11** depicts the closest airports with instrument approaches.

The secondary service area is the area within 20-miles/20-minute drive time of Roswell International Air Center. Users within this area may choose Roswell International Air Center over other airports if there are economic advantages such as lower lease rates, less expensive fuel or hangar availability.

There are no additional airports within the vicinity of the primary service area of Roswell International Air Center. The general aviation primary and secondary service areas are shown in **Figure 1-10**.

TABLE 1-11 ROSWELL INTERNATIONAL AIR CENTER AND NEARBY AIRPORTS WITH INSTRUMENT APPROACHES

	ID	Distance (Nautical Miles)	Distance (Highway Miles)	NPIAS Status	Runway Length(s) Width(s)	Pavement Type	Instrument Approaches	Fuel
Roswell International Air Center, Roswell, NM	ROW	--	--	P-CS	13,001'x150' 9,999'x100'	Concrete Asphalt	ILS/VOR GPS/DME	100LL & Jet-A/A1
Artesia Municipal, Artesia, NM	ATS	27 NM S	41	GA	6,301'x150' 5,390'x150'	Asphalt Asphalt	NDB/GPS	100LL& Jet-A1
Sierra Blanca Regional Airport, Ruidoso, NM	SRR	51 NM W	79	GA	8,120'x100' 6,309'x75'	Asphalt Asphalt	ILS/LOC/ DME/GPS	100LL& Jet-A
Cavern City Air Terminal, Carlsbad, NM	CNM	59 NM S	79	GA	7,854'x150' 5,839'x100' 5,333'x75'	Asphalt Asphalt Asphalt	ILS/VOR/ GPS	100LL & Jet-A1+
Lea County-Zip Franklin Memorial Airport, Lovington, NM	E06	60 NM E	110	GA	6,000'x75' 4,409'x60'	Asphalt Asphalt	GPS	No
Portales Municipal Airport, Portales, NM	PRZ	75 NM E	98	GA	5,700'x60' 4,560'x60'	Asphalt Asphalt	GPS	100LL & Jet-A

Source: AriNAV, 2011.
Prepared by: Armstrong Consultants, Inc., April, 2011.
Notes/ P-CS: Primary Commercial Service; GA: General Aviation

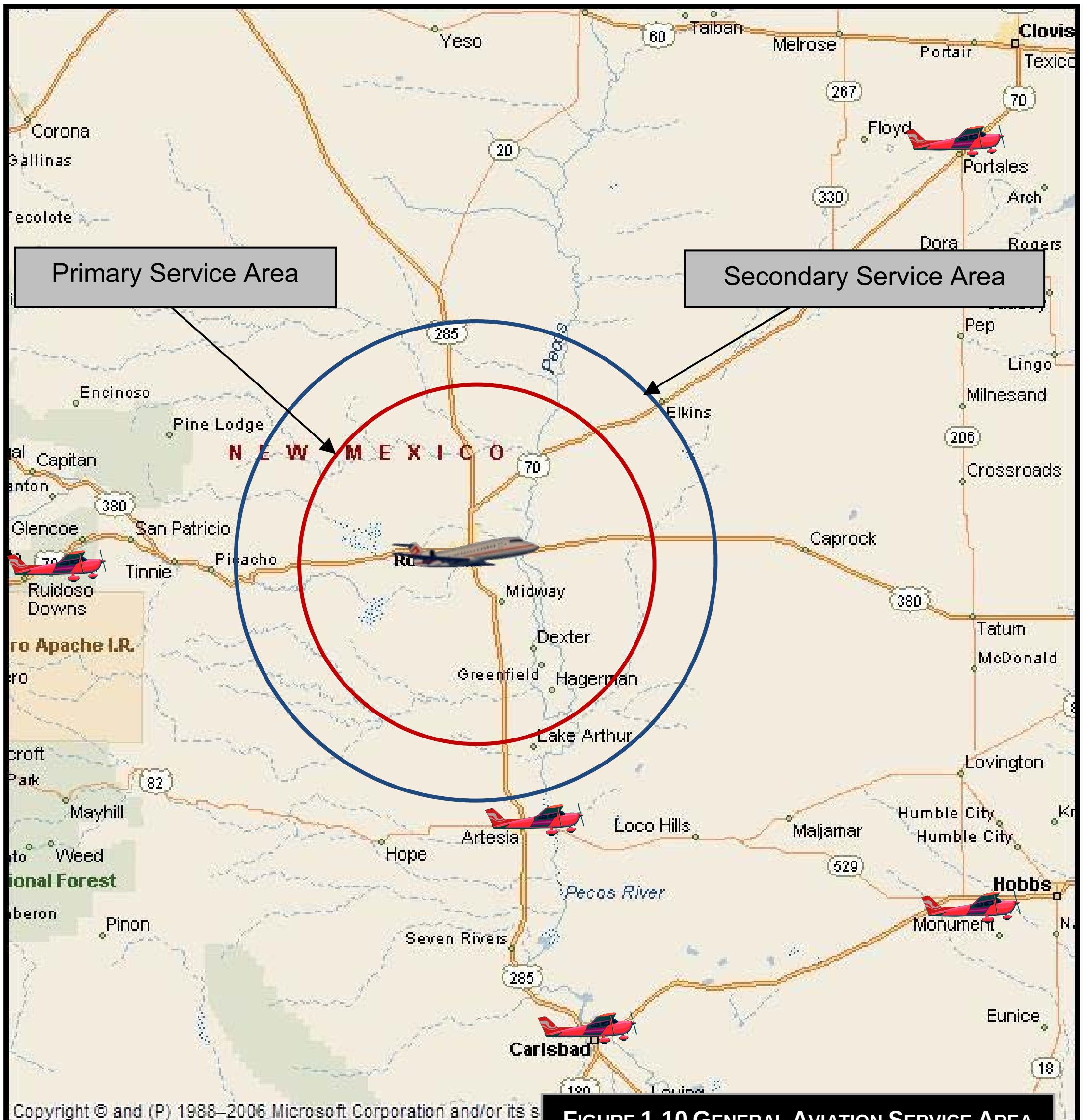


FIGURE 1-10 GENERAL AVIATION SERVICE AREA

Source: Microsoft Streets and Maps, 2010
Prepared by: Armstrong Consultants, Inc., April 2011

1.12.3 TOPOGRAPHY AND TERRAIN

The elevation of Roswell International Air Center is 3,671-feet Mean Sea Level (MSL). The Airport is located within an area comprised of gently undulating hills, low mesas and tributary canyons that drain into the Pecos River. The terrain surrounding the Airport within a ten mile radius is generally flat.

1.13 EXISTING AIRSIDE FACILITIES

The “airside” of an airport is the portion typically located within the security fenced perimeter, in which aircraft, support vehicles and equipment are located; and in which aviation-specific operational activities take place. This inventory of airside facilities (see **Figure 1-11**) provides the basis for the airfield demand/capacity analysis and the determination of any facility change requirements that might be identified later in this report.

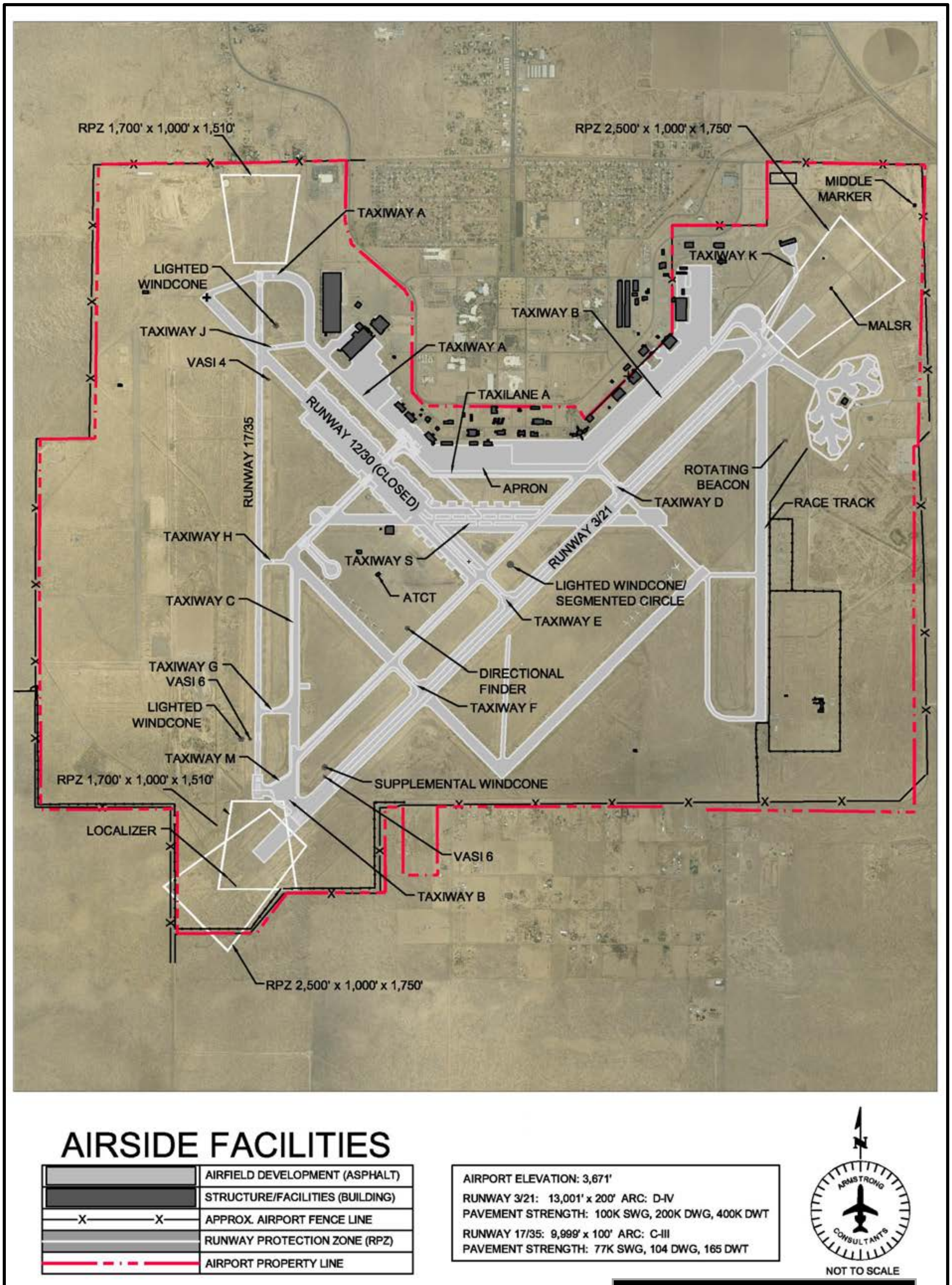


FIGURE 1-11 AIRSIDE FACILITIES

1.13.1 RUNWAYS

Roswell International Air Center has one concrete-surfaced runway (Runway 3/21), one asphalt-surfaced runway (Runway 17/35) (see **Figure 1-12**) and a third runway (Runway 12/30) that has been deactivated indefinitely and is in the process of permanent closure. Runway 12/30 was closed in 2008 to be utilized as an aircraft parking ramp for the salvaged and abandoned aircraft.

FIGURE 1-12 RUNWAY 35 AND RUNWAY 3 APPROACH

1.13.1.1 RUNWAY 3/21

Runway 3/21 is the primary runway at 13,001 feet long and 200 feet wide. Runway 3/21 is capable of supporting 100,000 pounds Single Wheel Gear (SWG), 200,000 pounds Dual Wheel Gear (DWG) and 400,000 pounds Dual Wheel Tandem (DTW) according to the design report for the runway reconstruction.[8]

The center 100 feet of Runway 3/21 is constructed with Portland cement concrete (PCC) and is not grooved; the outer 50-feet of shoulders are constructed with asphalt. The outer asphalt edges are in poor condition and need to be reconstructed and the center portion concrete is in satisfactory condition. Runway 3/21 has an Airport Reference Code (ARC) of D-IV and is marked with precision markings on Runway 21 end and Runway 3 is marked nonprecision; both ends are in good condition. Runway 3/21 is equipped with High Intensity Runway Lights (HIRL) which is currently located 160-feet from the edge of the runway pavement.

1.13.1.2 RUNWAY 17/35

Runway 17/35 is the crosswind runway primarily used when winds do not favor the use of the primary runway. Runway 17/35 is constructed of asphalt and is 9,999 feet long and 100 feet wide with a published strength of 77,000 pounds SWG, 104,000 pounds DWG and 165,000 pounds DTW. Runway 17/35 has an ARC of C-III and is marked with nonprecision markings. Runway 17/35 is an asphalt-surfaced runway and is grooved. Runway 17/35 is equipped with Medium Intensity Runway Lights (MIRL) located 10 feet from the edge of the runway pavement. The pavement and runway markings are both in good condition.

[8] Pavement strength throughout the document was obtained from the Pavement Strength Survey (1984) and has not been verified via testing by Armstrong Consultants, Inc.

1.13.1.3 RUNWAY 12/30

Runway 12/30 was recently closed in the process of permanent closure. The pavement is being utilized for large aircraft storage and salvage apron. Runway designation markings have been painted over with the standard ‘X’ marking that delineates a runway is not longer operative (see **Figure 1-13**). All signage has been removed except for the location sign at the intersection of Taxiway B.

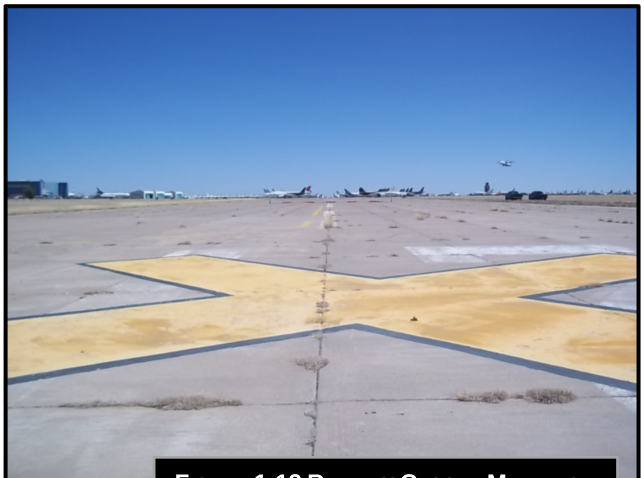


FIGURE 1-13 RUNWAY CLOSED MARKING

1.13.2 TAXIWAY SYSTEM

Taxiways provide a surface for aircraft access from the parking apron to and from the runways. They expedite aircraft departures from the runway and increase operational safety and efficiency. Overall Taxiway detail can be found in **Table 1-12** and **Figure 1-14**. All taxiways are equipped with standard Medium Intensity Taxiway Edge Lights (MITL) and the appropriate signage on all taxiway connectors as well as hold bar signage at all taxiway/runway intersections. There are run-up pads located at the departure ends of Runway 3/21 and Runway 35. A more detailed table can be found later in this Chapter under the Pavement Condition section which expands upon the condition of the pavement centerline and shoulder area.

1.13.2.1 TAXIWAY A

Taxiway A provides access to the end of Runway 17 from the terminal apron, is constructed with concrete and is 100 feet in width. Taxiway A extends east into the terminal area and transitions into the taxilane providing access to the entire terminal apron area. Taxiway A has been divided into two distinct pavement areas that have differing pavement conditions. The Taxiway A pavement strength is 40,000 pounds SWG, 60,000 pounds DWG and 120,000 pounds DTW.

The portion connecting to the end of Runway 17 is in fair condition and exhibits minimal cracking and distress. The portion of Taxiway A that transitions to the aircraft parking apron is showing significant signs of deterioration and is considered to be in poor condition. Pavement deterioration includes depression, cracking and swelling.

1.13.2.2 TAXIWAY B

Taxiway B is an asphalt-surfaced pavement that serves as the full-length parallel taxiway to Runway 3/21. This taxiway varies between 52 feet and 75 feet in width and the condition varies throughout its length (with a majority of the pavement in fair condition). The shoulders are in fair condition with isolated areas of low-severity distress. The pavement strength is equivalent to that of Runway 3/21. Taxiway B is located between 829 feet and 836 feet from the Runway 3/21 centerline.

1.13.2.3 TAXIWAY C

Taxiway C is the partial length parallel taxiway to Runway 17/35 and is a connector to Taxiway A. The asphalt pavement is in good condition and was rehabilitated in 2010. This taxiway serves as a connector to the main terminal apron and intersects with Taxiway B at the southern portion. The strength of the taxiway is equivalent to the strength of Runway 17/35 and the taxiway centerline is located 700 feet from the Runway 17/35 centerline. Taxiway C has a pavement strength equivalent to that of Runway 17/35 and varies between 50 feet and 75 feet in width.

1.13.2.4 TAXIWAY D, E & F CONNECTORS

Three concrete taxiways connect Taxiway B to Runway 3/21. Taxiway D and F are in fair condition and Taxiway E is in good condition. The taxiways are approximately 100 feet in width and have pavement strengths of 100,000 pounds SWG, 200,000 pounds DWG and 400,000 pounds DTW.

1.13.2.5 TAXIWAY G, H &J CONNECTORS

These three asphalt connecting taxiways provide access between Taxiway C and Runway 17/35. Taxiway G and H are both in good condition (rehabilitated in 2010 and 2011) and are 75 feet in width. Taxiway J is in good condition and is 50 feet in width. Pavement strengths vary between the two taxiways with Taxiway G having strength of 40,000 pounds SWG, 60,000 pounds DWG and 120,000 pounds DTW;100,000 pounds SWG, 200,000 pounds SWG and 400,000 pounds DTW for Taxiway's H and 85,000 pounds SWG, 130,000 pounds DWG and 240,000 pounds DTW for Taxiway J.

1.13.2.6 TAXIWAY K

Taxiway K connects the secondary general aviation development area to Runway End 21. Overall this pavement is deteriorated with approximately the entire area showing distress. The shoulders are in very poor condition and in extreme distress with vegetation growth throughout. Taxiway K is 50 feet in width and pavement strength of 100,000 pounds SWG, 200,000 pounds SWG and 400,000 pounds DTW.

1.13.2.7 TAXIWAY M

Taxiway M is an asphalt taxiway that connects the Runway 35 end to parallel Taxiway C. Taxiway M serves as a run-up pad for aircraft departing to Runway 35 and Runway 3. Taxiway M is 75 feet in width and pavement strength of 100,000 pounds SWG, 200,000 pounds SWG and 400,000 pounds DTW. This section of pavement is considered to be in fair condition.

1.13.2.8 TAXIWAY S

Taxiway S is an abandoned taxiway which previously served as a connector taxiway between Runway 12/30 and Taxiway B. Taxiway S is currently used for aircraft salvage and storage and is no longer in use as a taxiway; however, the signage and marking still indicate this pavement as a taxiway. There is a Notice to Airmen (NOTAM) issued stating that Taxiway S is considered a non-movement area. The non-movement area is defined as the taxilanes and ramp areas not under the control of the Air Traffic Control Tower. This taxiway pavement is noted as being in fair condition.

TABLE 1-12 TAXIWAY INVENTORY

Taxiway	Location	Width	Strength	Condition
A	Access point to the apron; connects to the end of RW 17.	100 feet	40,000 SWG 60,000 DWG 120,000 DTW	Fair
B	Full-length parallel taxiway to RW 3/21 and located 829 to 836 feet from Runway centerline.	Varies 52 feet - 75 feet	100,000 SWG 200,000 DWG 400,000 DWT	Fair to Poor
C	Partial-length parallel taxiway to RW 17/35 and located 700 feet from the Runway centerline.	Varies 50 feet - 75 feet	77,000 SWG 104,000 DWG 165,000 DWT	Good
D,E & F	Midfield connector taxiways between RW 3/21 and Taxiway B.	75 feet	100,000 SWG 200,000 DWG 400,000 DWT	TW D - Fair TW E - Good TW F - Fair
G & H	Connector taxiway between RW 17/35 and Taxiway C.	75 feet	40,000 SWG 60,00 DWG 120,000 DTW 100,000 SWG 200,000 DWG 400,000 DWT	TW G - Good TW H - Good
J	Connector taxiway between RW End 17 and Taxiway A.	50 feet	85,000 SWG 130,000 DWG 240,000 DTW	Good
K	Connector taxiway between the GA hangar and Runway End 21	50 feet	100,000 SWG 200,000 DWG 400,000 DWT	Poor
M	Connector taxiway between RW End 35 and Taxiway B.	75 feet	100,000 SWG 200,000 DWG 400,000 DWT	Fair
S	Abandoned connector taxiway between RW 12/30 and Taxiway B.	50 feet	100,000 SWG 200,000 DWG 400,000 DWT	Fair
Taxilane	**Location**	**Width**	**Strength**	
A	Services the entire apron and connects to Taxiways A,B and C.	100 feet	40,000 SWG 60,000 DWG 120,000 DTW	Fair

Source: Pavement Condition Survey, 2007 and Field Visit, April 2011.
Prepared by: Armstrong Consultants, Inc., June 2011.

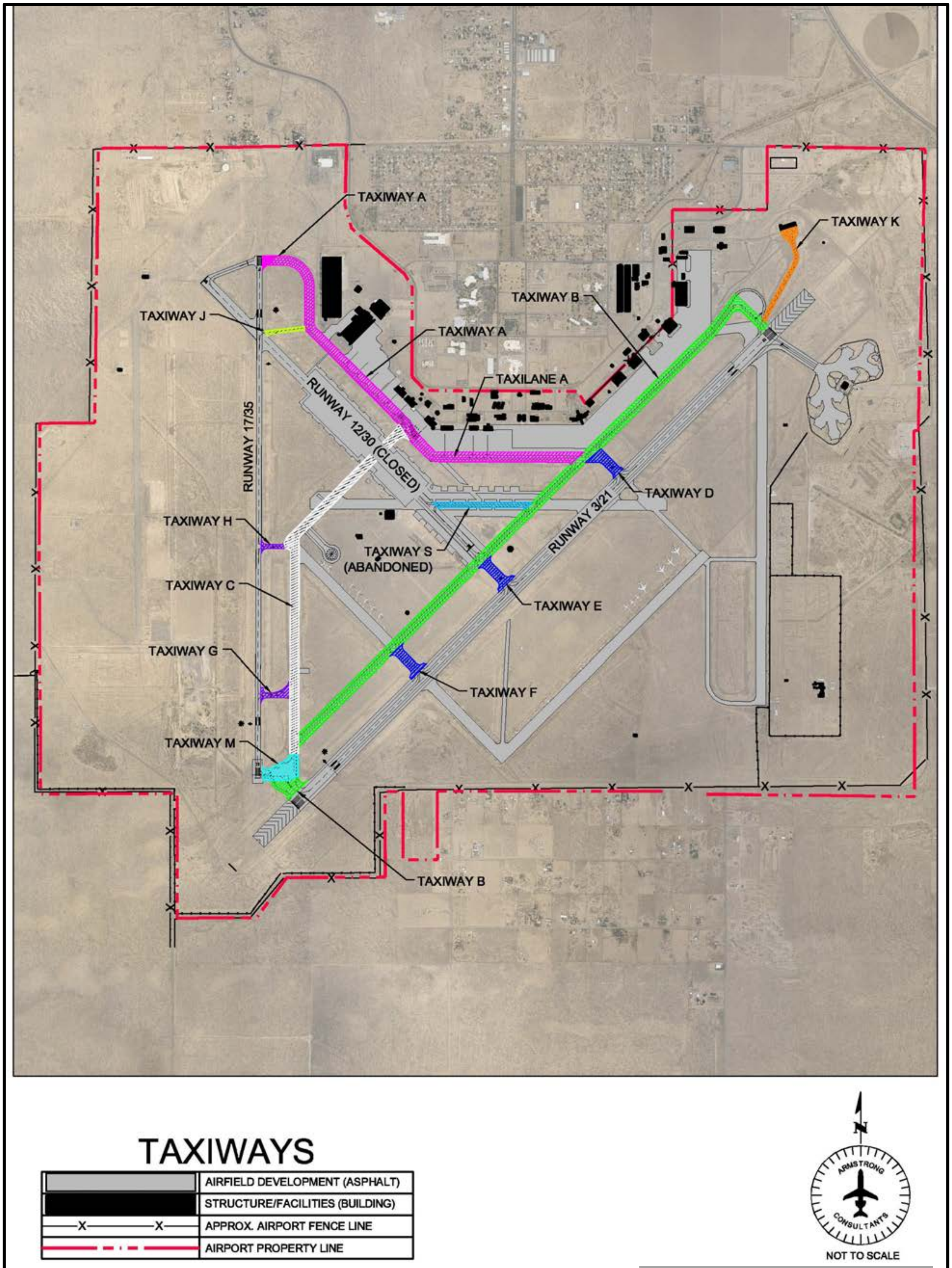


FIGURE 1-14 TAXIWAY SYSTEM

1.13.3 AIRCRAFT APRON AREA

The aircraft apron provides a defined area intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking or maintenance. The apron is typically connected to the runway via taxiways. There is one concrete aircraft parking apron located at the Roswell International Air Center that is divided into three sections: commercial service apron, general aviation (GA) apron and the industrial apron. The apron is centrally located between Runway 17/35 and Runway 3/21 and has approximately 531,309 square yards (SY) of area and contains an estimated 38 aircraft tiedown positions. The entire apron pavement is in fair to poor condition with significant signs of deterioration in various areas. According to the Pavement Strength Survey, the apron strength varies between 40,000 lbs and 70,000 lbs SWG; 60,000 lbs and 110,000 lbs DWG; 120,000 lbs and 160,000 lbs DTW.

The commercial service apron area encompasses approximately 9,995 square yards. This pavement is in fair to poor condition (see **Figure 1-15)**. The City of Roswell has conducted several temporary fixes on the commercial apron to reduce the risk of foreign object debris (FOD) ingestion. The Pavement Strength Survey indicates the pavement strength to be approximately 55,000 pounds SWG, 80,000 pounds DWG, and 145,000 pounds DTW.

FIGURE 1-15 PRIMARY COMMERCIAL SERVICE APRON AREA

FIGURE 1-16 FBO GENERAL AVIATION APRON AREA

There are two GA ramps located at Roswell International Air Center. The primary general aviation aircraft parking apron is located to the west of the commercial service parking apron and encompasses approximately 59,867 square yards of area and contains approximately 38 aircraft tiedowns. There is one helicopter parking pad located on this apron. The helicopter parking pad is not lighted and is in fair condition. The fixed base operator, Great Southwest Aviation, manages the ramp and leases the tiedown positions. Taxiway D and Taxiway A provide access to this section of the ramp area. This portion of pavement is on the verge of poor condition; signs of distress are prominent (see **Figure 1-16**).

FIGURE 1-17 SECONDARY GENERAL AVIATION APRON AREA

The secondary GA ramp is located in the northeast quadrant of the airfield located west of Runway End 21. This ramp, which encompasses approximately 6,659 square yards, serves as a secondary general aviation parking area and provides access to the GA hangar area. This ramp is accessible via Taxiway K, which connects to Runway End 21. This portion of pavement is in extremely poor condition with areas of severe distress (see **Figure 1-17**).

The remainder of the pavement, approximately 454,788 square yards primarily serves as an industrial apron area for aircraft salvage and long-term storage (see **Figure 1-18**). The industrial apron area has designated areas throughout the overall area to house salvaged aircraft. Many portions of this pavement are showing signs of deterioration and are experiencing high-levels of distress, vegetation growth and exhibiting medium- to high-severity of cracking.

FIGURE 1-18 INDUSTRIAL APRON AREA

The three sections of apron area are shown in **Figure 1-19**. Floodlights are located along the apron to enhance operations and security at night.

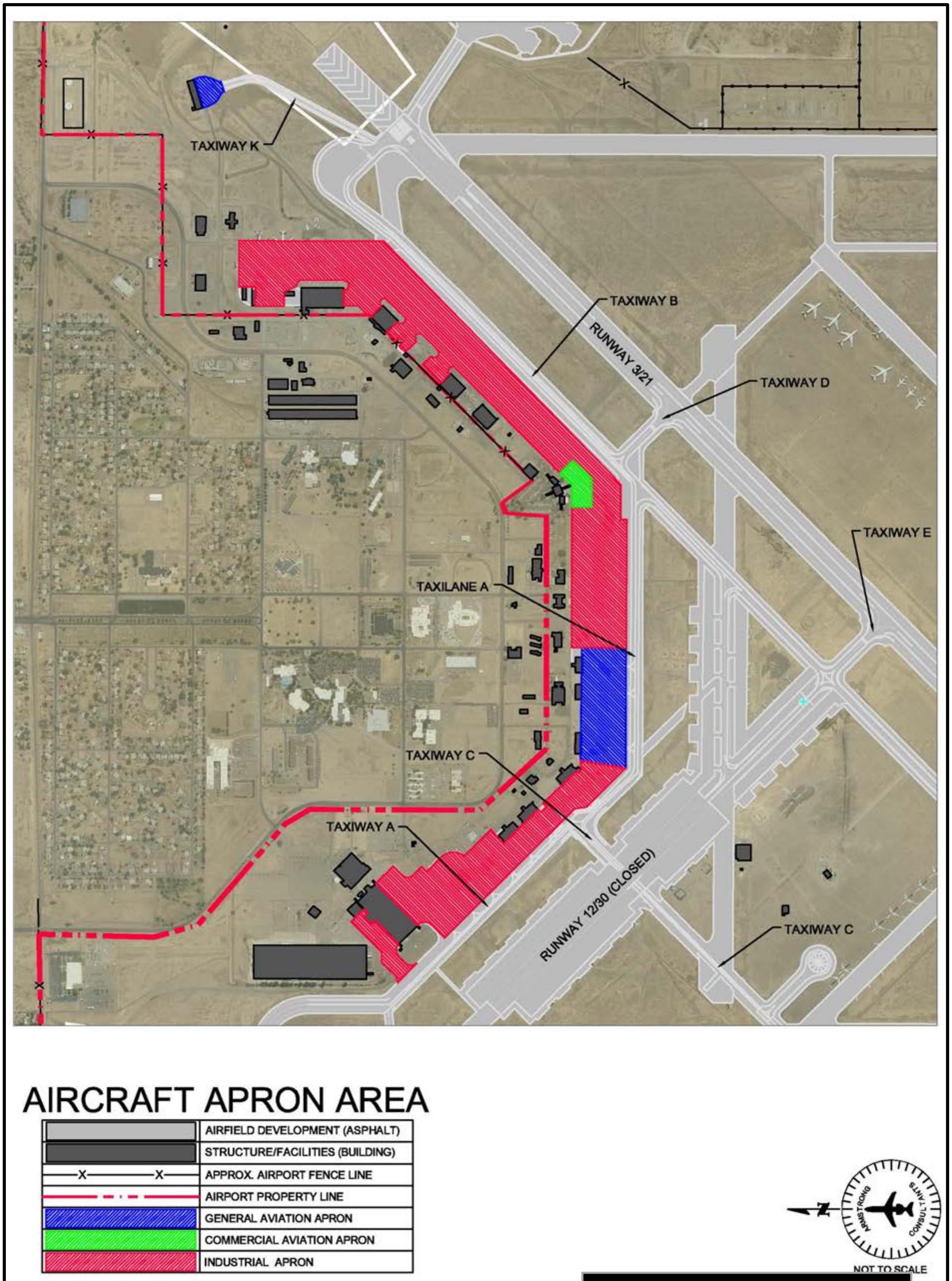


FIGURE 1-19 AIRCRAFT APRON AREA

1.13.4 PAVEMENT CONDITION INDEX (PCI)

The Pavement Condition Index (PCI) is a numerical index between 0 and 100 and is used to indicate the condition of the pavement. The PCI, as outlined by the New Mexico Department of Transportation, is based on a visual survey of the pavement and a numerical value between 0 and 100 is assigned defining the condition. Condition levels are defined as *Failed, Serious, Very Poor, Poor, Fair, Satisfactory, Good*. The corresponding index ranges for these condition levels are:

- 0 to 10 – Failed
- 11 to 25 – Serious
- 26 to 40 – Very Poor
- 41 to 55 – Poor
- 56 to 70 – Fair
- 71 to 85 – Satisfactory
- 86 to 100 – Good

As shown in **Table 1-13**, the last PCI inspection reported in 2007 for Runway 17/35, Runway 03/21, taxiways and apron areas confirm the pavement to be in various conditions and stages of deterioration. During the April, 2011 field inventory survey, a visual assessment of the apron indicated that the apron is in need of immediate improvement. Pavement maintenance recommendations will be discussed in Chapter 3 - Facility Requirements. According to the 2009 NMASP, Roswell International Air Center was identified as one of the "Primary Commercial Service Airports needing pavement maintenance" due to the runways not currently having a PCI of 71 or greater.[9]

TABLE 1-13 PAVEMENT CONDITION INDEX (PCI)

Airfield Area	Area (Square Ft.)	Number of Sections	PCI	Condition
Runway (Average PCI)	6,432,000	12	67.4	Fair
Apron (Average PCI)	4,107,575	20	50.0	Poor
Taxiway (Average PCI)	3,936,300	24	65.2	Fair
Other (Average PCI)	45,000	1	76.0	Satisfactory
Total	14,520,875	57	61.9	Fair

Source: New Mexico Department of Transportation, 2007 (Revised 2010).
Prepared by: Armstrong Consultants, April 2011.

A detailed assessment of each runway's and taxiway's pavement condition can be found in previous sections of this report (Section 1.13.1 and Section 1.13.2) and in **Table 1-14**; however, due to the total square yards of pavement found at the Airport, prioritizing pavement repair will need to be completed. In 2010, pavement rehabilitation was conducted on Taxiway C, G and H (including shoulders). A large amount of the industrial apron is in particularly poor condition with vegetation, spalling and cracking abundant. An example of existing pavement cracking can be found in **Figure 1-20** and **Figure 1-21**. A graphic outlaying the current (2007, revised 2010) PCI ratings for Roswell International Air Center from the New Mexico Department of Transportation can be found in **Figure 1-22**.

[9] Reference – New Mexico Airport System Plan Update, 2009; page 5-34.

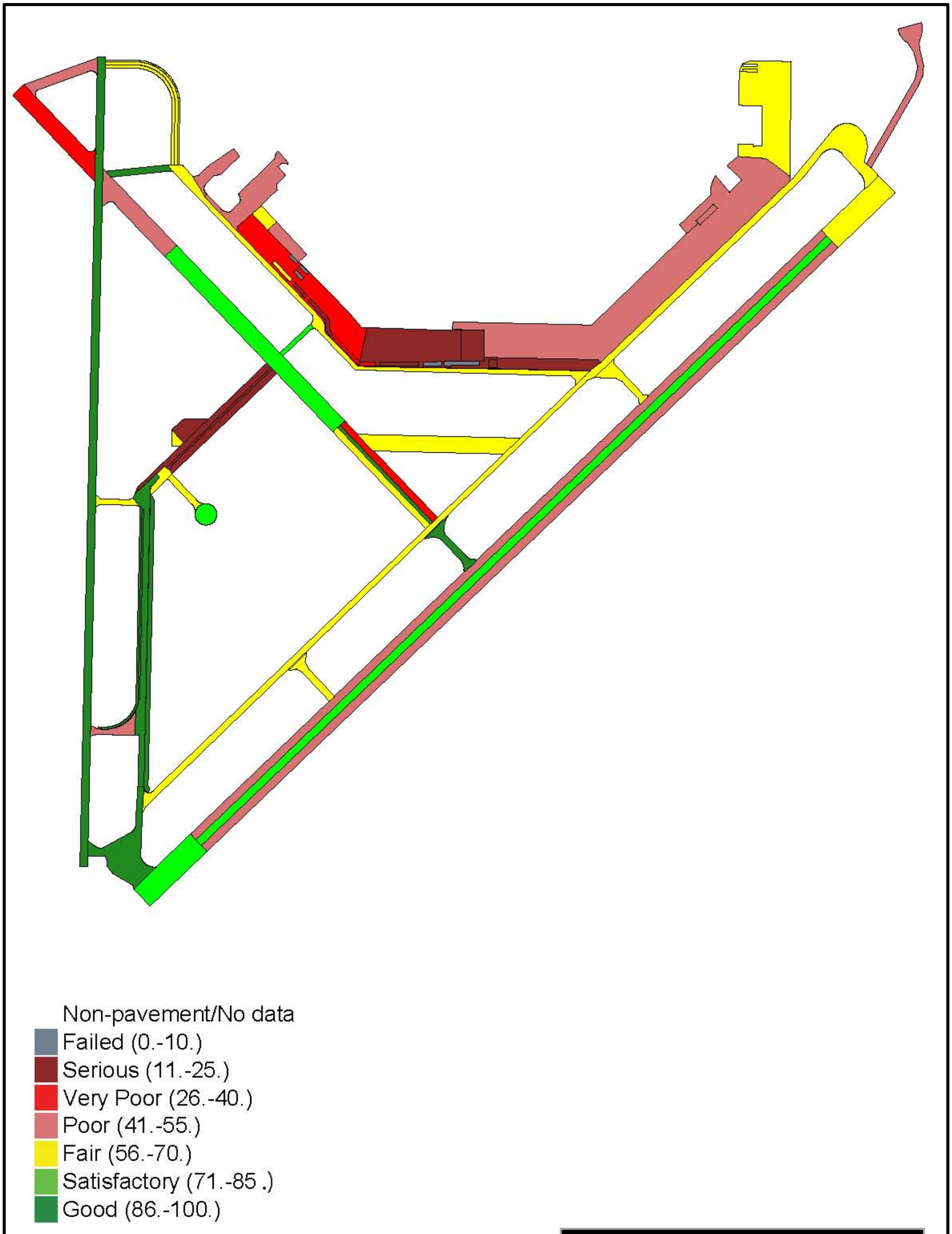
FIGURE 1-20 RUNWAY 3/21 AND SHOULDER

FIGURE 1-21 TAXIWAY B SHOULDER

TABLE 1-14 EXISTING PAVEMENT CONDITION INVENTORY

Pavement	Centerline Condition	Shoulder Condition
RUNWAY		
Runway 3/21	Center 100 feet is in satisfactory condition; outer 50 feet is in poor condition	Very poor condition
Runway 17/35	Good condition	Good condition
Runway 12/30 (Closed)	Areas of satisfactory condition in the center but poor and very poor conditions on the outer length with vegetation and cracking abundant	Very Poor to Good condition
TAXIWAY		
Taxiway A	Fair condition with areas of cracking and distress	Fair condition
Taxiway B	Fair condition with large percentage of the area showing low-severity distress.	Fair condition
Taxiway C	Good condition and was recently reconstructed in 2010	Good condition and was reconstructed in 2010
Taxiway D	Fair condition with minimal cracking	Fair condition
Taxiway E	Good condition with little distress	Good condition
Taxiway F	Fair condition with minimal cracking	Fair condition
Taxiway G	Good condition	Good condition
Taxiway H	Good condition	Good condition
Taxiway J	Good condition with little signs of distress	Fair condition
Taxiway K	Poor condition extreme distress and cracking	Poor condition with areas of cracking
Taxiway M	Good condition minimal distress	Good condition
Taxiway S	Abandoned taxiway and in fair to poor condition	Poor condition
Taxilane A	Fair condition showing signs of deterioration including depression, cracking, and swelling	Fair condition
APRON AREA		
Primary Commercial	Fair to poor condition with areas of cracking and low-severity distress	N/A
General Aviation - FBO	Areas of poor to very poor condition with portions of high-severity cracking and spalling.	N/A
General Aviation - Secondary	Poor condition with areas of extreme cracking and spalling	N/A
Industrial	Poor to very poor condition. Areas of high-severity distress and cracking. Vegetation is found overlaying various areas of pavement.	N/A
Helicopter Parking Position	Fair condition	N/A

Source: New Mexico Department of Transportation, 2007 and Armstrong Consultants Field Visit.
Prepared by: Armstrong Consultants, Inc., June 2011.



Source: New Mexico Department of Transportation, 2007 (Revised 2010)

FIGURE 1-22 PAVEMENT CONDITION INDEX

1.13.5 AIRFIELD LIGHTING, SIGNAGE AND VISUAL AIDS

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

Rotating Beacon. This visual aid is equipped with high intensity lamps mounted on an assembly which rotates 360 degrees every six seconds while emitting flashes of light. The designation for ROW, a civilian land airport, is alternating green and white lights in equal duration. The beacon is activated by a photocell from dusk to dawn and can also be activated by the Air Traffic Control Tower (ATCT). If the beacon is activated during other hours it typically indicates that the airport is operating under instrument flight rules (IFR). A new airport rotating beacon was installed in 2010 and is located to the east of Runway 21 end.

Wind Cone. This visual aid provides visual surface wind information to pilots. The primary wind cone is collocated with a segmented circle at the approach end of Runway 3. The segmented circle is a basic marking device used to aid pilots in locating airports, and that provides a central location for such indicators and signal devices as may be required. Lighted supplemental wind cones are located at the north end of the Airport at the approach end of Runway 21 and the approach end of Runway 35. The three existing wind indicators and segmented circle are in good condition.

Retroreflectors. This visual aid is used in lieu of taxiway lighting and consists of a single row bordering each side of the taxiway of reflective blue tape mounted on a pole. There are retroreflectors currently installed along Taxiway A leading to Runway 35 between the taxiway and apron. Taxiway K is also marked with retroreflectors.

Runway Edge Lights**.** This visual aid consist of a single row of white lights bordering each side of the runway and can be classified according to three intensity levels. High intensity runway lights (HIRL) are the brightest runway lights available. Medium intensity runway lights (MIRL) and low intensity runway lights (LIRL) are the lowest in intensity. At most towered airports, runway lights are activated and under the control of the ATCT when in operation. When the ATCT is not open, the runway lights are activated from the aircraft cockpit by transmitting a series of "clicks" on the radio transmitter on the common traffic advisory frequency (CTAF/ATCT: 118.5 MHz). Instrument runways incorporate amber/white runway remaining lights on the last half of the runway or last 2,000 feet of runway, whichever distance is less. Runway 3/21 is equipped with HIRL, and Runway 17/35 has MIRL installed, and both runway edge lights have white colored lenses (with amber/white lights on the last 2,000 feet). The lights are located 60 feet from the edge of pavement on Runway 3/21 and 10 feet from the edge of pavement on Runway 17/35.

Taxiway Edge Lights. This visual aid consists of a single row of blue lights bordering each side of the taxiway. These lights mark the edge of the taxiways and guide aircraft from the runway to the ramp or apron area. All the taxiways - except Taxiway K and the apron side of Taxiway A - at ROW are equipped with Medium Intensity Taxiway Lights (MITL).

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

Marking. This visual aid varies depending on whether the runway is used exclusively for visual flight rule operations (VFR) or instrument flight rule (IFR) operations. A visual runway is typically marked with the runway designator numbers and a dashed white centerline. Runway 21 is a precision instrument runway, and its pavement markings include runway numbers (i.e., designators), centerlines, runway thresholds, aiming points, and the touchdown zone. Runway designators indicate the magnetic azimuth of the runway centerline. The runway centerlines provide alignment guidance during takeoff and landing. The runway threshold markings consist of twelve longitudinal stripes of uniform dimensions painted systematically along the runway centerline. The aiming point markings are located approximately 1,000 feet from the runway ends which serve as a visual aiming point for landing aircraft. Runway touchdown markings identify the touchdown zone for landing operations and are spaced to provide distance information in 500 foot increments. These markings consist of one, two or three rectangular bars systematically arranged in pairs on either side of the runway centerline. The total number of markings is based on the runway length. Both runways have full sets (three on either side of the runway centerline) of runway threshold markings on each runway end.

Runway 3 and Runway 17/35 are nonprecision runways. The pavement markings are similar to those on Runway 21 end, but do not include touchdown zone markings. In addition, the Runway 17/35 threshold marking consists of only eight longitudinal stripes. Precision markings on Runway 21 are in fair condition. The nonprecision marking on Runway 3 is in fair condition and the nonprecision markings on Runway 17/35 are in good condition.

All taxiways at ROW have visible taxiway centerline stripes with hold-short lines located at the required locations (see **Figure 1-23**). These markings ensure that aircraft taxi along designated passageways for proper wingtip clearance and to warn of the areas protected for runway operations. Marking width is six to 12 inches as required by FAR Part 139. Enhanced centerline markings are located on the connector taxiways prior to the holding position markings, taxiway centerline marking along with surface painted hold signs (SPHS). Enhanced taxiway centerline marking begins 150 feet prior to all holding position markings and consists of a yellow dashed line on either side of the taxiway centerline. These dashes are nine feet long with three foot gaps. Enhanced taxiway centerlines are only installed at holding positions prior to aircraft entering the runway. Surface painted holding position signs are required at all Part 139 airports with more than one runway. SPHPS are located both to the left and to the right of the taxiway centerline, however, if the taxiway centerline is less than 45 feet from the left and right edge of the taxiway, then the SPHPS on the right side may be omitted.

FIGURE 1-23 ENHANCED CENTERLINE MARKING, HOLD MARKING AND SURFACE PAINTED HOLD SIGNS

Segmented Circle. This visual aid is located around the wind direction indicator. The segmented circle has two purposes, including identifying the location of the wind direction indicator and identifying any non-standard traffic patterns. As previously stated, ROW is equipped with a segmented circle at the end of Runway 3.

FIGURE 1-24 AIRFIELD SIGNAGE

Signage. Signs serve as a visual aid providing guidance for aircraft and vehicles on the airfield. Airfield signs include: mandatory instruction, location, direction, destination, information and runway distance remaining signs. ROW is equipped with lighted runway entrance signs, runway hold position signs, taxiway and runway location, directional and destination signs, runway boundary signs, and runway distance remaining signs (see **Figure 1-24**). Enhanced centerline markings are located on the connector taxiways prior to the holding position markings, taxiway centerline marking along with surface painted hold signs (SPHS).

Visual Approach Slope Indicator (VASI). This visual aid serves as a system of lights on the side of a runway threshold that is designed to provide pilots with visual descent guidance information during the approach to the runway. These lights may be visual from up to five miles during the day and up to 20 miles or more during at night. Each light is designed so that it appears as either white or red, depending on the angle at which the lights are viewed. Roswell International Air Center is equipped with a six box VASI at the end of Runway 3 and end of Runway 17. The VASI at ROW is owned and maintained by the FAA.

Precision Approach Path Indicator (PAPI). This visual aid is located on the left side of the runway and consists of two or four lights installed in a single row. A PAPI provides visual approach path guidance by emitting a series of white and red lights. On a four light PAPI, three white lights denote the aircraft is above the glide path. Three red lights denote the aircraft as being below the glide path. A split two red lights and two white lights mean the aircraft is on the glide path. These lights have an effective visual range of five miles during the day and up to 20 miles at night. This four box visual aid is installed on Runway End 17 and 35. The PAPI at ROW is owned and maintained by the FAA.

Approach Lighting System (ALS). This visual aid is a lighting system installed at the approach end of a runway and consists of a series of lights that provide the pilot with transition from the aircraft instrument to the visual runway environment. For traditional ground-based NAVAID approaches (e.g., Very High Frequency Omni-Directional Range (VOR), ILS, NDB) an ALS is required for visibility minimums of less than 1-statue mile; however, for GPS approaches with vertical guidance (e.g., LPV) they are only recommended, not required. Part of the ALS is a Medium-Intensity Approach Lighting System with Runway Alignment Indicator (MALSR). The MALSR is a medium approach intensity lighting system installed in airport runway approach zones along the extended centerline of the runway. The MALSR, consisting of a combination of threshold lamps, steady burning light bars and flashers, provides visual information to pilots on runway alignment, height perception, guidance, and horizontal references for Category I Precision Approaches.[10] Roswell International Air Center is equipped with a MALSR at the end of Runway 3.

[10] Reference – Federal Aviation Administration, Navigation Services website (faa.gov), May 2011

1.13.6 NAVIGATIONAL AIDS AND APPROACH PROCEDURES

A Navigational Aid (NAVAID) is the primary means of enroute navigation and includes any ground based or satellite based electronic device used to provide course or altitude information to pilots. NAVAIDs include Very High Omnidirectional Range (VORs), Very High Frequency Omnidirectional Range with Tactical Information (VOR-TAC), Nondirectional Beacons (NDBs), Tactical Air Navigational Aids (TACANs), Global Positioning System (GPS), and Instrument Landing Systems (ILS) as examples. **Figure 1-28** through **Figure 1-35** depicts the published approach minima for the equipment below. Available NAVAIDs present at ROW include:

Instrument Landing System (ILS). The ILS is designed to provide an approach path for precise alignment and descent of an aircraft on approach to a runway providing both lateral and vertical guidance. The ILS is considered the standard precision approach navigational aid. Ground equipment that comprises an ILS consists of two highly directional transmitting systems and, along the approach, up to three marker beacons. The ILS consists of a localizer antenna (see **Figure 1-25**) capture-effect glide slope antenna, Medium Intensity Approach Lights with Runway Alignment Indicator Lights (MALSR), and markers (see **Figure 1-26** and **Figure1-27** for examples)

The localizer provides horizontal electronic course guidance, while the glide slope provides vertical electronic course guidance, enabling a pilot to align the aircraft with the runway centerline and descend along a path clear of obstacles to the runway threshold. The approach lighting system provides the pilot with a transition from the aircraft instrument to the visual runway environment. The distance markers emit audible signals to the cockpit, indicating distance information from the runway threshold. The ILS approach provides the best instrument approach minimums for the Airport. Roswell International Air Center is equipped with an ILS precision instrument approach to Runway 21. Middle and Outer markers are also present at ROW. These marker beacons are used to alert pilots that an action is needed (e.g., altitude check). The marker beacons are located at specified intervals along the ILS approach and are identified by discrete audio and visual characteristics. The outer marker (blue beacon) is located between four to seven miles from the runway threshold. The middle marker (yellow beacon) is located 3,500 feet from the runway threshold and alerts the pilot that they have passed the missed approach point. This is typically the location where an aircraft on approach will be at an altitude of approximately 200 feet above the elevation of the landing area and the runway should visibly be able to see the runway. Included with the ILS is the localizer which provides horizontal guidance, enabling a pilot to align the aircraft with the runway centerline and the glide slope provides vertical guidance so the pilot can descend along a path clear of obstacles to the runway threshold.

Global Positioning System (GPS). The GPS is a satellite-based navigation system comprised of ground stations and user receivers. An aircraft GPS receiver can track the position of the aircraft by calculating and comparing signal distance from several satellites. The system is reliable in all terrain and all weather conditions and is typically accurate within 100 feet. Runway 17/35 and Runway 3/21 are equipped with precision/nonprecision RNAV (GPS) approaches with minimums as low as ½-statue miles visibility and ceiling minimums of 250-feet (AGL).

Wide Area Augmentation System (WAAS) is a GPS-based navigation system which augments the existing GPS signals to provide the user highly accurate position and tracking information.

Localizer Precision with Vertical Guidance (LPV) is an instrument approach procedure utilizing WAAS technology to provide both vertical and horizontal guidance to aircraft. Like basic GPS navigation, WAAS and LPV approaches are available in all weather terrain conditions. All GPS approaches at ROW are LPV approaches.

Very High Frequency Omni-Directional Range. This VOR-B operates by emitting a steady 360 degree signal, as well as producing a rotating signal which compares aircraft position information with a steady signal in order to transmit course information back to the aircraft. Its low altitude standard service volume has a range of 40 nautical miles (nm) between 1,000-feet and 18,000-feet MSL. The CHISUM VOR-B is incorporated as a NAVAID into all of the published instrument approaches at ROW and is located 4.2 miles northwest of the Airport. The VOR is used for instrument approaches to both Runway 17/35 and Runway 3/21. The Airport is equipped with VOR approach minimums as low as 1-statue mile visibility and ceiling minimums of 469-feet (AGL).

The Distance Measuring Equipment (DME) is a component of the ILS for precision and nonprecision approaches that measure the distance from the aircraft to the runway. The range is

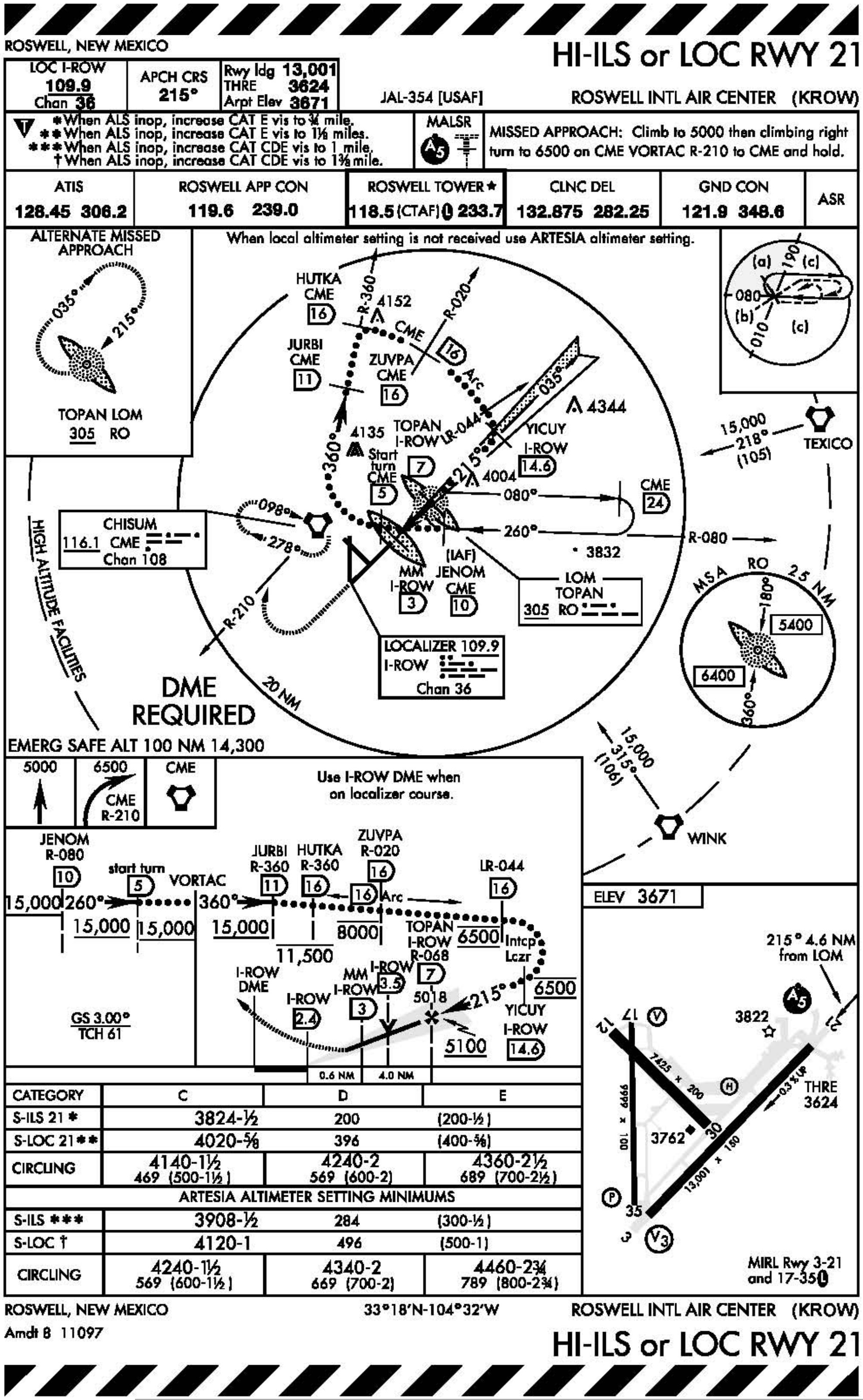
FIGURE 1-25 INSTRUMENT LANDING SYSTEM – LOCALIZER ANTENNA

approximately 40 miles from the airport and aids not only the approach but also in allowing pilots to remain position oriented around the airport. This is ground-based equipment that sends and receives pulse signals. The DME is used with VOR enroute navigation, which has a range of approximately 200 miles.[11] There is a DME approach at ROW for Runway 21.

[11] Reference - Federal Aviation Administration - Navigational Services, May 2011.

FIGURE 1-26 APPROACH LIGHTING SYSTEM

FIGURE 1-27 MALSR SEQUENTIAL FLASHER

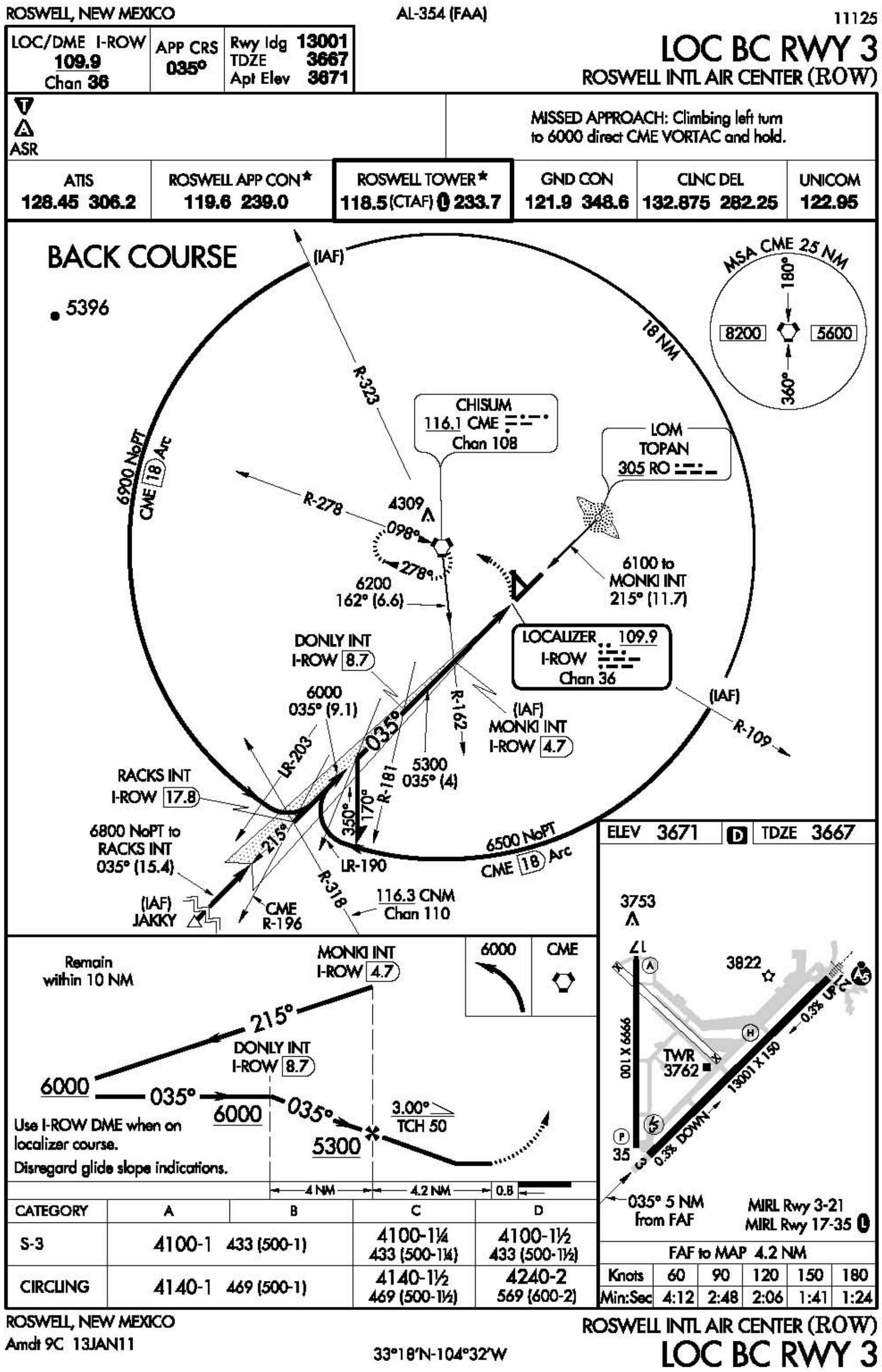


CATEGORY	C	D	E
S-ILS 21 *	3824-½	200	(200-½)
S-LOC 21**	4020-⅝	396	(400-⅝)
CIRCLING	4140-1½ 469 (500-1½)	4240-2 569 (600-2)	4360-2½ 689 (700-2½)
ARTESIA ALTIMETER SETTING MINIMUMS			
S-ILS ***	3908-½	284	(300-½)
S-LOC †	4120-1	496	(500-1)
CIRCLING	4240-1½ 569 (600-1½)	4340-2 669 (700-2)	4460-2¾ 789 (800-2¾)

ROSWELL, NEW MEXICO 33°18′N-104°32′W ROSWELL INTL AIR CENTER (KROW)
Amdt 8 11097
HI-ILS or LOC RWY 21

Source: FAA, 2011

FIGURE 1-28 HI-ILS OR LOC RUNWAY 21 (FOR INFORMATIONAL PURPOSES ONLY)

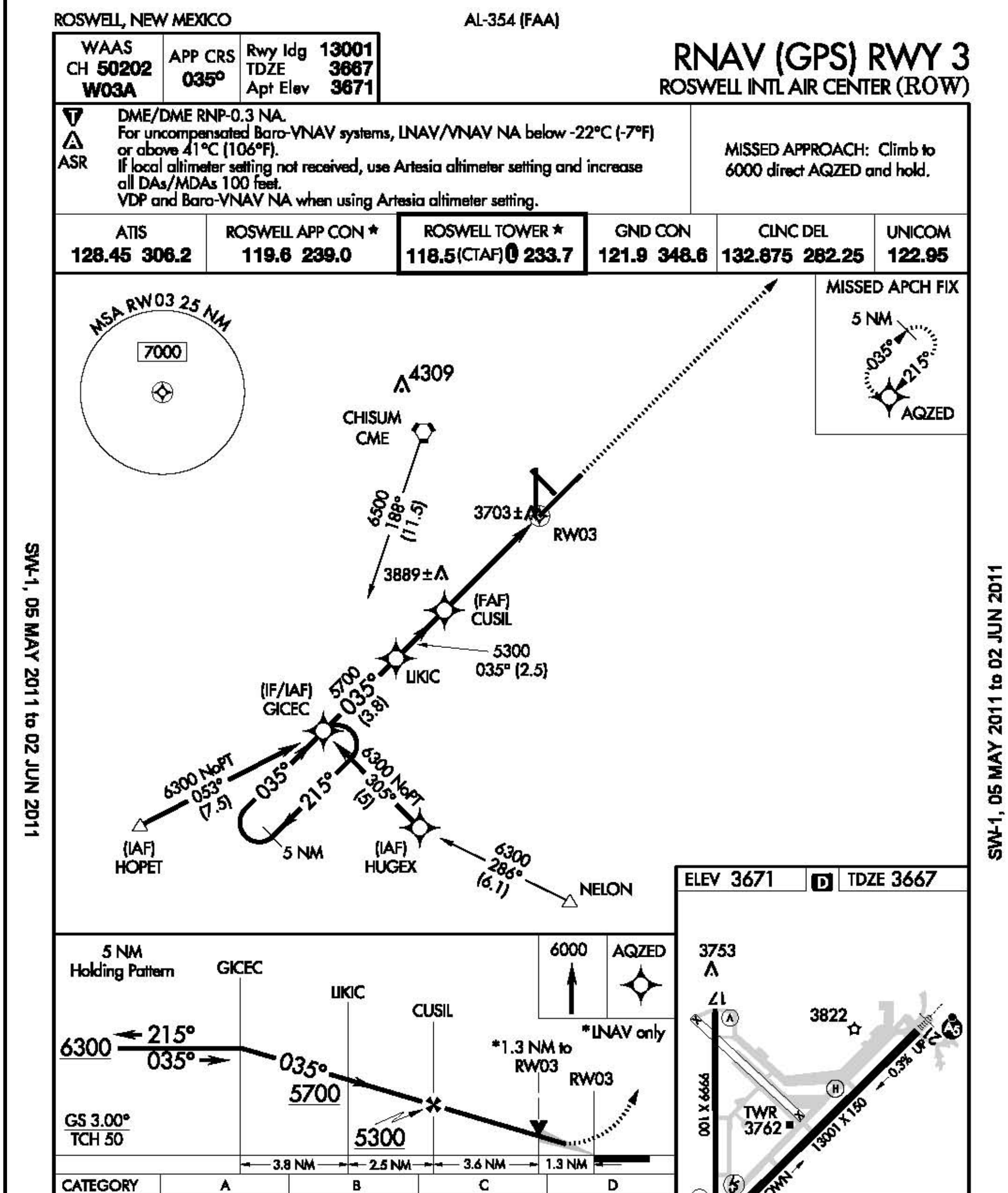


CATEGORY	A	B	C	D
S-3	4100-1	433 (500-1)	4100-1¼ 433 (500-1¼)	4100-1½ 433 (500-1½)
CIRCLING	4140-1	469 (500-1)	4140-1½ 469 (500-1½)	4240-2 569 (600-2)

Knots	60	90	120	150	180
Min:Sec	4:12	2:48	2:06	1:41	1:24

Source: FAA, 2011

Figure 1-29 LOC BC Runway 3 (for informational purposes only)



CATEGORY	A	B	C	D
LPV DA	3917-¾ 250 (300-¾)			
LNAV/VNAV DA	3987-1 320 (400-1)			
LNAV MDA	4140-1 473 (500-1)		4140-1¼ 473 (500-1¼)	4140-1½ 473 (500-1½)
CIRCLING	4140-1 469 (500-1)		4140-1½ 469 (500-1½)	4240-2 569 (600-2)

Source: FAA, 2011

FIGURE 1-30 RNAV (GPS) RUNWAY 3 (FOR INFORMATIONAL PURPOSES ONLY)

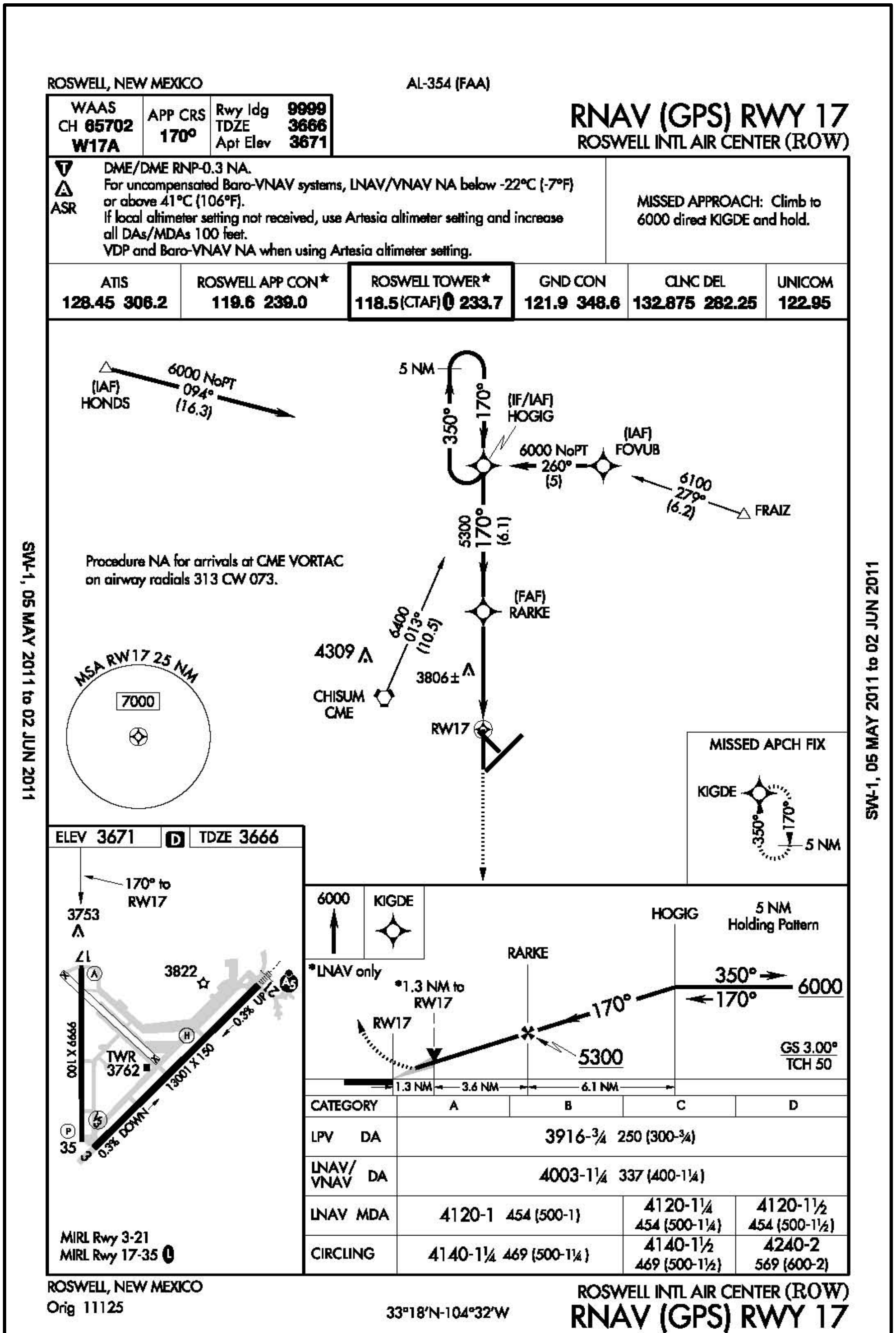
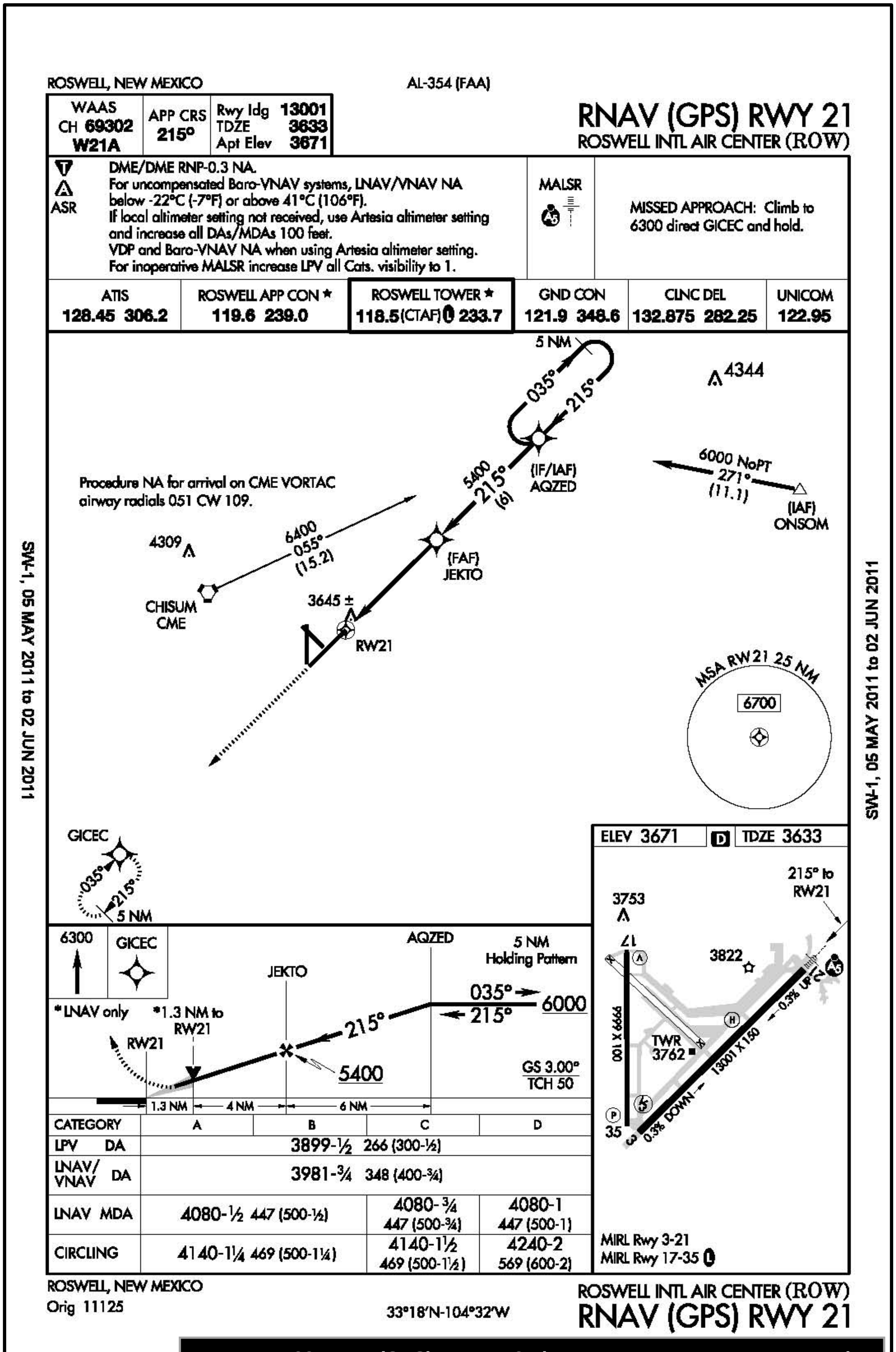


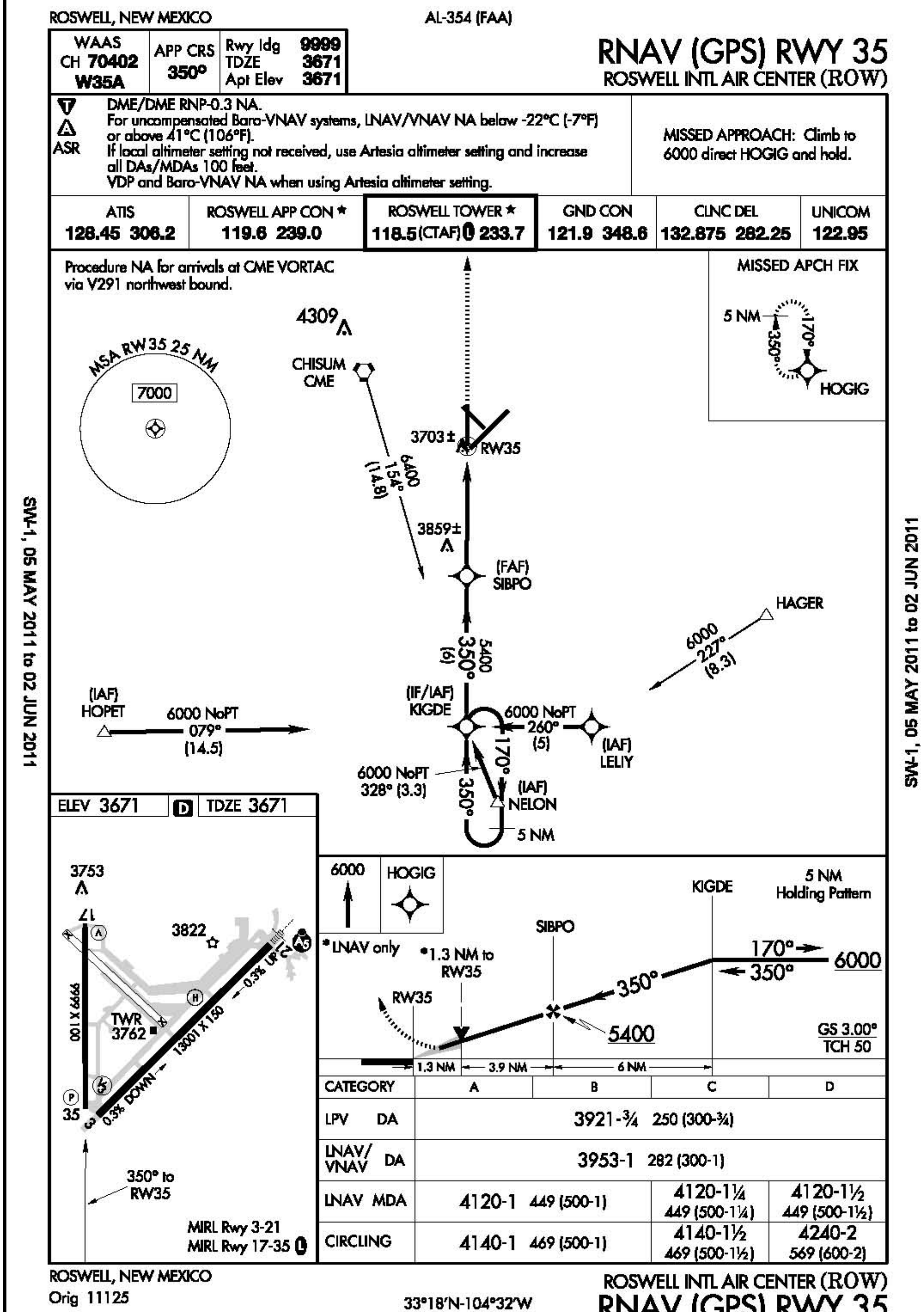
FIGURE 1-31 RNAV (GPS) RUNWAY 17 (FOR INFORMATIONAL PURPOSES ONLY)

Source: FAA, 2011



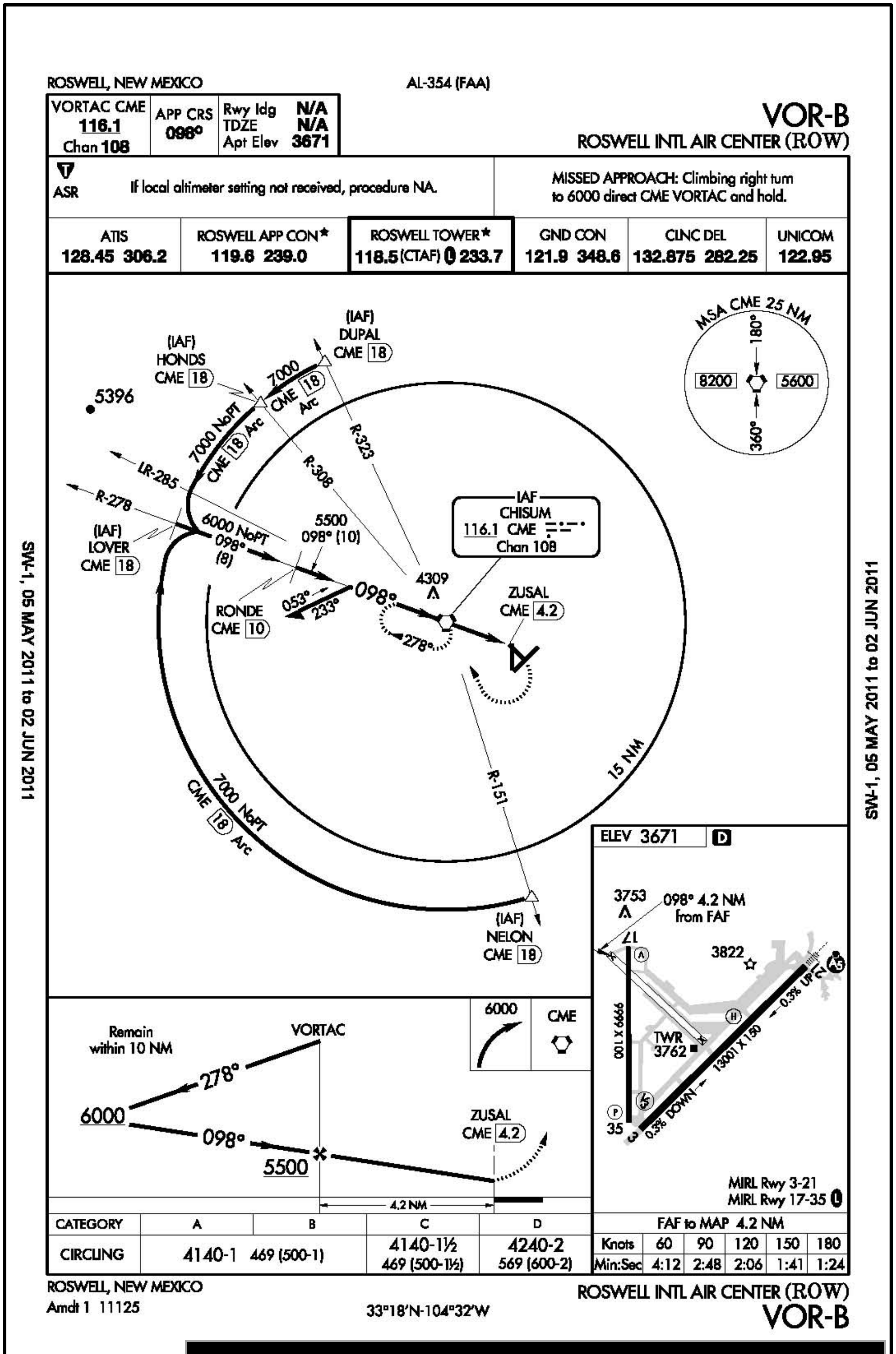
Source: FAA, 2011

FIGURE 1-32 RNAV (GPS) RUNWAY 21 (FOR INFORMATIONAL PURPOSES ONLY)



Source: FAA, 2011

FIGURE 1-33 RNAV (GPS) RUNWAY 35 (FOR INFORMATIONAL PURPOSES ONLY)



CATEGORY	A	B	C	D
CIRCLING	4140-1 469 (500-1)		4140-1½ 469 (500-1½)	4240-2 569 (600-2)

Knots	60	90	120	150	180
Min:Sec	4:12	2:48	2:06	1:41	1:24

FAF to MAP 4.2 NM

ROSWELL, NEW MEXICO
Amdt 1 11125
33°18'N-104°32'W
ROSWELL INTL AIR CENTER (ROW)
VOR-B

FIGURE 1-34 VOR-B (FOR INFORMATIONAL PURPOSES ONLY)

Source: FAA, 2011

1.14 EXISTING LANDSIDE FACILITIES

1.14.1 PASSENGER TERMINAL BUILDING

The airport passenger terminal building (see **Figure 1-35**) is used to transfer passengers between aircraft and ground transportation and provide facilities for passengers enplaning and deplaning aircraft. The terminal building houses ticket counters for airlines serving at an airport and includes space for issuing tickets, transferring checked baggage, security screening of checked bags, area for the Transportation Security Administration (TSA) personnel to screen passengers and sterile waiting area for passengers that have been processed through the security checkpoint. The terminal building provides gates for passengers' access to and from the aircraft. Roswell International Air Center has one gate and all passenger loading is conducted on the apron. The Airport does not have any jet bridges. The terminal building also provides a baggage claim area which includes baggage carousels for passengers to retrieve checked baggage upon arrival at the airport. The terminal building is utilized by airport management for office space and by airport tenants including rental car companies, restaurants and gift shops.

FIGURE 1-35 PASSENGER TERMINAL ENTRANCE

The Roswell International Air Center has a 25,703 square foot two story terminal building with an east and west wing and serves a regional/commuter airline. **Table 1-15** depicts the breakdown of space within the building.

The first level, or the passenger arrival and departure level, serves as the primary area for processing passengers and baggage services. This level provides services including: airline operations space (including baggage); inbound/outbound baggage handling systems; passenger screening equipment and passenger screening; rental car facilities; baggage claim; restrooms; concessions; electrical/mechanical rooms; and, public information desks. The second level is entirely dedicated to Airport's administration and their functions.

FIGURE 1-36 MAIN TERMINAL LOBBY

The main lobby houses the concession space (see **Figure 1-36**), public restrooms, and the TSA passenger screening area and holdrooms (departure lounge). A small restaurant, Cappuccino Grill, is located along the west wall and a museum is located to the west of the main entrance. The second level of the main terminal building houses the administrative offices for the Airport. There are 12 offices, two conference rooms and three ancillary rooms. **Figure 1-37** depicts an overall layout of the terminal building. **Figure 1-38** depict a breakdown of the 1st level (main lobby) of the terminal area, and **Figure 1-39** depicts the 2nd level of the main terminal.

The west wing of the terminal building (see **Figure 1-40**) houses the airline operations area, the TSA baggage screening equipment, airline outbound baggage system and the passenger check-in kiosks. American Eagle's office is located along the perimeter wall of the west wing. A lobby area occupies the entrance to the wing.

The east wing of the terminal building (see **Figure 1-41**) houses the three rental car companies: Hertz, Budget and Avis along the northern wall and the baggage claim area comprises the remainder of open space. There is also a restroom and storage room within the west wing. The terminal has undergone recent interior remodels and is in good condition. A fire suppression system was recently installed to ensure compliance with local fire code.

TABLE 1-15 TERMINAL BUILDING SUMMARY

Terminal Space	Existing Square Feet
Baggage Claim	1,299
Airline Ticket Counter / Baggage Screening	1,301
Airline Offices	837
Airline Passenger Gates	1
TSA Passenger Screening	536
Passenger (Secure) Holdrooms	1,418
Restrooms	1,636
Secure	475
Unsecure	1,161
Rental Car Facilities	724
Restaurant/Concessions	1,395
Airport Administration	6,637
Mechanical/Maintenance/Storage	1,368
Circulation Space	6,236
Passenger Boarding Ingress/Egress	885
Miscellaneous Office Space	1,431
Total	**25,703**

Source: Airport Base Files, 2011.
Prepared by: Armstrong Consultants, Inc., May, 2011.

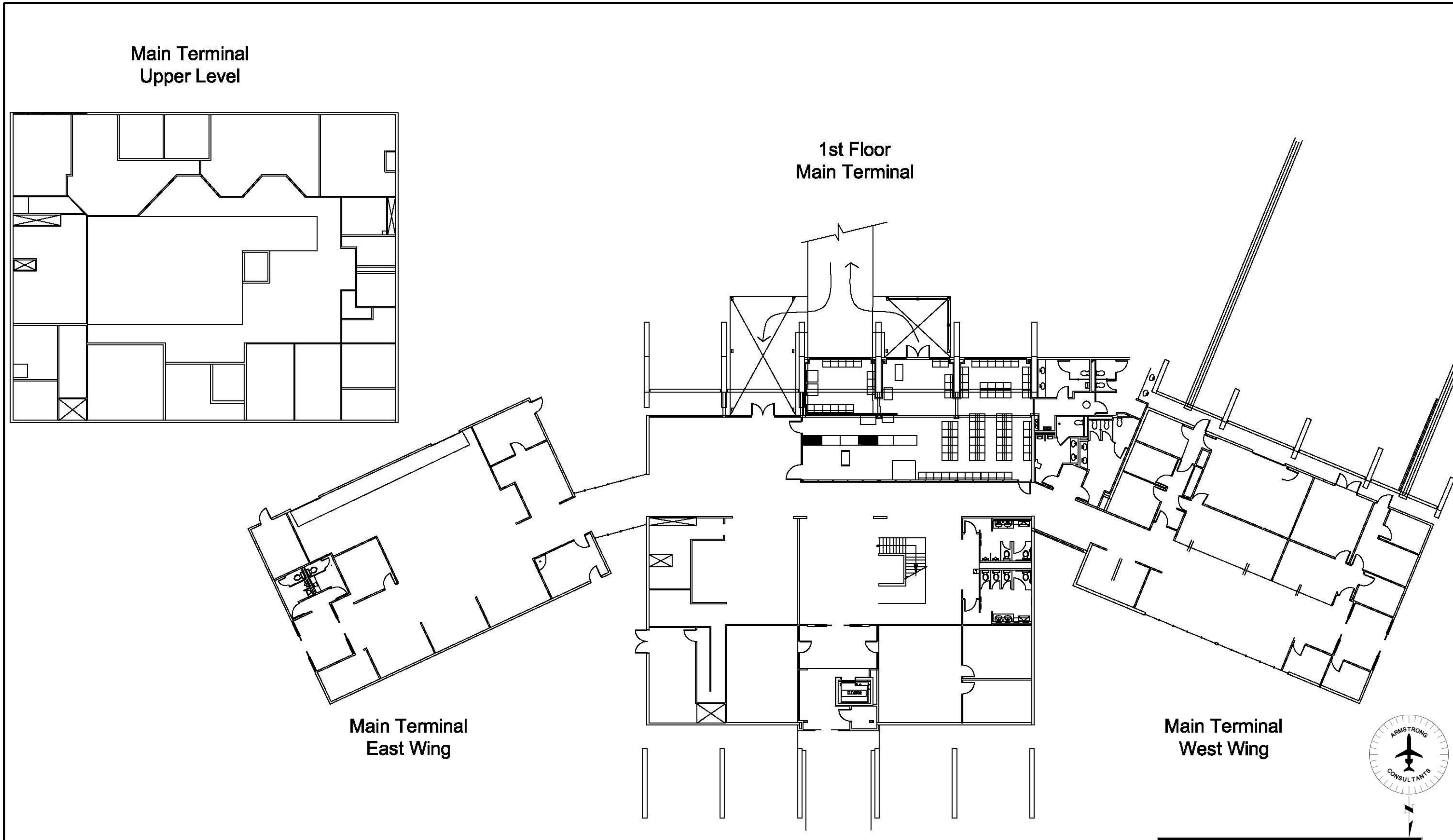


FIGURE 1-37 TERMINAL BUILDING LAYOUT

PAGE INTENTIONALLY LEFT BLANK

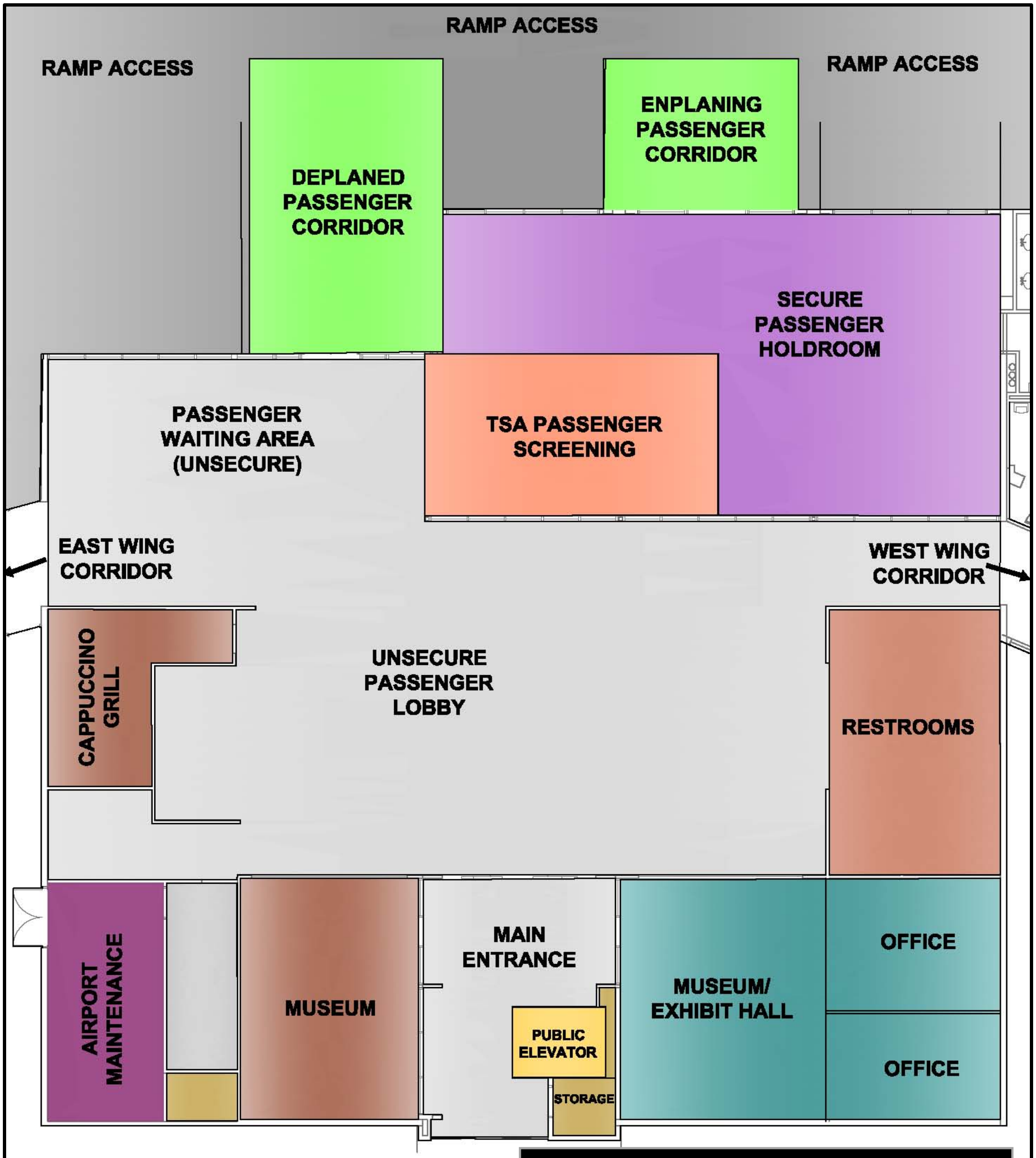


FIGURE 1-38 LEVEL 1 MAIN TERMINAL LOBBY

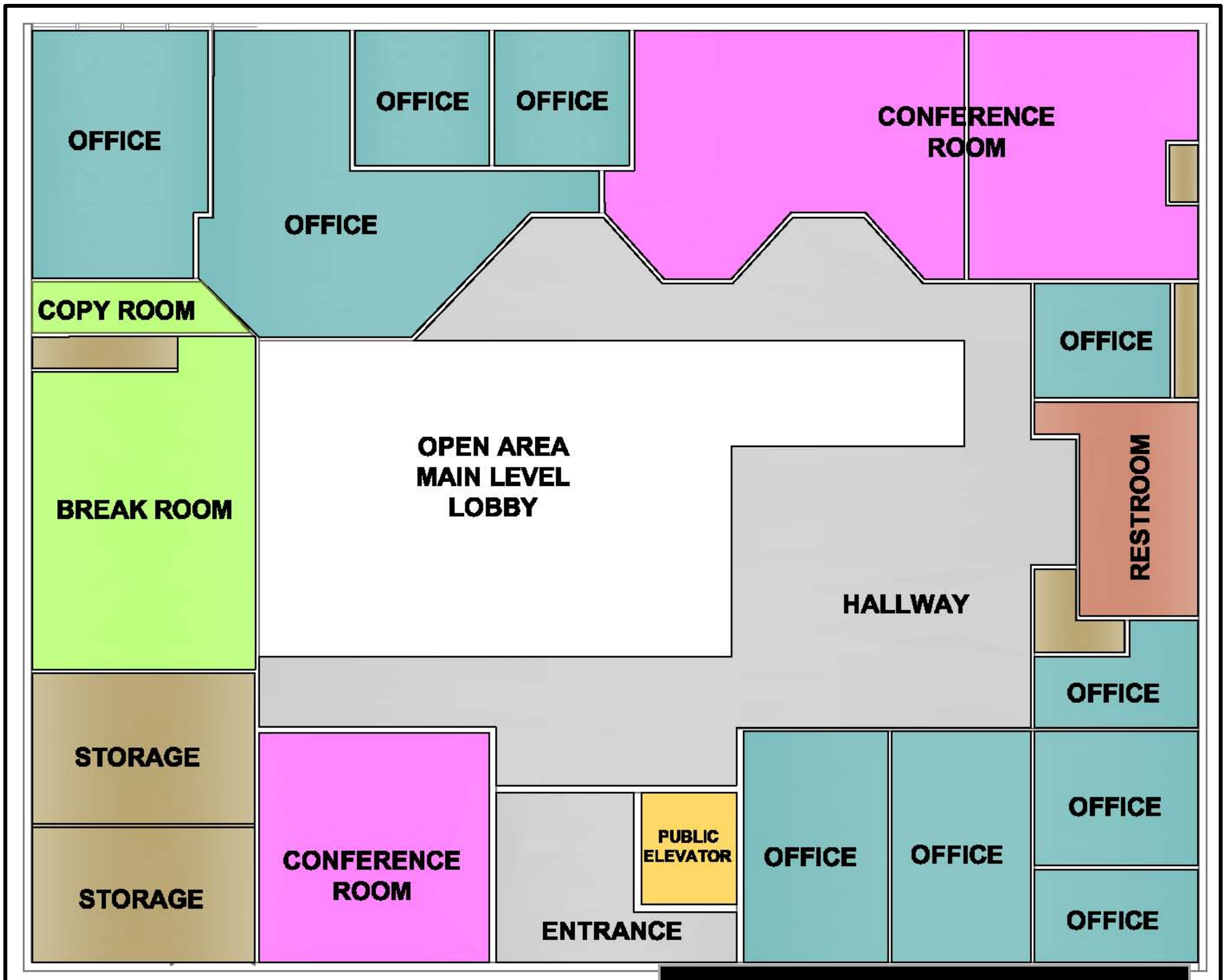


Figure 1-39 Level 2 Main Terminal

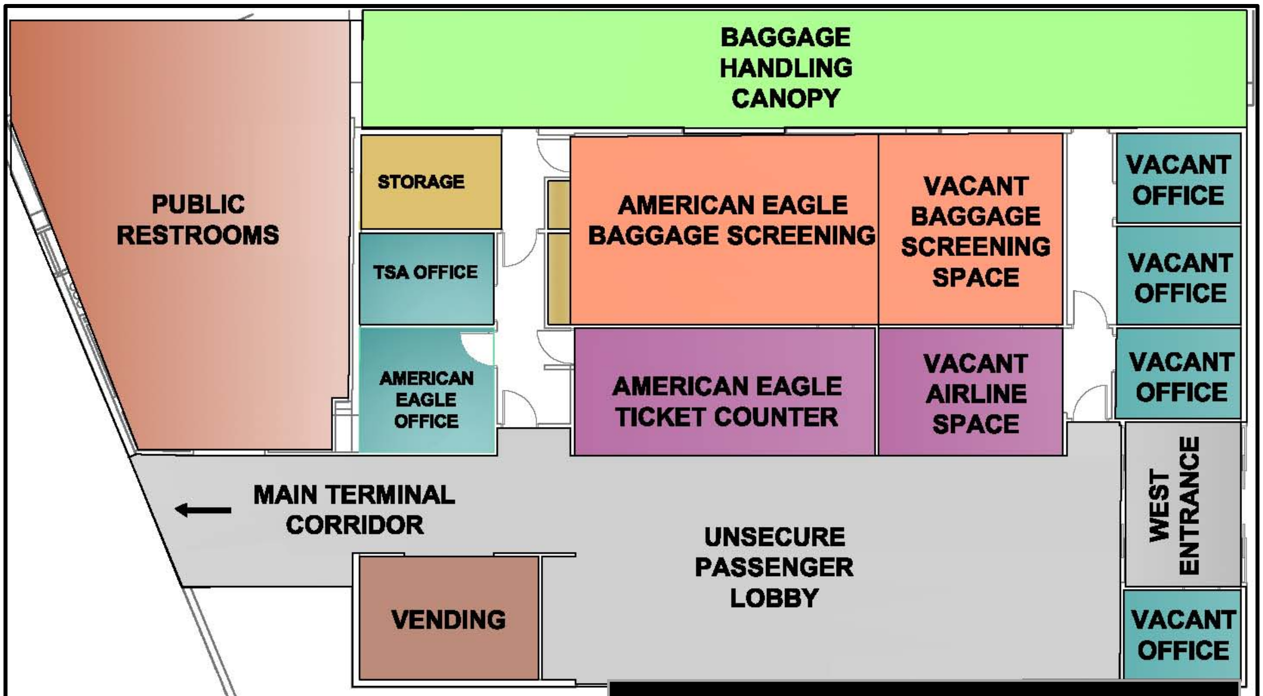


FIGURE 1-40 TERMINAL BUILDING WEST WING

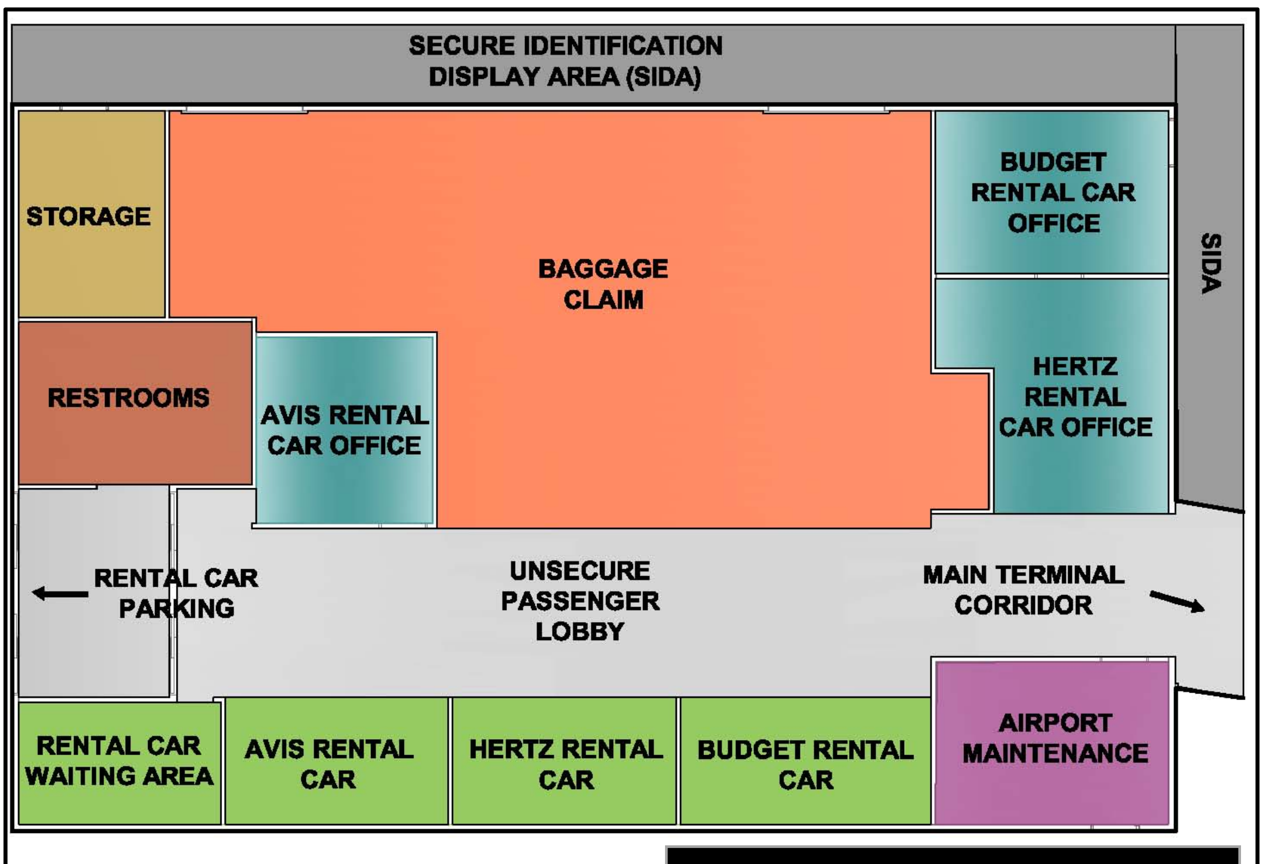


FIGURE 1-41 TERMINAL BUILDING EAST WING

1.14.2 AIR TRAFFIC CONTROL TOWER

The Roswell International Air Center is equipped with an FAA Air Traffic Control Tower (ATCT). The ATCT function is to provide arrival and departure clearances, instrument approach clearance, ground control and air traffic separation services as well as weather and airport information. The ROW ATCT is one of the over 264 air traffic control towers managed directly by the FAA. Towers that are not directly managed by the FAA are a part of the FAA's Contract Tower Program, which provides funding to airports to construct and support the operation of federal contract towers (FCTs). Federally funded towers are owned staffed, funded and operated by the FAA and place no burden of cost on the airport.

The ROW ATCT (118.5 MHz) directs all traffic at the Airport and in the immediate airspace, up to five miles from the tower and from the ground up to 2,500 feet above ground level (AGL). The Roswell ATCT is a standalone building that is located in the central quadrant of the airfield and south of the passenger terminal (see **Figure 1-42).** The building is approximately 110 feet tall and in good condition. According to the ATCT Manager, there are periodic temporary line-of-sight issues. Portions of Taxiway B may experience line-of-sight constraints due to the height of the tails of large aircraft parked for storage and salvage. The ATCT is operational from 6:00 AM to 9:00 PM local time. The Fort Worth Flight Service Station (FTWFFS) provides additional weather data and other pertinent weather information to pilots on the ground and enroute. The Air Route Traffic Control Center (ARTCC) for ROW is controlled by the Albuquerque ARTCC. The ARTCC is the facility responsible for controlling instrument flight rules aircraft enroute in particular volume of airspace at high altitudes between airport approaches and departures.

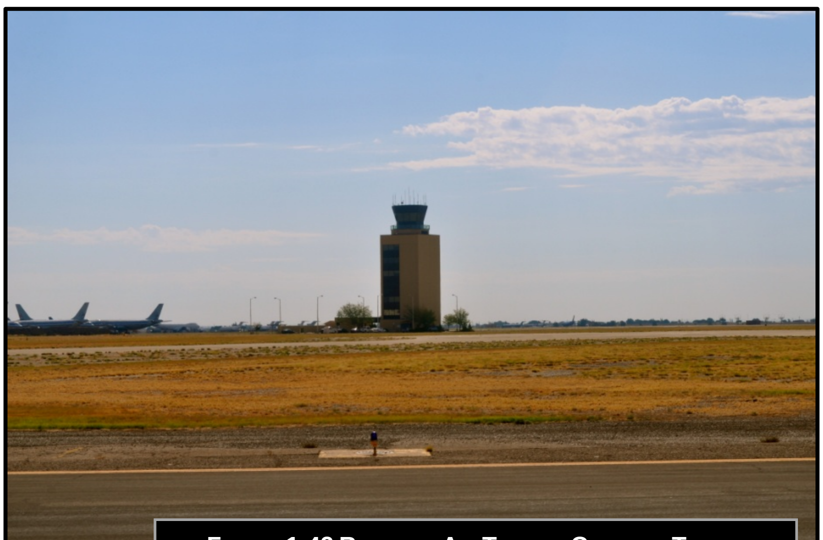


FIGURE 1-42 ROSWELL AIR TRAFFIC CONTROL TOWER

1.14.3 AIRPORT SERVICES/FIXED BASE OPERATORS

A Fixed Base Operator (FBO) is usually a private enterprise that leases land from the airport sponsor on which to provide services to based and transient aircraft. The extent of the services provided varies from airport to airport; however, these services frequently include: aircraft fueling; maintenance and repair; aircraft rental and/or charter services; flight instruction; pilot lounge and flight planning facilities; and, aircraft tie down and/or hangar storage.

FBO services at Roswell International Air Center are provided by Great Southwest Aviation. Great Southwest Aviation (see **Figure 1-43)** is located in the western portion of the main apron and to the west of the fire station and passenger terminal. Great Southwest Aviation provides a range of services including: full service Jet-A and Avgas 100 low lead (LL) fuel, on-site A&P maintenance, flight training, aircraft rental, charter, hangar storage, aircraft management, resale of aircraft, pilot supplies flight testing and military servicing. The FBO is accessible via West Enterprise Street, a two-lane road that surrounds the northern portion of the terminal roadways and property.

FIGURE 1-43 GREAT SOUTHWEST AVIATION FBO

1.14.4 AIRPORT MAINTENANCE AND EQUIPMENT

Airport maintenance is conducted under the authority of the Airport Operations Manager and the Airport Director. The Airport owns and operates several pieces of maintenance equipment including: 1996 Oshkosh snow blower, 1999 Komatsu road grader, 2010 John Deere 544k loader, and a 2010 Kubota tractor.

The existing maintenance building is located west of the fire station on the industrial apron (see **Figure 1-44**). The maintenance building has five storage bays and 12,461 square feet of space that are in poor condition. The building was constructed in the early 1950's and used originally as the fire station until the existing fire station was built in 2000. In addition to the maintenance building, the Airport has a maintenance yard constructed with steel covering that protects additional equipment against inclement weather conditions.

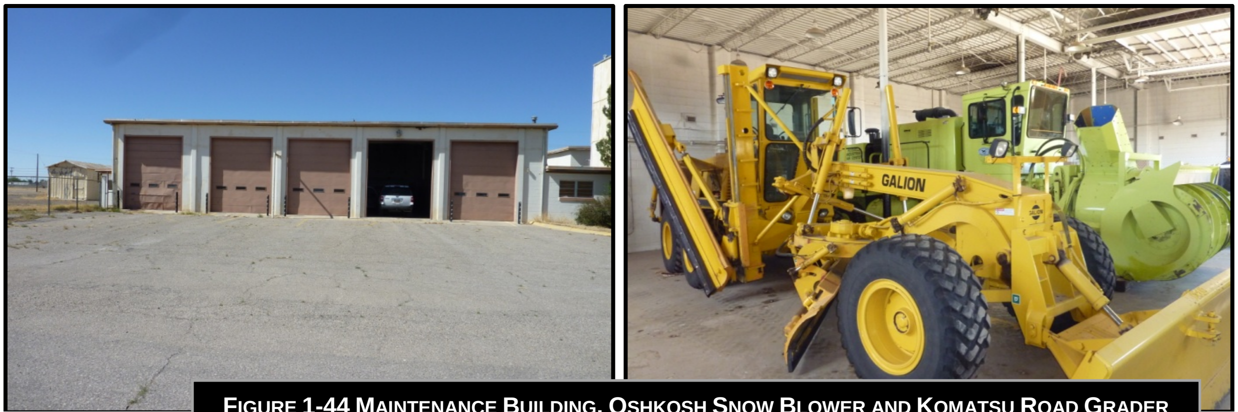


FIGURE 1-44 MAINTENANCE BUILDING, OSHKOSH SNOW BLOWER AND KOMATSU ROAD GRADER

1.14.5 HANGARS

Hangars are typically classified as either T-hangars (small multi-unit storage complexes that usually accommodate one single engine aircraft in each unit) or conventional box hangars, which range from small to very large accommodating a variety of aircraft types or corporate fleets. The number of aircraft that each conventional hangar can hold varies according to manufacturer and specification of airport owners or operators. The existing aircraft hangars consist of ten conventional hangars and ten T-hangars which are currently occupied. A majority of the hangars are more than 20 years old and in fair to poor condition. There are a total of 22 stand alone buildings on the airport which include: a maintenance building, fire department, storage hangars, T-hangars, conventional box hangars, commercial buildings and the main terminal. **Figure 1-45** show examples of hangars located at Roswell International Air Center.

FIGURE 1-45 CONVENTIONAL BOX HANGAR AND T-HANGAR

1.14.6 UTILITIES

Available utilities at Roswell International Air Center include power, water, sewer, gas, phone and internet. The electricity is provided by Xcel Energy; telephone and internet services are provided by Qwest. Gas services to the Airport are provided by New Mexico Gas Company. The water is provided by a municipal water line which provides water for fire suppression and other uses at the Airport. The City of Roswell also provides sewer and water service to the Airport.

1.14.7 ON-AIRPORT LEASES

An area encompassing a portion of the eastern quadrant of the Airport is currently leased out to MATRIX International Security Training and Intelligence Center (MISTIC). An organization that provides unique and sophisticated security and defense related operational training and technology testing and evaluation (T&E) for government and private organizations around the world.[12] Airfield access to the MISTIC facility is off the departure end of Runway 3 and is in a high-security location denying access to the public. Vehicle access is provided via an electronic gate off Will Rogers Road. This area utilized by MISTIC is the largest privately held training facility in the United States. MISTIC is responsible for all maintenance and operational costs associated with the land utilized by the organization.

The U.S Department of the Interior Bureau of Land Management (BLM) operates the Roswell Air Tanker Base (see **Figure 1-46**) and is a full support facility for the loading of both Type 1-3 air tankers and Type 4, Single Engine Air Tankers (SEATs). This facility is capable of reloading all size air tankers from SEATs to heavy air tankers. The Air Tanker Base is responsible for all maintenance of the area utilized for the operation.[13] Airfield access is located off the northeast industrial apron and has direct access to Runway 3 end. Vehicle access is provided via Will Rogers Road.

FIGURE 1-46 BLM FACILITY

FIGURE 1-47 DEAN BALDWIN PAINTING

Dean Baldwin painting is located in a 165,000 square foot facility on the northwest quadrant of the airfield (see **Figure 1-47**). The hangar complex has six bays with air filtration systems utilizing two independent integral waste management systems. This facility most notably paints and refinishes aircraft ranging from passenger commercial airlines, government aircraft, private companies and corporate aircraft, and a select few of international carriers. The facility has the ability to handle aircraft as large as the B767. Dean Baldwin has operated a facility at Roswell International Air Center since 1999.

Sections and portions of the industrial apron throughout the Airport are leased space by various commercial airlines which transport aircraft no longer used within their respective operation for storage and salvage (see **Figure 1-48**). The Airport has the ability to accommodate this type of operation due to the relatively moderate, dry climate and extensive amount of pavement.

FIGURE 1-48 AIRCRAFT STORAGE AND SALVAGE

[12] Reference - MATRIX International Security Training & Intelligence Center (MISTIC), 2011, www.matrixgro.net

[13] Reference - Bureau of Land Management, June 2011

1.14.8 ACCESS ROUTES, SIGNAGE AND AUTOMOBILE PARKING

Roswell International Air Center can be reached by following Main Street south from downtown (which turns into Walker Blvd.) on to University Boulevard. The airport is located approximately five miles south of downtown Roswell. Jerry Smith Circle provides public and non-public access and is the main circulation roadway to the Airport, with direct connection to downtown Roswell via W. Earl Cumming Loop and University Boulevard. Access to the general aviation ramp from Southwest Way is provided through the Great Southwest Aviation FBO gate. Jerry Smith Circle is a two lane loop roadway in the terminal area that provides access to the public and employee parking lots and terminal curbside. This inbound roadway serves as a multilane roadway that can service both the ticketing and baggage claim areas. Traffic leaving the terminal area will follow the remainder of the loop roadway to the connector road.

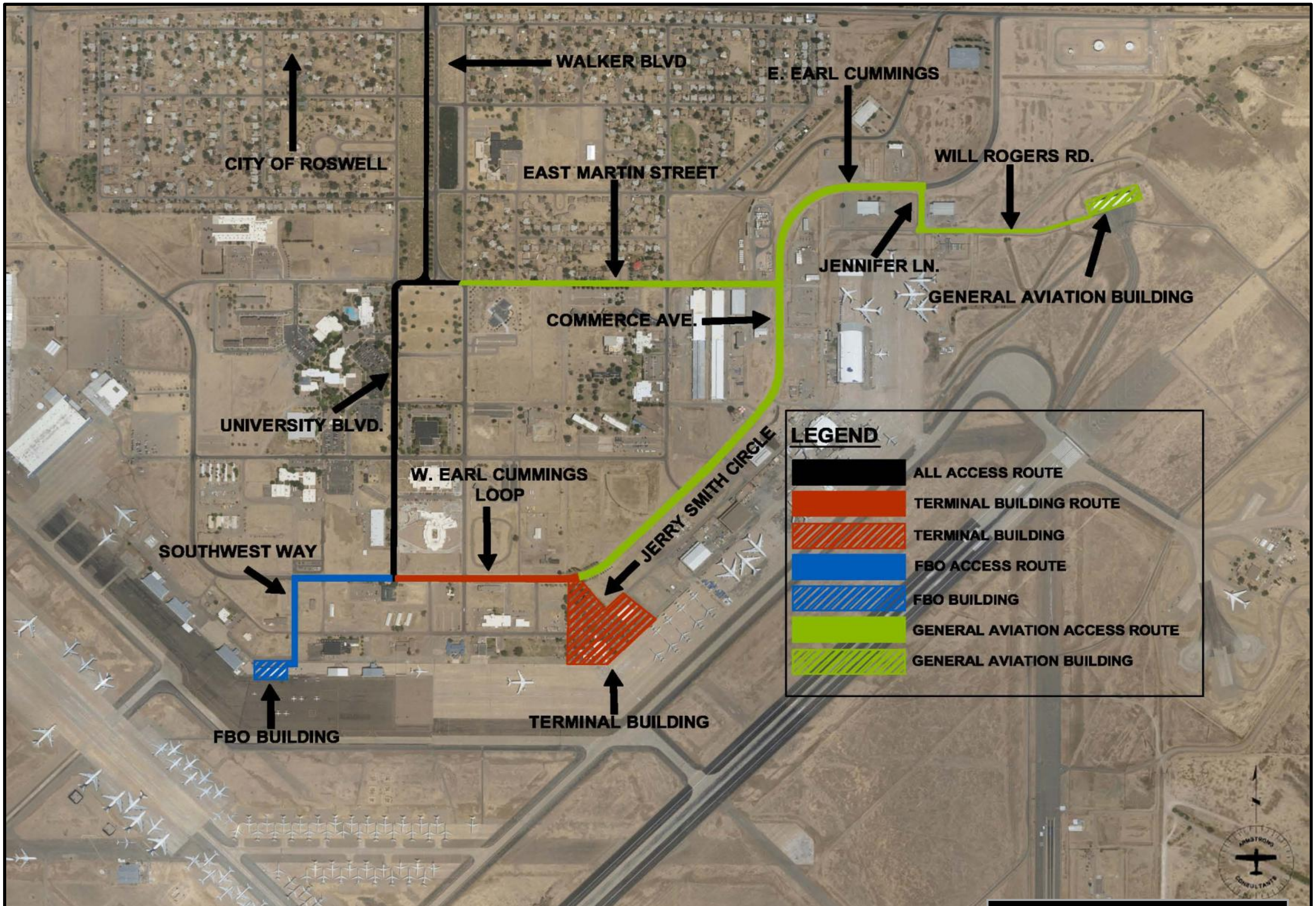
Access to the Fixed Based Operator includes traveling south on Main Street from downtown Roswell; west on E. Martin Street; south on University Boulevard; and west on Earl Cummings Loop and south on Southwest Way. Air cargo is accessed through the FBO facility. The secondary general aviation apron and hangar development is located in the northeast quadrant of the Airport and can be accessed from E. Earl Cummings Loop. **Figure 1-49** shows various access routes.

FIGURE 1-50 AIRPORT PARKING LOT

The parking lot (see **Figure 1-50**) is situated north of the terminal building and provides approximately 29,020 square feet with 182 paved and unpaved parking spaces, four of which are designated handicapped. Automobile parking is provided prior to reaching the terminal building on Jerry Smith Circle and is free to users. There is no separation of lots for public parking and employee parking. The parking lot is a paved asphalt surface and considered general parking with no breakdown of employee, short- or long-term parking and consist of 132 paved spots. There is an over flow gravel parking located to the west of the paved lot that provides an addition 50 unpaved parking spaces.

1.14.9 INTERMODAL TRANSPORTATION

The ground transportation network within the City of Roswell consists of private automobile transportation, public transportation buses, hotel courtesy transportation, and taxi and limo service. There is no passenger rail service to Roswell. The nearest rail service is located 200 miles northwest in Albuquerque, New Mexico. State Highway 285 runs north-south of Roswell eventually intersecting with Interstate 40 in Clines Corners, New Mexico. State Highway 380 heads east toward the Texas state line and State Highway 380/70 runs west splitting at Hondo with State Highway 380 going northwest connecting to Interstate 25 in San Antonio, New Mexico and State Highway 70 proceeding southwest towards San Patricio, New Mexico.



Prepared by: Armstrong Consultants, Inc., June 2011.

FIGURE 1-49 AIRPORT ACCESS

1.14.10 AIRCRAFT FUEL FACILITIES

A Fixed Base Operator (FBO) or the airport sponsor typically provides aircraft fuel services. Combinations of 100 low lead (LL) and 80 Octane Aviation Gas and/or Jet-A fuel are usually provided depending on the aircraft traffic mix.

As previously discussed, Great Southwest Aviation is the FBO, owns and operates two 60,000-gallon above ground Jet-A fuel tanks and one 10,000-gallon above ground 100LL Avgas tank, and provides service to both commercial and general aviation aircraft. The fuel farm is located on the northwest quadrant of the Airport. Great Southwest Aviation also operates two fuel trucks with capacities of 5,000 gallons each, one Jet-A fuel truck with a capacity of 2,000 gallons, and one 100LL Avgas fuel truck with 2,000 gallon capacity.

As mandated by the U.S. Environmental Protection Agency (EPA) a Spill Prevention, Control and Countermeasure Plan (SPCC) must be prepared by all facilities subject to regulation (40 CFR 112). This plan aids in preventing any discharge of oil into navigable waters or adjoining shorelines. This plan is intended to provide prevention as opposed to after-the-fact reactive measures commonly described in Oil Spill Contingency Plans. The owner or operator of the facility is responsible for preparing the SPCC. The Plan must be certified by a registered Professional Engineer (PE). Roswell International Air Center is equipped with three above ground storage tanks that individually handle a combined 130,000 gallons of fuel (see **Figure 1-51**). Great Southwest Aviation currently have an SPCC plan in place. The Airport has and maintains a Storm Water Pollution Prevention Plan (SWPPP which was updated in March, 2012.

FIGURE 1-51 AIRPORT FUEL TANKS

1.14.11 SECURITY

The primary purpose of airport fencing is to prevent unwanted intrusions by persons or animals on to airport property. Airport fencing provides increased safety and security for the airport. It is normally installed along the perimeter of the property and outside any of the safety areas defined by the Federal Aviation Administration (FAA) in Advisory Circular (AC) 150/5300-13, *Airport Design* and 14 Code of Federal Regulation (CFR) Part 77*, Objects Affecting Navigable Airspace.*

FIGURE 1-52 ELECTRIC VEHICLE GATE

The Airport is entirely fenced with an eight foot chain link fence with three strand barbed wire along the top - as required under Part 139. According to a field inspection in April, 2011, 14 airfield access gates are located at the Airport. There are four electric vehicle access gates, seven manual vehicle access gates and three pedestrian gates. **Figure 1-52** shows one of the existing vehicle access gates. The Airport has a full-time Security Coordinator who handles all security issues at the Airport. The Security Coordinator is the liaison between the Transportation Security Administration (TSA), the City of Roswell Police Department and the Airport. The Security Coordinator also takes care of all security directives and procedures. The City Police are not located on Airport property, but respond as needed. The Airport is equipped with Closed Circuit Television (CCTV) that is monitored by the Security Coordinator.

1.14.12 EMERGENCY SERVICES

Operators of Part 139 airports are required to provide aircraft rescue and fire fighting (ARFF) services during air carrier operations that require a Part 139 certificate. Roswell International Air Center is classified as a Class I FAR Part 139 Airport which means the Airport is certificated to serve scheduled operations of large air carrier aircraft (e.g. more than 31 passenger seats). The Airport can also serve unscheduled passenger operations of large air carrier aircraft and/or scheduled operations of small air carrier aircraft (e.g. more than 9 passenger seats but less than 31). As a result of being classified as a Class I airport certain criteria must be met by the Airport including providing a certain level of emergency response.

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

- Index A – Aircraft less than 90 ft in length
- Index B – Aircraft at least 90 ft but less than 126 ft,
- Index C – Aircraft at least 126 ft but less than 159 ft,
- Index D – Aircraft at least 159 ft but less than 200 ft, and
- Index E – Aircraft greater than 200 ft in length.

Roswell International Air Center is classified as an Index A airport; however the Airport currently meets Index B criteria in terms of the level of vehicles and capability. This is especially important considering the large variety and sizes of aircraft operating on a regular basis for training and flight testing.

The ARFF station is located on the Airport and provides fire fighting and rescue services for aircraft, buildings located on the Airport (main terminal, storage hangars), parking areas, and the fuel farm with a three minute response time to any area of the Airport. Ambulance services are also provided by the City of Roswell Fire Department. The ARFF building provides six vehicle storage bays and is 11,940 square feet and is in good condition. The ARFF building was constructed in 2000 and is located west of the Airport terminal and east of the original fire station. The ARFF vehicles and equipment are in fair to good condition and owned by the City of Roswell. The current ARFF fleet consists of:

- Three emergency vehicles, two crash trucks and one engine.
- Crash trucks are equipped with 1,500 gallons of water and 200 gallons of aqueous film forming foam (AFFF (see **Figure 1-53**).
- Engine #4 is equipped with a pumper with an added feature of a 105-foot aerial ladder and water tower along with fire and medical response.

There are four firefighters based at the Airport fire station 24 hours a day, seven days a week. Personnel consist of a lieutenant, two drivers and one firefighter. The nearest ambulance is located four miles away at Fire Station #1, and has a response time of four minutes. The Airport fire station has the capability to respond to City structural fires in addition to the Airport ARFF response. Three of the bays open to the airside, and three bays open to the landside used by structural fire equipment. The Airport fire station is shown in **Figure 1-54**. There are two hospitals located in Roswell: Eastern New Mexico Medical Center and Roswell Regional Hospital. Eastern New Mexico Medical Center has 162 licensed beds and 125 physicians on medical staff. Roswell Regional Hospital has 26 licensed beds. **Table 1-16** depicts the equipment breakdown for the Roswell International Air Center's fire department.

FIGURE 1-53 ARFF CRASH TRUCK #1

FIGURE 1-54 CITY OF ROSWELL FIRE STATION #4

TABLE 1-16 ROSWELL INTERNATIONAL AIR CENTER FIRE STATION DATA

Fire Station Located on Airport	**Response Time: 3 Minutes**
Personnel	
Total Personnel: 4 On Duty Per Shift	1 Lieutenant, 2 Drivers and 1 Fire Fighter
Equipment	**Operational Data**
Engine # 4	Pumper with added feature of a 105-foot aerial ladder with water tower
Crash #1 2007 Oshkosh Striker	1,500 gallons of water, 200 gallons of AFFF, 4 wheel drive and center driver positioning
Crash #2 1991 E-One Titan	1,500 gallons of water, 200 gallons of AFFF, 4 wheel drive and center driver positioning
Pumper Engine	Pumper used for structural fires with a 5 inch hose

Source: City of Roswell Fire Station #4, May 2011.
Prepared by: Armstrong Consultants, Inc., April 2011.

1.14.13 WEATHER REPORTING SYSTEM

The weather reporting system at Roswell International Air Center includes an Automated Surface Observing System (ASOS) and the Automatic Terminal Informational Service (ATIS). The ASOS program is a joint effort of the National Weather Service (NWS), the Federal Aviation Administration (FAA), and the Department of Defense (DOD). The ASOS systems serve as the nation's primary surface weather observing network. ASOS is designed to support weather forecast activities and aviation operations and, at the same time, support the needs of the meteorological, hydrological and climatological research communities.[14] The ASOS is connected to the National Airspace Data Interchange Network (NADIN) which disseminates weather conditions to pilots through various aviation weather websites including the FAA Terminal Aerodrome forecast. The ASOS is owned and operated by the National Oceanic and Atmospheric Administration.

The ATIS is a continuous broadcast of recorded non-control information in terminal areas. The ATIS (128.45 MHz) broadcasts contain essential information such as: weather information, which runways are active, available approaches, pertinent approaches, and other information

[14] Reference – National Weather System, 2011

required by the pilots such as important Notice to Airmen (NOTAMs). ATIS information is only available when the ATCT is in operation. When the ATCT is closed, weather is available via the ASOS or by dialing (575) 347-0040.

1.14.14 AIRPORT INVENTORY

A compilation of the Airport facilities are found in **Table 1-17** below.

TABLE 1-17 ROSWELL INTERNATIONAL AIR CENTER AIRPORT FACILITIES

Facility Information			
Identifier		ROW	
FAA Site Number		14719.*A	
NPIAS Number		35-0035	
ARC		D-IV	
Owner/Sponsor		City of Roswell	
Airport Elevation		3,671-feet Mean Sea Level (MSL)	
Runway and Taxiway Data			
Runway 3/21		Length: 13,001 feet / Width: 200 feet Surface: Concrete/Asphalt Marking: (21) Precision / (3) Nonprecision Runway lighting: HIRL	
Runway 17/35		Length: 9,999 feet / Width: 100 feet Surface: Asphalt Marking: Nonprecision Runway lighting: MIRL	
Pavement Strength		Runway 3/21 100,000 lbs. (SWG) 200,000 lbs. (DWG) 400,000 lbs. (DTW)	Runway 17/35 77,000 lbs. (SWG) 104,000 lbs. (DWG) 165,000 lbs. (DTW)
Visual Aids		RW 3: VASI-6; RW 21: MALSR; RW 17:VASI-4; RW 35: PAPI-4	
Approach Minimums		½-statue mile (RWY 21) & ¾-statue mile (RWY 17/35 and 3)	
Taxiways		A, B, C, D, E, F, G, H, J, K, M and S	
Taxiway Lighting		Medium intensity taxiway lights (MITL) & Retroreflectors	
Aircraft Apron		531,309 square yards	
Tie Downs		38	
Navigational Aids			
Air Navigation Aids		ILS, VOR-B, DME, GPS	Good condition
Airport Beacon		Clear-Green (Civil Airport)	Dusk to dawn
Wind Indicator		Lighted	Good condition
Segmented Circle		Yes (Orange-White)	Good condition
Unicom / Tower		122.95 MHz / 118.5 MHz	
Airport Buildings and Services			
T-Hangars		10 units	Fair condition
Hangars		10 conventional box hangars	
Terminal Area		25,703 square feet	Good condition
Automobile Parking		Approximately 132 paved spaces + 50 gravel spaces	
Perimeter Fencing		8 foot chain link fence 3 strand barbed wire	Good condition
Fuel	Jet A	60,000 gallon tanks (2) 5,000 gallon trucks (4) 2,000 gallon truck (1)	Good condition
	100LL	10,000 gallon tank (1) 2,000 gallon truck (1)	
Services		Car rental, taxi, wireless internet, airframe repairs, maintenance, in-hangar deicing, flight instruction, restrooms, flight instruction, aircraft rental, and charter.	
Weather Equipment		ASOS/ATIS	Good condition
FBO		Great Southwest Aviation	Good condition
Utilities		Electrical, natural gas, water, and sewer, land line telephone and internet	

Source: Airport Management, 2011 & ASCG 2003.
Prepared by: Armstrong Consultants, Inc., April 2011.

1.15 FEDERAL AVIATION ADMINISTRATION SAFETY AND DESIGN STANDARDS

FAA AC 150/5300-13, *Airport Design*, establishes design standards for airports based on the ARC and visibility minimums of the airport. When design standard deficiencies exist, the FAA recommends correction of such deficiencies as soon as practicable. The ARC is a combination of the wingspan, tail height and approach speed of the critical aircraft. Selected design standard categories are discussed below and **Table 1-18** shows the current design standards at Roswell International Air Center.

1.15.1 SAFETY AREAS

AC 150/5300-13 defines a Runway Safety Area (RSA) as "an identified surface surrounding the runway prepared and suitable for reducing risk of damage to airplanes in the event of an undershoot, overshoot or excursion from the runway."[15] The RSA has dimensional requirements as well as clearing, grading and drainage requirements.

The dimensional requirements for an RSA (and a subsequent Taxiway Safety Area) reflect the aircraft types utilizing the runway. As defined in AC 150/5300-13, both the Aircraft Design Group (ADG) (defined by the aircraft's wingspan) and the Aircraft Approach Category (defined by an aircraft approach speed) are the basis for establishing the RSA dimensions.

The Safety Areas must be:

- Cleared and graded and have no potentially hazardous surface variations.
- Drained so as to prevent water accumulation.
- Capable, under dry conditions, of supporting snow removal equipment, ARFF equipment and the occasional passage of aircraft without causing structural damage to the aircraft.
- Free of objects, except for objects that need to be located in the runway or taxiway safety area because of their function; and
- Installation of storm sewers is permissible within the RSA, but elevation of the storm water inlets may not vary more than three inches from surface elevation.

The RSAs were evaluated by a field inspection on April 28, 2011. The locations of objects identified on the ALP were visually inspected and the results of these findings are outlined in this section. The RSA off the ends of Runways 3/21 and 17/35 at Roswell International Air Center are clear of obstructions, in good condition and satisfy the requirements defined by the standards.

1.15.2 OBSTACLE FREE ZONE AND OBJECT FREE AREA

The Obstacle Free Zone (OFZ) is a three dimensional volume of airspace which supports the transition of ground to airborne aircraft operations. The clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual Navigational Aids (NAVAIDs) that need to be located in the OFZ because of their function. The OFZ is similar to the 14 Code of Federal Regulation (CFR) Part 77 Primary Surface insofar that it represents the volume of space longitudinally centered on the runway and it extends 200 feet beyond the end of each runway. The Runway Object Free Area (ROFA) is a two-dimensional ground area surrounding the runway. The ROFA standard precludes parked airplanes, agricultural operations and objects, except for objects that need to be located in the ROFA for air navigation

[15] FAA AC 150/5300-13, *Design Standards* – Chapter 1, page 3

or aircraft ground maneuvering purposes. Both the OFZ and OFA at ROW meet the requirements defined within FAA AC 150/5300-13.

1.15.3 Runway Protection Zone (RPZ)

The Runway Protection Zone (RPZ) is trapezoidal in shape and centered about the extended runway centerline. The RPZ dimension for a particular runway end is a function of the type of aircraft and approach visibility minimum associated with that runway end.

At the end of Runway 3/21 and Runway 17/35, the RPZs begin 200 feet from the runway. For Runway 21, the RPZ is 1,000 feet wide at the inner end and 1,750 feet wide at the outer end and extend 2,500 feet. For Runway 3 the RPZ is 1,000 feet wide at the inner and 1,510 feet wide at the outer end and extends 1,700 feet. Runway 21 is designated as a precision, greater than utility runway. The RPZs for Runway 17/35 are 1,000 feet wide at the inner end and 1,510 feet wide at the outer end and extend 1,700 feet. Runway 17/35 is designated as a nonprecision, greater than utility runway.

The land uses not recommended within the RPZ are residences and places of public assembly (e.g., churches, schools, hospitals, parking lots, office buildings, shopping centers and other uses with similar concentrations of persons typify places of public assembly). The FAA recommends that airport's control RPZs through fee simple ownership or avigation easements.

The approach and departure RPZs for Runway 3/21 and Runway 17/35 begin at 200 feet from the pavement edge and are located on Airport property. The City controls the RPZs through fee simple ownership.

TABLE 1-18 CURRENT AIRFIELD DESIGN STANDARD DIMENSIONS

	Current Dimension	Current Standard
	Runway 03/21	
Airport Reference Code (ARC)	D-IV	D-IV
Approach Visibility Minimums	½ - statue mile	-
RW Length	13,001	--
RW Width	200’	150’
RW Safety Area (RSA) width	500’	500’
RW Safety Area (RSA) length beyond runway end	1,000’	1,000’
RW Object Free Area (ROFA) width	800’	800’
RW Object Free Area (ROFA) length beyond runway end	1,000’	1,000’
Obstacle Free Zone (OFZ) width	400’	400’
Obstacle Free Zone (OFZ) length beyond runway end	200’	200’
Runway Protection Zone (RPZ)	(21): 2,500’ x 1,000’ x 1,750’ (3): 1,700’ x 1,000’ x 1,510’	(21): 2,500’ x 1,000’ x 1,750’ (3): 1,700’ x 1,000’ x 1,510’
RW centerline to hold line	Varies from 300’ to 400’	250’
RW centerline to taxiway/taxilane centerline	829’- 836’	400’
RW centerline to aircraft parking area	921’	500’
	Runway 17/35	
Airport Reference Code (ARC)	C-III	C-III
Approach Visibility Minimums	¾-statue mile	-
Runway length	9,999’	-
Runway width	100’	100’
Runway Safety Area (RSA) width	500’	500’
Runway Safety Area (RSA) length beyond runway end	1,000’	1,000’
Runway Object Free Area (ROFA) width	800’	800’
Runway Object Free Area (ROFA) length beyond runway end	200’	200’
Obstacle Free Zone (OFZ) width	400’	400’
Obstacle Free Zone (OFZ) length beyond runway end	200’	200’
Runway Protection Zone (RPZ)	1,700’ x 1,000’ x 1,510’	1,700’ x 1,000’ x 1,510’
Runway centerline to hold line	Varies from 250’ to 360’	250’
Runway centerline to taxiway/taxilane centerline	700’	400’
Runway centerline to aircraft parking area	1,096’	500’
	Design Group III*	**Design Group IV***
TW Width	50’	75’ (52’ actual)
TW Safety Area width	118’	171’
TW Object Free Area width	186’	259’
TW Centerline to Parallel TL Centerline	152’	215’
TL Object Free Area width	162’	225’

Source: FAA 150/5300-13, Airport Design
Prepared by: Armstrong Consultants, Inc., May, 2011.
*Notes/ *Taxiway design standards criteria are met throughout the Airport.*

1.16 14 CODE OF FEDERAL REGULATION (CFR) PART 77 IMAGINARY SURFACES

14 Code of Federal Regulation (CFR) Part 77 establishes several Imaginary Surfaces that are used as a guide to provide a safe, unobstructed operating environment for aviation activity. The Primary, Approach, Transitional, Horizontal and Conical Surfaces identified in CFR Part 77 are applied to each runway. The FAA defines runway types as the following:

- Visual/utility runway is a runway that is intended to be used by propeller driven aircraft of 12,500 pound maximum gross weight or less.

- Nonprecision instrument/utility runway is a runway that is intended to be used by aircraft of 12,500 pounds maximum gross weight and less with a straight-in instrument approach procedure and instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan or by any planning document submitted to the FAA by competent authority.

- Nonprecision instrument/larger-than-utility runway is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure.

- Precision Instrument is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure.

The Primary Surface is an imaginary surface of specific width longitudinally centered on a runway. Primary Surfaces extend 200 feet beyond each end of the paved surface of runways, but do not extend past the end of non-paved runways. The elevation of any point on the Primary Surface is the same as the elevation of the nearest point on the runway centerline. The width of the Primary Surface varies from 250, 500 or 1,000 feet depending on the type of approach and approach visibility minimums.

The Approach Surface is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the Primary Surface. An Approach Surface slope is applied to each end of the runway based upon the type of approach available or planned for that runway, either 20:1, 34:1 or 50:1. The inner edge of the surface is the same width as the Primary Surface. It expands uniformly to a width corresponding to the CFR Part 77 runway classification criteria.

The Transitional Surfaces extend outward and upward at right angles to the runway centerlines from the sides of the Primary and Approach Surfaces at a slope of 7:1 and end at the Horizontal Surface.

The Horizontal Surface is a horizontal plane 150 feet above the established airport elevation. The airport elevation is defined as the highest point of an airport's useable runways, measured in feet above mean sea level. The perimeter is constructed by arcs of specified radius from the center of each end of the Primary Surface of each runway. The radius of each arc is 5,000 feet for runways designated as utility or visual and 10,000 feet for all other runways.

The Conical Surface extends outward and upward from the periphery of the Horizontal Surface at a slope of 20:1 for a horizontal distance of 4,000 feet.

Table 1-19 delineates the CFR Part 77 Surfaces for the Runways at Roswell International Air Center

TABLE 1-19 CFR PART 77 AIRSPACE SURFACES FOR RUNWAY 3/21 AND RUNWAY 17/35

	Runway 3/21	**Runway 17/35**
CFR Part 77 Category	Nonprecision/Precision, greater than utility	Nonprecision, greater than utility
Primary Surface Width	1,000’	500’
Primary Surface Length Beyond Runway Ends	200’	200’
Approach Surface Dimensions	RW 21: 50,000 x 1,000 x 16,000 RW3: 10,000’ x 1,000’ x 4,000’	10,000 x 1,000 x 4,000’
Approach Surface Slope	RW 21: 50:1/40:1 RW3: 34:1	34:1
Transitional Surface Slope	7:1	7:1
Horizontal Surface From Radius from Runway	10,000	10,000
Conical Surface Width	4,000’	4,000’
Conical Surface Slope	20:1	20:1

Source: FAA, 2011 and Roswell International Air Center
Prepared by: Armstrong Consultants, Inc., April 2011.

1.17 AIRSPACE

1.17.1 NATIONAL AIRSPACE SYSTEM

The National Airspace System consists of various classifications of airspace that are regulated by the FAA and is considered controlled or uncontrolled airspace. Pilots flying in controlled airspace are subject to Air Traffic Control (ATC) regulations and must follow either Visual Flight Rule (VFR) or Instrument Flight Rule (IFR) requirements. These requirements include combinations of operating rules, aircraft equipment and pilot certification and vary depending on the Class of airspace and are described in Federal Aviation Regulations (FAR) Part 71, Class designations; Airways; Routes; and Reporting Points and FAR Part 91, General Operating and Flight Rules. **Figure 1-55** illustrates the different airspace classes and gives a graphical representation of them.

General definitions of the Classes of airspace are provided below:

Class A Airspace. Airspace from 18,000 feet Mean Sea Level (MSL) up to and including Flight Level (FL) 600.

Class B Airspace. Airspace from the surface to 10,000 feet MSL surrounding the nation’s busiest airports in terms of IFR operations or passenger enplanements.

Class C Airspace. 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 radar approach control and that have a certain number of IFR operations or passenger enplanements. The airspace usually consists of a 5 nautical mile (nm) radius core surface area that extends from the surface up to 1,200 feet above the airport elevation and a 10 nm radius shelf area that extends from 1,200 feet up to 4,000 feet above the airport elevation.

Class D Airspace. Airspace from the surface up to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports with an operational control tower.

Class E Airspace. Generally controlled airspace that is not Class A, Class B, Class C or Class D.

Class G Airspace. Generally uncontrolled airspace that is not designated Class A, Class B, Class C, Class D or Class E.

Victor Airways. These airways are low altitude flight paths between ground based VHF Omnidirectional Receivers (VORs).

Figure 1-56 illustrates that the airspace surrounding Roswell International Air Center is Class D from the ground to 2,500-feet AGL when ATC is operational. During hours when ATC is not operational, surrounding airspace is Class E.

The traffic patterns to Roswell International Air Center are standard left hand traffic and the published pattern altitude (TPA) is 1,500 feet above ground level (AGL) for multi-engine and turbo jet aircraft, 1,000 feet AGL for single engine aircraft and 500 feet AGL for rotorcraft. Airspace and future land use planning are further discussed in Chapter 3 – Facility Requirements.

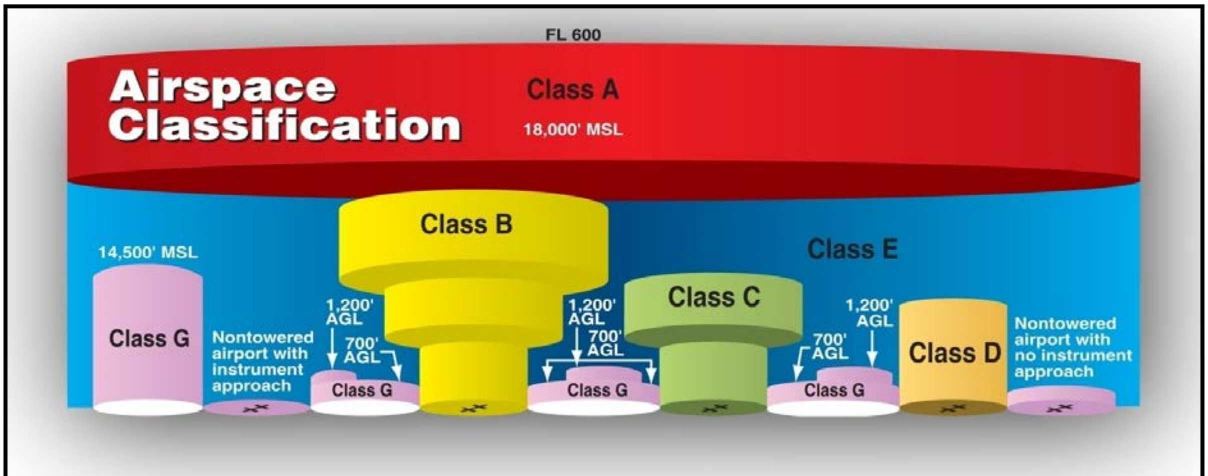


FIGURE 1-55 AIRSPACE CLASSIFICATION

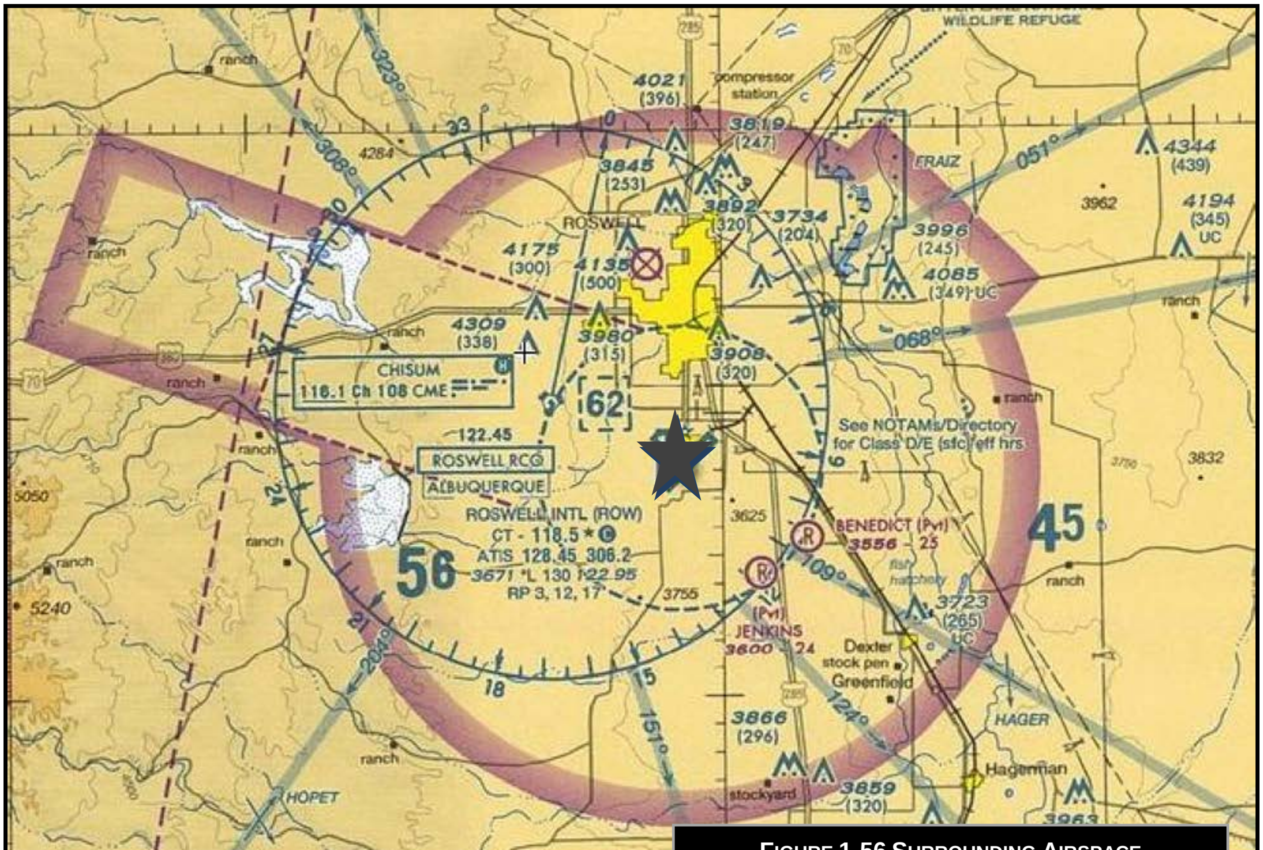


FIGURE 1-56 SURROUNDING AIRSPACE

1.17.2 AIRSPACE JURISDICTION

Roswell International Air Center is located within the jurisdiction of the Roswell International Air Center Air Traffic Control Tower (ATC) which is within the jurisdiction of the Albuquerque Route Control Center (ARTCC) and the Fort Worth Flight Service Station (FSS). The altitude of radar coverage by the Albuquerque ARTCC may vary as a result of the FAA navigational/radar facilities in operation, weather conditions and surrounding terrain. The Fort Worth FSS provides additional weather data and other pertinent information to pilots on the ground and enroute.

1.17.3 AIRSPACE RESTRICTIONS

Military Operations Areas (MOAs) consist of airspace with defined vertical and lateral limits established for the purpose of separating certain military training activities from general IFR traffic which separate certain nonhazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted.

Whenever an MOA is being used, nonparticipating IFR traffic may be cleared through an MOA if IFR separation can be provided by Air Traffic Control (ATC). Otherwise, ATC reroutes or restricts nonparticipating IFR traffic. MOAs are depicted on sectional, VFR terminal area, and en route low altitude charts. The MOAs are also further defined on the back of the sectional charts with times of operation, altitudes affected, and the controlling agency. There are MOAs currently in place within the surrounding Roswell airspace as depicted in **Table 1-20**.

TABLE 1-20 MILITARY OPERATIONS AREAS (MOA) WITHIN THE VICINITY TO ROSWELL INT'L AIR CENTER

MOA Name		Distance from ROW	Altitude (AGL)	Time of Use	Controlling Agency	Frequency (MHz)
Talon	High East	18 NM South	12,000'	Mon-Fri	Albuquerque Center	135.875
	Low		300' up to but not including 12,500'			
Beak	A, B, C	23 NM West	12,500' up to but not including 18,000'	0600-1800 Mon-Fri	Albuquerque Center	135.875
Pecos South	High	20 NM North	11,000' up to but not including 18,000'	Intermittent by NOTAM	Albuquerque Center	135.875
	Low		500' up to but not including 11,000'			
Bronco	1	35 NM East	8,000' up to but not including 18,000'	By NOTAM	Fort Worth Center	132.6 (N,E) 126.45 (S)
	2		10,000' up to but not including 18,000'			
	3,4		10,000' up to but not including 18,000'			

Source: Albuquerque Sectional Aeronautical Chart, 2011.
Prepared by: Armstrong Consultants, Inc., June 2011.

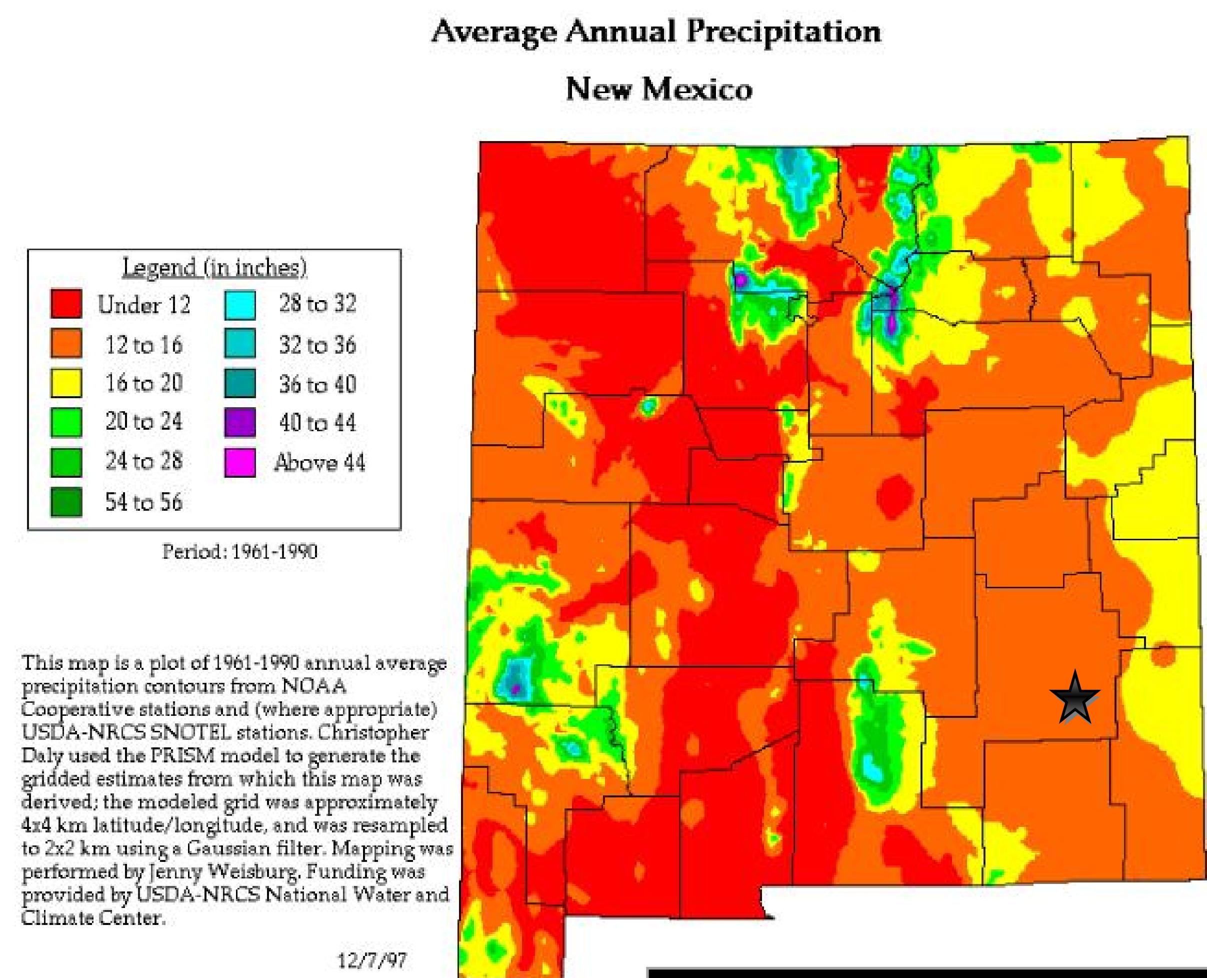
Restricted Areas denote the existence of unusual, often invisible, hazards to aircraft (e.g., artillery firing). Penetration of restricted areas without authorization from the using or controlling agency may be extremely hazardous to the aircraft and its occupants. Restricted Areas may not be entered into by civilian aircraft without specific permission from the controlling entity. There are no restricted areas in the vicinity of Roswell International Air Center with the closest restricted area being 75 nautical miles southwest (R-5103C).

1.18 CLIMATE AND METEOROLOGICAL CONDITIONS

Meteorological conditions play an important role in the planning and development of an airport. Wind direction and speed are essential in determining optimum runway orientation. Temperatures substantially affect aircraft performance and are a major factor in runway length determination. The percentage of time an airport experiences low visibility due to meteorological conditions is a key factor in determining the need for instrument approach procedures and the type of procedure and facilities needed. The type of instrument approach procedure that might be needed, in turn, determines airspace and imaginary surface requirements. The amount and type of precipitation that occurs at an airport affects visibility and runway friction, or runway braking effectiveness. It also affects the type of maintenance equipment required (e.g., snow and ice removal equipment).

1.18.1 LOCAL CLIMATOLOGICAL DATA

Roswell experiences a four-season climate generally experiencing warm, dry weather in the summer and cooler temperatures in the winter. The fall and spring season provide a good transition between the two extremes. Roswell is located in central Chaves County in an area that receives approximately 12 to 16 inches of precipitation annually. Average annual snowfall for Roswell is 7.4 inches. The average maximum temperature of the hottest month is 94.1 degrees Fahrenheit in July, while the average minimum temperature of the coldest month is 20.5 degrees Fahrenheit in January. The annual average maximum temperature is 77.5 degrees Fahrenheit and the annual average minimum temperature is 40.2 degrees Fahrenheit. **Figure 1-57** shows the average annual precipitation for the state of New Mexico which shows that Roswell is located within the moderately drier portion of the State with low humidity level.



Source: NOAA, 1997.

FIGURE 1-57 AVERAGE ANNUAL PRECIPITATION

1.18.2 CEILING AND VISIBILITY CONDITIONS

Ceiling and visibility conditions are important considerations since the occurrence of low ceiling and/or poor visibility conditions limit the use of an airport. Under poor visibility conditions or Instrument Meteorological Conditions (IMC), the pilot must operate under Instrument Flight Rules (IFR), rather than Visual Flight Rules (VFR). Under IFR, the pilot maneuvers the aircraft through sole reference to instruments in the aircraft and navigational aids on the ground. When flight conditions are visual or Visual Meteorological

Conditions (VMC), the pilot can maneuver the aircraft by reference to the horizon and objects on the ground.

There are several instrument approach procedures to the Airport including an Instrument Landing System (ILS) to Runway 21. According to the National Western Climatic Data Center there are approximately 84 cloudy days per year in Roswell.

1.18.3 WIND CONDITIONS

FAA Advisory Circular 150/5300-13, *Airport Design*, recommends that a runway should yield 95 percent wind coverage under stipulated crosswind components. If one runway does not meet this 95 percent coverage, then construction of an additional runway may be advisable. The crosswind component of wind direction and velocity is the resultant vector, which acts at a right angle to the runway. It is equal to the wind velocity multiplied by the trigonometric sine of the angle between the wind direction and the runway direction. The allowable crosswind component for each Airport Reference Code is shown in **Table 1-21**.

Wind conditions are based on weather observations taken in the Roswell area during the period 2000-2009. This data, obtained from the National Oceanic and Atmospheric Administration (NOAA) Climate Data Center, consists of 6,624 hourly observations separated by visual meteorological conditions (VMC) and instrument meteorological conditions (IMC), and "all weather" conditions as described below. Data was obtained from the automated surface observation system (ASOS) located on the airfield indicates that Runway 3/21 and Runway 17/35 provide more than 95 percent wind coverage for aircraft in the ARC A-I through D-IV, the percentage values are provided in **Table 1-22** and **Figure 1-58**. Therefore, the existing runway configuration is adequate for aircraft in categories A-I through D-VI. **Table 1-23** and **Figure 1-59** indicates winds in IFR conditions favor Runway 21 which is consistent with Runway 21 offering the lowest approach minimums with the ILS approach.

TABLE 1-21 CROSSWIND COMPONENTS

Allowable Crosswind in Knots	Airport Reference Code
10.5 knots	A-I & B-I
13 knots	A-II & B-II
16 knots	A-III, B-III & C-I through D-III
20 knots	A-IV through D-VI

Source: FAA AC 150/5300-13, Airport Design
Prepared by: Armstrong Consultants, Inc., April 2011.

When conducting a wind coverage evaluation analysis, the FAA suggests that historical weather information for the last ten consecutive years be utilized. Records of lesser duration may be acceptable on a case-by-case basis. In some instances, it may be desirable to obtain and assemble wind information for periods of particular significance, for example: seasonal variations; instrument weather conditions; daytime versus nighttime; and regularly occurring gusts.

TABLE 1-22 WIND DATA ALL WEATHER CONDITIONS

All Weather	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 3/21	86.41%	92.39%	97.61%	99.32%
Runway 17/35	93.00%	95.87%	98.06%	99.12%
Combined	96.28%	98.33%	98.33%	99.80%

Source: NOAA: Roswell ASOS, 2000-2009
Prepared by: Armstrong Consultants, Inc., June 2011.

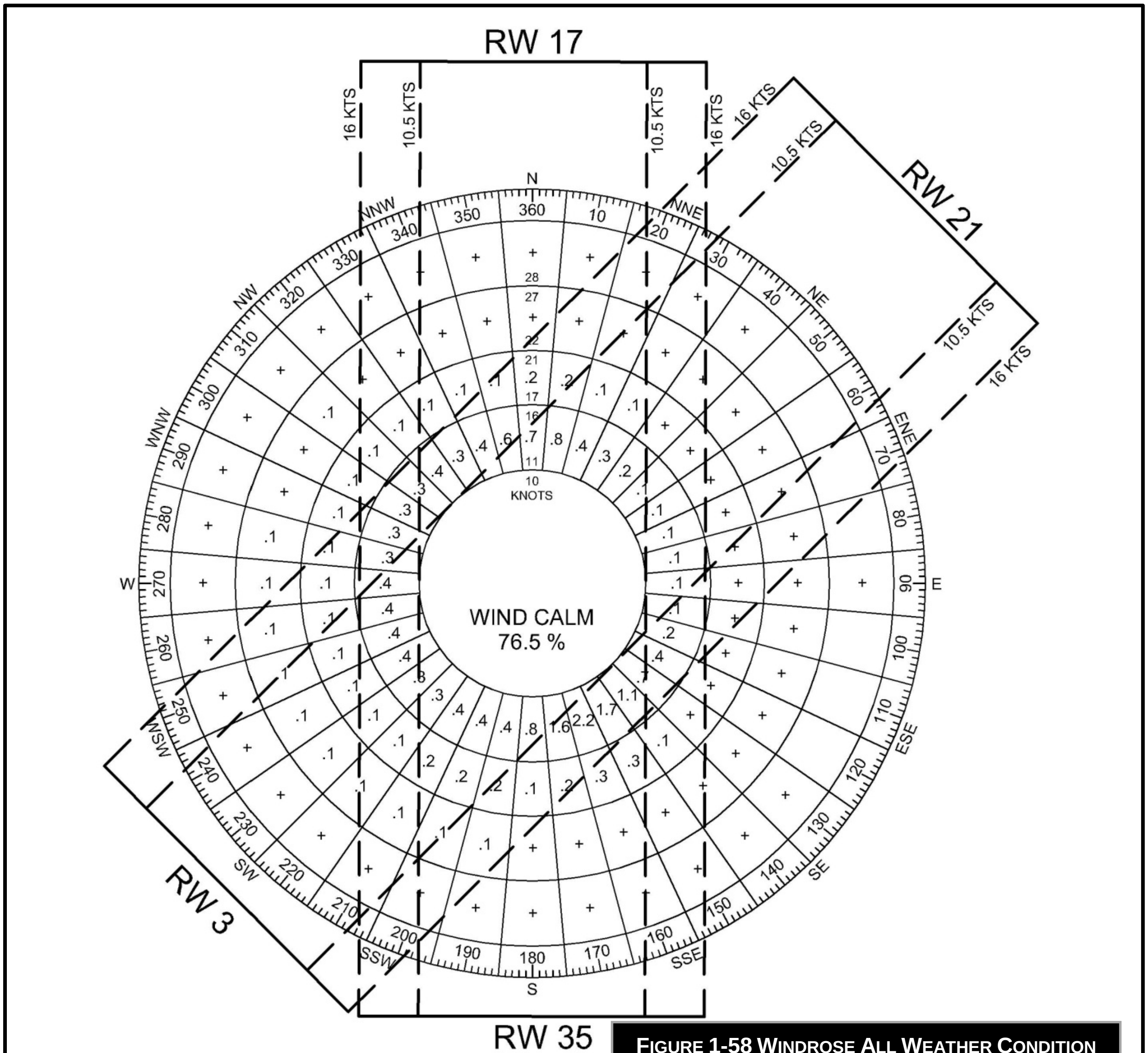


FIGURE 1-58 WINDROSE ALL WEATHER CONDITION

Source: NOAA: Roswell ASOS, 2000-2009
Prepared by Armstrong Consultants, Inc., June 2011

TABLE 1-23 WIND DATA IFR WEATHER CONDITIONS

All Weather	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 3/21	85.67%	92.50%	97.98%	99.16%
Runway 17/35	95.72%	97.34%	98.54%	98.78%
Combined	97.12%	98.55%	99.19%	99.54%

Source: NOAA: Roswell ASOS, 2000-2009
Prepared by: Armstrong Consultants, Inc., June 2011

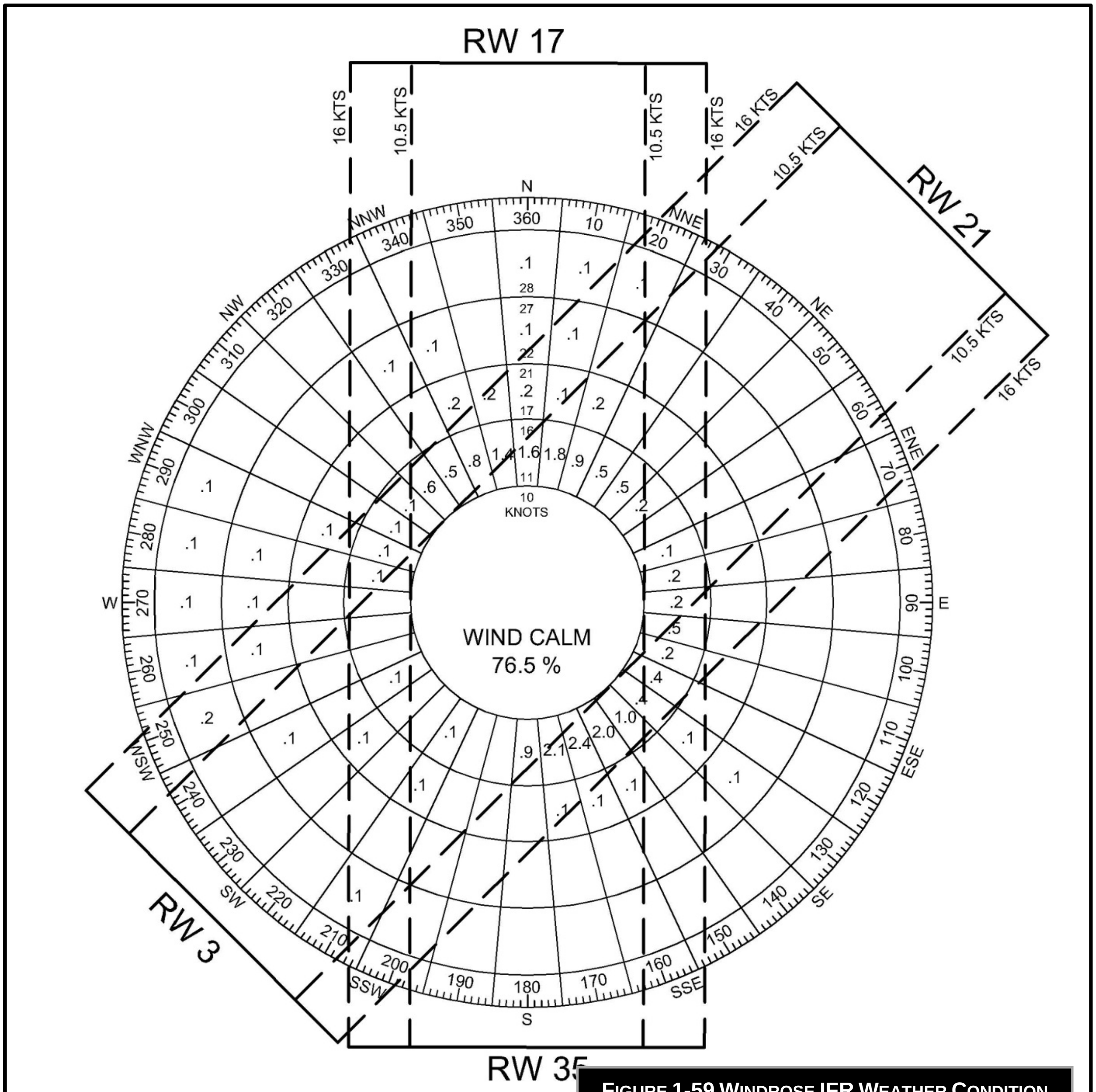


FIGURE 1-59 WINDROSE IFR WEATHER CONDITION

Source: NOAA: Roswell ASOS, 2000-2009
Prepared by Armstrong Consultants, Inc., June 2011.

1.19 ENVIRONMENTAL INVENTORY

The requirements of the National Environmental Policy Act (NEPA) require an environmental determination before implementing proposed airport improvement projects. The purpose of the environmental inventory is to identify key environmental resources that may be affected by potential airport development. The data compiled in this section will be used later in this study. Background research was completed by reviewing available documentation from the U.S. Environmental Protection Agency (EPA), Flood Insurance Rate Maps (FIRM), National Register of Historic Places (NHRP), and Federal Emergency Management Agency (FEMA).

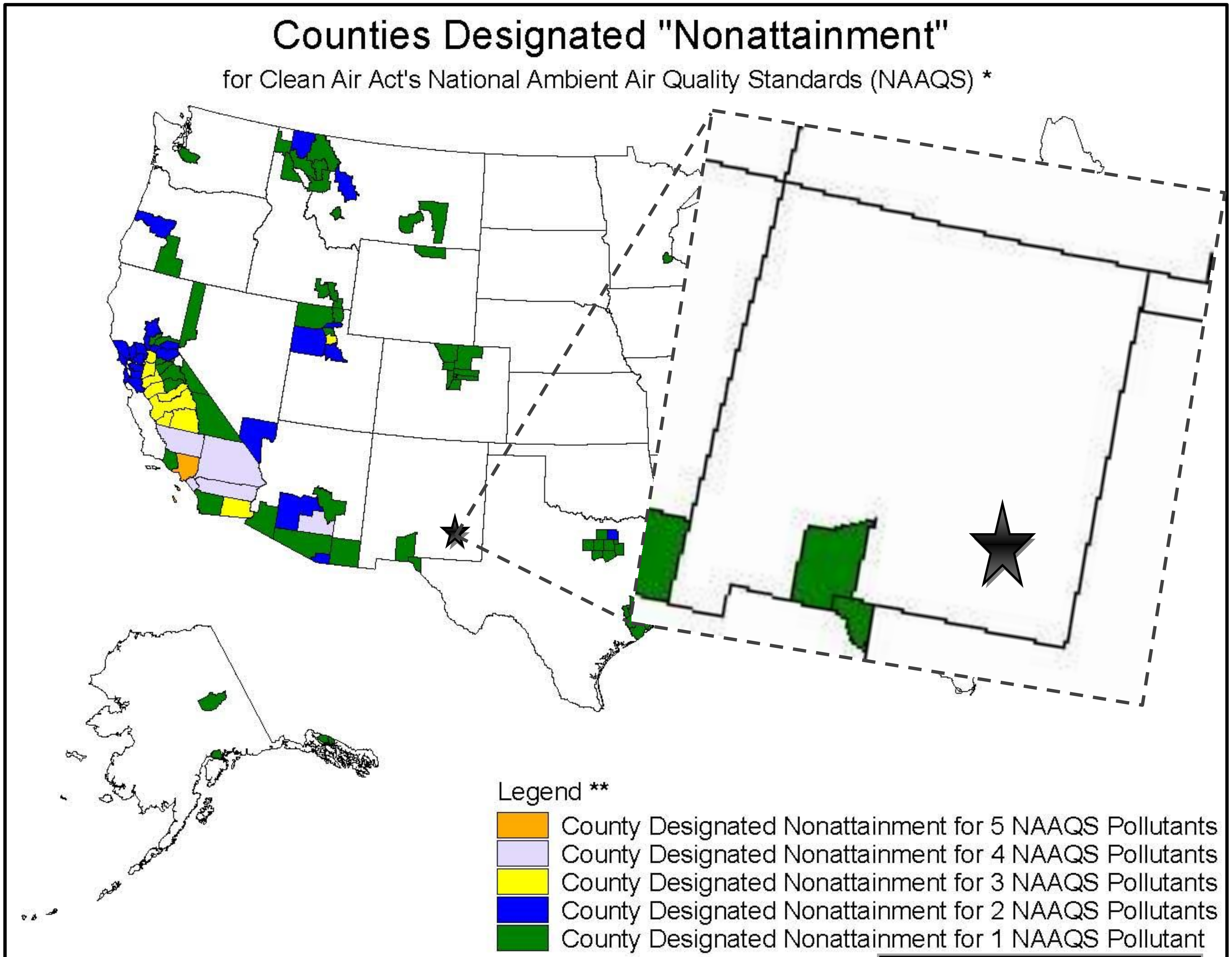
The level of the NEPA documentation required is usually based on the results of the environmental overview and the requirements specified in FAA Order 1050.1E, *Environmental*

Impacts: Policies and Procedures, and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions*. Typical levels of analysis and determinations include Categorical Exclusions (CatEx), Environmental Assessments (EA) with Finding of No Significant Impacts (FONSI), and Environmental Impact Statements (EIS) with a Record of Decision (ROD).

1.19.1 AIR QUALITY

The National Ambient Air Quality Standards (NAAQS) are set forth by the Clean Air Act Amendments of 1997 and establish the pollutant concentrations that states, cities and towns must comply with within specified timeframes.

Air quality attainment maps were obtained from the U.S. Environmental Protection Agency's (EPA) Green Book's 2010 map of nonattainment and attainment areas. The airport is located within an attainment area (see **Figure 1-60**). An attainment area is a zone within which the level of a pollutant is considered to meet National Ambient Air Quality Standards. Air pollutants are emitted by a variety of means and sources: aircraft, ground support equipment (GSE), auxiliary power units, motor vehicle operations, and construction activities.



Source: U.S. Environmental Protection Agency's (EPA) Green Book's, 2010

FIGURE 1-60 AIR QUALITY MAP

1.19.2 Compatible Land Use Planning

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

The Airport is located within City of Roswell incorporated city limits and falls within the I-2 zoning classification which is noted as a Heavy Industrial District (see **Figure 1-61**). Projects within the Heavy Industrial District are intended to provide for a wide range of industrial activities including heavy manufacturing, fabricating, assembly, disassembly, processing, and treatment activities conducted in a manner not detrimental to the rest of the community by reason of the emission or creation of noise, vibration, smoke, dust of other particulate matter, toxic or noxious materials odors, fire of explosive hazards, or glare or heat. The City ordinance also states there is no height restriction within the Heavy Industrial District except those prescribed by the approach zones of the Airport. The Airport is surrounded to the north by City of Roswell Rural-Suburban district (R-3). The R-3 zone is the Residence Zone which allows for the development of residential units. Compatible Land Use and Height Restriction drawings are included as part of this Airport Layout Plan as a tool for the City and County to use in reviewing and evaluating the compatibility of proposed development in the vicinity of the Airport.

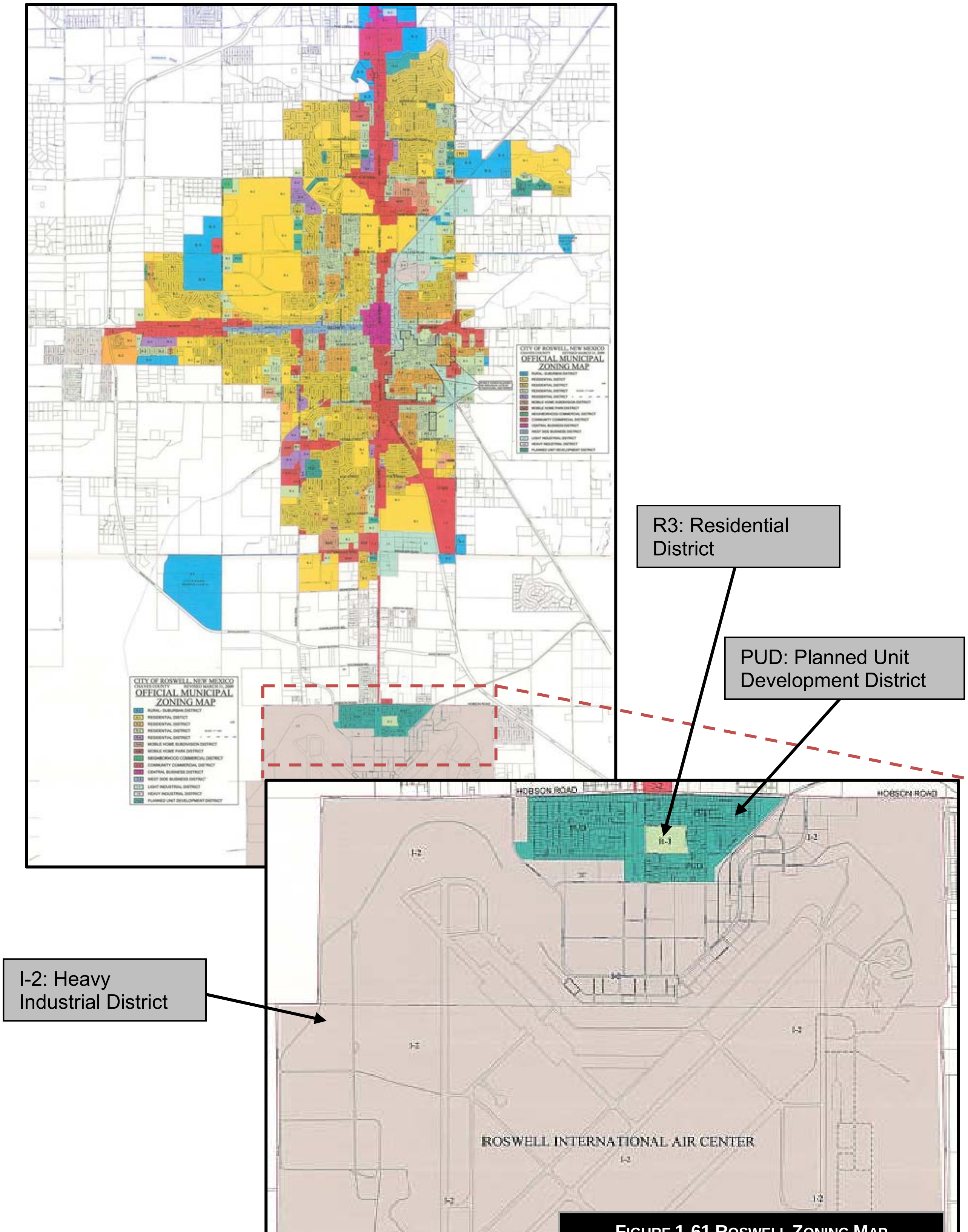


FIGURE 1-61 ROSWELL ZONING MAP

Source: City of Roswell (NM), 2011

1.19.3 Department of Transportation Act – Section 4(f)
The Department of Transportation Act (DOT Act) of 1966 included a special provision - Section 4(f) - which stipulated that the Federal Highway Administration (FHWA) and other DOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless the following conditions apply:

- There is no feasible and prudent alternative to the use of land.
- The action includes all possible planning to minimize harm to the property resulting from use.[16]

There are currently no parks within the vicinity of the airport property which have the potential to be designated as Section 4(f) property. There are currently no wildlife and waterfowl refuge of national, state or local significance or land from an historic site of national, state or local significance located in the vicinity of the Airport. The nearest wilderness area is the Bitter Lake National Wildlife Refuge which is located approximately ten miles northeast of Roswell.

1.19.4 Historical , Architectural, Archaeological and Cultural Resources
An important component of cultural heritage is cultural resources, which are artifacts and places that have significance to people within a specific community, and heritage. Cultural resources include archaeological sites, historic buildings and structures, rock art, shrines, trails, human made artifacts (such as pottery, metal objects, tools, projectile points, and grinding stones), traditional cultural places, and traditional cultural landscapes.

Traditional cultural places and traditional cultural landscapes are places and areas that have significant meaning to one or more cultural group, and often incorporate aspects of the natural and the human-made worlds. For example, a traditional cultural landscape may include a mountain that contains archaeological sites, human burials, herb gathering places and other important cultural resources. Human burials are a special type of cultural resource, which are usually, but certainly not always, found in archaeological sites or graveyards.

The New Mexico State Historic Preservation Office's website was contacted regarding possible impacts to historic architectural, archaeological and cultural resources. The agency indicated that no archaeological or historic sites have been recorded on or in the vicinity of the Airport.

1.19.5 Floodplains
Executive Order 11988, *Federal Floodplain Management*, states that agencies must reduce the risk of flood loss, minimize the impacts of floods on human safety, health, and welfare, and restore and preserve natural and beneficial values served by floodplains. Federal Emergency Management Agency (FEMA) floodplain maps were not available for the coordinates in which the Airport resides in. Historical data shows there have been no flooding events and the Airport is not located near a water way.

1.19.6 Fish, Wildlife and Plants
The *Endangered Species Act* (16 U.S.C. §1531 et. Seq. (1973)) provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The law requires federal agencies, in consultation with the U.S. Fish and Wildlife Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the

[16] U.S. Department of Transportation, Federal Highway Administration, 2011

continued existence of any listed species or result in the destruction or adverse modification of designed critical habitat of such species.[17]

The U.S. Fish and Wildlife Service website was consulted concerning the possibility of any impacts to threatened and endangered species and candidate species that may occur within the Airport environment. A list of federally threatened or endangered species was obtained for Chaves County. Future development projects should be evaluated to determine if any of the listed species occur or would be impacted.

The species shown in **Table 1-24** are currently listed for Chaves County but do not necessarily occur in the vicinity of Roswell International Air Center.

TABLE 1-24 ENDANGERED, THREATENED AND CANDIDATE SPECIES LIST FOR CHAVES COUNTY

Common Name	Scientific Name	Species Group	Status
Least tern	*Sterna antillarum*	Bird	Endangered
Noel's Amphipod	*Gammarus desperatus*	Crustaceans	Endangered
Pecos gambusia	*Gambusia nobilis*	Fish	Endangered
Kuenzler Hedgehog cactus	*Echinocereus fendleri kuenzleri*	Flowering Plant	Endangered
Pecos Assiminea snail	*Assiminea pecos*	Snail	Endangered
Roswell springsnail	*Pyrgulopsis roswellensis*	Snal	Endangered
Koster's springsnail	*Juturnia kosteri*	Snail	Endangered
Dunes Sagebrush Lizard	*Sceloporus arenicolus*	Reptile	Threatened/ Proposed Endangered
Mexican Spotted Owl	*strix occidentalis lucida*	Bird	Threatened
Pecos Bluntnose shiner	*Notropis simus pecosensis*	Fish	Threatened
Pecos Sunflower	*Helianthus paradoxus*	Flowering Plant	Threatened
Lesser prairir-chicken	*Tympanuchus pallidicinctus*	Bird	Candidate

Source: U.S. Fish and Wildlife Service, 2011.
Prepared By: Armstrong Consultants, Inc., March 2011.

1.19.7 WETLANDS

Executive Order 11990, *Protection of Wetlands,* requires federally supported projects to preserve wetlands and to avoid and minimize wetland impacts to the maximum extent practicable. The use of National Wetlands Inventory (NWI) mapping, field reconnaissance, and county soil survey can aid in identifying potential wetlands and jurisdictional waters of the U.S. subject to the permitting jurisdiction of the U.S. Corp of Engineers (USACE). There do not appear to be any jurisdictional wetlands within the Airport boundary as shown in **Figure 1-62**.

[17] Reference - United States Environmental Protection Agency (EPA), *Endangered Species Act,* (epa.gov), 2011

Source: U.S. Fish and Wildlife Service, National Wetlands, June 2011
Prepared by: Armstrong Consultants, Inc., June 2011

FIGURE 1-62 NATIONAL WETLANDS MAP

1.19.8 Noise

FAR Part 150 is a voluntary program that U.S. airports may undertake to seek a balance between their operational needs and the noise impacts their operations are having on the surrounding community. The study of airport noise and land use compatibility authorized under the Code of Federal Regulations (14 CFR) Part 150, *Airport Noise Compatibility Planning*, which sets out rules and guidelines and authorizes Federal assistance for the preparation of airport noise compatibility programs. There are two principal technical elements:

<u>Noise Exposure Maps (NEM)</u> – describe existing noise conditions are the Airport area and projected future conditions if no noise abatement actions were taken.

<u>Noise Compatibility Program (NCP)</u> – provides guidelines for the mitigation of existing incompatible land uses and the prevention of development that would introduce new incompatible uses.

The level of sound can be measured objectively, but noise, unwanted sound, is a very subjective matter. Techniques have been developed that measure single events in an effort to measure the noise in objective terms, giving extra weight to those sound frequencies that are most annoying to the human ear. The FAA has suggested, but not mandated, guidelines for determining land use compatibility with a given Ldn or DNL level (day/night average sound level). Ideally, residentially areas should be located in areas below 65 DNL. The existing 65 DNL noise contour extends beyond the Airport boundary; however, there is no noise sensitivity or incompatible land uses within the 65 DNL noise contour. The existing noise contour is shown in **Figure 1-63**. There are no existing noise abatement programs currently in use for the Roswell International Air Center.

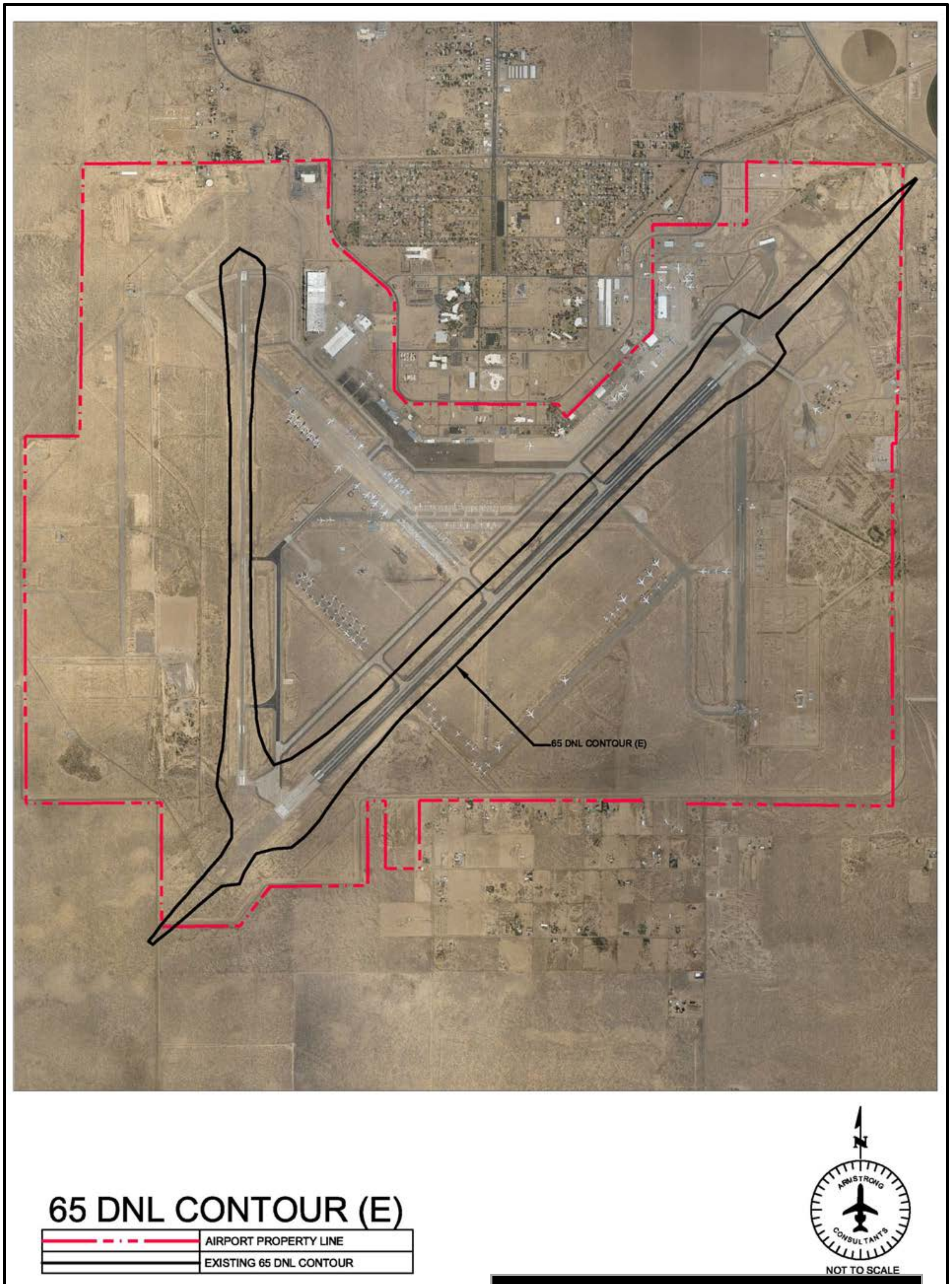


FIGURE 1-63 EXISTING 65 DNL NOISE CONTOUR

1.20 FINANCIAL INVENTORY

The primary goal of gathering financial data is to develop an understanding of the financial structure, constraints, requirements, and opportunities for airport activities as it relates to the development of the future airport improvements.

Table 1-25 provides a brief overview of historical financial information for the Airport. Financial statements have been gathered for fiscal years 2006 through 2010. A review of the financial documentation for Roswell International Air Center indicates that the Airport is operationally self-sufficient. Primary sources of revenue for the Airport include: hangar leases, Passenger Facility Charges (PFC), and landing fees, and Capital Improvement revenue. Primary expenses include: salaries and wages, benefits, operations and maintenance and funding local match on Airport Capital Improvement projects.

TABLE 1-25 AIRPORT REVENUE AND EXPENDITURES

AIRPORT REVENUE	2006	2007	2008	2009	2010
Capital Improvement Revenue *	$1,162,077	$859,802	$2,239,477	$1,598,396	$1,313,314
Fines and Forfeitures**	$568,462	$410,648	$371,792	$522,528	$553,579
Interest Incomes	$6,760	$105,302	$51,235	$42,746	$23,564
Rentals and Leases	$1,071,608	$1,173,050	$1,2016,366	$1,326,767	$1,396,418
Miscellaneous Revenue	$2,219,716	$23,234	$37,816	$21,309	$17,224
Passenger Facility Charge	$0	$0	$63,582	$173,877	$148,940
Charges for Services, use and landing fees and facility rental	$483,672	$473,434	$501,562	$513,964	$519,347
Transfers to Separate Accounts	($310,448)	($309,120)	($308,418)	($307,170)	($315,000)
Total Airport Revenue	**$5,201,847**	**$2,736,350**	**$4,173,413**	**$3,892,417**	**$3,657,387**
AIRPORT EXPENDITURES	**2006**	**2007**	**2008**	**2009**	**2010**
Salaries and Wages	$471,462	$442,650	$452,270	$377,103	$385,839
Benefits	$146,768	$136,122	$135,176	$111,980	$102,983
Operating Expense	$553,368	$2,248,865	$2,425,457	$1,708,267	$1,287,535
Capital Improvement Costs	$1,416,665	$1,589,198	$2,017,970	$1,755,627	$1,500,684
Retirement Fund	$47,951	$44,688	$44,843	$39,648	$42,372
Debt Service***	$0	$266,310	$266,310	$266,310	$266,310
Total Airport Expenditures	**$2,636,214**	**$4,727,833**	**$5,277,540**	**$4,258,935**	**$3,585,722**
Net Total Airport**	**$2,565,633**	**($1,991,483)**	**($1,168,613)**	**($366,517)**	**$71,665**

Source: Roswell International Air Center, Airport Management, 2011.
Prepared by: Armstrong Consultants, Inc., April 2011.
*Capital Improvement Revenue includes FAA and State grants.
** Payment from tenants/users for fines incurred during the calendar year
*** The amount you pay on a loan in principal and interest, over a period of time.
**** Individual totals rounded to the nearest tenth. Overall total is based on true total - not rounded.

PAGE INTENTIONALLY LEFT BLANK

CHAPTER
2
FORECASTS OF AVIATION ACTIVITY

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

ROSWELL NEW MEXICO

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING

Chapter Two
Forecasts of Aviation Activity

2.1 INTRODUCTION

Forecasts of aviation activity provide the basis for evaluating the adequacy of existing airport facilities and their capability to handle increased traffic levels or diverse types of traffic. Forecasting is the foundation for effective planning and is used to help determine when and if capital improvement projects are needed.

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

Commercial aviation forecasts and assumptions are typically developed from econometric models that explain and incorporate emerging trends from the different segments of the industry while integrating historical data and broadly accepted industry and governmental estimates of aviation activity, as well as the primary socioeconomic drivers of general aviation activity.

General aviation and commercial aviation forecasts vary in approach. The starting point for developing commercial aviation forecasts (air carriers and regional airlines) is the future schedules published in the Official Airline Guide (OAG). For initial-term forecasts (one year projection), current monthly trends are used in conjunction with published monthly schedules to allow FAA forecasters to develop monthly capacity and demand forecasts for both mainline and regional carriers for fiscal and calendar years 2012. Intermediate-and long-term forecasts (2013-2031) are based on results of econometric models. General aviation forecasts rely on discussions with industry experts and the results of the 2009 General Aviation and Part 135 Activity Survey. The assumptions in this report have been updated by FAA analysts to reflect more recent data and developing trends, as well as further information from industry experts.[1]

For this reason, an ongoing program of examination of local airport needs and national and regional trends is recommended and encouraged in order to promote the logical development of aviation facilities at Roswell International Air Center.

At airports served by air traffic control towers comprehensive logs of aircraft operations are available. The existing aviation activity levels are based upon this data to form the baseline to which forecasted aviation activity trends are applied. Roswell International Air Center has an Air Traffic Control Tower (ATCT) and activity level information was provided and utilized in this chapter.

Forecast methodologies and analysis consider historical aviation trends at Roswell International Air Center as well as throughout the nation. Local historical data was collected from the following sources: Federal Aviation Administration (FAA) Terminal Area Forecast (TAF) records; FAA Form 5010-1, Airport Master Record; 2009 New Mexico Airport System Plan (NMASP); Airport Management records; and, ATCT activity reports. Aviation activity projections are made based upon estimated growth rates, area demographics and socioeconomics, industry trends and other indicators. Forecasts are prepared for the Initial-Term (0-5 years); the Intermediate-Term (6-10 years); and, the Long-Term (11-20 years) time frames. Utilizing forecasts within

[1] Reference – FAA Aerospace Forecast Fiscal Years 2011-2031, June 2011.

these time frames will allow the Airport's improvements to be timed in order to efficiently meet demand, but not prematurely as to remain idle for an unreasonable length of time.

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

Local operations pertains to air traffic operations, aircraft operating in the local traffic pattern or within sight of the tower; aircraft known to be departing for, or arriving from, flight in local practice areas located within a 20-mile radius of the control tower; aircraft executing simulated instrument approaches or low passes at the airport.

Based aircraft operations are defined as the total operations made by aircraft based (stored at the airport on a permanent, seasonal or long-term basis) with no attempt to classify the operations as to purpose.

Itinerant operations are defined as arrivals and departures other than local operations and generally originate or terminate at another airport. These types of operations are closely tied to local demographic indicators, such as local industry and business use of aircraft and usage of the facility for recreational purposes.

Transient operations are defined as the total operations made by aircraft other than those based at the airport under study. These operations typically consist of business or recreational flights originating at other airports, with termination or a stopover at the study airport. The terms transient and itinerant are sometimes erroneously used interchangeably. This study will confine analysis to local and itinerant operations.

.

2.2 NATIONAL AND REGIONAL TRENDS

The FAA annually convenes expert panels in aviation and develops forecasts for future activity in all areas of aviation. The national trends listed below are from the *FAA Forecast Fiscal Years 2011-2031*. Given the current instability in the global economy, uncertainty remains in the timing for the recovery of demand in the aviation industry; therefore, the FAA has placed a larger variance around these forecasts than in previous years.

2.2.1 REGIONAL CARRIERS

Regional carrier aircraft flown domestically is projected to grow at a much faster pace than the mainline carriers. The faster growth in regional carriers is stimulated by the wave of 70 to 90 seat regional jet aircraft that are entering the fleet as well as reductions in the 50-seat and under jet fleet. Regional carriers are better equipped to support operations of their mainline partners by providing capacity that complements market demand. The greater number of the larger 70 to 90-seat regional jets in the fleet coupled with significant 50-seat jet retirements over the next few years increases the average seating capacity of the regional fleet from 56.2 seats in 2010 to 57.0 seats by 2012. The average seats per aircraft for the regional carriers' increases at an average annual growth rate of 0.5 seats per year; this growth equates to a total of 66 seats over the forecast period (2011-2031). The changing aircraft fleet mix is narrowing the gap between the size and aircraft types operated by the mainline and regional carriers.[2]

The regional carrier passenger fleet is forecast to increase by 31 aircraft in 2011 as increases in larger regional jets offset reductions in 50 seat and smaller regional jets. After 2011, the regional

[2] Reference – FAA Aerospace Forecast Fiscal Years 2011-2031, page 37.

carrier fleet is expected to increase by an average of 39 aircraft annually (1.3 percent) over the remaining years of the forecast period; totaling 3,384 aircraft in 2031 (see **Table 2-1**). The number of regional jets (90 seats and fewer) at regional carriers is projected to grow from 1,771 in 2010 to 2,764 in 2031, an average annual increase of 2.0 percent. All the growth in regional jets over the forecast period occurs in the larger 70 to 90-seat aircraft. During the forecast period, all regional jets of 50 or less seats are removed from the fleet. The turboprop/piston fleet is expected to shrink from 806 units in 2010 to 620 in 2031. Turboprop/piston aircraft are expected to account for just 18.3 percent of the regional carrier passenger fleet in 2031, down from a 31.3 percent share in 2010.[3]

The FAA's 2011-2031 forecast predicts regional carrier enplanements to increase 3.4 percent to 170 million in 2011 and grow at an average annual rate of 2.8 percent a year thereafter, reaching 295.9 million in 2031. In addition, the fleet is projected to grow by 1.2 percent in 2011.

TABLE 2-1 U.S REGIONAL CARRIERS PASSENGER AIRCRAFT

	Regional Aircraft											
				31 to 40 Seats			Over 40 Seats			Total Fleet		
	Less Than 9 Seats	10 To 19 Seats	20 to 30 Seats	Prop	Jet	Total	Prop	Jet	Total	Non-Jet	Jet	Total
Historical												
2008	451	107	68	180	43	223	121	1,730	1,851	927	1,773	2,700
2009	466	103	65	153	31	184	115	1,747	1,862	902	1,778	2,680
2010	406	96	64	124	3	127	116	1,768	1,884	806	1,771	2,577
2011	396	93	62	122	0	122	125	1,810	1,935	798	1,810	2,608
Forecast												
2012	383	91	60	117	0	117	136	1,858	1,994	787	1,858	2,645
2013	373	88	59	114	0	114	145	1,919	2,064	779	1,919	2,698
2014	362	86	57	110	0	110	155	1,962	2,117	770	1,962	2,732
2015	355	84	56	108	0	108	164	1,990	2,154	767	1,990	2,757
2016	343	81	54	105	0	105	173	2,004	2,177	756	2,004	2,760
2017	333	79	52	102	0	102	182	2,011	2,193	748	2,011	2,759
2018	323	76	51	99	0	99	191	2,017	2,208	740	2,017	2,757
2019	315	74	50	96	0	96	201	2,030	2,231	736	2,030	2,766
2020	305	72	48	93	0	93	210	2,057	2,267	728	2,057	2,785
2021	294	70	46	90	0	90	219	2,094	2,313	719	2,094	2,913
2022	284	67	45	87	0	87	229	2,136	2,365	712	2,136	2,848
2023	273	65	43	83	0	83	238	2,188	2,426	702	2,188	2,890
2024	263	62	42	80	0	80	247	2,245	2,492	694	2,245	2,939
2025	253	60	40	77	0	77	256	2,310	2,566	686	2,310	2,996
2026	243	58	38	74	0	74	265	2,382	2,647	678	2,382	3,060
2027	232	55	36	71	0	71	273	2,455	2,728	667	2,455	3,122
2028	220	52	35	67	0	67	283	2,531	2,814	657	2,531	3,188
2029	209	49	33	64	0	64	291	2,607	2,898	646	2,607	3,253
2030	196	46	31	60	0	60	300	2,689	2,989	633	2,689	3,322
2031	183	43	29	56	0	56	309	2,764	3,073	620	2,764	3,384
AAG												
2010-31	**-3.7%**	**-3.8%**	**-3.7%**	**-3.7%**	**-100%**	**-3.8%**	**4.8%**	**2.2%**	**2.4%**	**-1.2%**	**2.1%**	**1.3%**

Source: FAA Aerospace Forecast Fiscal Years 2011-2031, page 95
Prepared by: Armstrong Consultants, Inc., June 2011.

2.2.2 GENERAL AVIATION

General Aviation (GA) encompasses and touches nearly every aspect of the populations' lives and economy. GA is simply defined as all aviation other than military and scheduled commercial airlines. There are over 320,000 general aviation aircraft worldwide with nearly 228,000 of those

[3] Reference - FAA Aerospace Forecast Fiscal Years 2011-2031, page 43

aircraft based in the United States; including aircraft ranging from the Boeing Business Jet (B737) to the Piper Cub.

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

GA activity nationally has fallen 11.7 percent between 2009 and 2010 with steep declines in both itinerant (down 11.2 percent) and local (down 12.2 percent) activity. Most notably and recently, the U.S. economy went through an extremely turbulent time between 2009 and 2010 with unemployment reaching its highest point in the first quarter of FY 2010 (and will likely remain above 9.0 percent through 2012); the price of oil exceeding $100 a barrel and rising 35.5 percent (per barrel) in 2010 from 2009 prices; and, the downward spiral of the global economy. Data is not projecting forecasted relief within the oil sector and anticipates oil prices to maintain over $100 per barrel by 2018, gradually fall to just over $95 per barrel by 2023 and grow faster than the rate of inflation reaching $113.09 per barrel by 2030. The direct impact and correlation to the aviation industry is the restriction it places on commercial airlines' ability to experience profitability as well as the amount aircraft purchases and flight time for recreational pilots.[4] Business and corporate aviation have observed a significant downturn over the last couple of years, particularly in 2009 and 2010. The global economic recovery serves as the foundation for the length of slow down and growth within the aviation sector. These types of risk serve as major players within the forecast model. Perception of the public regarding the business and corporate aviation industry, unknown and potential environmental mitigation, regulation and taxes, and increased security measures placed on the business jet community and airports that service this sector will also put downward pressure on the forecast. **Figure 2-1** depicts the historical trend of national general aviation operations (in thousands) compared to Roswell International Air Center between 2000 and 2010.

[4] Reference - FAA *Aerospace Forecast Fiscal Years 2011-2031.*

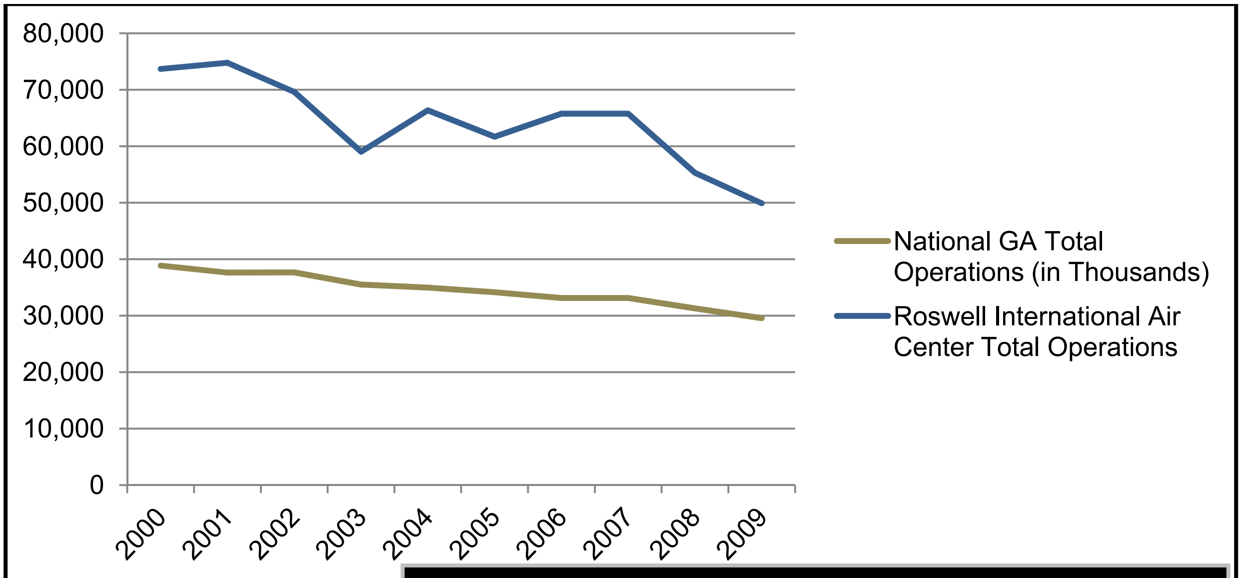


FIGURE 2-1 HISTORICAL NATIONAL GENERAL AVIATION OPERATIONS DATA

Source: 2011 General Aviation Manufactures Association & NMASP, 2009.
Prepared by: Armstrong Consultants, Inc., May 2011.

Within the last decade, environmental regulations and mitigation surrounding the regulations of noise, air quality, aviation emissions, and water quality concerns have impacted new construction and renovation for airports; each providing an impact on forecasting. The lack of progress on improving the environmental and energy outlook for the future can drive more restrictions via standards or operating limitations on the aircraft fleets in service, which in turn can depress activity. While many of the issues are more pronounced at commercial service airports, they do not go overlooked at local and regional airports where it has the potential to be a contentious issue with stakeholders and the airport alike.

As previously mentioned the FAA annually convenes expert panels in aviation and develops forecasts for future activity in all sectors of aviation - including general aviation. The FAA forecasts the fleet and hours flown for single-engine piston aircraft, multi-engine piston, turboprops, turbojets, rotorcraft (piston/turbine), sport, experiment and other (glider/balloon) aircraft. The FAA forecasts “active aircraft,” not total aircraft, and uses estimates of fleet size, hours flown, and utilization from the General Aviation and Air Taxi Activity and Avionics Survey (GA Survey). This survey serves as baseline figures upon which assumed growth rates can be applied.

According to the *FAA Aerospace Forecast Fiscal Years 2011-2031*, the demand for business jets has grown over the past several years due to new product offerings, the introduction of the very light jets (VLJ) and increasing foreign demand which have all contributed in driving this growth. Additionally, the current forecast assumes that business use of general aviation aircraft will expand at a more rapid pace than that for personal/sport use. In addition, corporate safety/security concerns for corporate staff, combined with increasing flight delays at some U.S. airports have made fractional, corporate, and on-demand charter flights practical alternatives to travel on commercial flights.

The active U.S. general aviation fleet is projected to increase at an average annual rate of 0.9 percent over the 21-year forecast period, growing from an estimated 224,172 in 2010 to 270,920 aircraft by 2031. The more expensive and sophisticated turbine-powered fleet (including rotorcraft) is projected to grow at an average of three percent a year over the forecast period with the turbine jet fleet increasing at 4.2 percent a year (see **Figure 2-2**); however, these numbers are down from previous year's outlook.[5]

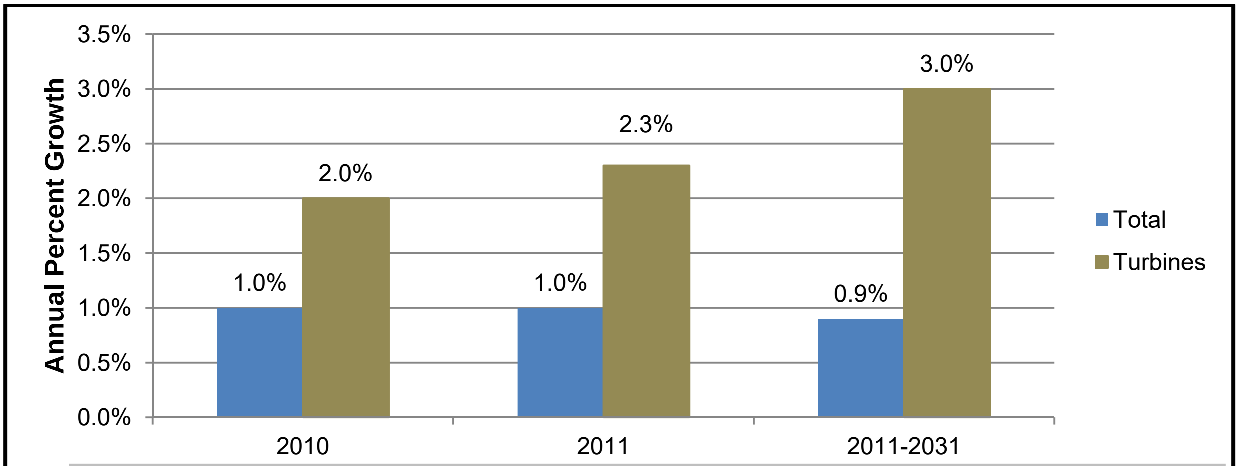


FIGURE 2-2 U.S. GENERAL AVIATION & ON-DEMAND FAR 135 PROJECTED OPERATIONS AND ENPLANEMENTS

Source: FAA Aerospace Forecast Fiscal Years 2011-2031
Prepared by: Armstrong Consultants, Inc., April 2011.

As recently as 2009, industry experts suggested the market for new Very Light Jets (VLJs) could add 440 aircraft to the US fleet over the next three years, with an average of 216 aircraft a year for the balance of the forecast period. The relatively inexpensive twin-engine VLJs (priced between $1 and $2 million) were believed by many to have the potential to redefine the business jet segment by expanding business jet flying and offering performance that could support a true on-demand air-taxi business service. However, events since that time have dampened original expectations for a rapid penetration of VLJs into the market, most notably the recession and the bankruptcy of Eclipse and the demise of DayJet. Recently the introduction of Embraer's Phenom 100 to the market has reignited the outlook and increased worldwide deliveries of the aircraft.[6]

By 2025 the annual utilization rate for all VLJs is forecast to be 432 hours. Traditional (non-VLJ) turbojets are expected to average approximately 368 hours per year by 2025, as VLJs are expected to have a greater share of their use in on-demand air taxi and shared ownership than the traditional turbojets.

The number of active piston-powered aircraft (including rotorcraft) is projected to decrease from the current total of 160,623 through 2018, with declines in both single and multi-engine fixed wing aircraft; however, it appears that the smaller category of piston-powered rotorcraft will project future growth. Beyond 2018, active piston-powered aircraft are forecasted to increase to 168,140 by 2031. This accounts for just 28.2 percent of the regional declines in both single-, and multi-engine aircraft. Over the forecast period, the average annual increase in piston-powered aircraft is 0.2 percent. Although piston rotorcrafts are projected to increase rapidly at 2.9 percent a year, they are a relatively small part of this segment of general aviation aircraft. Single-engine fixed-wing piston aircraft, which are much more common, are projected to grow at a much slower rate (0.3 percent respectively) while multi-engine fixed wing piston aircraft are projected to decline 0.9 percent a year. In addition, it is assumed that VLJs and new light sport aircraft could erode the replacement market for traditional piston aircraft at the high and low

[5] Reference - FAA *Aerospace Forecast Fiscal Years 2011-2031.*
[6] Reference - FAA *Aerospace Forecast Fiscal Years 2011-2031.*

ends of the market respectively.[7] **Figure 2-3** depicts the current general aviation fleet-mix percentages that are currently active and are broken down by aircraft type.

In 2005, a new category of aircraft (previously not included in the FAA's aircraft registry counts) was created: "light sport" aircraft. By the end of 2009, a total of 6,547 active aircraft were estimated to be in this category while the forecast assumes the fleet will increase approximately 450 aircraft per year until 2013. Thereafter the rate of increase in the fleet tapers considerably to roughly 330 per year. By 2031, a total of 13,870 light sport aircraft are projected to be in the fleet.[8]

The number of general aviation hours flown is projected to increase by 2.2 percent yearly over the forecast period. Much of the growth reflects increased flying by business and corporate aircraft as well as steady if relatively small annual percentage increases in utilization rates for piston-engine aircraft. Hours flown by turbine aircraft (including rotorcraft) are forecast to increase 3.7 percent yearly over the forecast period, compared with 0.8 percent for piston-powered aircraft; this forecasting period saw a decline in multi-engine piston aircraft compared to the increase in single-engine piston fixed wing aircraft. Turbojet turbine aircraft are forecast to account for most of the increase, with hours flown expanding at an average annual rate of 5.3 percent over the forecast period. The large increases in jet hours result mainly from the increasing size of the business jet fleet, along with measured recovery in utilization rates from recession induced record lows, and increases in the fractional ownership fleet and its activity level. According to the GAMA, worldwide fractional share owners decreased for the second year in a row to 4,862 from 4,881 (2009) and the number of owners is down 6.1 percent from its peak of 5,179 owners in 2008. Fractional ownership is defined as the opportunity for an individual or a company to purchase a share of an aircraft; most prominently found in the business jet sector. **Table 2-2** depicts the breakdown for all active general aviation aircraft (hours flown) and showing representation for the historical and future outlook during the forecast period.

The number of active general aviation pilots (excluding air transport pilots) is projected to be 527,660 in 2031, an increase of almost 42,000 (up 0.4 percent yearly) over the forecast period. Commercial pilots are projected to increase from 123,705 in 2010 to 136,300 in 2031, an average annual growth increase of 0.5 percent. The number of student pilots is forecast to increase at an average annual growth rate of 0.1 percent over the forecast period, growing from 119,119 in 2010 to 120,600 in 2031. In addition, FAA is projecting that by the end of the forecast period a total of 12,850 sport pilots will be certified. As of December 31, 2009, the number of sport pilot certificates issued was 3,682 reflecting a growing interest in this new "entry level" pilot certificate that was created in 2005. This number has increased 6.1 percent from 2009s projections. The number of private pilots' is projected to grow at an average annual growth rate of 0.3 percent over the forecast period to total 214,500 in 2031. New Mexico, compared to the national total of 584,437, has a total of 3,696 pilots ranking in the middle for the Southwest region and making up 0.6 percent of the national total.

---

[7] Reference - FAA *Aerospace Forecast Fiscal Years 2011-2031.*
[8] Reference - FAA *Aerospace Forecast Fiscal Years 2011-2031.*

TABLE 2-2 FAA FORECAST: U.S. GENERAL AVIATION AND ON-DEMAND PART 135 AIRCRAFT HOURS FLOWN (IN THOUSANDS)

	Fixed Wing				Rotorcraft		Experimental	Light Sport Aircraft	Other	Total General Aviation Fleet
	Piston		Turbine							
	Single Engine	Multi Engine	Prop	Jet	Piston	Turbine				
Historical										
2008	12,746	2,328	2,457	3,600	751	2,740	1,555	293	209	26,009
2009	11,732	1,904	2,225	3,161	755	2,248	1,286	282	178	23,771
2010	11,474	1,904	2,493	3,455	757	2,237	1,252	301	177	24,050
2011	11,449	1,845	2,538	3,595	781	2,300	1,289	326	178	24,301
Forecast										
2012	11,362	1,821	2,576	4,233	807	2,363	1,374	356	179	25,071
2013	11,248	1,821	2,609	4,780	833	2,430	1,489	384	180	25,774
2014	11,084	1,783	2,651	5,012	861	2,501	1,605	407	181	26,085
2015	10,936	1,728	2,680	5,250	892	2,579	1,721	431	181	26,398
2016	10,827	1,690	2,695	5,512	924	2,662	1,786	454	182	26,732
2017	10,796	1,664	2,712	5,763	958	2,748	1,830	478	183	27,132
2018	10,797	1,640	2,740	6,001	991	2,843	1,874	502	184	27,572
2019	10,835	1,618	2,767	6,258	1,025	2,921	1,910	528	184	28,046
2020	10,919	1,608	2,800	6,530	1,060	3,011	1,945	554	185	28,612
2021	11,036	1,592	2,827	6,803	1,095	3,101	1,981	581	186	29,202
2022	11,192	1,587	2,865	7,077	1,132	3,194	2,017	609	187	29,860
2023	11,388	1,589	2,907	7,369	1,169	3,288	2,054	638	188	30,590
2024	11,642	1,593	2,945	7,677	1,206	3,383	2,091	668	188	31,393
2025	11,942	1,603	2,983	7,997	1,243	3,478	2,128	699	189	32,262
2026	12,235	1,617	3,027	8,326	1,280	3,577	2,166	730	190	33,148
2027	12,533	1,631	3,071	8,666	1,317	3,676	2,204	763	191	34,052
2028	12,815	1,650	3,112	9,017	1,355	3,776	2,242	797	192	34,956
2029	13,090	1,671	3,154	9,391	1,392	3,877	2,280	832	192	35,879
2030	13,405	1,683	3,199	9,781	1,430	3,979	2,319	867	193	36,856
2031	13,699	1,693	3,250	10,178	1,469	4,082	2,359	904	194	37,828
AAG	**0.8%**	**-0.6%**	**1.3%**	**5.3%**	**3.2%**	**2.9%**	**3.1%**	**5.4%**	**0.4%**	**2.2%**

Source: FAA 2011-2031 Aerospace Forecast
Notes / AAG – Average Annual Growth ; Historical data is from 2000-2009, FAA General Aviation and Air Taxi (and Avionics) Surveys
Prepared by: Armstrong Consultants, Inc., April, 2011.

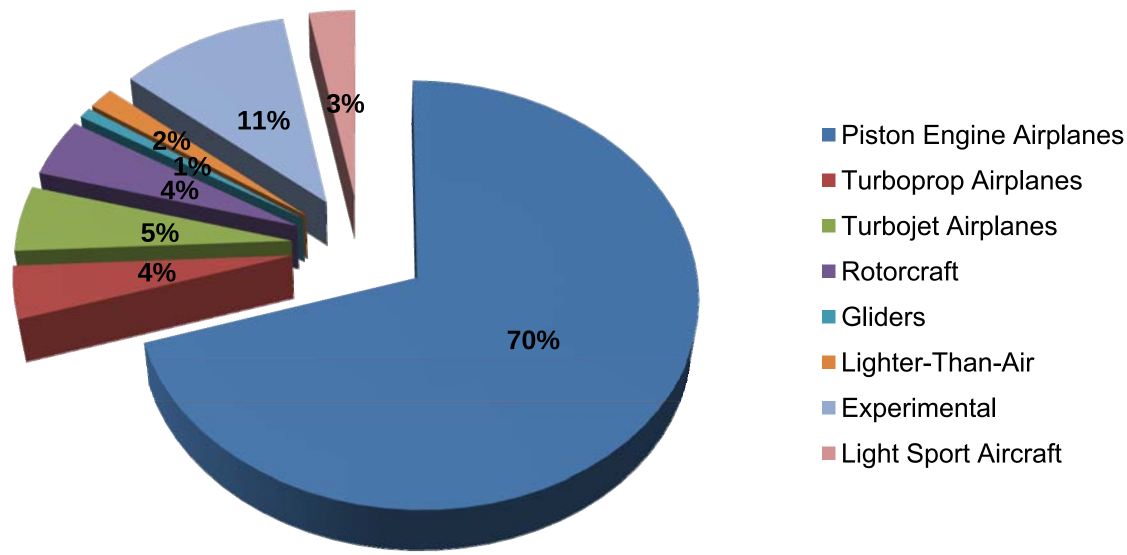


FIGURE 2-3 ACTIVE GENERAL AVIATION AND ON-DEMAND FAR 135 AIRCRAFT BY TYPE (2009)

Source: 2010 General Aviation Statistical Databook & Industry Outlook, published by GAMA, Page 30
Prepared by: Armstrong Consultants, Inc., April 2011.

2.2.3 OPERATIONS AT AIRPORTS WITH AIR TRAFFIC CONTROL SERVICE

Activity at the 510 FAA (264) and contract towers (246) totaled 51.2 million operations in 2010, down 3.2 percent from 2009. Activity is projected to decrease 0.6 percent in 2011, as declines in non-commercial operations more than offset increases in commercial activity. Growth in total activity at FAA and contract towers resumes in 2012 (1.6 percent) and for the balance of the forecast, activity grows at an average annual growth rate (AAGR) of 1.6 percent per year, reaching 69.3 million operations in 2031.

Most of the growth over the forecast period results from increased commercial aircraft activity (up 2.1 percent annually). Air carrier activity is projected to increase 2.6 percent in 2011 as carriers begin to restore flights following the 2009 recession. Beyond 2011, air carrier activity is projected to increase an average rate of 2.3 percent per year over the forecast period. Commuter/air taxi operations are forecasted to rise at an AAGR of 1.9 percent in 2011 and then increase 1.6 percent a year for the balance of the forecast period.

Over the forecast period, commercial aircraft operations at FAA TRACONs (Terminal Radar Approach Control) are forecast to increase at and AAGR of 2.1 percent with increases in air carrier activity surpassing commuter/air taxi activity. General aviation operations at FAA TRACONs are projected to grow 1.2 percent a year, reflecting the relatively slow growth in the general aviation fleet and hours. Military activity is expected to remain at its 2010 level (2.4 million) of activity throughout the forecast period.[9]

Another industry trend is the increasing amount of research funding for programs like NextGen. The National Aeronautics and Space Administration (NASA), Federal Aviation Administration, States, industry and academic partners have joined forces to pursue NextGen. This long-term strategic undertaking seeks to bring next-generation technologies and improved air access to small communities. The envisioned outcome is to improve travel between remote communities

[9] FAA Aerospace Forecast Fiscal Years 2011-2031, page 46-47.

and transportation centers in urban areas by utilizing a new generation of single-pilot light aircraft for personal and business transportation between the nation's 5,400 public use general aviation airports. Current NASA investments in aircraft technologies are enabling the industry to bring affordable, safe and easy-to-use features to the marketplace, including "Highway in the Sky" glass cockpit operating capabilities, affordable crashworthy composite airframes, more efficient Instrument Flight Rules (IFR) flight training, and revolutionary aircraft engines. To facilitate this initiative, a comprehensive upgrade of public infrastructure must be planned, coordinated and implemented within the framework of the national air transportation system. State partnerships are proposed to coordinate research support in key public infrastructure areas. Ultimately, NextGen may permit more than tripling aviation system throughput capacity by tapping the under-utilized general aviation facilities to achieve the national goal of doorstep-to-destination travel at four times the speed of highways for the nation's suburban, rural and remote communities.[10]

2.3 FORECASTING APPROACH

Projections of aviation demand incorporate local, regional and national trends assessing existing and future demand. Several methods have been applied in the development of the forecasts presented in this chapter. Socioeconomic factors such as local population and income, and employment are analyzed; the comparison of relationships among these various indicators provides the initial step in the development of realistic forecasts of demand. Activity levels generated by each methodology are presented in the following sections. Methodologies used to develop forecasts described in this chapter include:

- Socioeconomic Trends
- FAA Aerospace Forecast
- 2009 FAA Terminal Area Forecast
- 2009 New Mexico Airport System Plan Update
- Travel Propensity Factor (TPF)

The base year for the forecasts is 2010 and the forecast period is 20 years, with reporting periods at five-year increments for 2015, 2020, 2025, and 2030 and the preferred forecasts are presented at the end of each activity section. The average annual growth rate (AAGR) forecasting utilizes historical data to establish a growth rate for future years. AAGR is determined by the first and the last years in the historical period, and the length of the time in between those years. Future projections are determined by applying the AAGR to a base level of activity and forecasting levels for the desired number of years.

2.3.1 SOCIOECONOMIC TRENDS

Socioeconomics examine the direct relationship between economic and social factors that examine and develop an understanding of the service area. Local conditions that are examined typically focus on the population, economic strength of the area (per capita personal income) and the ability of the focus area to sustain economic growth throughout the planning period. Based upon the observed and projected correlation between historical aviation activity and the socioeconomic data, projected aviation forecasts are developed.

[10] Reference - FAA *Aerospace Forecast Fiscal Years 2011-2031.*

2.3.2 FAA AEROSPACE FORECAST

The FAA Aerospace Forecast is an annual publication that outlines the FAA's expectations for the future of the national airspace system. The FAA Aerospace Forecast considers national activity, instead of activity at specific airports which is forecasted by the FAA Terminal Area Forecast (TAF). This plan utilizes the FAA Aerospace Forecast Fiscal Year 2011-2031 to develop the Market Share.

2.3.3 2009 FAA TERMINAL AREA FORECAST

The FAA Terminal Area Forecast (TAF) is an annual publication that outlines the FAA's future expectations for airports in the National Plan of Integrated Airport Systems (NPIAS). The 2009 TAF serves as the baseline for forecasting methodologies. Data from the TAF will generate the growth rates used to forecast future aviation activity. The 2009 TAF is used to analyze historical correlation between aviation activity and the independent variables in the forecast methodology.

The first step in preparing aviation forecasts is to examine historical and existing activity levels and current available forecasts from other sources. The FAA TAF (December 2010) indicates 34 existing based aircraft for Roswell International Air Center, 49,906 existing annual operations and 36,168 annual enplanements. The TAF shows slow, marginal growth over the projected planning period ending with 39 based aircraft, 50,396 annual enplanements and 55,988 annual operations in 2030 (see **Figure 2-4**).

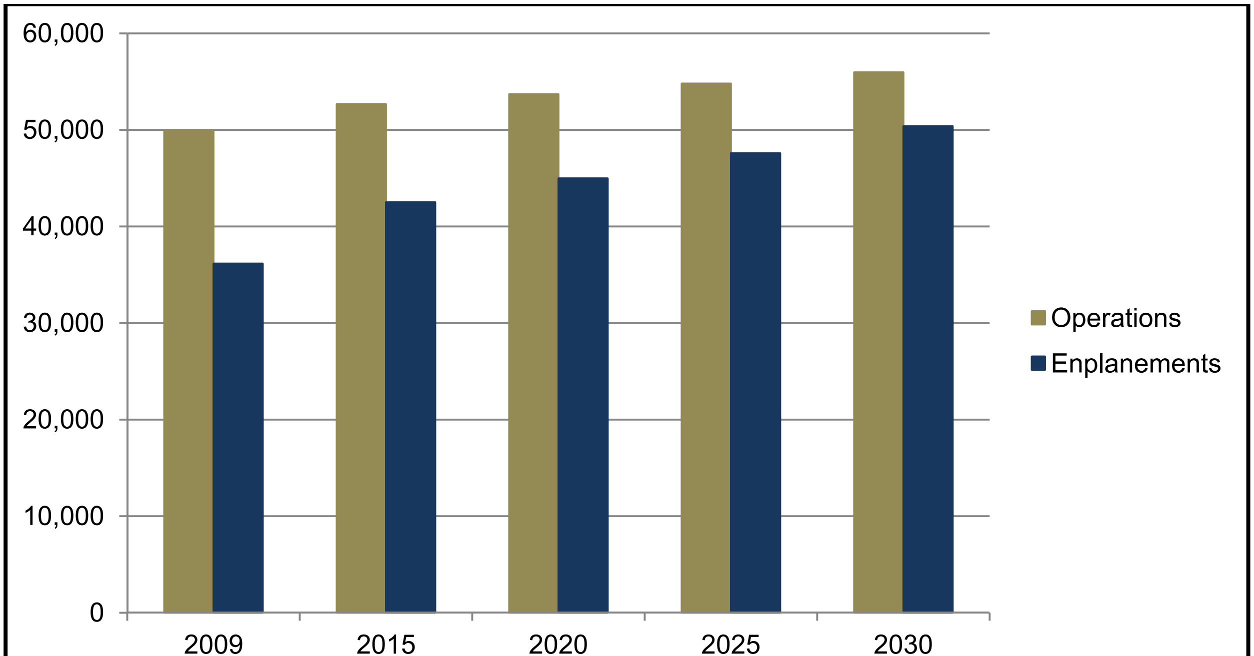


FIGURE 2-4 FAA TAF PROJECTED OPERATIONS AND ENPLANEMENTS

Source: FAA, 2009
Prepared by: Armstrong Consultants, Inc., April 2011.

2.3.4 New Mexico Airport System Plan Forecast

The 2009 New Mexico Airport System Plan (NMASP) is a document that summarizes the needs of New Mexico's airports and provides each airport with valuable information such as the economic importance of the airport and projected forecasted growth. **Figure 2-5** shows the forecast for Roswell International Air Center with a base year of 2007 in terms of enplanements and operations. The NMASP project enplanements to increase at an average annual growth rate of 4.3 percent; while the total operations are projected to grow at much slower average annual rate of 0.2 percent.

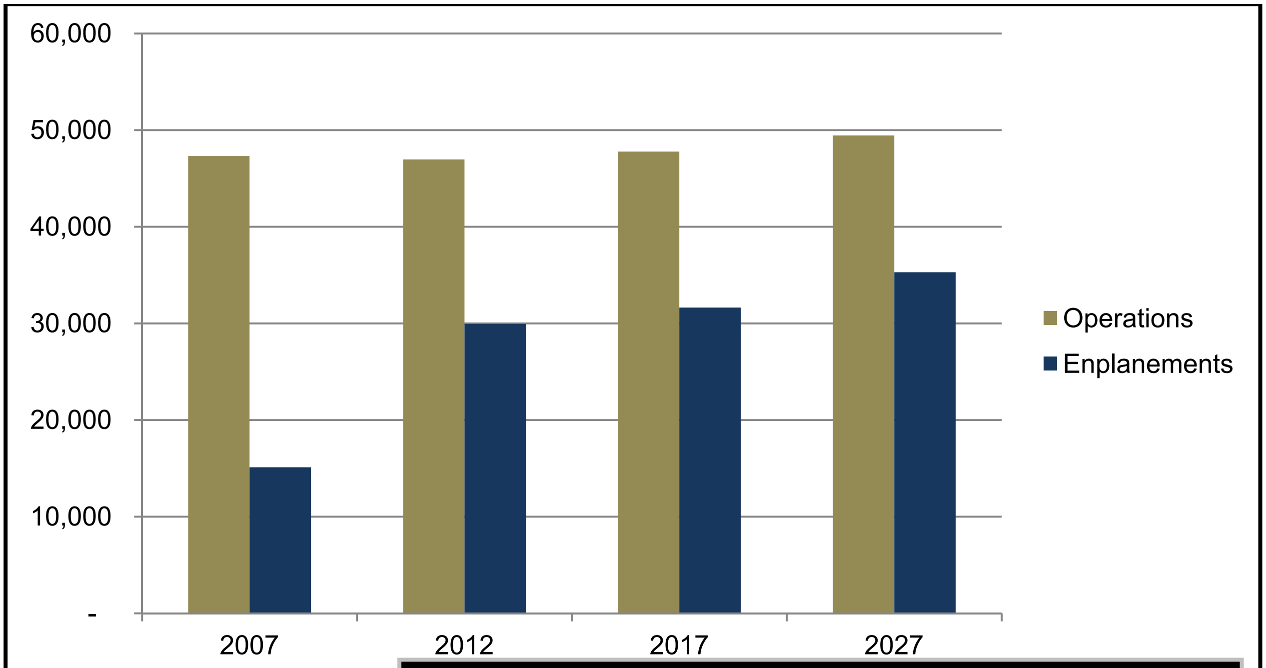


Figure 2-5 New Mexico Airport Systems Plan Update Forecast, 2009

Source: NMASP,2009
Prepared by: Armstrong Consultants, Inc., June 2011

2.3.5 Travel Propensity Factor (TPF)

The Travel Propensity Factor (TPF) method is defined as an individual's ability and willingness to travel based on various factors pertaining to life-style and socioeconomic conditions. This method may be used in determining forecast scenarios pertaining to enplanements and operations. In this report, historical enplanement and operations data was used in determining the average load factor over the course of the past ten years. Future projections are forecasted based on the average load factor over the past ten years applied to the planning period.

2.4 FAA Records of Based Aircraft and Operations

FAA Form 5010-1, Airport Master Record, is the official record kept by the Federal Aviation Administration to document airport physical conditions and other pertinent information. The record normally includes an annual estimate of aircraft activity as well as the number of based aircraft and this information is generally obtained from the airport sponsor. The accuracy of these documents varies directly with the sponsor's record keeping system. The FAA Form 5010-1 (January 2011) for Roswell International Air Center indicates 34 based aircraft and 49,713 annual aircraft operations. This form also breaks down the airport's operations to 303 Air

Carrier; 7,026 Air Taxi; 4,475 GA Local; 16,664 GA Itinerant operations; and, 21,245 military operations.

2.5 EXISTING AVIATION ACTIVITY

According to the Airport Manager (April, 2011) and ATCT activity counts there were 46 based aircraft, 51,558 annual operations and 38,933 annual enplanements at the Roswell International Air Center in 2010. These totals result in approximately 1,120 operations per based aircraft (OPBA). This represents the total annual operations divided by the number of based aircraft and includes operations by both based and transient aircraft. Airport management records are compiled from existing hangar and tie down leases, ATCT operational logs and are considered accurate and reliable for airport master planning purposes. **Table 2-3** shows the existing aviation activity for the Airport.

Roswell International Air Center serves a wide variety of aircraft ranging from small single-engine, multi-engine, and turbo-prop to heavy transport military aircraft. In general, uses include:

<u>Airline Transportation.</u> Airline passengers from southeastern New Mexico and west Texas are served at the Roswell International Air Center by American Eagle (dba AMR Corporation) which provides direct passenger service to Dallas/Fort Worth International Airport (DFW). Aircraft fleet mix includes the Embraer Regional Jet 145 (ERJ-145). The Airport is also occasionally utilized by aircraft diverting due to weather related issues at other surrounding commercial service airports.

<u>Air Cargo Transportation.</u> Cargo operations are conducted by Federal Express (FedEx) who operates Cessna 208's single-engine turbo prop aircraft.

<u>Aircraft Certification/Flight Testing.</u> These users test aircraft in order to receive an airworthiness certificate from the FAA which grants authorization to operate an aircraft in flight. Users who regularly utilize Roswell International Air Center include but not limited to: Boeing, Cessna, Gulfstream, and Embraer. This type of activity makes up a large portion the Airport's total operations.

<u>Business Transportation.</u> Business aviation users benefit by being able to travel to or from local commerce centers to conduct business activities in a single day - without requiring an overnight stay or extensive ground travel time. Local and other small businesses generally utilize single-, and multi-engine piston aircraft. Medium size businesses and large corporations having a need to travel to the Roswell area generally utilize multi-engine piston and turboprop aircraft and light to medium business jets respectively. This user category also includes state and federal agencies and travel by government officials.

<u>Personal Transportation</u>. These users desire the utility and flexibility offered by general aviation aircraft. The types of aircraft utilized for personal transportation vary with individual preference and resources and generally include a mix of single-, multi-engine and in some cases turbojet aircraft.

<u>Recreational and Tourism</u>. These users include transient pilots flying into the region to visit recreational and tourist attractions. These users typically utilize single-engine piston aircraft; however, a small percentage may operate multi-engine piston or larger aircraft. Other types of aircraft in this category often include home-built, experimental aircraft, gliders and ultralights.

Flight Training. These users conduct local and itinerant flights in order to meet flight proficiency requirements for obtaining FAA pilot certifications. These flights include touch-and-goes, day and night local and cross-country flights and practice approaches. Pilot certifications include Sport, Private, Instrument, Commercial, Instructor and Airline Transport ratings. Depending on the level of interest and aircraft availability, a multi-engine rating may or may not be available. A commercial rating may be accomplished with either a single-engine or multi-engine aircraft. Air transport ratings are usually obtained at larger regional FAR Part 121 certificated flight schools. Flight training is provided by the on-Airport fixed base operator (FBO), Great Southwest Aviation.

Fire Fighting. The U.S. Department of the Interior's Bureau of Land Management (BLM) currently oversees the Roswell Air Tanker Base, a reload base for large air tankers and host to single engine air tankers (SEAT's) during periods of peak fire activity. Implementing fire prevention activities to reduce the number of human-caused fires is also a program priority.

Military. The Airport is utilized on a daily basis by the Military for flight training as well as other activities including sky diving. Military aircraft which use the Airport include, but not limited to the MD-10, KC-10, C-130, C-5, C-17, V-22 and T-38's.

Storage and Salvage. Various commercial and cargo airlines utilize Roswell International Air Center for salvage and storage of discontinued aircraft from their fleet. Due to the dry, warm climate of Roswell, the Airport serves as a desirable place for aircraft storage and based on the minimal exposure to harsh weather conditions. The Airport stores predominately large and heavy jet aircraft.

2.5.1 Future Aviation Activity

In addition to the existing aviation activity mentioned in the section above, there are future activities anticipated at the Airport that are not currently utilizing the airport include:

Spaceport/Reusable Launch Vehicle (RLV). This activity would consist of and develop a horizontal launch facility at the Airport that will include various types and sizes of vehicles. Designated facilities would be constructed to house and operate this operation, and would not impact existing aviation activity. This operation would be utilized by operators who dedicate the activity to tourism and educational use throughout the planning period. These users would be different than conventional flight and not impact any of the existing commercial facilities. With the proximity of Roswell to Spaceport America, it is expected commercial space flights at Spaceport America will be focused on the end-user retail costumer experience and commercial spaceflight activities at Roswell would focus on research, development and testing activities. Therefore, future spaceport facilities at Roswell should consider existing RLVs as well as emerging technologies.

Unmanned Aircraft Vehicles (UAV). This operation would be one of six sites selected to serve as a location to test and operate unmanned aircraft vehicles (UAVs). The UAV operation would be operated under the MATRIX International Security Training and Intelligence Center (MISTIC) organization. The UAV operation would not impact the forecasted passenger demand through the planning period. It is also unknown at this time the impact on operational use; however, the operation is separate from existing aviation use and should not impact the Airport's forecast.

The two activities mentioned above would be included as industrial park activities further in the report and the impact to commercial aviation for forecasting purposes is unknown at this time. A detailed description as to the development and requirements for this time of these operations can be found in Chapter 3 – Facility Requirements.

TABLE 2-3 EXISTING AVIATION ACTIVITY

CATEGORY	2010
Enplaned Passengers	
	38,933
Annual Instrument Operations	
	20,635
Annual Operations	
Itinerant	
Air Carrier/Air Taxi/Commuter	6,340
General Aviation	9,447
Military	10,270
Total Itinerant	**26,087**
Local	
General Aviation	4,514
Military	20,957
Total Local	**25,471**
Total Operations	**51,558**
Based Aircraft	
Single Engine	42
Multi Engine	2
Jet	1
Rotorcraft	1
Total Based Aircraft	**46**

Source: Extrapolated from previous sections of this report
Prepared by: Armstrong Consultants, Inc., June 2011.

2.6 FORECASTS OF AVIATION ACTIVITY

2.6.1 FACTORS INFLUENCING AVIATION DEMAND

Factors influencing aviation demand at Roswell International Air Center incorporate the growth of the City of Roswell and the population within the service area - including the growth in the business industry for commercial development as well as residential growth. The area has also shown significant economic stability due to the notoriety for UFO incident and the nickname, “Alien Capital of the World.” The city also has an economic strong-hold in the ranching industry.

Air service by American Eagle to Dallas/Ft. Worth International Airport connects Roswell to the world. Competitive airfare rates influence regional aviation demand by reducing the need or desire to drive to Albuquerque, NM; El Paso, TX; Amarillo, TX; or, Lubbock, TX to fly. Competitive fuel prices will also influence demand especially for general aviation airport users.

Additional flights serving the Airport could include connections to Los Angeles, CA; Phoenix, AZ; and Denver, CO[11] which would increase the regional and local demand.

2.7 PASSENGER ENPLANEMENT FORECAST

Passenger enplanements are the total number of revenue passengers boarding an aircraft, including originating, stopover, and transfer passengers, in scheduled and nonscheduled service operated by aircraft with more than 30 seats. The FAA characterizes enplanements as air carrier and commuter. Air Carrier enplanements are those that occur on an aircraft with more than 60 seats, and commuter enplanements are those that occur on an aircraft with 60 or fewer seats; total enplanements at Roswell International Air Center are provided by commuter enplanements. Over the past ten years, the Airport has witnessed its passenger activity fluctuate. The Airport experienced a steep decline of passengers between 2000 and 2007 falling 57 percent. The introduction of new service (additional daily flights) by American Eagle has provided Roswell International Air Center with steady growth since 2008.

A comparative analysis of enplanement forecasts was accomplished using three methodologies to derive a preferred forecast of enplanements.

Cohort – Method 1

The cohort forecast utilized a balanced correlation between the *FAA Aerospace Forecast Fiscal Years 2011-2031* on the national level and the New Mexico Airport System Plan on the regional/state level to determine projected enplanement growth. Based on historical trends and state wide economic projections, the NMASP forecasted an average annual growth of 4.3 percent for the planning period. U.S. annual enplanement growth of 2.8 percent was slated for regional enplanement growth based by the *FAA Aerospace Forecast Fiscal Years 2011-2031*. The average annual growth rate between the two forecasts projects a 3.5 percent growth over the planning period (see **Table 2-4**).

TABLE 2-4 COHORT - METHOD 1

Year	FAA	NMASP	Cohort
2010	38,933	38,933	38,933
2015	44,698	48,055	46,240
2020	51,316	59,315	54,919
2025	58,913	73,212	65,226
2030	67,636	90,366	77,486
AAGR	**2.8%**	**4.3%**	**3.5%**

Source: TAF, December 2010 & NMASP, 2009
Prepared by: Armstrong Consultants, Inc., June 2011.

Per Capita Personal Income (PCPI) – Method 2

Per capita personal income (PCPI) is an indicator of economic health and stability of a community. In terms of forecasting enplanements, Chaves County anticipates forecasted growth in PCPI due to the growth of higher paying and manufacturing jobs, which will cause the per capita income to trend upwards. It is assumed that an increase in population will have a direct impact on the number of enplanements occurring at the Airport. This results in 65,053 enplanements in 2030 with an average annual growth rate of 3.1 percent. The second method results are shown in **Table 2-5**.

[11] *Boyd Group International, "Air Service Study," 2011.*

TABLE 2-5 PER CAPITA PERSONAL INCOME - METHOD 2 (PREFERRED)

Year	PCPI	Enplanements
2010	$18,141	38,933
2015	$20,625	44,264
2020	$23,450	50,326
2025	$26,661	57,217
2030	$30,312	65,053
AAGR	**2.6%**	**2.6%**

Source: Bureau of Business and Economic Research, University of Mexico, August 2008
Prepared by: Armstrong Consultants, Inc., June 2011.

Population Growth – Method 3

According to the Bureau of Business and Economic Research organization, it is estimated that Chaves County will grow at an average annual growth rate of 0.55 percent (see **Figure 2-6**); thus providing a low growth rate in terms of enplanements. Population has a direct impact on the number of enplanements occurring at the Airport; as population grows, it is assumed that the total number of people traveling (enplanements) will increase equally. This method projects 43,447 enplanements by 2030.

TABLE 2-6 POPULATION GROWTH - METHOD 3

Year	Population	Enplanements
2010	65,645	38,933
2015	67,470	40,015
2020	69,346	41,128
2025	71,274	42,272
2030	73,256	43,447
AAGR	**0.55%**	**0.55%**

Source: New Mexico County Population Projections, Bureau of Business and Economic Research, University of New Mexico (2008)
Prepared by: Armstrong Consultants, Inc., June 2011.

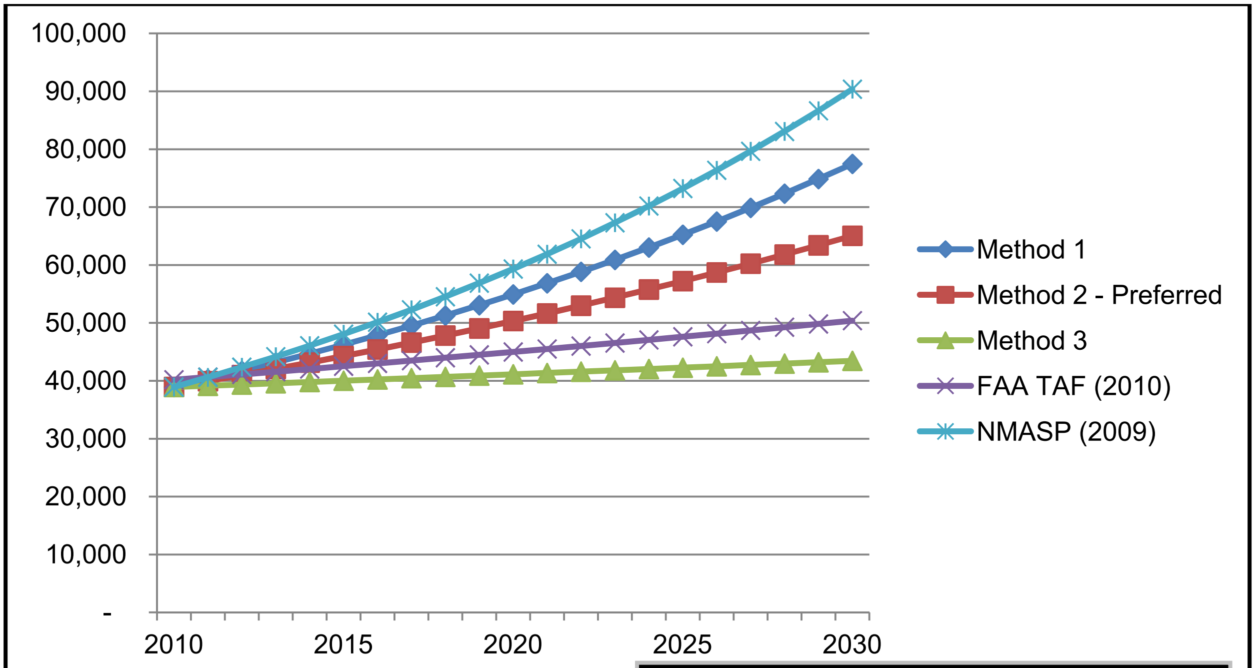
Preferred Forecast

These forecasts provide a reasonable range for projected enplanements (see **Table 2-7**). The Per Capita Personal Income (Method 2) was selected as the preferred forecast for future enplanement projections. It was assumed that Population growth (Method 3) forecast would grow at the slowest rate and the Cohort (Method 1) at a higher rate than the PCPI, thus making Method 2 the preferred method. The Method 2 forecast was selected due to the condition of the current economy and the expected slowdown in growth over the next few years; thus, providing the most realistic method for projected growth. **Figure 2-6** shows the likely range of future enplanements at Roswell International Air Center; however, because existing enplanement levels are based on a single route provided by a single carrier the introduction of new route or carrier can result in wide variations of passenger enplanements.

TABLE 2-7 ENPLANEMENT FORECAST COMPARISON

Year	Cohort	PCPI	Population
2010	38,933	38,933	38,933
2015	46,240	44,264	40,015
2020	54,919	50,326	41,128
2025	65,226	57,217	42,272
2030	77,486	65,053	43,447
AAGR	**3.5%**	**2.6%**	**0.55%**

Source: Extrapolated from forecasts in Section 2.7
Prepared by: Armstrong Consultants, Inc., June 2011.



Source: Extrapolated from forecasts in Section 2.7
Prepared by: Armstrong Consultants, Inc., June 2011.

FIGURE 2-6 ENPLANEMENT FORECAST COMPARISON

2.8 BASED AIRCRAFT FORECAST

Based aircraft represent aircraft that are stored in a hangar and/or tie-down at Roswell International Air Center. The TAF categorizes based aircraft as single-engine, multi-engine, jet, helicopter, and other. Single-engine aircraft and multi-engine aircraft are propeller-driven turbine and piston aircraft. Jet aircraft include turbine jet engines. Helicopters include rotorcraft and other includes gliders and hot air balloons.

A comparative analysis of based aircraft forecasts was accomplished using four methodologies to derive a preferred forecast of based aircraft for Roswell International Air Center.

Cohort – Method 1

The cohort forecast utilized a balanced correlation between the FAA *Aerospace Forecast Fiscal Years 2011-2031* on the national level and the New Mexico Airport System Plan on the regional/state level to determine forecasted based aircraft growth. Based on historical trends and state wide economic projections, the NMASP forecasted an average annual growth of 0.8 percent for the planning period. The FAA *Aerospace Forecast Fiscal Years 2011-2031* projects 1.8 percent average annual national growth over the planning period. The average annual growth rate between the two forecasts projects a 1.3 percent growth over the 20-year planning period resulting in 60 based aircraft in 2030 as shown in **Table 2-8**.

TABLE 2-8 COHORT - METHOD 1 (PREFERRED)

Year	FAA Aerospace Forecast	NMASP	Roswell International Air Center
2010	2,014	2,189	46
2015	2,202	2,278	49
2020	2,407	2,370	52
2025	2,632	2,467	56
2030	2,877	2,567	60
AAGR	**1.8%**	**0.8%**	**1.3%**

Source: FAA TAF, 2010 & NMASP, 2009
Prepared by: Armstrong Consultants, Inc., June 2011.

Per Capita Personal Income (PCPI) – Method 2

The Per Capita Personal Income (PCPI) method utilized an average annual growth rate approach that projects the number of based aircraft in direct proportion to the projected per capita personal income of Chaves County. This method results in 77 based aircraft at Roswell International Air Center in 2030 (see **Table 2-9**).

TABLE 2-9 PER CAPITA PERSONAL INCOME - METHOD 2

Year	Per Capita Personal Income	Roswell International Air Center
2010	$18,141	46
2015	$20,625	52
2020	$23,450	59
2025	$26,661	68
2030	$30,312	77
AAGR	**2.6%**	**2.6%**

Source: Bureau of Business and Economic Research, University of Mexico, August 2008 and Airport Management
Prepared by: Armstrong Consultants, Inc., June 2011.

Population Growth – Method 3

According to the Bureau of Business and Economic Research organization, it is estimated that Chaves County will grow at an average annual growth rate of 0.55 percent (see **Table 2-10**); thus providing low growth rate in terms of based aircraft. Population has a direct impact on the number of based aircraft at an airport. As population grows, it is assumed that the total number of based aircraft will increase equally. This method projects 51 based aircraft at Roswell International Air Center in 2030.

TABLE 2-10 POPULATION GROWTH - METHOD 3

Year	Chaves County Population	Roswell International Air Center
2010	65,645	46
2015	67,470	47
2020	69,346	49
2025	71,274	50
2030	73,256	51
AAGR	**0.55%**	**0.55%**

Source: New Mexico County Population Projections, Bureau of Business and Economic Research, University of New Mexico (2008)
Prepared by: Armstrong Consultants, Inc., June 2011.

Preferred Forecast

It is anticipated that Roswell International Air Center's based aircraft growth rate will trend closer to the Cohort (Method 1) rather than the County population (Method 3) or PCPI (Method 2) forecast. Therefore, Method 1, the Cohort method was selected as the preferred based aircraft forecast (see **Table 2-11** and **Figure 2-7**).

TABLE 2-11 BASED AIRCRAFT FORECAST COMPARISON

Year	Cohort	PCPI	Population
2010	46	46	46
2015	49	52	47
2020	52	59	49
2025	56	68	50
2030	60	77	51
AAGR	**1.3%**	**2.6%**	**0.55%**

Source: Extrapolated from the tables within Section 2.8
Prepared by: Armstrong Consultants, Inc., June 2011.

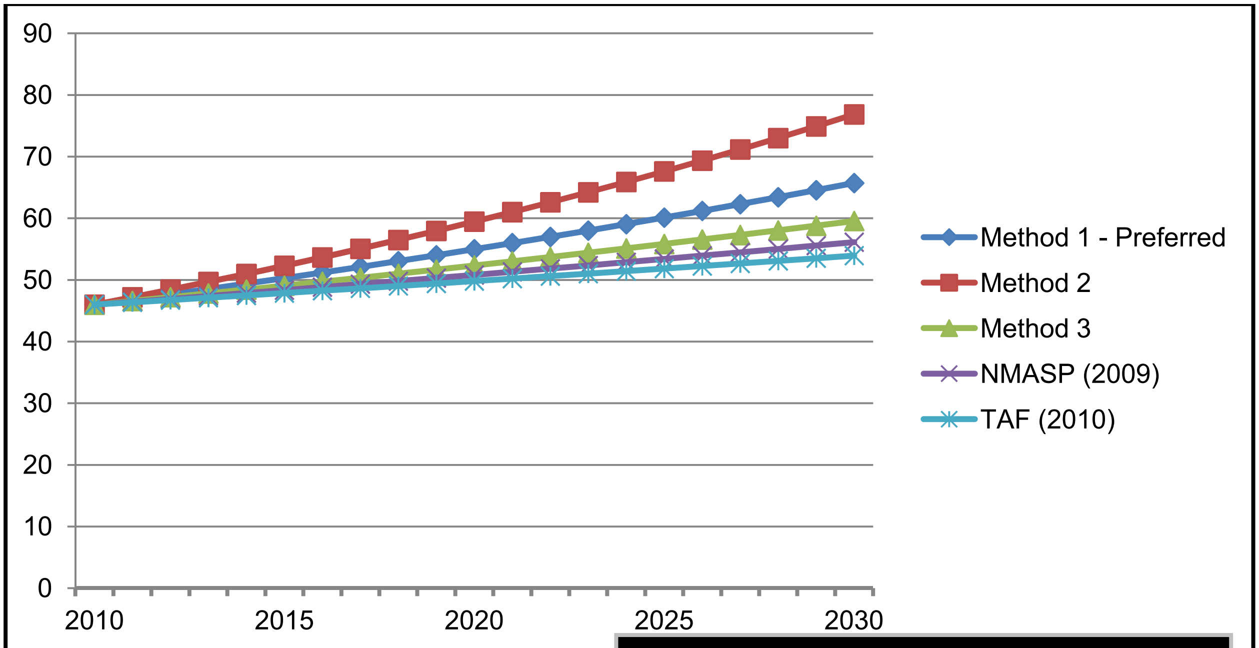


FIGURE 2-7 BASED AIRCRAFT FORECAST COMPARISON

Source: Extrapolated from the tables within Section 2.8
Prepared by: Armstrong Consultants, Inc., June 2011.

2.9 AIRCRAFT OPERATIONS FORECAST

Forecasts of aircraft operations were prepared for three separate elements of aviation activity. The three elements include: commercial service operations, general aviation operations and military operations.

2.9.1 COMMERCIAL SERVICE OPERATIONS

In an effort to develop a preferred method of forecasting commercial service aircraft operations at Roswell International Air Center, three methods were analyzed:

Travel Propensity Factor - Method 1

The Travel Propensity Factor (TPF) method is defined as an individual's ability and willingness to travel based on various factors pertaining to life-style and socioeconomic conditions. For this method, historical enplanement (and projected enplanement based on the preferred method) and the correlation to operations was utilized to determine the future annual growth of operations. This method is based on the average load factor ratio (5.45) for the past ten years of historical information and carried forward through the planning period. The average load factor was derived by dividing the total number of enplanements by the total number of commercial operations. The average load factor of 5.45 was utilized for the planning period average annual growth, thus resulting in 11,929 operations in 2030 (see **Table 2-12**).

TABLE 2-12 TPF - METHOD 1

Year	Enplanements	TPF	Operations
Historical			
2000	16,706	2.28	7,330
2001	12,941	1.94	6,658
2002	9,296	1.10	8,472
2003	6,447	0.74	8,751
2004	8,482	0.91	9,364
2005	9,570	0.97	9,915
2006	9,298	1.05	8,849
2007	15,112	1.71	8,814
2008	34,712	4.58	7,571
2009	38,391	5.49	6,990
2010	39,933	6.29	6,340
Forecast			
2015	44,264	5.45	8,117
2020	50,326	5.45	9,228
2025	57,217	5.45	10,492
2030	65,053	5.45	11,929
AAGR	**--**	**5.45**	**5.45**

Source: Armstrong Consultants, Inc., June 2011
Prepared by: Armstrong Consultants, Inc., June 2011.

Per Capita Personal Income - Method 2

The Per Capital Personal Income (PCPI) method was utilized in determining the total number of commercial service operations at Roswell International Air Center. A future average annual increase of 2.6 percent over the course of the planning period results in 10,593 commercial operations in 2030, as shown in **Table 2-13**.

TABLE 2-13 PER CAPITA PERSONAL INCOME - METHOD 2 (PREFERRED)

Year	PCPI	Operations
2010	$18,141	6,340
2015	$20,625	7,208
2020	$23,450	8,195
2025	$26,661	9,318
2030	$30,312	10,593
AAGR	**2.6%**	**2.6%**

Source: Bureau of Business and Economic Research, University of Mexico, August 2008 and Airport Management
Prepared by: Armstrong Consultants, Inc., June 2011.

Population Growth - Method 3

According to the Bureau of Business and Economic Research organization, it is estimated that Chaves County population will grow at an average annual growth rate of 0.55 percent (see **Table 2-14**); thus providing low growth rate in terms of commercial operations. Population has a direct impact on the number of operations occurring at the Airport. As population grows, it is assumed that the total number of operations will increase proportionately. This method projects 10,593 commercial service operations at Roswell International Air Center by 2030.

TABLE 2-14 POPULATION GROWTH - METHOD 3

Year	Chaves Co. Population	Operations
2010	65,645	6,340
2015	67,470	6,516
2020	69,346	6,697
2025	71,274	6,884
2030	73,256	7,075
AAGR	**0.55%**	**0.55%**

Source: New Mexico County Population Projections, Bureau of Business and Economic Research, University of New Mexico (2008)
Prepared by: Armstrong Consultants, Inc., June 2011.

Preferred Forecast

It is anticipated that Roswell International Air Center's based aircraft growth rate will trend closer to the Per Capita Personal Income projection rather than the County population or TPF forecast. Therefore, Method 2, the PCPI method was selected as the preferred based aircraft forecast as shown in **Table 2-15**.

TABLE 2-15 COMMERCIAL OPERATIONS FORECAST COMPARISON

Year	TPF	PCPI	Population
2010	6,340	6,340	6,340
2015	8,117	7,208	6,516
2020	9,228	8,195	6,697
2025	10,492	9,318	6,884
2030	11,929	10,593	7,075
CAGR	**5.45**	**2.6%**	**0.55%**

Source: Extrapolated from the tables within Section 2.9.1.
Prepared by: Armstrong Consultants, Inc., June 2011.

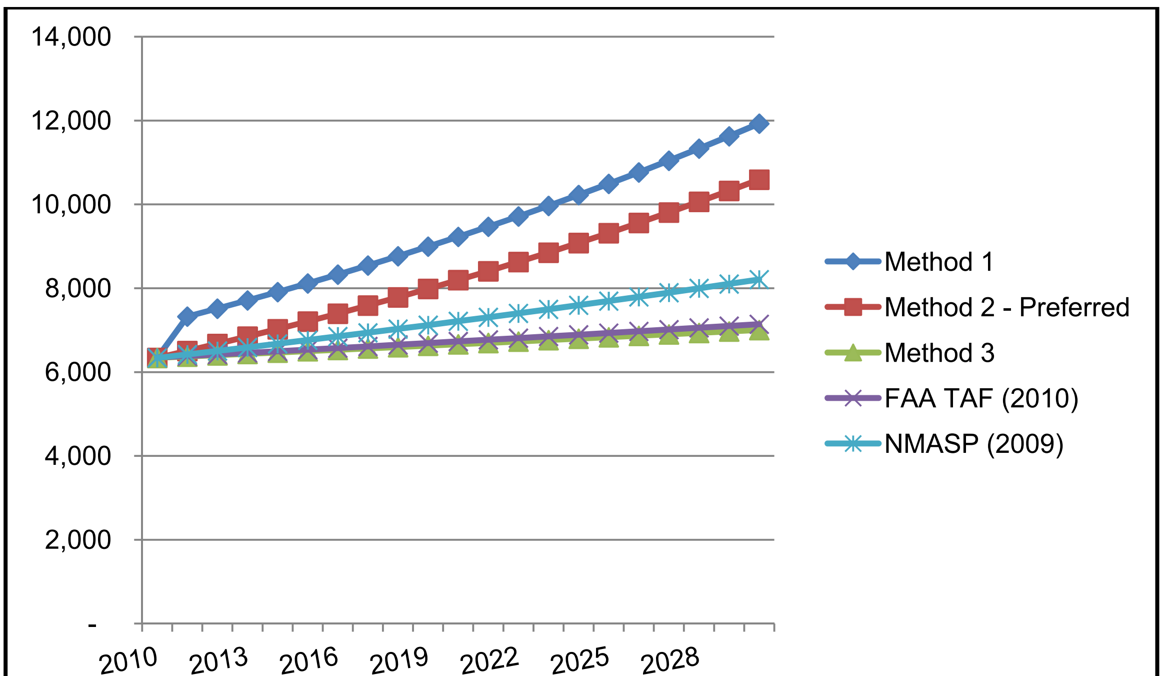


FIGURE 2-8 COMMERCIAL OPERATIONS FORECAST SUMMARY

Source: Extrapolated from the tables within Section 2.9.1
Prepared by: Armstrong Consultants, Inc., June 2011.

2.9.2 GENERAL AVIATION OPERATIONS

Three methods were analyzed in an effort to develop a preferred method of forecasting general aviation aircraft operations at Roswell International Air Center. As a baseline reference, historical general aviation operations can be found below in **Table 2-16**.

TABLE 2-16 GENERAL AVIATION HISTORICAL OPERATIONS

	General Aviation Operations		
Year	**Itinerant**	**Local**	**Total**
2000	24,292	12,741	37,033
2001	18,523	7,964	26,487
2002	16,340	10,635	26,975
2003	14,397	10,277	24.674
2004	18,479	11,626	30,105
2005	16,804	10,487	27,291
2006	20,200	6,729	26,929
2007	18,355	5,739	24,094
2008	18,536	5,887	24,423
2009	12,480	5,219	17,699
2010	9,447	4,514	13,961
Forecast			
2015	11,010	5,181	16,191
2020	12,742	5,996	18,738
2025	14,745	6,939	21,684
2030	17,054	8,026	25,080

Source: FAA TAF, December 2010 & FAA ATCT Activity Report, 2010
Prepared by: Armstrong Consultants, Inc., June 2011.

Each of the three methods utilizes the preferred forecast of 60 based aircraft in 2030 and then applies an OPBA to the based aircraft forecast. The methods utilized are summarized as follows:

Method 1: Existing operations and based aircraft (304 OPBA)

Method 2: FAA Order 5090.3C (750 OPBA)

Method 3: FAA TAF OPBA (456 OPBA)

For the first method (Method 1), the base year level of operations per based aircraft of 304 was applied to the preferred based aircraft forecast. Applying 304 OPBA to the preferred based aircraft forecast results in 18,240 annual operations in 2030.

For the second method (Method 2), a general guideline from FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)* of 750 OPBA for busy reliever airports with a high number of itinerant operations was utilized. Applying 750 OPBA to the preferred based aircraft forecast results in 45,000 annual operations in 2030.

The third method (Method 3), as outlined in FAA Advisory Circular 150/5300-13, *Airport Design*, applied 456 OPBA (for NPIAS Public-Use Airports) to the preferred based aircraft forecast. This method results in a forecast of 27,360 annual operations in 2030.

These estimates provide a likely range of activity for future general aviation operations at Roswell International Air Center and are shown in **Figure 2-9**. Aircraft operations are expected to increase with the additional based aircraft. It is reasonable to anticipate that the OPBA will increase at a gradual pace over the planning period. Therefore, Method 3 has been selected as the preferred general aviation operations forecast due to its moderate growth in correlation with the pace of growth expected in other areas of the Airport.

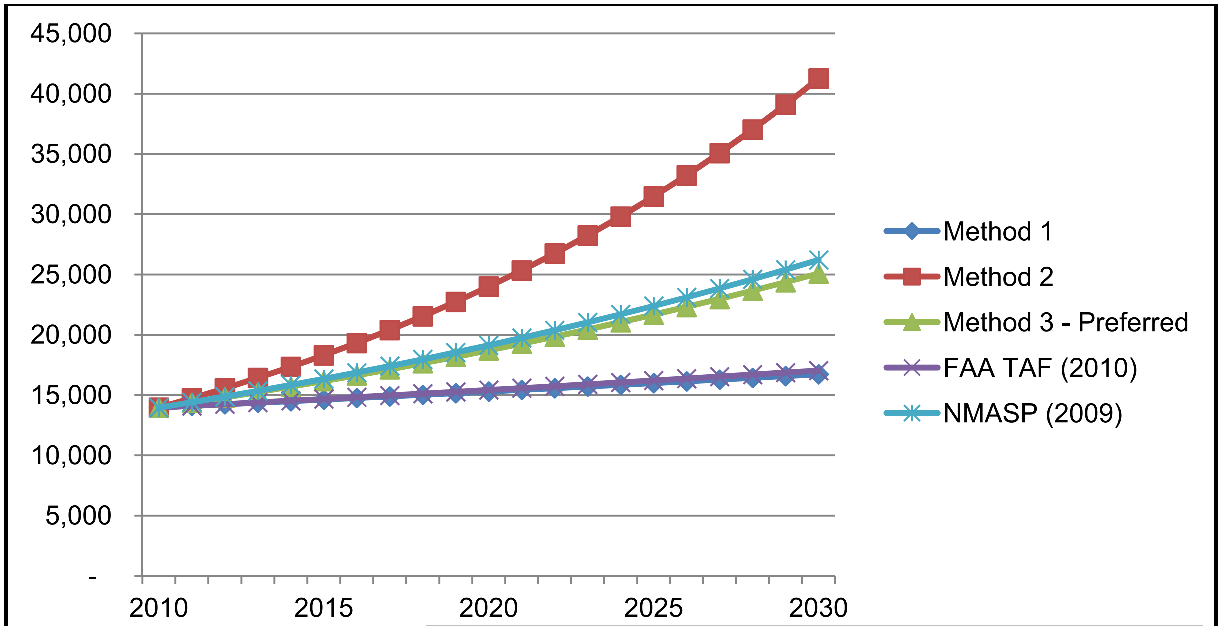


FIGURE 2-9 GENERAL AVIATION OPERATIONS FORECAST SUMMARY

Source: Extrapolated from Tables within Chapter
Prepared by: Armstrong Consultants, Inc., June 2011.

2.9.3 MILITARY OPERATIONS

Annual military aircraft activity is a function of the Department of Defense (DOD) policy, military appropriateness and mission assigned to a particular unit or division; therefore projections of military aircraft are not quantitatively practicable through previous methods of forecasting (socioeconomic indicators). Historical military operations at Roswell International Air Center obtained from the FAA Terminal Area Forecast (December, 2010) and presented in **Table 2-17** show the total operations (itinerant and local) for military activity fluctuating broadly between 2000 and 2010. For the purposes of this forecast effort, military activity is projected to maintain an average annual growth of three percent (the average growth rate during the historical ten year timeframe) through the planning period.

TABLE 2-17 MILITARY OPERATIONS

Year	Military Operations			AAGR
	Itinerant	Local	Total	
Historical				
2000	12,019	17,310	29,329	--
2001	17,263	24,838	41,646	42%
2002	17,643	16,539	34,182	-18%
2003	13,237	12,373	25,610	-25%
2004	13,663	13,222	26,885	5%
2005	11,914	12,564	24,478	-9%
2006	14,874	15,133	30,007	23%
2007	15,343	17,520	32,863	10%
2008	11,846	11,445	23,291	-29%
2009	12,001	13,216	25,217	8%
2010	10,270	20,957	31,227	24%
Forecast				
2015	11,946	24,254	36,200	3%
2020	13,849	28,118	41,967	3%
2025	16,055	32,596	48,651	3%
2030	18,612	37,788	56,400	3%

Source: FAA Terminal Area Forecast, December 2010 and Armstrong Consultants, Inc., June 2011.
Prepared by: Armstrong Consultants, Inc., June 2011.

2.9.4 ITINERANT AND LOCAL OPERATIONS

Aircraft operations are defined in this chapter as commercial service, general aviation and military operations. General aviation and military operations can be segregated into two further categories - local or itinerant. Local operations are defined as air traffic operating in the local traffic pattern or within sight of the tower; aircraft known to be departing for, or arriving from, flight in local practice areas located within a 20-mile radius of the ATCT; aircraft executing simulated instrument approaches or low passes at the airport. This type of operation is made-up of primarily training, business, aircraft testing and certification and recreational flights in the area.

Itinerant operations are defined as all aircraft arrivals and departures other than local operations. These flights include those by locally based aircraft; primarily consisting of airline, cargo, personal transportation, business transportation and recreational flights to and from other airports. The existing split of 51 percent itinerant operations and 49 percent local operations is expected to remain fairly constant over the 20-year planning period. Anticipated users whose operations would likely be considered local include ranchers, aerial observation and surveying, recreation, tourism and flight training according to Airport Management. The breakdown of itinerant operations is less than 1.0 percent air carrier, 12 percent air taxi, 27 percent general aviation and 61 percent military.

2.9.5 AIRCRAFT OPERATIONS SUMMARY

Table 2-18 depicts the forecast summary utilizing the preferred projections for Roswell International Air Center. This is a fairly conservative outlook that shows marginal growth over the 20-year planning period. Based on the forecasted types of uses for the Airport, local and itinerant operations are expected to be conducted by light single-, and multi-engine and medium to large turboprop and jet aircraft. The future based aircraft fleet mix is anticipated to remain mostly single-, and multi-engine aircraft.

TABLE 2-18 FORECAST SUMMARY

CATEGORY	Current	Forecast			
	2010	**2015**	**2020**	**2025**	**2030**
Enplaned Passengers					
	38,933	44,264	50,326	57,217	65,053
Annual Instrument Operations					
	20,635	23,840	27,560	31,861	36,829
Annual Operations					
Itinerant					
Air Carrier/ Air Taxi/Commuter	6,340	7,208	8,195	9,317	10,593
General Aviation	9,447	11,010	12,742	14,745	17,054
Military	10,270	11,946	13,849	16,055	18,612
Total Itinerant	**26,087**	**30,164**	**34,768**	**40,118**	**46,259**
Local					
General Aviation	4,514	5,181	5,996	6,939	8,026
Military	20,957	24,254	28,118	32,596	37,788
Total Local	**25,471**	**29,435**	**34,114**	**39,535**	**45,814**
Total Operations	**51,558**	**59,599**	**68,882**	**79,653**	**92,073**
Based Aircraft					
Single Engine	42	44	47	49	51
Multi Engine	2	3	3	4	5
Jet	1	1	1	1	2
Rotorcraft	1	1	1	2	2
Total Based Aircraft	**46**	**49**	**52**	**56**	**60**

Source: Extrapolated from previous sections of this report
Prepared by: Armstrong Consultants, Inc., June 2011.

2.10 AIRPORT SEASONAL USE DETERMINATION

A seasonal fluctuation in aircraft operations may be expected at any airport. This fluctuation is most apparent in regions with severe winter weather patterns and at non-towered general aviation airports. The fluctuation is less pronounced at major airports, with a high percentage of commercial and scheduled airline activity.

The average seasonal use trend for FAA towered airports from the 1979-1984 records (total aircraft operations handled by tower facilities nationally from FAA Statistical Handbook of Aviation) was used as a baseline for determining seasonal use trends. As discussed above, the seasonal fluctuation is less pronounced at towered airports than non-towered airports. This is presented in **Table 2-19** and in **Figure 2-10**.

TABLE 2-19 SEASONAL USE TREND

Month	Non-Towered	Towered
January	3.5%	7.2%
February	4.0%	8.2%
March	4.8%	8.6%
April	7.5%	9.0%
May	11.3%	9.1%
June	13.5%	9.4%
July	14.8%	9.1%
August	13.0%	8.7%
September	10.0%	8.7%
October	8.0%	7.8%
November	5.8%	7.1%
December	3.8%	7.1%

Source: FAA Statistical Handbook of Aviation, 1979-1984
Prepared by: Armstrong Consultants, Inc., April 2011.

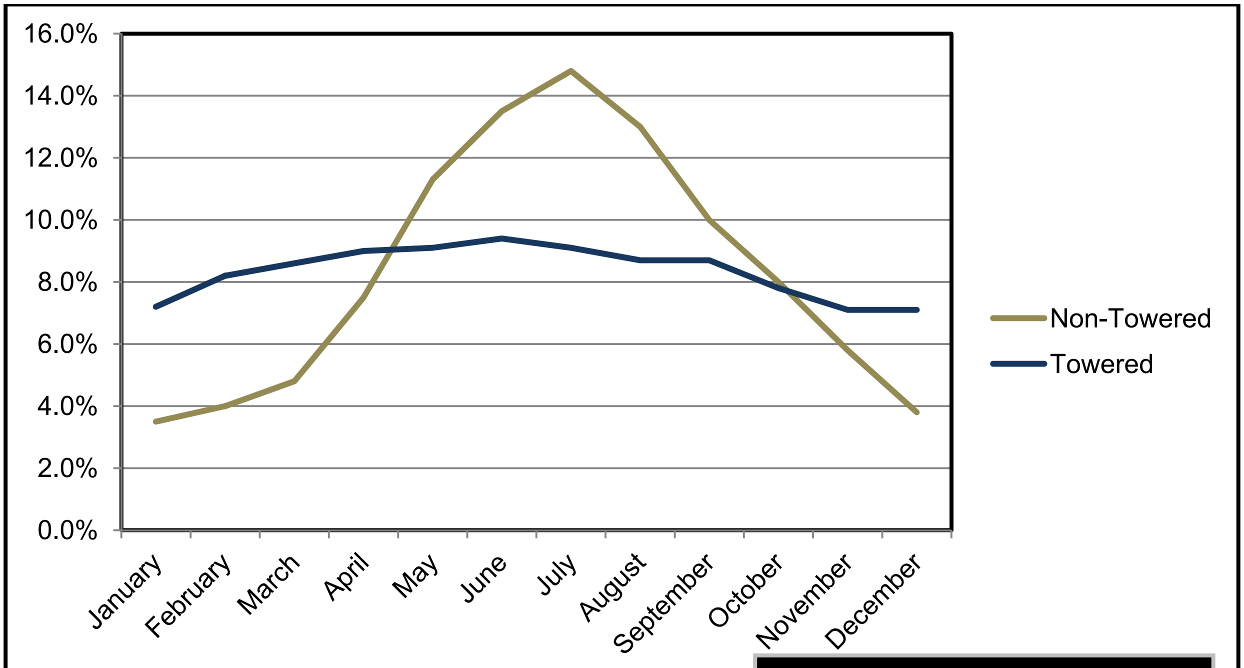


FIGURE 2-10 SEASONAL USE TREND

Source: FAA Statistical Handbook of Aviation, 1979-1984
Prepared by: Armstrong Consultants, Inc., April 2011.

2.11 HOURLY DEMAND AND PEAKING TENDENCIES

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

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

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

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

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

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

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

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

$$P=1.5\ (0.90D/12)$$

Where D=Average Daily Operations in a given month.
P=Peak Hourly Demand in a given month.

These calculations were prepared for each month of each phase of the planning period. The results of the calculations are shown in **Table 2-20** and **Table 2-21**. As is evident in the Tables, the Design Day and Design Hour peak demand in the planning year occurs under VFR weather conditions in the month of June (highlighted in bold in each Table), with 285 daily operations and approximately 32.1 operations per hour in 2030.

TABLE 2-20 ESTIMATED HOURLY DEMAND/MONTH (PASSENGERS)

Operations	2010	2015	2020	2025	2030
Annual	38,933	44,264	50,326	57,217	65,053
Peak Month	3,660	4,161	4,731	5,378	6,115
Peak Month Average Day	120	137	156	177	201
Peak Hour	13.5	15.4	17.6	19.9	22.6

Source: FAA Statistical Handbook of Aviation, 1979-1984 & Data extrapolated from previous section
Prepared by: Armstrong Consultants, Inc., June 2011.

TABLE 2-21 ESTIMATED HOURLY DEMAND/MONTH (OPERATIONS)

Planning Year: 2015
Operations: 59,599

Month	% use	Monthly	Daily	Hourly
January	7.2	4,291	141	15.9
February	8.2	4,887	161	18.1
March	8.6	5,126	169	19.0
April	9.0	5,364	176	19.8
May	9.1	5,424	178	20.0
June	**9.4**	**5,602**	**184**	**20.7**
July	9.1	5,424	178	20.0
August	8.7	5,185	170	19.1
September	8.7	5,185	170	19.1
October	7.8	4,649	153	17.2
November	7.1	4,232	139	15.6
December	7.7	4,589	151	17.0

Planning Year: 2020
Operations: 68,882

Month	% use	Monthly	Daily	Hourly
January	7.2	4,961	163	18.3
February	8.2	5,650	186	20.9
March	8.6	5,925	195	21.9
April	9.0	6,201	204	23.0
May	9.1	6,270	206	23.2
June	**9.4**	**6,477**	**213**	**24.0**
July	9.1	6,270	206	23.2
August	8.7	5,994	197	22.2
September	8.7	5,994	197	22.2
October	7.8	5,374	177	19.9
November	7.1	4,892	161	18.1
December	7.7	5,305	174	19.6

Planning Year: 2025
Operations: 79,652

Month	% Use	Monthly	Daily	Hourly
January	7.2	5,735	189	21.3
February	8.2	6,531	215	24.2
March	8.6	6,850	225	25.3
April	9.0	7,169	236	26.6
May	9.1	7,248	238	26.8
June	**9.4**	**7,487**	**246**	**27.7**
July	9.1	7,248	238	26.8
August	8.7	6,930	228	25.7
September	8.7	6,930	228	25.7
October	7.8	6,213	204	23.0
November	7.1	5,655	186	20.9
December	7.7	6,133	202	22.7

Planning Year: 2030
Operations: 92,073

Month	% Use	Monthly	Daily	Hourly
January	7.2	6,629	218	24.5
February	8.2	7,550	248	27.9
March	8.6	7,918	260	29.3
April	9.0	8,287	272	30.6
May	9.1	8,379	275	30.9
June	**9.4**	**8,655**	**285**	**32.1**
July	9.1	8,379	275	30.9
August	8.7	8,010	263	29.6
September	8.7	8,010	263	29.6
October	7.8	7,182	236	26.6
November	7.1	6,537	215	24.2
December	7.7	7,090	233	26.2

Source: FAA Statistical Handbook of Aviation, 1979-1984 & Data extrapolated from previous section
Prepared by: Armstrong Consultants, Inc., June 2011.

2.12 FORECAST SUMMARY

Multiple forecasts were prepared for Roswell International Air Center to determine a probable range of projected aircraft activity levels. Activity estimates were made for enplanements, based aircraft, operations, and the ultimate fleet mix at the Airport and the forecasts represent low, medium and high expected activity trends. A summary of the forecasts of aviation activity are provided in accordance with the FAA forecast format in **Appendix B**. A review of the Airport Master Plan forecast and TAF indicates that the Master Plan exceeds the TAF in operations and based aircraft. The FAA shows a slow, marginal growth in based aircraft and operations. The projected growth from existing activity levels explains why the Master Plan preferred forecasts exceed the TAF by more than 10 percent. The Air Service Market Analysis performed by the Boyd Group (2011) recommends the Airport continue to research and maintain communication with other airlines whom might be interested in starting service at Roswell International Air

Center. The Airport's first priority should be to maintain its existing level of service and then develop additional service for those passengers visiting Roswell. While looking to increase service at the Airport, it is advantageous for the Airport to communicate and reach out to the local community for ideas in partnering with airlines for potential financial incentives.

PAGE INTENTIONALLY LEFT BLANK

CHAPTER

3

FACILITY REQUIREMENTS

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

Chapter Three
Facility Requirements

3.1 INTRODUCTION

One of the primary objectives of this Airport Master Plan is to determine the size and configuration of airport facilities needed to accommodate the types and volume of aircraft expected to utilize the Airport. Chapter 1 – Inventory, and Chapter 2 – Forecasts of Aviation Activity are coupled with established planning criteria to determine improvements that are necessary to airside and landside areas. This chapter provides an assessment of the ability of existing facilities to meet current demands and provides Roswell International Air Center with alternatives in Chapter 4 – Development Alternatives that determine the ability for meeting the facility's future demand needs.

The time frame for addressing development needs usually involves Initial-Term (0-5 years), Intermediate-Term (6-10 years) and Long-Term (11-20 year) periods. Long-range planning primarily focuses on the ultimate role of the airport and is related to development. Intermediate-term planning focuses on a more detailed assessment of needs, while the initial-term analysis focuses on immediate action items and may include details not geared towards long-term development.

3.2 AIRPORT REFERENCE CODE

The Airport Reference Code (ARC) is a coding system established by the FAA and used to relate airport design criteria to the operational and physical characteristics of the aircraft intended to operate at the airport. The ARC has two components relating to the airport design aircraft.

The first component, depicted by a letter (e.g. A, B, C, D, or E) is the aircraft approach category and relates to the aircraft approach speed based upon operational characteristics. An aircraft fits into a category based on 1.3 times the stall speed of that aircraft at maximum gross weight in the landing configuration.

The second component of the ARC is the aircraft design group and is depicted by a Roman numeral (e.g. I, II, III, IV V or VI). The aircraft design group is based on an aircraft's physical characteristics (wingspan or tail height, whichever is most demanding).

In general, runway standards are related to aircraft approach speed, airplane wingspan, and designated or planned approach visibility minimums. Taxiway and taxilane standards are related to aircraft design group. **Table 3-1** and **Figure 3-1** provides a definition of both Aircraft Approach Categories and Aircraft Design Groups. The Airport has two runways, both of which are capable of handling air carrier traffic. One runway has an ARC D-IV classification (Runway 3/21) and the other has an ARC C-III classification (Runway 17/35). The ARC, along with approach minimums, has a direct impact and affect on the size of the surfaces associated with each runway.

TABLE 3-1 AIRPORT REFERENCE CODE

Approach Category	Approach Speed (knots)
Category A	Less than 91
Category B	91 to 120 knots
Category C	121 to 140 knots
Category D	141 to 165
Category E	166 or more

Design Group	Wingspan (feet)	Tail Height (feet)
Group I	Less than 49	Less than 20
Group II	49 to 78	20 to 29
Group III	79 to 117	30 to 44
Group IV	118 to 170	45 to 59
Group V	171 to 213	60 to 65
Group VI	214 to 261	66 to 79

Source: FAA AC 150/5300-13, Airport Design
Prepared by: Armstrong Consultants, Inc., April, 2011.

FIGURE 3-1 AIRPORT REFERENCE CODE (ARC)

Source: FAA AC 150/5300- 13, Airport Design
Prepared by: Armstrong Consultants, Inc., June 2011

To ensure that all airport facilities are designed to accommodate the expected air traffic and to meet FAA criteria, the specific ARC for the airport must be determined. In order to designate a specific ARC for an airport, aircraft in that ARC should perform a minimum of 500 annual itinerant operations (250 takeoffs and 250 landings). The majority of aircraft currently utilizing Roswell International Air Center have an ARC of A-I through D-IV; however, there are frequent operations by D-V aircraft, primarily landings of Boeing 747-400s for salvage and C-VI aircraft (Lockheed C-5 Galaxy) conducting training exercises (airport users and fleet mix were discussed in Chapter 2 – Forecasts of Aviation Activity). Examples of aircraft with an ARC of A-II and B-II are listed in **Table 3-2**. Examples of aircraft with an ARC of C-II and D-II are listed in **Table 3-3**. Examples of aircraft with an ARC of C-III and D-III are listed in **Table 3-4** and examples of aircraft with an ARC of C-IV and D-IV are listed in **Table 3-5**. Lastly, examples of aircraft with an ARC of D-V and C-VI are listed in **Table 3-6.** Aircraft with an ARC of B-II through D-IV are expected to be the predominant aircraft to utilize the Airport in the initial-, intermediate-, and long-term time frames.

This information indicates that fundamental development items should be based on an ARC of D-IV for aircraft weighing up to 140,000 pounds SWG, 175,000 pounds DWG or 270,000 pounds DTW. The design aircraft for Roswell International Air Center is the Boeing DC-10-40. The Roswell International Air Center BLM Tanker Base is designed to accommodate the MDC-DC-10-40 air tanker which is the most demanding aircraft operating at the Airport on a regular basis. As previously stated, the Airport is also utilized by Group V aircraft such as the Boeing 747-400, the Lockheed C-5 Galaxy and other large aircraft for testing and certification.

TABLE 3-2 ARC A-II AND B-II AIRCRAFT

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Air Tractor 802F	105	58.0	11.2	16,000
Beech King Air C90-1	100	50.3	14.2	9,650
Beech Super King Air B200	103	54.5	14.1	12,500
Cessna 441	100	49.3	13.1	9,925
Cessna Citation II	108	51.6	15.0	13,300
Cessna Citation III	114	50.6	16.8	17,000
Cessna Citation Bravo	112	52.2	15.0	14,800
Dassault Falcon 50	113	61.9	22.9	37,480
Dassault Falcon 200	114	53.5	17.4	30,650
Dassault Falcon 900	100	63.4	24.8	45,500
DHC-6 Twin Otter	75	65.0	19.5	12,500
Gulfstream I	113	78.5	23.0	35,100
Pilatus PC-12	85	52.3	14.0	9,920

Source: FAA AC 150/5300-13, Airport Design and Aircraft Manufacturer's Data
Prepared by: Armstrong Consultants, Inc., April 2011.

TABLE 3-3 ARC C-II AND D-II AIRCRAFT

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Canadair CL-600	125	61.8	20.7	41,250
Gulfstream-III	136	77.8	24.4	68,700
1329 JetStar	132	54.5	20.4	43,750
Sabre 80	128	50.4	17.3	24,500
Gulfstream-II	141	68.8	24.5	65,300
Gulfstream-IV	145	77.8	24.4	71,780
Embraer 145	131	65.9	22.2	48,501
Cessna Citation 650	126	53.6	20.4	23,000
Cessna Citation 750 X	131	63.6	19.3	36,100
Astra 1125	126	52.5	18.2	23,500
Hawker 125-1000	130	61.9	16.6	36,000
Falcon 900 EX	126	63.5	24.9	48,300

Source: FAA AC 150/5300-13, Airport Design and Aircraft Manufacturer's Data
Prepared by: Armstrong Consultants, Inc., April 2011.

TABLE 3-4 ARC C-III AND D-III AIRCRAFT

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Airbus A-320-100	138	111.3	39.1	145,505
Boeing 727-200	138	108	34.9	209,500
Boeing 737-500	140	94.8	36.6	133,500
Fairchild C-119	122	109.3	27.5	77,000
BAC 111-475	135	93.5	24.5	98,500
Lockheed P-3 Orion	134	99.7	33.8	135,000
MDC DC-9-82	135	107.8	30.3	149,500
BAC 111-500	144	93.5	24.5	104,500
HS. 121 Trident Super 3B	146	98	28.3	158,000

Source: FAA AC 150/5300-13, Airport Design and Aircraft Manufacturer's Data
Prepared by: Armstrong Consultants, Inc., April 2011.

TABLE 3-5 ARC C-IV AND D-IV AIRCRAFT

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Boeing 707-200	145	130.8	41.7	257,340
Boeing 757-200	135	156.1	52.9	335,000
Boeing 767-300ER	145	156.1	52.6	412,000
MD- KC-10 Extender	149	165.4	58.6	590,000
MDC-DC-8-20/30/40	133	142.4	43.3	315,000
MDC-DC-10-40*	149	165.3	58.6	572,000
MDC-MD-11	155	169.8	57.8	602,500

Source: FAA AC 150/5300-13, Airport Design and Aircraft Manufacturer's Data
Prepared by: Armstrong Consultants, Inc., April 2011.
**Design aircraft for Roswell International Air Center*

TABLE 3-6 ARC D-V AND C-VI AIRCRAFT

Aircraft	Approach Speed (knots)	Wingspan (feet)	Tail Height (feet)	Max T.O. Weight (pounds)
Boeing 747-400	157	213.0	64.0	875,000
Boeing 777-200	136	199.0	61.5	545,000
Boeing 777-300	149	199.0	61.5	660,000
Boeing 747-8F	159	224.7	63.6	975,000
Lockheed Galaxy C-5B	135	222.7	65.1	837,000

Source: FAA AC 150/5300-13, Airport Design and Aircraft Manufacturer's Data
Prepared by: Armstrong Consultants, Inc., April 2011.

3.3 AIRSIDE FACILITY REQUIREMENTS

3.3.1 RUNWAY REQUIREMENTS

Annual Service Volume (ASV). The ASV is a calculated reasonable estimate of an airport's annual capacity; taking into account differences in runway utilization, weather conditions and aircraft mix that would be encountered in one year. When compared to the forecasts or existing operations of an airport, the ASV will give an indication of the adequacy of a facility in relationship to its activity level. The ASV is determined by reference to the charts contained in FAA Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*.

The FAA has developed a computer software program entitled "Airport Design." The program provides the user with recommended runway lengths and other facilities on an airport according to FAA design standards. The FAA Airport Design Program was used to calculate the ASV for a single runway airport with the forecasted operation levels determined in Chapter 2. ASV for the runway configuration is 230,000 operations per year. Under these conditions, the existing runway facilities will adequately meet the demand within the time frame of this study. The existing operations are approximately 19 percent of the ASV for the airport and the forecasted operations are approximately 29 percent of the ASV for the airport.

The demand/capacity relationship provides airport's with valuable planning tools that will aid in determining the timing of airfield capacity enhancing projects. Demands that approach and/or exceed the ASV will result in significant delays at the airport; and demands can occur before an airport has reached its capacity. According to FAA Order 5090.3C, *Field Formation of the National Plan of Integrated Airport Systems (NPIAS),* planning for capacity enhancing projects should begin once the airfield has reached 60 percent of its current capacity and construction of capacity enhancing projects should be complete prior to reaching 80 percent of ASV.

Runway Length. Runway length at an airport is determined by evaluating the requirements of the critical design aircraft having more than 500 annual itinerant operations. FAA Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design*, provides guidance for determining runway length requirements. For airports serving aircraft over 60,000 pounds, runway length is generally calculated specifically for the most demanding aircraft operating at the airport on a regular basis. The FAA defines the regular basis as a minimum of 500 annual operations, or 250 departures. At Roswell International Air Center, the critical aircraft is the MDC-DC-10-40. The FAA Airport Design Program was used to calculate recommended runway length requirements, the information required to execute the program for recommended runway lengths, includes airfield elevation, mean maximum temperature of the hottest month and the effective gradient for the runway. The input data for Roswell International Air Center is listed below:

Runway 3/21
Field Elevation: 3,671 feet MSL
Mean Maximum Temperature of Hottest Month: 94.1° F
Effective Gradient: 38 feet[1]

Runway 17/35
Field Elevation: 3,671 feet MSL
Mean Maximum Temperature of Hottest Month: 94.1° F
Effective Gradient: 4.5 feet[1]

Runway length requirements were evaluated using the mean maximum temperatures of the hottest month ("hot day"). At high temperatures, the relative density of the air decreases, which causes a decrease in aircraft performance, which results in increased demands for more runway length. According to the Western Region Climate Center (WRCC), the mean maximum temperature of the hottest month (July) is 94.8 degrees Fahrenheit.

With this data, the Airport Design program provides several runway length recommendations for both small and large aircraft according to varying percentages of aircraft fleet and associated takeoff weights. A summary of the data provided by the program is listed in **Table 3-7** and **Table 3-8**.

[1]Effective Gradient: The actual difference in feet from runway end to runway end is required to run the FAA software program and is listed as the effective gradient. However, the effective gradient is usually shown as a percent.)

TABLE 3-7 RECOMMENDED RUNWAY LENGTH – RUNWAY 3/21

Description	Runway Length
Existing Runway Length (Runway 3/21)	13,001’
Recommended to accommodate:	
Small Aircraft (<12,500 lbs.)	
Less than 10 passenger seats	
75 percent of these small airplanes	3,920’
95 percent of these small airplanes	5,020’
100 percent of these small airplanes	5,400’
10 or more passenger seats	5,400’
Large Aircraft (>12,500 lbs., <60,000 lbs.)	
75 percent of these planes at 60 percent useful load	6,480’
75 percent of these planes at 90 percent useful load	8,980’
100 percent of these planes at 60 percent useful load	8,650’
100 percent of these planes at 90 percent useful load	10,290’
Heavy Aircraft (> 60,000 lbs.)	14,270’

Source: FAA Computer Software Program, Airport Design Version 4.2d
Prepared by: Armstrong Consultants, Inc., April 2011

TABLE 3-8 RECOMMENDED RUNWAY LENGTH – RUNWAY 17/35

Description	Runway Length
Existing Runway Length	9,999’
Recommended to accommodate:	
Small Aircraft (<12,500 lbs.)	
Less than 10 passenger seats	
75 percent of these small airplanes	3,290’
95 percent of these small airplanes	5,020’
100 percent of these small airplanes	5,400’
10 or more passenger seats	5,400’
Large Aircraft (>12,500 lbs., <60,000 lbs.)	
75 percent of these planes at 60 percent useful load	6,150’
75 percent of these planes at 90 percent useful load	8,650’
100 percent of these planes at 60 percent useful load	8,230’
100 percent of these planes at 90 percent useful load	9,960’
Heavy Aircraft (> 60,000 lbs.)	14,270’

Source: FAA Computer Software Program, Airport Design Version 4.2d
Prepared by: Armstrong Consultants, Inc., April 2011

Takeoff Distance Requirements. When determining runway length requirements for any airport, it is necessary to consider the types of aircraft (aircraft design group and critical aircraft) that will be using the airport and their respective takeoff distance requirements. **Figure 3-2** gives examples of takeoff distance requirements for the aircraft currently using Roswell International Air Center and aircraft that are anticipated to use the Airport in the future.

Based on the required runway lengths for these categories of aircraft, the existing runway length of 13,001 feet on Runway 3/21 provides adequate runway length for 100 percent of the small aircraft fleet mix and the majority of the larger commercial service aircraft. Therefore, existing runway length is considered adequate for existing and future Airport users, providing for aircraft to take on higher fuel loads and accommodates newer generation aircraft.

The existing length of 9,999 feet on Runway 17/35 feet accommodates 100 percent of the small aircraft fleet mix and 100 percent of the majority of the larger commercial service aircraft at approximately 85 percent useful load. Therefore, the existing length is considered adequate for existing and future airport users.

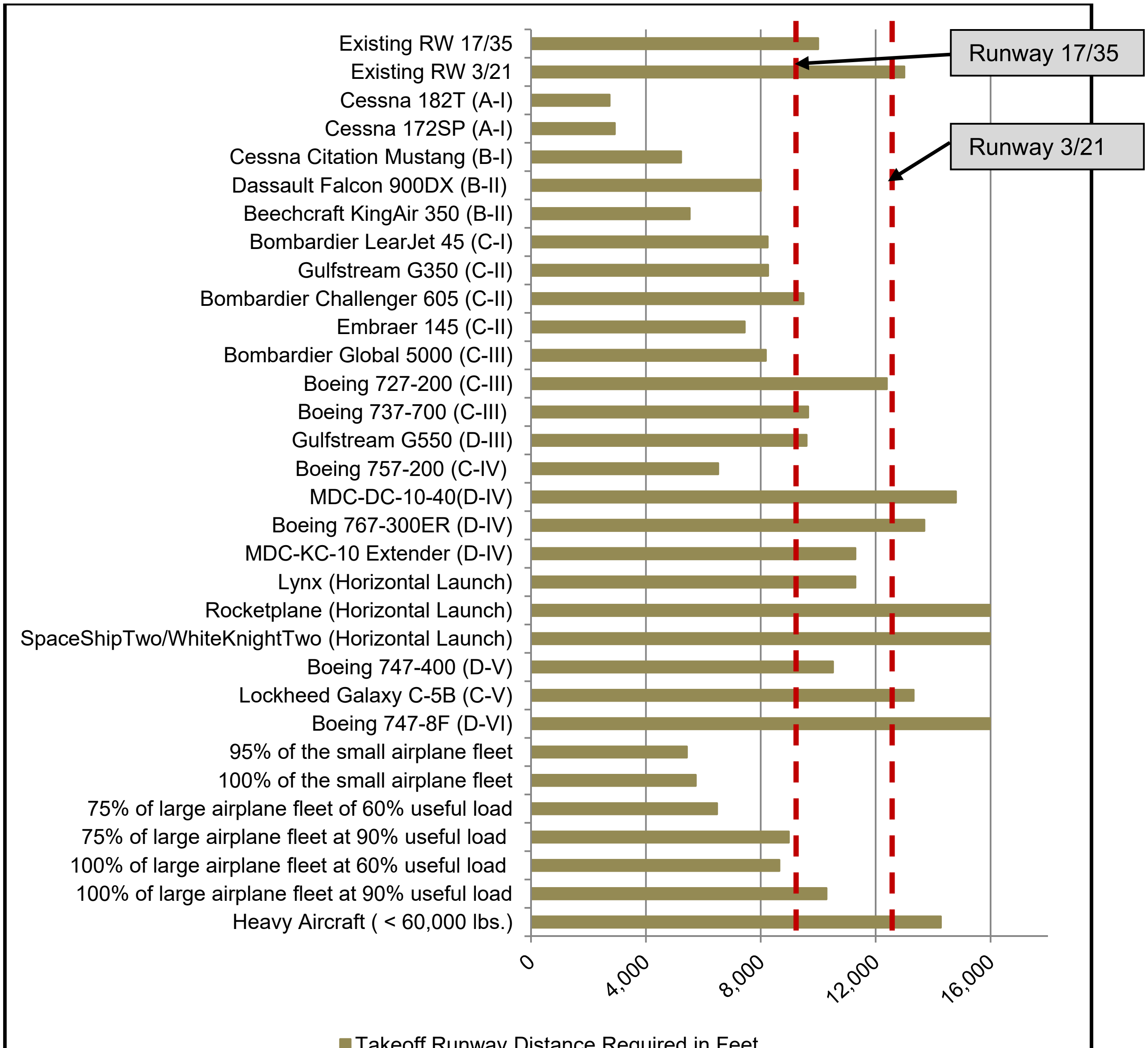


FIGURE 3-2 TAKEOFF RUNWAY DISTANCE REQUIREMENTS

Source: FAA, 2011 & Aircraft Characteristics Database, June 2011.
Prepared by: Armstrong Consultants, Inc., June 2011
Note/ MTOW at 3,671 feet and 94.1° Fahrenheit

Runway Strength and Width. Runway strength requirements are normally based upon the design aircraft that may be expected to use the airport on a regular basis. The existing strength of Runway 3/21 is 100,000 pounds Single Wheel Gear, 200,000 pounds Dual Wheel Gear and 400,000 pounds Dual Tandem Wheel Gear. The existing pavement strength of Runway 3/21 is considered adequate for the planning period. The existing strength of Runway 17/35 is 77,000 pounds Single Wheel Gear, 104,000 pounds Dual Wheel Gear and 165,000 pounds Dual Tandem Wheel Gear. The existing strength of Runway 17/35 is also considered adequate for the planning period.

FAA design standards for runways serving aircraft having an ARC D-IV require a minimum runway width of 150 feet. The center 100 feet of Runway 3/21 is constructed with Portland

Concrete Cement (PCC) and is in good condition. The runway has an additional 50 feet of asphalt on either side of the center keel section providing a 200 foot wide runway. There is an additional 50 feet of asphalt shoulders on either side of the runway providing a 300 foot wide pavement width. The runway edge lights are located 10 feet beyond the shoulders at 60 feet from the runway edge marking. The asphalt runway portion and shoulders are in poor condition and reconstruction is recommended in the initial-term. A runway width of 200 feet would be recommended through the planning period to coincide with the operational use of the runway and the costs associated with narrowing the runway and relocating the lights, as well as its use by Airport Design Group (ADG) VI and flight test aircraft. Runway 17/35 is 100 feet wide and meets this standard. Runway 3/21 is used extensively for the testing and certification of new aircraft and the additional runway width provides an additional margin of safety for these types of operations. A runway width of 200 feet would provide additional measures to ensure safety. The options for the runway width will be further evaluated in Chapter 4 - Development Alternatives. Runway 3/21 is currently not grooved and has a Modification of Design Standards (MODs) allowing this due to the use of the runway for flight testing and aircraft certification. There is no intention to groove the runway in through the planning period. FAA design standards for runways serving aircraft having an ARC C-III require a minimum runway width of 100 feet.

Runway reconstruction projects in the future should ensure that all FAA longitudinal and transverse grade requirements are met. Future runway improvement projects should also take into account drainage including the installation of culverts and drainage basins. Proper grading and drainage will help to avoid water from ponding on and surrounding aircraft movement surfaces as well as potential erosion of runway safety areas. The transverse grades on Runway 3/21 do not appear to meet FAA design standards and therefore should be corrected as part of the long term development of the airport.

Runway 12/30 was recently closed and is in the process of permanent closure. The standard ‘X’ has been painted over the runway designation markings to delineate closure of the runway. There are two runway entrance signs still in place at the intersection of Runway 12/30 and Taxiway B and Runway 12/30 and Taxiway C; all other signage has been removed. The area is currently utilized for existing aircraft storage and salvage purposes.

3.3.2 CROSSWIND WIND COVERAGE

The FAA recommends that a runway’s orientation provide at least 95 percent crosswind coverage. If the wind coverage of the runway does not meet this 95 percent minimum for the appropriate ARC, then a crosswind runway should be considered. Hourly wind data collected by the National Oceanic and Atmospheric Administration (NOAA) Climate Data Center from the automated surface observation system (ASOS) located at the Airport indicates that Runway 3/21 provides less than 95 percent coverage for B-I and B-II aircraft, and more than 95 percent wind coverage for aircraft C-II and above. The combined wind coverage for Runway 3/21 and 17/35 is over 99 percent for ARC A-I through D-IV. Crosswind Runway 17/35 is currently utilized primarily by general aviation aircraft. Runway 17/35 provides adequate length and width to accommodate almost all aircraft at the Airport, including air carrier. The availability of having Runway 17/35 also increases the utility of the Airport by providing an additional runway in the event Runway 3/21 needs to be closed for any reason.

3.3.3 RUNWAY INCURSIONS

The Airport is controlled by an Air Traffic Control Tower (ATCT) between the hours of 6:00 A.M. and 9:00 P.M. local time. However, when aviation activity occurs outside those hours, all pilots and ground vehicles are responsible for maintaining communication on the common traffic advisory frequency (CTAF: 118.5 MHz) to avoid runway incursions. The airport is fenced by an eight foot chain link fence with three strand barbed wire which helps to avoid inadvertent access to the Airport Operating Area (AOA) by animals and humans.

3.3.4 TAXIWAY REQUIREMENTS

Length and Width. The primary function of a taxiway system is to provide access between runways and the terminal area. The taxiways should be located so that aircraft exiting the runway will have minimal interference with aircraft entering the runway or aircraft flying in the pattern. Taxiways expedite aircraft departures from the runway and increase operational safety and efficiency.

According to FAA Advisory Circular 150/5300-13, *Airport Design*, the required runway to taxiway centerline separation for a runway with an ARC of D-IV is 400 feet (lower than ¾- statue mile visibility minimums). Taxiway B, the full-length parallel taxiway, ranges from 52 to 80 feet in width and is located 829 feet to 836 feet from taxiway centerline to runway centerline. It is recommended that Taxiway B be increased in width where is does not meet the 75 foot wide requirements. Roswell International Air Center currently meets ARC D-IV runway to taxiway centerline separation standards for the current and future visibility minimums.

According to FAA Advisory Circular 150/5300-13, *Airport Design*, the required runway to taxiway centerline separation for a runway with an ARC of C-III is 400 feet (with as low as ¾-statue mile visibility minimums). Taxiway C is a partial-length parallel taxiway and ranges from 55 feet to 75 feet in width and is located 700 feet from taxiway centerline to runway centerline. The Airport currently meets ARC C-III runway to taxiway centerline separation standards for the current and future visibility minimums. There is a taxiway at both ends of Runway 17/35 so a full-length parallel taxiway is not needed since aircraft are not required to back taxi on the active runway. Taxiway S is also a closed taxiway and used primarily for aircraft salvage and storage parking; all markings and signage have been removed. Permanent closure of Taxiway S is recommended for the future.

Strength. The strength of the taxiway should be maintained at strength equal to that of the associated runway pavement. Currently, the pavement strength of the parallel taxiways at Roswell International Air Center is equivalent to the runway pavement strength.

3.3.5 AIRCRAFT APRON

The apron space requirements as shown in this planning document were developed according to recommendations given in AC 150/5300-13, *Airport Design*. Consideration must be made in the overall apron requirements for aircraft parking and tiedown requirements, taxilanes, adjacent taxiways and proximity to all aircraft expected to use the airport. FAA guidance suggests apron area analysis be based on 50 percent of the average day peak month (ADPM).

Apron Requirements. Generally speaking, an apron tiedown area should allow approximately 360 square yards per transient aircraft and 300 square yards per based aircraft. This square yardage per aircraft provides adequate space for tiedowns, aircraft circulation and fuel truck movement.

The majority of the aircraft apron is in poor to severe and in degraded condition. High severity, cracking and distress are prominent throughout all sections (general aviation (GA), commercial and industrial apron areas) of the pavement. The last pavement replacement/rehabilitation project was conducted in 1992 and 1993. A Pavement Management Program (PMP) should be considered in identifying priority for pavement repair within the initial-, intermediate and long-term periods. Continued deterioration of the pavement has the potential for foreign object debris (FOD) issues resulting in aircraft damage. The central portion of the apron, which is currently utilized by the FBO and GA parking, is considered to be in the worst condition. The western portion, considered the Industrial Apron, is in poor condition with low-, to medium-severity.

Tiedown Requirements. Aircraft tiedowns should be provided for small and medium size aircraft utilizing the Airport. These aircraft risk being damaged or may cause damage or injury in sudden wind gusts if not properly secured. A number of tiedown locations are required to accommodate the peak daily transient aircraft and overnight transient aircraft, plus based aircraft that are not stored in hangars. The current tiedown layouts on the GA ramps are based on Group II taxilane Object Free Area (OFA). Typically large aircraft, including business jets, are not tied down but will usually occupy multiple tiedown spaces and a dedicated large aircraft apron should be considered.

Future apron square yardage should be planned for both transient and based aircraft. Planning parameters recommend that the Airport provide for 20,160 square feet (or 2,239 square yards) during the planning period to meet future needs; however, Roswell International Air Center currently provides 66,526 square yards which exceeds the future area required and has the capacity to handle 1,663 based aircraft based on a ratio of 175 square feet per aircraft. Redesign of the current layout is recommended to improve efficiency. An apron expansion is not necessary for the planning period; however, a high-priority recommendation is to focus on rehabilitating the apron pavement in the sections where based and transient aircraft are stored. Areas where large aircraft are parked for storage and salvage do not need to be reconstructed. Areas where active aircraft are parked and taxied under their own power need to be kept in a safe and useable condition to avoid damage caused by FOD.

3.3.6 AEROSPACE INDUSTRIAL PARK

The proposed Roswell Aerospace Industrial Park (RAIP) would be a facility that encompasses both a facility available for both Spaceport and Unmanned Aerial Vehicle (UAV). The facility would utilize the Airport's its existing 13,001 foot long Runway 3/21 to launch and recover horizontal launch space vehicles. The RAIP could be utilized to conduct horizontal space launch operations using existing facilities to the extent possible as well as UAV testing and operation.

Dedicated facilities may be constructed by operators to conduct space flight operations from the RAIP. The RAIP would produce revenue for the region and state via economic development, tourism and educational opportunities. The climate and infrastructure growth capability provided at Roswell International Air Center would provide for ideal conditions for this type of operation.

The RAIP would need to be granted a Commercial Launch Site Operator License by the Federal Aviation Administration's Office of Commercial Space Transportation (FAA-AST). Federal law also requires commercial launch vehicles to hold individual licenses, either as permission for a single launch or a specific vehicle or a broader license to allow a certain type of vehicle to be launched by that operator from a specific facility. The licensing/permitting, launch safety and operational rules and regulations can be found in 14 CFR 400-460, respectively.

The existing airfield infrastructure at Roswell International Air Center is fully capable of supporting operations by reusable launch vehicle (RLV) operators. Runway and taxiway capabilities meet or exceed the requirements set by current RLV developers. The focus would be to plan facilities that could be converted to aviation use should horizontal launch activities prove not to be viable over the long-term. Facilities that should be built to support long-term horizontal launch operations would include hangars, parking aprons, offices, propellant (fuel and oxidizer) storage and a visitor center. In addition, additional oxidizer loading areas beyond what is currently approved in the FAA Commercial Launch Site Operator License should be identified to allow increased flexibility in meeting requirements to separate the launch vehicle from the occupied buildings as well as providing space for an engine testing facility. The FAA has published the "*Guide to Verifying Safety-Critical Structures for Reusable Launch and Reentry Vehicles*" which was published in November 2005.

Estimates for when horizontal takeoff/landing RLVs may become operational at the Airport could be as early as 2015. This schedule would allow for the planning design and construction of some required infrastructure. Roswell International Air Center plans to develop facilities that will accommodate RLVs that use horizontal takeoff and landing. The Airport's existing environmental approval covers conventional jet power. Although Roswell is considering a vehicle that takes off horizontally under rocket power and lands as an unpowered glider, at present the vehicle falls outside of the existing environmental approval. An Environmental Assessment would be required for areas the spaceport would occupy. Appropriate National Environmental Policy Act (NEPA) documentation for the spaceport development would be conducted under a separate planning process.

Although the proposed vehicles are currently considered experimental, spaceport operations would not include the launch and reentry of any vehicles operating under an experimental permit. Only launch vehicles holding FAA-AST Launch Operator license will be permitted to operate at RAIP. Users of the spaceport would range from experimental organizations to tourism functions.

Spaceport activities would include and are anticipated to fall into the following categories:

- Transporting the vehicle, vehicle components, and propellants to RAIP via road, rail, air, or a combination of these methods
- Assembling the various vehicle components
- Conducting checkout activities
- Storing vehicle propellants
- Loading the propellants into the launch vehicle
- Loading the pilot, passengers and other payload
- Towing and moving the launch vehicle to the proper launch or takeoff location
- Igniting the rocket engines once the vehicle has reached a designated area over the Gulf of Mexico or any other approved flight corridor
- Removing any debris from the runway prior to another vehicle operating on the runway
- Recovering and transporting the launch vehicle from the runway after landing

3.3.6.1 RLV and UAV Runway and Taxiway Requirements

The runway requirements are evaluated based on "typical" space vehicles that could be expected to operate from Roswell International Air Center, as well as future potential launch vehicles. The parameters evaluated include the runway length, width, strength, and pavement type.

Two vehicles with the most immediate market promise are Virgin Galactic/Scale Composites SpaceShipTwo/WhiteKnightTwo (see **Figure 3-3**) and XCOR Aerosmith's Lynx. Both companies have signed contracts with NASA to provide flight opportunities for scientist, engineers and other researchers to fly technology payloads. Roswell International Air Center is ideally suited to take advantage of this market. Two RLVs have progressed to the point that initial operational requirements can be identified with some degree of confidence. Those RLVs are documented in **Table 3-9,** and their operational requirements are compared to those of the MD-10-40 (critical aircraft). The result of this comparison is that all three RLVs are significantly smaller and lighter than the "Critical Aircraft," and the current dimensions of Runway 3/21 satisfy all operational requirements of the RLVs. Runway 17/35 would satisfy the requirements for two of these aircraft; however, because liquid oxygen and asphalt are an in compatible ad potentially explosive combination Runway 17/35 is not suitable for RLV operations. A summary of the requirements can be found in **Table 3-10**. Virgin Galactic's vehicle would be considered the design criteria due to the company's existing presence in New Mexico (Spaceport America) and the company's advanced development.

TABLE 3-9 RLV RUNWAY REQUIREMENTS

	Rocketplane	Lynx	SpaceShipTwo/ WhiteKnightTwo	MD 10-40 (Critical Aircraft)
Aircraft Design Group	I	I	I / IV	IV
Min. Runway Length	15,978 feet	11,299 feet	15,978 feet	
Min. Runway Width	100 feet	100 feet	100 feet / 150 feet	150 feet
Compatible Pavement	Concrete	Concrete	Concrete	Concrete
Wingspan	25 feet	24 feet	60 feet / 141 feet	165.3 feet
Max. Takeoff Weight	20,000 lbs	11,000 lbs	N/A	572,000

Source: Rocketplane information provided by Rocketplane Global, Inc., June 2012; Lynx information provided by XCOR Aerospace, Inc., May 2012; SpaceShipTwo/WhiteKnightTwo information gathered from public sources, June 2012.
Prepared by: Armstrong Consultants, Inc., June 2012

TABLE 3-10 RLV RUNWAY REQUIREMENTS SUMMARY

	RLV Requirement	Runway 3/21	Requirement Satisfied
Aircraft Design Group	I & IV	IV	Yes
Min. Runway Length	11.299 feet	13,001 feet	Yes
Min. Runway Width	150 feet	200 feet	Yes
Compatible Pavement	Concrete	Concrete	Yes
Wingspan	60 feet / 141 feet	>150 feet	Yes
Max. Takeoff Weight	20,000 lbs	400,000 lbs DWT	Yes

Source: Armstrong Consultants, Inc., June 2012
Prepared by: Armstrong Consultants, Inc., June 2012

The taxiway requirements were also evaluated based on "typical" space vehicles that could be expected to operate from Roswell Spaceport, as well as future potential launch vehicles. The parameters evaluated include the taxiway width, strength, and pavement type. A description of taxiway requirements are shown in **Table 3-11** and summarized in **Table 3-12**.

TABLE 3-11 RLV TAXIWAY REQUIREMENTS

	Rocketplane	Lynx	SpaceShipTwo/ WhiteKnightTwo	MD 10-40 (Critical Aircraft)
Aircraft Design Group	I	I	I / IV	IV
Min. Taxiway Width	25 feet	25 feet	25 feet / 75 feet	50 feet – 75 feet
Min. Taxiway Turn Radius	75 feet	75 feet	75 feet / 150 feet	150 feet
Compatible Pavement	Concrete	Concrete	Concrete	Concrete
Wingspan	25 feet	24 feet	60 feet / 141 feet	165.3 feet
Max. Takeoff Weight	20,000 lbs	11,000 lbs	N/A	572,000

Source: Rocketplane information provided by Rocketplane Global, Inc., June 2012; Lynx information provided by XCOR Aerospace, Inc., May 2012; SpaceShipTwo/WhiteKnightTwo information gathered from public sources, June 2012.
Prepared by: Armstrong Consultants, Inc., June 2012

TABLE 3-12 TAXIWAY REQUIREMENTS SUMMARY

	RLV Requirement	Existing Taxiways	Requirement Satisfied
Aircraft Design Group	I & IV	IV	Yes
Min. Taxiway Width	75 feet	50-75 feet	No. Areas Deficient
Min. Taxiway Turn Radius	150 feet	150 feet	Yes
Compatible Pavement	Concrete	Concrete	Yes
Wingspan	60 feet / 141 feet	>150 feet	Yes
Max. Takeoff Weight	20,000 lbs	400,000 lbs DWT	Yes

Source: Armstrong Consultants, Inc., June 2012
Prepared by: Armstrong Consultants, Inc., June 2012

3.3.6.2 FUEL/OXIDIZER LOADING AND STORAGE REQUIREMENTS

The Airport will need to obtain an FAA Launch Site Operator License with an explosive site plan which would identify proposed propellant loading areas. Chapter 4 will analyze and determine sites for propellant loading areas. RAIP operations are different from aviation operations in several ways, but one of the most important differences stems from the fact that the RLV must carry oxidizer as well as fuel, whereas an aircraft uses air from the atmosphere as an oxidizer to promote fuel burn.

Two of the RLVs examined use a fuel very similar to conventional Jet-A, while the third uses a pulverized rubber compound that is essentially inert without the presence of concentrated oxidizer.

Table 3-13 illustrates the approximate quantities of fuel and oxidizer that will be carried by each type of vehicle on each flight. The RLVs will be fueled at their respective operator facilities and then taxi or be towed to the oxidizer loading area. Once the oxidizer is loaded onto the vehicle, it must be surrounded by a "protective bubble" (i.e., the Inhabited Building Distance (IBD) or Public Traffic Route Distance (PTRD)) until it either departs or the oxidizer or fuel is unloaded. The recommended setback from a loaded RLV is 1,250 feet to any inhabited building or runway and 750 feet from any public street, road highway, navigable stream or passenger railroad.

Roswell International Air Center must designate a suitable oxidizer loading area, with preference given to an area more than 1,250 feet from the runway to prevent runway closures during the oxidizer loading operation. The oxidizer loading area would need to be concrete, due to the fact that liquid oxygen and asphalt are a potentially explosive combination.

TABLE 3-13 RLV PROPELLANT REQUIREMENTS FOR 1 MISSION

	Rocketplane	Lynx	SpaceShipTwo/ WhiteKnightTwo
Propellant Type	Liquid	Liquid	Hybrid
Aviation Fuels	Jet A 2,300 lbs		Jet A 32,000 lbs
Rocket Fuels	RP-1 2,500 lbs	Kerosene Blend 2,059 lbs	HTPB CTN 1,500 lbs
Oxidizers	Liquid Oxygen 6,500 lbs Hydrogen Peroxide 300 lbs	Liquid Oxygen 5,267 lbs	Nitrous Oxide 13,500 lbs
Other Commodities	GN2, LH2, GHe	GH2, GN2	60 feet / 141 feet

Source: Rocketplane information provided by Rocketplane Global, Inc., June 2012; Lynx information provided by XCOR Aerospace, Inc., May 2012; SpaceShipTwo/WhiteKnightTwo information gathered from public sources, June 2012.

The rocket fuels identified by several manufacturers are similar to conventional jet fuel in terms of handling, storage and safety requirements. Virgin Galactic uses a solid, rubber-like polymer that, while flammable, requires very high ignition temperatures, making it functionally inert without a chemical oxidizer present. It is recommended that each operator store its own fuel in tanker trucks parked on 75 foot by 15 foot concrete pads adjacent to their facilities in the initial-term, with permanent tanks installed at those locations in the future. The solid-fuel rockets used by Virgin Galactic do not require isolated storage and can be stored within the vehicle's hangar. It is recommended in the intermediate-term, that permanent tanks be installed at those locations.

The storage areas will be sized to accommodate up to 10 missions of each RLV; however, the concept of operations and the anticipated launch rates for each RLV mission are unique. **Table 3-14** and **Table 3-15** provide a summary of the estimated propellant storage requirements for 10 missions of each RLV.

TABLE 3-14 TOTAL PROPELLANT REQUIREMENTS FOR 10 MISSIONS

Propellant	Approx. Net Weight (lbs)	Approx. Net Volume (gal)
Oxidizers		
LOX	65,000 lbs	6,845 gal
N_2O	135,000 lbs	20,930 gal
Fuels		
RP-1	25,000 lbs	3,676 gal
Kerosene Blend	42,000 lbs	6,360 gal
Jet-A	23,000 lbs	34,400 gal
HTPB	15,000 lbs	N/A

Source: Jacksonville Aviation Authority, Cecil Spaceport Master Plan, 2011
Prepared by: Armstrong Consultants, Inc., June 2012

TABLE 3-15 ONSITE PROPELLANT STORAGE REQUIREMENTS

Propellant	Quantity	Storage Required
Oxidizers		
LOX	13,500 gal	3 Tanker Trucks @ 6,500 gal each (4,500 gal delivered)
N_2O	22,000 gal	4 Tanker Trucks @ 5,800 gal each (5,500 gal delivered)
Fuels		
RP-1 or Ethanol	5,000 gal	2 Tanker Trucks @ 3,000 gal each (2,500 gal delivered)
Kerosene Blend	7,500 gal	3 Tanker Trucks @ 3,000 gal each (2,500 gal delivered)
HTPB	15,000 gal	10 SpaceShipTwo Solid Motor CTN @ 1,500 lbs each

Source: Jacksonville Aviation Authority, Cecil Spaceport Master Plan, 2011
Prepared by: Armstrong Consultants, Inc., June 2012

The onsite storage recommendations have been used for sizing both temporary storage and permanent storage tanks. Initially, while flight rates are low, temporary storage can be used. As flight rates increase, fixed storage tanks should be installed. The temporary and permanent storage facilities would occupy the same footprint. The permanent sites will include tanks, aprons, fill connections, discharge connections, vacuum jacketed piping (for cryogenic propellants) to fill/discharge locations, valve skid and instrumentation, deluge water system, lighting and grounding.

3.3.6.3 HORIZONTAL LAUNCH APRON AND AIRFIELD ACCESS REQUIREMENTS

Because WhiteKnightTwo is the most demanding horizontal takeoff RLV under development, its requirements drive the planning parameters related to initial spaceport development. As an ADG IV aircraft, WhiteKnightTwo requires 75 foot wide taxiways with 150 foot centerline radius taxiway turns. If taxiway exits fillets and the taxiways that connect the taxiways to the apron are built to ADG IV standards, the facility would be able to accommodate both WhiteKnightTwo in Spaceport operations and the Airport's design aircraft.

Apron space is a more complex to plan, given the dissimilar sizes of the largest potential vehicle and the smallest. Using existing FAA guidelines for the aircraft as outlined in the Advisory Circular 150/5300-13, the required apron area for the Rocketplane and Lynx vehicles would be about 360 square yards per vehicle, and facilities should be sized to accommodate at least two of the operator's vehicles, or approximately 760 square yards per operator. The apron area required by the WhiteKnightTwo vehicle would be about 3,700 square yards. However, the unique staging requirements of the RLVs argue in favor of slightly exceeding these aircraft figures.

The WhiteKnightTwo/SpaceShipTwo (see **Figure 3-3**) will likely egress the hangar as one vehicle, but return as two separate vehicles. This dynamic argues in favor of providing at least 4,400 square yards of apron to provide adequate room for both vehicles when separated, plus circulation and maneuvering space. These vehicles will require apron space extending approximately 200 feet from the hangar. For planning purposes, it is logical to size the operators' apron to be the width of the planned hangar, extending 200 feet toward the taxiway.

WHITEKNIGHTTWO

Source: Virgin Atlantic, 2012

XCOR LYNX

Source: XCOR, 2012

ROCKETPLANE

Source: Rocketplane Global, 2012

FIGURE 3-3 RLVS

This allows maximum flexibility for the operator facilities to accommodate various Spaceport operators or convert to adequate aviation facilities should such a conversion be required. Total apron square yardage would total 13,200 to accommodate both operations. It is also recommended all pavements be constructed with concrete due to the oxidization combustibility factor with asphalt.

3.3.6.4 UNMANNED VEHICLE SYSTEM

The FAA is in the process of selecting sites throughout the United States to serve as research and development hubs for unmanned aerial vehicles (UAV). UAV is an aircraft with no pilot on board. The aircraft can be remote controlled aircraft or can fly autonomously based on pre-programmed flight plans on more complex dynamic automation systems. The FAA has adopted the acronym UAS (Unmanned Aircraft System) to reflect the fact that these complex systems include ground stations and other elements besides actual air vehicles. There are various types of UAVs that can be utilized at the Airport such as the Global Hawk, Predator A, Predator B, X-47A, X-47B, Mariner, Altair, Fire Scout, ER/MP UAS, Hunter, I-GNAT, Army IGNAT ER, etc.

3.4 NAVIGATIONAL AIDS

A Navigational Aid (NAVAID) is the primary means of enroute navigation and includes any ground based or satellite based electronic device used to provide course or altitude information to pilots. AC 150/5070-6B, *Airport Master Plans*, defines NAVAIDs as "aids to navigation [that] provide pilots with information to assist them in locating the airport and to provide horizontal and/or vertical guidance during landing." The following sections provide an overview of existing instrumentation, airport approach capabilities, and the proposed improvements during the planning period.

Precision Approach NAVAIDs assist aircraft by providing course and glide slope information to pilots on the approach to a runway end. Roswell International Air Center has the following Precision Approach NAVAIDs:

Instrument Landing System (ILS). This localizer provides horizontal electronic course guidance, and the glide slope provides vertical electronic course guidance, enabling a pilot to align the aircraft with the runway centerline and descend along a path clear of obstacles to the runway threshold. The Approach Lighting System (ALS) provides the pilot with transition from the aircraft instrument to the visual runway environment. The distance markers emit audible signals to the cockpit, indicating distance information from the runway threshold. The ILS approach provides the lowest instrument approach minimums for Roswell International Air Center. The Airport is equipped with an ILS precision instrument approach to Runway 21. The ILS consists of a localizer antenna, capture-effect glide slope antenna, Medium Intensity Approach Lights with Runway Alignment Indicator Lights (MALSR), and markers.

Nonprecision approach NAVAIDs assist pilots by providing course bearing guidance to a point near the runway environment. Roswell International Air Center is currently equipped with the following Nonprecision Approach NAVAIDs:

Global Positioning System (GPS). The GPS is a satellite-based navigation system comprised of, ground stations, and user receivers. An aircraft GPS receiver can track the position of the aircraft by calculating and comparing signal distance from several satellites. The system is reliable in all terrain and all weather conditions and is typically accurate within 100 feet.

The Wide Area Augmentation System (WAAS) is a GPS-based navigation system which augments the existing GPS signals to provide the user highly accurate position and tracking information. Localizer Precision with Vertical Guidance (LPV) is an instrument approach procedure utilizing WAAS technology to provide both vertical and horizontal guidance to aircraft. The LPV approaches are currently available to Runway 3 and Runway 17/35. The LPV approaches all provide ¾-statue mile visibility minimums and the ceiling heights of 250 feet.

Very High Frequency Omni-Directional Range (VOR). The VOR operates by emitting a steady 360 degree signal, as well as producing a rotating signal which compares aircraft position information with a steady signal in order to transmit course information back to the aircraft. Its low altitude standard service volume has a range of 40 nautical miles (nm) between 1,000-feet and 18,000-feet Mean Sea Level (MSL). At Roswell International Air Center, the CHISUM VOR is incorporated as a NAVAID into all published instrument approaches. The Roswell International Air Center CHISM VOR is located 4.2 northwest of the Airport. The Airport is equipped with VOR approach minimums as low as 1½- statue mile visibility and ceiling minimums of 469-feet Above Ground Level (AGL) for Category C aircraft; 2-statue mile visibility and ceiling minimums of 569-feet AGL for Category D aircraft. Nationwide, the FAA has begun phasing out funding and maintenance of VOR stations in favor of satellite-based global positioning system (GPS) navigation as part of NextGen.

The existing instrument approach procedures at Roswell include ILS, GPS and VOR. The existing instrument approach procedures are considered adequate.

3.4.1 Visual Approach Aids, Lighting and Markings

Visual Approach Aids provide the pilot guidance once the aircraft is within sight of an airport, and aids only in the transition of flight to landing. This approach is normally achieved through the aid of the Precision Approach Path Indicators (PAPI). Runway 35 is the only runway equipped with a PAPI. Runway 3 and Runway 17 are both equipped with a Visual Approach Slope Indicator (VASI). Runway 3/21 is equipped with High Intensity Runway Lights (HIRL) and Runway 17/35 is equipped with Medium Intensity Runway Lights (MIRL). There is also an airport rotating beacon located on the Airport that is in good condition. The runway edge lights are not in the standard location, however, location meets standards.

Additional existing inventory of lighting and markings consist of: Medium Intensity Taxiway Lights (MITLs); precision and nonprecision runway markings; aircraft hold bar markings; wind cones and a segmented circle; lighted runway entrance signs; runway hold position signs; taxiway and runway location, directional and destination signs; runway boundary signs; and, runway distance remaining signs. It is recommended that all existing signage be maintained in good condition.

No additional visual aids are recommended at Roswell International Air Center.

3.5 Landside Facility Requirements

Landside facilities are another important aspect of an airport. Landside facilities serve as the processing interface between the surrounding community and the airport operating environment. Likewise, it offers the traveler the first impression of the Airport and the local area. Landside facilities house the support infrastructure for airside operations and often generate substantial revenue for the Airport.

Large portions of the Airport's property are currently undeveloped, providing vast potential for new future revenue generating development. Recognizing market realities and development costs, an overall master plan can establish a low-risk, step-by-step approach to exploit this resource for beneficial results to the Airport and the community of Roswell. It is important that any new development at the Airport establish a sense of place, an abstract concept made up of the impressions one gets by the elements that make up the built environment. At the present time, the property is framed with land that has a high potential for light and heavy industrial and commercial development.

It is important that any new development establish a positive impression through coordinated planning and design. By doing so, these responsible actions will make the Airport an attractive location for new business and associated economic investments will be protected. A sense of place with an allure to business will be established by simple actions directed at building design and placement, layout of roads, and landscaping.

FIGURE 3-4 AIRPORT TERMINAL LOBBY

3.5.1 TERMINAL BUILDING

A terminal building at any airport offers several amenities to passengers, local and transient pilots and airport tenants and management (see **Figure 3-4**). This section of the chapter identifies terminal facility requirements that must be considered to meet FAA airport design standards and accommodate the projected demand trend in the most efficient manner. FAA documents such as the AC 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities* and AC150/5360-9, *Planning and Design of Airport Terminal Facilities at Non-Hub Location*, Transportation Security Administration (TSA) and other airport planning guidance documents, accepted methodologies and sizing factors from airport facilities should be used to evaluate and document the facility requirement needs.

At airports similar to Roswell International Air Center, empirical forecasting and planning formulas are not always the best fit and indicator of actual space needs within the terminal. Dependent on the forecasting approach utilized, inadequate forecasting of future enplanement numbers can result in space requirements that fall short of the necessary space needed in the real-world. The airlines, TSA, rental car operators and subsequent tenants require specific and minimal amounts of space to operate their business function.

At Roswell International Air Center, commercial service is provided by a single airline: American Eagle. This airline currently operates three round trip flights a day to and from the Dallas Fort/Worth International Airport (an unsuccessful attempt was made by American Eagle to provide service to Los Angeles, California). Typical planning models that tend to average out peak day enplanement activity which may work adequately at some commercial service airports do not necessarily work well at Roswell International Air Center. The level of service at Roswell International Air Center does not fluctuate throughout the year based on seasonal trends. Thus, forecasting a fleet mix utilizing the 70- to 90-seat regional jet aircraft currently operated out of Roswell International Air Center as the critical commercial aircraft throughout the planning period is a more realistic scenario in determining adequate terminal space. The average day peak month (ADPM) peak hour load factor is a better gauge of terminal occupancy space requirements in determining load factor in order to better satisfy demand. Additional future service may be added during the 20 year planning period and the terminal requirements set forth in this chapter would adequately accommodate future enplaned growth.

The following recommendations focus on the condition, configuration and capacity of the specific facilities or areas at the time they were reviewed during the inventory process. Modifications, additions and equipment upgrades may be necessary during the planning period to maintain an efficient terminal building as described in the following sections:

- Baggage Claim
- Airline Ticket Counters and Baggage Screening
- Transportation Security Administration (TSA) Passenger Screening Checkpoint
- Passenger Holdroom
- Restrooms
- Rental Car Facilities
- Restaurant and Concessions
- Airport Administrative Offices
- Mechanical and Maintenance Facilities

3.5.1.1 BAGGAGE CLAIM

The baggage claim area and facilities are utilized primarily by commercial service passenger airlines. The baggage claim area serves passengers with facilities consisting of a waiting lobby which will overlap with circulation and baggage display device. Roswell International Air Center is not currently equipped with a conveyor belt baggage claim system, however, the Airport does have three retrieval doors that can adequately accommodate the current peak hour arriving flights. With the forecasted increase of 73 percent in enplanements projected during the planning period, additional baggage space and the addition of a conveyor belt is recommended. Depending on the type of baggage claim device used, a conservative calculation of two bags per terminal peak hour deplaning passenger and average retrieval time of 10 to 15 minute time span, frequently before bags are delivered to the claim facility. However, due to the volatility of the airline industry, rising costs of air travel and the decrease in passenger numbers, airlines are placing more of the cost of air travel on to the consumer. Today, many airlines are charging passengers to check bags resulting in a decrease in the total number of bags traveling through the baggage handling system.

In conclusion, AC 150/5360-9 recommends 600 square feet of baggage claim area to meet current level of demand. The existing baggage claim encompasses 1,299 square feet and exceeds the recommended minima's for the existing period; however, 1,643 square feet of space in the baggage claim area is recommended for the future planning period. Development of a baggage conveyor system may require additional space within the lobby and circulation area in order to meet the needs during the planning period.

3.5.1.2 AIRLINE TICKET COUNTERS AND BAGGAGE SCREENING

Airline ticket counters are where passengers obtain a boarding pass, check their luggage, and receive customer service. Airline employees utilize space behind the ticket counter for offices and baggage processing. The ticket counter space provides space for multiple airlines, however, there is currently only one airline currently occupying the space. Airlines typically require a minimum of two agent positions to effectively serve passengers. Approximately eight feet should be provided between the counter and the wall behind the counter for counter airline personnel and baggage conveyors. Airlines typically prefer to have self check-in kiosks located in line with the ticket counter to reduce the amount of airline staffing for passenger assistance and to ease the baggage check-in procedure. A pair of check-in kiosks will occupy 5 to 5.5 linear feet of counter area with an additional three feet of frontage for ingress and egress traffic. At Roswell International Air Center, 20 linear feet of counter area is required to accommodate a single airline (see **Figure 3-5**). American Eagle currently occupies the center ticket counter space and has adequate space for the current operation.

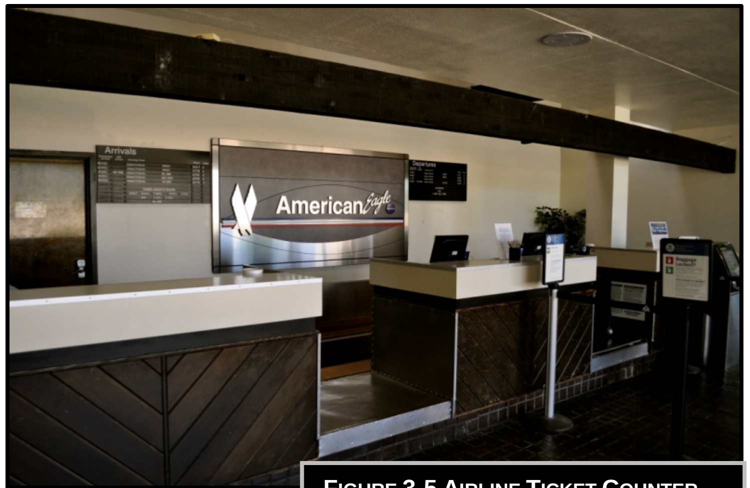


FIGURE 3-5 AIRLINE TICKET COUNTER

Baggage screening takes place behind the ticket counters on the first floor at Roswell International Air Center. There is approximately 785 square feet devoted to this operation and three existing ticket counters. The current space for this operation meets future planning period.

In December 2002, the United States Government and Congress mandated that 100 percent of all checked baggage be screened for explosives by the Transportation Security Administration (TSA) as a result of the events of September 11, 2001. Requirements of these machines and their integration is at the discretion of the TSA and the airport based on a number of requirements such as equipment availability, staffing requirements, and capital cost acceptable to the airport.

There are currently two methods to screening baggage for explosives: explosive detection systems (EDS) or explosive trace detection (ETD). An EDS machine works like an MRI machine in a doctor's office. Some models can be used as part of an in-line conveyor system to automatically clear or identify suspect baggage, others are manually fed. Baggage that triggers an alarm on the system is then required to be investigated with supplemental screening technology. Protocols for on-screen resolution (OSR) are developed and utilized to speed up the process of alarm bag resolution. An ETD is accomplished manually and utilizes smaller machines but is more labor intensive and has a slower processing rate. Operators swab the baggage with a special cloth and then analyze the trace elements. Both methods require large amounts of space. The most common screening method is the ETD option and is utilized by Roswell International Air Center.

Space requirements and capacity for the planning of this equipment can be found in the TSA, *Planning Guidelines and Design Standards for Checked Baggage Inspection Systems (CBIS)* dated January, 2009. For manually fed bags through an EDS machine, the typical rate is 120 to 130 bags per hour. A single ETD machine will typically clear a single bag in two minutes or 30 bags per hour. The number of screening machines required is determined by the peak period baggage demand. The FAA AC 150/5300-13 states that 1.3 bags is the average number of checked bags per passenger and the TSA CBIS averages 1.15 bags per passenger. The median of these two is 1.2 and is used to estimate the number of peak hour passengers of required baggage peak demand for the initial-term planning. At Roswell International Air Center, this results in a peak hour demand of 28.2 bags. An additional ETD machine is recommended to meet planning period demand.

The spatial requirement for the baggage screening area varies by the type of equipment utilized; the proximity and relationship between the baggage screening area; TSA employee space; and conveyor space. ETD units are free standing or placed on a standard three foot by six foot table. The smallest EDS unit requires a minimum of 150 square feet of space for the machine and necessary clearance with an additional 300 square feet for maneuvering space. For minimal planning purposes, 500 square feet is required for a single EDS station and 200 square feet per ETD station and additional 150 square feet for conveyors.

Currently, the airline ticket counter and baggage screening area meets the necessary spatial requirements with 1,301 square feet and has the ability to handle additional capacity with the addition of new service and airline occupancy. In order to meet future planning period requirements, 2,419 square feet of space is needed with the addition of two counter locations.

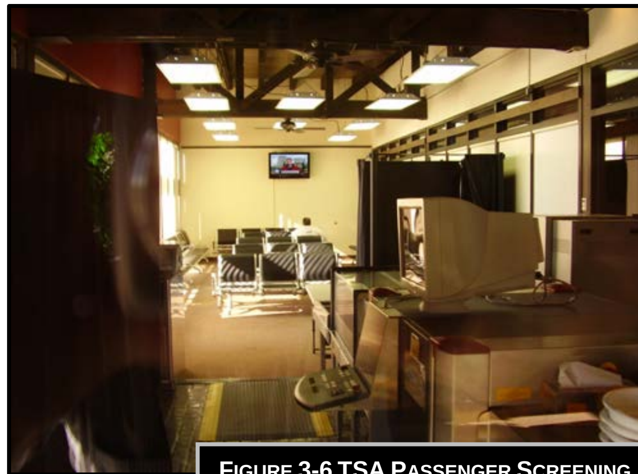


FIGURE 3-6 TSA PASSENGER SCREENING

3.5.1.3 TRANSPORTATION SECURITY ADMINISTRATION (TSA) PASSENGER SCREENING CHECKPOINT

Under the direction of the U.S. Congress, Transportation Security Administration (TSA) is required to screen 100 percent of passengers utilizing TSA screening standards. This mandate created new space requirements necessary to screen passengers and their carry-on belongings. New equipment and procedures include body searches, x-ray equipment and ETD. The current standard equipment consists of x-ray equipment for carry-on baggage and magnetometers for scanning passengers (see **Figure 3-6**). Each screen station needs space for the equipment, TSA security officers, and the search and inspection areas. Per the TSA manual, *Security Checkpoint Layout Design/Reconfiguration Guide* dated November 7, 2006, the passenger screening footprint for a single lane checkpoint is 17 feet by 43 feet. This area requires 730 square feet of space. Since that publication, TSA has increased the security protocol thus resulting in slower passenger throughput and generating the need for increase queuing space. At Roswell International Air Center where the holdroom is not continuously open, it can be assumed that approximately 75 percent of the peak hour passengers may be in line at the same time.
The spatial recommendations for the passenger screening area are as follows:

- 9 to 11 square feet per passenger queuing
- 400 square feet per screening lane
- 60 square feet per private screening room
- 12 feet by 17 feet of space considered the ‘transition area’ for passengers to repack carry-on and wait for remaining individuals in their party
- 75 square feet for a TSA communications room

It is recommended that a total of 1,200 square feet per lane of passenger screening area or security screen checkpoint (SSCP) be provided for the future planning period, including an allowance for queuing and TSA office space. This is based on the forecasted 50 passenger throughput per hour during the planning period. It is recommended that the area be expanded to 1,200 square feet in order to meet the demands of the planning period.

3.5.1.4 PASSENGER HOLDROOMS

Passenger holdrooms occur on the sterile side of the terminal and include amenities such as restrooms, concessions and vending. When evaluating and determining spatial requirements for this area, the peak 30-minute load factor of 100 percent of the terminal peak hour passengers is used. Industry standards recommend 1,800 square feet of holdroom per passenger boarding gate to accommodate the necessary facilities. 25 square feet per passenger is recommended to determine the required area for seating and standing circulation. Additional space is recommended in the event more than one aircraft is on the ground at the same time due to a diversion or emergency. For planning purposes, the Airport should consider a second aircraft at 75 percent load capacity to provide additional area to match. In addition to seating, the holdroom should allow 250 square feet per airline queuing and ticket lift station. In the future there may be more than one arriving or departing aircraft on the ground at the same time.

Passenger boarding gates provide egress between the holdroom and the apron. Passenger boarding gates can be passenger boarding doors (PBD) at ground level or passenger boarding bridges (PBB) which are generally elevated. Based on the mix of aircraft and the current operation at Roswell International Air Center, the continuation of passenger boarding doors at ground level will adequately meet the growth. However, consideration of designated parking positions and ground service equipment (GSE) staging locations should be considered for safety and efficiency of the loading and fueling procedure.

It is recommended that the existing 1,418 square feet be expanded to approximately 2,375 square feet to be allocated to accommodate passenger holdroom facilities and two PBD to accommodate the planning period growth.

3.5.1.5 RESTROOMS

It is assumed that a majority of the passengers may be enplaning or deplaning within a 15 to 20 minute period of time. In order to determine the number of fixtures required to accommodate the level of passengers, assume that 20 percent of the passengers will be utilizing the public restroom facilities and approximately 80 square feet per fixture should be provided.

Restroom locations should include the secure holdroom and unsecured public areas. Additional space for the code required water fountains and janitor closets are collocated with the restroom facilities. Currently, there is 475 square feet of restroom space within the secure portion of the terminal and 1,161 square feet in the unsecured public area. It is recommended that the secure restroom area be expanded to meet the planning period needs of 800 square feet for peak hour enplanement/deplanement. The inclusion of a diverted aircraft (capacity at 75 percent) should be factored into the recommended spatial area and 1,400 square feet are recommended for restroom space within the secure area. The unsecured restroom area space meets planning period requirements.

3.5.1.6 RENTAL CAR FACILITIES

There are three existing car rental services offered at Roswell International Air Center: Avis, Hertz and Budget Rental Car (see **Figure 3-7**). The availability of rental car facilities in the passenger terminal building with rental ready lots in an adjacent parking lot improves the passengers' experience. It is recommended that a minimum of 100 square feet per rental car vendor be provided (8 feet counter by 6 feet depth) with an additional 100 square feet for office space per agency. It is recommended that there be at least 10 feet for queues in front of the counters and circulation areas. Currently, 724 square feet of space and three counter locations are allocated to the rental car facilities which meet the current period demand. Rental car counters should consist of 240 square feet of floor space. Current spatial demand is met, however, in order to meet future demand and provide adequate space to the rental car companies, approximately 960 square feet of additional space and one additional counter location is recommended.

FIGURE 3-7 RENTAL CAR TERMINAL SPACE

3.5.1.7 RESTAURANTS AND CONCESSIONS

It is not uncommon for a small- or nonhub airports to not provide a full-service restaurant; however, at Roswell International Air Center there is a full service restaurant, Cappuccino Grill, located in the unsecure waiting lobby that encompasses approximately 726 square feet (see **Figure 3-8**); however, there is no food service/concessions facility within the secure portion of the terminal. An area of 400 to 600 square feet is suggested by FAA AC 150-5360-9 for airports of similar size to Roswell International Air Center. The standard planning parameters of 25 square feet per peak hour passenger is used to determine the restaurant concession requirement. Based on the projected growth during the planning period, and the level of commercial service during peak hour, the Airport should plan for 25 square feet per hour per passenger. The concession area meets current demand at 1,395 square feet, however, it is recommended that an additional 1,250 square feet be provided that would include seating, circulation, and service areas related to the concession facility for the future planning period.

FIGURE 3-8 RESTAURANT AND VENDING SERVICES (UNSECURE)

3.5.1.8 AIRPORT ADMINISTRATIVE OFFICES

Planning parameters for the airport administrative offices vary by airport to airport due to level of operations, total number of enplanements, and degree of activities performed by the staff. Rowell International Air Center currently allocates 6,637 square feet of space for administrative offices for the Airport staff (e.g., airport director, property management, airport operations staff, administrative staff, and conference rooms). There is specific office space for the Director, administrative assistant, Operations, Security and Maintenance Manager and two conference rooms (see **Figure 3-9**).

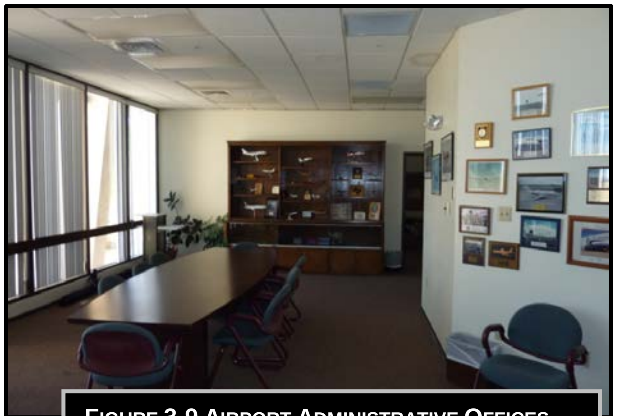


FIGURE 3-9 AIRPORT ADMINISTRATIVE OFFICES

No additional space for the airport administrative offices is recommended during the planning period.

3.5.1.9 TERMINAL BUILDING SUMMARY

As passenger activity increases the need for additional space to accommodate those users will be needed. The information mentioned in all the previous sections is summarized in a single source table that depicts information on the current capacity of the terminal building facilities and provides spatial recommendations for the planning period.

A summary of passenger terminal facility space analysis indicates an initial-term need for expansion of the baggage claim, TSA screening and secure passenger hold room areas. Additional expansion of the secure area restrooms and passenger boarding area may also be needed in the initial-term planning period.

FAA AC 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities* notes that information contained within the document provides general guidelines and approximations for determining spatial and terminal facility requirements for planning purposes. It is not intended that they be used to replace detailed architectural or engineering analysis necessary for the specific design of individual airport terminal facilities. The square footage recommendations in **Table 3-16** is for planning purposes only. Further detailed analysis is recommended prior to actual design. Future square footage recommendations were based on the peak hourly passenger demand and annual enplanements for each time period.

TABLE 3-16 PASSENGER TERMINAL FACILITY SPACE REQUIREMENTS (SQUARE FEET)

	EXISTING	RECOMMENDED	PROJECTED			
	2010	2010	2015	2020	2025	2030
Annual Enplanements	38,933	38,933	44,698	51,316	58,913	67,636
Baggage Claim	1,299	1,400	1,451	1,505	1,560	1,643
Airline Ticket Counter / Baggage Screening	1,301	1,301	1,450	1,530	1,687	2,429
Airline Offices	837	837	837	837	837	837
Airline Passenger Gates	1	1	1	2	2	2
TSA Passenger Screening	536	838	869	945	1,030	1,200
Passenger (Secure) Holdrooms	1,418	1,800	1,868	1,901	2,002	2,375
Restrooms						
Secure	475	475	800	1,150	1,275	1,400
Unsecure	1,161	1,161	1,161	1,161	1,161	1,161
Rental Car Facilities	724	724	764	807	853	960
Restaurant/Concessions	1,395	1,395	1,749	2,103	2,457	2,812
Airport Administration	6,637	6,637	6,637	6,637	6,637	6,637
Mechanical/Maintenance/ Storage	1,368	1,368	1,368	1,368	1,368	1,368
Circulation Space	6,236	6,236	6,236	6,236	6,236	6,236
Passenger Boarding Ingress/Egress	885	885	1,051	1,217	1,383	1,549
Miscellaneous Office Space	1,431	1,431	1,431	1,431	1,431	1,431
Total	**25,703**	**26,488**	**26,908**	**28,021**	**29,064**	**32,038**

Source: AC 150/5360-9 & ACI, Inc.
Prepared by: Armstrong Consultants, Inc. May 2011.

3.5.2 CARGO FACILITIES

Federal Express (FedEx) currently does not operate out of a designated building at the Airport. FedEx and cargo enters through the FBO gate which provides direct aircraft delivery vehicle loading and unloading. Increased space for cargo facilities, truck delivery and pickup, employee parking and apron parking is recommended. The future cargo apron should be sized to accommodate the Boeing 727 for future FedEx operations and Boeing 757-200 for long-term planning. The options for additional cargo facilities will be further evaluated in Chapter 4 – Development Alternatives.

3.5.3 AEROSPACE INDUSTRIAL PARK HANGAR AND VISITOR CENTER REQUIREMENTS

Hangar requirements for the vehicles are similar to that of a typical aircraft hangar. Hangar size is based on the type of operation, with the Lynx vehicle being the least demanding and the SpaceShipTwo/WhiteKnightTwo being the most demanding. The hangar area would handle the spacecraft processing and assembly, payload processing, clean room access, ground service equipment storage and necessary office space.

For planning purposes, the requirements for Rocketplane's hangar would require 200 foot by 125 foot hangar. Lynx would require a hangar of 100 feet by 125 feet to house the vehicle. The largest hangar would be occupied by Virgin Galactic which would require a hangar developed at 200 feet by 235 feet.

Due to the anticipated public interest in commercial space operations and the likelihood that many participants will bring friends and family with them who would not actually participate in the flight, RLV facility planning should incorporate a visitor center that would serve as a viewing area, departure/arrival facility, gathering spot and education/training facility. Depending on operator preference, the visitor center could also include a spectator-friendly mission control facility.

Ideally a visitor center would be centrally located on the Airport in order to provide the best view of takeoff and landing. It would serve as the departure/arrival point for the flight and include facilities that allow spectators to view and photograph the flight, media access, gift shop, educational displays, food service and restrooms. The visitor center would require approximately 5,000 square yards of space. Using the standard of one parking space for every 300 square feet of space more many different types of public buildings, the visitor center would require approximately 17 parking spaces. Within the initial to intermediate-term, a dedicated FBO-type building would be appropriate within the development.

It is also recommended that the Airport develop and create a viable aerospace industrial park that will meet the evolving needs of the commercial space launch industry. Chapter 4 will define and develop alternatives for the facilities likely needed by horizontal-launch spacecraft. The commercial space launch business is still in its infancy and RAIP finds itself on the ground floor of an emerging line of business. The development of RAIP provides an opportunity to establish a leading-edge facility unlike any other in the world.

3.5.4 HANGAR FACILITIES

Hangars are typically classified as either T-hangars, (small multi-unit storage complexes that usually accommodate one single engine aircraft in each unit) or conventional box hangars, (small to very large units), which accommodate a variety of aircraft types or corporate fleets. The number of aircraft that each conventional hangar can hold varies according to the manufacturer and the specifications of the airport owner or operators.

Based Aircraft Hangar Requirements. The facility requirements for based aircraft typically determine the quantity of tiedown locations, shaded spaces, T-hangars and conventional type hangars required for the future. Chapter 4 - Development Alternatives will identify development options for a mix of T-hangars, box hangars, and corporate hangars.

Transient Aircraft Hangar Requirements. Transient single-engine aircraft operators generally do not require aircraft storage facilities unless inclement weather is expected - such as hail or snow - or if the operator is planning an extended stay. Some higher performance single-engine and multi-engine aircraft operators may desire overnight aircraft storage, a heated hangar in the winter, and in-hangar deicing capability. The FBO currently provides hangar space for overnight transient aircraft.

Approximately 1,090 acres of land is available on the southeastern quadrant of the airfield for future hangar, general aviation and commercial development. Chapter 4 - Development Alternatives will present options for expansion during the planning period based on the projected demand.

3.5.5 AVIATION FUEL FACILITIES

The current locations of the fuel tanks are in the northeast quadrant of the airfield in an area that is considered “bulk fuel storage.” Fuel is solely owned and operated by the FBO, Great Southwest Aviation, in supplying Jet-A and AvGas 100 Low-Lead (LL) to air carrier, commuter, cargo and general aviation aircraft and the current area is considered adequate. No additional expansion within the planning period is recommended.

As mandated by the U.S. Environmental Protection Agency (EPA), a Spill Prevention, Control and Countermeasure (SPCC) must be prepared by all facilities subject to regulation (40 CFR 112). This plan aids in preventing any discharge of oil into navigable waters or adjoining shorelines. This plan is intended to provide prevention as opposed to after-the-fact reactive measures commonly described in Oil Spill Contingency Plans. The owner or operator of the facility is responsible for preparing the SPCC. The Plan must be certified by a registered Professional Engineer (PE). The Airport is equipped with four, above ground storage tanks that individually handle 10,000 gallons. Great Southwest Aviation FBO currently has an SPCC plan in place.

3.5.6 AIRPORT ACCESS AND VEHICLE PARKING

FAA AC 150/5300-6A provides information on the study of ground access. An important planning consideration in ground access development is proximity of parking sites to activity centers at the terminal and transportation between the two.

3.5.6.1 AIRPORT ACCESS

Jerry Smith Circle provides public access and is the main circulation roadway to the Airport with direct connection to downtown Roswell via West Earl Cummings Street and and University Boulevard. Access to cargo and general aviation operations is through the Great Southwest Aviation gate off Southwest Way. An important planning consideration is to separate airline passenger traffic from supplementary vehicle traffic on the main inbound roadway in an effort to enhance safety and simplify wayfinding. Jerry Smith Circle becomes a one-way, two lane loop roadway in the terminal area that provides access to the public and rental car lots and terminal curbside. This inbound roadway serves as a multilane road that can service both the ticketing and baggage claim areas. Traffic leaving the terminal area will follow the remainder of the loop roadway to the connector road. The current roadway system is expected to accommodate passenger demand increases anticipated in the planning period with no significant increase in capital improvement necessary.

3.5.6.2 PUBLIC AND EMPLOYEE PARKING

Parking can be one of the largest revenue generators at an airport. The passenger terminal building parking consists of a rental car, and a passenger/employee combined parking lot. Surface parking lots typically require 450 square feet per parking space, including room for automobile circulation within the lot. Some passengers will be picked-up and dropped-off, and not utilize the parking facilities. Future public parking requirements are based on existing demand patters and growth rate assumptions.

Currently, Roswell International Air Center does not have a designated short- and long-term parking facility. Determining the total number of automobile parking spaces is based on the total annual enplaned passengers. The designated paved parking lot at the Airport consists of 29,020 square feet with 132 spaces (four of the spaces are designated for handicap parking). An additional 50 unpaved parking spaces are available around the paved lot totaling 182 available parking spaces. Current parking capacity meets the current demand, however, for the planning period it is recommended that the 50 unpaved parking spaces be paved and 46 of the total parking spaces be designated for short-term parking. Additionally, the American Disability Act (ADA) requires five handicap spaces and one designated handicap van parking space for a parking lot with 151-200 spaces. It is recommended that a total of 200 paved parking spaces be made available for the planning period.

It is recommended that 15 to 20 percent of the allotted parking be designated for short-term parking (up to three hours duration) remaining balance for long-term parking. Short-term parking should be located nearer to the terminal for two basic reasons:

- Higher turnover rate (usually five percent more than that of long-term lots), and
- Parking fees for the short-term lot usually command a higher rate per hour than the long-term lots.

It is recommended that the Airport consider charging a parking fee to generate revenue for the Airport. It is also recommended that the dirt lot directly west of the main parking lot be paved and serve primarily long-term parking which will free up the parking directly in front of the terminal for short-term parking capability. It is also recommended that the Airport provide designated parking for employees (airport, airline and tenants) in order to provide more parking spaces for paying passengers in an effort to increase revenue.

3.5.6.3 RENTAL CAR PARKING

Three rental car companies currently operate at Roswell International Air Center. Rental car parking is located outside the terminal which consists of all facilities (e.g., ready/return spaces, vehicle maintenance/wash, and storage). There are a total of 29 spaces designated for rental car parking. The companies lease space to the northeast of the Terminal building for on-Airport parking to accommodate the projected increase in operations and enplanement over the planning period, an additional 23 spaces from the existing 29 spaces are recommended to provide the necessary capacity of 52 rental car spaces.

3.5.7 SECURITY

The Airport is currently fenced with an eight foot chain link fence with three strands of barbed wire along the top. The chain link property fence is in good condition and there are currently four existing electric vehicle gates, seven manual vehicle gates, and three pedestrian gates providing access to the Airport terminal area. There is a continuous perimeter road which follows along the fence at the Airport and no additional security facilities are recommended.

3.5.8 AIRPORT RESCUE AND FIRE FIGHTING (ARFF) STORAGE BUILDING

Roswell International Air Center is a commercial service airport certified under FAR Part 139, and is required to provide ARFF services. The ARFF Index level required is determined by the longest passenger aircraft with an average of five daily departures serving the airport as follows:

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

The ERJ-145 is currently the most demanding passenger aircraft in terms of length, measuring 98 feet, utilizing the Airport on a daily basis. The ERJ-145 specifications fall under the Index B aircraft category; however it does not meet the five daily departure requirements to make Roswell International Air Center an Index B airport. The Airport currently operates under the Index A category; however, it meets Index B requirements should additional flights be added to the daily total. Should an aircraft that falls within the Index C category occur on a daily basis exceeding five daily flights, the airport will need to upgrade in order to meet Index C standards.

The ARFF facility was constructed at the Airport in 2000 (see **Figure 3-10**) and has three vehicle bays capable of accommodating three ARFF trucks. Three full size ARFF trucks allow the airport to provide Index C level of service. The ARFF requirements for Indices A, B and C are shown in **Table 3-17.** It is, however, recommended that the Airport purchase an additional ARFF truck within Index B criteria due to the high potential for additional daily flights and the unique role the Airport serves with a high percentage of test flights and military training. In 2011, a Gulfstream 650 test aircraft crashed on the Airport and an Index A vehicle would have been inadequate for extinguishing the fire. The ARFF and storage building are adequate for the 20 year planning period.

FIGURE 3-10 AIRPORT ARFF FACILITY

TABLE 3-17 ARFF REQUIREMENTS

Index	Aircraft	Vehicles and Extinguishing Agent
A	Less than 90 feet	One Vehicle carrying the following: Once vehicle carrying at least 500 pounds of sodium based dry chemical, halon 1211, or clean agent, or One vehicle carrying 450 pounds of potassium based dry chemical and water with a commensurate quantity of ARFF to total 100 gallons.
B	At least 90 feet but less than 126 feet	Either of the following: One vehicle carrying at least 500 pounds of sodium based dry chemical or halon 1211 and 1,500 gallons of water and the commensurate quantity of AFFF for foam production Two vehicles: One vehicle carrying the extinguishing agents as specified for in Index A; and one vehicle carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons
C	At Least 126 feet but less than 159 feet	Either of the following: Three vehicles: One carrying the extinguishing agents as specified for Index A; and two vehicles carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam Two vehicles: One vehicle carrying the extinguishing agents as specified for in Index B; and one vehicle carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 3,000 gallons Each ARFF vehicle used to comply with Index B and C requirements with a capacity of at least 500 gallons, but less than 2,000 gallons shall be equipped with a turret. Vehicle turret discharge rate should be at least 500 gallons per minute but less than 1,000 gallons per minute. Required discharge capacity for dry chemical through a hand line is 5 lbs/sec; and 16 lbs/sec through a turret.

Source: FAR Part 139, 2011
Prepared by: Armstrong Consultants, Inc., May 2011.

3.5.9 GROUNDS MAINTENANCE EQUIPMENT AND STORAGE BUILDING

The City of Roswell is responsible for grounds maintenance and snow removal at the Airport. The Airport requires only a minimal amount of snow removal equipment due to the relatively mild climate of the area. Additional multi-function grounds maintenance equipment capable of snow removal, mowing and sweeping is recommended within the future planning period. This type of equipment helps to maintain the safety areas as well as remove objects from the apron, taxiway and runway to minimize FOD. A dedicated facility to house all the maintenance and snow removal equipment and its accessories is stored in the old fire station and is approximately 12,461 square feet. Additional storage for maintenance equipment is located at a secondary maintenance yard and is constructed with a steel covering. The existing snow removal equipment storage building is in poor condition. The development of a new snow removal equipment storage building is recommended.

3.5.10 AIR TRAFFIC CONTROL TOWER/FACILITIES

Roswell International Air Center is equipped with an Air Traffic Control Tower (ATCT) that operates from 6:00 A.M. to 9:00 P.M. The ATCT is 110 feet tall and incurs periodic minimal line-of-sight constraints. No additional improvements are recommended for the tower during the planning period.

3.6 INFRASTRUCTURE NEEDS

3.6.1 UTILITIES

The City of Roswell currently provides sanitary sewer, storm sewer, and culinary water to the Airport. Gas is provided by New Mexico Gas Company. Phone is provided by Qwest and individual FBOs provide wireless internet to users. The existing utilities are considered adequate for the planning period.

3.6.2 WEATHER REPORTING

The weather reporting system at Roswell International Air Center includes an Automated Surface Observing System (ASOS) and the Automatic Terminal Informational Service (ATIS). The ATIS frequency at Roswell International Air Center is 128.45 MHz. The ASOS program is a joint effort of the National Weather Service (NWS), the Federal Aviation Administration (FAA), and the Department of Defense (DOD). The ASOS system serves as the nation's primary surface weather observing network. ASOS is designed to support weather forecast activities and aviation operations and, at the same time, support the needs of the meteorological, hydrological and climatologically research communities.[2] The ASOS is connected to the National Airspace Data Interchange Network (NADIN) which disseminates weather conditions to pilots through various aviation weather websites including the FAA Terminal Aerodrome forecast. The ASOS provides continuous minute-by-minute observations and performs the basic observing functions necessary to generate an aviation routine weather report (METAR) and other aviation weather information. Elements and information disseminated by the ASOS are: pressure, ambient temperature, dew point temperature, wind direction, sky condition, visibility, altimeter setting, and precipitation accumulation using a fixed location and time-averaging technique.[3] The ASOS ((575)-347-0040) is owned and operated by the National Oceanic and Atmospheric Administration. There are no recommended upgrades needed throughout the planning period.

3.7 PAVEMENT MANAGEMENT

Pavement at an airport is one of the most important infrastructure investments. Reoccurring assessment and inventory of condition is the most cost-effective way to track this important capital investment while planning for long-term preservation and providing preventative maintenance and planning for eventual rehabilitation. Monitoring the pavement condition is done through a Pavement Management Program (PMP). Pavement Management (PM) is the process for maintaining and preserving pavement assets at a certain level of performance in the most

[2] Reference – National Weather System, 2011

[3] Federal Aviation Regulations/Aeronautical Information Manual 2011

cost-effective manner. The PMP is the working system that enables for coordination of all planning, programming, design, construction, and monitoring in service activities.[4]

Currently, Roswell International Air Center has a Pavement Management Program in place for only the pavement sections that have recently been reconstructed (Taxiway C, G and H). The condition of the pavement for the majority of the airfield is in very poor to serious condition.

3.7.1 PAVEMENT MANAGEMENT PROGRAM

As part of the FAA's Airport Improvement Program (AIP) funds, Congress has mandated that facilities receiving federal monies for replacement or reconstruction of paved surfaces must create a pavement maintenance/ management program and consist of four components:

- A pavement inventory which shows the dimensions, locations and maintenance history of all paved surfaces.
- A prescribed inspection schedule, which will minimally involve detailed annual assessments, and monthly drive-by observations.
- Record keeping which documents inspection dates, findings, locations of distress, and remedial actions scheduled and performed, and
- A method of data retrieval which would permit a comprehensive presentation to the FAA if they request one.[5]

A proper and effective pavement management program will reduce maintenance costs and improve pavement serviceability. If proper records are not kept, there will be no benefit to the future use of the pavement and inability to reduce future costs. Pavement condition is assessed by the Pavement Condition Index (PCI) procedure (visual signs of distress were identified and measured). There are various factors that lead to distress of pavement, such as: traffic/load, the environment, material/mix problems, and water infiltration/poor drainage.

3.7.2 PAVEMENT PRIORITIZATION

The pavement condition at the Airport varies throughout the airfield depending on age, material, and use. Prioritizing the rehabilitation of sections is essential in determining what pavement sections need immediate attention. Prioritization enables the Airport to identify pavement sections in need of immediate or future repair and is an effective tool for decision making. A minimum acceptable level of PCI for runways is 75, 70 for taxiways, and 60 for aprons and roadways. The factors that need to be considered while assigning priorities are:

- PCI
- Branch use (runway, taxiway, apron)
- Pavement rank (primary, secondary or tertiary).

Prioritization also depends on traffic conditions, subgrade conditions, drainage condition, etc. and some of which cannot be accomplished solely from this airport master plan. When the PCI falls below the acceptable level, immediate attention is required. Method of prioritization in this study is based on the PCI value for the worst condition of the sections. If the current PCI for an apron area is 20 and the primary runway is 50, the apron should (in statistical form) take priority,

[4] Reference - FAA Pavement Management, 2010
[5] Reference - FAA Pavement Management, 2010

however, in reality, the runway will take precedence over the apron area. Areas are rated on a scale of urgency based on the following levels:[6]

Level I: 1-5 years**.** PCI has fallen below minimal acceptable standards; primary surface and considered the highest priority based on PCI level and operational sensitivity.

Level II: 5-10 years. PCI is within five points of falling below the minimal acceptable standard; and/or primary or secondary surface. This is the second highest priority of pavement and the operational sensitivity of the area pertains to primary and secondary pavements.

Level III: 10-15 years. PCI is within 10-15 points of falling below the minimum acceptable standard; primary or secondary surface. This is the intermediate-range with an operational sensitivity level for secondary and tertiary pavement sections.

Level IV: 15+ years. PC is within 15+ points of falling below the minimum acceptable standard; secondary surface; fair and better condition and considered the lowest level of priority.

Various options are available for the treatment and rehabilitation of pavement. Determining the specific needs of the pavement and the associated life cycle cost is pivotal in getting the most out the dollar invested. The expected service life (in years) is dependent on the type of material and rehabilitation utilized (see **Table 3-18**).

Table 3-19 and **Table 3-20** depicts a high-level prioritization for rehabilitation of existing pavement and order in which pavements should be replaced. **Figure 3-11** depicts current pavement condition around the Airport.

Figure 3-12 through **Figure 3-15** show in layout form the pavement sections in need of repair and or rehabilitation based on aforementioned Levels.

TABLE 3-18 EXPECTED SERVICE LIFE (IN YEARS) AND RELATIVE COST FOR PAVEMENT REHABILITATION

Pavement Alternatives	Expected Service Life	Relative Cost
Flexible Pavements		
Reconstruction	Up to 12-15	High
Resurfacing (Thin overlay)	Up to 8-10	Low
Resurfacing (Thick overlay)	Up to 12-15	High
Full-depth reclamation	Up to 12-15	High
Crack Seal & Fog Seal	Up to 2-4	Low
Rigid Pavements		
Asphalt concrete surfacing	Up to 12-15	Medium
Joint stabilization	Up to 5-10	Low
Crack, seal, and surfacing	Up to 12-15	High
Unbonded concrete overlay	Up to 25-30	High

Source: Armstrong Consultants, Inc., June 2011.
Prepared by: Armstrong Consultants, Inc., June 2011.

[6] PCI values were obtained from the 2010 New Mexico Department of Transportation (NMDOT) pavement survey previously noted in the report. Armstrong Consultants, Inc. has not performed a detailed PCI survey assessment and future prioritization in this report is based on the said NMDOT survey and ACI visual inspection during the field survey in April, 2011.

FIGURE 3-11 AIRPORT PAVEMENT CONDITIONS

(Top-Bottom: Taxiway K at Runway 21 End; Aircraft Salvage Parking (closed Runway 12/30)/Taxiway B; Taxiway A shoulder; Taxiway A showing aircraft parked on closed Runway 12/30

TABLE 3-19 PAVEMENT CONDITION AND MANAGEMENT PRIORITIZATION

PAVEMENT		PAVEMENT CONDITION INDEX		PRIORITIZATION * REPLACEMENT		PRIORITIZATION * REHABILITATION/ MAINTENANCE		POTENTIAL FUNDING SOURCE
RUNWAY (R)	**OPERATIONAL SENSIVITY**	**CTR. LINE**	**SHOULDER**	**CTR. LINE**	**SHOULDER**	**CTR. LINE**	**SHOULDER**	
RWY 3/21 (R3)	Primary	Satisfactory	Poor	IV	I	III	III	FAA/State/Local
RWY 17/35 (R17)	Secondary	Good	Good	IV	IV	II	II	FAA/State/Local
TAXIWAY (T)	**OPERATIONAL SENSIVITY**							
TWY A (TA)	Secondary	Fair	Fair	II	IV	IV	I	FAA/State/Local
TWY B (TB)	Primary	Fair	Fair	II	II	I & IV	I & IV	FAA/State/Local
TWY C (TC)	Primary	Good	Good	IV	IV	II	II	FAA/State/Local
TWY D (TD)	Primary	Fair	Fair	III	III	II	II	FAA/State/Local
TWY E (TE)	Primary	Good	Good	IV	IV	II	II	FAA/State/Local
TWY F (TF)	Primary	Fair	Fair	III	III	II	II	FAA/State/Local
TWY G (TG)	Secondary	Good	Good	IV	IV	II	II	FAA/State/Local
TWY H (TH)	Secondary	Good	Good	IV	IV	II	II	FAA/State/Local
TWY J (TG)	Secondary	Good	Good	IV	IV	II	II	FAA/State/Local
TWY K (TK)	Secondary	Poor	Poor	II	II	I	I	FAA/State/Local
TWY M (TM)	Secondary	Good	Good	IV	IV	II	II	FAA/State/Local
TXL A (TLA)	Primary	Serious	Fair	I	N/A	III	N/A	FAA/State/Local
APRON AREA	**OPERATIONAL SENSIVITY**	**PAVEMENT AREA**		**PAVEMENT AREA**		**PAVEMENT AREA**		
Commercial Apron	Primary	Poor		I		III		FAA/State
General Aviation FBO Apron	Primary	Very Poor - Serious		I		III		FAA/State
General Aviation - Secondary	Secondary	Poor		II		IV		Local
Industrial								Local
A1	Tertiary	Poor		N/A		I / II / IV		Local
A2	Tertiary	Serious		N/A		I / II / IV		Local
A3	Tertiary	Very Poor		N/A		I / II / IV		Local

Source: New Mexico Department of Transportation, 2007 and ACI Field Visit (April, 2011)
Prepared by: Armstrong Consultants, Inc., June 2011.
**Prioritization levels and timelines are referenced in this section*

TABLE 3-20 PAVEMENT REPLACEMENT AND REHABILITATION SCHEDULE

Priority Level	Replacement	Rehabilitation/Maintenance
Level I	Runway 3/21 - Shoulder	Taxiway K - Centerline/Shoulder
	Taxilane A - Centerline	General Aviation (Secondary)
	Commercial Apron	Industrial Apron A1/A2/A3
	General Aviation FBO Apron	Taxiway B - Centerline/Shoulder
Level 2	Taxiway A - Centerline	Runway 17/35 - Centerline/Shoulder
	Taxiway B - Centerline/Shoulder	Taxiway A - Shoulder
	Taxiway K - Centerline/Shoulder	Taxiway C - Centerline/Shoulder
	General Aviation - Secondary	Taxiway D - Centerline/Shoulder
		Taxiway E - Centerline/Shoulder
		Taxiway F - Centerline/Shoulder
		Taxiway G - Centerline/Shoulder
		Taxiway H - Centerline/Shoulder
		Taxiway J - Centerline/Shoulder
		Taxiway M - Centerline/Shoulder
		Industrial Apron A1/A2/A3
Level 3	Taxiway D - Centerline/Shoulder	Runway 3/21 - Centerline/Shoulder
	Taxiway F - Centerline/Shoulder	Taxilane A - Centerline
		Commercial Apron
		General Aviation FBO Apron
Level 4	Runway 3/21 - Centerline/Shoulder	Taxiway A - Centerline
	Runway 17/35 - Centerline/Shoulder	Taxiway B - Centerline/Shoulder
	Taxiway A - Shoulder	Taxiway K - Centerline/Shoulder
	Taxiway C - Centerline/Shoulder	General Aviation - Secondary
	Taxiway E - Centerline/Shoulder	Industrial Apron A1/A2/A3
	Taxiway G - Centerline/Shoulder	
	Taxiway H - Centerline/Shoulder	
	Taxiway J - Centerline/Shoulder	
	Taxiway M - Centerline/Shoulder	

Source: Armstrong Consultants, Inc., June 2011.
Prepared by: Armstrong Consultants, Inc., June 2011.

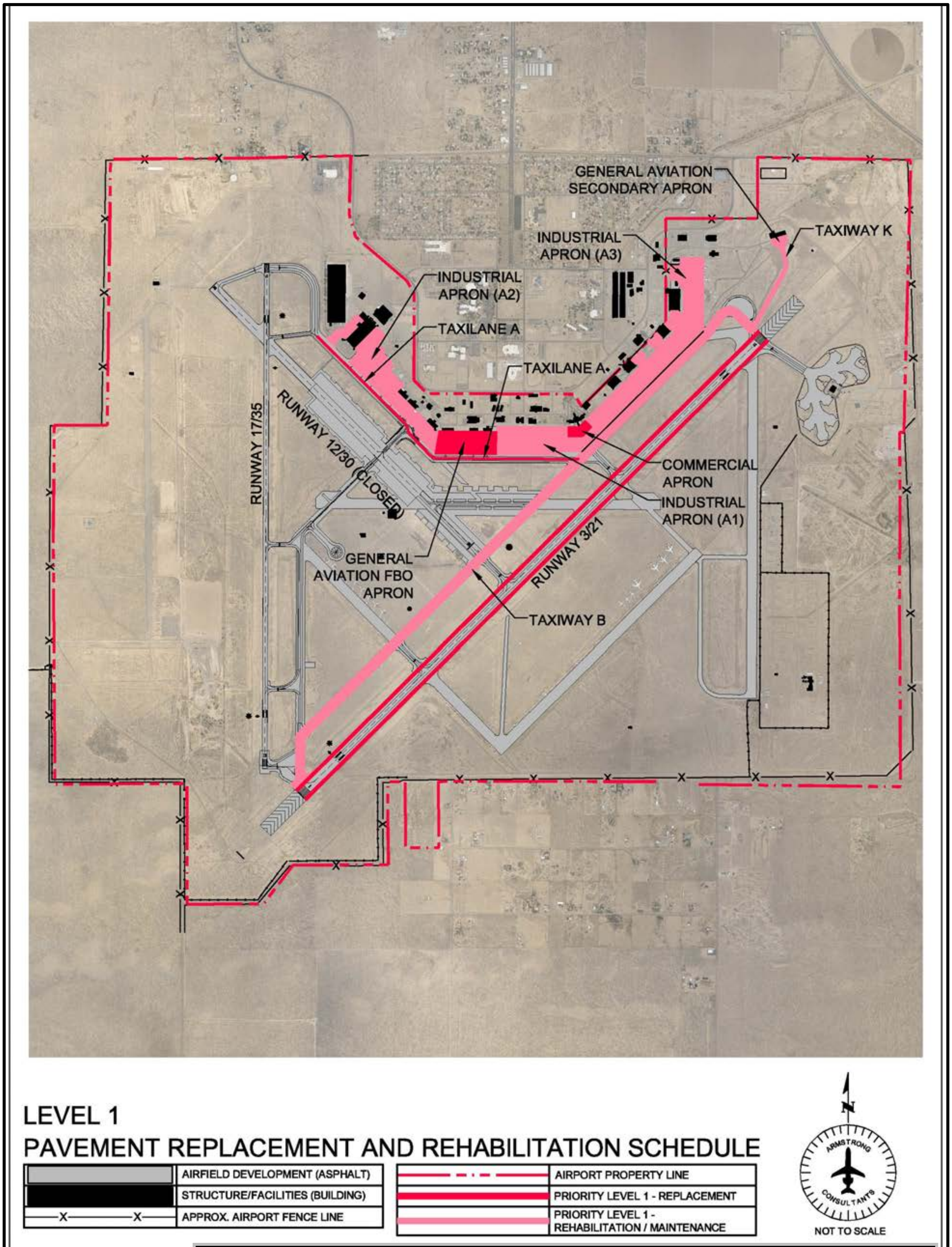


FIGURE 3-12 LEVEL 1: PAVEMENT REPLACEMENT AND REHABILITATION SCHEDULE

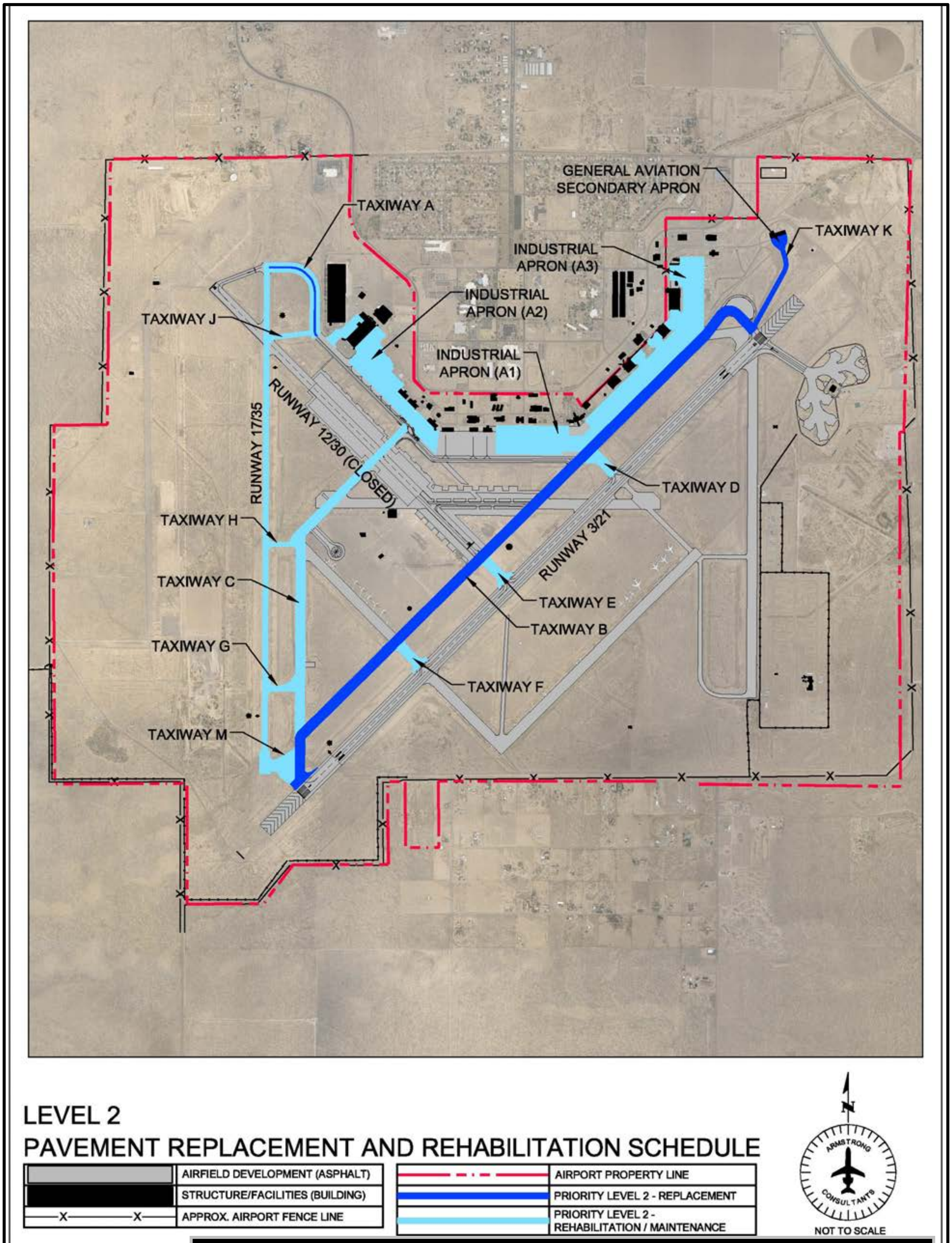


FIGURE 3-13 LEVEL 2: PAVEMENT REPLACEMENT AND REHABILITATION SCHEDULE

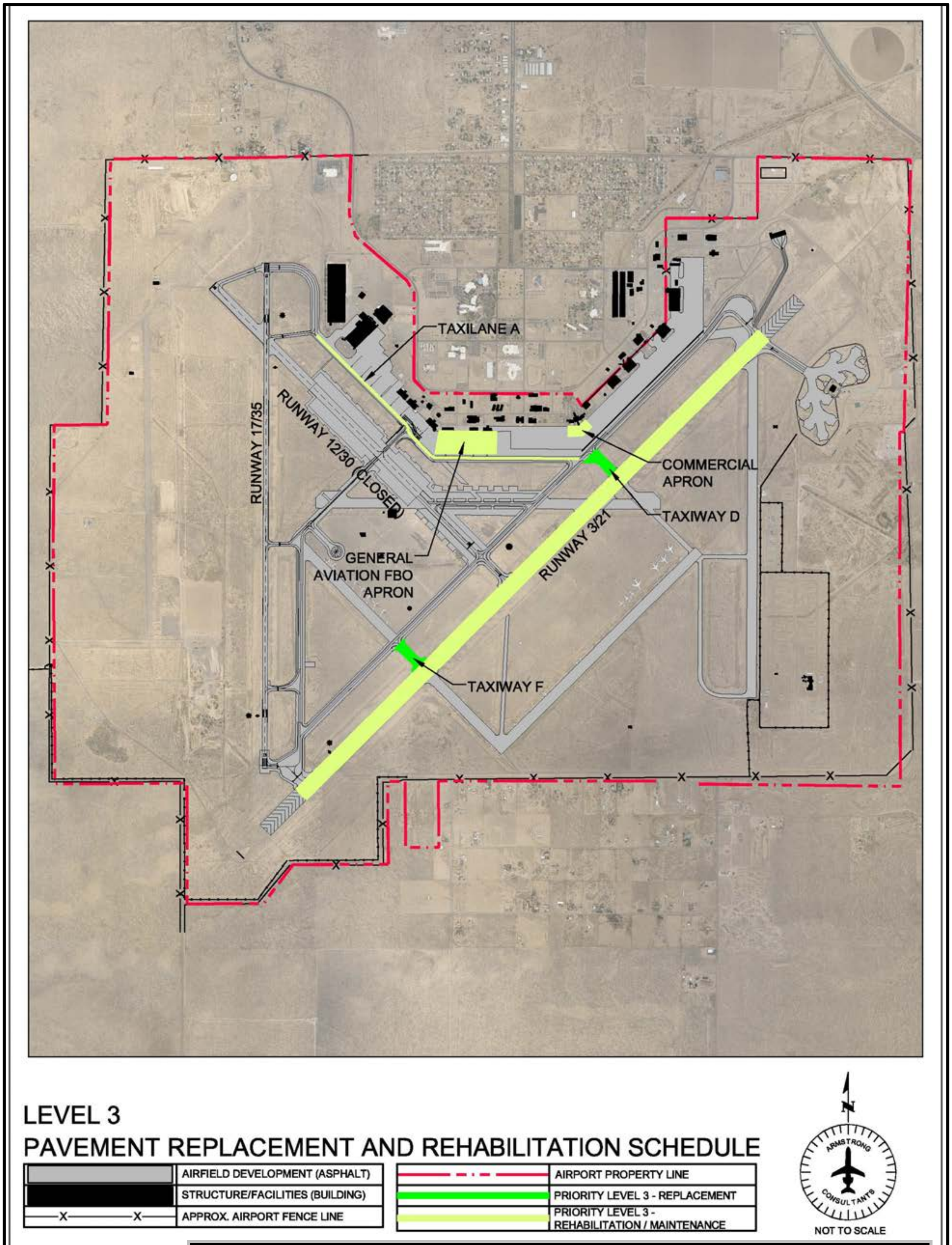


FIGURE 3-14 LEVEL 3: PAVEMENT REPLACEMENT AND REHABILITATION SCHEDULE

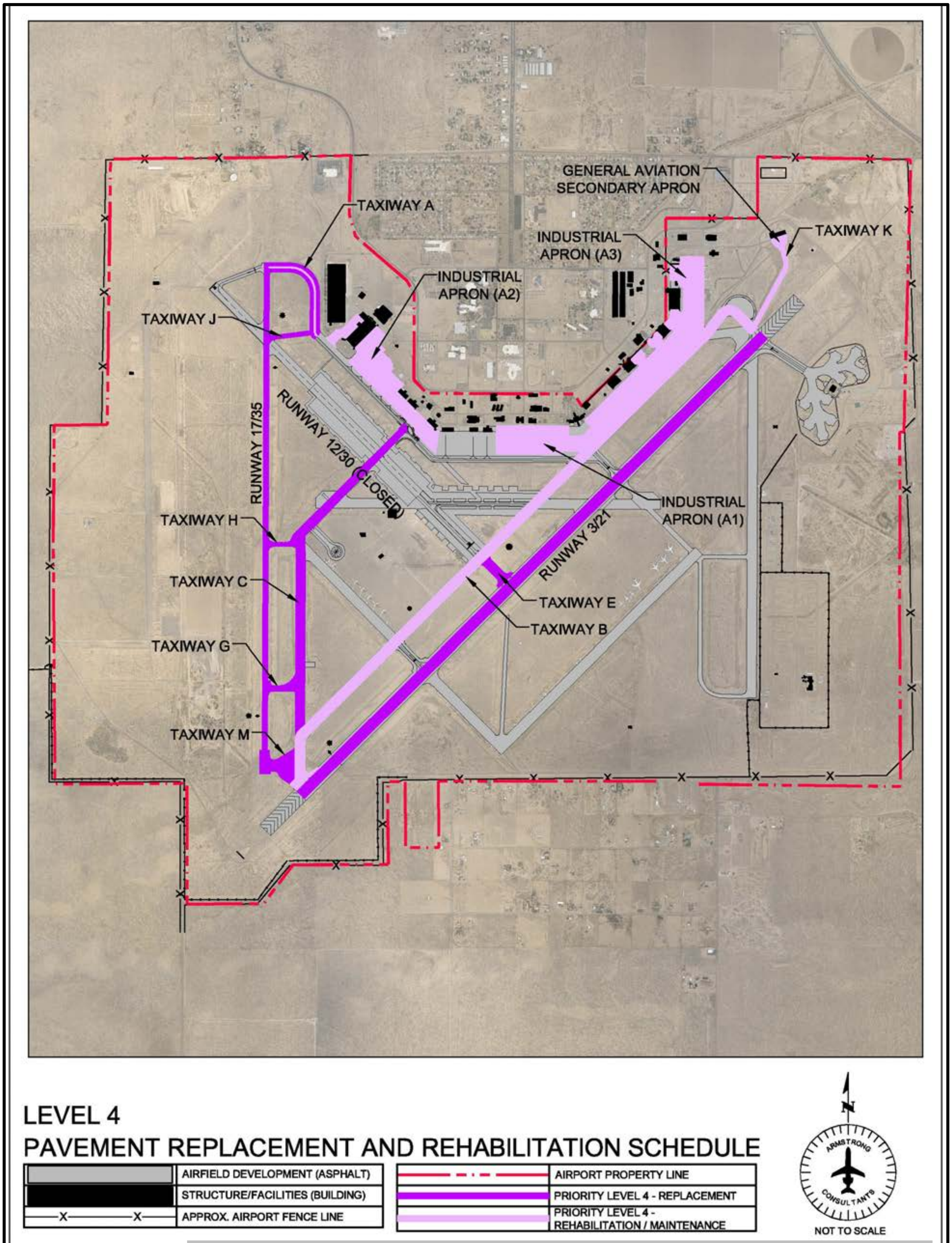


FIGURE 3-15 LEVEL 4: PAVEMENT REPLACEMENT AND REHABILITATION SCHEDULE

3.8 AIRSPACE REQUIREMENTS

14 Code of Federal Regulations (CFR) Part 77 establishes several Imaginary Surfaces that are used as a guide to provide a safe, unobstructed operating environment for aviation. These surfaces, which are typical for civilian airports are shown in **Figure 3-16**. The Primary, Approach, Transitional, Horizontal and Conical Surfaces identified in CFR Part 77 are applied to each runway. For the purpose of this section, a visual/utility runway is a runway that is intended to be used by propeller driven aircraft of 12,500 pound maximum gross weight and less. A nonprecision instrument/utility runway is a runway that is intended to be used by aircraft of 12,500 pounds maximum gross weight and less with a straight-in instrument approach procedure and instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan or by any planning document submitted to the FAA by competent authority. A nonprecision instrument/larger-than-utility runway is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure.

The Primary Surface is an imaginary surface of specific width longitudinally centered on a runway. Primary Surfaces extend 200 feet beyond each end of the paved surface of runways, but do not extend past the end of non-paved runways. The elevation of any point on the Primary Surface is the same as the elevation of the nearest point on the runway centerline. The width of the Primary Surface varies from 250, 500 or 1,000 feet depending on the type of approach and approach visibility minimums.

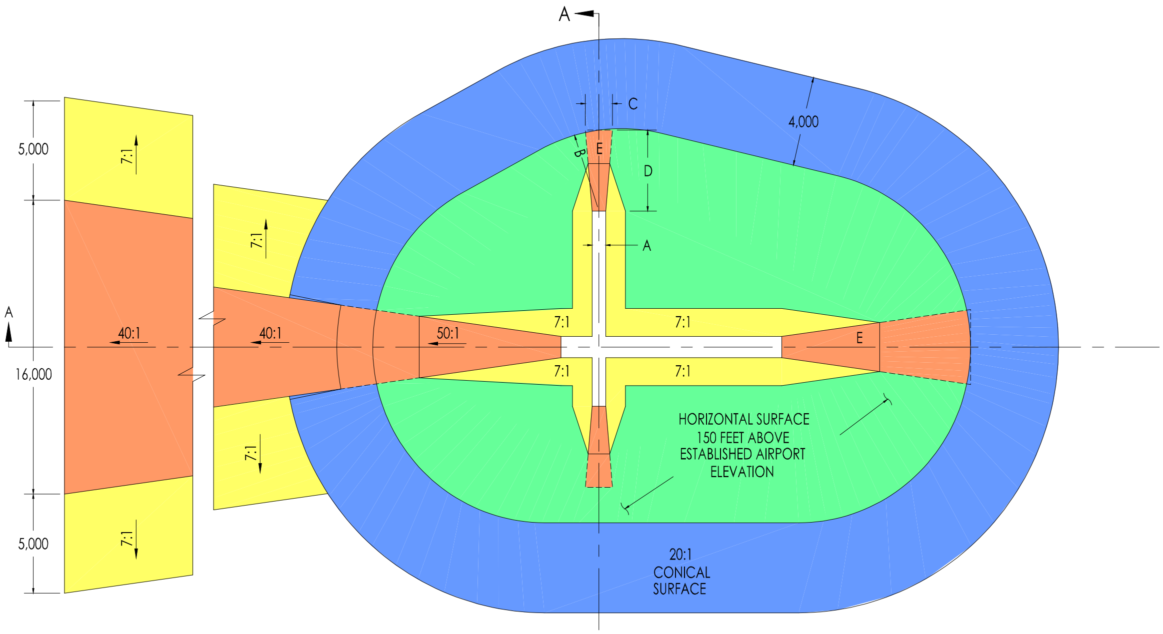
The Approach Surface is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the Primary Surface. An Approach Surface slope is applied to each end of the runway based upon the type of approach available or planned for that runway, either 20:1, 34:1 or 50:1. The inner edge of the surface is the same width as the Primary Surface. It expands uniformly to a width corresponding to the CFR Part 77 runway classification criteria.

The Transitional Surfaces extend outward and upward at right angles to the runway centerlines from the sides of the Primary and Approach Surfaces at a slope of 7:1 and end at the Horizontal Surface.

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

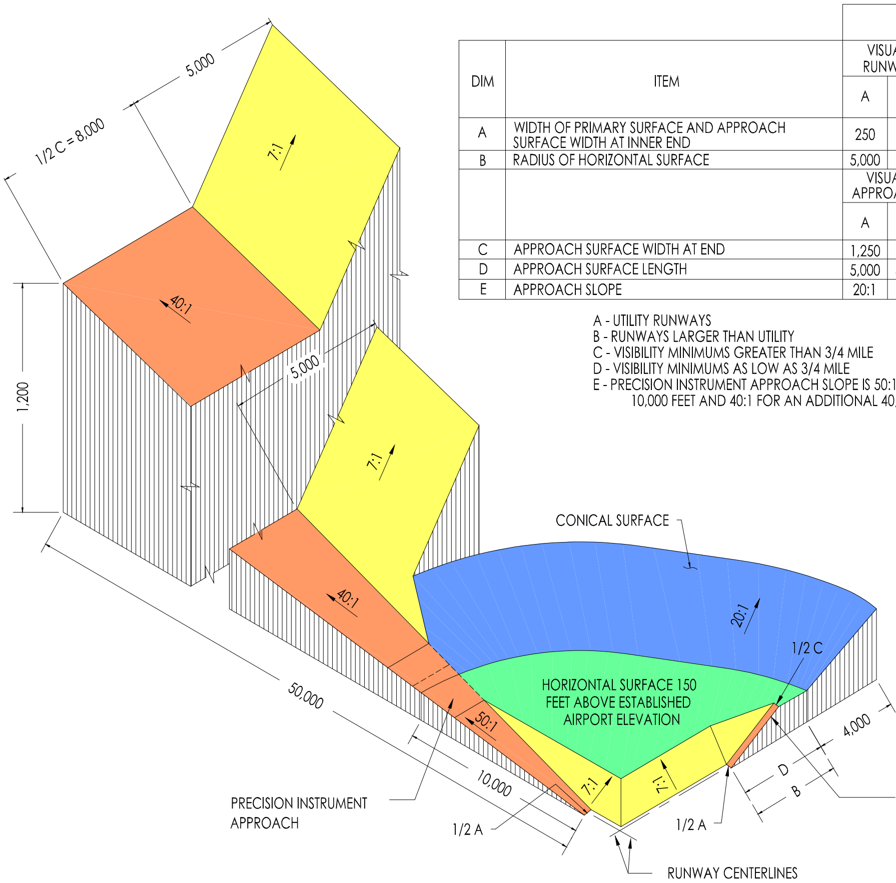
The Conical Surface extends outward and upward from the periphery of the Horizontal Surface at a slope of 20:1 for a horizontal distance of 4,000 feet.

The dimensions of the CFR Part 77 imaginary surfaces depend on the size of aircraft using the airport and the type of instrument approach procedures. No existing approach minimums will be affected; therefore, the size and location of the CFR Part 77 are expected to remain the same in the future.



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

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



SURFACE LEGEND

- PRIMARY
- APPROACH
- HORIZONTAL
- CONICAL
- TRANSITIONAL

ISOMETRIC VIEW OF SECTION A-A

FIGURE 3-16 CFR PART 77 IMAGINARY SURFACES

Source: FAA, June 2011.

3.9 LANDSIDE USE COMPATIBILITY AND CONTROL

3.9.1 AIRPORT PROPERTY

According to the Airport Property Map Exhibit "A", the existing Airport property encompasses approximately 4,679 acres and no additional land is recommended for the Airport during the planning period. However, certain portions and areas of the Airport property may be identified as not needed for aeronautical use and may be leased out for future non-aeronautical revenue generating development such as a solar panel farm or Aerospace/Business Industrial Park.

3.9.2 HEIGHT RESTRICTION ZONING

Development around airports can pose certain hazards to air navigation if appropriate steps are not taken to ensure that buildings and other structures do not penetrate the CFR Part 77 Airspace Surfaces (discussed in the previous Section 3.8). The FAA, therefore, recommends that all Airport Sponsors implement height restrictions in the vicinity of the Airport to protect these CFR Part 77 Surfaces.

The City of Roswell does not have an Airport Overlay Zoning plan that establishes specific zones that include all the land lying beneath the Approach, Transitional, Horizontal and Conical surfaces that protect, mitigate and prevent the creation of future airport hazards. Detail of these hazards range from: height restrictions; noise; electrical interference to navigational devices and communication between aircraft and airports; gas, smoke, dust, glare or other visual hazard; or, structures that interfere with aircraft safety should be addressed.

Chaves County and the City of Roswell do have Zoning Ordinance addressing height regulations; however, it does not directly reference 14 CFR Part 77, *Airspace Surfaces.* Section 3.f, *Height Regulations* state:

> "Heights of buildings and structures shall result in a development that will blend well with adjacent developments by matching the height requirements, as set forth elsewhere in this Ordinance, of the original zoning district classification of the area that is now proposed for the planned unit development district or the height requirements applicable to the adjacent zoning districts."[7]

Development and implementation of an Airport Height Restriction Overlay Zoning document is recommended in the initial-term planning period.

3.9.3 COMPATIBLE LAND USE

In addition to ensuring that obstructions to Part 77 Surfaces are avoided or appropriately marked and lighted, it is recommended that the Airport Sponsor make reasonable efforts to prevent incompatible land uses from the immediate area of the Airport, including wildlife attractants and noise sensitive land uses such as residential developments, schools, churches and hospitals. For example, the FAA states in the FAA Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*, that landfills and/or transfer stations are incompatible land uses with airports. Therefore, these types of facilities should be located at least 5,000 feet from any point on a runway that serves piston type aircraft and 10,000 feet from any point on a runway that serves turbine type aircraft. Furthermore, any facility which may attract wildlife (especially birds) such as sewage treatment ponds and wastewater treatment

[7] Reference – Chaves County : *Roswell Zoning Ordinance*, Section 3.f. Page 61,

plants should also be located this same distance from any point on the runway. Development proposals should also be reviewed to ensure compatibility in the vicinity of the Airport.

It is recommended that the City of Roswell develop an Airport Overlay Zoning Ordinance to reflect existing conditions and future planning development. The Airport Overlay Zoning Ordinance should include the off-airport land use drawing and CFR Part 77 Airspace drawing, which are included as part of this Airport Master Plan, to use as a planning resource to ensure future development surrounding the Airport is compatible. It is also recommended that Chaves County adopt the City's Airport Overlay Zoning in an effort to ensure continued land use compatibility in the vicinity of the Airport.

3.10 SUMMARY OF FACILITY REQUIREMENTS

The facility requirements for Roswell International Air Center are based on the types and volume of aircraft expected to use the Airport in the initial-, intermediate-, and long-term timeframes. These facilities will enable the Airport to serve its users in a safe and efficient manner. The recommended airside and landside facilities are summarized in **Table 3-21** and **Table 3-22**. The various means to meet the Airport's needs and priority of importance are addressed in Chapter 7 – Airport Development and Financial Plan.

TABLE 3-21 SUMMARY OF AIRPORT FACILITY REQUIREMENTS – RUNWAY 3/21

Runways			
3/21	Length and Width	13,001' x 200'	Same*
3/21	Strength (pounds)	100,000 SWG 200,000 DWG 400,000 DWT	Same
Markings	Runway 3	Nonprecision	Same
	Runway 21	Precision	Same
Taxiways			
	Parallel	Yes	Same
	Bypass Taxiways/Turnarounds	Yes	Same
	Width (feet)	50' - 80'	Same
	Strength (pounds)	100,000 SWG 200,000 DWG 400,000 DWT	Same
Apron			
	Size	531,309 square yards	569,509 square yards
	Tie Downs	38	60**
NAVAIDS			
	Approaches	Precision ILS, Nonprecision, VOR, GPS/LPV	Same
	Minimums	RW 3: ¾ -statue mile RW 21: ½-statue mile	Same
Lighting & Visual Aids			
	Runway Edge	HIRL	Same
	Taxiway/Apron Edge	MITL	Same
	Threshold Lights	Yes	Same
	REILs	Yes	Same
	Approach Slope Indicator	RW 3: VASI-6	Same
	Segmented Circle/Wind Cone	Yes	Same
	Rotating Beacon	Yes	Same
	Approach Lighting System	RW 21: MALSR	Same
Access & Parking			
	Automobile	132 Paved/50 Unpaved	200
Hangar Facilities			
	T-Hangars	2	10**
	Conventional-Small	6	20**
	Conventional-Medium/Large	4	20**
Fuel Storage			
	100 LL (gallons)	10,000	Same
	Jet-A (gallons)	120,000	Same
	Self-Serve	Yes	Same
Other			
	AWOS	ASOS	Same
	Unicom	Yes	Yes
	Terminal Building	25,703 square feet	37,038 square feet***

Prepared by: Armstrong Consultants, Inc., June 2011.
**Runway width may be reduced to 150 feet pending outcome of cost analysis*
***Based on actual demand*
**** Total includes square footage for Aerospace Industrial Park Visitors' Center*

TABLE 3-22 SUMMARY OF AIRPORT FACILITY REQUIREMENTS – RUNWAY 17/35

Runways			
17/35	Length and Width	9,999’ x 100’	Same
17/35	Strength (pounds)	77,000 SWG 104,000 DWG 165,000 DWT	Same
Markings	Runway 17	Nonprecision	Same
	Runway 35	Nonprecision	Same
Taxiways			
	Parallel	Yes – Partial	Same
	Bypass Taxiways/Turnarounds	Yes	Same
	Width (feet)	50’ - 75’	Same
	Strength (pounds)	77,000 SWG 104,000 DWG 165,000 DWT	Same
NAVAIDS			
	Approaches	Nonprecision, VOR, LPV	Same
	Minimums	RW 17: ¾-statue mile RW 35: ¾-statue mile	Same
Lighting & Visual Aids			
	Runway Edge	MIRL	Same
	Taxiway/Apron Edge	MITL	Same
	Threshold Lights	Yes	Same
	REILs	Yes	Same
	Approach Slope Indicator	RW 35: PAPI-4 RW 17: VASI-4	Same
	Segmented Circle/Wind Cone	Yes	Same
	Rotating Beacon	Yes	Same
	Approach Lighting System	No	No

Source: Airport Management, 2011 & ACI
Prepared by: Armstrong Consultants, Inc., May 2011.
**Based on actual demand*

CHAPTER

4

DEVELOPMENT ALTERNATIVES

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

Chapter Four
Development Alternatives

4.1 INTRODUCTION

While there are theoretically a broad range of options and variations for each aspect of airport development, an organized approach to identifying and evaluating alternatives that reasonably meet future aviation demand and a community's strategic goals and objectives is essential for effective airport master planning. The preceding chapters have established the projected activity levels at Roswell International Air Center and estimated facilities that will be needed to accommodate growth for the 20-year planning horizon. Determining the best option for airside and landside development will allow the Airport to invest in long-term capital infrastructure and investment for the future.

Included herein is a comprehensive breakdown of alternatives and recommended development options for the airside and landside projects. The airside development primarily focuses on Runway 3/21's dimensional criteria. The landside development will focus on the terminal building improvements, long-term and employee parking facility, general aviation expansion and industrial and aerospace business park development.

4.2 DEVELOPMENT OBJECTIVES

The overall objective of this chapter's analysis is to 1) review the facility requirements that have been determined necessary to safely and efficiently service aviation demand over the planning period; and 2) through investigation of available projects and options, where applicable, to determine the best way to implement the facility requirements and growth over the planning period.

There is countless variety for potential development options for any particular airport and Roswell International Air Center is no exception. The selection of a favored project can often result from a straightforward and logical discussion of the options at hand. Upon review of the existing conditions, the future development options and recommendations are based on a balanced discussion of where and how they can best be planned.

A combination of effective airside and landside planning is critical to successful development. Airside facilities are those used during takeoff, landing and ground maneuvering of aircraft. Landside facilities generally support aircraft after they exit the runway and park, and typically consist of a system of hangars, fixed base operator (FBO), fuel systems, airport maintenance and support facilities, vehicle parking areas, utility infrastructure and revenue generating areas.

4.3 AIRSIDE DEVELOPMENT

The majority of the future airfield development remains unchanged with no major additional airfield infrastructure required for the planning period. Other than maintaining the existing airfield pavements the alternatives focus primarily on the runway dimensional criteria for Runway 3/21. As described in Chapter 3, the existing runways and taxiways provide sufficient length and strength for the existing and forecasted operations. The instrument approach minimums meet future requirements and do not require the installation of any new Navigational Aids (NAVAIDs), marking or lighting. The primary focus of the airside development focuses on the dimensional criteria for Runway 3/21 which is discussed in the following section 4.3.1.

4.3.1. RUNWAY 3/21 ALTERNATIVES

When identifying the airfield alternatives, it is important the long-term plan and needs of the runway is met. Runway 3/21 (see **Figure 4-1**) is currently 200 feet wide with runway edge lighting and pavement marking located 160 feet from either side of the centerline (60 feet from the runway edge). Four alternatives for reconstructing the pavement, relocating the lighting and re-marking Runway 3/21 have been identified. The four alternatives are as follows and illustrated on **Figure 4-2**:

FIGURE 4-1 RUNWAY 3/21

1) **Alternative 1A**. This alternative retains the existing runway width of 200 feet and the lighting and runway edge marking at 160 feet on either side of the runway centerline (see **Figure 4-3**). This alternative would reconstruct 50 feet of pavement on either side of the runway centerline, and mill and overlay the remaining asphalt shoulders and blast pads at both ends of the runway to mitigate foreign object debris (FOD). *Estimated Cost of this alternative: $29,000,000.*

Advantages	Disadvantages
▪ Runway configuration remains the same ▪ Runway would be 50 feet wider than Alternative 2A and 2B ▪ Meets aircraft manufacture testing needs ▪ Preferred by the Airport Sponsor for meeting the Airport's long-term strategic goals	▪ Higher construction costs than Alternative 2A and 2B ▪ Modification to standards required for runway width ▪ Modification to standards required for edge light location ▪ Higher maintenance cost due to greater useable runway pavement than Alternative 2A and 2B

2) **Alternative 1B.** This alternative retains the runway width at 200 feet but relocates the runway edge lighting and marking from the existing 160 feet on either side of the centerline to 110 feet from either side of the runway, 10 feet from the runway edge (see **Figure 4-4**). This alternative will also mill and overlay the asphalt shoulders and blast pads. *Estimated cost of this alternative: $30,000,000.*

Advantages	Disadvantages
▪ Runway would be 50 feet wider than Alternative 2A and 2B ▪ Meets aircraft manufacturer testing needs for runway width ▪ Runway lights would meet FAA	▪ Highest construction costs of all alternatives ▪ Requires modification to FAA Design Standards for runway width ▪ Requires modification to standards for

criteria for 200 feet runway width
- FAA visual aids would not need to be reconfigured

runway width
- Higher maintenance cost due to greater useable runway pavement than Alternative 2A and 2B

3) **Alternative 2A.** This alternative narrows the runway from the existing 200 feet to 150 feet in width. The runway edge lights would remain at 160 feet from either side of the runway centerline; 85 feet from the runway edge (see **Figure 4-5**). This alternative would reconstruct 25 feet on either side of the runway centerline. *Estimated cost of this alternative: $19,842,300.*

Advantages
- Meets FAA design standards for runway width
- Does not require runway edge light relocation
- Lowest construction costs
- Reduced maintenance costs

Disadvantages
- Modification to standards required for edge light location
- Reduces runway utility and safety margin for flight test operations

4) **Alternative 2B.** This alternative narrows the runway from the existing 200 feet to 150 feet in width (see **Figure 4-6**). The runway edge lights would be relocated to 85 feet from either side of the runway centerline (10 feet from runway edge). *Estimated cost of this alternative: $20,320,500*.

Advantages
- Meets FAA design standards for runway width and edge light location
- Lowest construction costs
- Reduced maintenance costs

Disadvantages
- Reduces runway utility and safety margin for flight test operations

Runway 3/21 is not currently grooved. The runway is extensively utilized for the testing and certification of new aircraft, including break testing, for which a non-grooved surface is needed. The additional runway width (200 feet versus 150 feet) provides an additional margin of safety for flight testing, commercial service and general aviation operations. None of the alternatives recommend grooving within the replacement project due to this type of testing operation at the Airport.

4.3.2 Recommended Runway 3/21 Alternative

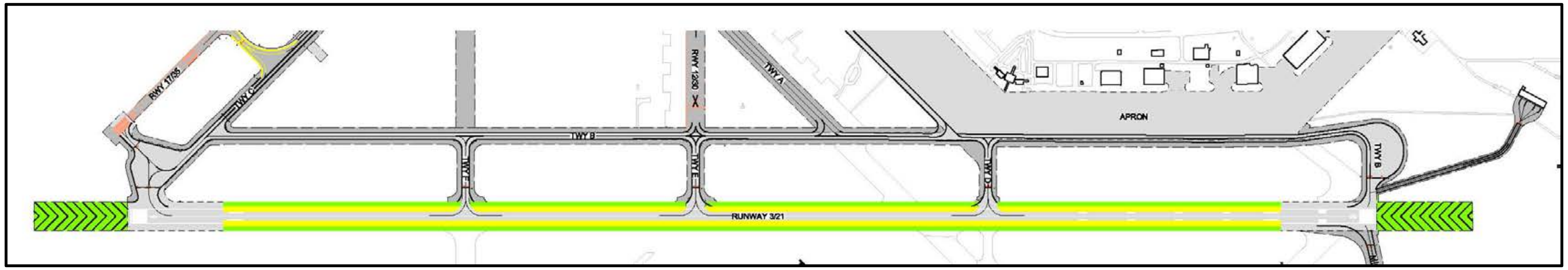
Airport management and Armstrong Consultants met with the Airport Sponsor, FAA, and New Mexico Aviation Division at a Joint Planning Conference (JPC) in November, 2011 to discuss the future development and planning for Runway 3/21. It was determined that Alternative 1A is the preferred alternative to be carried forward within this Airport Master Plan. This Alternative provides the maximum level of safety, utility, utilization and economic benefit to the community; however, implementation of this Alternative requires the preparation and FAA approval of Modifications to Standards for the runway width, edge light location and non-grooving. (Note: Although Alternative 1A was selected as the preferred alternative, the results of the requested Modification to Standards and subsequent selected alternative are discussed in Section 4.10 on pages 4-35 and 4-36.)

4.3.3 HELICOPTER DEVELOPMENT

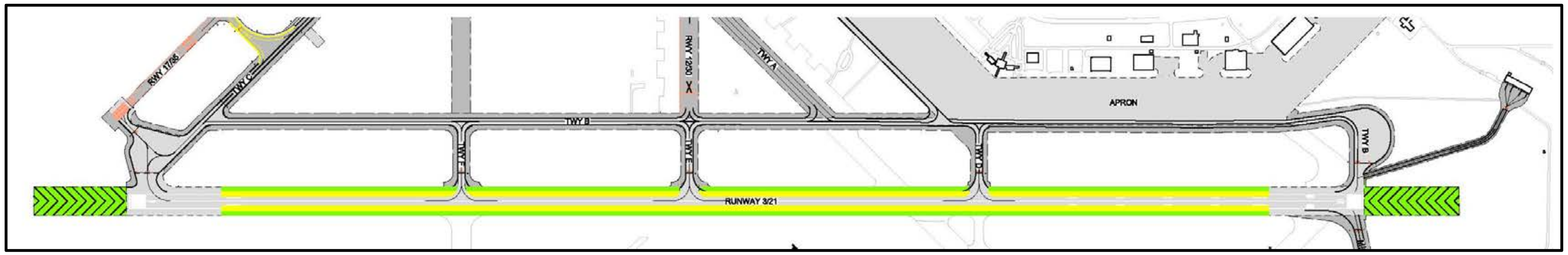
Roswell International Air Center does not have a designated helicopter parking position for air medivac helicopters. A helicopter parking position is recommended to the south of Great Southwest Aviation FBO for existing and future emergency service operations. A helipad with a touchdown and lift-off area (TLOF) and final approach and take-off area (FATO) was considered but conflicted with air traffic control operations and procedures, and a helicopter parking pad was selected as the preferred option.

4.3.4 RUNWAY 12/30

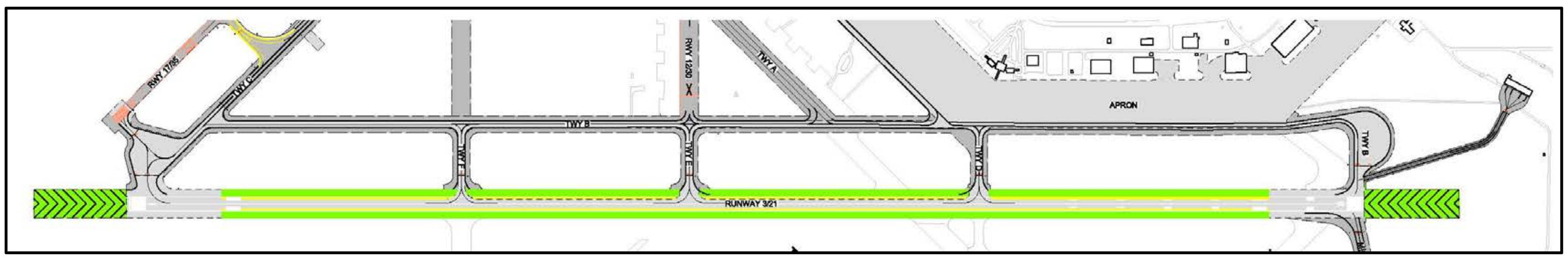
Runway 12/30 is permanently closed and the pavement is currently being utilized as a large aircraft storage and salvage apron. Runway designation markings have been painted over with the standard ‘X’ marking which delineates a runway is not longer operative. There are two runway entrance signs still in place at the intersection of Runway 12/30 and Taxiway C; all other signage has been removed. It is recommended that this signage be removed in the initial-term. It is recommended the closed runway continue to be utilized as a large aircraft storage apron. The connector taxiway between Runway 12/30 and Taxiway B is Taxiway S. Taxiway S is currently used for aircraft salvage and storage and is not longer in use as a taxiway; however, existing signage and marking currently indicate the pavement is a taxiway. It is recommended that all signage and marking relating to Taxiway S be removed in the initial-term. There is currently a NOTAM issued stating that Taxiway S is considered a non-movement area. Once all pavement marking and frangible signage is removed, Taxiway S will serve as an industrial apron.



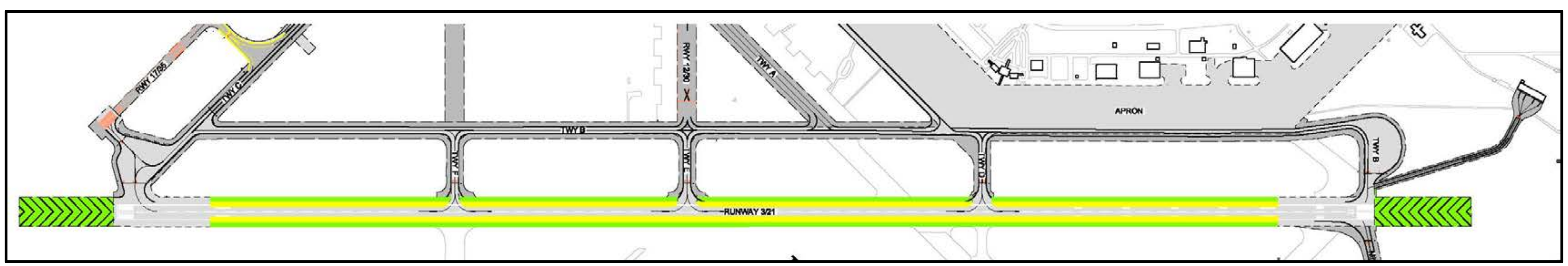
Alternative 1A



Alternative 1B



Alternative 2A



Alternative 2B

FIGURE 4-2 RUNWAY 3-21 ALTERNATIVES

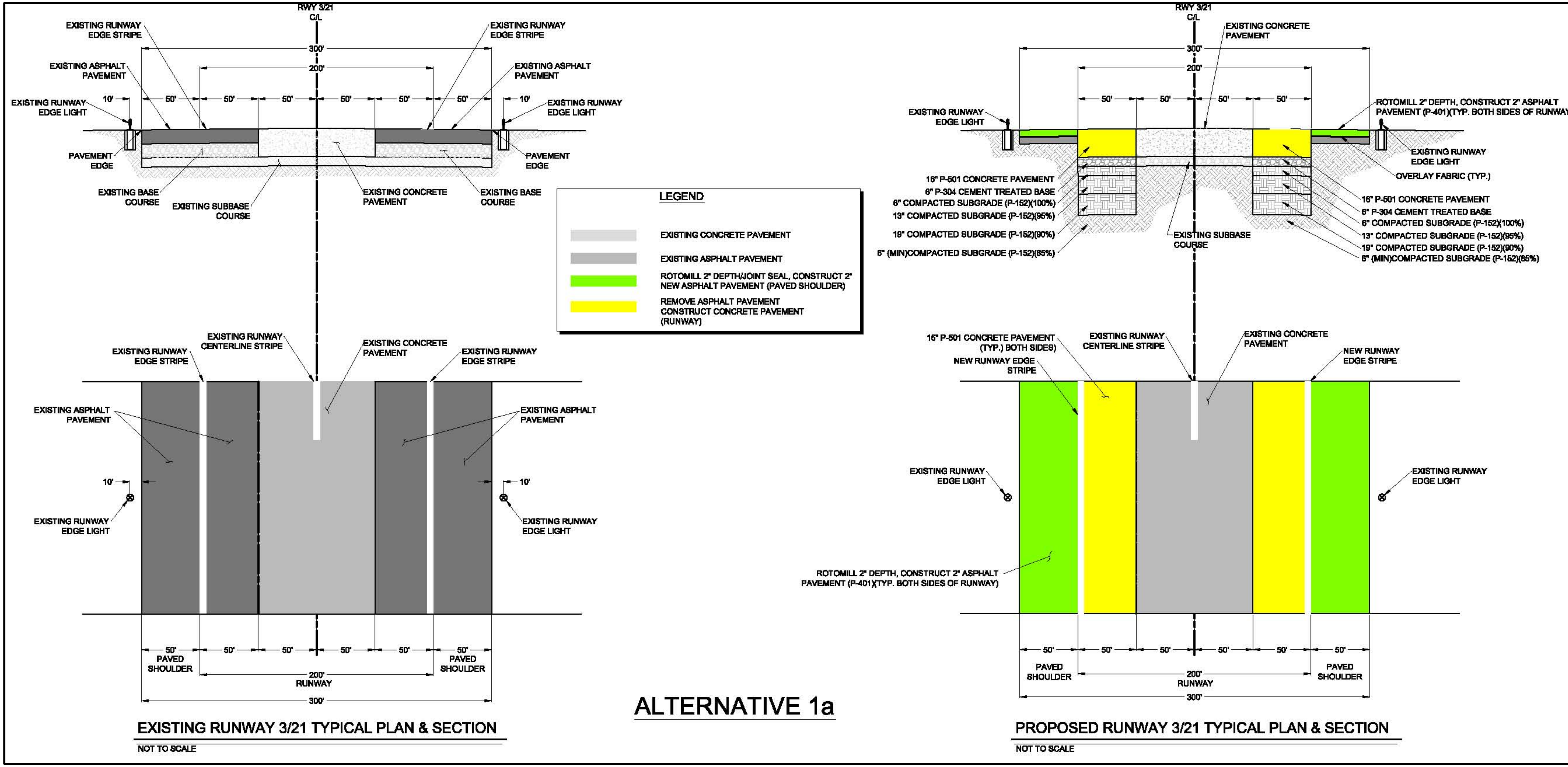


FIGURE 4-3 RUNWAY 3-21 ALTERNATIVE 1A

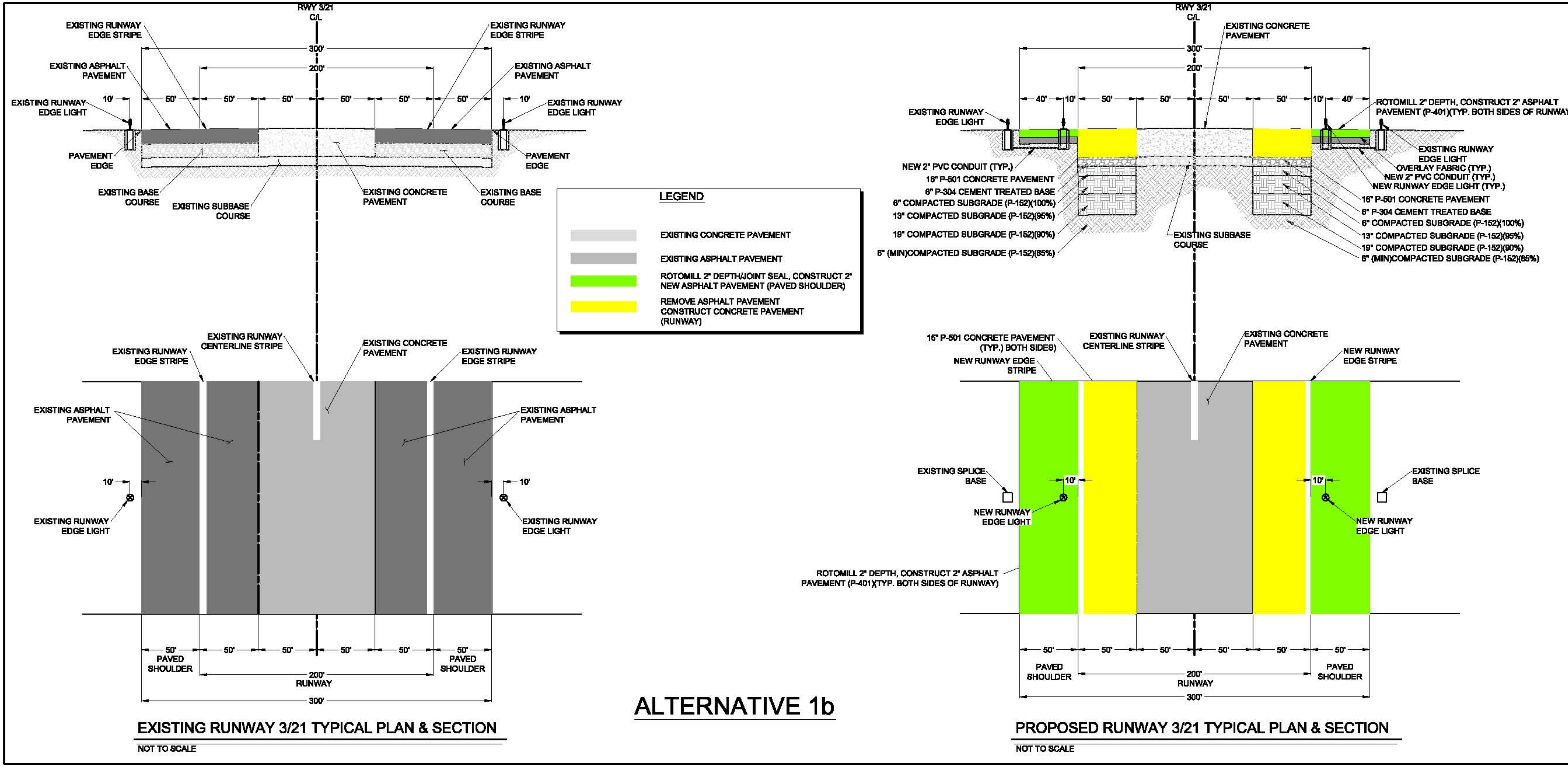


FIGURE 4-4 RUNWAY 3-21 ALTERNATIVE 1B

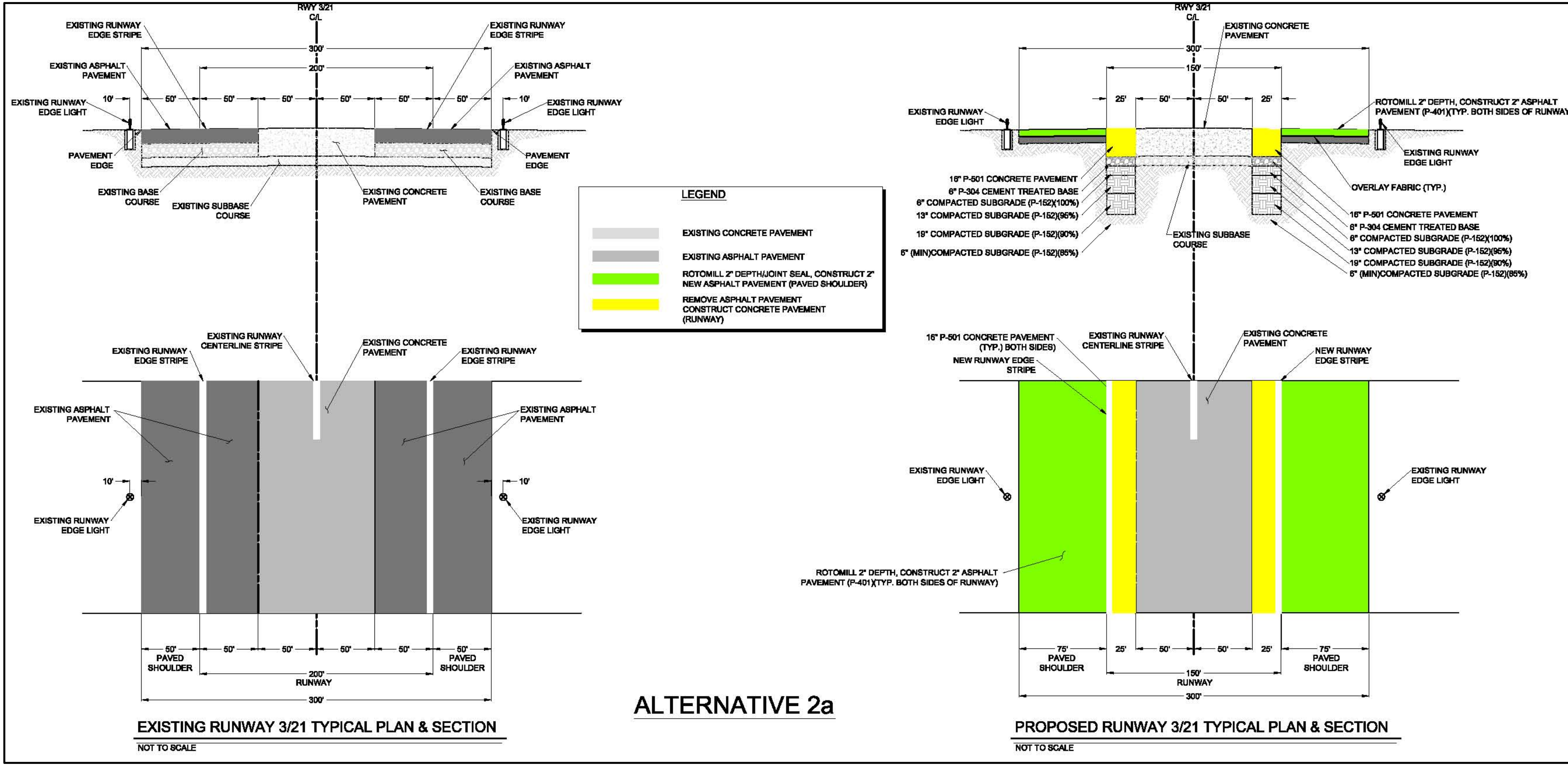


FIGURE 4-5 RUNWAY 3-21 ALTERNATIVE 2A

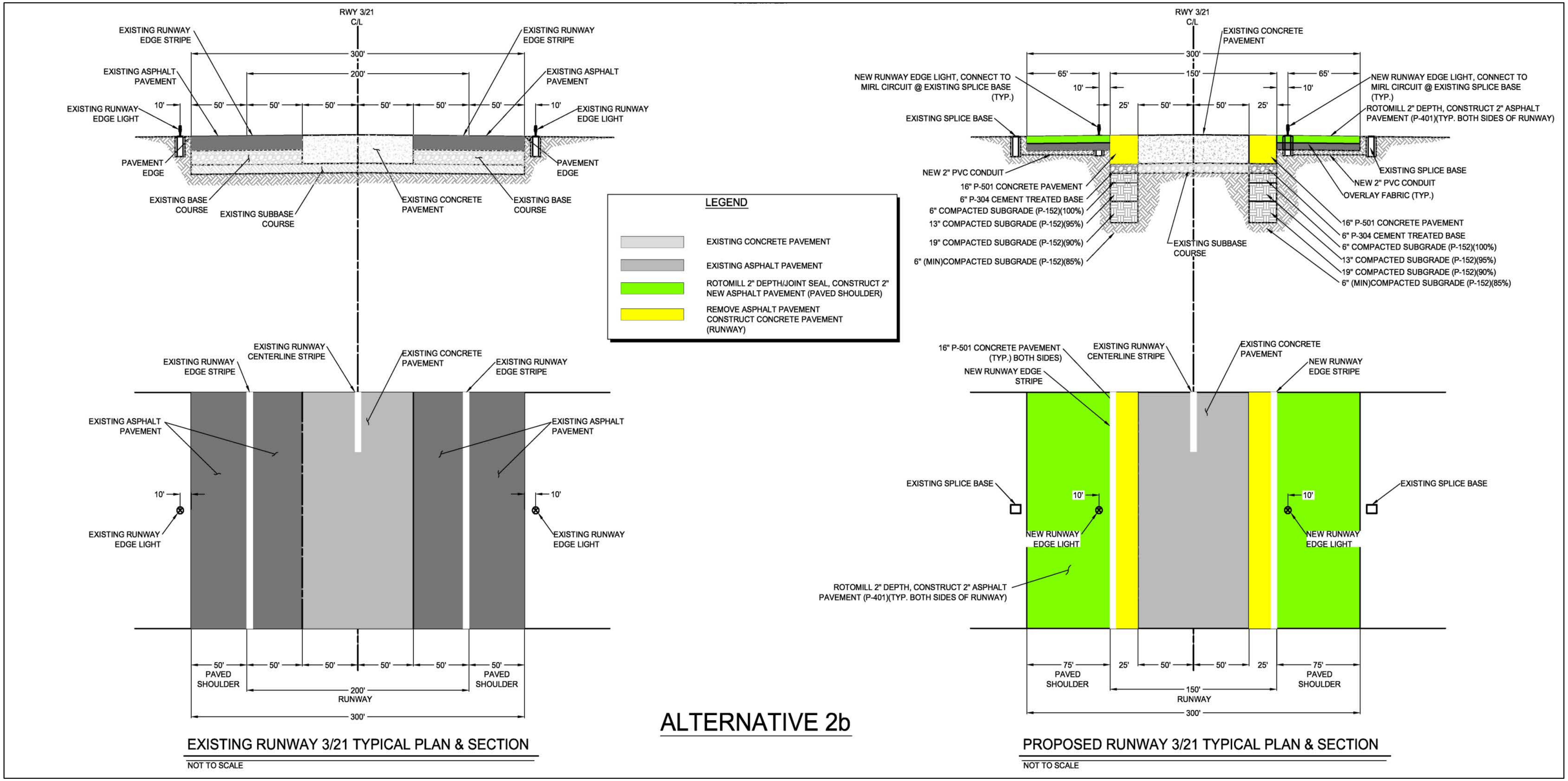


FIGURE 4-6 RUNWAY 3-21 ALTERNATIVE 2B

PAGE INTENTIONALLY LEFT BLANK

4.3.5 PAVEMENT MANAGEMENT PLAN

A pavement management plan (PMP) has been developed which assesses the condition of all existing pavement on the airfield. This plan addresses the lifecycle maintenance and rehabilitation of the airfield system. The overall goal of this plan is to extend the life of the pavement and reduce the lifecycle costs. The objectives of the PMP are to:

- Develop a plan that will preserve and/or improve the quality of the airfield's pavement in a fiscally responsible manner.
- Develop and implement a plan that considers immediate-, and long-term needs.
- Prepare a systematic plan and a workable method of financing.

The PMP is used in determining an annual maintenance budget for the City of Roswell and allow for the necessary grant funding through the state of New Mexico and FAA while serving as a roadmap for future projects. **Table 4-1** and **Figures 4-8** through **4-11** illustrates the recommended schedule for pavement maintenance and rehabilitation through the planning period and the time-frames the repairs and rehabilitation are recommended for completion.

The pavement condition at the Airport varies throughout the airfield depending on age, material, and use. Prioritization enables the Airport to identify pavement areas in need of immediate or future repair and is an effective tool for decision making. A minimum acceptable level of PCI for runways is 75, 70 for taxiways, and 60 for aprons and roadways. The factors that need to be considered while assigning priorities are:

- PCI
- Branch use (runway, taxiway, apron)
- Pavement rank (primary, secondary or tertiary).

The first step was to identify which pavements are eligible for FAA and/or state funding participation, and which would require local only funding. This breakdown is depicted in **Figure 4-7** and is further broken down in **Table 4-1**

Prioritization also depends on traffic conditions, subgrade conditions, drainage condition, etc. and some of which cannot be accomplished solely from this airport master plan. When the PCI falls below the acceptable level, immediate attention is required. Method of prioritization in this study is based on the PCI value for the worst condition of the sections. If the current PCI for an apron area is 20 and the primary runway is 50, the apron should (in statistical form) take priority, however, in reality, the runway will take precedence over the apron area. Areas are rated on a scale of urgency based on the following levels:[1]

<u>Level I: 1-5 years.</u> PCI has fallen below minimal acceptable standards; primary surface and considered the highest priority based on PCI level and operational sensitivity.

<u>Level II: 5-10 years.</u> PCI is within five points of falling below the minimal acceptable standard; and/or primary or secondary surface. This is the second highest priority of pavement and the operational sensitivity of the area pertains to primary and secondary pavements.

[1] PCI values were obtained from the 2010 New Mexico Department of Transportation (NMDOT) pavement survey previously noted in the report. Armstrong Consultants, Inc. has not performed a detailed PCI survey assessment and future prioritization in this report is based on the said NMDOT survey and ACI visual inspection during the field survey in April, 2011.

Level III: 10-15 years. PCI is within 10-15 points of falling below the minimum acceptable standard; primary or secondary surface. This is the intermediate-range with an operational sensitivity level for secondary and tertiary pavement sections.

Level IV: 15+ years. PC is within 15+ points of falling below the minimum acceptable standard; secondary surface; fair and better condition and considered the lowest level of priority.
A detailed phasing plan and costs for the PMP are included in Chapter 7-Airport Development and Financial Plan.

TABLE 4-1 PAVEMENT REPLACEMENT AND REHABILITATION SCHEDULE

Priority Level	Replacement	Funding Source	Rehabilitation/Maintenance	Funding Source
Level I	Runway 3/21 - Shoulder	FAA/State/Local	Taxiway K - Centerline/Shoulder	FAA/State/Local
	Taxilane A - Centerline	FAA/State/Local	General Aviation (Secondary)	Local
	Commercial Apron	FAA/State/Local	Industrial Apron A1/A2/A3	Local
			Taxiway B - Centerline/Shoulder	FAA/State/Local
Level 2	Taxiway A - Centerline	FAA/State/Local	Runway 17/35 - Centerline/Shoulder	FAA/State/Local
	Taxiway B - Centerline/Shoulder	FAA/State/Local	Taxiway A - Shoulder	FAA/State/Local
	Taxiway K - Centerline/Shoulder	FAA/State/Local	Taxiway C - Centerline/Shoulder	FAA/State/Local
	General Aviation - Secondary	Local	Taxiway D - Centerline/Shoulder	FAA/State/Local
			Taxiway E - Centerline/Shoulder	FAA/State/Local
			Taxiway F - Centerline/Shoulder	FAA/State/Local
			Taxiway G - Centerline/Shoulder	FAA/State/Local
			Taxiway H - Centerline/Shoulder	FAA/State/Local
			Taxiway J - Centerline/Shoulder	FAA/State/Local
			Taxiway M - Centerline/Shoulder	FAA/State/Local
			Industrial Apron A1/A2/A3	Local
Level 3	Taxiway D - Centerline/Shoulder	FAA/State/Local	Runway 3/21 - Centerline/Shoulder	FAA/State/Local
	Taxiway F - Centerline/Shoulder	FAA/State/Local	Taxilane A - Centerline	FAA/State/Local
			Commercial Apron	FAA/State
			General Aviation FBO Apron	Local
Level 4	Runway 3/21 - Centerline/Shoulder	FAA/State/Local	Taxiway A - Centerline	FAA/State/Local
	Runway 17/35 - Centerline/Shoulder	FAA/State/Local	Taxiway B - Centerline/Shoulder	FAA/State/Local
	Taxiway A - Shoulder	FAA/State/Local	Taxiway K - Centerline/Shoulder	FAA/State/Local
	Taxiway C - Centerline/Shoulder	FAA/State/Local	General Aviation - Secondary	Local
	Taxiway E - Centerline/Shoulder	FAA/State/Local	Industrial Apron A1/A2/A3	Local
	Taxiway G - Centerline/Shoulder	FAA/State/Local		
	Taxiway H - Centerline/Shoulder	FAA/State/Local		
	Taxiway J - Centerline/Shoulder	FAA/State/Local		
	Taxiway M - Centerline/Shoulder	FAA/State/Local		

Source: Armstrong Consultants, Inc., October 2011.
Prepared by: Armstrong Consultants, Inc., June 2011.

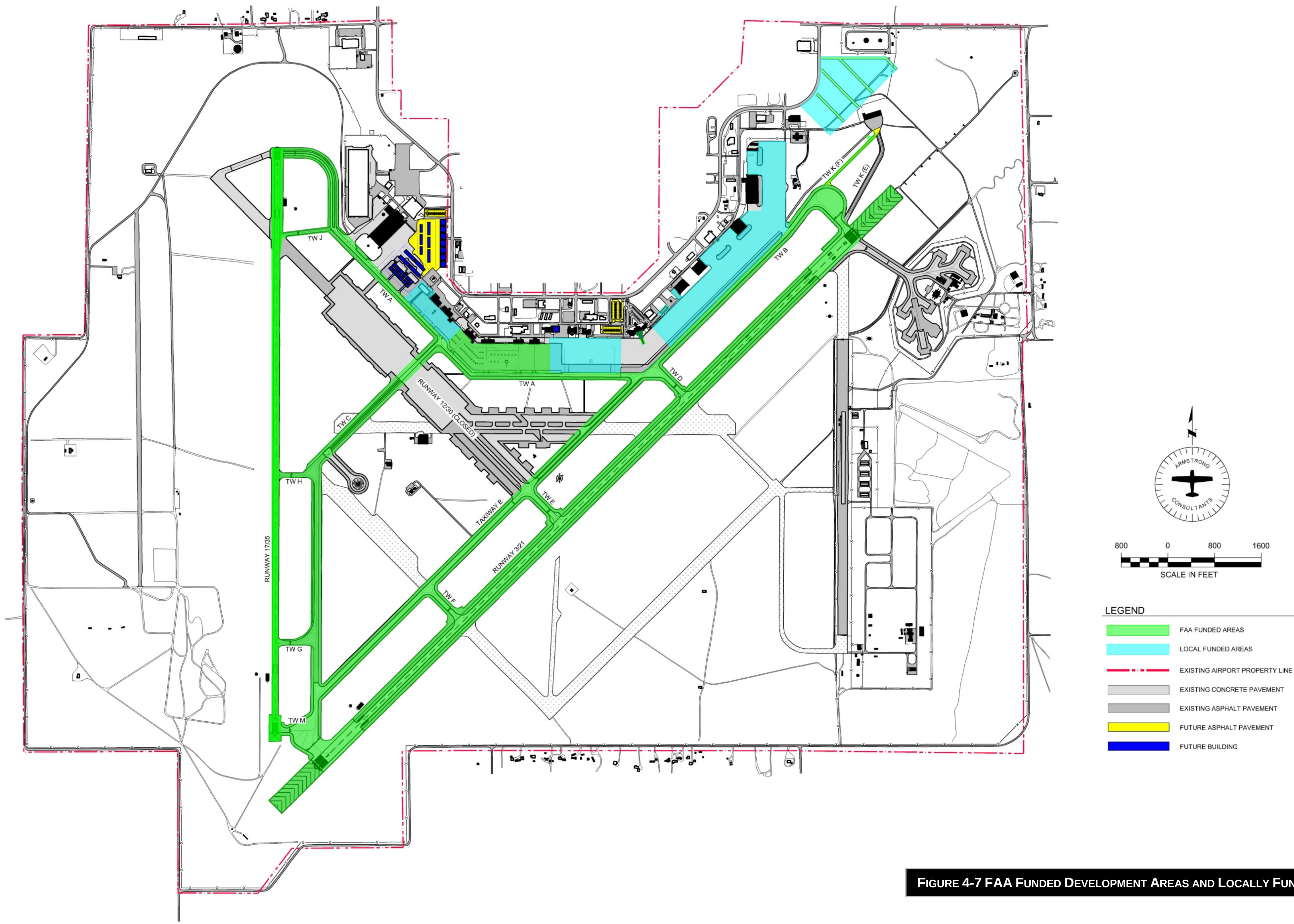


FIGURE 4-7 FAA FUNDED DEVELOPMENT AREAS AND LOCALLY FUNDED DEVELOPMENT AREAS

PAGE INTENTIONALLY LEFT BLANK

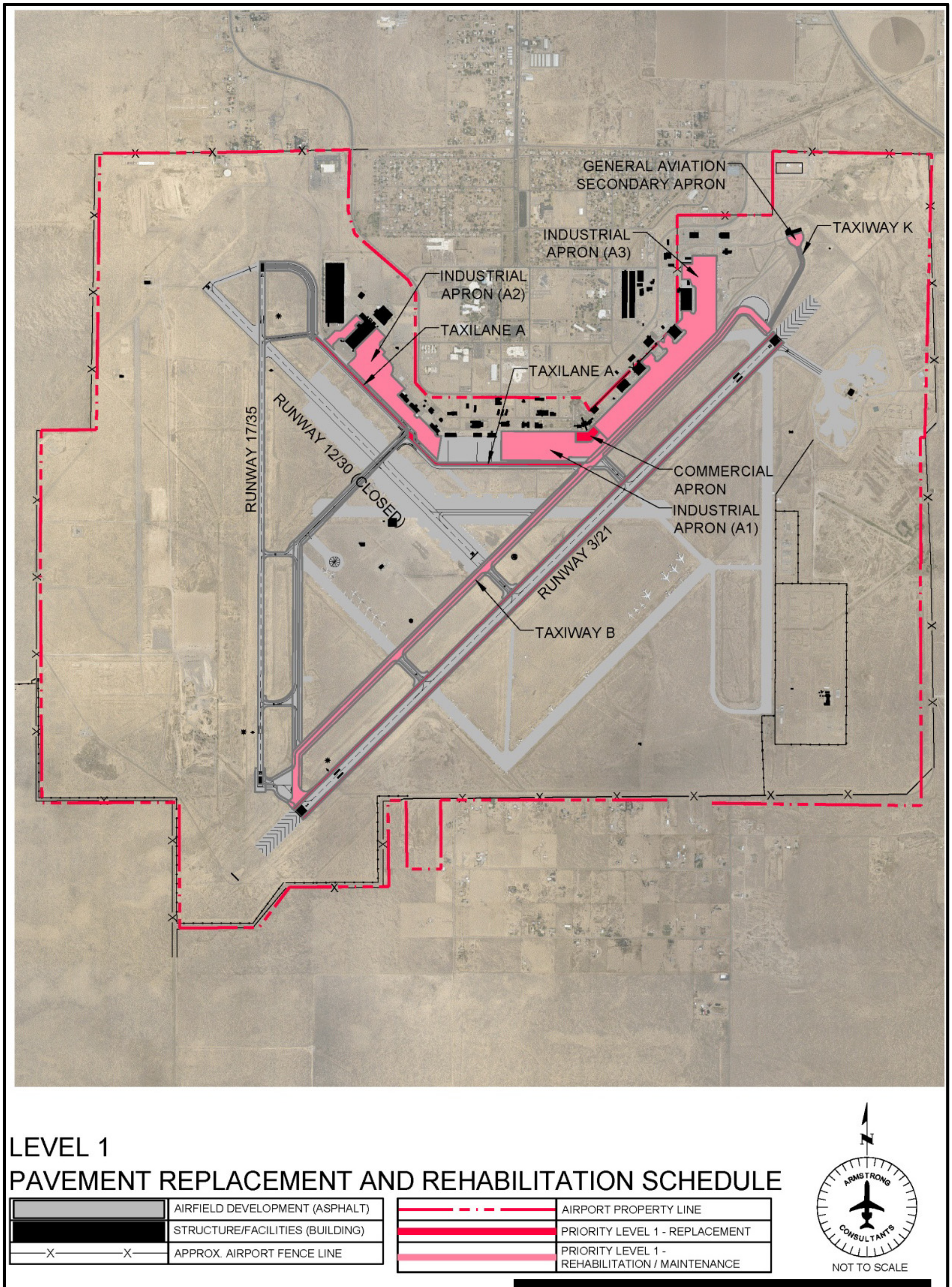


FIGURE 4-8 LEVEL 1 PAVEMENT MAINTENANCE

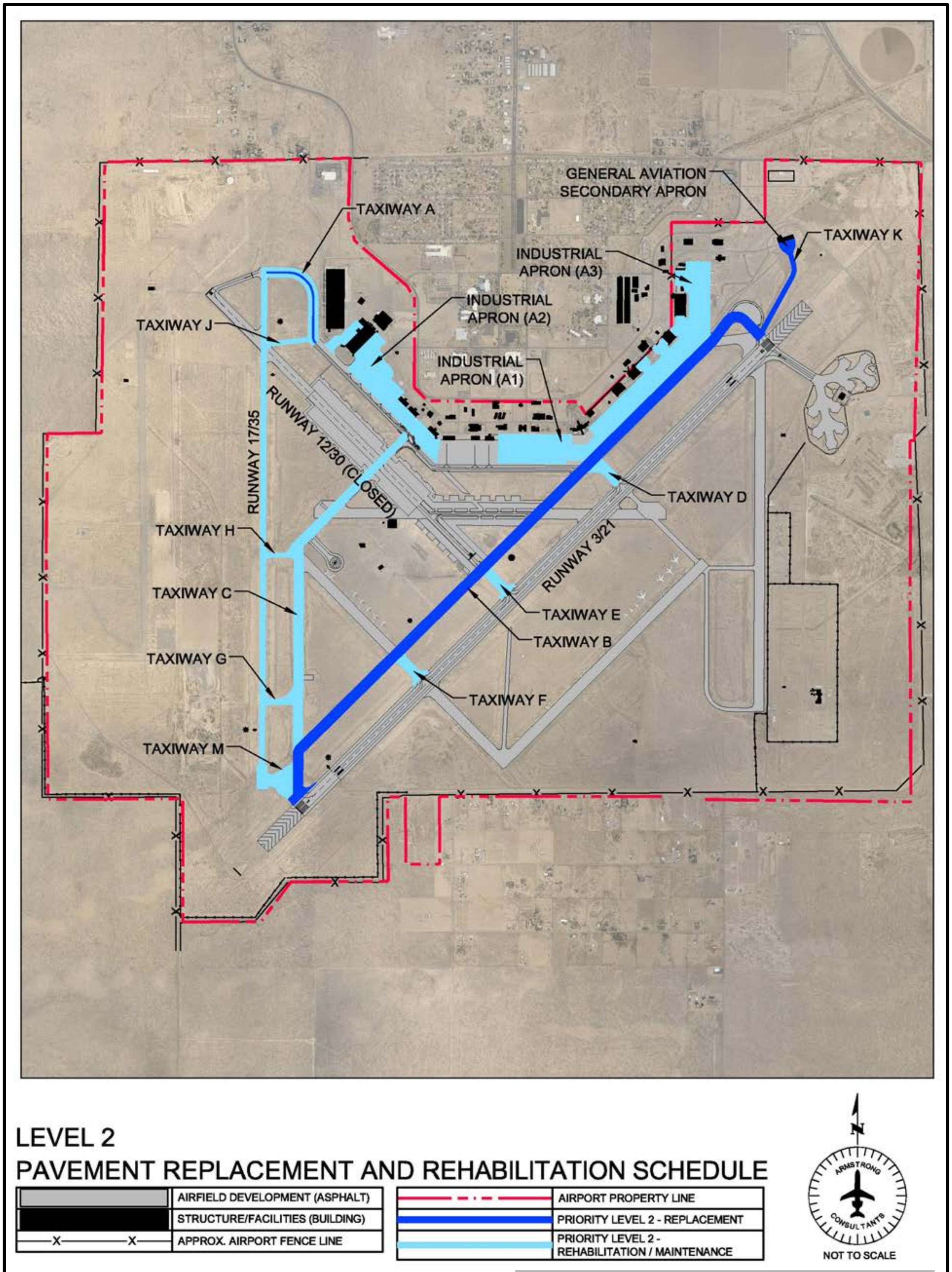


Figure 4-9 Level 2 Pavement Maintenance

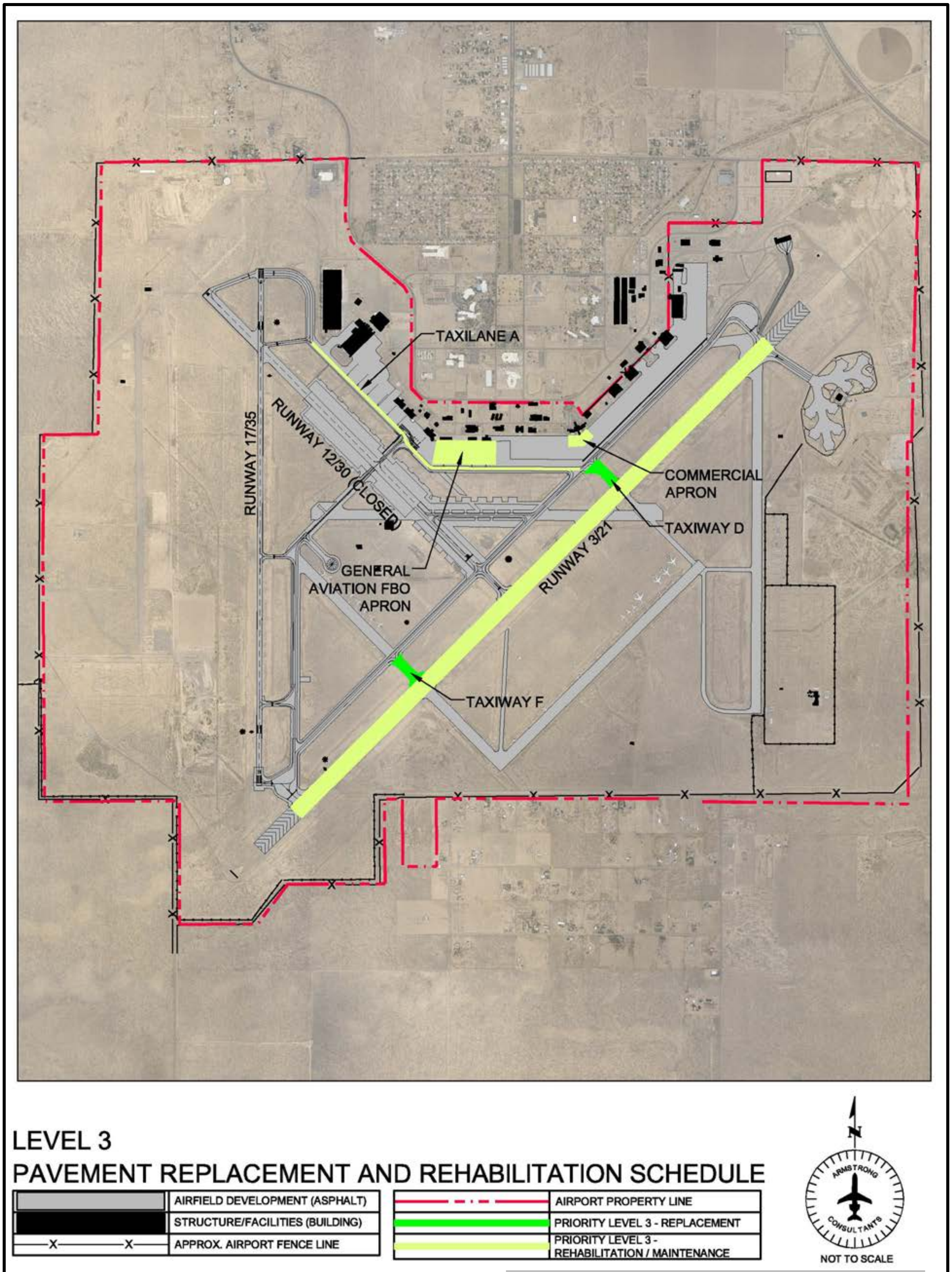


FIGURE 4-10 LEVEL 3 PAVEMENT MAINTENANCE

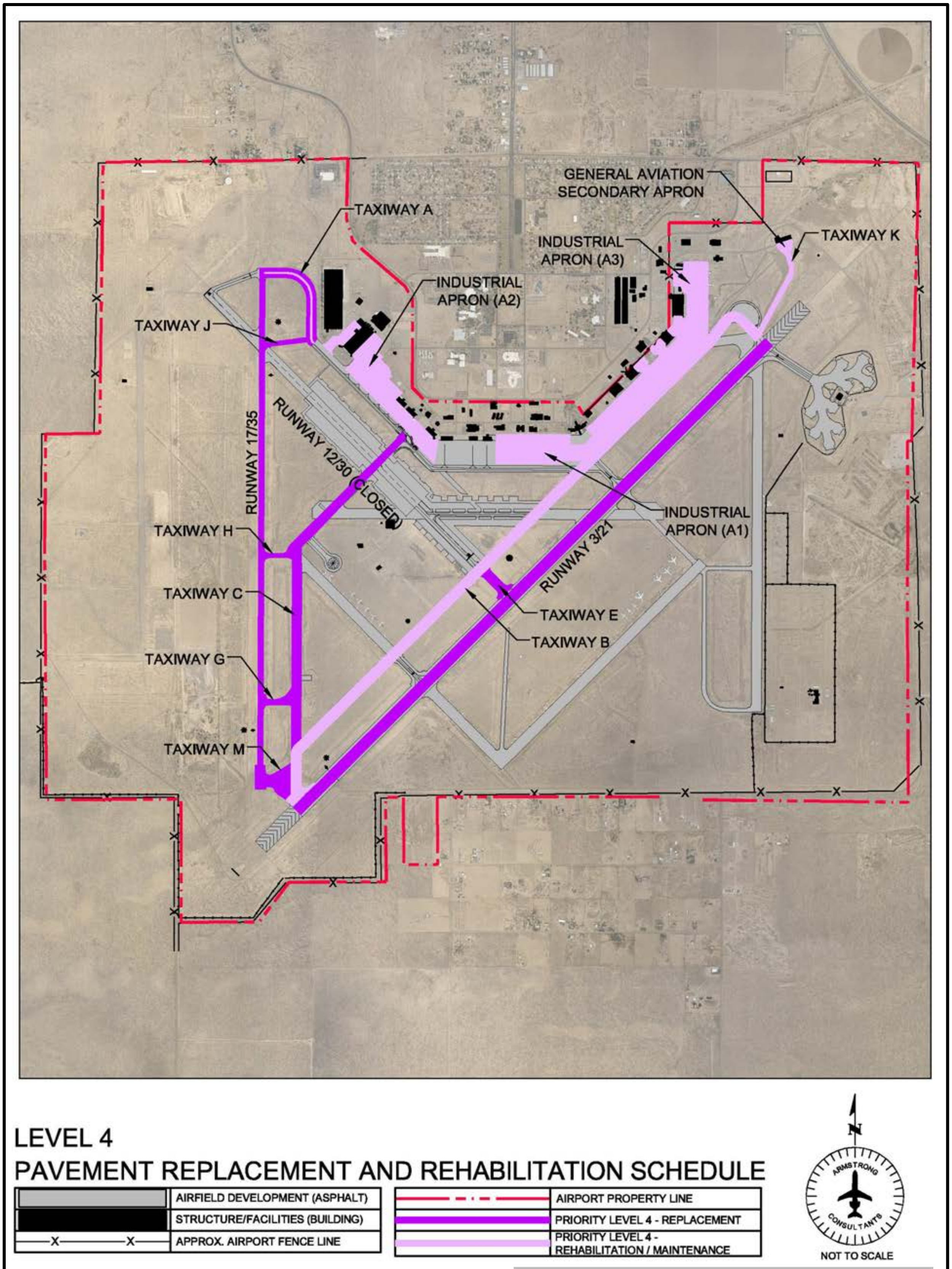


FIGURE 4-11 LEVEL 4 PAVEMENT MAINTENANCE

4.3.6 TAXIWAY K

The current location for Taxiway K impacts the non-movement area for Runway 21. The intersection of Taxiway K and Taxiway B is beyond the runway hold bar for Taxiway B and affects the safety of aircraft landing and departing Runway 21. It is recommended that Taxiway be relocated 400 feet to the northwest. Taxiway K will be an extension of Taxiway B and continue to connect aircraft to the secondary general aviation area (see **Figure 4-12**). The asphalt taxiway will be lined with retroreflectors. *Estimated cost of relocation: $ 670,000.*

FIGURE 4-12 TAXIWAY K RELOCATION

4.4 LANDSIDE DEVELOPMENT

Landside development consists of all portions of the airport designed to serve the passengers and users. These areas consist of the passenger terminal building, vehicle roads, parking facilities, general aviation development areas and industrial park. The following recommendations are necessary to meet future forecast of aviation, passenger activity and growth for landside development.

4.4.1 TERMINAL BUILDING IMPROVEMENTS

The airline passenger terminal building was evaluated within the Chapter 3 - Facility Requirements analysis of the master plan. This analysis generally focused on the available space, current space allocation within the terminal building, and the aircraft gate space. The facility requirements chapter identified the terminal building and associated facilities as providing inadequate space to accommodate forecasted demand.

It is recommended that in the future and when demand warrants, the terminal building be extended to the south, providing up to 5,000 square feet of additional gate frontage, passenger hold rooms, concessions and restrooms in order to meet the forecasted growth. **Figure 4-13** depicts the recommended future build out of the passenger terminal facility. Passenger ground loading access gates would continue and an additional parking location with the ability to handle up to an MD-90 aircraft. Aircraft would operate single-engine pushback procedures and no ground service equipment (GSE) will be utilized.

Refurbishments and renovations of the terminal building are integrated as part of the recommended plan, including replacement of ceiling tiles, carpeting, lighting, and re-painting as appropriate. *Estimated cost of improvements: $1,500,000*.

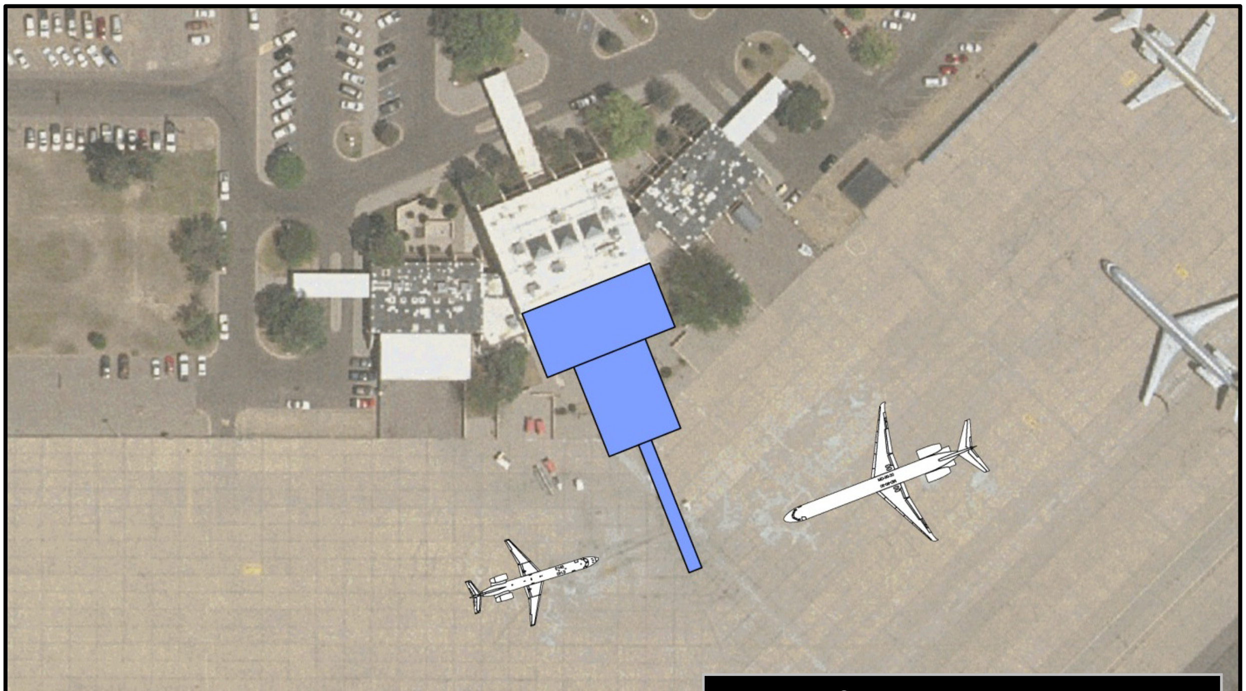


FIGURE 4-13 TERMINAL BUILDING EXPANSION

4.4.2 GENERAL AVIATION HANGAR DEVELOPMENT

The Forecasts of Aviation Activity and Facility Requirements Chapters identified the need for additional general aviation (GA) facilities throughout the planning period. Based on the forecast of GA demand and associated facility requirements, there are several potential areas available for future GA expansion. The following alternatives (see **Figure 4-13**) describe the logical options for meeting the needs of the future GA growth while maintaining the strategic goals of the Airport:

1) **Alternative 1.** This alternative is located in the northeast quadrant of the Airport, north of the Bureau of Land Management's (BLM) Air Tanker Base (see **Figure 4-14**). This alternative would utilize approximately 53,188 square yards of existing apron area and provide approximately 14,155 square yards of hangar area development which could provide for a mix of small and medium conventional box hangars and T-hangars. An additional 5,300 square yards of apron pavement would need to be constructed. No additional tie-down positions would be constructed. Taxilanes between hangars provide for Aircraft Design Group (ADG) I and ADG II separation. All the hangars are positioned north-south with the exception of one T-hangar located north of the development which is positioned east-west. This alternative provides for a designated general aviation area clear from commercial operations with easy access to the approach end of Runway 21 via Taxiway A. However, this location would require a lengthened taxi time to aircraft departing Runway 3 or Runway 17/35. Utilities would be easily accessible around the

outer perimeter of the development but would require trenching through existing concrete to access the interior hangars. *Estimated Cost of this alternative: $2,875,366.*[2]

Advantages	Disadvantages
▪ Designated GA facilities ▪ Landside accessibility ▪ Proximity to Runway 21	▪ ADG II largest capability ▪ Growth and expansion constraints ▪ Lengthened taxi times to Runways 3, 17, and 35

2) **Alternative 2.** This alternative is located in the center of the existing commercial apron to the south of the ARFF building (see **Figure 4-16**) No additional apron pavement would need to be constructed to accommodate this alternative. Five ADG I and one ADG II east-west taxilanes could be developed and five north-south taxilanes between the hangar clusters to accommodate the projected general aviation fleet mix. Approximately 37,335 square yards of apron, including hangars and apron to centerline of taxilane, would be utilized. 11,714 square yards of hangars would accommodate a mix of small and medium hangars along with T-hangar development. Within this alternative, one tie-down location would need to be removed to accommodate the taxilane radii. This alternative provides for a centralized location on the airfield providing access to Runway 17/35 and Runway 3/21. Access to utilities would require trenching through the existing concrete apron. *Estimated cost of this alternative: $2,023,104.*

Advantages	Disadvantages
▪ Centralization to Runway 17/35 and Runway 3/21 ▪ Fuel facility accessibility ▪ Proximity to FBO ▪ Utilizes existing pavement area	▪ Hangars will occupy a portion of the FBO apron area. ▪ Growth and expansion constraints ▪ Functionality and size of hangars ▪ Potential security impacts ▪ Difficult utility access

3) **Alternative 3.** This alternative is located in the northwest quadrant of the Airport adjacent to Dean Baldwin Painting (See **Figure 4-17**). This alternative provides for a designated general aviation area clear from commercial operations with easy access to the approach end of Runway 17 via Taxiway A. Approximately 89,682 square yards of total of overall apron space (10,549 square yards of new taxilane) and 20,933 square yards of hangar space will be utilized within this area and accommodate small, medium and large hangars, and a mix of T-hangars and could accommodate ADG I through ADG III separations. Access to this area is separate from passengers traveling commercially, providing for a centralized location for general aviation operations. A Utility infrastructure corridor has been developed for area assuming water and electric going to the T-hangars, and full-utility infrastructure providing service to the box and corporate hangars. Utilities would be easily accessible around the outer perimeter and could be trenched across the existing unpaved areas of the site. *Estimated cost of this alternative: $5,500,000.*

[2] Estimated costs of the general aviation development alternatives include pavement, marking, and utilities. The cost of hangars is not included.

Advantages	Disadvantages
▪ Clear of commercial aircraft operations ▪ Accessibility to fuel farm facility ▪ ADG I-III accessibility ▪ Provides largest development area ▪ Development can be phased to accommodate demand ▪ Development provides for large corporate style hangars and a mix of small and general aviation hangars	▪ High development cost due to site size

4.4.2.1 RECOMMENDED GENERAL AVIATION HANGAR DEVELOPMENT

As discussed in Chapter 2-Forecasts of Aviation Activity, the local general aviation activity is expected to double from 4,514 operations currently to 8,026 in 2030. Based aircraft are expected to rise from the 2010 level 46 to 60 in 2030. Based on input from Airport Management, Alternative 3 was selected as the preferred general aviation hangar development area. Alternative 3 provides the ability to phase expansion through the initial-, intermediate-, and long-term forecast. Alternative 3's location provides efficient access to Runway 17/35 and Runway 3/21 as well as close proximity to the fuel facility.

Another advantage to Alternative 3 is the existing utility infrastructure which would support the expansion. The infrastructure includes taxiways, apron, vehicle access, and utility lines. The recommended site would also promote a centralized area for general aviation activities and pull traffic away from the commercial traffic access routes.

FIGURE 4-14 GENERAL AVIATION DEVELOPMENT ALTERNATIVES

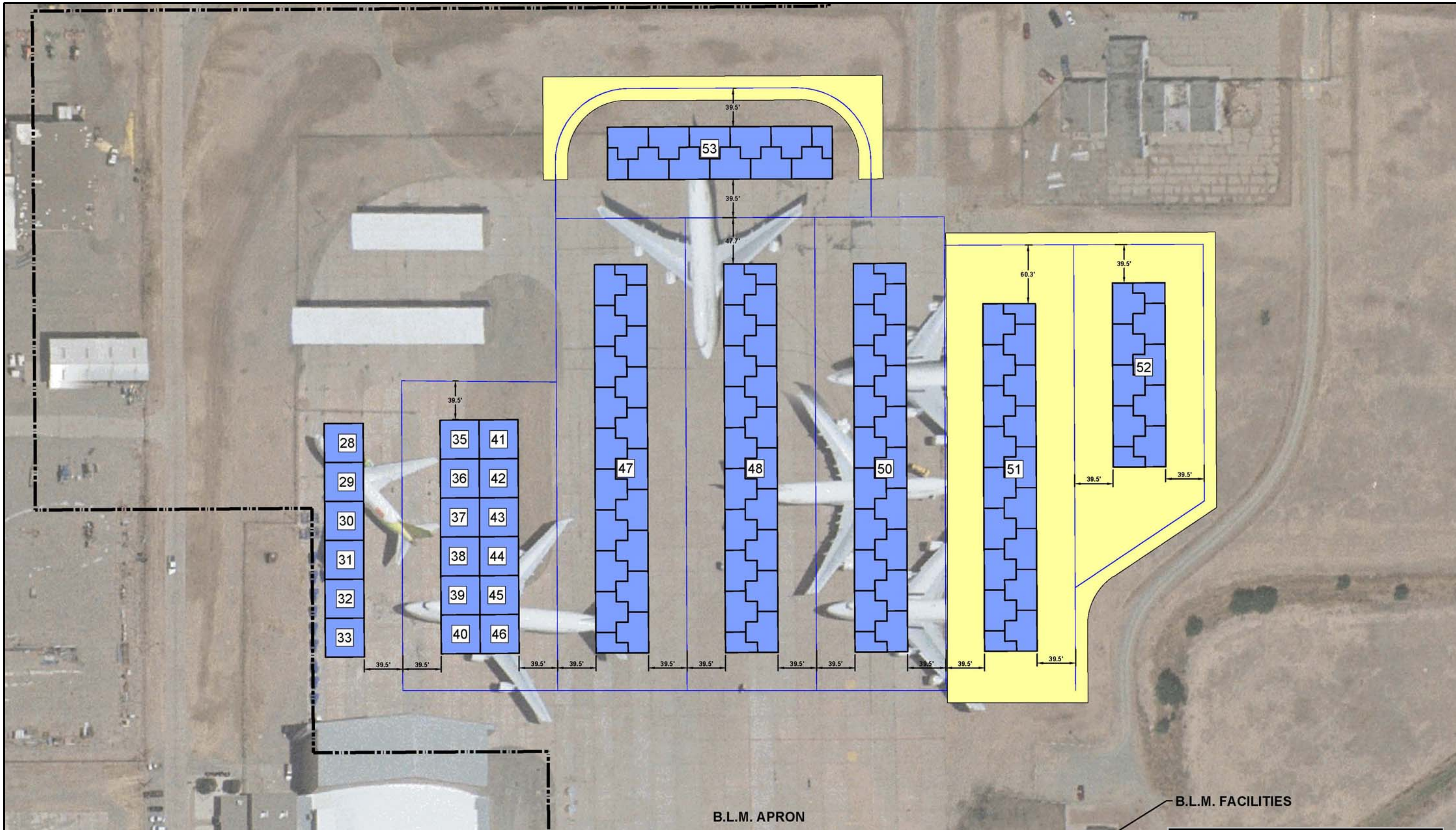


FIGURE 4-15 GENERAL AVIATION ALTERNATIVE 1

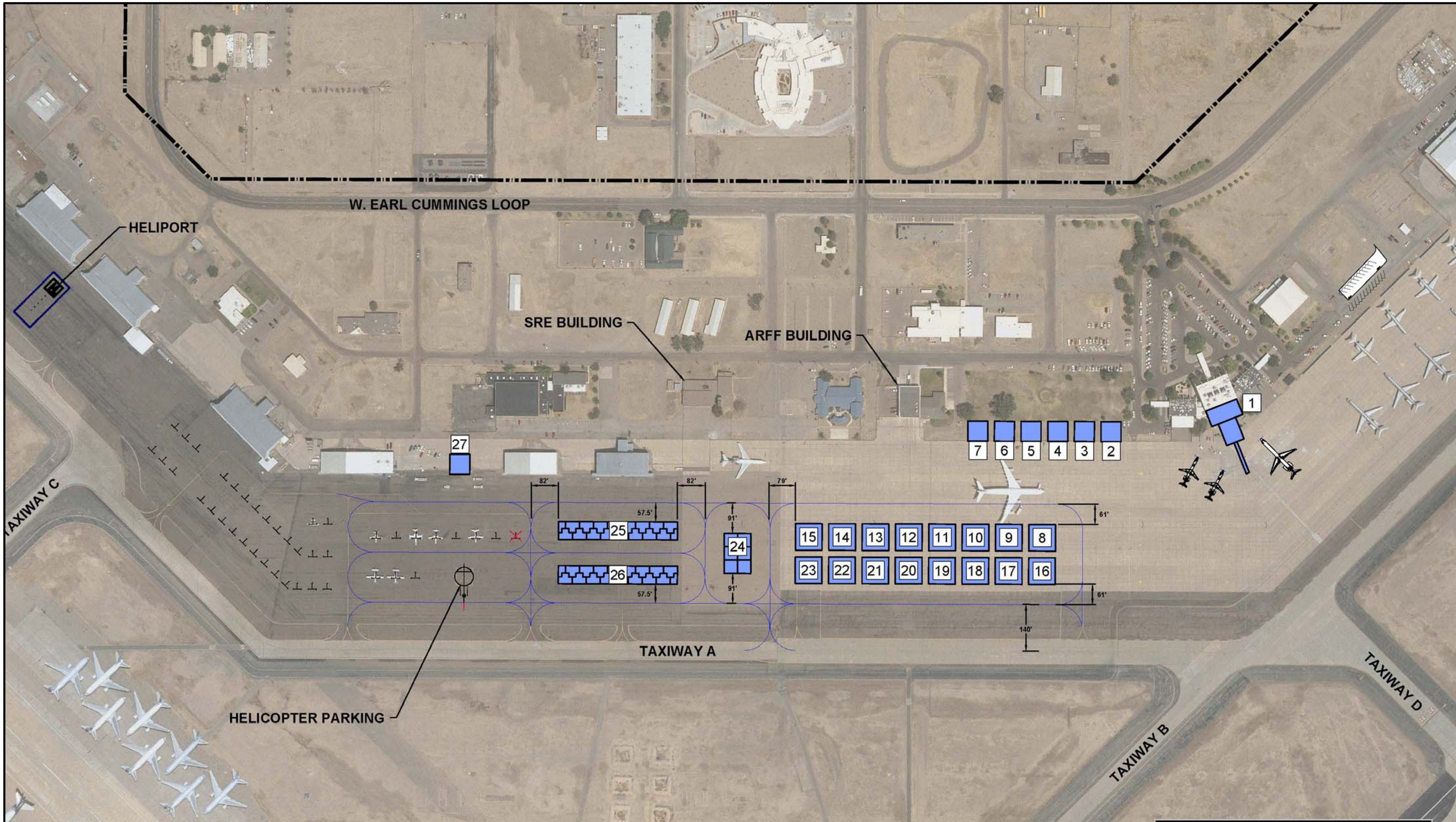


Figure 4-16 General Aviation Alternative 2

FIGURE 4-17 GENERAL AVIATION ALTERNATIVE 3

4.4.3 AEROSPACE DEVELOPMENT PARK

4.4.3.1 SPACEPORT FACILITIES (REUSABLE LAUNCH VEHICLES)

Commercial space flight vehicles anticipated for use at Roswell would be horizontally launched Reusable Launch Vehicles (RLV) using suborbital trajectories and Unmanned Aerial Vehicles (UAVs). Longer term, these operations may evolve into point-to-point transportation using space flight profiles. These vehicles, when operated out of Roswell, could carry passengers, scientific experiments or satellite payloads.

Roswell International Air Center currently provides substantial airfield infrastructure and facilities in support of commercial and general aviation that can also be utilized by potential RLV operators and employ horizontal takeoffs and landings. Those facilities include existing runways, taxiways, and aprons for propellant storage/loading and RLV operations. The Roswell Aerospace Park (RAP) would be developed to provide operational facilities including hangar, offices, manufacturing, storage, ramp and vehicle parking to support these activities. Based on the identification of overall facility requirements, three RAP alternatives have been developed for the Airport.

The alternatives would develop the RAP on the southeast or west side of the Airport providing adequate area of development and to provide the necessary space for safety. All horizontal launch alternatives contain similar requirements for an oxidizer loading area, visitor center, and a vehicle operator ramp/building area that would be constructed in phases as demand warranted. An overall layout of the alternatives can be found in **Figures 4-18 and 4-19**.

1) **Alternative 1.** This alternative would construct two hangar facilities and supplemental facilities on the southeast side of the airport approximately 1,297 feet from Runway 3/21 centerline. The taxiway would be constructed 75 feet wide with pavement strength to accommodate an ADG IV aircraft. There would be multiple phases during construction. Long-term development would construct two taxilane entrances to the facility, however, during the initial term, a single taxilane would be necessary. **Figures 4-18** and **4-19** illustrate Alternative 1 which would locate the operator opposite of Taxiway D on the east side of Runway 3/21. The apron area would be developed to accommodate 13,200 square yards of apron. This would house two hangars, one constructed at 100 feet by 125 feet and the second hangar would be 200 feet by 235 feet (or build-to-suit by the operator). Separation between the hangars would be designed to International Building Code (IBC) criteria, and 200 feet of apron space would be constructed in front of the each hangar. A 5,000 square foot visitors' center would be constructed adjacent to the facilities with a ground access route and parking lot to accommodate 100 parking spaces. This alternative is also in relatively close proximity to the MISTIC facility for dual visitor center and parking capability should the Airport develop and construct a UAV facility. *Estimated cost of this alternative: $4,500,000.*

2) **Alternative 2.** This alternative would develop essentially the same facilities and infrastructure as Alternative 1 in a location on the west side of Runway 17/35. **Figures 4-18** and **4-19** illustrate Alternative 2. *Estimated cost of this alternative: $4,500,000*

Runway 17/35 would be suitable for activities with UAVs with up to a Group III wingspan; however, because the runway is asphalt it is not compatible with RLV operations. Oxidizer loading areas 1, 2 and 4 could be utilized without affecting (closing) Runway 3/21 or 17/35 until the vehicle is pulled onto the runway for launch. Loading area 3 would essentially close Runway 3/21 during oxidizer and passenger loading.

4.4.3.2 UNMANNED AERIAL VEHICLES

Roswell International Air Center provides an environment that is not heavily saturated with commercial service and is not in a highly populated area. The Airport currently serves as a testing facility for companies such as Boeing, Cessna and Gulfstream. There is vast amount of land the facility could be located and one option is east of Runway 21 end. MATRIX International Security Training and Intelligence Center (MISTIC), an organization that provides unique and sophisticated security and defense related operational training and technology testing and evaluation (T&E) for government and private organizations around the world, is spearheading the UAV siting for the airport. It would assume that the UAV facility would be collocated with the MATRIX facility on the northeast quadrant of the airport, off of Runway 21.

The facility would be a part of the Aerospace Industrial Park and could share a visitor’s center with the RLV facility. Alternative 1 would develop the facility adjacent to the RLV facility opposite of Taxiway D. This facility would be developed

The second alternative would be to develop the facility adjacent to the RLV facility opposite Taxiway E.

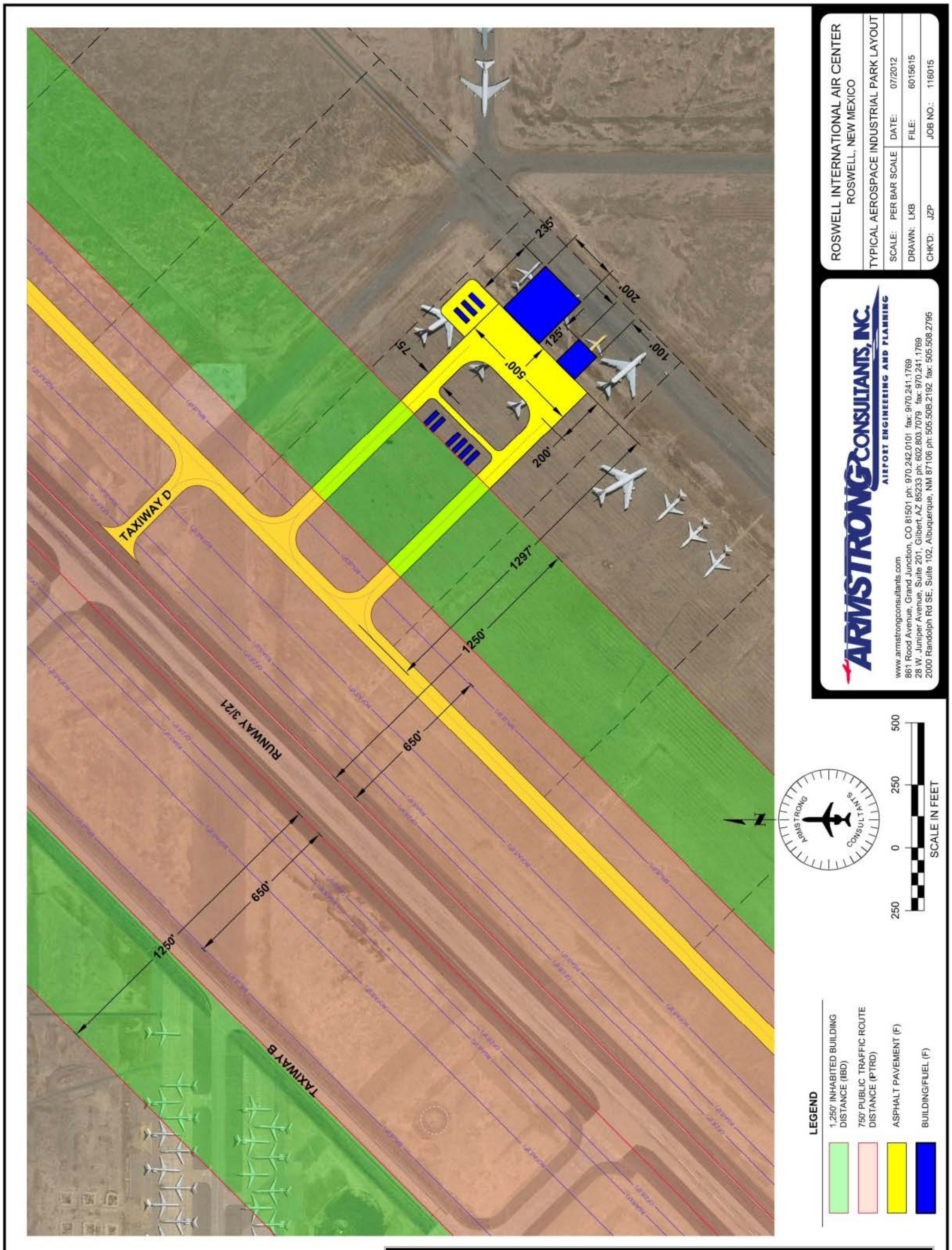


FIGURE 4-18 TYPICAL AEROSPACE INDUSTRIAL PARK LAYOUT

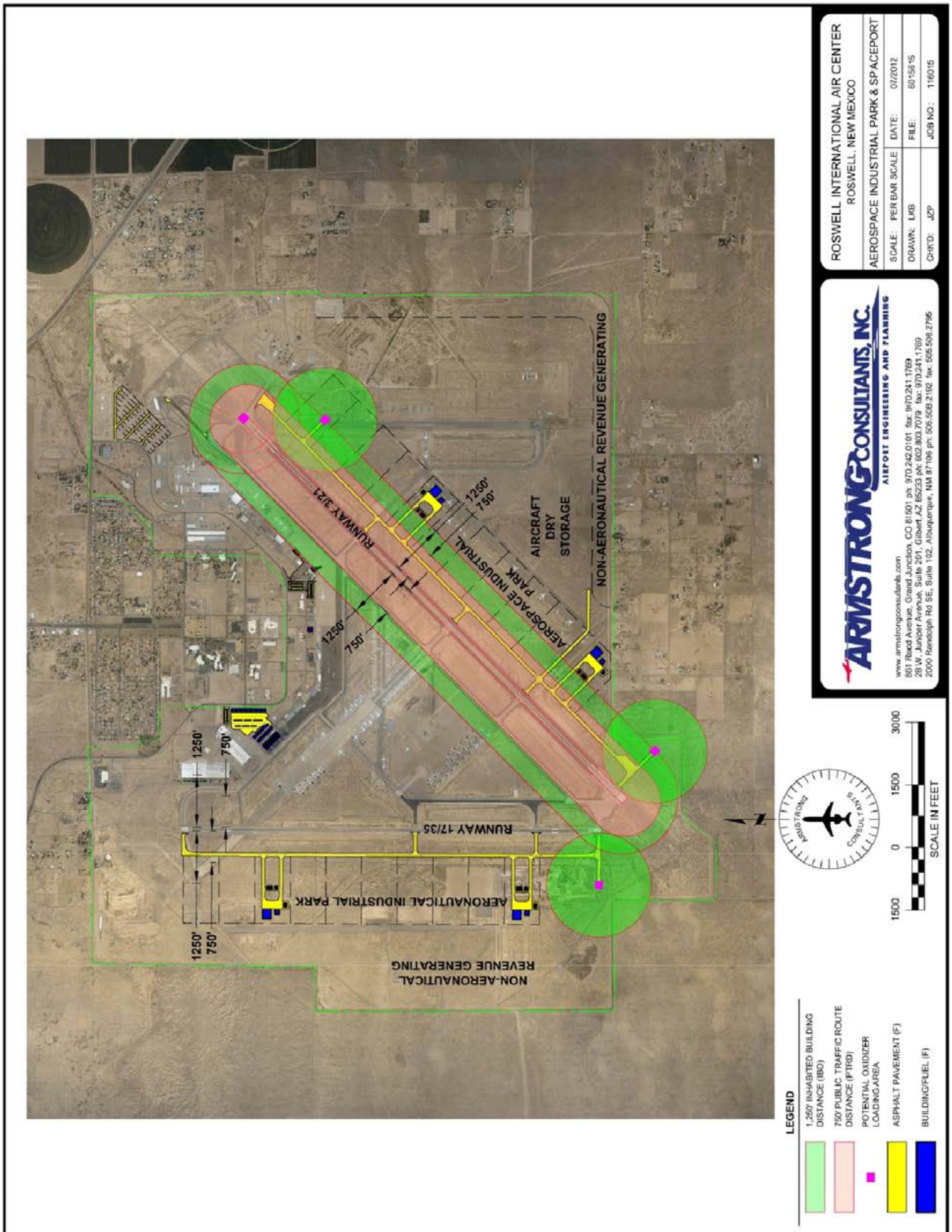


FIGURE 4-19 AEROSPACE INDUSTRIAL PARK LAYOUTS

4.5 GROUND TRANSPORTATION PROJECTS

The Airport operates one terminal area parking lot to accommodate public passenger parking and employee parking. The forecasted increase in enplanements at Roswell International Air Center will increase the demand for short-term and long-term parking at the Airport. The existing parking lot is located to the north of the terminal building and currently occupies 3,224 square yards with 132 paved surface parking spaces with an additional 50 unpaved parking spaces located to the west of the terminal.

It is recommended within the future expansion, the Airport designate separate lots for short-term parking, long-term parking and employee parking. Two lots have been recommended, as illustrated in **Figure 4-20**. The existing passenger lot would serve as the future short-term parking lot. Vehicles will access the lot as they currently do, but would exit through a potential centralized parking toll facility to the west of the terminal.

A long-term parking lot would be constructed to the west of the existing lot and will consist of 116 parking spaces. A designated entrance will be constructed for the long-term lot; however, a two-booth exit plaza, located between the future employee lot and long-term parking lot, serves both the short- and long-term parking lots. The parking lot expansion is configured to accommodate future revenue collection should the Airport elect. Funding for construction of the parking lot can come from local, Airport Improvement Program (AIP) and Passenger Facility Charges (PFC); however, if the Airport elects to charge for parking for revenue purposes then only local funding may be used. External factors such as public perception should be taken into consideration when determining revenue collection opportunities.

Employees would park in a lot which will be built adjacent to the apron. A card reader will be installed so only individuals whom are assigned an airport badge can access the lot. The employee lot is approximately 6,192 square yards and consists of 72 surface parking spaces. Funding for the employee parking lot construction is AIP eligible. *Estimated cost for the ground transportation expansion: $1,400,000*.

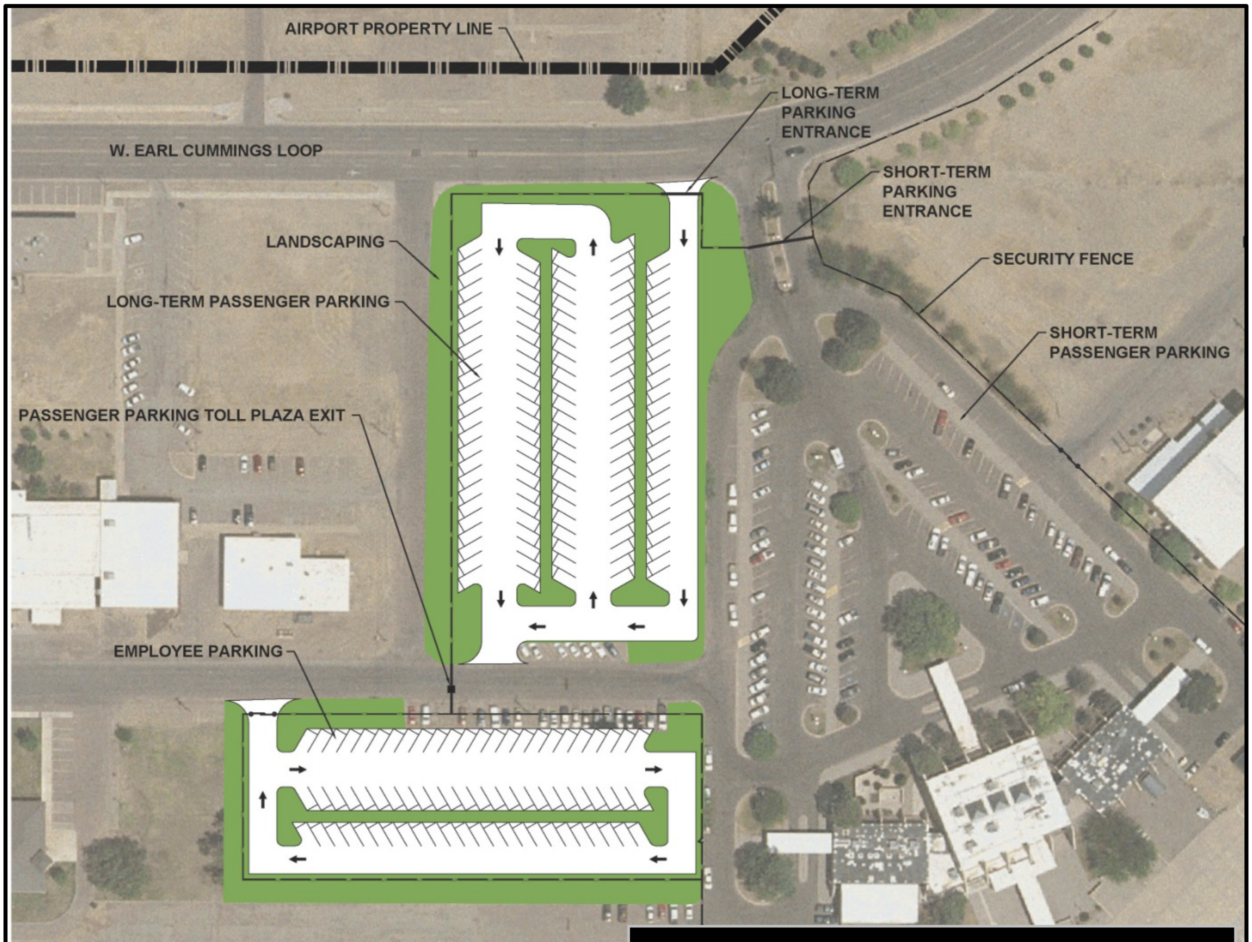


FIGURE 4-20 GROUND TRANSPORTATION EXPANSION

4.5.1 RENTAL CAR FACILITIES

The Airport provides on-site rental car facilities within walking distance to the Passenger Terminal Building. The Airport has agreements with three on-Airport rental car companies that are allocated counter space within the Terminal. The on-Airport rental car companies are Avis, Budget and Enterprise. The companies lease space to the northeast of the Terminal building for on-Airport parking to accommodate the projected increase in operations and enplanement over the planning period, an additional 23 spaces from the existing 29 spaces are recommended to provide the necessary capacity of 52 rental car spaces (see **Figure 4-21**). Expansion of the rental car facility would include extending the paved area to the northwest of the existing lot and adding a designated entrance and exit for access in and out of the lot. Expansion of the car rental parking lot will consist of 1,688 square yards. *Estimated cost of this development: $160,000.*

4.6 NON-AVIATION SUPPORT FACILITIES

This section discusses the recommended development for non-aviation support facilities. There are several areas within the existing airport property boundary that can be allocated for revenue generating uses, such as industrial parks. Generally speaking, the areas defined are typically vacant or lands with minimal existing structures, all of which are currently owned by the Airport. These parcels or areas of land can be leased to private users for either aeronautical or non-aeronautical development that is compatible with the long-term development plans for the Airport.

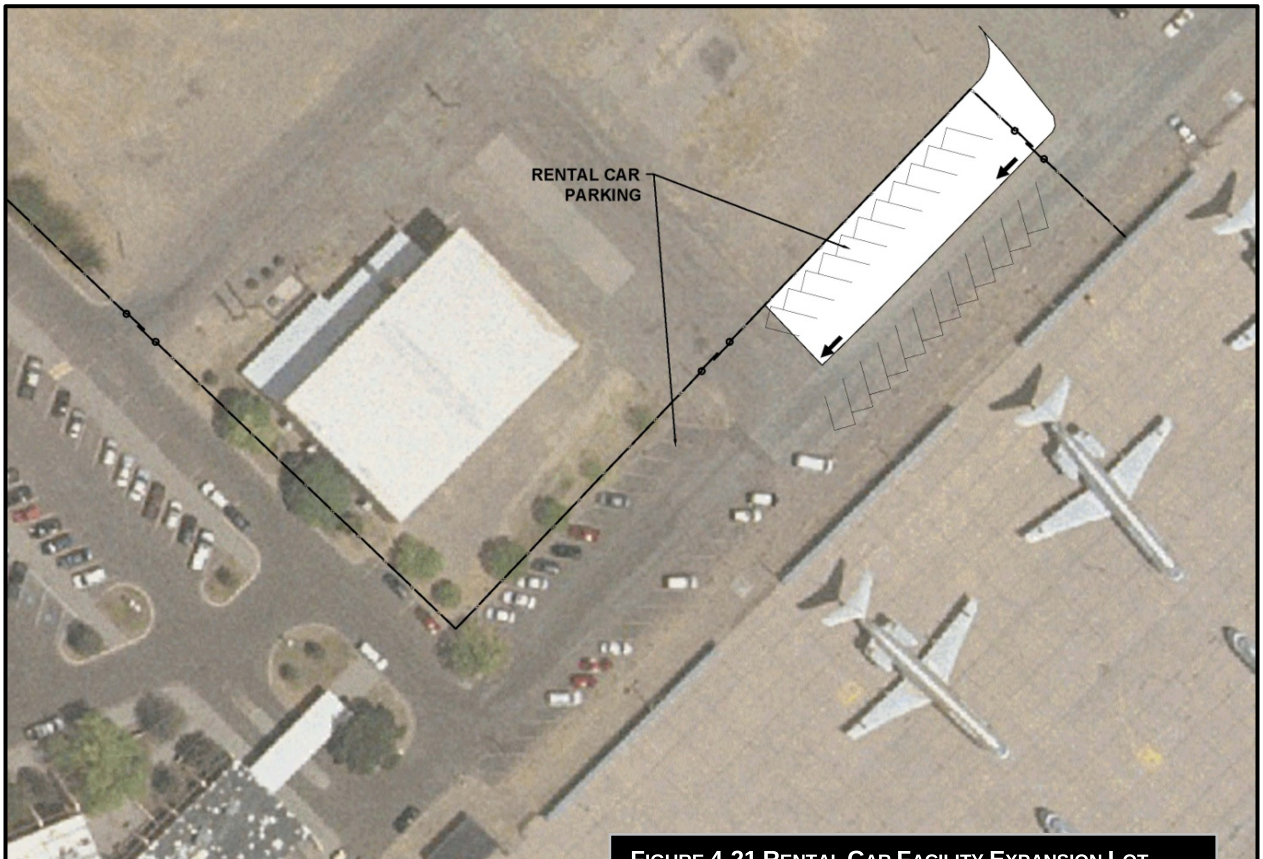


FIGURE 4-21 RENTAL CAR FACILITY EXPANSION LOT

4.6.1 INDUSTRIAL AND BUSINESS PARK DEVELOPMENT

An area for future airport business park/industrial park development has been identified in the Airport's northwest quadrant. This area is comprised of approximately 27 acres which provides for both landside and airside access. The conceptual plan for the industrial park is divided into one acre parcels designed for manufacturing distribution firms and equipped with all utility infrastructures (see **Figure 4-22**). *Estimated cost for this development: $1,600,000.*

4.7 CONSIDERATION OF COSTS

The cost estimates developed in this chapter and later in Chapter 7 - Airport Development and Financial Plan used information and assumptions that provide a reasonable basis for analysis at a master plan appropriate level of detail. Some of the assumptions may not be realized, and unforeseen events and circumstances may occur. Therefore, actual results may vary from those projected, and such variations could be material. These costs are not considered the full Capital Improvement Plan (CIP), which will be discussed later in this report. Phased construction of the airside and landside development areas may be necessary to meet funding constraints and will be further evaluated in Chapter 7.

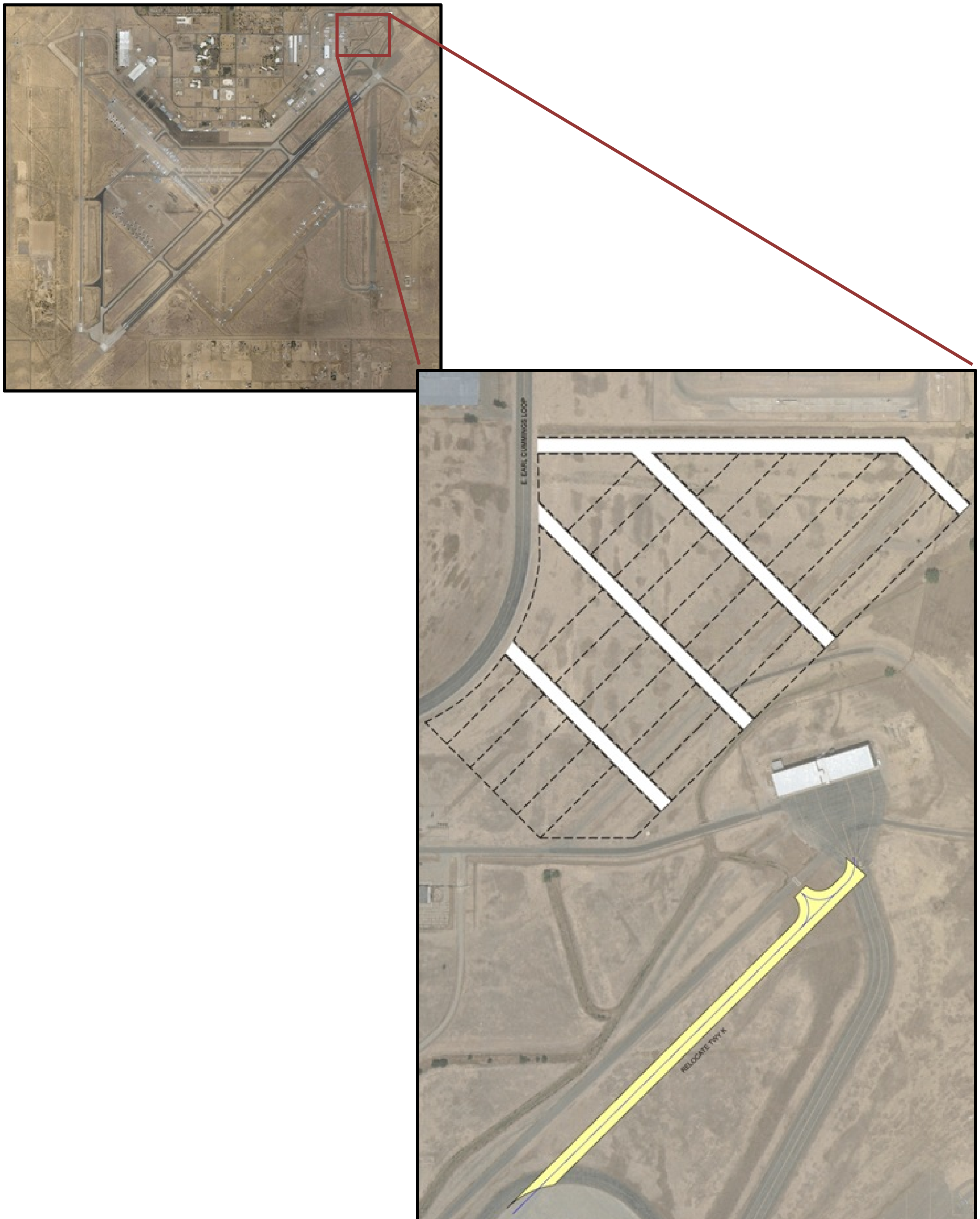


Figure 4-22 Industrial and Business Park Development

4.8 DEVELOPMENT IMPACTS

The recommended development projects meet the FAA's safety and design standards for the existing Airport Reference Code (ARC) D-IV and C-III. This will allow the Airport to accommodate the existing and projected type of aircraft fleet mixes using and projected to use the Airport in the future.

4.8.1 AIRSPACE IMPACTS

The construction of a general aviation hangar area and industrial park development will not impact existing or future airspace surfaces. There will be no changes to the existing 14 CFR Part 77 Airspace Surfaces at Roswell International Air Center.

4.8.2 ENVIRONMENTAL IMPACTS

Development projects will likely cause short-term construction impacts, including mitigatable impacts to air quality. None of the projects are expected to cause significant environmental impacts based on the FAA's Order 5050.4B, *Environmental Handbook* or FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*. Environmental impact categories and potential impacts are further evaluated in Chapter 6 - Environmental Overview and include further discussion on potential environmental impacts.

4.9 DEVELOPMENT COSTS

Estimated development costs for each recommended project analyzed in this chapter will be further discussed in Chapter 7 - Airport Development and Financial Plan. Development costs discussed in this Chapter are preliminary estimates related to construction, engineering and administration.

A detailed phasing plan is recommended to accommodate budgetary constraints. Phasing should mirror, to the extent practical, the requirements of users at the Airport by phasing in accordance to known and forecasted operations during the initial -, intermediate-, and long-term development.

4.10 CONCLUSION AND RECOMMENDATIONS

A site visit and meeting was conducted with the Sponsor, State, FAA and Consultant to discuss the requested modifications to standards for Runway 3/21 and the Runway 3/21 development alternatives. The following discussion describes the results of the meeting, the outcomes of the requested modifications to standards, and the resulting configuration of facilities to be carried forward into the Capital Improvement and Airport Layout Plans.

1) Runway Width: The FAA approved the modification to standard to allow the runway width to remain at 200 feet; however, the FAA also explained that in accordance with D-IV design standards only 150 feet in width would be eligible for FAA grant participation. The difference in cost between widths of 150 feet and 200 feet would be the Sponsor's (or private, third party, State or other funding source) responsibility. The removal of the full 75 foot width of the existing paved shoulders and runway area would be eligible for FAA grant funding in order to meet standard safety area and cross sectional grades, and the reconstruction of the paved shoulders at the standard width of 25 feet would be FAA eligible.

   Although the Sponsor's preferred alternative would be the 200 foot width (Alternative 1B), it is not probable the Sponsor or third parties will be able to contribute the additional $10 million estimated cost needed for the 200 foot runway width. Therefore, a future runway width of 150 feet is anticipated. However, should this additional funding materialize prior to the completion of the project, the design and construction could be revised to accomplish the rehabilitation at the preferred 200 foot width.

2) Runway Lighting: The FAA approved the modification to standard for the existing lights to remain at 300 feet until the end of their useful life. At that time the FAA would require the lights to be replaced and relocated to the standard 10 feet from the runway edge (for either the 150 foot or 200 foot wide runway). However, upon visual inspection of the Runway 3/21 lighting system, the FAA determined the lighting to be at or near the end of its useful life. As such, the lights will need to be replaced as part of the runway rehabilitation project and located at the standard 10 foot distance from the runway edge.

3) Grooving: The FAA reported that Runway 3/21 failed supplemental friction testing. However, the FAA explained that diamond grinding 25 feet on each side of the runway centerline (50 foot total width), in lieu of grooving, would be an acceptable method of providing increased friction levels for the runway pavement.

As a result, a modified Alternative 2B with a 150 foot wide runway and 25 foot paved shoulders best reflects the outcome of the requests for modifications to standards and the most financially feasible development alternative (see **Figure 4-23)**. The FAA further indicated that phasing of the project over several years would likely be necessary to secure sufficient discretionary funding to complete the project. The project costs and phasing are further discussed in the financial and Capital Improvement Plans in Chapter 7. A conceptual Layout Plan for the Airport showing the industrial park on the south side of Runway 3/21 and the west side of Runway 17/35 are shown in **Figures 4-24 and 4-25**.

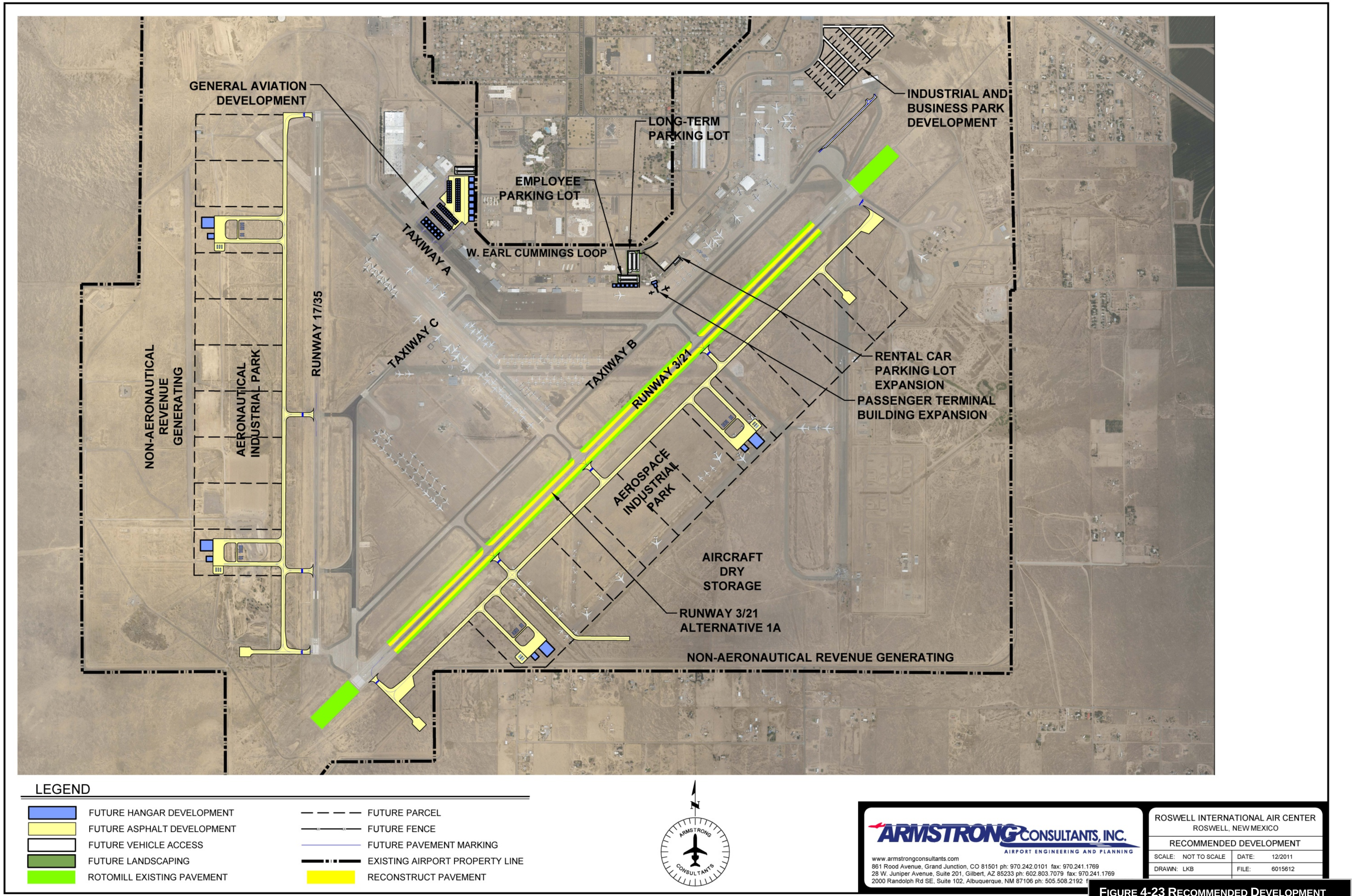


Figure 4-23 Recommended Development

PAGE INTENTIONALLY LEFT BLANK

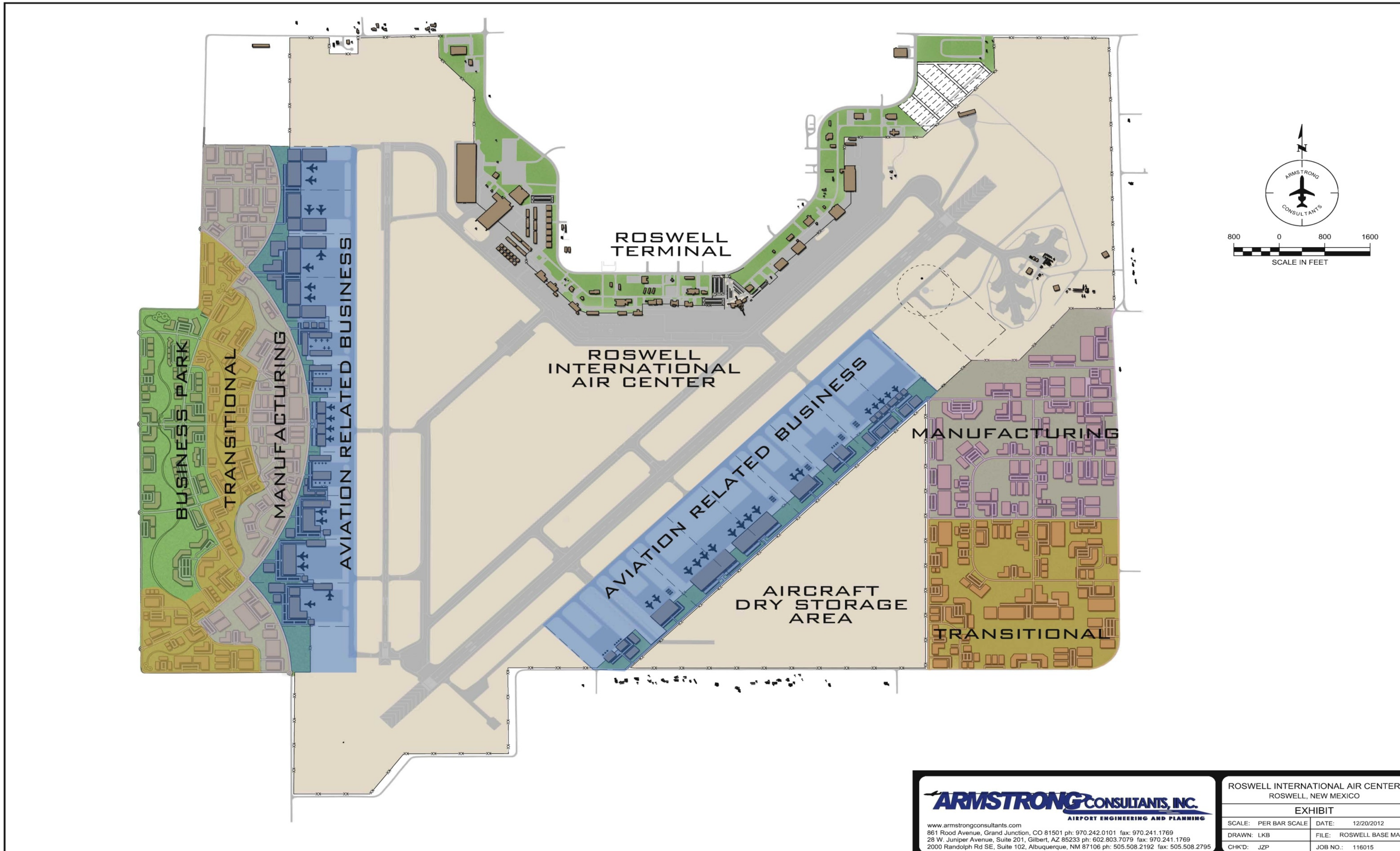


FIGURE 4-24 OVERALL CONCEPTUAL LAYOUT

PAGE INTENTIONALLY LEFT BLANK

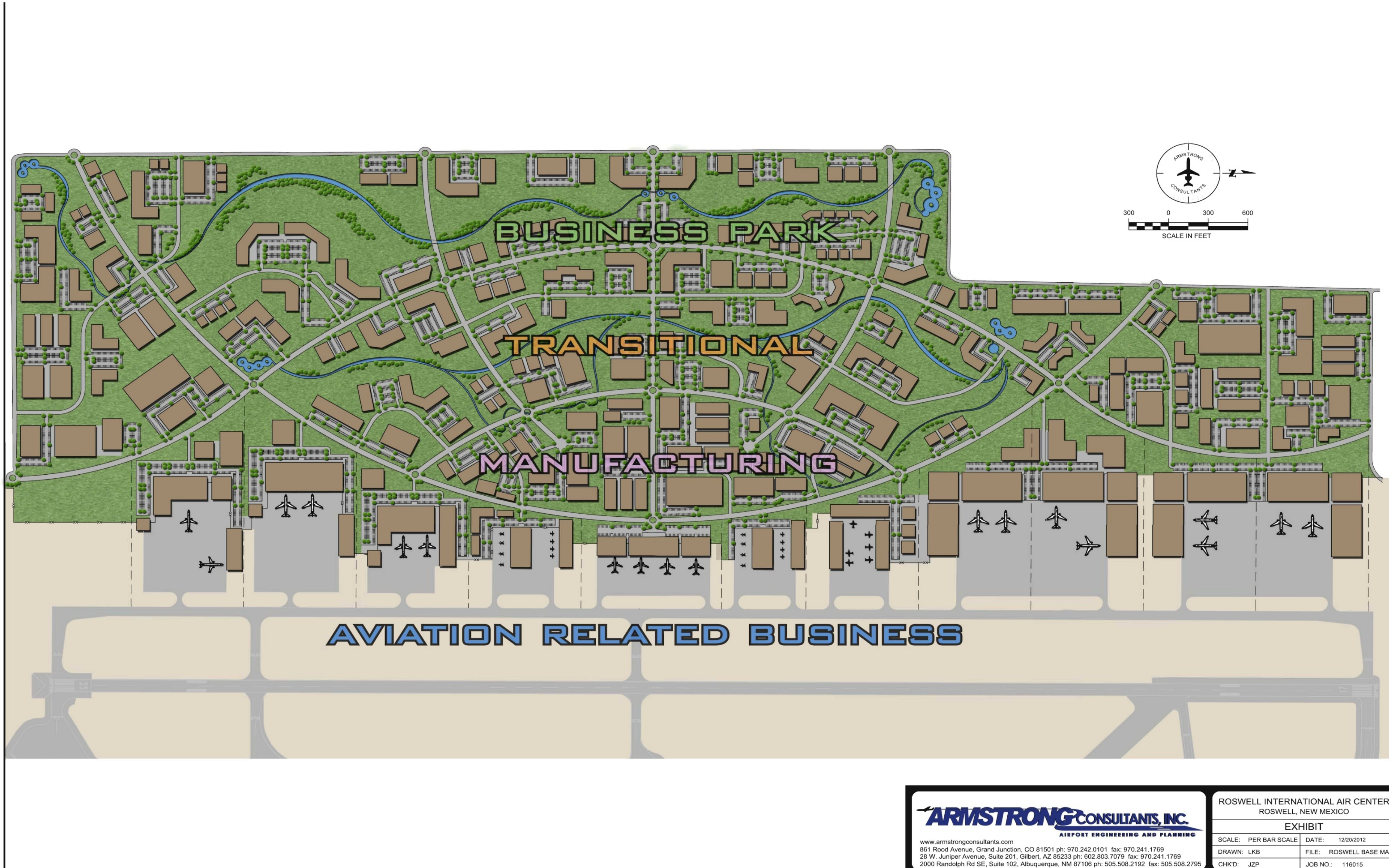


FIGURE 4-25 WEST SIDE CONCEPTUAL LAYOUT

PAGE INTENTIONALLY LEFT BLANK

CHAPTER

5

AIRPORT LAYOUT PLAN

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

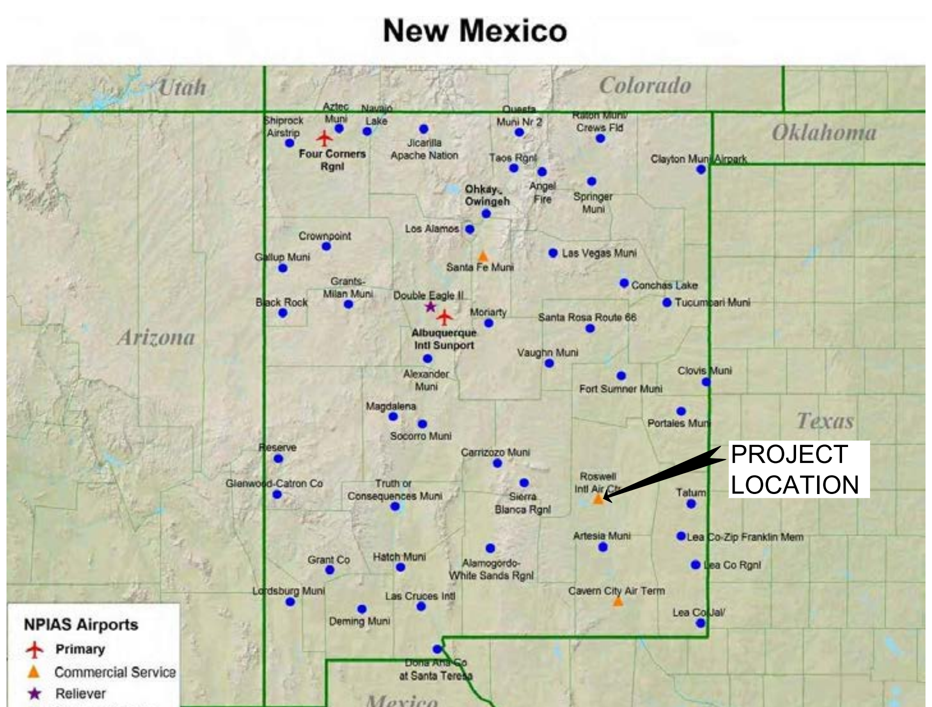
AIRPORT LAYOUT PLAN

PREPARED BY:

ARMSTRONG CONSULTANTS, INC.

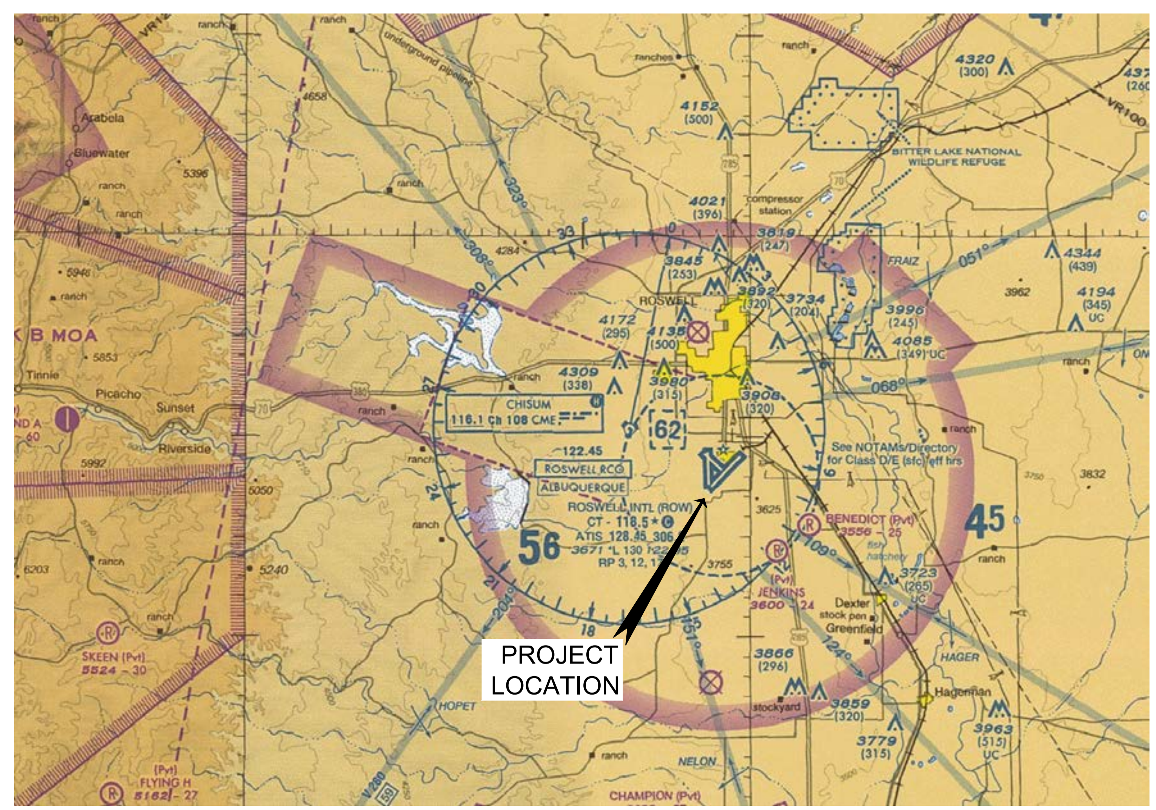
STATE GRANT No. ROW-11-004
A.C.I. PROJECT No. 116015
DATE: DECEMBER, 2012

INDEX TO SHEETS



LOCATION MAP

N.T.S.

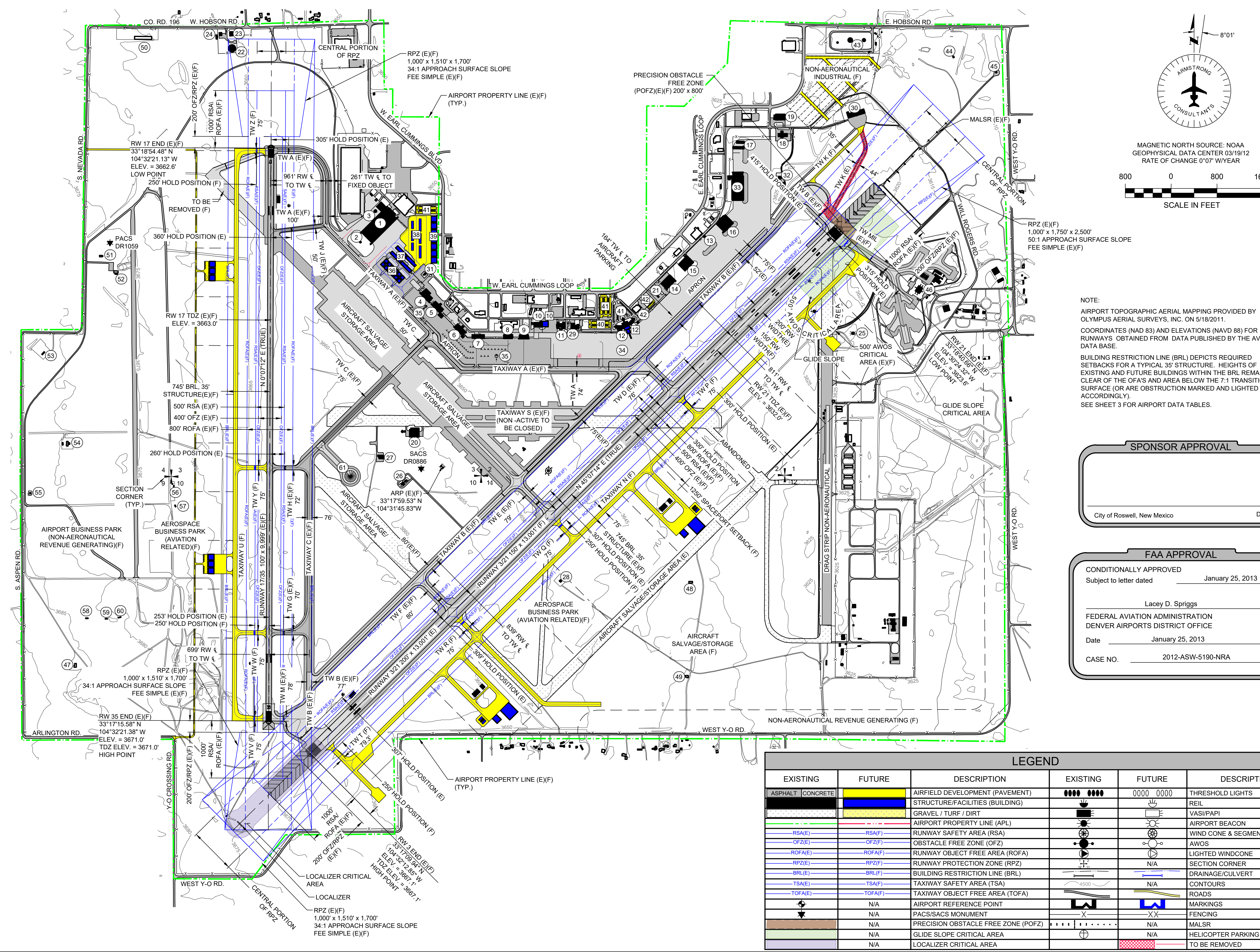


VICINITY MAP

N.T.S.

6015501

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795



NOTE:

AIRPORT TOPOGRAPHIC AERIAL MAPPING PROVIDED BY OLYMPUS AERIAL SURVEYS, INC. ON 5/18/2011.

COORDINATES (NAD 83) AND ELEVATIONS (NAVD 88) FOR RUNWAYS OBTAINED FROM DATA PUBLISHED BY THE AVN DATA BASE.

BUILDING RESTRICTION LINE (BRL) DEPICTS REQUIRED SETBACKS FOR A TYPICAL 35' STRUCTURE. HEIGHTS OF EXISTING AND FUTURE BUILDINGS WITHIN THE BRL REMAIN CLEAR OF THE OFA'S AND AREA BELOW THE 7:1 TRANSITIONAL SURFACE (OR ARE OBSTRUCTION MARKED AND LIGHTED ACCORDINGLY).

SEE SHEET 3 FOR AIRPORT DATA TABLES.

SPONSOR APPROVAL

City of Roswell, New Mexico   Date

FAA APPROVAL

CONDITIONALLY APPROVED

Subject to letter dated January 25, 2013

Lacey D. Spriggs

FEDERAL AVIATION ADMINISTRATION
DENVER AIRPORTS DISTRICT OFFICE

Date January 25, 2013

CASE NO. 2012-ASW-5190-NRA

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT / CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT	X	XX	FENCING
	N/A	PRECISION OBSTACLE FREE ZONE (POFZ)		N/A	MALSR
	N/A	GLIDE SLOPE CRITICAL AREA		N/A	HELICOPTER PARKING
	N/A	LOCALIZER CRITICAL AREA			TO BE REMOVED

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
STATE GRANT No. ROW-11-004
AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015502	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

AIRPORT LAYOUT PLAN

Sheet: 2 of: 24

AIRPORT DATA

ITEM		EXISTING/FUTURE (E)(F)
AIRPORT ELEVATION (NAVD 88)(MSL)*		3,671.0'
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	LATITUDE	33°17'59.53" N
	LONGITUDE	104°31'45.83" W
MEAN MAX. TEMP: HOTTEST MONTH (JULY)		94.1° F
RUNWAY WIND COVERAGE	13 MPH / 10.5 kts	96.28%
	16 MPH / 13kts	98.33%
	20 MPH / 16 kts	99.35%
	23 MPH / 20 kts	99.80%
AIRPORT REFERENCE CODE		D-IV
NPIAS ROLE		PRIMARY COMMERCIAL SERVICE
MAGNETIC VARIATION		8°01' EAST
TAXIWAY LIGHTING		MITL
TAXIWAY MARKING		CENTERLINE/ENHANCED
AIRPORT & TERMINAL NAVAIDS		GPS, ILS, VOR, BEACON

* NAVD 88 ELEVATIONS FROM AVN DATA.

RUNWAY END COORDINATES (NAD 83)

	EXISTING		FUTURE	
	RW 3 END	RW 21 END	RW 3 END	RW 21 END
LATITUDE	33°17'09.94" N	33°18'40.66" N	SAME	SAME
LONGITUDE	104°32'12.85" W	104°30'24.32" W	SAME	SAME
	RW 17 END	RW 35 END	RW 17 END	RW 35 END
LATITUDE	33°18'54.48" N	33°17'15.58" N	SAME	SAME
LONGITUDE	104°32'21.13" W	104°32'21.38" W	SAME	SAME

NOTE: NAD 83 COORDINATE DATA PUBLISHED BY AVN DATABASE.

NON-STANDARD CONDITIONS

ITEM	RW DESIGN CATEGORY	STANDARD	NON-STD CONDITION	PROPOSED ACTION
TAXIWAY B WIDTH	IV	75'	52'	REMARK SHOULDER MARKINGS TO 75'

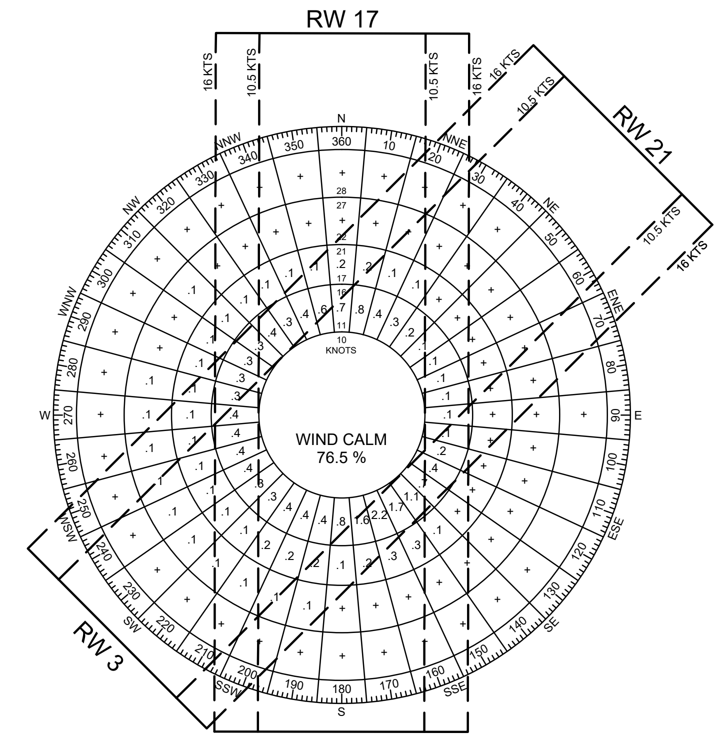
RUNWAY DATA

ITEM		RW 3/21 EXISTING/FUTURE (E)(F)		RW 17/35 EXISTING/FUTURE (E)(F)
AIRPORT REFERENCE CODE		D-IV		C-III
APPROACH MINIMUMS	RW 3	3/4 - STATUTE MILE	RW 17	3/4 - STATUTE MILE
	RW 21	1/2 - STATUTE MILE	RW 35	3/4 - STATUTE MILE
APPROACH TYPE	RW 3	NON-PRECISION, >UTILITY	RW 17	NON-PRECISION, >UTILITY
	RW 21	PRECISION	RW 35	NON-PRECISION, >UTILITY
FAR PART 77 APPROACH SLOPE	RW 3	34:1	RW 17	34:1
	RW 21	40:1 / 50:1	RW 35	34:1
RUNWAY LENGTH		13,001'		9,999'
RUNWAY WIDTH		200' (E) / 150' (F) **		100'
RUNWAY & TAXIWAY PAVEMENT		ASPHALT/CONCRETE		ASPHALT/CONCRETE
PAVEMENT STRENGTH (LBS)		100,000 SWG 200,000 DWG 400,000 DWT		77,000 SWG 104,000 DWG 165,000 DWT
RUNWAY LIGHTING		HIRL		MIRL
RUNWAY MARKING	RW 3	NON-PRECISION	RW 17	NON-PRECISION
	RW 21	PRECISION	RW 35	NON-PRECISION
% EFFECTIVE GRADIENT		0.34%		0.09%
% MAXIMUM GRADE		1.41%		1.45%
LINE OF SIGHT REQUIREMENTS MET		YES		YES
VISUAL APPROACH AIDS	RW 3	VASI (V6L)	RW 17	VASI (V4L)
	RW 21	MALSR	RW 35	GPS/PAPI-4
INSTRUMENT APPROACH AIDS		ILS/VOR/GPS/LPV		VOR/LPV
DESIGN AIRCRAFT	CRITICAL AIRCRAFT	BOEING DC-10-40		BOEING 737-300
	APPROACH SPEED (KNOTS)	149		135
	WINGSPAN (FEET)	165.3		94.8
	TAIL HEIGHT (FEET)	58.6		37.6
	MAX. CERTIFIED TAKEOFF WT. (LBS)	572,000		138,500
RUNWAY SAFETY AREA (RSA)	WIDTH	500'		500'
	LENGTH BEYOND RW END	1,000'		1,000'
RUNWAY OBJECT FREE AREA (ROFA)	WIDTH	800'		800'
	LENGTH BEYOND RW END	1,000'		1,000'
OBSTACLE FREE ZONE (OFZ)	WIDTH	400'		400'
	LENGTH BEYOND RW END	200'		200'
RUNWAY ELEVATIONS (NAVD 88)				
RUNWAY END	RW 3	3,667.1'	RW 17	3,662.6'
	RW 21	3,623.6'	RW 35	3,671.0'
DISPLACED THRESHOLD	RW 3	N/A	RW 17	N/A
	RW 21	N/A	RW 35	N/A
TOUCHDOWN ZONE (TDZ)	RW 3	3,667.1'	RW 17	3,663.0'
	RW 21	3,632.0'	RW 35	3,671.0'
HIGH POINT		3,667.1'		3,671.0'
LOW POINT		3,623.6'		3,662.6'
RUNWAY PROTECTION ZONE DIMENSIONS	RW 3	1,000' x 1,510' x 1,700'	RW 17	1,000' x 1,510' x 1,700'
	RW 21	1,000' x 1,750' x 2,500'	RW 35	1,000' x 1,510' x 1,700'
APPROACH SURFACE DIMENSIONS	RW 3	1,000' x 4,000' x 10,000'	RW 17	1,000' x 4,000' x 10,000'
	RW 21	1,000' x 16,000' x 50,000'	RW 35	1,000' x 4,000' x 10,000'
RUNWAY C/L TO HOLD BARS AND SIGNS		≥ 300'		>250'
RUNWAY / PARALLEL TAXIWAY C/L SEPARATION		829' - 836'		700' - 961'
TAXIWAY OBJECT FREE AREA WIDTH		259'		186'
TAXIWAY SAFETY AREA WIDTH		171'		118'
TAXIWAY WING TIP CLEARANCE		44'		34'
TAXIWAY C/L TO FIXED OR MOVABLE OBJECT		129.5'		93'
TAXIWAY WIDTH		VARIES - 43'* - 80'		VARIES - 50' - 100'

* 43' TAXIWAY WIDTH IS ON TAXIWAY K, GROUP II AIRCRAFT ACCESS TO GENERAL AVIATION HANGARS.
** FUTURE RUNWAY 3/21 MAY REMAIN AT 200 FEET WIDE IF SUFFICIENT SUPPLEMENTAL LOCAL OR THIRD PARTY FUNDING BECOMES AVAILABLE TO COVER ADDITIONAL COSTS.

AIRPORT FACILITIES LIST

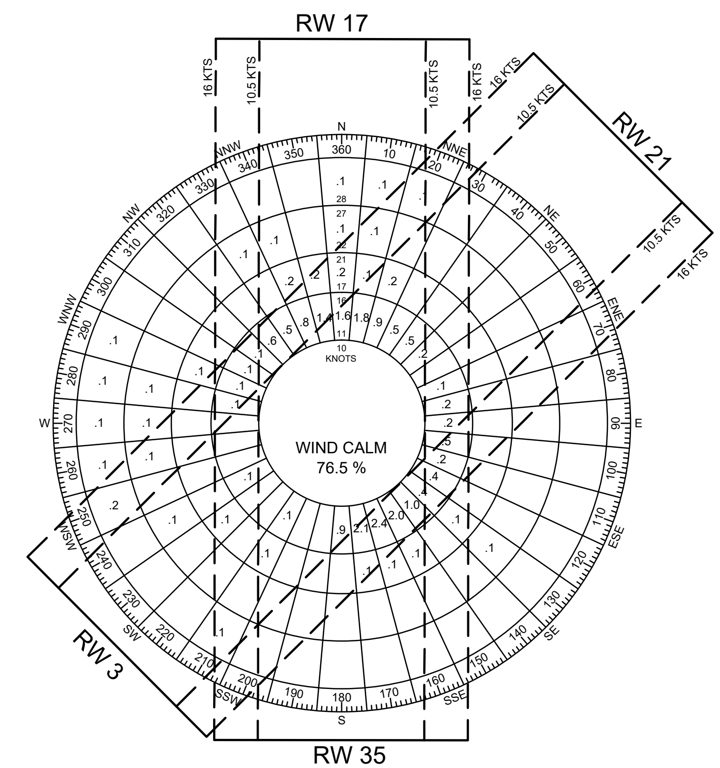
EXISTING	FUTURE	FACILITY DESCRIPTION	HEIGHT (FT.) (ESTIMATED)	TOP ELEVATION (MSL) (ESTIMATED)
1		DEAN BALDWIN PAINTING	69'	3776'
2		BUILDING	15'	3722'
3		TANK	30'	3685'
4		HANGAR	50'	3703'
5		HANGAR	48'	3700'
6		HANGAR	53'	3704'
7		GREAT SOUTHWEST AVIATION FBO	34'	3682'
8		HANGAR	28'	3675'
9		HANGAR	38'	3684'
10	10	SNOW REMOVAL EQUIP. BUILDING	15'	3659'
11		BUILDING	34'	3675'
12	12	TERMINAL	33'	3671'
13		BUILDING	15'	3647'
14		HANGAR	38'	3673'
15		HANGAR	35'	3668'
16		HANGAR	32'	3662'
17		T-HANGARS	15'	3640'
18		BUILDING	16'	3639'
19		BUILDING	20'	3642'
20		BUILDING	22'	3678'
21		BUILDING	15'	3651'
22		WATER TANK	36'	3696'
23		BUILDING	25'	3686'
24		ANTENNA	90'	3750'
25		BEACON	50'	3675'
26		AIR TRAFFIC CONTROL	90'	3748'
27		BUILDING	22'	3681'
28		BUILDING	13'	3661'
29		FIRE STATION	27'	3669'
30		HANGAR	30'	3647'
31		FUEL FARM	-	-
32		ROSWELL BLM AIR TANKER BASE	25'	3650'
33		HANGAR	30'	3685'
34		COMMERCIAL SERVICE APRON	-	-
35		HELICOPTER PARKING	-	-
	36	T-HANGAR	15'	3672'
	37	T-HANGAR	15'	3669'
	38	T-HANGAR	15'	3668'
	39	BOX HANGAR	35'	3686'
	40	EMPLOYEE VEHICLE PARKING	16'	3655'
41	41	VEHICLE PARKING	16'	3655'
42	42	RENTAL CAR PARKING	16'	3653'
43		BULK FUEL STORAGE	35'	3649'
44		BUILDING	15'	3627'
45		MIDDLE MARKER	15'	3624'
46		MISTIC	35'	3659'
47		BUILDING	15'	3702'
48		BUILDING	15'	3653'
49		BUILDING	15'	3654'
50		BUILDING	15'	3679'
51		BUILDING	15'	3692'
52		BUILDING	15'	3691'
53		BUILDING	15'	3697'
54		BUILDING	15'	3695'
55		BUILDING	15'	3699'
56		BUILDING	15'	3688'
57		BUILDING	15'	3688'
58		BUILDING	15'	3697'
59		BUILDING	15'	3695'
60		BUILDING	15'	3695'
61		COMPASS CALIBRATION PAD	-	-



RUNWAY	10.5 KNOTS 13 MPH	13 KNOTS 16 MPH	16 KNOTS 20 MPH	20 KNOTS 23 MPH
3/21	86.41%	92.39%	97.61%	99.32%
17/35	93.00%	95.87%	98.06%	99.12%
COMBINED	96.28%	98.33%	99.35%	99.80%

ALL WEATHER WIND ROSE

WIND DATA SOURCE: NOAA, ROSWELL ASOS: NATIONAL OCEANIC AND ADMINISTRATION, 2011 (COLLECTION BETWEEN 2000-2009).
NUMBER OF OBSERVATIONS: 6,624



RUNWAY	10.5 KNOTS 13 MPH	13 KNOTS 16 MPG	16 KNOTS 20 MPH	20 KNOTS 23 MPH
3/21	85.67%	92.50%	97.98%	99.16%
17/35	95.72%	97.34%	98.54%	98.78%
COMBINED	97.12%	98.55%	99.19%	99.54%

IFR-WEATHER WIND ROSE

WIND DATA SOURCE: NOAA, ROSWELL ASOS: NATIONAL OCEANIC AND ADMINISTRATION, 2011 (COLLECTION BETWEEN 2000-2009).
NUMBER OF OBSERVATIONS: 6,624

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

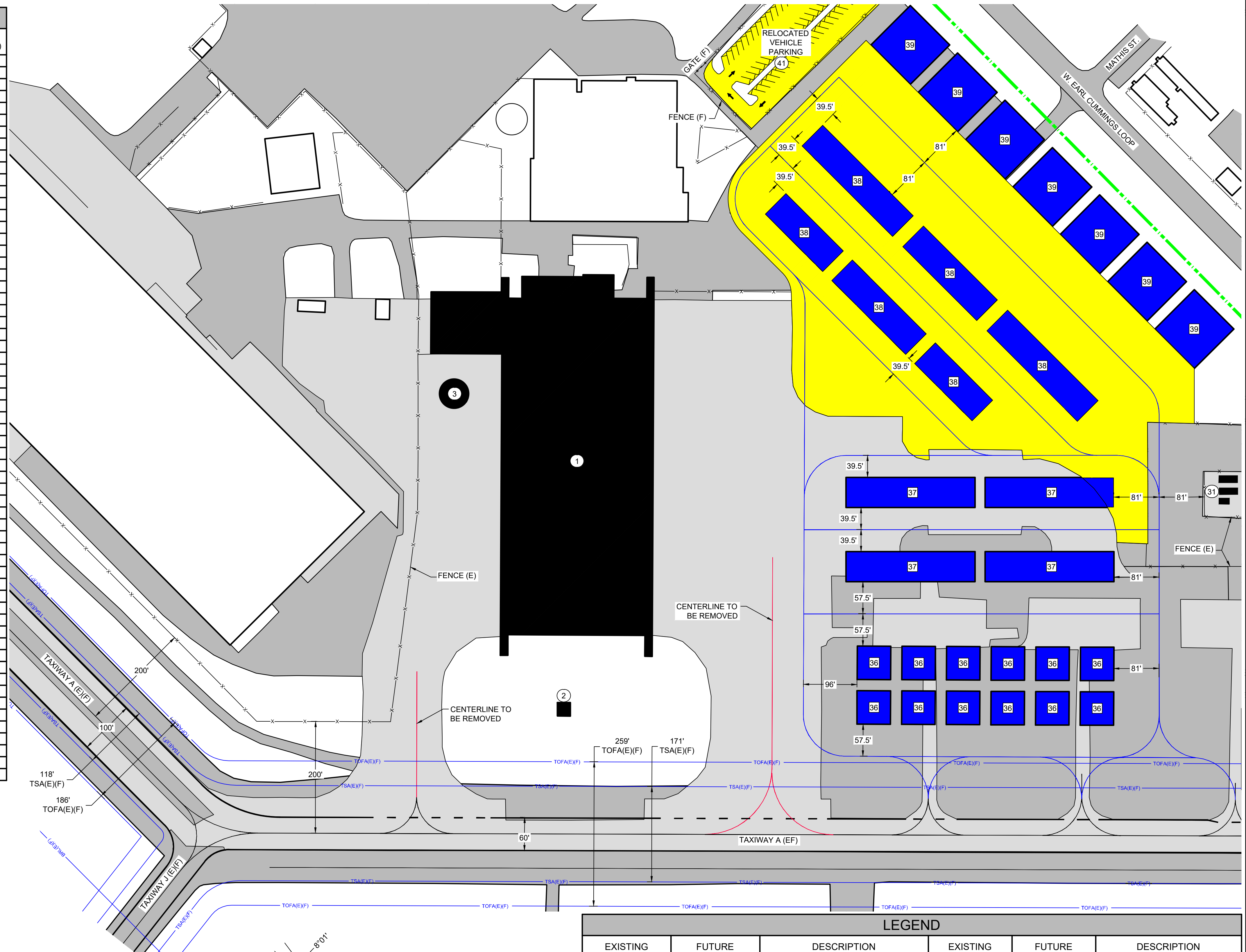
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015502	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

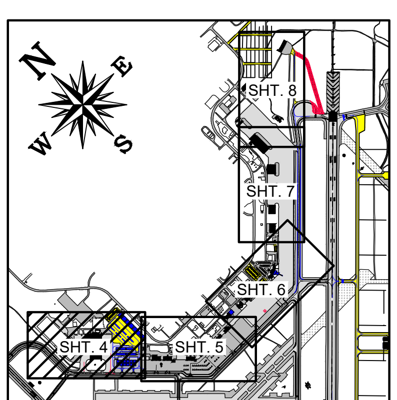
THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

AIRPORT DATA SHEET

AIRPORT FACILITIES LIST

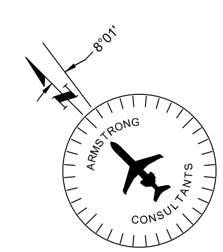
EXISTING	FUTURE	FACILITY DESCRIPTION	HEIGHT (FT.) (ESTIMATED)	TOP ELEVATION (MSL) (ESTIMATED)
1		DEAN BALDWIN PAINTING	69'	3776'
2		BUILDING	15'	3722'
3		TANK	30'	3685'
4		HANGAR	50'	3703'
5		HANGAR	48'	3700'
6		HANGAR	53'	3704'
7		GREAT SOUTHWEST AVIATION FBO	34'	3682'
8		HANGAR	28'	3675'
9		HANGAR	38'	3684'
10	10	SNOW REMOVAL EQUIP. BUILDING	15'	3659'
11		BUILDING	34'	3675'
12	12	TERMINAL	33'	3671'
13		BUILDING	15'	3647'
14		HANGAR	38'	3673'
15		HANGAR	35'	3668'
16		HANGAR	32'	3662'
17		T-HANGARS	15'	3640'
18		BUILDING	16'	3639'
19		BUILDING	20'	3642'
20		BUILDING	22'	3678'
21		BUILDING	15'	3651'
22		WATER TANK	36'	3696'
23		BUILDING	25'	3686'
24		ANTENNA	90'	3750'
25		BEACON	50'	3675'
26		AIR TRAFFIC CONTROL	90'	3748'
27		BUILDING	22'	3681'
28		BUILDING	13'	3661'
29		FIRE STATION	27'	3669'
30		HANGAR	30'	3647'
31		FUEL FARM	-	-
32		ROSWELL BLM AIR TANKER BASE	25'	3650'
33		HANGAR	30'	3685'
34		COMMERCIAL SERVICE APRON	-	-
35		HELICOPTER PARKING	-	-
	36	T-HANGAR	15'	3672'
	37	T-HANGAR	15'	3669'
	38	T-HANGAR	15'	3668'
	39	BOX HANGAR	35'	3686'
	40	EMPLOYEE VEHICLE PARKING	16'	3655'
41	41	VEHICLE PARKING	16'	3655'
42	42	RENTAL CAR PARKING	16'	3653'
43		BULK FUEL STORAGE	35'	3649'
44		BUILDING	15'	3627'
45		MIDDLE MARKER	15'	3624'
46		MISTIC	35'	3659'
47		BUILDING	15'	3702'
48		BUILDING	15'	3653'
49		BUILDING	15'	3654'
50		BUILDING	15'	3679'
51		BUILDING	15'	3692'
52		BUILDING	15'	3691'
53		BUILDING	15'	3697'
54		BUILDING	15'	3695'
55		BUILDING	15'	3699'
56		BUILDING	15'	3688'
57		BUILDING	15'	3688'
58		BUILDING	15'	3697'
59		BUILDING	15'	3695'
60		BUILDING	15'	3695'
61		COMPASS CALIBRATION PAD	-	-



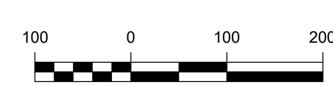


KEY MAP

NOT TO SCALE



MAGNETIC NORTH SOURCE: NOAA GEOPHYSICAL DATA CENTER 03/19/12 RATE OF CHANGE 0°07' W/YEAR



SCALE IN FEET

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT / CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT	X	X X	FENCING
	N/A	PRECISION OBSTACLE FREE ZONE (POFZ)		N/A	MALSR
	N/A	GLIDE SLOPE CRITICAL AREA		N/A	HELICOPTER PARKING
	N/A	LOCALIZER CRITICAL AREA			TO BE REMOVED

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

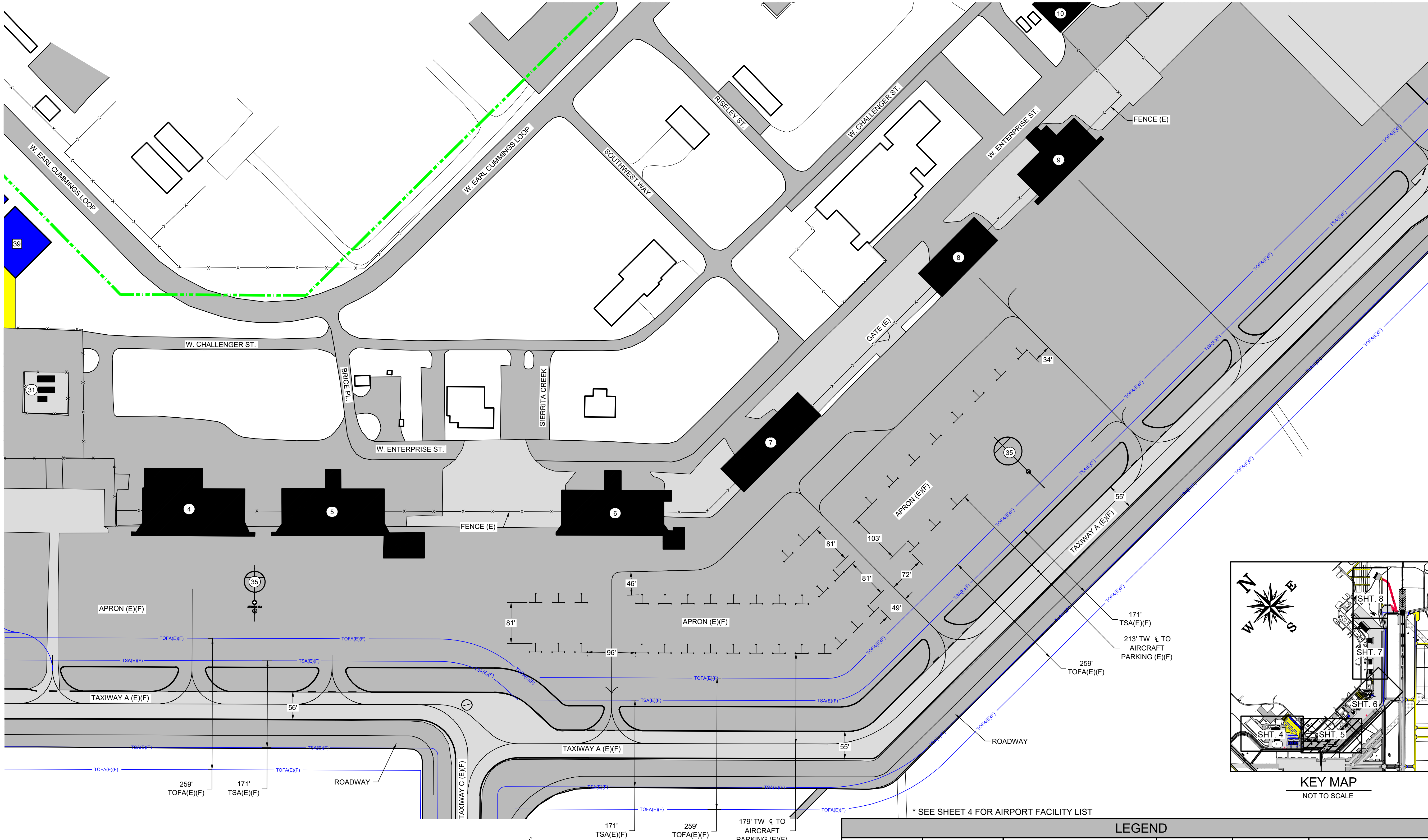
AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015503	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

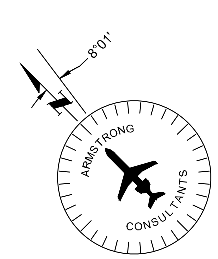
THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

TERMINAL AREA DRAWING

Sheet: 4 of: 24



* SEE SHEET 4 FOR AIRPORT FACILITY LIST



MAGNETIC NORTH SOURCE: NOAA
GEOPHYSICAL DATA CENTER 03/19/12
RATE OF CHANGE 0°07' W/YEAR

100 0 100 200
SCALE IN FEET

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT / CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT			FENCING
	N/A	PRECISION OBSTACLE FREE ZONE (POFZ)		N/A	MALSR
	N/A	GLIDE SLOPE CRITICAL AREA		N/A	HELICOPTER PARKING
	N/A	LOCALIZER CRITICAL AREA			TO BE REMOVED

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

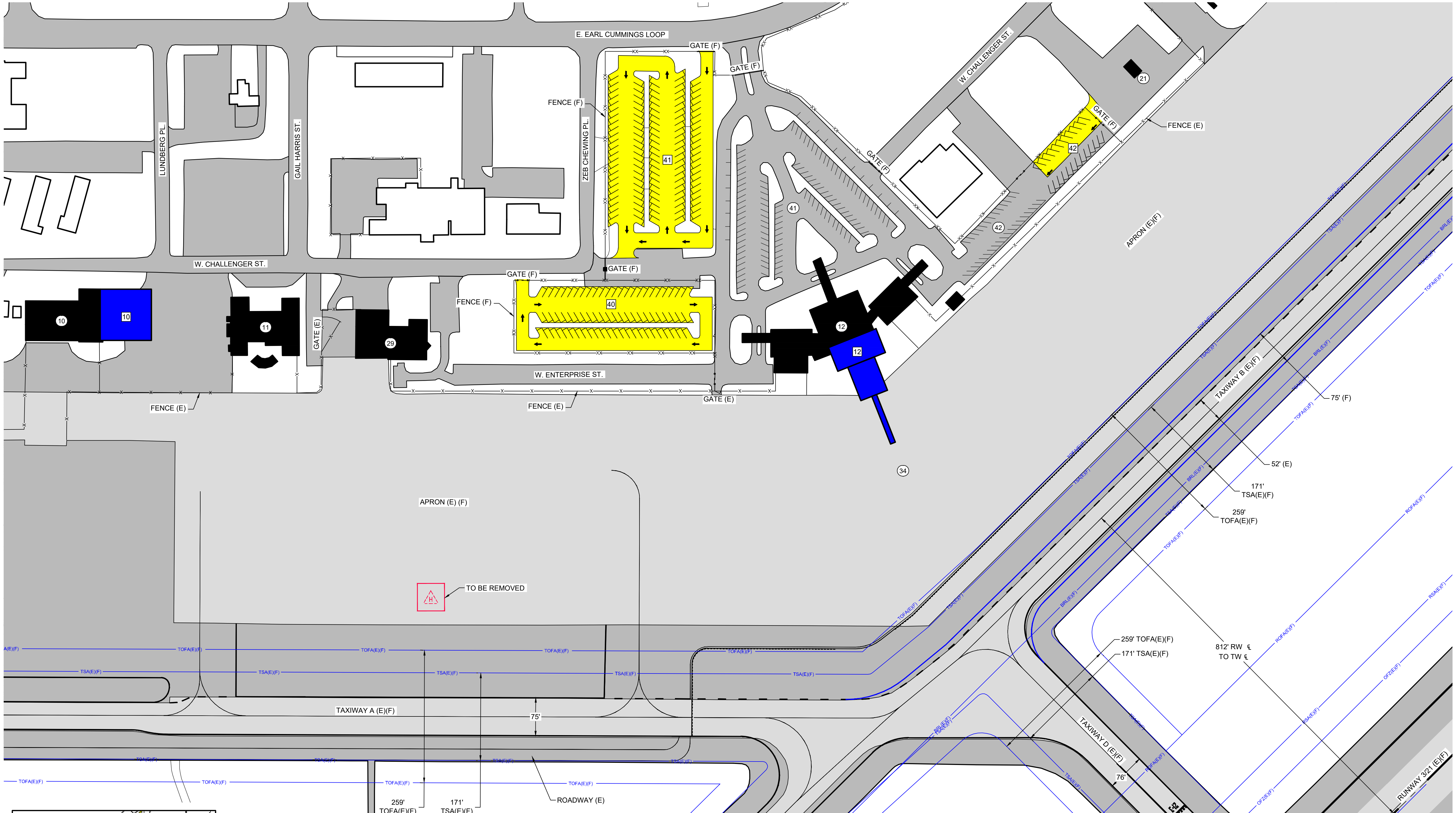
ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

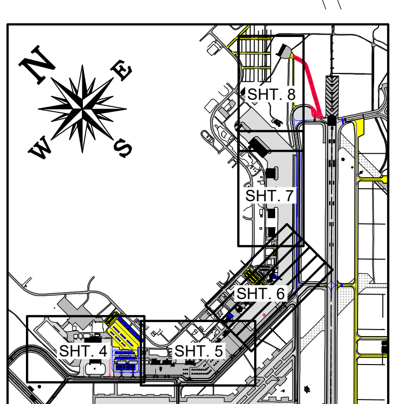
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015503	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

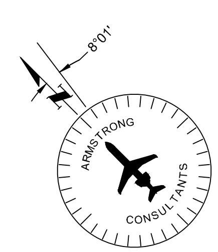
TERMINAL AREA DRAWING



* SEE SHEET 4 FOR AIRPORT FACILITY LIST



KEY MAP
NOT TO SCALE



MAGNETIC NORTH SOURCE: NOAA
GEOPHYSICAL DATA CENTER 03/19/12
RATE OF CHANGE 0°07' W/YEAR

100 0 100 200
SCALE IN FEET

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT / CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)	1 2 12 11	N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT	X	XX	FENCING
	N/A	PRECISION OBSTACLE FREE ZONE (POFZ)		N/A	MALSR
	N/A	GLIDE SLOPE CRITICAL AREA		N/A	HELICOPTER PARKING
	N/A	LOCALIZER CRITICAL AREA			TO BE REMOVED

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

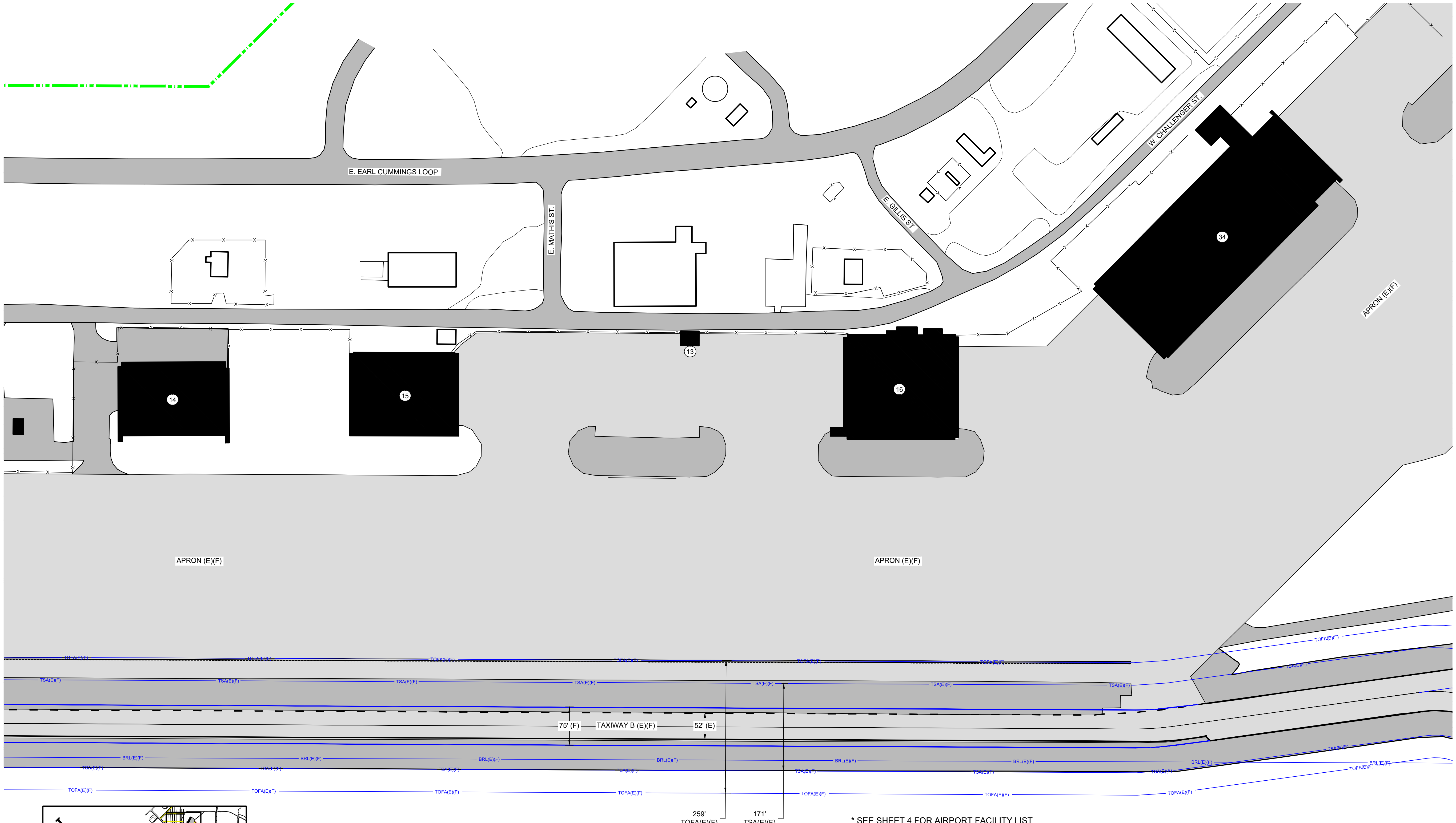
ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

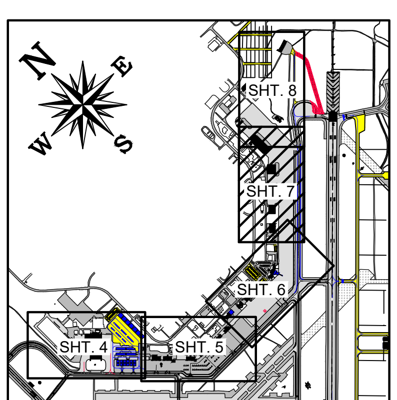
AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015503	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

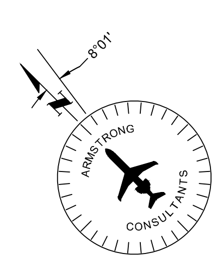
TERMINAL AREA DRAWING





KEY MAP

NOT TO SCALE



MAGNETIC NORTH SOURCE: NOAA
GEOPHYSICAL DATA CENTER 03/19/12
RATE OF CHANGE 0°07' W/YEAR

100 0 100 200

SCALE IN FEET

* SEE SHEET 4 FOR AIRPORT FACILITY LIST

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)	1 2 12 11	N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT	X	XX	FENCING
	N/A	PRECISION OBSTACLE FREE ZONE (POFZ)		N/A	MALSR
	N/A	GLIDE SLOPE CRITICAL AREA		N/A	HELICOPTER PARKING
	N/A	LOCALIZER CRITICAL AREA			TO BE REMOVED

ARMSTRONG CONSULTANTS, INC.

AIRPORT ENGINEERING AND PLANNING

www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL
AIR CENTER
ROSWELL, NEW MEXICO

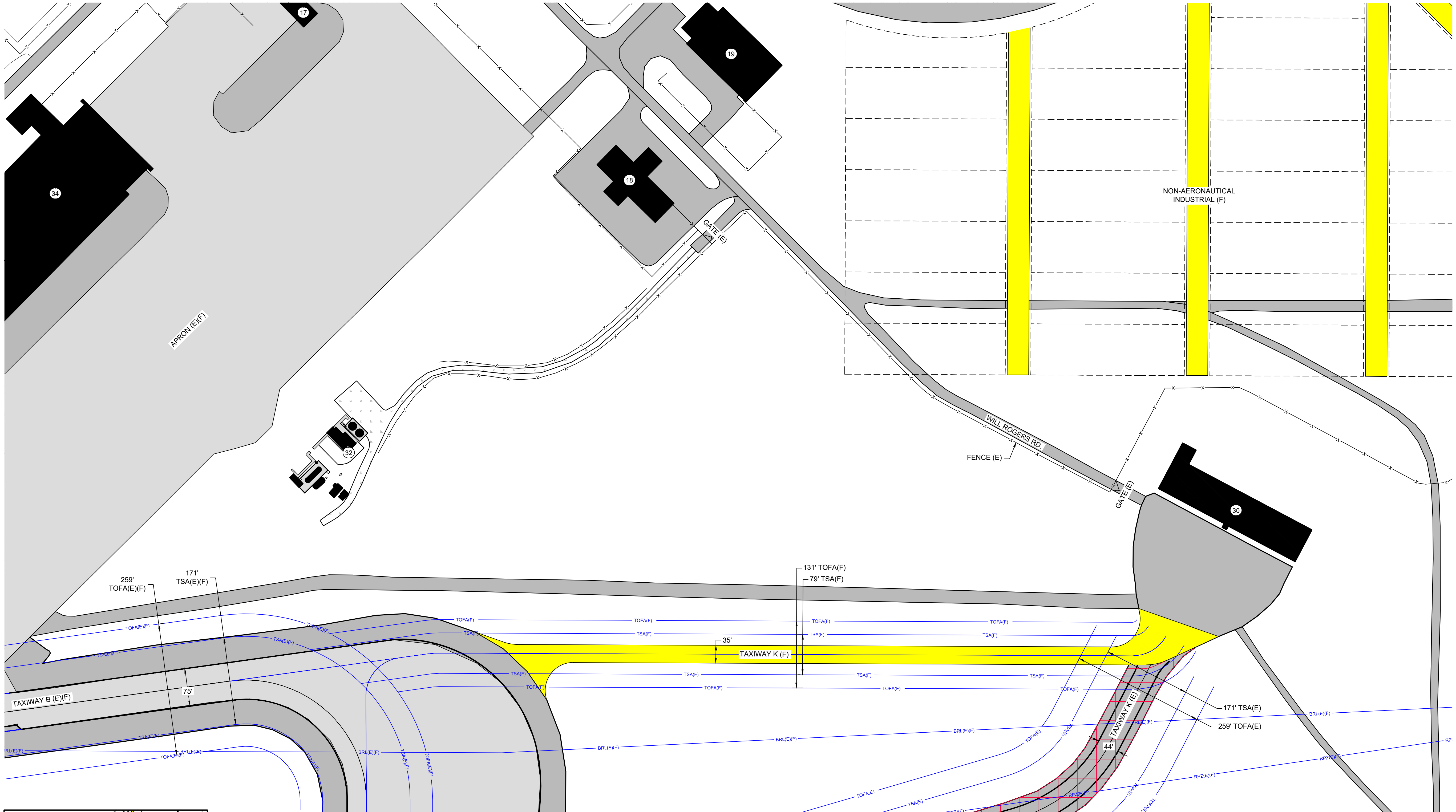
AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015503	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

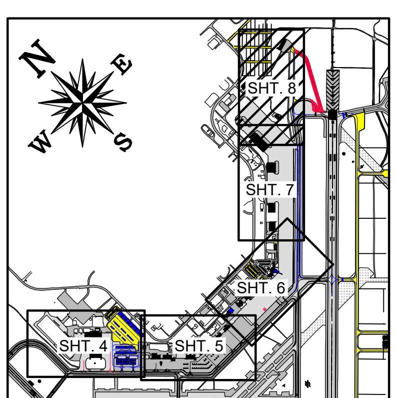
THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

TERMINAL AREA DRAWING

Sheet: 7 of: 24

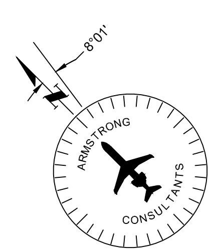


* SEE SHEET 4 FOR AIRPORT FACILITY LIST



KEY MAP

NOT TO SCALE



MAGNETIC NORTH SOURCE: NOAA
GEOPHYSICAL DATA CENTER 03/19/12
RATE OF CHANGE 0°07' W/YEAR

SCALE IN FEET

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT			FENCING
	N/A	PRECISION OBSTACLE FREE ZONE (POFZ)		N/A	MALSR
	N/A	GLIDE SLOPE CRITICAL AREA		N/A	HELICOPTER PARKING
	N/A	LOCALIZER CRITICAL AREA			TO BE REMOVED

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

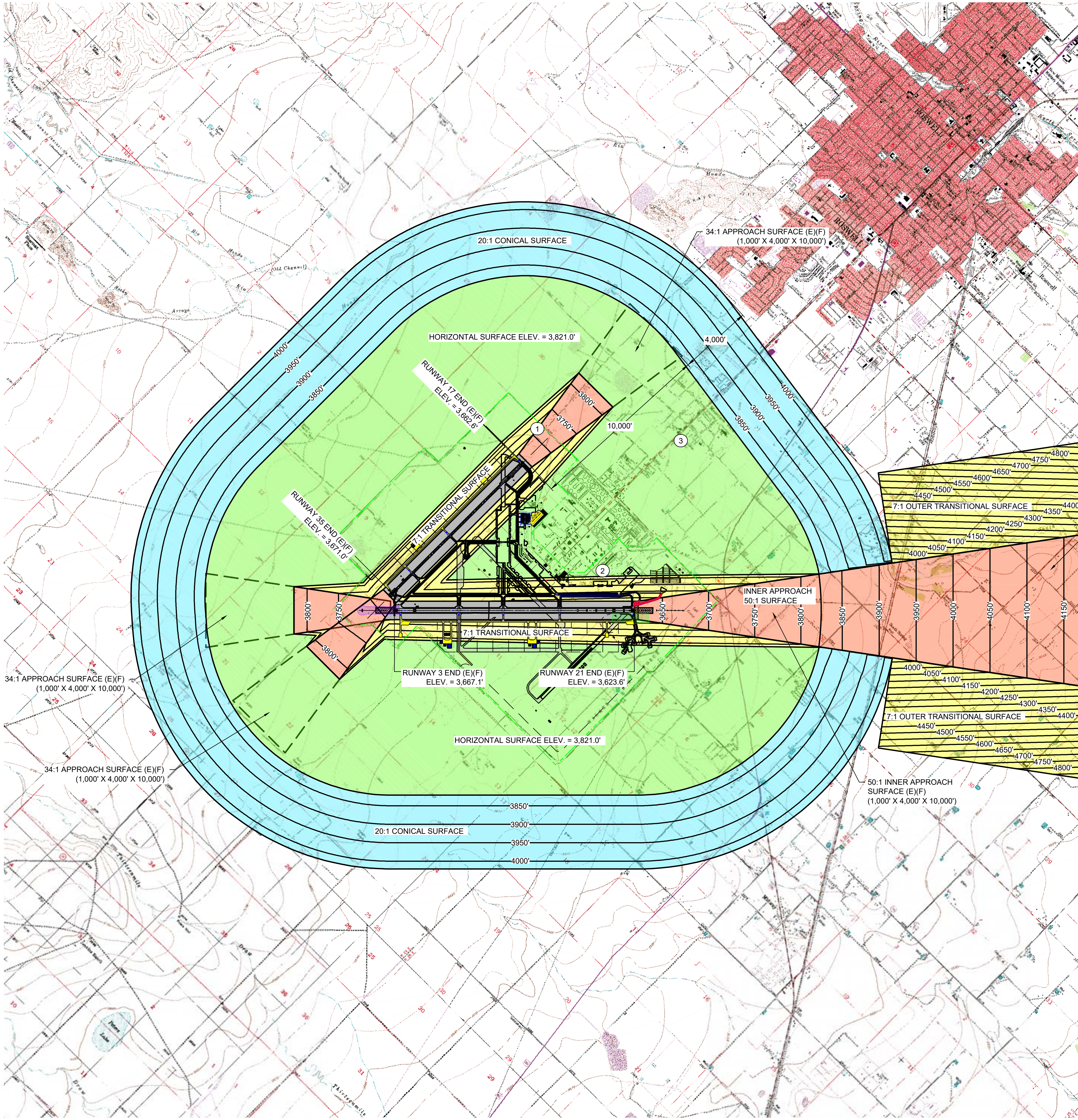
AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015503	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

TERMINAL AREA DRAWING

Sheet: 8 of: 24

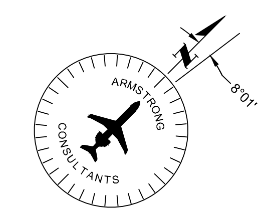


OBSTRUCTION CHART

SURFACE		DESCRIPTION	TOP ELEVATION	PENETRATION	REMARKS
PRIMARY		NONE	----	----	----
TRANSITIONAL	1	ANTENNA TOWER	3748'	+36	VIEW MARKED & LIGHTED
HORIZONTAL	2	WATER TANK W/ ANTENNA	3822'	+1	----
HORIZONTAL	3	AGC TOWER	3821'	+1	----
CONICAL		NONE	----	----	----
APPROACH		-SEE NOTE 2-	----	----	----

NOTES

1. NO CURRENT HEIGHT RESTRICTION ZONING IN EFFECT.
2. REFER TO "INNER PORTION OF THE APPROACH SURFACE" DRAWING FOR DETAILS ON CLOSE-IN APPROACH OBSTRUCTIONS.
3. APPROACH SURFACES BASED ON ULTIMATE CONDITION.
4. THE FAR PART 77 AIRSPACE DRAWING WAS BASED ON ESTIMATED TERRAIN ELEVATIONS AND ESTIMATED DEVELOPMENT HEIGHTS ALONG WITH THE USE OF AIRSPACE EVALUATION CASES THAT HAVE BEEN SUBMITTED THROUGH THE FAA OBSTRUCTION EVALUATION / AIRPORT AIRSPACE ANALYSIS (OE/AAA) PROCESS AND THE NOAA OBSTRUCTION SURVEY DATED 02/10/1998.



MAGNETIC NORTH SOURCE: NOAA
GEOPHYSICAL DATA CENTER 03/19/12
RATE OF CHANGE 0° 07' W/YEAR

3000 0 3000 6000

SCALE IN FEET

TRANSITIONAL SURFACE

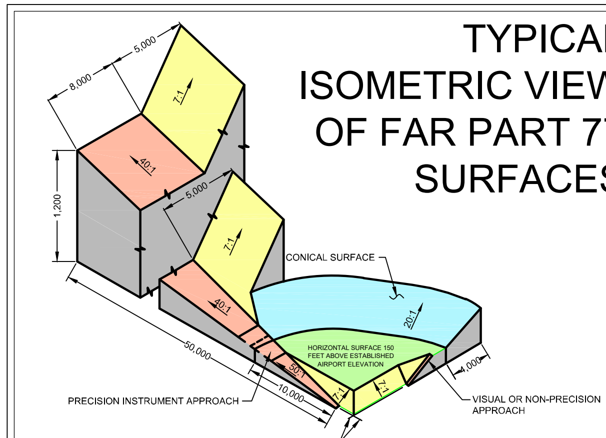
HORIZONTAL SURFACE

APPROACH SURFACE

CONICAL SURFACE

PRIMARY SURFACE

TYPICAL ISOMETRIC VIEW OF FAR PART 77 SURFACES



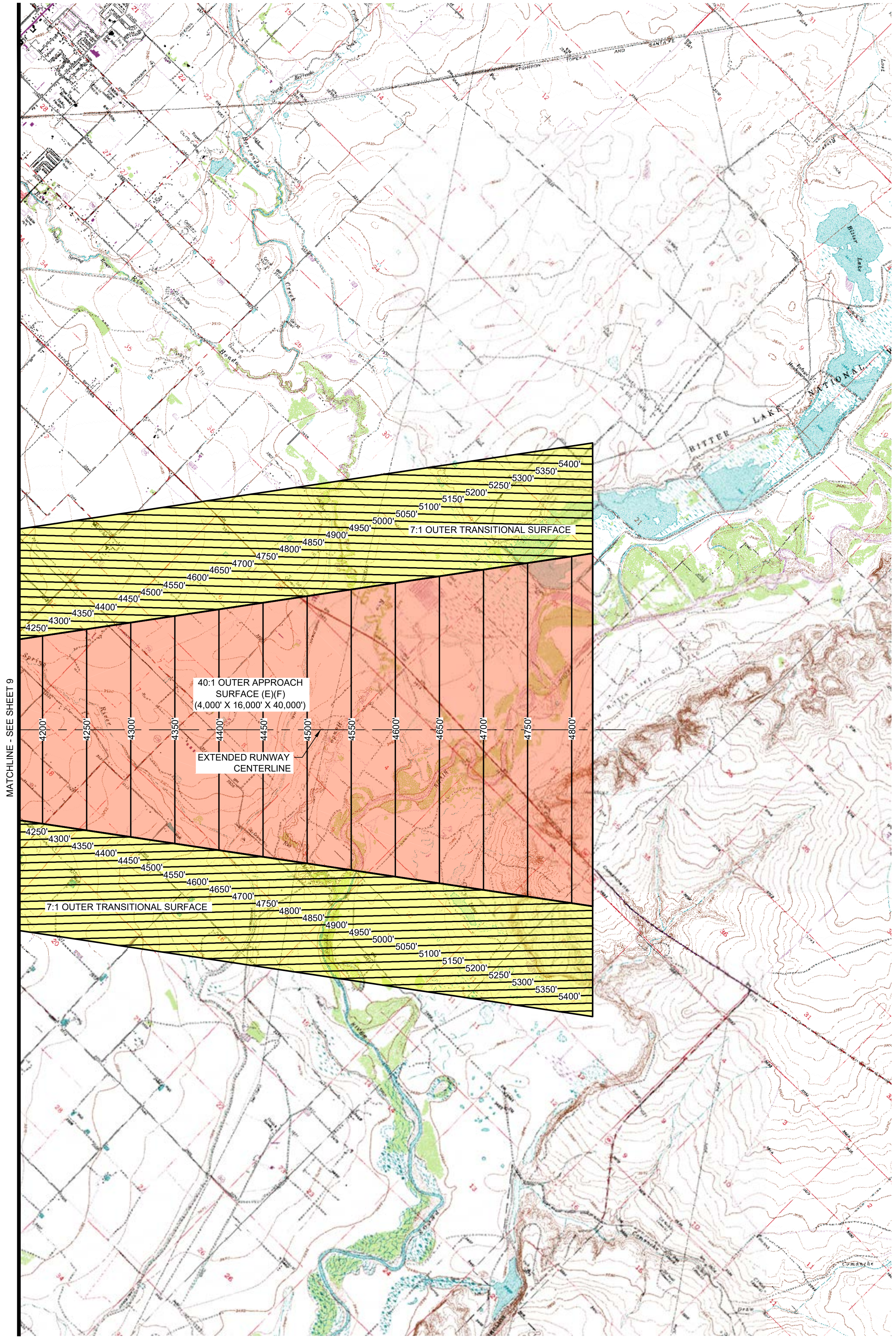
ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL
AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015504	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

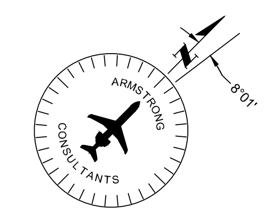
FAR
PART 77
AIRSPACE



OBSTRUCTION CHART				
SURFACE	DESCRIPTION	TOP ELEVATION	PENETRATION	REMARKS
PRIMARY	NONE	----	----	----
TRANSITIONAL	1 ANTENNA TOWER	3748'	+36	SEE PLAN VIEW, SHEET 9 MARKED & LIGHTED
HORIZONTAL	2 WATER TANK W/ ANTENNA	3822'	+1	SEE PLAN VIEW, SHEET 9
HORIZONTAL	3 AGC TOWER	3821'	+1	SEE PLAN VIEW, SHEET 9
CONICAL	NONE	----	----	----
APPROACH	-SEE NOTE 2-	----	----	----

NOTES

1. NO CURRENT HEIGHT RESTRICTION ZONING IN EFFECT.
2. REFER TO "INNER PORTION OF THE APPROACH SURFACE" DRAWING FOR DETAILS ON CLOSE-IN APPROACH OBSTRUCTIONS.
3. APPROACH SURFACES BASED ON ULTIMATE CONDITION.
4. THE FAR PART 77 AIRSPACE DRAWING WAS BASED ON ESTIMATED TERRAIN ELEVATIONS AND ESTIMATED DEVELOPMENT HEIGHTS ALONG WITH THE USE OF AIRSPACE EVALUATION CASES THAT HAVE BEEN SUBMITTED THROUGH THE FAA OBSTRUCTION EVALUATION / AIRPORT AIRSPACE ANALYSIS (OE/AAA) PROCESS AND THE NOAA OBSTRUCTION SURVEY DATED 02/10/1998.



MAGNETIC NORTH SOURCE: NOAA
GEOPHYSICAL DATA CENTER 03/19/12
RATE OF CHANGE 0° 07' W/YEAR

3000 0 3000 6000

SCALE IN FEET

TRANSITIONAL SURFACE

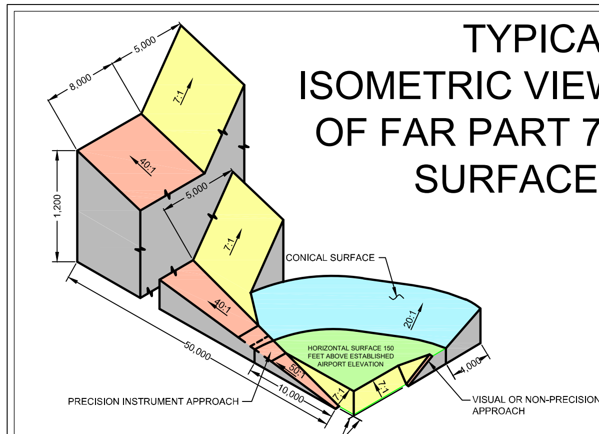
HORIZONTAL SURFACE

APPROACH SURFACE

CONICAL SURFACE

PRIMARY SURFACE

TYPICAL ISOMETRIC VIEW OF FAR PART 77 SURFACES



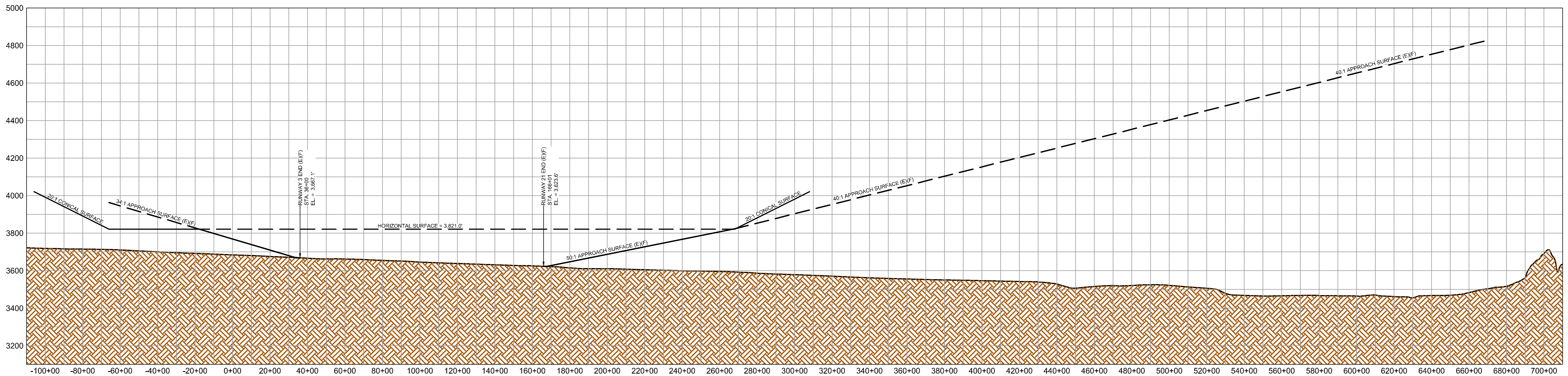
ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

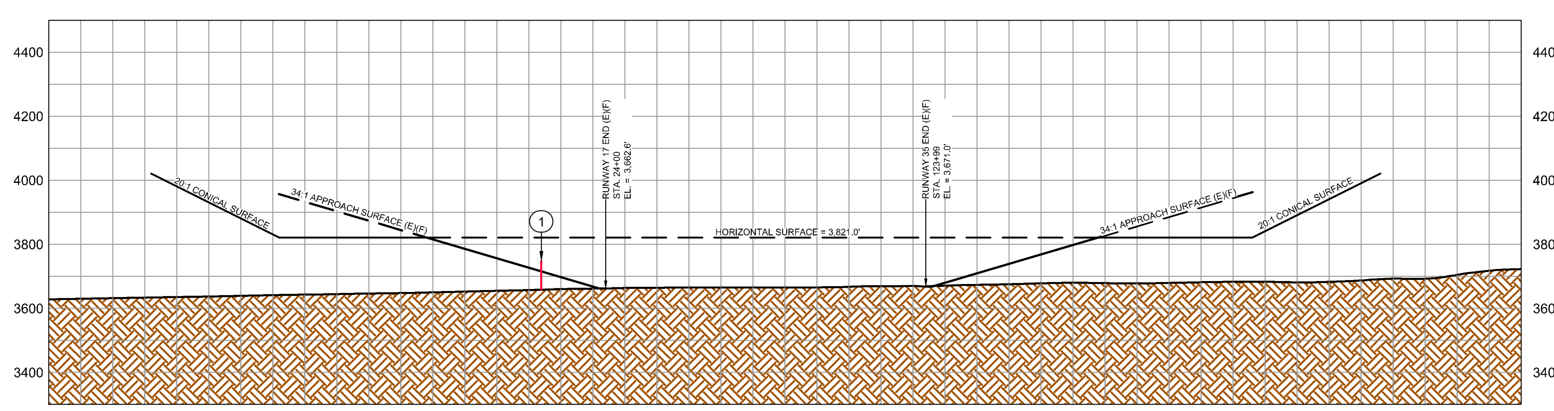
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015504	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

FAR PART 77 AIRSPACE



RUNWAY 3/21 PROFILE (E)(F)

SCALE PER GRID



RUNWAY 17/35 PROFILE (E)(F)

SCALE PER GRID

OBSTRUCTION CHART				
SURFACE	DESCRIPTION	TOP ELEVATION	PENETRATION	REMARKS
PRIMARY	NONE	----	----	----
TRANSITIONAL	1 ANTENNA TOWER	3748'	+36	SEE PLAN VIEW, SHEET 9 MARKED & LIGHTED
HORIZONTAL	2 WATER TANK W/ ANTENNA	3822'	+1	SEE PLAN VIEW, SHEET 9
HORIZONTAL	3 AGC TOWER	3821'	+1	SEE PLAN VIEW, SHEET 9
CONICAL	NONE	----	----	----
APPROACH	-SEE NOTE 2-	----	----	----

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

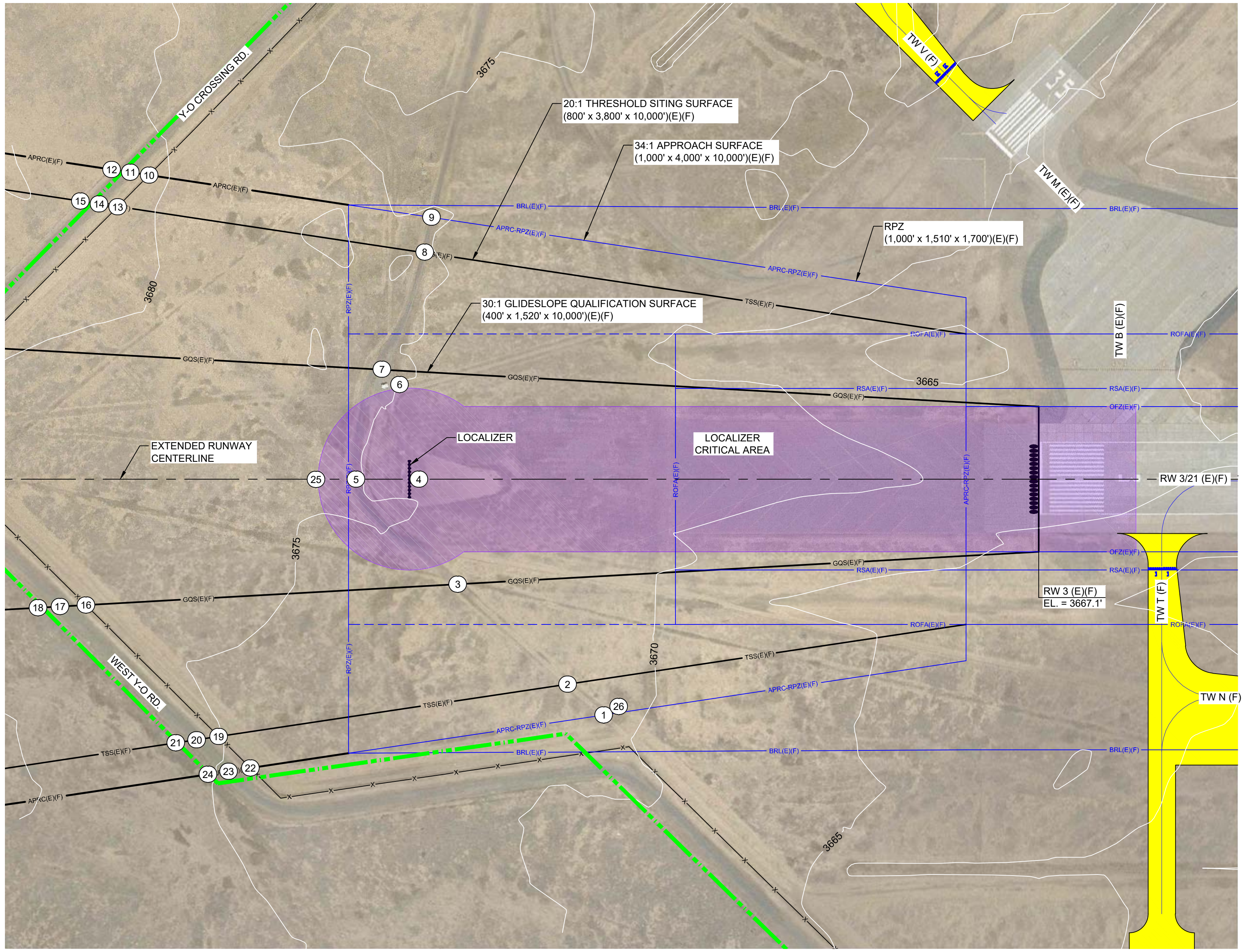
ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

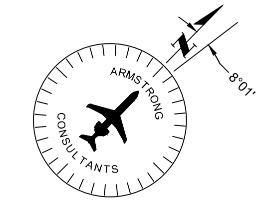
AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015504	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

FAR PART 77 PROFILES





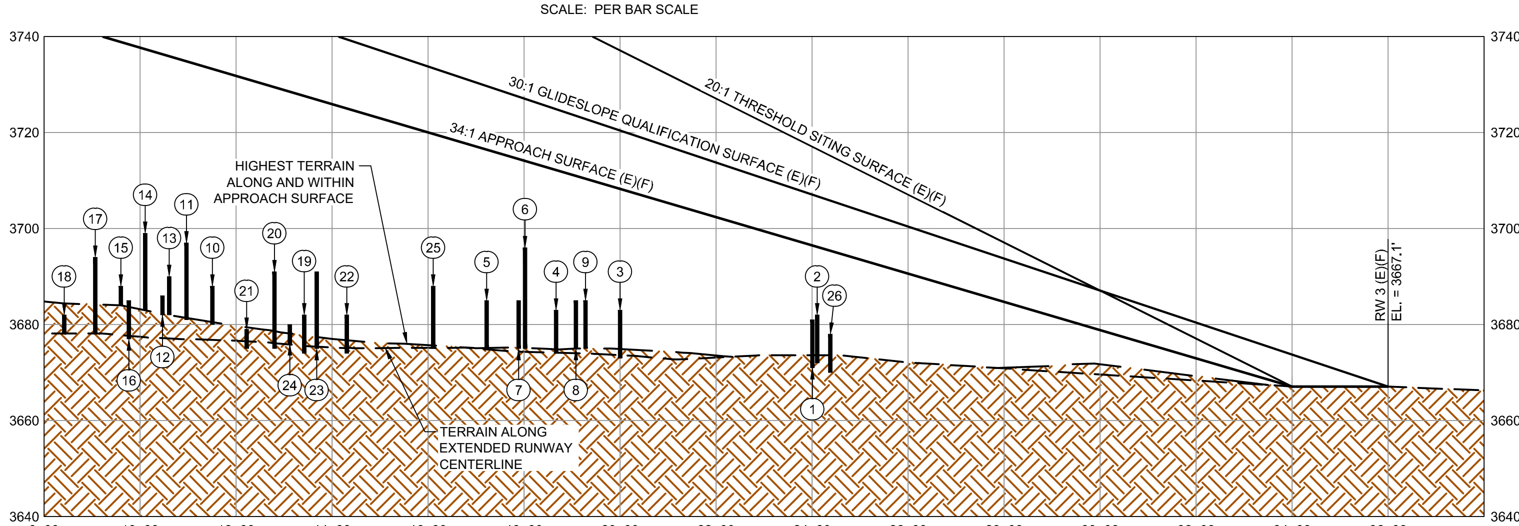
MAGNETIC NORTH SOURCE: NOAA
GEOPHYSICAL DATA CENTER 03/19/12
RATE OF CHANGE 0°07' W/YEAR

200 0 200 400

SCALE IN FEET

PLAN RUNWAY 3 END (E)(F)

SCALE: PER BAR SCALE



PROFILE RUNWAY 3 END (E)(F)

SCALE: PER GRID

OBJECTS WITHIN RUNWAY 3 GQS, APRC, AND TSS SURFACES (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	30:1 GQS PEN.	20:1 TSS PEN.	34:1 APRC SURFACE PEN.	REMARKS
1	* SERVICE ROAD	10'	3681'	-	-	NONE	N/A
2	* SERVICE ROAD	10'	3682'	-	NONE	NONE	N/A
3	* SERVICE ROAD	10'	3683'	NONE	NONE	NONE	N/A
4	** LOCALIZER	9'	3683'	NONE	NONE	NONE	N/A
5	* SERVICE ROAD	10'	3685'	NONE	NONE	NONE	N/A
6	** BUILDING/ANTENNA	21'	3696'	NONE	NONE	NONE	N/A
7	* SERVICE ROAD	10'	3685'	NONE	NONE	NONE	N/A
8	* SERVICE ROAD	10'	3685'	-	NONE	NONE	N/A
9	* SERVICE ROAD	10'	3685'	-	-	NONE	N/A
10	* FENCE	8'	3688'	-	-	NONE	N/A
11	* ROAD	16'	3697'	-	-	NONE	N/A
12	* FENCE	4'	3686'	-	-	NONE	N/A
13	* FENCE	8'	3690'	-	NONE	NONE	N/A
14	* ROAD	16'	3699'	-	NONE	NONE	N/A
15	* FENCE	4'	3688'	-	NONE	NONE	N/A
16	* FENCE	8'	3685'	NONE	NONE	NONE	N/A
17	* ROAD	16'	3694'	NONE	NONE	NONE	N/A
18	* FENCE	4'	3682'	NONE	NONE	NONE	N/A
19	* FENCE	8'	3682'	-	NONE	NONE	N/A
20	* ROAD	16'	3691'	-	NONE	NONE	N/A
21	* FENCE	4'	3679'	-	NONE	NONE	N/A
22	* FENCE	8'	3682'	-	-	NONE	N/A
23	* ROAD	16'	3691'	-	-	NONE	N/A
24	* FENCE	4'	3680'	-	-	NONE	N/A
25	** RADAR REFLECTOR	13'	3688'	NONE	NONE	NONE	N/A
26	** SIGN	8'	3688'	-	-	NONE	N/A

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
** = OBJECT ELEVATIONS ARE FROM OBSTRUCTION SURVEY (UDDF 2-10-98).
\- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
= OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT	X	XX	FENCING
	N/A	PRECISION OBSTACLE FREE ZONE (POFZ)		N/A	MALSR
	N/A	GLIDE SLOPE CRITICAL AREA		N/A	HELICOPTER PARKING
	N/A	LOCALIZER CRITICAL AREA			TO BE REMOVED

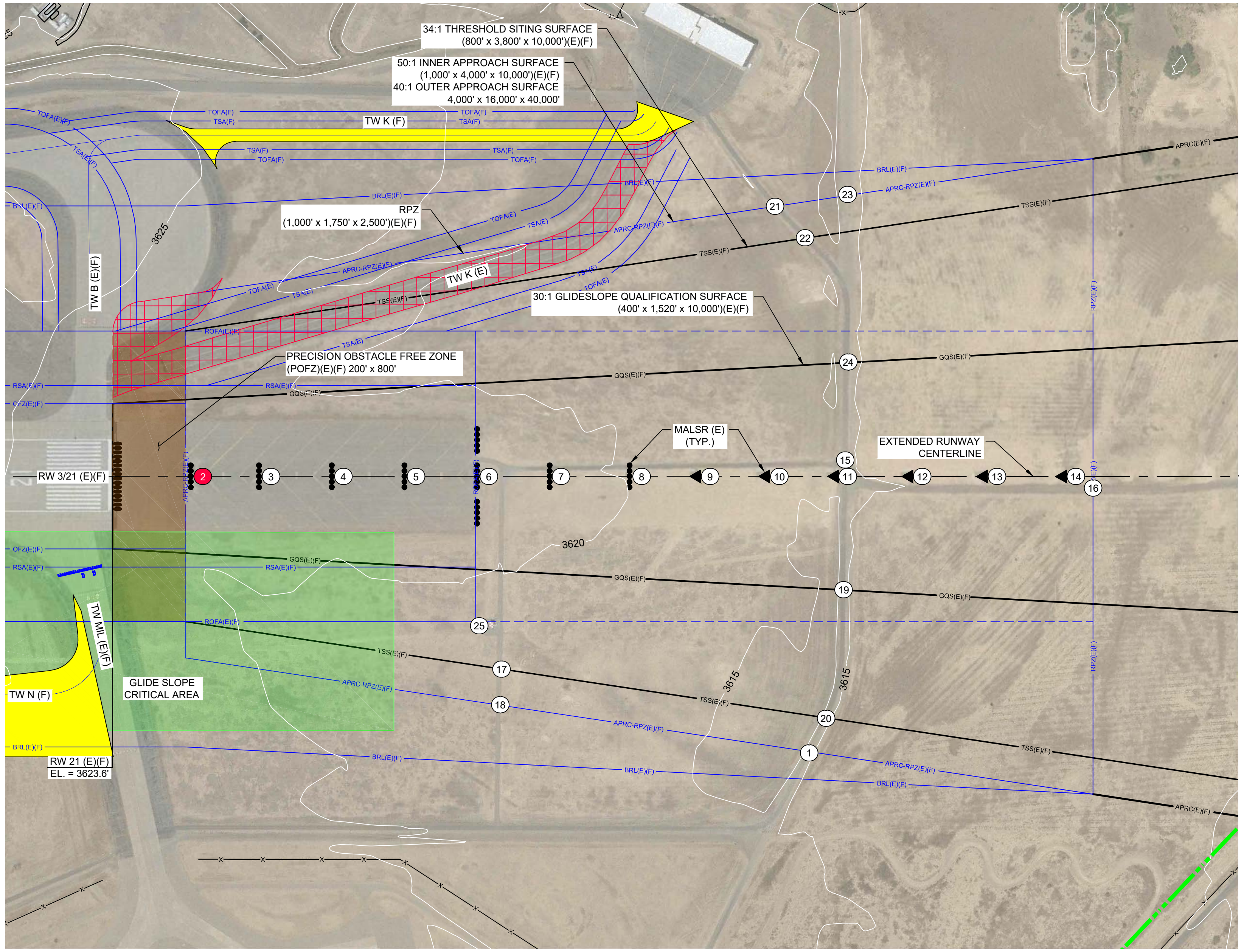
ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL
AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

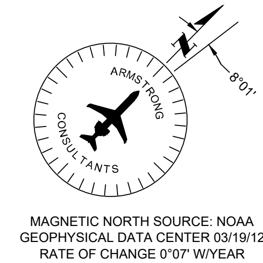
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015505	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

RUNWAY 3
(E)(F) INNER
APPROACH



PLAN RUNWAY 21 END (E)(F)

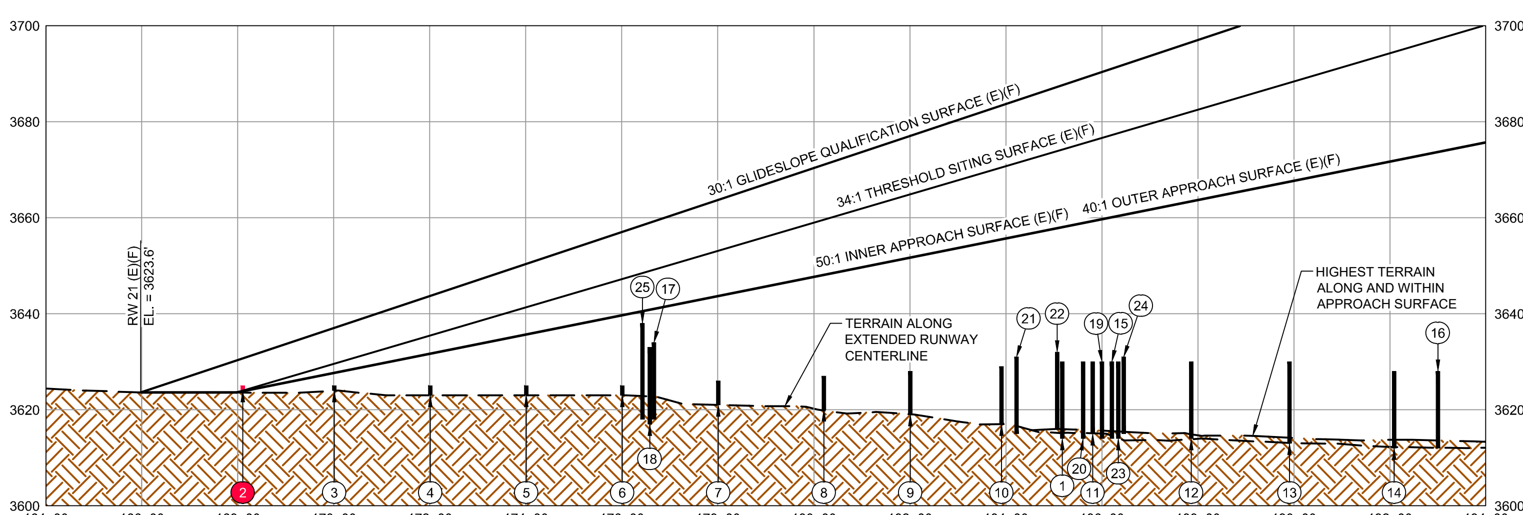
SCALE: PER BAR SCALE



OBJECTS WITHIN RUNWAY 21 GQS, APRC, AND TSS SURFACES (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	30:1 GQS PEN.	34:1 TSS PEN.	50:1 APRC SURFACE PEN.	REMARKS
1	* SERVICE ROAD	10'	3624'	-	-	NONE	N/A
2	* MALSR	1'	3625'	NONE	+1'	+1'	N/A
3	* MALSR	1'	3625'	NONE	NONE	NONE	N/A
4	* MALSR	2'	3625'	NONE	NONE	NONE	N/A
5	* MALSR	2'	3625'	NONE	NONE	NONE	N/A
6	* MALSR	2'	3625'	NONE	NONE	NONE	N/A
7	* MALSR	5'	3626'	NONE	NONE	NONE	N/A
8	* MALSR	7'	3627'	NONE	NONE	NONE	N/A
9	* MALSR	9'	3628'	NONE	NONE	NONE	N/A
10	* MALSR	12'	3629'	NONE	NONE	NONE	N/A
11	* MALSR	15'	3630'	NONE	NONE	NONE	N/A
12	* MALSR	16'	3630'	NONE	NONE	NONE	N/A
13	* MALSR	17'	3630'	NONE	NONE	NONE	N/A
14	* MALSR	5'	3617'	NONE	NONE	NONE	N/A
15	* SERVICE ROAD	10'	3624'	NONE	NONE	NONE	N/A
16	* SERVICE ROAD	10'	3622'	NONE	NONE	NONE	N/A
17	* SERVICE ROAD	10'	3628'	-	NONE	NONE	N/A
18	* SERVICE ROAD	10'	3628'	-	-	NONE	N/A
19	* SERVICE ROAD	10'	3624'	NONE	NONE	NONE	N/A
20	* SERVICE ROAD	10'	3624'	-	NONE	NONE	N/A
21	* SERVICE ROAD	10'	3625'	-	-	NONE	N/A
22	* SERVICE ROAD	10'	3626'	-	NONE	NONE	N/A
23	* SERVICE ROAD	10'	3624'	-	-	NONE	N/A
24	* SERVICE ROAD	10'	3625'	NONE	NONE	NONE	N/A
25	* BUILDING	10'	3628'	-	NONE	NONE	N/A

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
** = OBJECT ELEVATIONS ARE FROM OBSTRUCTION SURVEY (UDDF 2-10-98).
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
= OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE



PROFILE RUNWAY 21 END (E)(F)

SCALE: PER GRID

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT	X	X X	FENCING
	N/A	PRECISION OBSTACLE FREE ZONE (POFZ)		N/A	MALSR
	N/A	GLIDE SLOPE CRITICAL AREA		N/A	HELICOPTER PARKING
	N/A	LOCALIZER CRITICAL AREA			TO BE REMOVED

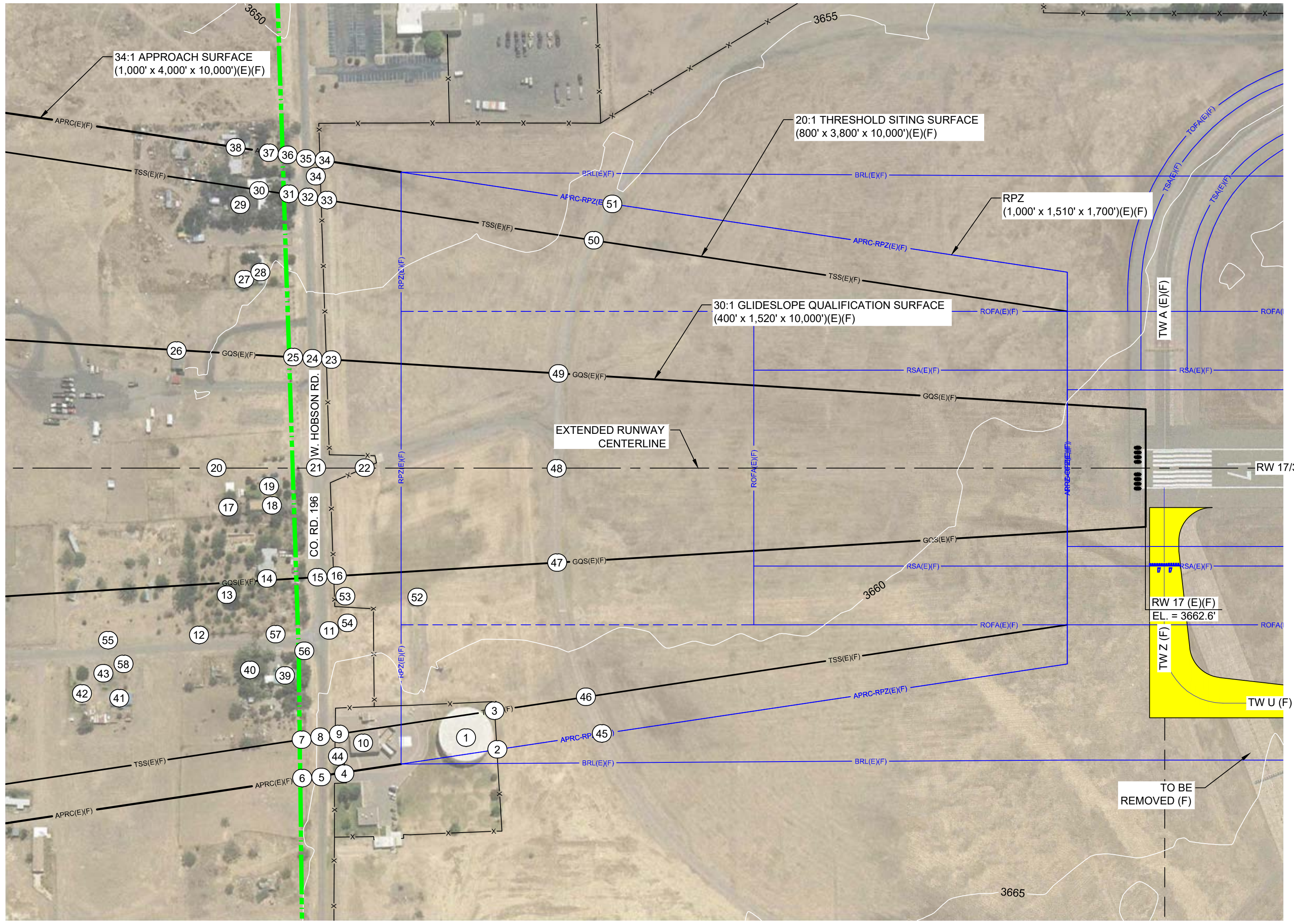
ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

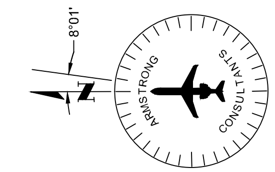
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015505	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

RUNWAY 21 (E)(F) INNER APPROACH



PLAN RUNWAY 17 END (E)(F)

SCALE: PER BAR SCALE



MAGNETIC NORTH SOURCE: NOAA
GEOPHYSICAL DATA CENTER 03/19/12
RATE OF CHANGE 0°07' W/YEAR

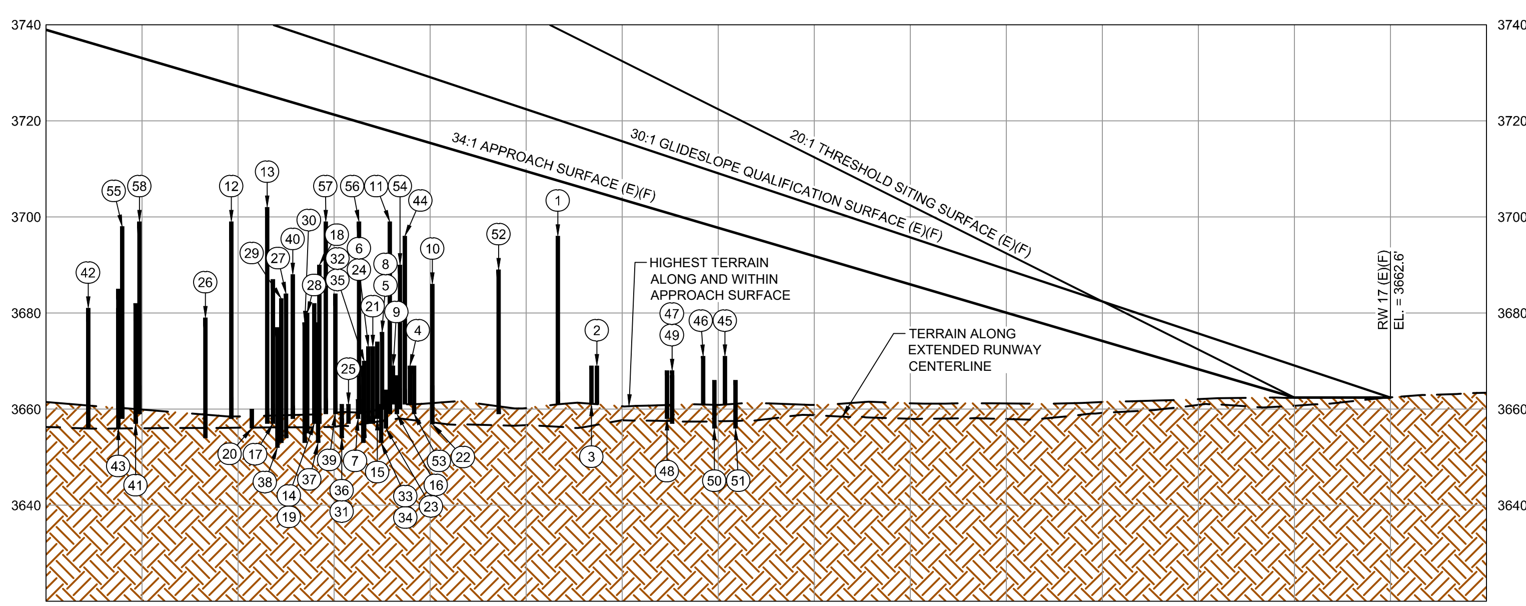
200 0 200 400

SCALE IN FEET

OBJECTS WITHIN RUNWAY 17 GQS, APRC, AND TSS SURFACES (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	30:1 GQS PEN.	20:1 TSS PEN.	34:1 APRC SURFACE PEN.	REMARKS
1	* WATER TANK	35'	3696'	-	NONE	NONE	N/A
2	* FENCE	8'	3669'	-	-	NONE	N/A
3	* FENCE	8'	3669'	-	NONE	NONE	N/A
4	* FENCE	8'	3669'	-	-	NONE	N/A
5	* ROAD	16'	3676'	-	-	NONE	N/A
6	* FENCE	4'	3663'	-	-	NONE	N/A
7	* FENCE	4'	3663'	-	NONE	NONE	N/A
8	* ROAD	16'	3676'	-	NONE	NONE	N/A
9	* FENCE	8'	3669'	-	NONE	NONE	N/A
10	* BUILDING	25'	3686'	-	-	NONE	N/A
11	** POLE	39'	3699'	-	NONE	NONE	N/A
12	** POLE	41'	3699'	-	NONE	NONE	N/A
13	*** TREE	45'	3702'	-	NONE	NONE	N/A
14	* BUILDING	25'	3682'	NONE	NONE	NONE	N/A
15	* ROAD	16'	3674'	NONE	NONE	NONE	N/A
16	* FENCE	8'	3667'	NONE	NONE	NONE	N/A
17	*** TREE	30'	3687'	NONE	NONE	NONE	N/A
18	** TREE	33'	3690'	NONE	NONE	NONE	N/A
19	* BUILDING	25'	3682'	NONE	NONE	NONE	N/A
20	* FENCE	4'	3697'	NONE	NONE	NONE	N/A
21	* ROAD	16'	3673'	NONE	NONE	NONE	N/A
22	* FENCE	8'	3665'	NONE	NONE	NONE	N/A
23	* FENCE	8'	3664'	NONE	NONE	NONE	N/A
24	* ROAD	16'	3673'	NONE	NONE	NONE	N/A
25	* FENCE	4'	3661'	NONE	NONE	NONE	N/A
26	* BUILDING	25'	3679'	NONE	NONE	NONE	N/A
27	*** TREE	30'	3684'	-	NONE	NONE	N/A
28	* BUILDING	25'	3680'	-	NONE	NONE	N/A
29	*** TREE	30'	3683'	-	NONE	NONE	N/A
30	* BUILDING	25'	3678'	-	NONE	NONE	N/A
31	* FENCE	4'	3658'	-	NONE	NONE	N/A
32	* ROAD	16'	3670'	-	NONE	NONE	N/A
33	* FENCE	8'	3661'	-	NONE	NONE	N/A
34	* FENCE	8'	3661'	-	-	NONE	N/A
35	* ROAD	16'	3659'	-	-	NONE	N/A
36	* FENCE	4'	3657'	-	-	NONE	N/A
37	* BUILDING	25'	3678'	-	-	NONE	N/A
38	* BULDING	25'	3677'	-	-	NONE	N/A
39	* BUILDING	25'	3684'	-	NONE	NONE	N/A
40	*** TREE	30'	3688'	-	NONE	NONE	N/A
41	* BUILDING	25'	3682'	-	NONE	NONE	N/A
42	* BUILDING	25'	3681'	-	NONE	NONE	N/A
43	*** TREE	30'	3686'	-	NONE	NONE	N/A
44	* TREE	35'	3695'	-	-	NONE	N/A
45	* SERVICE ROAD	10'	3671'	-	-	NONE	N/A
46	* SERVICE ROAD	10'	3671'	-	NONE	NONE	N/A
47	* SERVICE ROAD	10'	3668'	NONE	NONE	NONE	N/A
48	* SERVICE ROAD	10'	3668'	NONE	NONE	NONE	N/A
49	* SERVICE ROAD	10'	3667'	NONE	NONE	NONE	N/A
50	* SERVICE ROAD	10'	3666'	-	NONE	NONE	N/A
51	* SERVICE ROAD	10'	3666'	-	-	NONE	N/A
52	* TREE	30'	3689'	NONE	NONE	NONE	N/A
53	* TREE	10'	3669'	NONE	NONE	NONE	N/A
54	* TREE	30'	3690'	NONE	NONE	NONE	N/A
55	* POLE	40'	3698'	-	NONE	NONE	N/A
56	* POLE	40'	3699'	-	NONE	NONE	N/A
57	* POLE	40'	3699'	-	NONE	NONE	N/A
58	* POLE	40'	3698'	-	NONE	NONE	N/A

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
** = OBJECT ELEVATIONS ARE FROM OBSTRUCTION SURVEY (UDDF 2-10-98).
*** = TALLEST TREE IN GROUP OF TREES (ESTIMATED).
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
= OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE



PROFILE RUNWAY 17 END (E)(F)

SCALE: PER GRID

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT / CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)	1 2 12 11	N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT			FENCING
	N/A	PRECISION OBSTACLE FREE ZONE (POFZ)		N/A	MALSR
	N/A	GLIDE SLOPE CRITICAL AREA		N/A	HELICOPTER PARKING
	N/A	LOCALIZER CRITICAL AREA			TO BE REMOVED

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

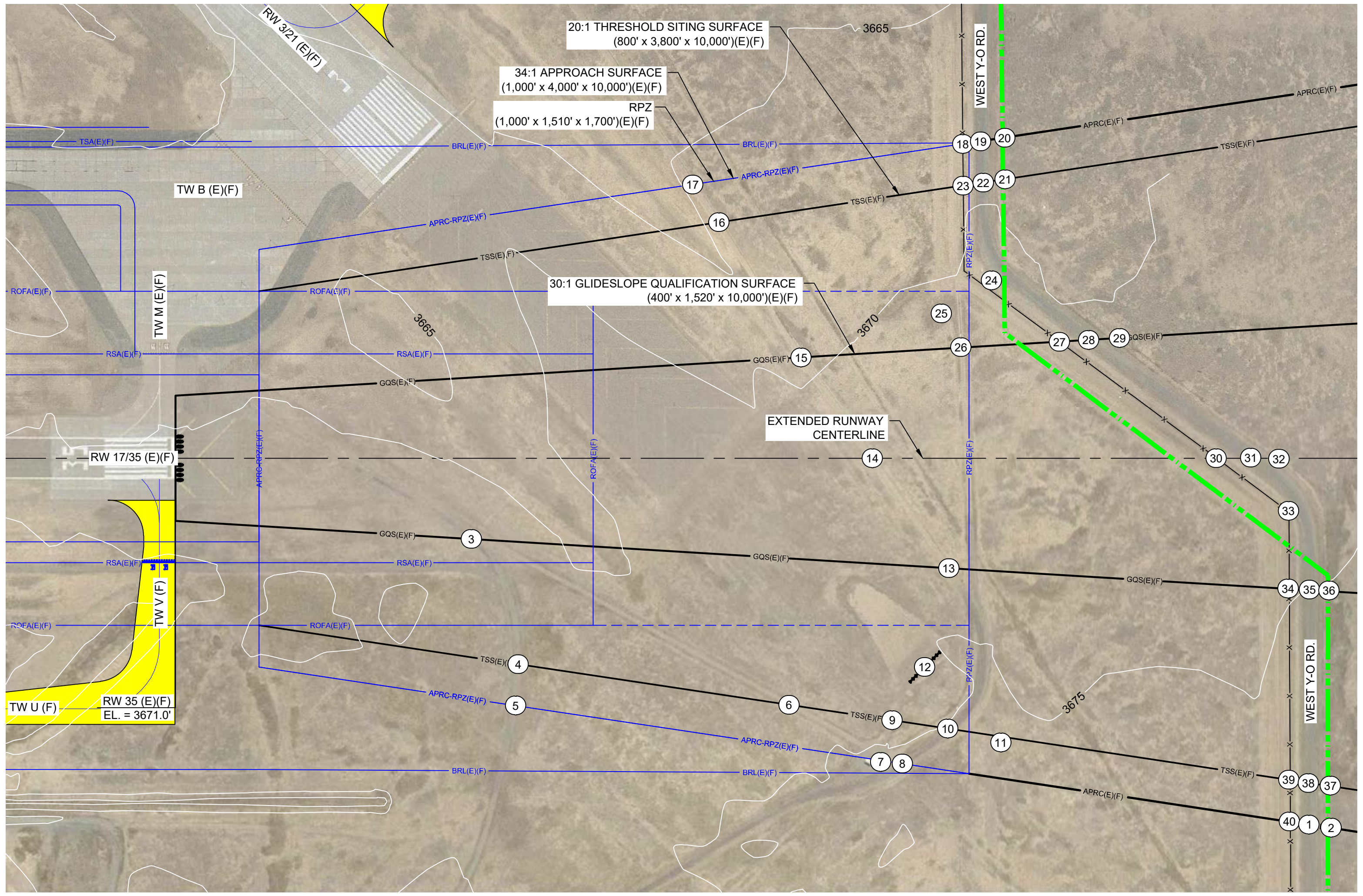
AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015505	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

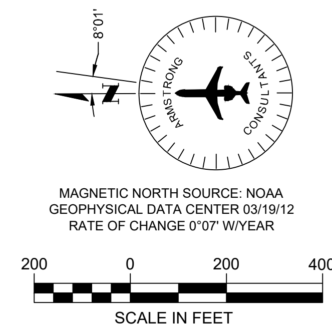
RUNWAY 17 (E)(F) INNER APPROACH

Sheet: 14 of: 24



PLAN RUNWAY 35 END (E)(F)

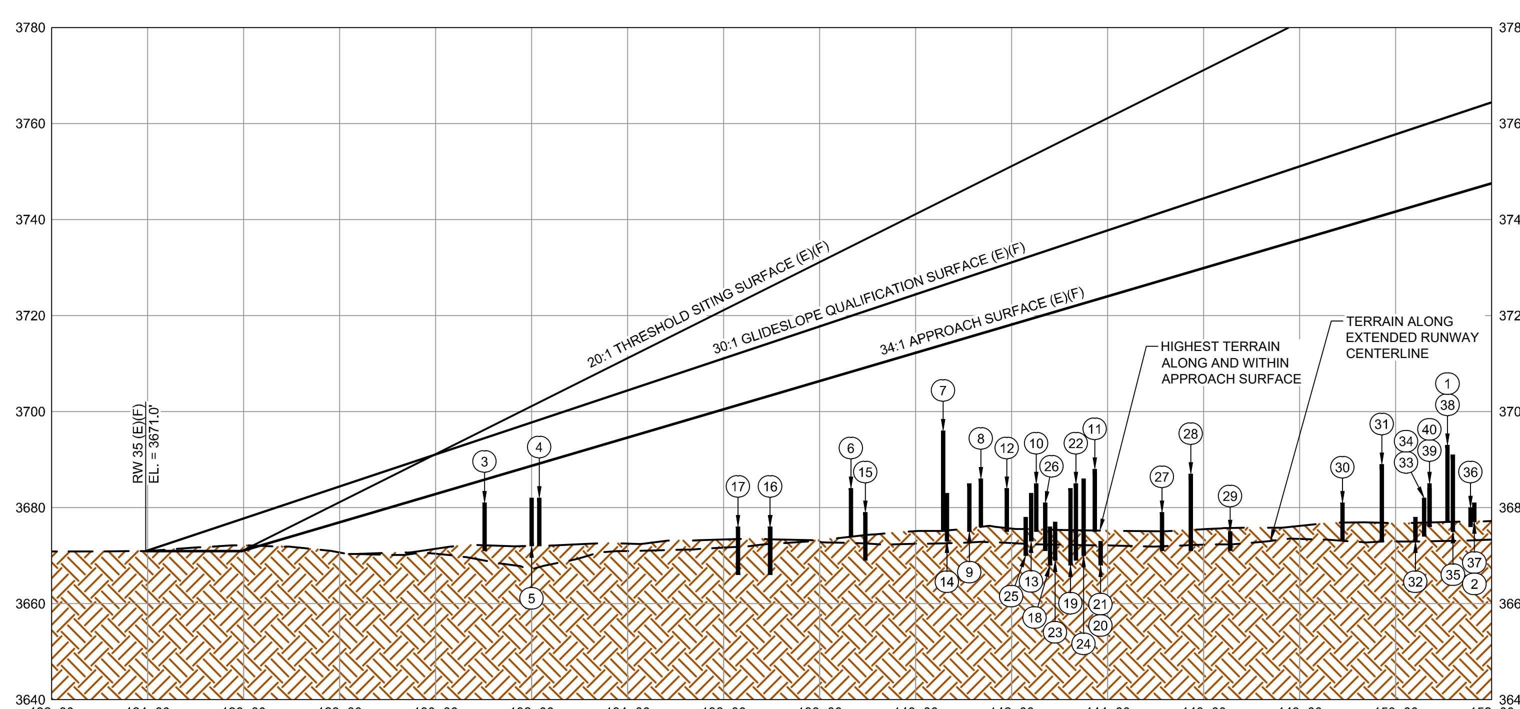
SCALE: PER BAR SCALE



OBJECTS WITHIN RUNWAY 35 GQS, APRC, AND TSS SURFACES (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	30:1 GQS PEN.	20:1 TSS PEN.	34:1 APRC SURFACE PEN.	REMARKS
1	* ROAD	16'	3693'	-	-	NONE	N/A
2	* FENCE	4'	3681'	-	-	NONE	N/A
3	* SERVICE ROAD	10'	3681'	NONE	NONE	NONE	N/A
4	* SERVICE ROAD	10'	3682'	-	NONE	NONE	N/A
5	* SERVICE ROAD	10'	3682'	-	-	NONE	N/A
6	* SERVICE ROAD	10'	3684'	-	NONE	NONE	N/A
7	** BUILDING/ANTENNA	21'	3696'	-	-	NONE	N/A
8	* SERVICE ROAD	10'	3686'	-	-	NONE	N/A
9	* SERVICE ROAD	10'	3685'	-	NONE	NONE	N/A
10	* SERVICE ROAD	10'	3685'	-	NONE	NONE	N/A
11	** RADAR REFLECTOR	13'	3688'	-	-	NONE	N/A
12	** LOCALIZER	9'	3683'	-	NONE	NONE	N/A
13	* SERVICE ROAD	10'	3683'	NONE	NONE	NONE	N/A
14	* SERVICE ROAD	10'	3683'	NONE	NONE	NONE	N/A
15	* SERVICE ROAD	10'	3679'	NONE	NONE	NONE	N/A
16	* SERVICE ROAD	10'	3676'	-	NONE	NONE	N/A
17	* SERVICE ROAD	10'	3676'	-	-	NONE	N/A
18	* FENCE	8'	3676'	-	-	NONE	N/A
19	* ROAD	16'	3684'	-	-	NONE	N/A
20	* FENCE	4'	3672'	-	-	NONE	N/A
21	* FENCE	4'	3673'	-	NONE	NONE	N/A
22	* ROAD	16'	3685'	-	NONE	NONE	N/A
23	* FENCE	8'	3677'	-	NONE	NONE	N/A
24	** ROAD	16'	3686'	-	NONE	NONE	N/A
25	** SIGN	8'	3678'	-	NONE	NONE	N/A
26	* SERVICE ROAD	10'	3681'	NONE	NONE	NONE	N/A
27	* FENCE	8'	3679'	NONE	NONE	NONE	N/A
28	* ROAD	16'	3687'	NONE	NONE	NONE	N/A
29	* FENCE	4'	3675'	NONE	NONE	NONE	N/A
30	* FENCE	8'	3681'	NONE	NONE	NONE	N/A
31	* ROAD	16'	3689'	NONE	NONE	NONE	N/A
32	* FENCE	4'	3677'	NONE	NONE	NONE	N/A
33	** FENCE	8'	3682'	NONE	NONE	NONE	N/A
34	* FENCE	8'	3682'	NONE	NONE	NONE	N/A
35	* ROAD	16'	3691'	NONE	NONE	NONE	N/A
36	* FENCE	4'	3680'	NONE	NONE	NONE	N/A
37	* FENCE	4'	3681'	-	NONE	NONE	N/A
38	* ROAD	16'	3693'	-	NONE	NONE	N/A
39	* FENCE	8'	3684'	-	NONE	NONE	N/A
40	* FENCE	8'	3685'	-	-	NONE	N/A

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
** = OBJECT ELEVATIONS ARE FROM OBSTRUCTION SURVEY (UDDF 2-10-98).
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
= OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE



PROFILE RUNWAY 35 END (E)(F)

SCALE: PER GRID

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT			FENCING
	N/A	PRECISION OBSTACLE FREE ZONE (POFZ)		N/A	MALSR
	N/A	GLIDE SLOPE CRITICAL AREA		N/A	HELICOPTER PARKING
	N/A	LOCALIZER CRITICAL AREA			TO BE REMOVED

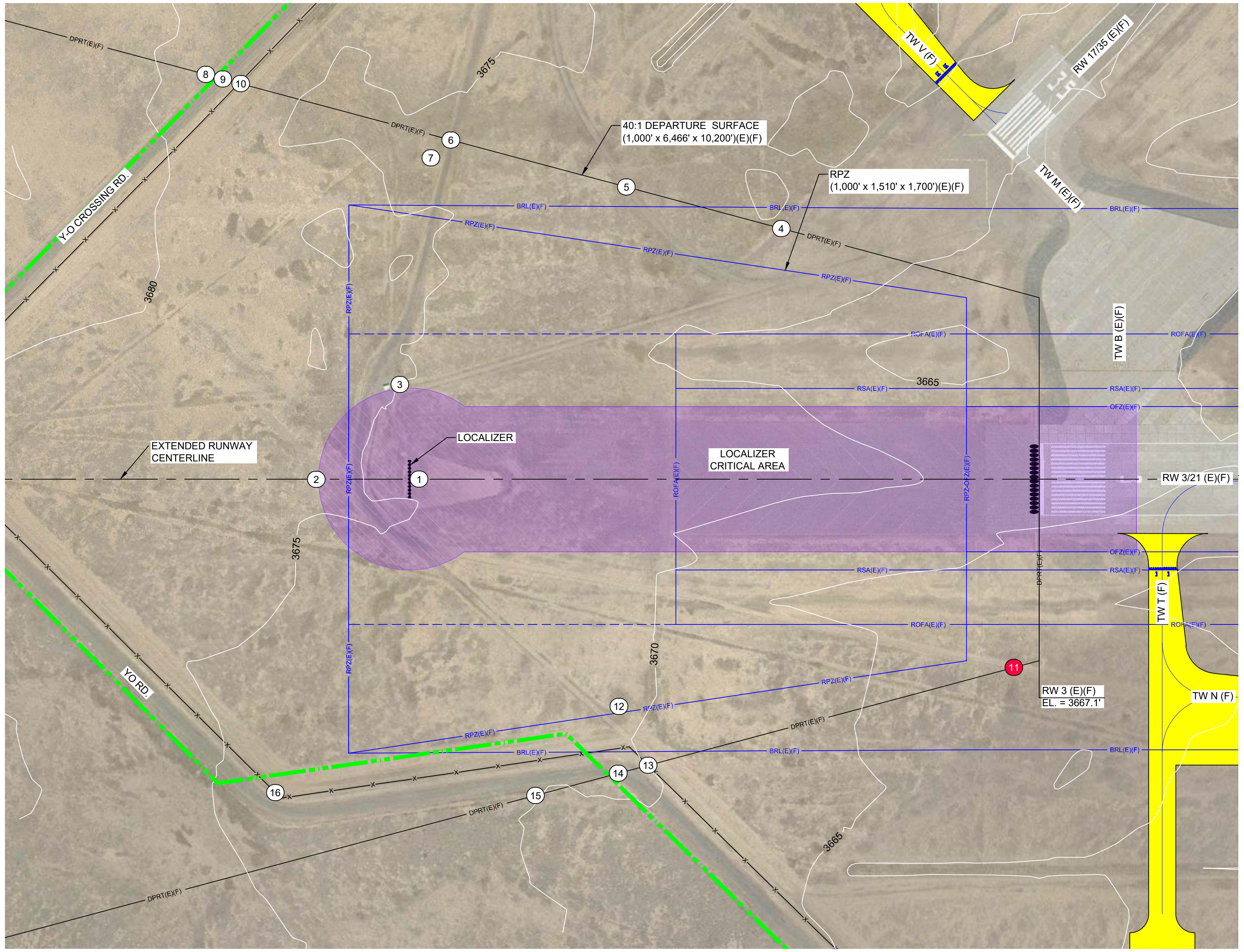
ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

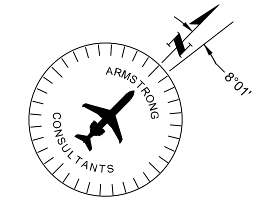
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015505	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

RUNWAY 35 (E)(F) INNER APPROACH



PLAN RUNWAY 3 END (E)(F)

SCALE: PER BAR SCALE



MAGNETIC NORTH SOURCE: NOAA
GEOPHYSICAL DATA CENTER 03/19/12
RATE OF CHANGE 0°07' W/YEAR

200 0 200 400

SCALE IN FEET

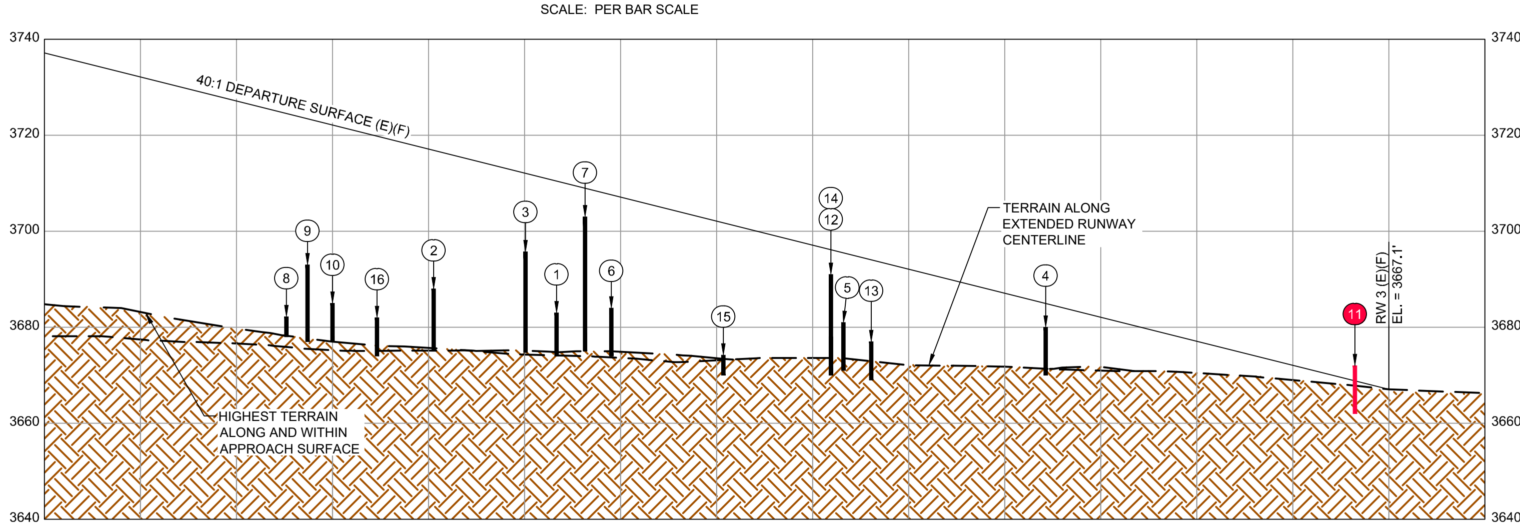
OBJECTS WITHIN RUNWAY 3 DEPARTURE SURFACE (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	40:1 DPTR. PEN.	REMARKS
1	** LOCALIZER	9'	3683'	NONE	N/A
2	** RADAR REFLECTOR	13'	3688'	NONE	N/A
3	** BUILDING/ANTENNA	21'	3696'	NONE	N/A
4	* SERVICE ROAD	10'	3680'	NONE	N/A
5	* SERVICE ROAD	10'	3682'	NONE	N/A
6	* SERVICE ROAD	10'	3684'	NONE	N/A
7	** POLE	28'	3703'	NONE	N/A
8	* FENCE	4'	3682'	NONE	N/A
9	* ROAD	16'	3693'	NONE	N/A
10	* FENCE	8'	3685'	NONE	N/A
11	* SERVICE ROAD	10'	3672'	+3'	N/A
12	** SIGN	8'	3678'	NONE	N/A
13	* FENCE	8'	3677'	NONE	N/A
14	** ROAD	16'	3686'	NONE	N/A
15	* FENCE	4'	3674'	NONE	N/A
16	** FENCE	8'	3682'	NONE	N/A

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
** = OBJECT ELEVATIONS ARE FROM OBSTRUCTION SURVEY (UDDF 2-10-98).
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
= OBJECT PENETRATION LOCATION

EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; DPRT = DEPARTURE SURFACE; OIS = OBSTACLE IDENTIFICATION SURFACE

PER FAA 150/5300-13 CHANGE 18, A NATIONAL ONE ENGINE INOPERATIVE (OEI) POLICY IS UNDER DEVELOPMENT BASED ON THE RECOMMENDATIONS FROM THE NATIONAL OEI PILOT PROJECT. IMPLEMENTATION IS ANTICIPATED FOR FALL 2012.



PROFILE RUNWAY 3 END (E)(F)

SCALE: PER GRID

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT	X	X X	FENCING
	N/A	PRECISION OBSTACLE FREE ZONE (POFZ)		N/A	MALSR
	N/A	GLIDE SLOPE CRITICAL AREA		N/A	HELICOPTER PARKING
	N/A	LOCALIZER CRITICAL AREA			TO BE REMOVED

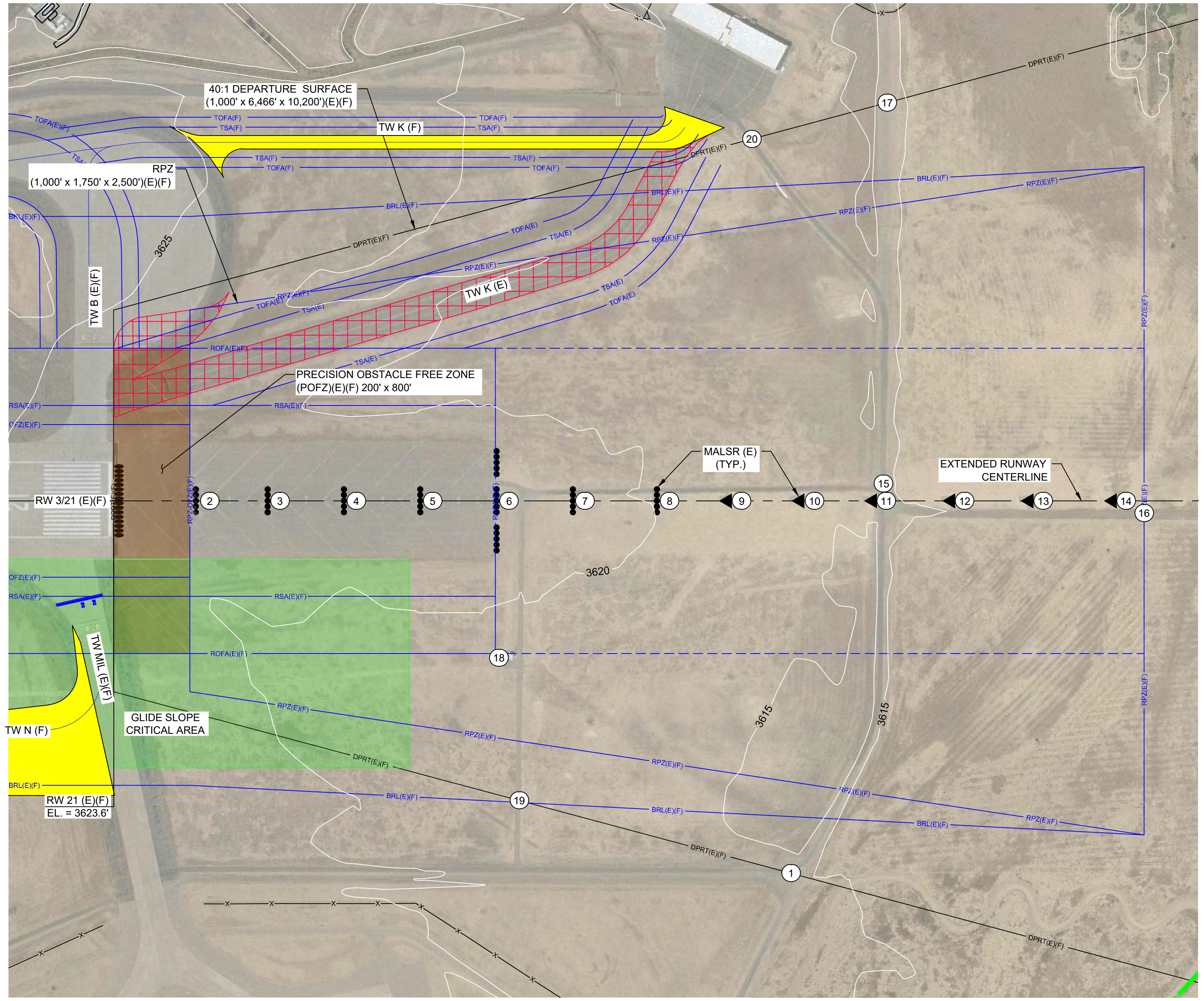
ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

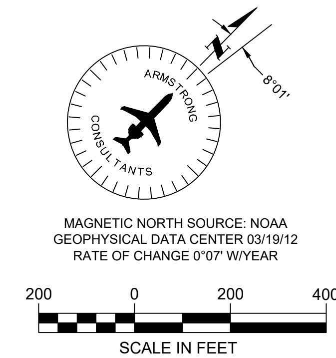
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015505	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

RUNWAY 3 (E)(F) DEPARTURE SURFACE



PLAN RUNWAY 21 END (E)(F)

SCALE: PER BAR SCALE

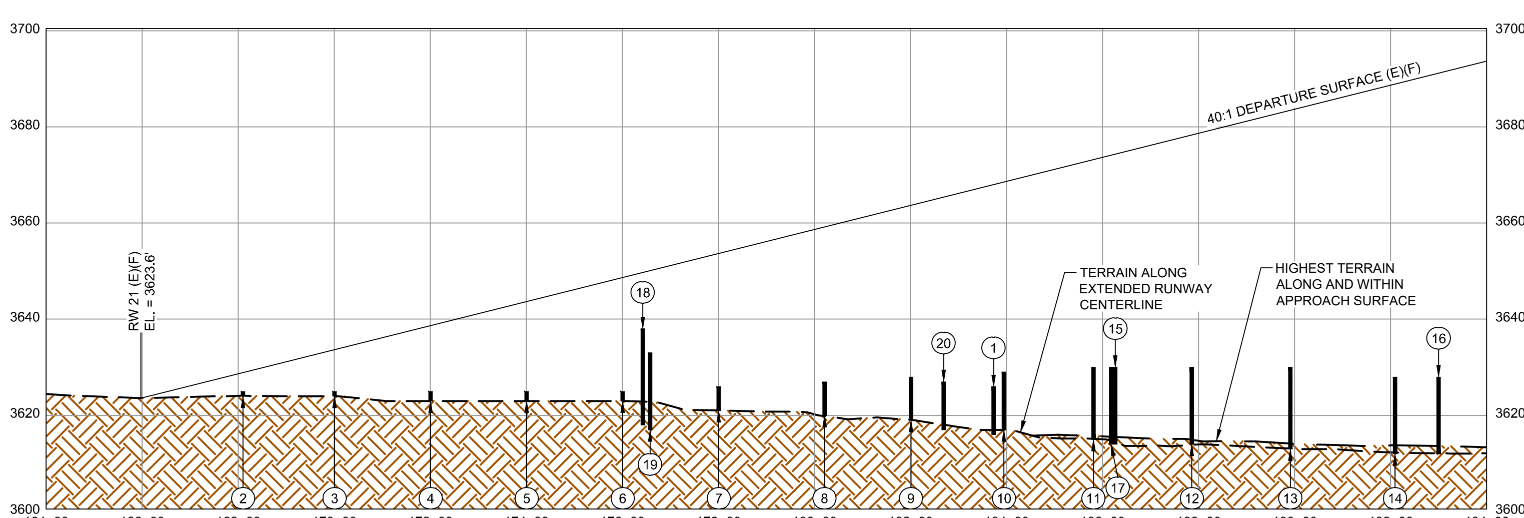


OBJECTS WITHIN RUNWAY 21 DEPARTURE SURFACE (E)(F)					
No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	40:1 DPTR. PEN.	REMARKS
1	* SERVICE ROAD	10'	3626'	NONE	N/A
2	* MALSR	1'	3625'	NONE	N/A
3	* MALSR	1'	3625'	NONE	N/A
4	* MALSR	2'	3625'	NONE	N/A
5	* MALSR	2'	3625'	NONE	N/A
6	* MALSR	2'	3625'	NONE	N/A
7	* MALSR	5'	3626'	NONE	N/A
8	* MALSR	7'	3627'	NONE	N/A
9	* MALSR	9'	3628'	NONE	N/A
10	* MALSR	12'	3629'	NONE	N/A
11	* MALSR	15'	3630'	NONE	N/A
12	* MALSR	16'	3630'	NONE	N/A
13	* MALSR	17'	3630'	NONE	N/A
14	* MALSR	5'	3617'	NONE	N/A
15	* SERVICE ROAD	10'	3624'	NONE	N/A
16	* SERVICE ROAD	10'	3622'	NONE	N/A
17	* SERVICE ROAD	10'	3624'	NONE	N/A
18	* BUILDING	10'	3628'	NONE	N/A
19	* SERVICE ROAD	10'	3627'	NONE	N/A
20	* SERVICE ROAD	10'	3627'	NONE	N/A

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
** = OBJECT ELEVATIONS ARE FROM OBSTRUCTION SURVEY (UDDF 2-10-98).
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
= OBJECT PENETRATION LOCATION

EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION;
N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; DPRT = DEPARTURE SURFACE;
OIS = OBSTACLE IDENTIFICATION SURFACE

PER FAA 150/5300-13 CHANGE 18, A NATIONAL ONE ENGINE INOPERATIVE (OEI) POLICY IS UNDER DEVELOPMENT BASED ON THE RECOMMENDATIONS FROM THE NATIONAL OEI PILOT PROJECT. IMPLEMENTATION IS ANTICIPATED FOR FALL 2012.



PROFILE RUNWAY 21 END (E)(F)

SCALE: PER GRID

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT			FENCING
	N/A	PRECISION OBSTACLE FREE ZONE (POFZ)		N/A	MALSR
	N/A	GLIDE SLOPE CRITICAL AREA		N/A	HELICOPTER PARKING
	N/A	LOCALIZER CRITICAL AREA			TO BE REMOVED

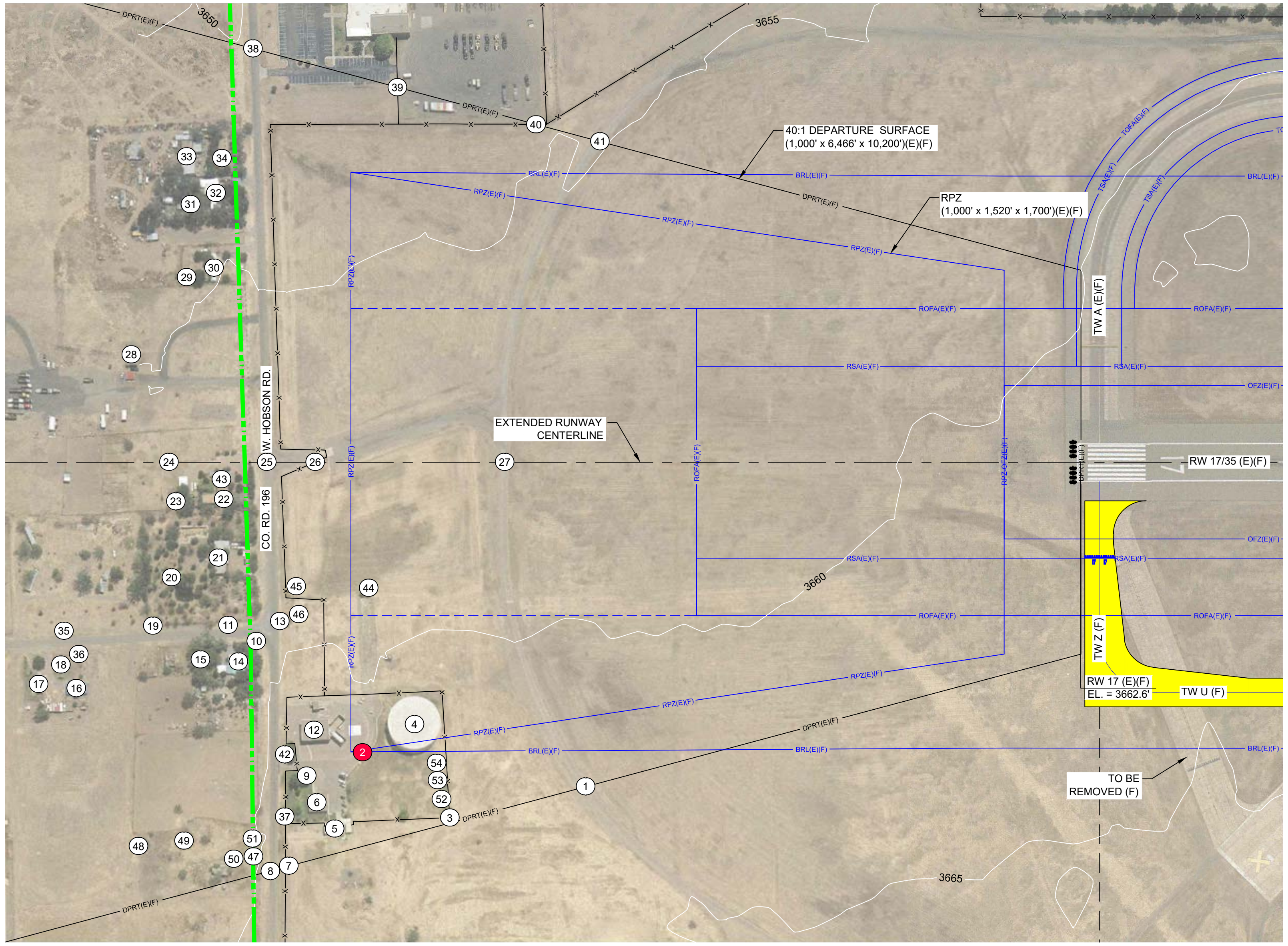
ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

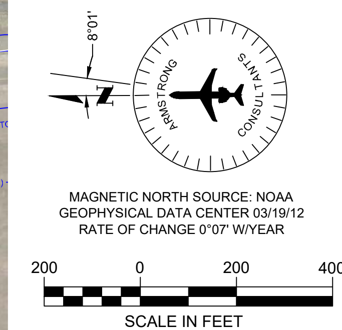
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015505	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

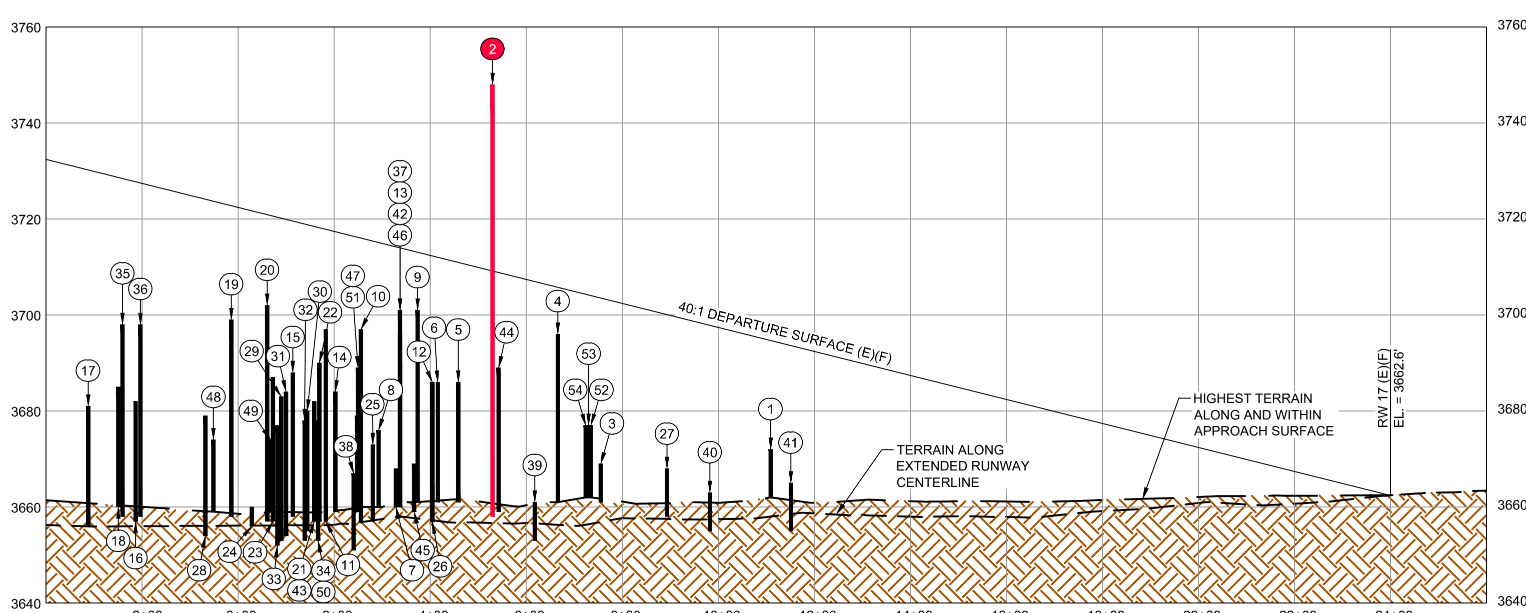
RUNWAY 21 (E)(F) DEPARTURE SURFACE



PLAN RUNWAY 17 END (E)(F)

SCALE: PER BAR SCALE





PROFILE RUNWAY 17 END (E)(F)

SCALE: PER GRID

OBJECTS WITHIN RUNWAY 17 DEPARTURE SURFACES (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	40:1 DPTR. PEN.	REMARKS
1	* SERVICE ROAD	10'	3672'	NONE	N/A
2	** ANTENNA	90'	3748'	+39'	RED LIGHTS AND PAINTED (E)
3	* FENCE	8'	3669'	NONE	N/A
4	* WATER TANK	35'	3696'	NONE	N/A
5	* BUILDING	25'	3686'	NONE	N/A
6	* BUILDING	25'	3686'	NONE	N/A
7	* FENCE	8'	3668'	NONE	N/A
8	* ROAD	16'	3676'	NONE	N/A
9	*** TREE	40'	3701'	NONE	N/A
10	* POLE	40'	3699'	NONE	N/A
11	* POLE	40'	3699'	NONE	N/A
12	* BUILDING	25'	3686'	NONE	N/A
13	** POLE	39'	3699'	NONE	N/A
14	* BUILDING	25'	3684'	NONE	N/A
15	* TREE	30'	3688'	NONE	N/A
16	* BUILDING	25'	3682'	NONE	N/A
17	* BUILDING	25'	3681'	NONE	N/A
18	* TREE	30'	3686'	NONE	N/A
19	** POLE	41'	3699'	NONE	N/A
20	* TREE	45'	3702'	NONE	N/A
21	* BUILDING	25'	3682'	NONE	N/A
22	** TREE	33'	3690'	NONE	N/A
23	* TREE	30'	3687'	NONE	N/A
24	* FENCE	4'	3697'	NONE	N/A
25	* ROAD	16'	3673'	NONE	N/A
26	* FENCE	8'	3665'	NONE	N/A
27	* SERVICE ROAD	10'	3668'	NONE	N/A
28	* BUILDING	25'	3679'	NONE	N/A
29	* TREE	30'	3684'	NONE	N/A
30	* BUILDING	25'	3680'	NONE	N/A
31	* TREE	30'	3683'	NONE	N/A
32	* BUILDING	25'	3678'	NONE	N/A
33	* BUILDING	25'	3677'	NONE	N/A
34	* BUILDING	25'	3677'	NONE	N/A
35	* POLE	40'	3698'	NONE	N/A
36	* POLE	40'	3698'	NONE	N/A
37	* POLE	40'	3701'	NONE	N/A
38	* ROAD	16'	3661'	NONE	N/A
39	* FENCE	8'	3661'	NONE	N/A
40	* FENCE	'8	3663'	NONE	N/A
41	* SERVICE ROAD	10'	3665'	NONE	N/A
42	* TREE	35'	3696'	NONE	N/A
43	* BUILDING	25'	3682'	NONE	N/A
44	* TREE	30'	3689'	NONE	N/A
45	* TREE	10'	3669'	NONE	N/A
46	* TREE	30'	3690'	NONE	N/A
47	* POLE	39'	3698'	NONE	N/A
48	* TREE	15'	3674'	NONE	N/A
49	*** TREE	15'	3674'	NONE	N/A
50	* BUILDING	12'	3671'	NONE	N/A
51	* TREE	20'	3680'	NONE	N/A
53	* TREE	15'	3677'	NONE	N/A
54	* TREE	15'	3677'	NONE	N/A
55	* TREE	15'	3677'	NONE	N/A

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
** = OBJECT ELEVATIONS ARE FROM OBSTRUCTION SURVEY (UDDF 2-10-98).
*** = TALLEST TREE IN GROUP OF TREES (ESTIMATED)
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
= OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; DPRT = DEPARTURE SURFACE; OIS = OBSTACLE IDENTIFICATION SURFACE

PER FAA 150/5300-13 CHANGE 18, A NATIONAL ONE ENGINE INOPERATIVE (OEI) POLICY IS UNDER DEVELOPMENT BASED ON THE RECOMMENDATIONS FROM THE NATIONAL OEI PILOT PROJECT. IMPLEMENTATION IS ANTICIPATED FOR FALL 2012.

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT	X	X X	FENCING
	N/A	PRECISION OBSTACLE FREE ZONE (POFZ)		N/A	MALSR
	N/A	GLIDE SLOPE CRITICAL AREA		N/A	HELICOPTER PARKING
	N/A	LOCALIZER CRITICAL AREA			TO BE REMOVED

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

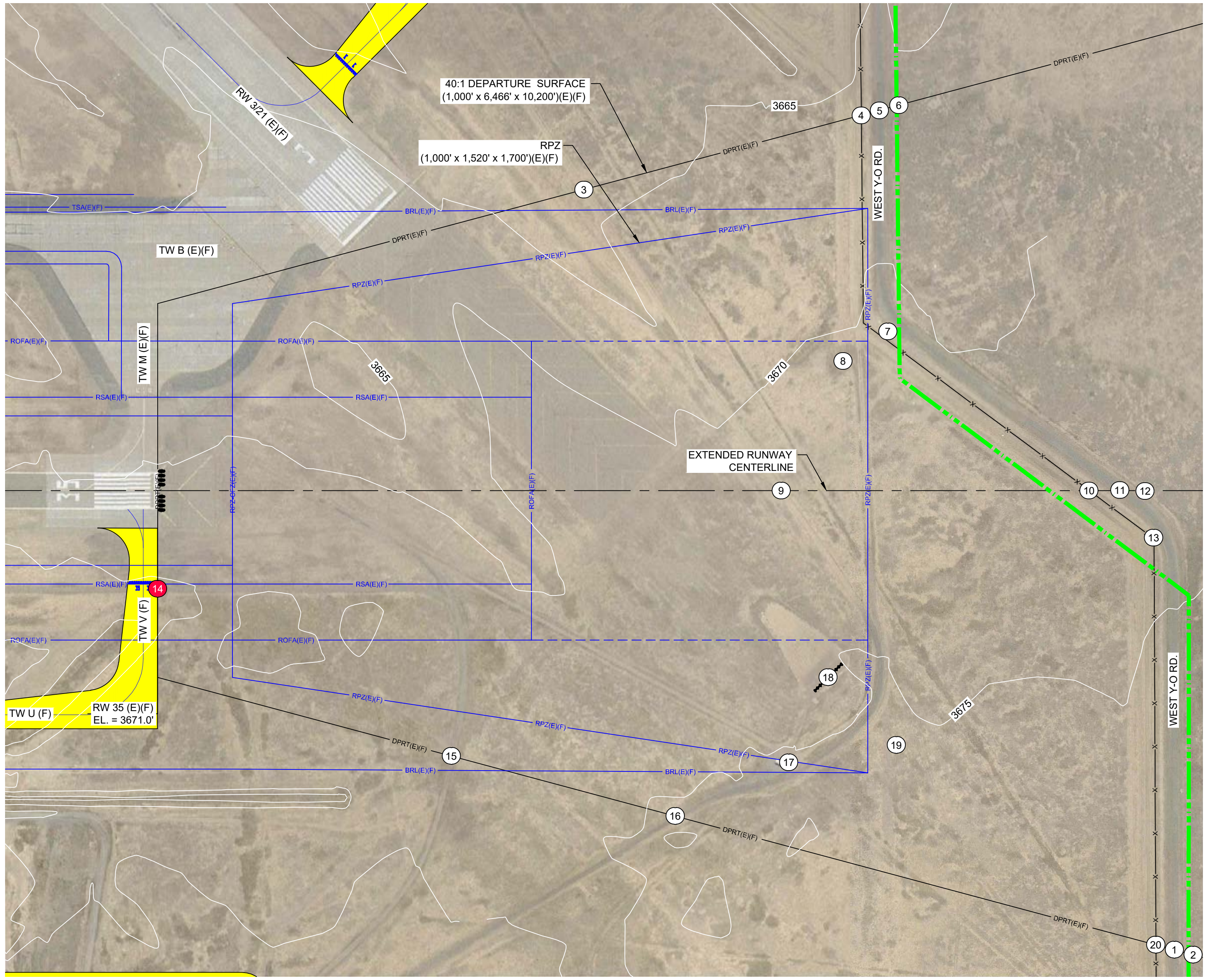
ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015505	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

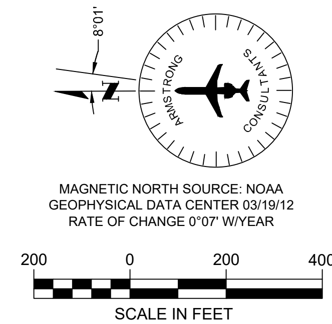
THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

RUNWAY 17 (E)(F) DEPARTURE SURFACE



PLAN RUNWAY 35 END (E)(F)

SCALE: PER BAR SCALE

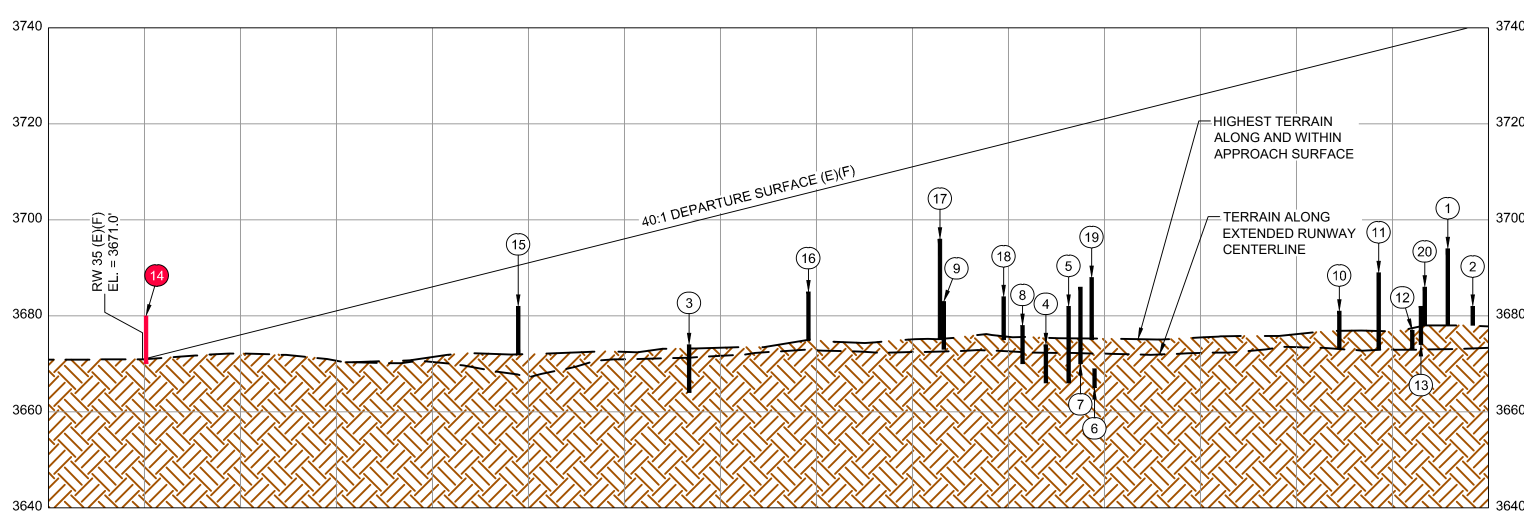


OBJECTS WITHIN RUNWAY 35 DEPARTURE SURFACES (E)(F)

No.	OBJECT	EST. OBJECT HT.	TOP ELEV. (MSL)	40:1 DPTR. PEN.	REMARKS
1	* ROAD	16'	3694'	NONE	N/A
2	* FENCE	4'	3682'	NONE	N/A
3	* SERVICE ROAD	10'	3674'	NONE	N/A
4	* FENCE	8'	3674'	NONE	N/A
5	* ROAD	16'	3682'	NONE	N/A
6	* FENCE	4'	3669'	NONE	N/A
7	** ROAD	16'	3686'	NONE	N/A
8	** SIGN	8'	3678'	NONE	N/A
9	* SERVICE ROAD	10'	3683'	NONE	N/A
10	* FENCE	8'	3681'	NONE	N/A
11	* ROAD	16'	3689'	NONE	N/A
12	* FENCE	4'	3677'	NONE	N/A
13	* FENCE	8'	3682'	NONE	N/A
14	* SERVICE ROAD	10'	3680'	+9'	N/A
15	* SERVICE ROAD	10'	3682'	NONE	N/A
16	* SERVICE ROAD	10'	3685'	NONE	N/A
17	** BUILDING/ANTENNA	21'	3696'	NONE	N/A
18	** LOCALIZER	9'	3683'	NONE	N/A
19	** RADAR REFLECTOR	13'	3688'	NONE	N/A
20	* FENCE	8'	3686'	NONE	N/A

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
* = OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY.
** = OBJECT ELEVATIONS ARE FROM OBSTRUCTION SURVEY (UDDF 2-10-98).
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
= OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; DPRT = DEPARTURE SURFACE; OIS = OBSTACLE IDENTIFICATION SURFACE

PER FAA 150/5300-13 CHANGE 18, A NATIONAL ONE ENGINE INOPERATIVE (OEI) POLICY IS UNDER DEVELOPMENT BASED ON THE RECOMMENDATIONS FROM THE NATIONAL OEI PILOT PROJECT. IMPLEMENTATION IS ANTICIPATED FOR FALL 2012.



PROFILE RUNWAY 35 END (E)(F)

SCALE: PER GRID

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)		0000 0000	THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT	X	XX	FENCING
	N/A	PRECISION OBSTACLE FREE ZONE (POFZ)		N/A	MALSR
	N/A	GLIDE SLOPE CRITICAL AREA		N/A	HELICOPTER PARKING
	N/A	LOCALIZER CRITICAL AREA			TO BE REMOVED

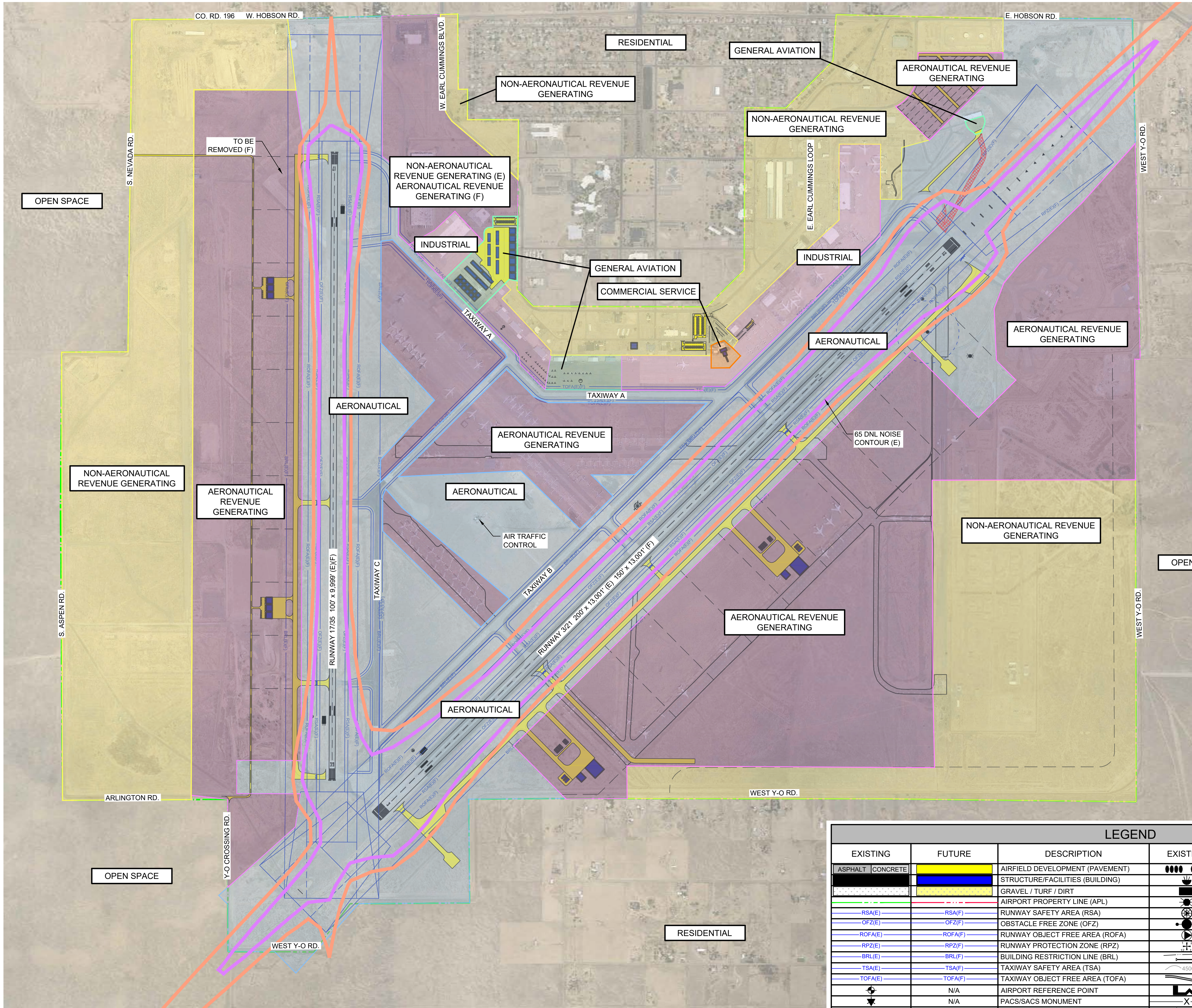
ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015505	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

RUNWAY 35 (E)(F) DEPARTURE SURFACE



8°01'

ARMSTRONG CONSULTANTS

MAGNETIC NORTH SOURCE: NOAA GEOPHYSICAL DATA CENTER 03/19/12
RATE OF CHANGE 0°07' W/YEAR

800 0 800 1600

SCALE IN FEET

NOTE:

AIRPORT TOPOGRAPHIC AERIAL MAPPING PROVIDED BY OLYMPUS AERIAL SURVEYS, INC. ON 5/18/2011.

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

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT / CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)		N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT	X	XX	FENCING
		65 DNL NOISE CONTOUR		N/A	MALSR

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

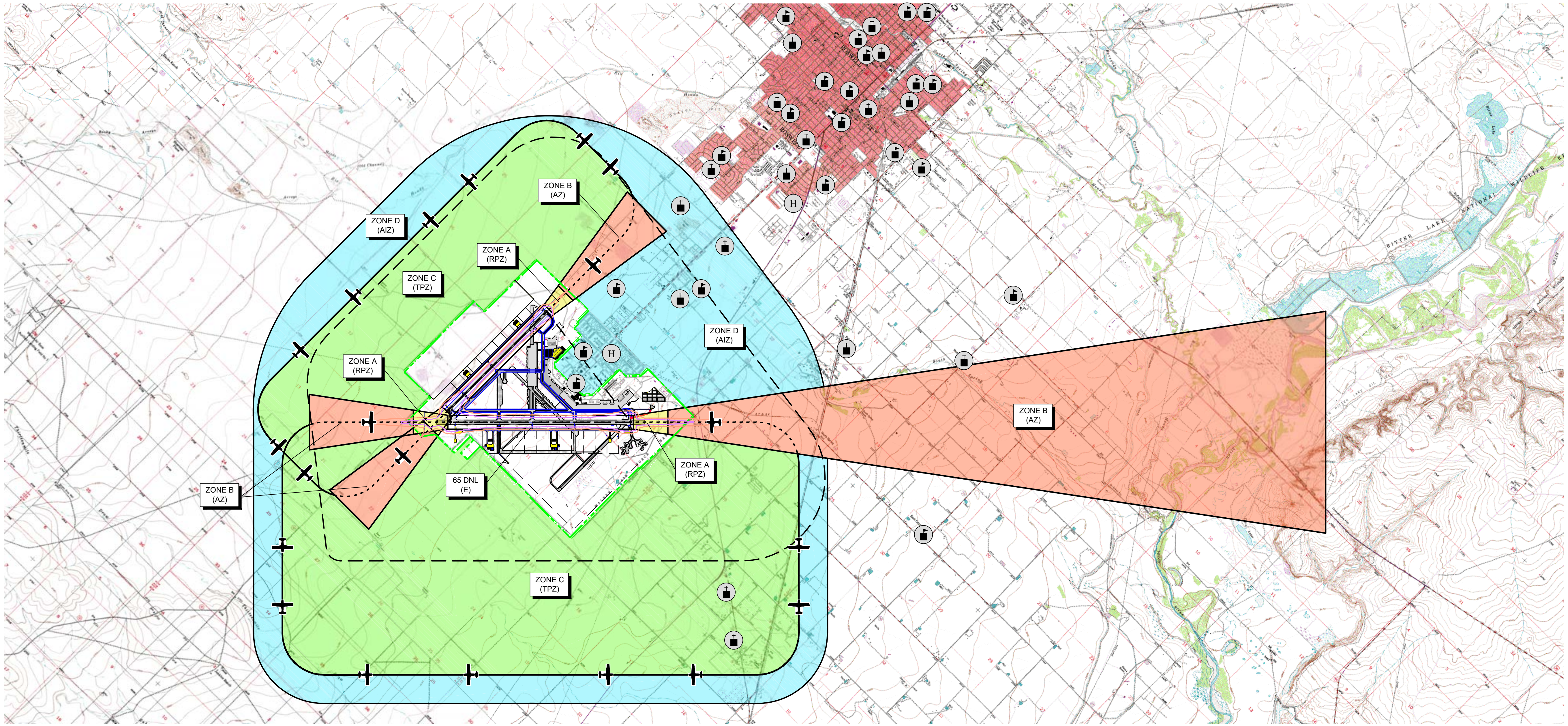
ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015506	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

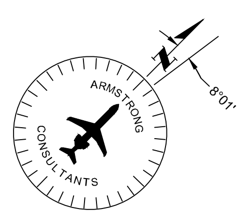
THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

ON AIRPORT LAND USE MAP



PLAN

SCALE: PER BARSCALE



MAGNETIC NORTH SOURCE: NOAA
GEOPHYSICAL DATA CENTER 03/19/12
RATE OF CHANGE 0°07' W/YEAR

4000 0 4000 8000

SCALE IN FEET

NOTICE OF PROPOSED CONSTRUCTION

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

LEGEND

CHURCH

SCHOOL

HOSPITAL

TYPICAL TRAFFIC PATTERN DIRECTION AND FLIGHT TRACK AREA.

RUNWAY PROTECTION ZONE (RPZ) AS DIMENSIONED ON SHEET 2 OF AIRPORT LAYOUT PLAN.

APPROACH SURFACE AS DESCRIBED ON THE FAR PART 77 DRAWING OF THE AIRPORT LAYOUT PLAN.

EXISTING AIRPORT PROPERTY LINE

FUTURE AIRPORT PROPERTY LINE

NO HAZARDOUS WILDLIFE ATTRACTANT RING

CRITERIA

Land Use Availability	Interpretation/Comments
++ Clearly Acceptable	The activities associated with the specified land use will experience little or no impact due to airport operations. Disclosure of airport proximity should be required as a condition of development.
+ Normally Acceptable	The specified land use is acceptable in this zone or area. Impact may be perceived by some residents. Disclosure of airport proximity should be required as a condition of development. Dedication of avigation easements may also be advisable.
o Conditionally Acceptable	If appropriate disclosure avigation easements and density limitations are put in place, residential uses and uses involving indoor public assemblies are acceptable.
- Normally Unacceptable	Specified use should be allowed only if no reasonable alternative exists. Disclosure of airport proximity and avigation easements must be required as a condition of development.
- - Clearly Unacceptable	Specified use must not be allowed. Potential safety or overflight nuisance impacts are likely in this area.

LAND USE COMPATIBILITY GUIDELINES

Land Use Category	ZONE D Airport Influence (AIZ)	ZONE C Traffic Pattern (TPZ)	ZONE B Approach (AZ)	ZONE A Runway Protection (RPZ)
Residential				
single-family, nursing homes, mobile homes, multi-family, apartments, condominiums	+	o (3)	- (1,3)	- -
transient lodging, hotel, motel	+	o (3)	- (1,3)	- -
Public				
schools, libraries, hospitals	+	o (3)	- (3)	- -
churches, auditoriums, concert halls	+	o (3)	- (3)	- -
transportation, parking, cemeteries	++	++	++	- (2,5)
Commercial and Industrial				
offices, retail trade, service commercial, wholesale trade, warehousing, light industrial, general manufacturing, utilities, extractive industry	++	+	o (3)	- -
Agricultural and Recreational				
cropland	++	++	++	++
livestock breeding	++	++	++	- (2)
parks, playgrounds, zoos, golf courses, riding stables, water recreation	++	++	++	- (2)
outdoor spectator sports	++	+	- (3)	- -
amphitheaters	o	- (4)	- -	- -
open space	++	++	++	++

NOTE: DEVELOPMENT PROJECTS WHICH ARE WILDLIFE ATTRACTANT, INCLUDING SEWERAGE PONDS AND LANDFILLS, WITHIN 10,000 FEET OF THE AIRPORT ARE UNACCEPTABLE. (REF.: FAA AC 150/5200-33)

(1) If allowed, avigation easements and disclosure must be required as a condition of development.
(2) Any structures associated with uses allowed in the RPZ must be located outside the RPZ.
(3) If no reasonable alternative exists, use should be located as far from extended centerline as possible.
(4) If no reasonable alternative exists, use should be located as far from extended runway centerline and traffic patterns as possible.
(5) Transportation facilities in the RPZ (i.e. roads, railroads, waterways) must be configured to comply with Part 77 requirements.

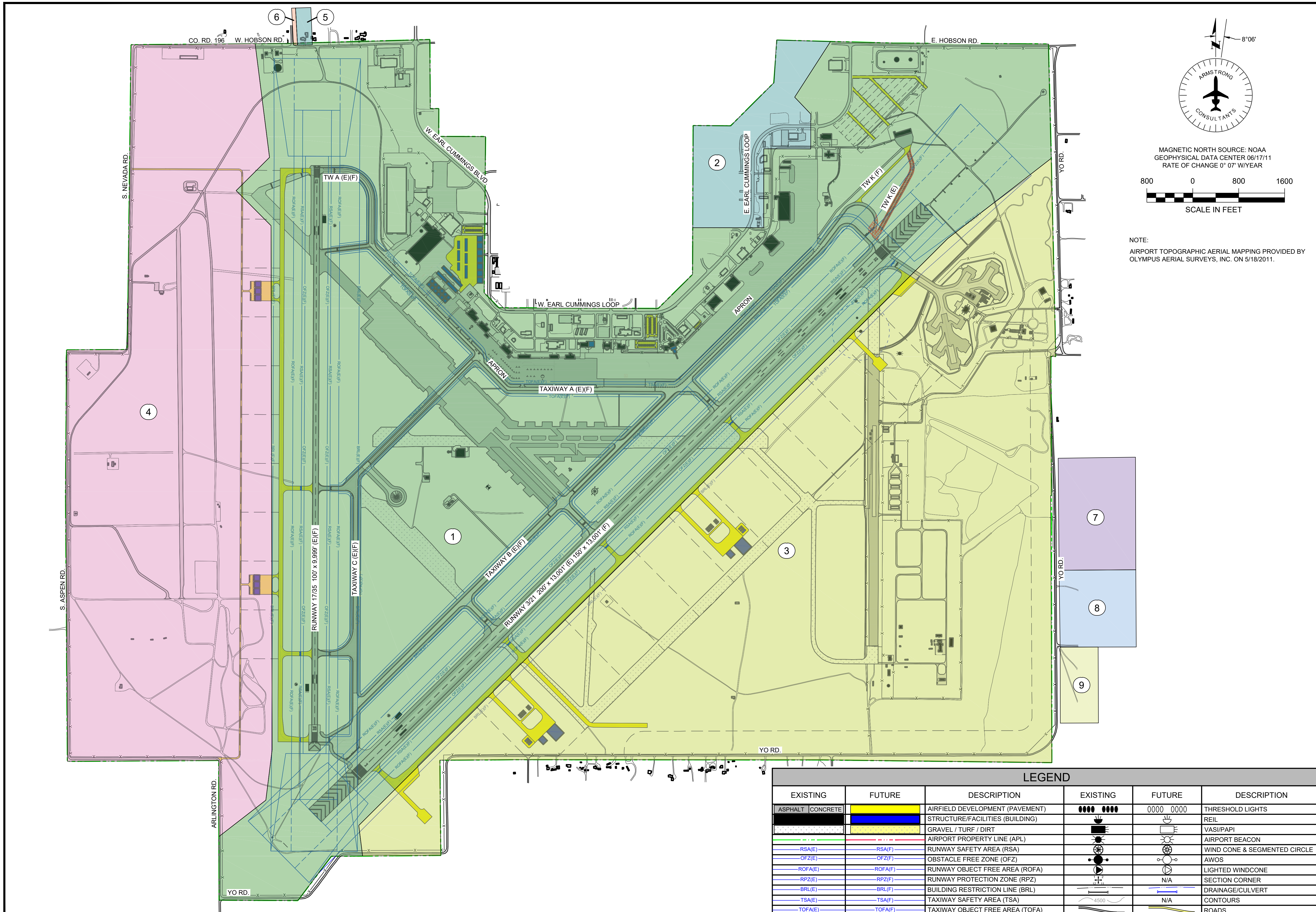
ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL
AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015507	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

OFF
AIRPORT
LAND USE



NOTE:
AIRPORT TOPOGRAPHIC AERIAL MAPPING PROVIDED BY OLYMPUS AERIAL SURVEYS, INC. ON 5/18/2011.

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
ASPHALT / CONCRETE		AIRFIELD DEVELOPMENT (PAVEMENT)			THRESHOLD LIGHTS
		STRUCTURE/FACILITIES (BUILDING)			REIL
		GRAVEL / TURF / DIRT			VASI/PAPI
		AIRPORT PROPERTY LINE (APL)			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)			LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)	1 2 12 11	N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	N/A	AIRPORT REFERENCE POINT			MARKINGS
	N/A	PACS/SACS MONUMENT	X	XX	FENCING
		AIRPORT PROPERTY (SEE SHEET 23)			MALSR

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015508	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

EXHIBIT "A"
PROPERTY
MAP

EXISTING AIRPORT PROPERTY

PARCEL	CURRENT OWNER	GRANTOR	INTEREST	LOCATION	BOOK/PAGE	DATE	ACREAGE	PURPOSE	FEDERAL PARTICIPATION
1	CITY OF ROSWELL	UNITED STATES OF AMERICA	FEE SIMPLE	T 11 S, R 24 E, SECTIONS 31, 32, 33, 34 AND T12 S, R 24 E, SECTIONS: 1, 2, 3, 10, 11, 15	BOOK 218 PAGES 301, 302	01/24/68	2,178.0	AERONAUTICAL	NONE
2	CITY OF ROSWELL	UNITED STATES OF AMERICA	FEE SIMPLE	T 11 S, R 24 E, SECTION: 33	BOOK 218 PAGE 308	01/24/68	85.6	NON-AERONAUTICAL REVENUE PRODUCING	NONE
3	CITY OF ROSWELL	UNITED STATES OF AMERICA	FEE SIMPLE	T 11 S, R 24 E, SECTION: 34 AND T 12 S, R 24 E, SECTIONS: 1, 2, 10, 11, 12	BOOK 218 PAGE 308	01/24/68	1397.1	NON-AERONAUTICAL REVENUE PRODUCING	NONE
4	CITY OF ROSWELL	UNITED STATES OF AMERICA	FEE SIMPLE	T 11 S, R 24 E, SECTION: 31 AND T 12 S, R 24 E, SECTIONS: 3, 4, 9, 10, 15	BOOK 218 PAGE 308	01/24/68	893.7	NON-AERONAUTICAL REVENUE PRODUCING	NONE
5	CITY OF ROSWELL	UNITED STATES OF AMERICA	FEE SIMPLE	T 11 S, R 24 E, SECTION: 29	BOOK 51 PAGE 25	10/02/53	4.0	AVIGATION EASEMENT	NONE
6	CITY OF ROSWELL	UNITED STATES OF AMERICA	FEE SIMPLE	T 11 S, R 24 E, SECTION: 29	BOOK 51 PAGE 191	11/04/53	1.0	AVIGATION EASEMENT	NONE
7	CITY OF ROSWELL	UNITED STATES OF AMERICA	FEE SIMPLE	T 11 S, R 24 E, SECTIONS: 1, 29	BOOK 53 PAGE 153	05/21/54	60.0	RESTRICTIVE EASEMENT	NONE
8	CITY OF ROSWELL	UNITED STATES OF AMERICA	FEE SIMPLE	T 12 S, R 24 E, SECTION: 12	BOOK 53 PAGE 151	05/21/54	40.0	RESTRICTIVE EASEMENT	NONE
9	CITY OF ROSWELL	UNITED STATES OF AMERICA	FEE SIMPLE	T 12 S, R 24 E, SECTION: 12		06/28/55	20.0	RESTRICTIVE EASEMENT	NONE

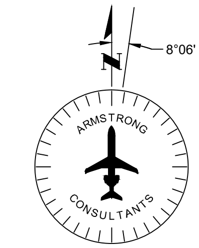
ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015508	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

EXHIBIT "A"
PARCEL DATA



MAGNETIC NORTH SOURCE: NOAA
GEOPHYSICAL DATA CENTER 03/19/12
RATE OF CHANGE 0°07' W/YEAR

800 0 800 1600

SCALE IN FEET

AERIAL PHOTOGRAPH PROVIDED BY
OLYMPUS AERIAL SURVEYS, INC. ON 5/18/2011.

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
www.armstrongconsultants.com
861 Rood Avenue, Grand Junction, CO 81501 ph: 970.242.0101 fax: 970.241.1769
28 W. Juniper Avenue, Suite 201, Gilbert, AZ 85233 ph: 602.803.7079 fax: 970.241.1769
2000 Randolph Rd SE, Suite 102, Albuquerque, NM 87106 ph: 505.508.2192 fax: 505.508.2795

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
3							
2	116015	12/2012	ALP UPDATE	6015506	LKB	SDM	JZP
1	105968	03/2011	ACI - RELOCATED BEACON	KROW	BKR	MJG	JZP
0	-	09/2003	CHANGES BY ASCG, INC.	-	-	-	-

THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THIS PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

AERIAL PHOTOGRAPH

CHAPTER
6
ENVIRONMENTAL OVERVIEW

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

Chapter Six
Environmental Overview

6.1 INTRODUCTION

This environmental overview chapter examines the potential environmental impacts associated with the proposed airport improvements discussed in Chapter 4 - Development Alternatives and in Chapter 7 - Airport Development and Financial Plan. This Chapter is intended to provide an overview of the potential impacts and identify additional environmental documentation that may be required as a prerequisite to development through the planning period.

6.2 AIR QUALITY

Air quality has become a major component of pollution control in the last 40 to 50 years. The passing of the Clean Air Act (CAA) in 1970 marked the beginning of a serious government regulation to ensure pollution is controlled to the maximum extent possible.

The Clean Air Act of 1970 was enacted to reduce emissions of specific pollutants via uniform Federal standards. These standards include the National Ambient Air Quality Standards (NAAQS) which set maximum allowable ambient concentrations of ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), lead (Pb) and particulate matter 10 microns or smaller (PM_{10}). Section 176(c) of the Act, in part, states that no Federal agency shall engage in, support in any way or provide financial assistance for, license or permit or approve any activity that does not conform to the State Implementation Plan.

Federal Aviation Administration Orders 5050.4B and 1050.1E require air quality analysis for projects in areas not in compliance with the Environmental Protection Agency (EPA) approved State Implementation Plan (SIP). Because the entire area is considered in attainment with the SIP, no further air quality analysis is required.

Construction emissions, specifically dust, are not a long-term factor. These emissions are described in the “Construction Impacts” section of this Chapter. The necessary permits will be obtained before construction begins and construction projects will conform to FAA Advisory Circular (AC) 150/5370-10F, Standards for Specifying Construction of Airports.

The following Best Management Practices (BMP) is recommended to minimize construction emissions:

I. Site Preparation
   A. Minimize land disturbance
   B. Use watering trucks to minimize dust
   C. Cover trucks when hauling dirt or debris
   D. Stabilize the surface of dirt piles and any disturbed areas
   E. Use windbreaks to prevent any accidental dust pollution, and
   F. Segregate storm water drainage from construction sites and material piles.

II. Construction Phase
  A. Cover trucks when transferring materials, and
  B. Minimize unnecessary vehicular and machinery activities.

III. Completion Phase
  A. Revegetate any disturbed land not used, and
  B. Remove unused material and dirt piles.

Temporary air pollution may occur as a result of the proposed action. The design and construction of the proposed improvements will incorporate BMP to reduce air quality impacts, including minimizing land disturbance, wetting down, using water trucks, dust suppressant, covering trucks when hauling soil and the use of wind breaks. These practices will be selected based on the site's characteristics. No significant air quality impacts are anticipated as a result of the proposed development.

The Airport is located within an attainment area. An attainment area is a zone within which the level of pollutant is considered to meet National Ambient Air Quality Standards. Air pollutants are emitted by a variety of means and sources: aircraft, ground support equipment (GSE), auxiliary power units, motor vehicle operations, and construction activities.

Correspondence was sent in January, 2012 to the New Mexico Environment Department Air Quality Bureau regarding potential impacts to air quality (see **Appendix C**). Response from the Bureau was received on March 29, 2012 (see **Appendix D**). The Bureau did not find any long-term air quality impacts with the proposed development. It was, however, noted that appropriate air quality permits be in place prior to construction.

6.3 COASTAL RESOURCES

There are no coastal zones associated with the proposed development. Therefore, compliance with the Coastal Zone Management Act of 1972 and the Coastal Barriers Resources Act of 1982 is not a factor.

6.4 COMPATIBLE LAND USE

Land use compatibility considerations include safety, height hazards and noise exposure. Although extremely rare, most aircraft accidents occur within 5,000 feet of a runway. Therefore, the ability of the pilot to bring the aircraft down in a manner that minimizes the severity of an accident is dependent upon the type of land uses within the vicinity of the airport. Land uses are reviewed in three zones surrounding the airport: the Runway Protection Zone (RPZ), the Approach Zone, Airport Influence Zone and the Traffic Pattern Zone. The RPZ is a trapezoidal area extending 1,200 feet beyond the ends of the runway and is typically included within the airport property boundary. Residential and other uses that result in congregations of people are not recommended within the RPZ. The Approach Zone generally falls within the Code of Federal Regulations (CFR) Part 77 Approach Surface area. Within the Approach Zone, public land uses, such as schools, libraries, hospitals and churches should be avoided. New residential developments should include avigation easements and disclosure statements. The Traffic Pattern Zone is generally the area within one mile of the airport. Within the Traffic Pattern Zone, avigation easements should be considered for residential and public uses within this area and disclosure statements should be included. The Airport Influence Zone is the area where aircraft transition to or from an enroute altitude or airport over-flight altitude to or from the standard traffic pattern altitude of 800 to 1,000 feet above airport elevation.

Surrounding land uses include sparsely populated residential development, and ranching activities which are considered conditionally compatible with the airport, if appropriate disclosure, avigation easements and density limitations are put in place.

14 CFR Part 77, Objects Affecting Navigable Airspace, provides imaginary surfaces surrounding an airport that should be protected from penetration by objects. These include the primary, transitional approach surface, horizontal surface and conical surface. These surfaces were described in Chapter Three. Proposed structures in the vicinity of the airport should be reviewed against the Part 77 criteria to ensure hazards to air navigation are not created. No penetrations to the approach surface currently exist. Objects penetrating these surfaces could result in a hazard to air navigation.

The Airport is located within the City of Roswell incorporated city limits and falls within the I-2 zoning classification which is noted as a Heavy Industrial District (see **Figure 6-1**). Projects within the Heavy Industrial District are intended to provide for a wide range of industrial activities including heavy manufacturing, fabricating, assembly, disassembly, processing, and treatment activities conducted in a manner not detrimental to the rest of the community by reason of the emission or creation of noise, vibration, smoke, dust of other particulate matter, toxic or noxious materials odors, fire or explosive hazards, or glare and heat. The City ordinance also states there is no height restriction within the Heavy Industrial District except those prescribed by the approach zones of the Airport. The Airport is surrounded to the north by the City of Roswell Rural-Suburban districts (R-3). The R-3 zone is the Residence Zone which allows for the development of residential units. Compatible Land Use and Height Restriction drawings are included as part of this Airport Layout Plan as a tool for the City and County to use in reviewing and evaluating the compatibility of proposed development in the vicinity of the Airport.

If acquisition of real property or displacement of persons is involved, 49 CFR Par 24, Implementing the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended must be met for Federal projects and projects involving Federal funding. Otherwise, the FAA, to the fullest extent possible, observes all local and State laws, regulations and ordinances concerning zoning, transportation, economic development, housing, etc. when planning, assessing or implementing the proposed action. There is no land acquisition required for the planned improvements at the Roswell International Air Center.

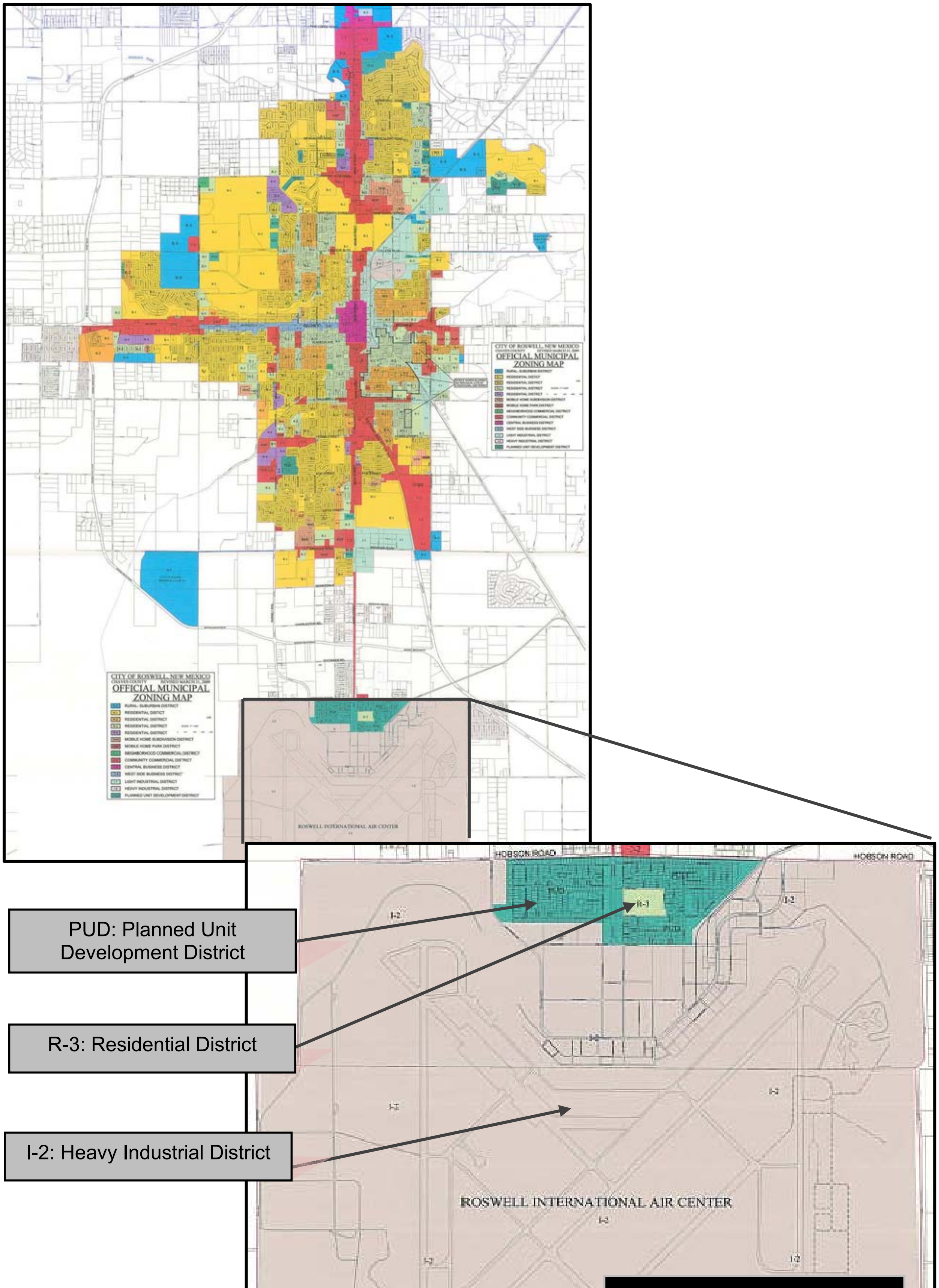


FIGURE 6-1 ROSWELL ZONING MAP

Source: Box Elder County, 2011

6.5 CONSTRUCTION IMPACTS

Local, State and Federal ordinances and regulations address the impacts of construction activities, including construction noise, dust and noise from heavy equipment traffic, disposal of construction debris and air and water pollution.

Construction operations for the proposed development will cause specific impacts resulting solely from and limited exclusively to the construction project. Construction impacts are distinct in that they are temporary in duration and the degree of adverse impacts decreases as work is concluded. The following construction impacts can be expected:

- A temporary increase in particulate and gaseous air pollution levels as a result of dust generated by construction activity and by vehicle emissions from equipment and worker's automobiles
- Increases in solid and sanitary wastes from the workers at the site
- Traffic volumes that would increase in the airport vicinity due to construction activity (workers arriving and departing, delivery of materials, etc.)
- Increase in noise levels at the airport during operation of heavy equipment, and
- Temporary erosion, scarring of land surfaces and loss of vegetation in areas that are excavated or otherwise disturbed to carry out future developments.

All construction projects will comply with guidelines set forth in FAA Advisory Circular 150/5370-10F, *Standards for Specifying the Construction of Airports*. The contractor will obtain the required construction permits as well as prepare a Storm Water Pollution Prevention Plan (SWPPP) and Fugitive Dust Control Plan for construction. These requirements will be specified in the contract documents for the construction of the proposed improvements.

6.6 DEPARTMENT OF TRANSPORTATION ACT – SECTION 4(F)

Section 303c of Title 49, U.S.C., formerly Section 4(f) of DOT Act of 1966, provides that the Secretary of Transportation shall not approve any program or project that requires the use of any publicly owned land from a public park, recreation area or wildlife or waterfowl refuge of National, State or Local significance or land from an historic site of National, State or Local significance, as determined by the officials having jurisdiction thereof, unless there is no feasible and prudent alternative to the use of such land and such project includes all possible planning to minimize impacts. The proposed improvements at Roswell International Air Center will not require land from any public park, recreation area or wildlife or waterfowl refuge.

There are currently no parks within the vicinity of the Airport property which have the potential to be designed as Section 4(f) property. There are currently no wildlife and waterfowl refuge of national, state or local significance or land from a historic site of national, state or local significance located in the vicinity of the Airport. Recreation facilities within the area of the Airport are found in **Table 6-1**.

TABLE 6-1 RECREATION FACILITIES IN THE CITY OF ROSWELL

CITY PARKS	DISTANCE FROM AIRPORT
Cahoon Park	8 miles north
Capitan Park	11 miles northwest
Carpenter Park	6 miles north
Carver Park	6 miles north
Cielo Park	9 miles north
Coca Cola Field	5 miles north
Del Norte Park	9 miles north
Delta West	10 miles north
Enchanted Lands Park	8 miles north
Fifth St. Park	7 miles north
Guffey Park	10 miles north
J.C. Park	9 miles north
Linda Vista	9 miles north
Loveless Park	8 miles north
Margot Purdy	7 miles north
Marin L. King	5 miles north
Melendez Park	6 miles north
MIA/POW Park	7 miles north
Missouri Ave. Park	6 miles north
Randy Willis	5 miles north
Reichman Park	6 miles north
RIAC Park	1 mile west
Spring River Zoo	17 miles north
Stiles Park and Ball field	7 miles west
Tierra Berrenda	10 miles north
Valley View Park	6 miles north
RECREATION CENTERS	**DISTANCE FROM AIRPORT**
Yucca Recreation Center	6 miles north
Roswell Adult and Senior Center	7 miles north
GOLF COURSES	**DISTANCE FROM AIRPORT**
Spring River Golf Course	12 miles north
New Mexico Military Institute Golf Course	8 miles north
STATE PARKS	**DISTANCE FROM AIRPORT**
Bitter Lake National Wildlife Refuge	19 miles northeast
Bottomless Lakes State Park	24 miles east

Source: City of Roswell, January 2012
Prepared by: Armstrong Consultants, Inc.,

6.7 FARMLANDS

The Farmland Protection Policy Act (FPPA) authorizes the Department of Agriculture to develop criteria for identifying the effects of Federal programs upon the conversion of farmland to uses other than agriculture.

Conversion of "Prime or Unique" farmland may be considered a significant impact. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed or fiber without intolerable soil erosion as determined by the Secretary of Agriculture. Unique farmland is land other than prime farmland which is used to produce specific high value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits and vegetables.

Figure 6-2 illustrates the "prime and unique" farmland in Chaves County which is depicted in pink and blue. As shown, there is prime farmland (if irrigated) surrounding the Airport, however, the land is not irrigated which means there is not high quality farmland within the Airport's boundaries.

FIGURE 6-2 PRIME AND UNIQUE FARMLAND

Source: U.S. Department of Agriculture, 2011

The identified prime farmland of statewide importance within the Airport's boundaries is depicted as Reaker loam (ReB and Rg) and Reakor sandy loam (Ra). Tencee-Upton complex is located within the vicinity of the industrial park development within the south west quadrant; it is not considered prime farmland. While these particular farmland areas are identified surrounding the Roswell International Air Center, and within the boundary of the Airport, future improvements will not impact the prime and unique farmland.

6.8 FISH, WILDLIFE AND PLANTS

This category concerns potential impacts to existing wildlife habitat and threatened and endangered species. Examining both the area of land to be altered or removed and its relationship to surrounding habitat quantify the significance of the impacts in this category. For example, removal of a few acres of habitat which represents a small percentage of the area's total similar habitat or which supports a limited variety of common species would not be considered significant. However, removal of a sizeable percentage of the area's similar habitat or habitat which is known to support rare species would be considered a significant impact.

Section 7 of the Endangered Species Act, as amended, requires each Federal agency to insure that "any action authorized, funded or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat of such species . . ."

An *Endangered Species* is defined as any member of the animal or plant kingdoms determined to be in danger of extinction throughout all or a significant portion of its range. A *Threatened Species* is defined as any member of the animal or plant kingdoms that are likely to become endangered in the foreseeable future. A *Candidate Species* is defined as a plant or animal for which there is sufficient information on their biological status and threats to propose them as endangered or threatened but for which development of a proposed listing regulation is precluded by other higher priority listing activities. A *Candidate Conservation Agreement* is a formal agreement between the U.S. Fish and Wildlife Service and one or more parties to address the conservation needs of proposed or candidate species, or species likely to become candidates, before they become listed as endangered or threatened.

Correspondence was sent to the US Fish and Wildlife Service (USFWS) and State of New Mexico Department of Game & Fish in January, 2012 requesting information on the potential impact to endangered, threatened, and proposed and or candidate species or designated critical habitat from the proposed improvement at the Roswell International Air Center. A copy of the letter can be found in **Appendix C.** Response from the USFWS was obtained on March 3, 2012 and response from the New Mexico Department of Game & Fish was obtained on February 27., 2012. Both of these response letters can be found in **Appendix D.**

A list of federally threatened or endangered specifies was obtained for Chaves County, but do not necessarily occur in the vicinity of Roswell or within the project areas at the Airport.

<u>Federal Endangered:</u>

- Tern, Least Interior - *Sterna antillarum*
- Noel's Amphipod - *Gammarus desperatus*
- Pecos gambusia - *Gambusia nobilis*
- Kuenzler Hedgehog cactus - *Echinocereus fendleri kuenzler*
- Pecos Assiminea snail - *Assiminea pecos*
- Roswell springsnail - *Pyrgulopsis roswellensis*
- Koster's springsnsail - *Juturnia kosteri*

<u>Federal Threatened:</u>

- Dunes Sagebrush Lizard - *Sceloporus arenicolus*
- Mexican Spotted Owl - *Strix occidentalis lucida*
- Pecos Bluntnose shiner - *Notropis simus pecosensis*
- Pecos Sunflower - *Helianthus paradoxus*

<u>Federal Candidate:</u>

- Lesser prairie-chicken - *Tympanuchus pallidicinctus*

All species listed under the Endangered Species Act (ESA) for Chaves County, New Mexico were evaluated for their potential to be present in the Roswell International Air Center project area based on general geographic and elevation distribution, habitat requirements. **Table 6-2** lists each of the species and provides the biological basis for including or excluding each species from further evaluation of potential impacts from the project site.

TABLE 6-2 THREATENED, ENDANGERED, AND CANDIDATE SPECIES POTENTIALLY OCCURRING WITHIN OR ADJACENT TO THE PROJECT AREA

Species	**ESA Status**	**Habitat Requirements**	**Project-specific Inclusion/Exclusion Justification**
Tern, Least Interior *Sterna antillarum*	FE	Nesting habitat includes bare or sparsely vegetated sand, shell, and gravel beaches, sandbars, islands and salt flats associated with rivers and reservoirs.	No habitat present in the project area
Noel's Amphipod *Gammarus desperatus*	FE	Generally found in small streams, ponds and springs where the freshwater habitat is cool and well-oxygenated. They are light sensitive and are most active at night.	No habitat present in the project area
Pecos gambusia *Gambusia nobilis*	FE	Found in spring-fed pools and marshes with constant temperature.	No habitat present in the project area
Kuenzler Hedgehog cactus *Echinocereus fendleri kuenzler*	FE	Prefers warm aspects, gentle slopes, and rocky soils and grow most often on gentle, southwest-facing slopes or ridge tops.	No habitat present in the project area
Pecos Assiminea snail *Assiminea pecos*	FE	This species is not fully aquatic, preferring a humid habitat in wet mud or beneath mats of vegetation, typically within a few centimeters of running water.	No habitat present in the project area
Roswell springsnail *Pyrgulopsis roswellensis*	FE	Found primarily in sinkholes, springs, and associated spring runs and wetland habitats.	No habitat present in the project area
Koster's springsnsail *Juturnia kosteri*	FE	Found primarily in sinkholes, springs, and associated spring runs and wetland habitats.	No habitat present in the project area
Dunes Sagebrush Lizard *Sceloporus arenicolus*	FT	Habitat requirements include large networks of shinnery oak (which are short ((<2m)) shrubs) and a sloping, sandy topography, where the species use "blowouts" as their primary microhabitat.	No habitat present in the project area
Mexican Spotted Owl *Strix occidentalis lucida*	FT	This species is found in deep, steep-walled canyons with little canopy cove. These species territories occur in trees at elevations from 6,000 to 8,500 feet.	No habitat present in the project area and project area is below species elevation range.
Pecos Bluntnose shiner *Notropis simus pecosensis*	FT	Found primarily in rivers and most frequently in the main stream channel, over a sandy substrate with low velocity flow, and at depths between 7 inches and 16 inches.	No habitat present in the project area

Pecos Sunflower *Helianthus paradoxus*	FT	Found in areas that have permanently saturated soils, including desert wetlands that are associated with springs, but may include stream and lake margins.	No habitat present in the project area
Lesser prairie-chicken *Tympanuchus pallidicinctus*	FC	Found in prairie grasslands where there is shinnery oak or sand sagebrush.	No habitat present in the project area

Source: U.S. Fish and Wildlife Service (USFWS), 2011
Prepared by: Armstrong Consultants, Inc., 2012
Note1. ESA = Endangered Species Act: FE = Federally Endangered, FT = Federally Threatened, FC = Federal Candidate

6.9 FLOODPLAINS

Floodplains are defined by Executive Order 11988, *Floodplain Management*, as "the lowland and relatively flat areas adjoining coastal water… including at a minimum, that area subject to a one percent or greater chance of flooding in any given year…", that is, an area which would be inundated by a 100-year flood. If a proposed action involves a 100-year floodplain, mitigating measures must be investigated in order to avoid significant changes to the drainage system.

As described in FAA Order 5050.4B, *Airport Environmental Handbook*, an airport development project would be a significant impact pursuant to National Environmental Protection Agency (NEPA) if it results in notable adverse impacts on natural and beneficial floodplain values. Mitigation measures for base floodplain encroachments may include committing to special flood related design criteria, elevating facilities above base flood level, locating nonconforming structures and facilities out of the floodplain or minimizing fill placed in floodplains.

Roswell International Air Center and surrounding area has been mapped by the Federal Emergency Management Agency (FEMA), topography maps and aerial photography of the airport is not within a 100-year floodplain. Floodplain mapping for Roswell International Air Center from FEMA is not available.

6.10 HAZARDOUS MATERIALS, POLLUTION PREVENTION AND SOLID WASTE

Four primary laws have been passed governing the handling and disposal of hazardous materials, chemicals, substances and wastes. The two statues of most importance to the FAA in proposing actions to construct and operate facilities and navigational aids are the Resource Conservation and Recovery Act (RCRA) (as amended by the Federal Facilities Compliance Act of 1992), and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) [as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA or Superfund) and the Community Environmental Response Facilitation Act of 1992]. RCRA governs the generation, treatment, storage and disposal of hazardous wastes. CERCLA provides for consultation with natural resource trustees and cleanup of any release of a hazardous substance (excluding petroleum) into the environment. The area surrounding Roswell International Airport is currently used for commercial business, heavy and light industry. There are no known hazardous wastes located on existing Airport property.

Airport development actions that relate only to construction or expansion of runways, taxiways, and related facilities do not normally include any direct relationship to solid waste collection, control or disposal other than that associated with the construction itself. The nature of the proposed airport meets these criteria and will not significantly increase net waste output for the Airport.

Any solid waste disposal facility (i.e. sanitary landfill) which is located within 5,000 feet of all runways planned to be used by piston-powered aircraft or within 10,000 feet of all runways planned to be used by turbine aircraft, is considered by the FAA to be an incompatible land use because of the potential for conflicts between bird habitat and low-flying aircraft. This determination is found in FAA Advisory Circular 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*. There are no solid waste disposal facilities within 10,000 feet of the Airport. Any planned solid waste disposal facilities should be located at least 10,000 feet from the runway.

The Airport updated their Stormwater Pollution Prevention Plan (SWPPP) in March 2012. The SWPPP identifies structural and non-structural controls that will be put in place to minimize negative impacts caused by offsite storm water discharges to the environment. The purpose of these controls is to minimize erosion and run-off of pollutants and sediment.

Aircraft fuel is currently stored in three above ground tanks at the Airport which store a combined 130,000 gallons. A Spill Prevention Control and Countermeasure (SPCC) plan includes requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters. Great Southwest Aviation, who owns and operates the fuel facilities at the Roswell International Air Center have and maintain the SPCC plan for the fuel system.

6.11 Historical, Architectural, Archaeological and Cultural Resources

The National Historic Preservation Act of 1966 requires that an initial review be made in order to determine if any properties in or eligible for inclusion in the National Register of Historic Places are within the area of a proposed action’s potential environmental impact (the area within which direct and indirect impacts could occur and thus cause a change in historic, architectural, archaeological or cultural properties).

The Archaeological and Historic Preservation Act of 1974 provides for the survey, recovery and preservation of significant scientific, prehistoric, historical, archaeological or paleontological data when such data may be destroyed or irreparably lost due to a Federal, Federally funded or federally licensed project.

Correspondence to the State Historic Preservation Office (SHPO) was sent in January, 2012 regarding possible impacts to historic, archaeological and cultural resources. A copy of the letter can be found in **Appendix C**. A response has not been received from the agency.

6.12 Light Emissions and Visual Impacts

Airfield lighting is the main source of light emissions emanating from an airport. The purpose of evaluating the change in light emissions is to determine the extent to which lighting improvements associated with proposed airport development will create an annoyance for inhabitants of properties in the immediate vicinity of the Airport. The determination of impact was based on the nature and intensity of lighting facilities at the Airport and its physical characteristics and anticipated uses of adjacent properties.

Light emissions from any of the development projects are expected to be localized and should not have any impacts beyond the areas of concern. Given the nature of the projects, lighting will be confined to area illumination of runway ends, parking areas, aircraft apron areas, and roadway lighting as required.

Proposed improvements for the Airport are constrained to the landside development and no major impact to light emissions is anticipated due to the nature of the improvements. No additional airside lighting development is proposed. Light emissions, if generated, will come from parking lot lighting and general aviation hangar development area. If complaints are received, the lights can be shielded or baffled to minimize their impact.

6.13 NATURAL RESOURCES, ENERGY SUPPLY AND SUSTAINABLE DESIGN

Executive order 13123, *Greening the Government through Efficient Energy Management* (64 FR 30851, June 8, 1999), encourages each Federal agency to expand the use of renewable energy within its facilities and in its activities. Executive order 13123 also requires each Federal agency to reduce petroleum use, total energy use and associated air emissions and water consumption in its facilities.

It is also the policy of the FAA, consistent with NEPA and the CEQ regulations, to encourage the development of sustainability. All elements of the transportation system should be designed with a view to their aesthetic impact, conservation of resources such as energy, pollution prevention, harmonization with the community environment and sensitivity to the concerns of the traveling public.

Energy requirements associated with airport improvements generally fall into two categories: 1) changed demand for stationary facilities (i.e. airfield lighting and terminal building heating) and 2) those that involve the movement of air and ground vehicles (i.e. fuel consumption). The use of natural resources includes primarily construction materials and water.

Energy requirements are not expected to significantly increase as a result of the proposed improvements. Demand for electricity and aircraft fuel is expected to increase with future development; however, the increase will be minimal. Aircraft fuel should be stored in above ground tanks at the airport that conform to U.S. EPA regulations. Significant increases in ground vehicle fuel consumption are not anticipated.

Improvements and renovation to the terminal building should consider the application of Leadership in Energy and Environmental Design (LEED) certification. LEED design utilizes strategies aimed at achieving high performance in key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. LEED provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

Future development and improvement projects should take into account and apply sustainable design measures. Examples of sustainable design initiatives include, but are not limited to: adaptive shading, double skin walls, photovoltaic (PV) roof panels, induction lights on photocell, recycled flooring and carpets. Additional measures could also include reducing energy use through the installation of light-emitting diodes (LED) energy efficient airfield lighting.

6.14 Noise

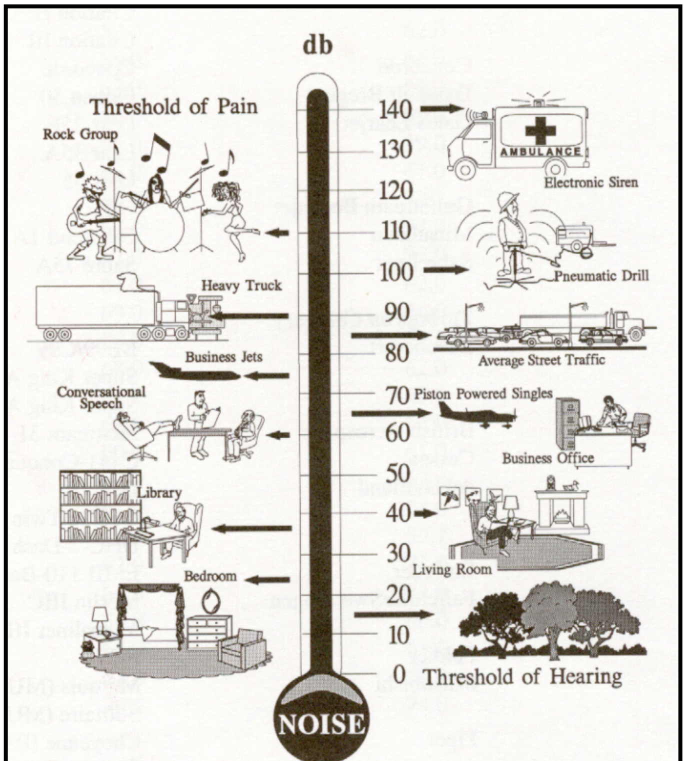


Figure 6-3 Sound Level Comparison

Noise analysis considerations include: 1) whether the Federal thresholds of noise exposure are exceeded, 2) whether the 65 day-night level (DNL) noise contour extends beyond airport property and 3) if there are any residences, churches, schools or hospitals within the 65 DNL noise contour. The basic measure of noise is the sound pressure level that is recorded in decibels (dBA). The important point to understand when considering the impact of noise on communities is that equal levels of sound pressure can be measured for both high and low frequency sounds. Generally, people are less sensitive to sounds of low frequencies than they are high frequencies. An example of this might be the difference between the rumble of automobile traffic on a nearby highway and the high-pitched whine of jet aircraft passing overhead. At any location, over a period of time, sound pressure fluctuates considerably between high and low frequencies. **Figure 6-3** depicts a Sound Level Comparison of different noise sources.

The identification of airport generated noise impacts and implementation of noise abatement measures is a joint responsibility of airport operators and users. FAA Order 5050.4B states that "no noise analysis is needed for proposals involving Design Group I and II airplanes operating at airports whose forecast operations in the period covered by the EA do not exceed 90,000 annual adjusted propeller operations or 700 annual adjusted jet operations…" Based on existing and forecasted aircraft operations, noise analysis is required for Roswell International Air Center and a future noise contour was developed as a part of this Airport Master Plan.

The future 65 DNL noise contour is shown in **Figure 6-4** and does not impact any residences, churches, schools or hospitals.

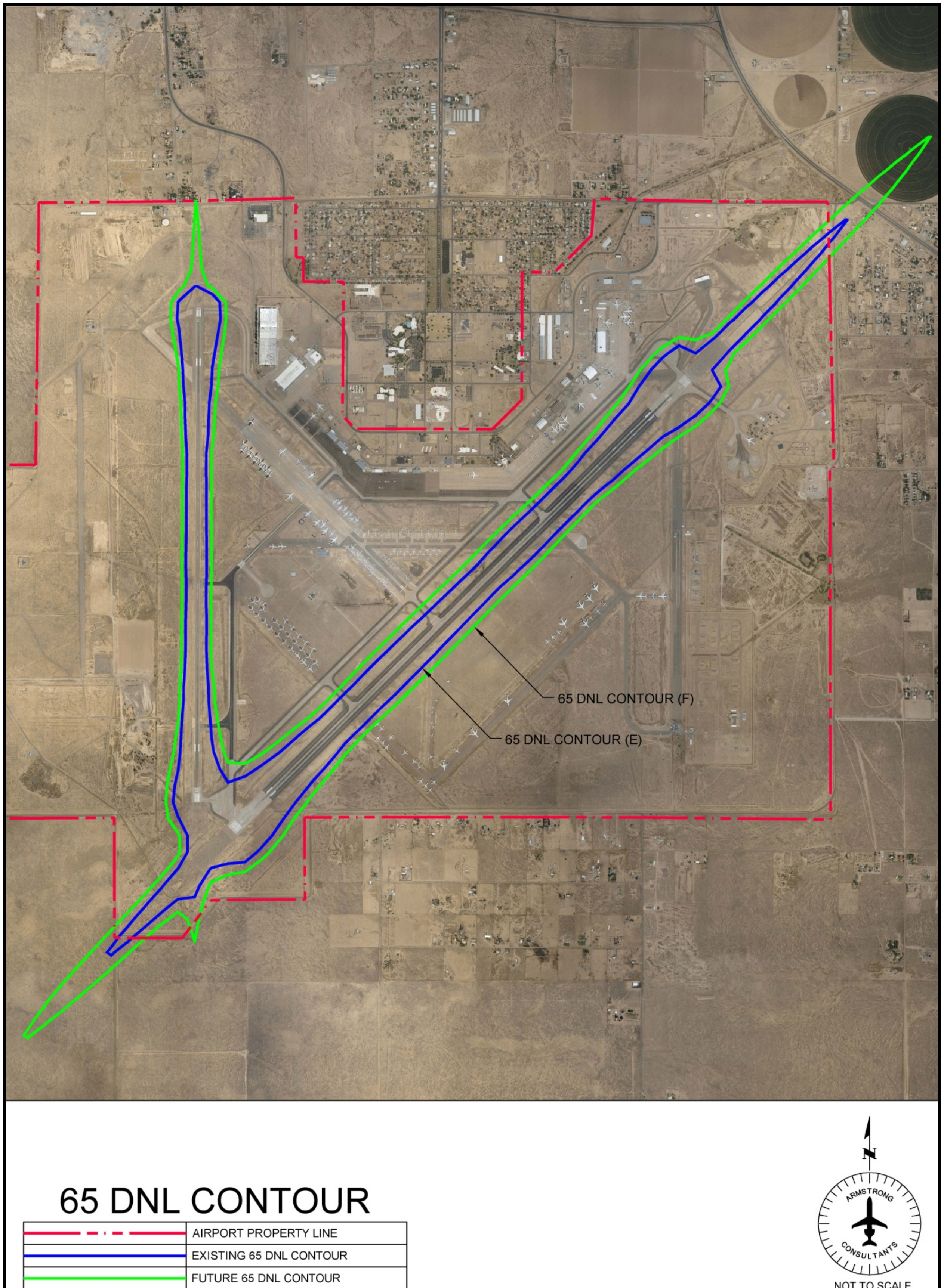


FIGURE 6-4 EXISTING AND FUTURE 65 DNL NOISE CONTOUR

6.14.1 VOLUNTARY NOISE ABATEMENT PROGRAM

Although the noise exposure levels will not exceed 65 DNL over any noise sensitive area, several voluntary measures can be applied to minimize noise exposure to surrounding areas. Several of these measures are listed below. It is recommended that a voluntary noise abatement program be implemented for the airport and publicized to all based and transient pilots.[1]

Pilots:

- Be aware of noise sensitive areas, particularly residential areas near the airport and avoid low flight.
- Fly traffic patterns tight and high, keeping the aircraft as close to the field as possible.
- In constant-speed-propeller aircraft, do not use high RPM settings in the pattern. Propeller noise from high-performance singles and twins increases drastically at high RPM settings.
- On takeoff, reduce to climb power as soon as safe and practical.
- Climb after liftoff at best-angle-of-climb speed until crossing the airport boundary, then climb at best rate.
- Depart from the start of the runway rather than intersections, for the highest possible altitude when leaving the airport vicinity.
- Avoid prolonged run-ups and do them inside the airport area, rather than at its perimeter.
- Try low-power approaches and always avoid the low, dragged-in approach.

Instructors:

- Teach noise abatement procedures to all students, including pilots you take up for flight reviews.
- Know noise-sensitive areas and point them out to students.
- Assure students fly at or above the recommended pattern altitude.
- Practice maneuvers over unpopulated areas and vary practice areas so that the same locale is not constantly subjected to aircraft operations.
- During practice of ground-reference maneuvers, be particularly aware of houses or businesses in your flight path.
- Stress that high RPM propeller settings are reserved for takeoff and for short final but not for flying in the pattern. Pushing the propeller to high RPM results in significantly higher levels of noise.

Fixed Base Operators (FBOs):

- Identify noise-sensitive areas and work with customers to create voluntary noise abatement procedures.
- Post any noise abatement procedures in a prominently visible area and remind pilots of the importance of adhering to them.
- Call for the use of the least noise sensitive runway whenever wind conditions permit.
- Initiate pilot education programs to teach and explain the rationale for noise abatement procedures and positive community relations.

[1] Aircraft Owners and Pilots Association (AOPA)

Airport Owner and Surrounding Jurisdictions:

- Maintain appropriate zoning in the vicinity of the airport and see that noise sensitive land uses are not authorized within pattern, approach and departure paths.
- Disclose the existence of the airport and the airport influence area to real estate purchasers.
- Publish voluntary noise procedures on the Internet.
- Publish voluntary calm runway use procedures.

6.15 SECONDARY (INDUCED) IMPACTS

These secondary or induced impacts involve major shifts in population, changes in economic climate or shifts in levels of public service demand. The effects are directly proportional to the scope of the project under consideration. Assessment of induced socioeconomic impacts is usually only associated with major development at large air carrier airports, which involve major terminal building development or roadway alignments and similar work. The extent of the indirect socioeconomic impacts of the proposed development is not of the magnitude that would normally be considered significant; however, positive impacts can be foreseen in the form of direct, indirect and induced economic benefits generated from the airport.

6.16 SOCIOECONOMIC IMPACTS, ENVIRONMENTAL JUSTICE AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, the accompanying Presidential Memorandum and Order DOT 5610.2, Environmental Justice, require the FAA to provide for meaningful public involvement by minority and low-income populations and analysis, including demographic analysis, which identifies and addresses potential impacts on these populations that may be disproportionately high and adverse. Included in this process is the disclosure of the effects on subsistence patterns of consumption of fish, vegetation or wildlife and effective public participation and access to this information. The Presidential Memorandum that accompanied E.O. 12898, as well as the CEQ and EPA Guidance, encourage consideration of environmental justice impacts in EA's, especially to determine whether a disproportionately high and adverse impact may occur. Environmental Justice is examined during evaluation of other impact categories, such as noise, air quality, water, hazardous materials and cultural resources.

6.16.1 SOCIOECONOMIC IMPACTS

Induced socioeconomic impacts are usually only associated with major development at large air carrier airports. The socioeconomic impacts produced as a result of the proposed improvements to the Roswell International Air Center are expected to be positive in nature and would include direct, indirect and induced economic benefits to the local area. These airport improvements are expected to attract additional users and in turn to encourage tourism, industry and to enhance the future growth and expansion of the community's economic base.

Positive impacts are expected from the proposed development by further enabling commercial activity, industry and enabling further enhancements in the future growth and expansion of the community's economic base.

6.16.2 ENVIRONMENTAL JUSTICE

The focus of the Environmental Justice evaluation is to determine whether the proposed action results in an inequitable distribution of negative effects to special population groups, as compared to negative effects on other population groups. These special population groups include minority or otherwise special ethnicity or low-income neighborhoods.

The proposed action is not expected to result in any significant negative impacts to any population groups and therefore, would not result in disproportionate negative impacts to any special population group. Socioeconomic and induced economic impacts are expected to be positive in nature and are expected to benefit all population groups in the area.

6.16.3 Children's Environmental Health and Safety Risks

Pursuant to Executive Order 13045, *Protection of Children from the Environmental Health Risks,* Federal agencies are directed, as appropriate and consistent with the agency's mission, to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. Agencies are encouraged to participation in implementation of the Order by ensuring that result from environmental health risks or safety risks. The proposed improvements are not expected to result in any environmental health risks or safety risks on children.

6.17 Water Quality

Water quality considerations related to airport improvement often include increased surface runoff and erosion and pollution from fuel, oil, solvents and deicing fluids. Potential pollution could come from petroleum products spilled on the surface and carried through drainage channels off of the airport. State and Federal laws and regulations have been established to safeguard these facilities. These regulations include standards for above ground and underground storage tanks, leak detection and overflow protection. An effective Storm Water Pollution Prevention Plan (SWPPP) identifies storm water discharge points on the airport, describes measures and controls to minimize discharges and details spill prevention and response procedures. In March 2012, the Airport updated the SWPPP in accordance with EPA regulations.

In July of 2002, the EPA amended the Oil Pollution Prevention Regulation at Title 40 of the Code of Federal Regulations, Part 112 (40 CFR Part 112). Subparts A through C of this regulation is often referred to as the "SPCC rule" because they describe requirements for certain facilities (including airports) to prepare and implement Spill Prevention Control and Countermeasure (SPCC) Plans. Since there are currently three above group fuel storage facilities at the Airport, a SPCC Plan is required. The above ground storage tanks are currently operated by the FBO. There is not an SPCC plan in place, and one should be prepared in addition to this Airport Master Plan by the FBO.

In accordance with Section 402(p) of the Clean Water Act, a National Pollution Discharge Elimination System (NPDES) General Permit is required from the EPA for construction projects that disturb one or more acres of land. Applicable contractors will be required to comply with the requirement and procedures of the NPDES General Permit, including the preparation of a Notice of Intent and a Storm Water Pollution Prevention Plan, prior to the initiation of construction activities.

Recommendations established in FAA Advisory Circular 150/5370-10F, *Standards for Specifying Construction of Airports*, item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control, will be incorporated into the project design and specifications. The design and construction of the proposed improvements will incorporate BMP to reduce erosion, minimize sedimentation, control non-storm water discharges and protect the quality of surface water features potentially affected. These practices will be selected based on the site's characteristics and those factors within the contractor's control and may include: construction scheduling, limiting exposed areas, runoff velocity reduction, sediment trapping and good housekeeping practices.

Correspondence was sent to the New Mexico Environment Department Ground Water Quality Bureau regarding potential impacts to water quality. A copy of the letter can be found in **Appendix C.** Agency response can be found in **Appendix D**.

Future fuel storage and dispensing facilities should be designed, constructed, operated and maintained in accordance with applicable federal, state and local regulations. Waste fluids, including oils, coolants, degreasers and aircraft wash facility wastewater should be managed and disposed of in accordance with applicable federal, state and local regulations.

6.18 WETLANDS

Wetlands are defined in Executive Order 11990, Protection of Wetlands, as "those areas that are inundated by surface or ground water with a frequency sufficient to support and under normal circumstances does or would support, a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs and similar areas such as sloughs, potholes, wet meadows, river overflows and natural ponds. Jurisdictional Waters of the United States may also include drainage channels, washes, ditches, arroyos or other waterways that are tributaries to Navigable Water of the United States or other waters where the degradation or destruction of which could affect interstate or foreign commerce.

According to the U.S. Fish and Wildlife Service's National Wetlands Inventory, there are no impacts to wetlands within the recommended improvements for the Airport during the planning period, as shown in **Figure 6-5**.

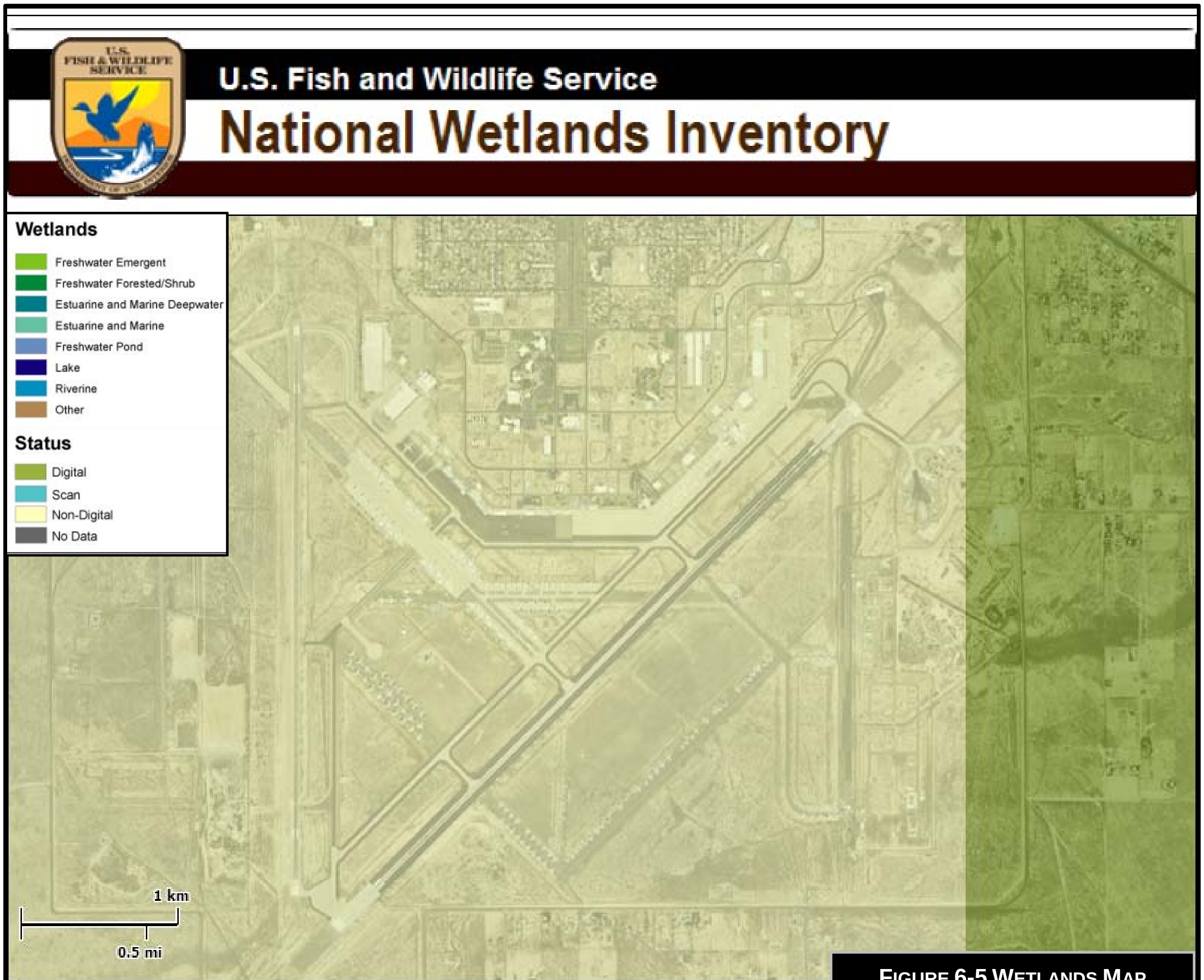


FIGURE 6-5 WETLANDS MAP

Source: U.S. Fish and Wildlife Service, National Wetlands Inventory, January 2012
Prepared by: Armstrong Consultants, Inc., January 2012

6.19 WILD AND SCENIC RIVERS

The Wild and Scenic Rivers Act (PL 90-542) describes those river areas eligible for protection from development. As a general rule, these rivers possess outstanding scenic, recreational, geological, fish and wildlife, historical, cultural or other similar value.

The Wild and Scenic River list from the National Park Service indicated that there are four Wild and Scenic Rivers in the State of New Mexico. The nearest Wild and Scenic River is the East Fork Jemez River located more than 260 miles northwest of Roswell, New Mexico and would not be affected by the future improvements, as shown in **Figure 6-6**.

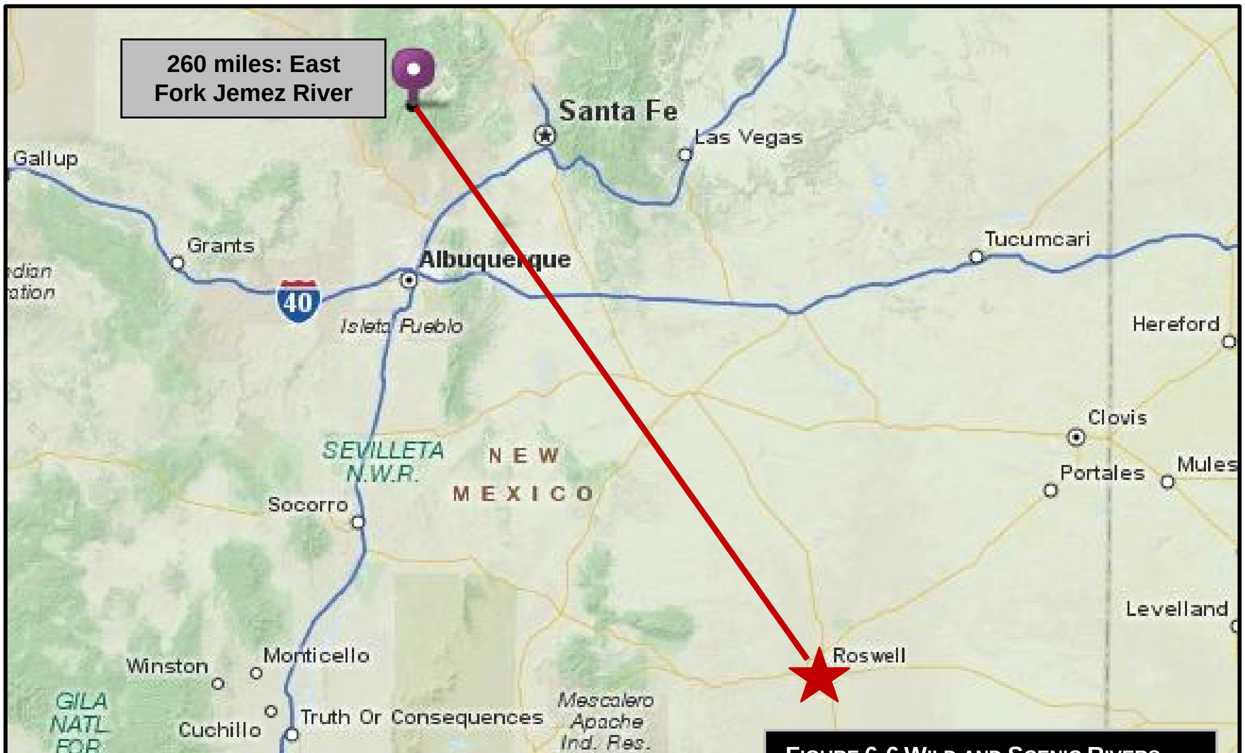


FIGURE 6-6 WILD AND SCENIC RIVERS

Source: MapQuest, 2012
Prepared by: Armstrong Consultants, Inc., January 2012

6.20 MEANS TO MITIGATE AND/OR MINIMIZE ADVERSE ENVIRONMENTAL IMPACTS

Where appropriate, the mitigation or minimization of environmental impacts was noted in the discussion of impacts. These actions are summarized below:

- Maintain compatible land uses in the vicinity of the airport.
- Adhere to FAA AC 150/5370-10F, *Standards for Specifying the Construction of Airports* and BMP to minimize or eliminate impacts to water quality and air quality during construction.
- Incorporate practicable sustainably designed terminal building improvements and future lighting projects.

6.21 SUMMARY AND CONCLUSIONS OF ENVIRONMENTAL IMPACTS

Table 6-3 provides a summary of the analysis ratings for each of the environmental impact categories with respect to the proposed airport improvements. While some categories indicate a potential impact, they are all estimated to be below the threshold of significance as described in FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects.* As mentioned in Chapter 3 – Facility Requirements, when the Reusable Launch Vehicle (RLV) and Unmanned Aircraft Vehicle (UAV) projects are ready for execution, the appropriate National Environmental Policy Act (NEPA) environmental documentation for the Aerospace Industrial Park development would be conducted under a separate planning process.

TABLE 6-3 SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS

Impact Category		Description
Air Quality	⦿	Short-term dust and exhaust during construction
Coastal Resources	O	
Compatible Land Use	O	
Construction Impacts	⦿	Short-term dust, exhaust erosion
DOT Act Section 4(F)	O	
Farmlands	O	
Fish, Wildlife and Plants	O	
Floodplains	O	
Hazardous Material, Pollution Prevention and Cultural Resources	O	
Historical, Architectural, Archaeological and Cultural Resources	O	
Light Emissions and Visual Impacts	O	
Natural Resources and Energy Supply	O	
Noise	⦿	Increased aircraft operations
Secondary (Induced) Impacts	⦿	Positive - direct/indirect economic benefits
Socioeconomic Impacts, Environmental Justice and Children's Environmental Health	⦿	Increased employment short-term
Water Quality	⦿	Storm water runoff
Wetlands	O	
Wild and Scenic Rivers	O	

O- No Impact ⦿- Moderate Impact ● - Significant Impact

Source: Armstrong Consultants, Inc., February 2012
Prepared by: Armstrong Consultants, Inc., February 2012

Based on this evaluation no significant environmental impacts are expected from the projects and improvements included in the Chapter 7 - Airport Development and Financial Plan during the planning period.

PAGE INTENTIONALLY LEFT BLANK

CHAPTER 7

AIRPORT DEVELOPMENT AND FINANCIAL PLAN

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

Chapter Seven
Airport Development and Financial Plan

7.1 INTRODUCTION

The airport development plan and financial feasibility analysis provides a demonstration of the Airport's ability to fund the projects presented in the Airport Master Plan. The recommended capital plan for the Roswell International Air Center based on the facility requirements identified earlier in this report. The assumptions within this Chapter are contingent upon the Federal Aviation Administration (FAA), the continuation of the existing capital funding programs and the growth of the Airport's aviation activity as projected within the report.

Roswell International Air Center, much like all Part 139 U.S. airports strive to be, is self-sustaining. The intrinsic value that a well-maintained airport brings to a community or region goes far beyond the day-to-day operational costs. In other words, the money spent and benefits received in the community or region by individuals or businesses that use the airport equals or exceeds the expenses, which are a result of operations at the Airport.

The principal objective of this Chapter is to assess the financial ability of the proposed capital improvement projects for Roswell International Air Center. The analysis covers a 20-year planning period including the initial-, intermediate-, and long-term goals and objectives. This Chapter indicates the ability of the Airport to undertake such capital projects and improvements proposed within the Master Plan.

7.2 AIRPORT DEVELOPMENT PLAN

Future airport development at Roswell International Air Center as included in this Airport Master Plan covers a 20-year planning period. Development items are grouped into three phases:

- Phase I: Initial-term (1-5 years)
- Phase II: Intermediate-term (6-10 years)
- Phase III: Long-term (11-20 years)

Estimated development costs are based on the proposed improvements (as shown on the Airport Layout Plan) and are included for each item in the financial development plan. Proposed improvements are based on the recommended facility requirements discussed in Chapter 3-Facility Requirements. The phasing of projects assists the airport sponsor in budgetary planning for future construction projects. **Figure 7-1** through **Figure 7-3**, at the end of the Chapter, shows the phasing of each project and is included at the end of this Chapter. **Table 7-1** outlines the 20-year financial development plan. The sequence in which the projects are completed is important as the ultimate configuration of the Airport will require numerous projects.

7.3 CAPITAL DEVELOPMENT

Potential funding sources for the recommended development projects indentified in Chapter 4 - Development Alternatives provided the bases for financial analysis. Funding sources come from the FAA, State and Local contribution. This section will identify and quantify the expected sources of capital funds. As previously indicated, FAA funds represent the majority of expected capital; however, a number of sources are identified and indicated below.

7.3.1 FEDERAL AVIATION ADMINISTRATION

In 2012, the FAA approved a Modernization and Report Act extending the reauthorization bill through September 2015. This bill returns the federal/state-local matching ratio to 90 percent/10 percent for AIP approved projects. The previous bill provided a 95 percent/5 percent federal/state-local matching ratio. The Federal Aviation Administration levies user charges on aviation that are returned to airports to pay for eligible projects. There are three types of FAA funding that may be used to pay for Master Plan projects; each is described below.

Entitlement – FAA entitlement funds are “earned” by airports based on the number of enplaned passengers using a sliding scale. An airport’s first 50,000 passengers per year earn $7.80 per passenger and the second 50,000 earn $5.20 per passenger. Additional passengers over certain levels earn $2.60 and $0.65 with passengers over 1,000,000 earning $0.50 each. The total earnings per airport are doubled if the AIP is funded over $3.35 billion per year, which has occurred in recent years. However, the minimum entitlement for FAA Primary airports (those that enplane at least 10,000 passengers per year) is $1,000,000.

Discretionary – Airport capacity, safety, and security projects are funded on a national priority system based on need. Many of the most expensive projects in the CIP such as the reconstruction of the primary Runway 3/21 are expected to be funded from discretionary funds. Other CIP projects may be eligible for FAA discretionary dollars, but are less highly ranked or have portions of the project that may be funded from discretionary funds. Discretionary funds provide for 90 percent of the cost of eligible projects.

Special FAA Funding – The FAA has additional funds reserved for unique types of projects that may be applicable to the Airport’s CIP. Navigation aids are one of these special areas, but none of the Airport’s current capital projects appears to apply.

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

TABLE 7-1 20 YEAR FINANCIAL DEVELOPMENT PLAN

			FAA Grant Eligible			Non-FAA Grant Eligible
Project No.	Phase I, Initial-Term Development	Total	FAA (90%)	State (5%)	Local (5%)	Local/Tenant (100%)
A1	Runway 3/21 Rehabilitation (Alt. 2B)[5]	$22,929,094	$20,636,184	$1,146,455	$1,146,455	-
A2	Taxiway A Shoulder Rehabilitation**	$1,500,000	$1,350,000	$75,000	$75,000	-
A3	Commercial Apron Rehabilitation	$76,000	$68,400	$3,800	$3,800	-
A4	General Aviation Apron (FBO) Overlay	$2,500,000	$2,250,000	$125,000	$125,000	-
A5	Taxiway K Relocation**	$1,300,000	$1,170,000	$65,000	$65,000	-
A6	Runway 17/35 Rehabilitation	$500,000	$450,000	$25,000	$25,000	-
A7	Industrial Apron Phase I Rehabilitation	$300,000	-	-	-	$300,000
A8	General Aviation Development	$1,100,000	$990,000	$55,000	$55,000	-
A9	Snow Removal Building Construction*	$800,000	$720,000	$40,000	$40,000	-
A10	Snow Removal Equipment	$300,000	$270,000	$15,000	$15,000	-
A11	Terminal Building Rehabilitation	$400,000	$360,000	$20,000	$20,000	-
A12	ARFF Equipment	$700,000	$630,000	$35,000	$35,000	-
A13	Closed Runway 12/30 Signage and Marking Update	$20,000	$18,000	$1,000	$1,000	
	Total Initial-Term Development	**$32,425,094**	**$28,912,584**	**$1,606,255**	**$1,606,255**	**$300,000**
Project No.	Phase II, Intermediate-Term Development	Total	FAA	State	Local	Local/Tenant
B1	Commercial Apron Overlay	$1,500,000	$1,350,000	$75,000	$75,000	-
B2	General Aviation Apron (FBO) Rehabilitation	$165,000	$148,500	$8,250	$8,250	-
B3	General Aviation Apron (Secondary) Rehabilitation	$18,000	$16,200	$900	$900	-
B4	Industrial Apron Phase II Rehabilitation	$300,000	-	-	-	$300,000
B5	Taxiway D Keel Rehabilitation	$51,000	$45,900	$2,550	$2,550	-
B6	Taxiway D Shoulder Reconstruction **	$300,000	$270,000	$15,000	$15,000	-
B7	Taxiway E Keel Rehabilitation	$40,000	$36,000	$2,000	$2,000	-
B8	Taxiway E Shoulder Reconstruction **	$340,000	$306,000	$17,000	$17,000	-
B9	Taxiway F Keel Rehabilitation	$41,000	$36,900	$2,050	$2,050	-
B10	Taxiway F Shoulder Reconstruction **	$340,000	$306,000	$17,000	$17,000	-
B11	Taxiway B Keel Rehabilitation	$950,000	$855,000	$47,500	$47,500	-
B12	Taxiway B Shoulder Reconstruction **	$3,500,000	$3,150,000	$175,000	$175,000	-
B13	Runway 17/35 Rehabilitation	$500,000	$450,000	$25,000	$25,000	-
B14	Taxiway M Keel Rehabilitation	$133,000	$119,700	$6,650	$6,650	-
B15	Taxiway M Shoulder Reconstruction **	$300,000	$270,000	$15,000	$15,000	-
B16	Taxiway C Rehabilitation **	$245,000	$220,500	$12,250	$12,250	-
B17	Taxiway G Rehabilitation **	$24,000	$21,600	$1,200	$1,200	-
B18	Taxiway H Rehabilitation **	$21,000	$18,900	$1,050	$1,050	-
B19	Taxiway J Rehabilitation **	$28,000	$25,200	$1,400	$1,400	-
B20	Ground Transportation Expansion	$1,400,000	-	-	-	$1,400,000
B21	Airport Layout Plan Update	$150,000	$135,000	$7,500	$7,500	-
B22	Electronic Airport Layout Plan	$450,000	$405,000	$22,500	$22,500	
	Total Intermediate-Term Development	**$10,796,000**	**$8,186,400**	**$454,800**	**$454,800**	**$1,700,000**
Project No.	Phase III, Long-Term Development	Total	FAA	State	Local	Local/Tenant
C1	Taxiway A Keel Rehabilitation	$320,000	$288,000	$16,000	$16,000	
C2	General Aviation Apron (FBO) Overlay	$2,500,000	$2,250,000	$125,000	$125,000	
C3	Taxiway K Rehabilitation	$39,000	$35,100	$1,950	$1,950	
C4	Industrial Apron Phase III Rehabilitation	$300,000	-	-	-	$300,000
C5	Runway 17/35 Overlay	$4,600,000	$4,140,000	$230,000	$230,000	
C6	Terminal Building Expansion	$1,500,000	$1,350,000	$75,000	$75,000	-
C7	Rental Car Facility Expansion	$160,000	-	-	-	$160,000
C8	Industrial and Business Park Development	$1,600,000	-	-	-	$1,600,000
C9	Airport Master Plan Update	$250,000	$225,000	$12,500	$12,500	-
	Total Long-Term Cost	**$11,269,000**	**$8,288,100**	**$460,450**	**$460,450**	**$2,060,000**
	TOTAL DEVELOPMENT COST	**$54,490,094**	**$45,387,084**	**$2,521,505**	**$2,521,505**	**$4,060,000**

Prepared by: Armstrong Consultants, Inc, 2012
Note 1. All costs are estimated in 2011 dollars and include mobilization, administrative and engineering costs
Note 2. Rehabilitation: Asphalt (Crack Seal, Seal Coat) and Concrete (Surface Patching, Joint Seal Concrete)
Note 3. Overlay: Mill and Overlay Asphalt
Note 4. Reconstruction: Remove and Replace
Note 5. Alternative 1B would require an additional $10 million of non-FAA funding for a 200' runway width versus 150' width
**Denotes Passenger Facility Charge (PFC) contribution within the local share.*
***Reconstruction also includes Lighting and Signage Upgrade to LED Light Fixtures*

PAGE INTENTIONALLY LEFT BLANK

7.3.2 State of New Mexico

The State funds certain airfield and landside capital projects. The New Mexico Department of Transportation Aviation Division has historically provides 2.5 percent (half of the five percent matching funds) of the project costs on AIP eligible projects. The State also funds a percentage of capital and pavement maintenance projects which are State funded only. Since 2000, the State has contributed $1.5 million to the Airport's development and improvement.

7.3.3 Roswell International Air Center

The Airport sponsor has several methods available for funding the capital required to meet the local share of airport development costs. The most common methods involve cash (including Passenger Facility Charge (PFC) revenues, debt financing (which amortize the debt over the useful life of the project), force accounts, in-kind service, third-party support and donations.

The Airport will fund all remaining capital project amounts from annual earning or reserves. The Airport principally collects revenues from rental cars, general aviation users, and tenants such as airlines and Fixed Base Operators (FBO). As necessary, rate increases or new charges can be implemented to obtain the necessary capital funds. Borrowing can also occur, but such funds are ultimately repaid with operating earnings. Increased air traffic should also generate more revenue.

Local funding and financing alternatives are listed below:

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

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

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

<u>Revenue Bonds.</u> Revenue Bonds are payable solely from the revenues of a particular project or from operating income of the borrowing agency, such as an airport commission which lacks taxing power. Generally, they fall outside of constitutional and statutory limitations and in many cases do not require voter approval. Because of the limitations on the other public bonds, airport

sponsors are increasingly turning to revenue bonds whenever possible. However, revenue bonds normally carry a higher rate of interest because they lack the guarantees of municipal bonds. It should also be noted that the general public would usually be wary of the risk involved with a revenue bond issue for a general aviation airport. Therefore, the sale of such bonds could be more difficult than other types of bonds.

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

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

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

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

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

7.4 PAVEMENT MAINTENANCE PLAN

Periodic maintenance is necessary to prolong the useful life of the airport pavements. The affects of weather, oxidation and usage cause the pavement to deteriorate. The accumulation of moisture in the pavement causes heaving and cracking and is one of the greatest causes of pavement distress. The sun's ultraviolet rays oxidize and break down the asphalt binder in the pavement mix. This accelerates raveling and erosion and can reduce asphalt thickness.

The appropriate pavement maintenance will minimize the effects of weather damage and oxidation. Crack sealing is accomplished to keep moisture from accumulating inside and underneath the pavement and should be accomplished at least every five years prior to fog sealing or overlaying the pavements. Fog seals, slurry seals and coal tar emulsion (fuel resistant) seals are spread over the entire paved area to replenish the binder lost through aggregate to increase the friction coefficient of the pavement. Asphalt overlays are accomplished near the end of the useful life of the pavement. A layer of new asphalt is placed over the existing pavement to renew the life of the pavement and to recover lost strength due to deterioration. Unless specially designed, the overlay is not intended to increase the weight bearing capacity of the pavement. Overlays may be supplemented with a porous friction course of grooving to increase friction and minimize hydroplaning. Remarking of the pavement is required following a fog seal or overlay.

The recommended pavement maintenance cycle time frames are listed below in **Table 7-2**. It should be noted that the time frames are recommendations only. Actual pavement deterioration will be affected by use of the Airport and weather exposure. Maintenance actions should be programmed as necessary through close monitoring and inspection of the pavements.

TABLE 7-2 PAVEMENT MAINTENANCE SCHEDULE

Pavement Maintenance Cycle	Approximate Time Frames
Crack Seal Pavement	1 - 2 years
Crack Seal, Seal Coat and Remark Pavements	3 - 8 years
Overlay Pavements	15 - 18 years
Seal Concrete Joints	6 - 8 years

Source: Armstrong Consultants, Inc.
Prepared By: Armstrong Consultants, Inc. Oct, 2011

7.5 AEROSPACE INDUSTRIAL PARK

The Federal Aviation Administration (FAA) Office of Commercial Space Transportation (AST) has established a Space Transportation Infrastructure Matching (STIM) Grants Program for the purpose of ensuring the resiliency of the space transportation infrastructure in the United States. The U.S. Congress mandated the Grant Program under 51 U.S.C. Chapter 511 Space Infrastructure Matching Grants 51 U.S.C. Chapter 511 Space Infrastructure Matching Grants. This legislation authorizes the use of Federal monies in conjunction with matching state, local government, and private funds.

FY 2010 was the first year that Federal funds were appropriated. Under this program, development projects eligible for funding include technical and environmental studies; construction, improvement, and design and engineering of space transportation infrastructure, including facilities and associated equipment; and real property to meet the needs of the United States commercial space transportation industry. The program provides up to 50 percent of the total project cost in conjunction with state and local government funding. A minimum of 10 percent of the funding must come from private sources. The program received an additional appropriation in 2011.

Since 2010, approximately $1 million in funding ($500,000 per year) has been awarded to five commercial spaceport authorities. In the 2012 proposed budget, FAA's Office of Commercial Space Travel (FAA-AST) has requested an $11 million increase in total funding to $26 million. However, there has been some pushback in Congress with the House Appropriations Committee voting to support a $2 million decrease to $13 million. Therefore, there is no certainty that the STIM program will continue in 2012. If the program is continued, it will remain at current $500,000 annual amount, which could constitute the total funding for spaceport infrastructure for all US commercial spaceports.

Roswell International Air Center could utilize several sources to support development of aviation and spaceport projects. The Airport would work closely with FAA and NMDOT to develop projects that could meet priority requirements of each agency. For projects that are specifically for space transportation, Roswell must work with the FAA-AST to determine availability of funds, as these funds are not assured. A detailed description of the financial responsibility can be found in 14 Code of Federal Regulations (CFR) Part 440.

7.6 FINANCIAL PLAN

The principal objective in this financial plan is to assess the feasibility of the proposed capital improvements at Roswell International Air Center. This analysis covers a 20 year planning period including the initial, intermediate, and long-term and indicates the ability of the Airport to undertake the improvements proposed in the Airport Master Plan Capital Improvement Program (CIP). The analysis considers several elements including the following:

- The Airport's historical financial structure including revenue sources, expense categories, debt service obligations, and recent trends in operating expenses and revenues.
- The phased plan of scheduled/proposed capital projects covering the Airport Master Plan period presented in the previous chapter. The phasing plan also includes a proposed funding plan for the initial term.
- An analysis of Passenger Facility Charge (PFC) revenue and its use in funding future Airport improvements.

An airport's financial structure can vary, perhaps significantly, from year to year as changes occur in air traffic, number of tenants, rates charged, construction costs, level of operating expenses, and other factors. Financial projections for the intermediate and long-term planning phases, in particular, should be viewed as tentative and updated frequently in the future. The capital project financial plan presented in this Chapter, while representative of today's best estimate, is subject to a wide variety of influences and may prove to need adjustment in the future for several reasons including, but not limited to, the following:

- The priorities in identified capital improvements may change. For example, market conditions may cause changes in maintenance of existing facilities, require new facilities, or redefine priorities.
- Safety and security improvements, whether they are reflected in the CIP or not, may require immediate funding and force postponement of other projects.
- Cost estimates to provide improvements can fluctuate particularly when considering factor such as technological advancements, economies of scale related to undertaking

several improvements at once, and the cost of raw materials such as concrete, steel, and other building materials.
- Emergency repairs or changes required by new regulations may require funds that had been programmed for other projects are reallocated.

It is recommended that the financial plan, including the CIP, be utilized as a working tool, which should be updated as necessary. Capital improvements, their associated costs, and financial projections should be re-examined periodically throughout the planning period even though the figures contained herein present a reasonable forecast of needed initiatives to implement the Master Plan recommendations.

7.6.1 PROJECTED REVENUE AND EXPENDITURE

Airport operating expenditures typically include insurance, utilities, and maintenance and management costs. Insurance costs include liability insurance for the Airport and property insurance for any real property on the Airport owned by the City of Roswell. Utility expenses primarily consist of electrical power to operate airfield lighting and visual aids and water for public use areas. Pavement maintenance consists of crack sealing on an annual basis and seal coating and remarking the pavements every five years. Facility maintenance consists of mowing, snow removal and repair and replacement of parts and equipment such as light bulbs, light fixtures, fences, etc. Management costs include an airport manager and staff members, maintenance and emergency response. Currently at Roswell International Air Center, there is a full-time airport management team which consists of an airport manager, security and operations supervisor, maintenance staff and property manager.

Airport revenues at Roswell International Air Center consist of land leases, user fees, fuel flowage fees, landing fees, PFCs, tenant lease space, fines and forfeitures, and property taxes generated from on-airport improvements. Descriptions of airport revenue generating opportunities are found below:

Land and Ground Leases. Property on the airport that is not devoted to airfield use, vehicle parking or contained within areas required to be cleared of structures may be leased to individual airport users or aviation related businesses. Typically, the individual is provided a long-term lease on which to construct a hangar, business or other facility. At the termination of the lease, the lessee has the option to renew the lease, sell or lease the buildings or to remove the buildings. Roswell International Air Center currently collects revenue through the form of land leases. The main component of the land lease is comprised of aircraft storage around the airfield.

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

Hangar Rental. The FBO Hangar is available for monthly or nightly rental. The fees are usually established on a monthly basis for based aircraft and on an overnight basis for transient aircraft. Roswell International Air Center currently collects revenue through the form of hangar rentals.

Fines and Forfeitures. The Airport has the ability to collect revenue through fines and penalties imposed to users through the form of flowage fees, parking fees, Foreign Trade Zone (FTZ) user fees and property damage claims.

Passenger Facility Charges (PFC). The Aviation Safety and Capacity Expansion Act of 1990 authorized the Secretary of Transportation to grant public agencies the authority to impose a Passenger Facility Charge (PFC) to fund eligible airport projects. The initial legislation set the maximum PFC level at $3.00 per enplaned passenger. AIR-21 increased the maximum PFC level form $3.00 to $4.50. In 2012, the FAA Modernization and Report Act retained the PFC cap at $4.50. Although the FAA is required to approve PFCs, the program allows for local collection of PFC revenue through the airlines operating at an airport and provides more spending flexibility to airport sponsors versus AIP funds (see **Table 7-3**). The Airport currently imposes a PFC at the $4.50 level and this charge is expected to continue. At current passenger levels, in 2010, approximately $148,940 was collected from PFCs.

TABLE 7-3 POTENTIAL PASSENGER FACILITY CHARGE (PCF) REVENUES

	Calendar Year	Annual Enplanements	Potential Annual PFCs ($4.50)
Historical	2010	38,933	$148,940
Projected	2015	44,264	$193,212
	2020	50,326	$219,673
	2025	57,217	$249,752
	2030	65,053	$283,956

Prepared by: Armstrong Consultants, Inc., January 2012
Note: PFC Calculation assumes that 97 percent of enplanements are revenue passengers.

Tie-Down Fees. A fee is typically established for the use of fixed ramp tiedowns on paved apron areas. The fees are usually established on a monthly or annual basis for based aircraft and on an overnight basis for transient aircraft. Roswell International Air Center does not currently collect tie-down fees for aircraft.

Through-the-Fence Fees. A fee is typically charged to adjacent landowners who are provided access directly from their private parcel to the public use airport facilities. This fee ensures that the level of rates and charges assessed to on-airport users is equitable to off-airport users and that there is not an unfair economic advantage to operating through-the-fence. Additionally, through-the-fence operators are required to maintain a secure airport perimeter with fencing and/or gates and to construct paved access taxiways to the airport operating areas. However, the FAA generally discourages through-the-fence operations. Therefore, it is anticipated that all aircraft operations will be conducted from on airport and therefore will not generate through-the-fence fees. In lieu of through-the-fence fees, these aircraft would generate tie-down fees or land lease revenue from hangars. Roswell International Air Center does not currently collect any through-the-fence fees.

Fuel Flowage Fee. This fee is typically imposed on all aircraft fuels delivered to the airport and would include all fuels used by aircraft including AvGas and Jet-A. The fee would apply to fixed base operators, self-fueling and through-the-fence operators who conduct self-fueling. Roswell International Air Center currently collects a fuel flowage fee.

Airport Usage, Landing and Ramp Fee. This fee is typically imposed on commercial and charter aircraft and can be waived if the operator purchases a minimum of 50 gallons of fuel. The airport usage fee is usually charged by the FBO. Roswell International Air Center currently collects fees associated with airport, landing and ramp usage.

Table 7-4 shows the existing rates and charges for Roswell International Air Center.

TABLE 7-4 EXISTING RATES AND CHARGES

Description	Rate/Charge
Hangar Lease Space	$1.25 per square foot (monthly)
Ground and Land Lease	$235 per acre fenced / $100 per acre unfenced (monthly)
Tie Down	N/A
Fuel Flowage Fee	$0.04 per gallon
Landing Fees	$0.50 per 1,000 pounds gross takeoff weight

Source: Airport Manager, 2011
Prepared by: Armstrong Consultants, Inc., January 2012

All revenues generated by the Airport must be expended by the Airport for the capital or operating costs of the Airport. No revenue generated on the Airport may go into the general fund for the City of Roswell.

Table 7-5 shows the historically and projected revenues and expenses for Roswell International Air Center. The projections are based on historical data provided by the Airport Manager. Historically the revenues have exceeded the expenses at the Airport. The excess revenues can be used toward the local match for federal or state capital improvement projects, self-funded airport improvements, airport marketing and promotion or other airport generating and maintenance costs.

Table 7-5 also shows how the implementation of the Airport Layout Plan capital improvement projects would increase revenues at the Airport. The assumption is made that as infrastructure is put in place at the Airport that additional revenues would result from the increased number of based aircraft, additional hangars, increased aircraft operations and corporate influx. The Airport has additional methods of generating revenue which were not included in the calculation below such as charging for parking.

Table 7-5 Annual Airport Revenues and Expenses[1, 2]

AIRPORT REVENUE	2010	2015	2020	2030
Capital Improvement Revenue [3]	$1,313,314	$1,020,000	$3,851,250	$4,174,706
Fines and Forfeitures[4]	$553,579	$553,579	$553,579	$553,579
Interest Incomes	$23,564	$27,317	$31,668	$42,559
Rentals and Leases	$1,396,418	$1,759,181	$2,039,373	$2,740,746
Miscellaneous Revenue	$17,224	$17,224	$17,224	$17,224
Passenger Facility Charge	$148,940	$193,212	$219,673	$283,956
Charges for Services, use and landing fees and facility rental	$519,347	$602,066	$697,959	$937,998
Total Airport Revenue	**$3,972,386**	**$4,172,578**	**$7,410,726**	**$8,750,769**
AIRPORT EXPENDITURES	**2010**	**2015**	**2020**	**2030**
Salaries and Wages	$385,839	$385,839	$385,839	$385,839
Benefits	$102,983	$102,983	$102,983	$102,983
Operating Expense	$1,287,535	$1,287,535	$1,287,535	$1,287,535
Capital Improvement Costs[5]	$1,731,665	$2,150,000	$5,500,000	$6,600,000
Retirement Fund	$42,372	$42,372	$42,372	$42,372
Debt Service	$266,310	$133,155	$0	$0
Total Airport Expenditures	**$3,916,704**	**$4,101,884**	**$7,318,729**	**$8,670,000**
Net Total Airport[6]	**$55,682**	**$70,694**	**$91,997**	**$80,769**

Prepared by: Armstrong Consultants, Inc., 2012
1/ Projections based on the average of each time period with 3 percent annual growth (in 2011 dollars)
2/ Projections based on 3 gallons of fuel required per aircraft operation
3/ Capital Improvement Revenue include FAA and State grants.
4/ Payment from tenants/users for fines incurred during the calendar year
5/ Capital Improvement costs include local matching contribution as well as grant funds expanded.
6/ Individual totals rounded to the nearest tenth. Overall total is based on true total, not rounded.

7.7 RECOMMENDATIONS

The Roswell International Air Center has a limited amount of revenue collection. The most effective means of increasing revenue at the Airport is to accommodate existing unmet demand and to continue to attract new and additional users. Several potential strategies for increasing revenues are listed below:

- Increase rates for ground leases and increase the number of ground leases for aircraft storage hangars
- Increase hangar storage rates
- Increase landing fees
- Charge passengers and visitors for short-, and long-term parking
- Increase fuel flowage fee
- Focus on attracting business/corporate aviation tenants
- Increase the industrial and business development park

In November, 2011, a Traffic and Demand Analysis and Air Service Strategy study[1] was completed for the Airport. The Roswell International Air Center and its primary service area are currently served by American Airlines (American Eagle) air service access to Dallas-Fort Worth International Airport (DFW). DFW is a major US hub and allows for air travelers to connect to many domestic and international destinations on a daily, non-stop basis. Given the population of the Roswell International Air Center's service area and enplanement generation ability, the DFW

1 *The Boyd Group International, November 2011*

access is a very strong service for the community. Air service revolves squarely around the connecting airline hubs. In the case of Roswell International Air Center, there are three geographically logical new airline hubs that would provide increased access. They are Denver, Phoenix, and Salt Lake City. Increased air service will provide for additional enplanements which positively affect the community's economic output and increases the Airport's PFC collection. The strongest growth outlook for Roswell is the additional service to Phoenix International Airport (PHX) via U.S. Airways. This air service will provide Roswell with good westbound connectivity without circuitous routings that DFW service offers.

Increasing aircraft storage hangars at the airport would result in not only increased direct revenues generated through property leases, but would also produce indirect revenue through increased use of airport services and facilities, such as fuel purchases. Several aircraft owners have indicated an interest in leasing land from the airport to construct hangars. Locations for additional nested T-hangars and individual box hangars have been identified on the Terminal Area Drawing (TAD) of the Airport Layout Plan. Business/corporate tenants are typically flight departments for local businesses and provide employment in the local community. They generally operate multi-engine turboprop or business jet aircraft. Their land lease parcels are usually large, the aircraft are typically operated two to three times per week and fuel purchases are typically larger than other general aviation user (several hundred gallons per fueling).

Whether the improved Roswell International Air Center operates at an annual surplus or subsidy depends greatly on the amount of activity and facilities that are constructed at the Airport. Existing demand is currently constrained by inadequate hangar space. With increased operations at the airport due to the availability of hangar space, the airport would then need to accommodate increased numbers of based and transient aircraft with hangars. This can be accommodated through the construction of taxilanes and providing land leases for hangars.

7.7.1 COMMUNITY SUPPORT

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

The use of corporate and business aircraft is an increasing trend throughout the United States. The movement of American industry from large metropolitan areas to smaller communities which offer lower taxes and labor costs and a better working environment has influenced this trend. Time is money in the business environment and corporate aircraft are answering the need for quick and convenient access to and from these new locations for both executives and management personnel. The ability of a community to provide convenient access to corporate aircraft will be reflected not only in benefits to existing businesses and industries but will be a strong factor in attracting new industry. These factors place Roswell International Air Center in a prime position to capitalize on the trends in the commercial and general aviation industry and to maximize the benefits the airport provides to the community.

Commercial development can be grown through assistance of local businesses and community members. Because it has been identified that the airline hub with the greatest potential for

Roswell International Air Center flights is US Airways hub in Phoenix, the following is a recommended course of action for the Airport and the community:

- Roswell International Air Center inquires with local businesses/community about the possibility of a potential financial incentive for US airways to offset the risk of operating a ROW-PHX flight. Any type of financial risk abatement is attractive to an airline.
- Specific business and economic activity in the Roswell service area that can be connected to the PHX region or areas west of PHX that would be logical connections over PHX. A revenue guarantee or subsidy is often used.
- Prepare a community survey to aid in the determination of market demand for a PHX connection.
- Detailed incentive plan that can be offered to US Airways should be shared with the airline to let them know what ROW can do to help make the flight successful. This would allow US Airways to take into consideration any cost benefit or fee waivers that they might not otherwise be aware of when examining the market viability at Roswell International Air Center.

7.8 CONTINUOUS PLANNING PROCESS

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

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

7.9 SUMMARY

This Chapter indicates that funding will be available to plan, design and construct the projects identified in the Airport Master Plan. A total of 62 CIP projects have been identified of which all are programmed within the next 20-year planning period.

This financial analysis is based on the continuation FAA and State funding at the current levels. However, there is a competition for FAA and State funds, so the Airport will need to aggressively communicate its CIP needs to the FAA, State, and other relevant agencies as opportunities arise.

Based on the assumptions, the financial analysis presented herein, the CIP is considered practicable and it is anticipated that Roswell International Air Center will be able to construct the necessary aviation facilities as recommended herein. Of course, the continued monitoring of the Airport's financial status is necessary to adapt and adjust to condition change.

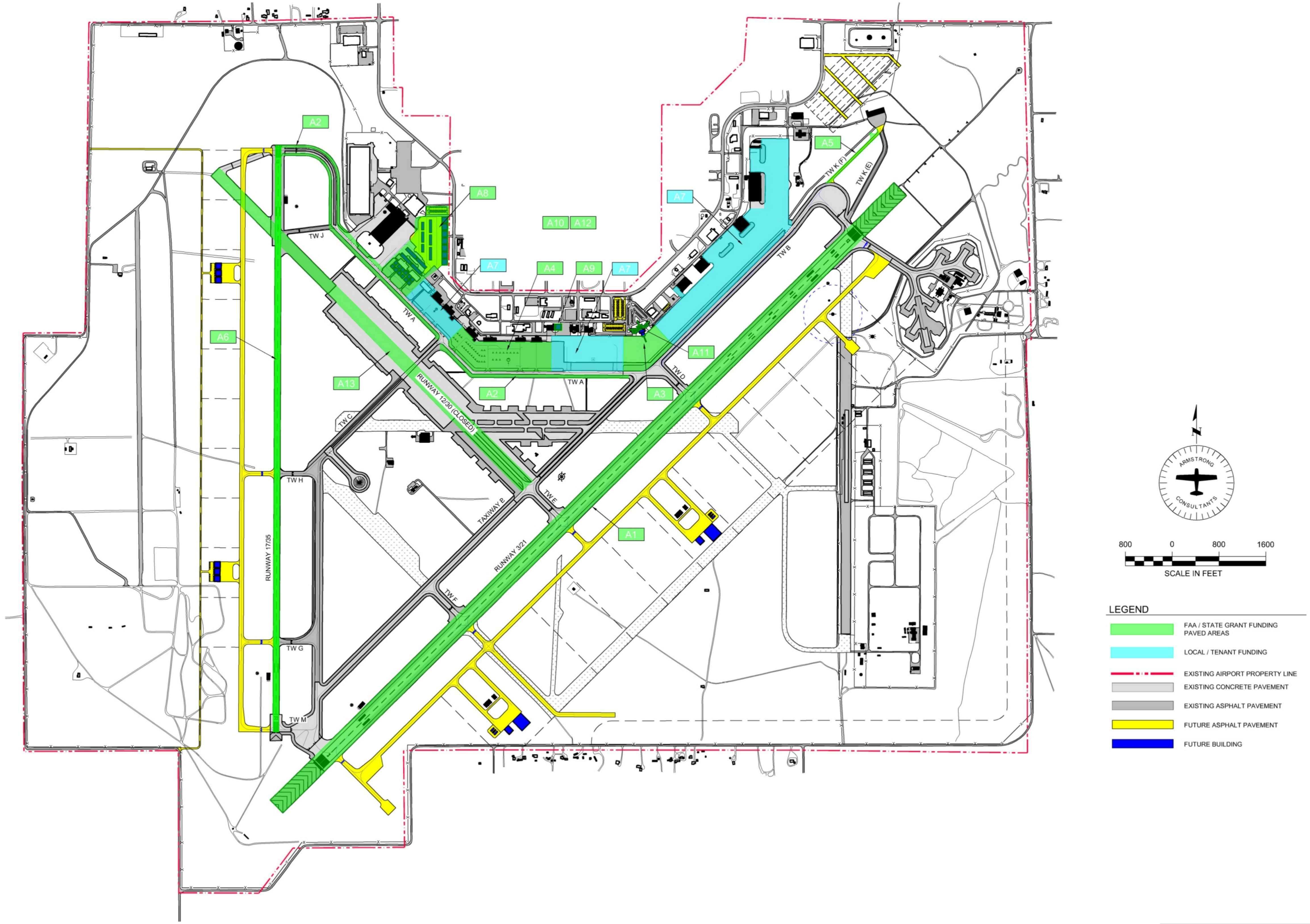


Figure 7-1 Phase I Initial-Term Development

Page Intentionally Left Blank

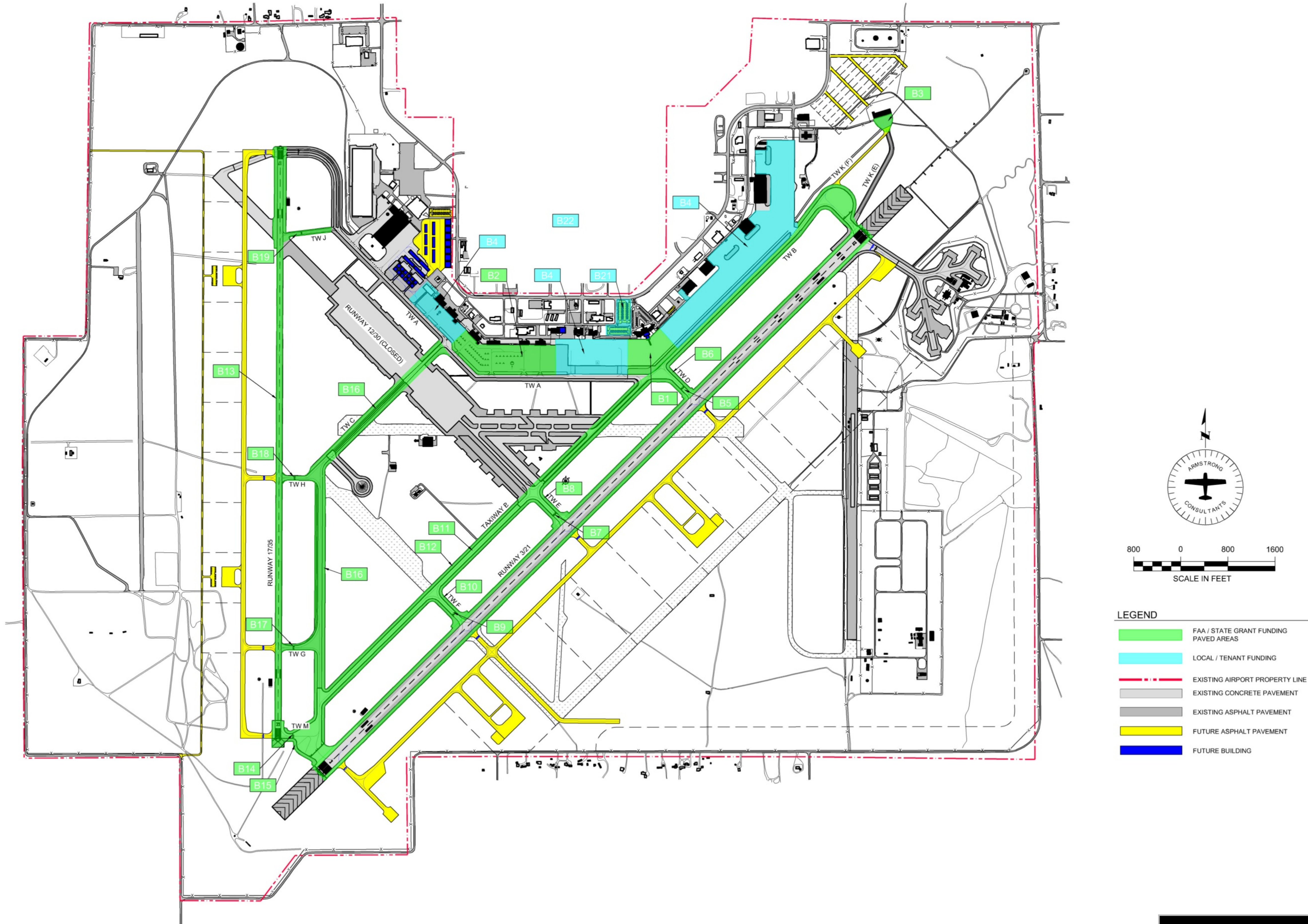


FIGURE 7-2 PHASE II INTERMEDIATE-TERM DEVELOPMENT

PAGE INTENTIONALLY LEFT BLANK

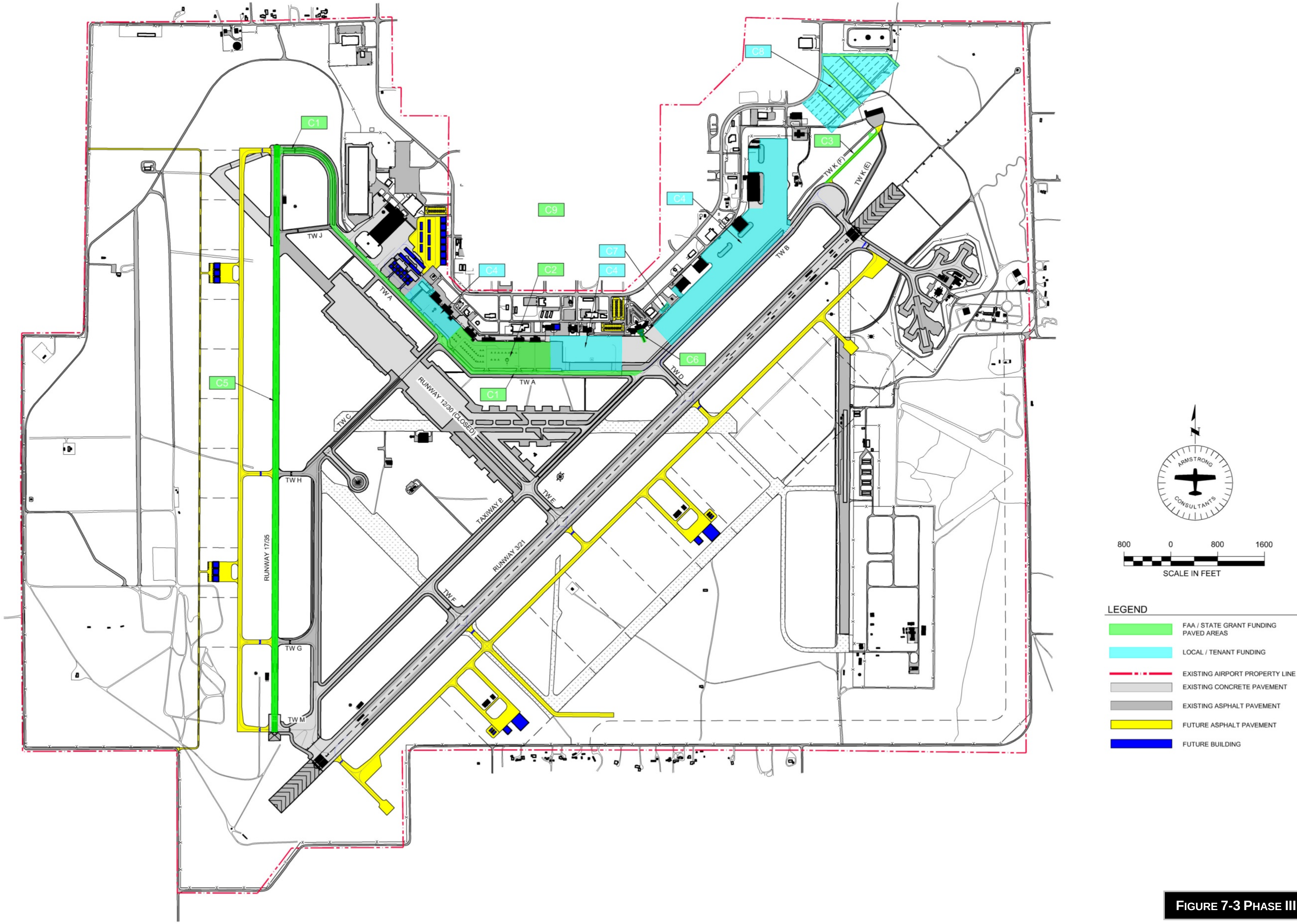


FIGURE 7-3 PHASE III LONG-TERM DEVELOPMENT

PAGE INTENTIONALLY LEFT BLANK

APPENDIX

A

DESIGN STANDARDS INVENTORY

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

ROSWELL NEW MEXICO

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING

Airside Inventory Checklist

Airport	Roswell International Air Center	ARC	D-IV
City	Roswell, New Mexico	Approach Type	Nonprecision/Precision
Contact	Jennifer Brady	Date Inventoried	April 28, 2011
Phone No.	(575) 347-5703	Inspected By	JZP

Runway 3/21 Inventory	**Published**	**Required D-IV**	**Actual**
Distance To:			
Hold lines from centerline		250'	300'-400'
Parallel taxiway from centerline		400'	829'-836'
Aircraft parking from centerline		500'	921'
Runway width	200'	150'	200'
Runway length	13,001'	-	13,001'
RSA width		500'	500'
ROFA width		800'	800'
Primary/transitional surface penetrations		Clear	Clear
Longitudinal grade - site distance problems		.8% - 1.5% -.8%	Met
OFZ Width		400'	400'
Pavement marking type	Yes	Precision	Precision
Pavement marking condition	Fair	-	Fair
Pavement strength	100,000 SWG 200,000 DWG 400,000 DTW	-	100,000 SWG 200,000 DWG 400,000 DTW
Pavement condition	Good	-	Good
Runway 3 End Inventory			
RSA beyond runway end	-	1,000'	1,000'
ROFA beyond runway end	-	1,000'	1,000'
Approach obstructions	-	--	-
Runway end elevation	-	--	3,666'
RPZ	-	Owned in Fee	Owned in Fee
Runway 21 End Inventory			
RSA beyond runway end	-	1,000'	1,000'
ROFA beyond runway end	-	1,000'	1,000'
Approach obstructions	-	-	-
Runway end elevation	-	-	3.622'
RPZ	-	Owned in Fee	Owned in Fee
Runway Lighting Inventory			
Distance from pavement edge	-	10' Max	60'
Maximum distance between lights	-	200' Max	200'
Type	HIRL	HIRL	HIRL
Condition	-	-	Good
Color	-	White/Amber	White/Amber
Runway 3 Threshold			
Distance from pavement edge	-	10' Max	60'
Color / Number of lights	-	Red/Green/8	Red/Green/8
	-		
Runway 21 Threshold			
Distance from pavement edge	-	10' Max	60'
Color	-	Red/Green/8	Red/Green/8

COMMENTS

Airside Inventory Checklist

Airport	Roswell International Air Center	ARC	C-III
City	Roswell, New Mexico	Approach Type	Nonprecision
Contact	Jennifer Brady	Date Inventoried	April 28, 2011
Phone No.	(575) 347-5703	Inspected By	JZP

Runway 17/35 Inventory	Published	C-III	Actual
Distance To:			
Hold lines from centerline		250'	250' - 360'
Parallel taxiway from centerline		400'	700'
Aircraft parking from centerline		500'	1,096'
Runway width	100'	100'	100'
Runway length	9,999'	-	9,999'
RSA width		500'	500'
ROFA width		800'	800'
Primary/transitional surface penetrations		Clear	Clear
Longitudinal grade - site distance problems		.8% - 1.5% -.8%	Met
OFZ Width		400'	400'
Pavement marking type	Yes	Nonprecision	Nonprecision
Pavement marking condition	Fair	-	Fair
Pavement strength (in pounds)	77,000 SWG 104,000 DWG 165,000 DTW	-	77,000 SWG 104,000 DWG 165,000 DTW
Pavement condition	Good	-	Good
Runway 17 End Inventory			
RSA beyond runway end	-	1,000'	1,000'
ROFA beyond runway end	-	1,000'	1,000'
Approach obstructions	-	--	-
Runway end elevation	-	--	3,661'
RPZ	-	Owned in Fee	Owned in Fee
Runway 35 End Inventory			
RSA beyond runway end	-	1,000'	1,000'
ROFA beyond runway end	-	1,000'	1,000'
Approach obstructions	-	-	-
Runway end elevation	-	-	3,670'
RPZ	-	Owned in Fee	Owned in Fee
Runway Lighting Inventory			
Distance from pavement edge	-	10' Max	10'
Maximum distance between lights	-	200' Max	200'
Type	MIRL	MIRL	MIRL
Condition	-	-	Good
Color	-	White/Amber	White/Amber
Runway 17 Threshold			
Distance from pavement edge	-	10' Max	10'
Color / Number of lights	-	Red/Green/8	Red/Green/8
0	-		
Runway 35 Threshold			
Distance from pavement edge	-	10' Max	10'
Color	-	Red/Green/8	Red/Green/8

COMMENTS

Airside Inventory Checklist

Airport	Roswell International Air Center	ARC	D-IV
City	Roswell, New Mexico	Approach Type	Nonprecision/Precision
Contact	Jennifer Brady	Date Inventoried	April 28, 2011
Phone No.	(575) 347-5703	Inspected By	JZP

Taxiway Inventory	Published	Required D-IV	Actual
Taixway width	-	75'	75' - 80'
TSA width	-	171'	171'
TOFA width	-	225'	225'
Dist. from centerline to fixed or movable obj	-	112.5'	112.5'
Pavement marking type	-	Centerline	Centerline
Pavement marking condition	-	-	Fair
Pavement strength (in pounds)	100,000 SWG 200,000 DWG 400,000 DTW	-	100,000 SWG 200,000 DWG 400,000 DTW
Pavement condition	Varies	-	Varies
Taxiway Lighting Inventory			
Distance from pavement edge	-	10'	10'
Maximum distance between lights	100'	100' Max	100'
Type	MITL	-	MITL
Condition	-	-	Good
Color	-	Blue	Blue
Miscellaneous			
Type of beacon	White-Green	Yes	White - Green
Visual Aids (i.e. PAPI, VASI, REIL, etc.)	VASI-6 (RW 3) MALSR (RW 21)	-	VASI-6 (RW 3) MALSR (RW 21)
Windcone (condition & compliance)	Yes-L	Yes	Yes-L
Segmented circle (condition & compliance)	Yes	Yes	Yes
Traffic Pattern Indicator	L	No	L
Fencing	-	Perimeter/Terminal	Perimeter/Terminal
Signs (type, condition)	-	Yes	Yes, Good

COMMENTS

Airside Inventory Checklist

Airport	Roswell International Air Center	ARC	C-III
City	Roswell, New Mexico	Approach Type	Nonprecision
Contact	Jennifer Brady	Date Inventoried	April 28, 2011
Phone No.	(575) 347-5703	Inspected By	JZP

Taxiway Inventory	Published	Required D-IV	Actual
Taixway width	-	50'	50' - 75'
TSA width	-	118'	118'
TOFA width	-	186'	186'
Dist. from centerline to fixed or movable obj	-	81'	81'
Pavement marking type	-	Centerline	Centerline
Pavement marking condition	-	-	Fair
Pavement strength (in pounds)	77,000 SWG 104,000 DWG 165,000 DTW	-	77,000 SWG 104,000 DWG 165,000 DTW
Pavement condition	Varies	-	Varies
Taxiway Lighting Inventory			
Distance from pavement edge	-	10'	10'
Maximum distance between lights	Yes	100' Max	
Type	MITL	-	MITL
Condition	-	-	Good
Color	-	Blue	Blue
Miscellaneous			
Type of beacon	White-Green	Yes	White - Green
Visual Aids (i.e. PAPI, VASI, REIL, etc.)	PAPI-4 (RW 35) VASI-4 (RW 17)	-	PAPI-4 (RW 35) VASI-4 (RW 17)
Windcone (condition & compliance)	Yes-L	Yes	Yes-L
Segmented circle (condition & compliance)	Yes	Yes	Yes
Traffic Pattern Indicator	L	No	L
Fencing	-	Perimeter/Terminal	Perimeter/Terminal
Signs (type, condition)	-	Yes	Yes, Good

COMMENTS

Landside Inventory Checklist

Airport	Roswell International Air Center	ARC	D-IV
City	Roswell, New Mexico	Approach Type	Precision/Nonprecision
Contact	Jennifer Brady	Date Inventoried	April 28, 2011
Phone No.	(575) 347-5703	Inspected By	JZP

Facilities	Existing	Notes
Tie-downs	26	
T-hangars	2	
Box hangars	10	
Apron		
Size	531,309 SY	
Pavement strength (in pounds)	40,000 - 70,000 SWG 60,000 -110,000 DWG 120,000 - 160,000 DTW	-
Pavement condition	Poor to Very Poor	
Pavement marking	Tiedowns / Taxilane	
Pavement marking condition	Good to Fair	
Automobile parking	182 (132 Paved/50 Unpaved)	
Weather equipment	Yes (ASOS)	
Fuel storage	Yes	
Fuel type available	Jet-A and 100LL Avgas	
FBO/Terminal building	Yes / 25,703 sf	

COMMENTS

APPENDIX

B

TAF FORECAST COMPARISON

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

Template for Comparing Airport Planning and TAF Forecasts

AIRPORT NAME: ROSWELL INTERNATIONAL AIR CENTER

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Itinerant Operations				
Base yr.	2010	26,087	27,207	-4.1%
Base yr. + 5yrs.	2015	30,164	27,547	9.5%
Base yr. + 10yrs.	2020	34,768	28,543	21.8%
Base yr. + 15yrs.	2025	40,117	29,609	35.5%
Base yr. + 20yrs.	2030	46,259	30,749	50.4%
Local Operations				
Base yr.	2010	25,471	25,916	-1.7%
Base yr. + 5yrs.	2015	29,435	25,134	17.1%
Base yr. + 10yrs.	2020	34,114	25,169	35.5%
Base yr. + 15yrs.	2025	39,535	25,204	56.9%
Base yr. + 20yrs.	2030	45,814	25,239	81.5%
Total Operations				
Base yr.	2010	51,588	52,943	-2.6%
Base yr. + 5yrs.	2015	59,599	52,681	13.1%
Base yr. + 10yrs.	2020	68,900	53,712	28.3%
Base yr. + 15yrs.	2025	79,652	54,813	45.3%
Base yr. + 20yrs.	2030	92,073	55,988	64.5%

NOTES: TAF data is on a U.S. Government fiscal year basis (October through September).
AF/TAF (% Difference) column has embedded formulas.

APPENDIX

C

AGENCY COORDINATION

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING

January 31, 2012

ACI # 116105

Mr. Richard Goodyear
New Mexico Environment Department
Air Quality Bureau
1301 Siler Road
Building B
Santa Fe, New Mexico 87507

RE: Roswell International Air Center Airport Master Plan

Dear Mr. Goodyear:

Armstrong Consultants has been retained to prepare an updated Airport Master Plan for the Roswell International Air Center in Roswell, New Mexico. To assist us in preparing this Airport Master Plan and to comply with the requirements of NEPA and the Federal Aviation Administration, we request your comments concerning potential impacts to air quality and any permitting requirements resulting from the proposed improvements.

Enclosed for your reference is a drawing for the proposed improvements to the Roswell International Air Center. The Airport is located within portions of Township 11 South and Range 24 East of the Principal Meridian. Please forward any comments at your earliest convenience. Please contact me at (970) 242-0101 if you have any questions regarding this project. Thank you for your assistance.

Sincerely,

ARMSTRONG CONSULTANTS, INC.

Sara D. McCook, C.M.

Enclosure

861 Rood Avenue • Grand Junction, Colorado 81501
www.armstrongconsultants.com
tel 970.242.0101
fax 970.241.1769

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING

January 31, 2012 ACI # 116105

Mr. Clint Marshall
New Mexico Environment Department
Ground Water Quality Bureau
Harold Runnels Building, Room N2250
1190 Saint Francis Drive
P.O. Box 5469
Santa Fe, New Mexico 87502-5469

RE: Roswell International Air Center Airport Master Plan

Dear Mr. Marshall:

Armstrong Consultants has been retained to prepare an updated Airport Master Plan for the Roswell International Air Center in Roswell, New Mexico. To assist us in preparing this Airport Master Plan and to comply with the requirements of NEPA and the Federal Aviation Administration, we request your comments concerning the possibility of proposed development actions impacting water quality.

Enclosed for your reference is a drawing for the proposed improvements to the Roswell International Air Center. The Airport is located within portions of Township 11 South and Range 24 East of the Principal Meridian. Please forward any comments at your earliest convenience. Please contact me at (970) 242-0101 if you have any questions regarding this project. Thank you for your assistance.

Sincerely,

ARMSTRONG CONSULTANTS, INC.

Sara D. McCook, C.M.

Sara D. McCook, C.M.

Enclosures

861 Rood Avenue • Grand Junction, Colorado 81501
www.armstrongconsultants.com
tel 970.242.0101
fax 970.241.1769

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING

January 31, 2012

ACI # 116105

Mr. Leon Redman
Chief, Southeast Office
New Mexico Fish and Game
1912 W. Second Street
Roswell, New Mexico 88201

RE: Roswell International Air Center Airport Master Plan

Dear Mr. Redman:

Armstrong Consultants has been retained to prepare an updated Airport Master Plan for the Roswell International Air Center in Roswell, New Mexico. To assist us in preparing this Airport Master Plan and to comply with the requirements of NEPA and the Federal Aviation Administration, we request your comments concerning the possibility of proposed development actions impacting and area threatened or endangered species or state sensitive species.

Enclosed for your reference is a drawing for the proposed improvements to the Roswell International Air Center. The Airport is located within portions of Township 11 South and Range 24 East of the Principal Meridian. Please forward any comments at your earliest convenience. Please contact me at (970) 242-0101 if you have any questions regarding this project. Thank you for your assistance.

Sincerely,

ARMSTRONG CONSULTANTS, INC.

Sara D. McCook, C.M.

Enclosures

861 Rood Avenue • Grand Junction, Colorado 81501
www.armstrongconsultants.com
tel 970.242.0101
fax 970.241.1769

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING

January 31, 2012 ACI # 116105

Mr. Marlin J. Johnson
Director, Planning and Zoning
#1 St. Mary's Place
Suite #180
Roswell, New Mexico 88203

RE: Roswell International Air Center Airport Master Plan

Dear Mr. Johnson:

Armstrong Consultants has been retained to prepare an updated Airport Master Plan for the Roswell International Air Center in Roswell, New Mexico. Enclosed for your reference is a drawing for the proposed improvements to the Roswell International Air Center. Please contact me at (970) 242-0101 if you have any questions regarding this project. Thank you for your assistance.

Sincerely,

ARMSTRONG CONSULTANTS, INC.

Sara D. McCook, C.M.

Enclosures

861 Rood Avenue • Grand Junction, Colorado 81501
www.armstrongconsultants.com
tel 970.242.0101
fax 970.241.1769

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING

January 31, 2012 ACI # 116105

Historical Society of New Mexico
P.O. Box 1912
Santa Fe, New Mexico 87504

RE: Roswell International Air Center Airport Master Plan

To Whom It May Concern:

Armstrong Consultants has been retained to prepare an updated Airport Master Plan for the Roswell International Air Center in Roswell, New Mexico. To assist us in preparing this Airport Master Plan and to comply with the requirements of NEPA and the Federal Aviation Administration, we request your comments concerning the possibility of proposed development actions impacting any historical, cultural and archeological resources.

Enclosed for your reference is a drawing for the proposed improvements to the Roswell International Air Center. The Airport is located within portions of Township 11 South and Range 24 East of the Principal Meridian. Please forward any comments at your earliest convenience. Please contact me at (970) 242-0101 if you have any questions regarding this project. Thank you for your assistance.

Sincerely,

ARMSTRONG CONSULTANTS, INC.

Sara D. McCook, C.M.

Enclosure

861 Rood Avenue • Grand Junction, Colorado 81501
www.armstrongconsultants.com
tel 970.242.0101
fax 970.241.1769

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING

January 31, 2012 ACI # 116105

Mr. Wally Murphy
Field Supervisor
U.S. Fish and Wildlife Services
New Mexico Ecological Services Field Office
2105 Osuna Road NE
Albuquerque, New Mexico 87113

RE: Roswell International Air Center Airport Master Plan

Dear Mr. Murphy,

Armstrong Consultants has been retained to prepare an updated Airport Master Plan for the Roswell International Air Center in Roswell, New Mexico. To assist us in preparing this Airport Master Plan and to comply with the requirements of NEPA and the Federal Aviation Administration, we request your comments concerning the possibility of proposed development actions impacting and area threatened or endangered species.

Enclosed for your reference is a drawing for the proposed improvements to the Roswell International Air Center. The Airport is located within portions of Township 11 South and Range 24 East of the Principal Meridian. Please forward any comments at your earliest convenience. Please contact me at (970) 242-0101 if you have any questions regarding this project. Thank you for your assistance.

Sincerely,

ARMSTRONG CONSULTANTS, INC.

Sara D. McCook, C.M.

Sara D. McCook, C.M.

Enclosures

861 Rood Avenue • Grand Junction, Colorado 81501
www.armstrongconsultants.com
tel 970.242.0101
fax 970.241.1769

APPENDIX

D

AGENCY RESPONSE

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

ROSWELL
NEW MEXICO

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING

NEW MEXICO
ENVIRONMENT DEPARTMENT

Office of the Secretary

SUSANA MARTINEZ
Governor
JOHN A. SANCHEZ
Lieutenant Governor

Harold Runnels Building
1190 Saint Francis Drive (87505)
PO Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-2855 Fax (505) 827-2836
www.nmenv.state.nm.us

DAVE MARTIN
Cabinet Secretary
BUTCH TONGATE
Deputy Secretary

March 29, 2012

Sara D. McCook, C.M.
861 Road Avenue
Grand Junction, Co 81501

RE: Roswell International Air Center (RAIC) Airport Master Plan (NMED File No. 3642ER)

Dear Mrs. McCook:

Your letter regarding the above named project was received in the New Mexico Environment Department (NMED) and was sent to various Bureaus for review and comment. Comments were provided by the Surface Water Quality Bureau, Ground Water Quality Bureau and Air Quality Bureau and are as follows.

Surface Water Quality Bureau
The U.S. Environmental Protection Agency (USEPA) requires National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) coverage for storm water discharges from construction projects (common plans of development) that will result in the disturbance (or re-disturbance) of one or more acres, including expansions, of total land area. Because this project appears to exceed one acre (including staging areas, etc.), it may require appropriate NPDES permit coverage prior to beginning construction (small, one - five acre, construction projects may be able to qualify for a waiver in lieu of permit coverage - see Appendix C).

Among other things, this permit requires that a Storm Water Pollution Prevention Plan (SWPPP) be prepared for the site and that appropriate Best Management Practices (BMPs) be installed and maintained both during and after construction to prevent, to the extent practicable, pollutants (primarily sediment, oil & grease and construction materials from construction sites) in storm water runoff from entering waters of the U.S. This permit also requires that permanent stabilization measures (revegetation, paving, etc.), and permanent storm water management measures (storm water detention/retention structures, velocity dissipation devices, etc.) be implemented post construction to minimize, in the long term, pollutants in storm water runoff from entering these waters. In addition, permittees must ensure that there is no increase in sediment yield and flow velocity from the construction site (both during and after construction) compared to pre-construction, undisturbed conditions (see Subpart 9.4.1.1)

You should also be aware that EPA requires that all "operators" (see Appendix A) obtain NPDES permit coverage for construction projects. Generally, this means that at least two parties will require permit coverage. The owner/developer of this construction project who has operational control over project specifications, the general contractor who has day-to-day operational control of those activities at the site, which are necessary to ensure compliance with the storm water pollution plan and other permit conditions, and possibly other "operators" will require appropriate NPDES permit coverage for this project.

The CGP was re-issued effective February 16, 2012. The CGP, Notice of Intent (NOI), Fact Sheet, and Federal Register notice can be downloaded at:
http://cfpub.epa.gov/npdes/stormwater/cgp.cfm

In addition, operation of these types of facilities requires Storm Water Multi-sector General Permit (MSGP – see http://cfpub.epa.gov/npdes/stormwater/msgp.cfm) coverage. This permit requires preparation of a Storm Water Pollution Prevention Plan (SWPPP), and installation of appropriate Best Management Practices (BMPs), such as oil/water separators, dikes or berms, use of absorptive materials during fueling operations, use of dry cleanup methods, or other practices to prevent or reduce the pollution of waters of the United States (per the SWPPP). RAIC (NMR05A762) had NPDES MSGP 2000 coverage and has presumably implemented a SWPPP which addresses pollutants in storm water runoff, and drainage systems. However, this permit expired on September 29, 2008 and the 2008 MSGP required that the operator update their SWPPP and file a Notice of Intent to request coverage under the re-issued MSGP no later than January 5, 2009.

Activities at airports result in the creation of various pollutant sources including, but not limited to, the following:

- Aircraft, Ground Vehicle, and Equipment Maintenance and Washing - Spills and leaks of fuels, engine oils, hydraulic fluids, transmission oil, radiator fluids, and chemical solvents used for parts cleaning; disposal of used parts, batteries, oil, filters, and oily rags;
- Runway Maintenance - tire rubber, oil and grease, paint chips, and fuel from runway surface cleaning operations.

Generally, the airport authority (i.e., the City of Roswell) and all "tenants" of the airport that conduct "industrial activities" as described in **40 CFR Part 122.26(b)(14)** (e.g., fueling concession or other Fixed Base Operators, as well as all other facilities "engaging in industrial activity") are required to apply for NPDES storm water permit coverage for discharges from their areas of operation. The airport authority and tenants of the airport should work in partnership in the development and implementation of a SWPPP. However, SWPPPs developed separately for areas of the airport facility occupied by these tenants must be integrated into the SWPPP for the entire airport facility.

Ground Water Quality Bureau
The Ground Water Quality Bureau has reviewed the project description and location for the above-referenced project, focusing on the potential effect of ground water resources in the area of the proposed project plan. The proposed project involves construction of infrastructure and improvements to the Roswell International Air Center.

As part of the review, Ground Water Quality Bureau considered information from the Groundwater Investigation Report, Walker Air Force Base and Roswell, New Mexico Draft Final September 2008 prepared by MAssist for the U.S. Army Corps of Engineers. Upon review of the diagram provided in the proposed Master Plan and in relation to the 2008 Groundwater Investigation report, there are a number of proposed areas of construction with subsurface ground water contamination where a source at the surface has not yet been fully characterized.

The diagram in the proposed Master Plan includes an Industrial and Business Park Development area, and Employee and Long Term Parking areas. Below these proposed areas of construction, the Groundwater Investigation report indicates that ground water is contaminated with trichloroethene (TCE) well above Federal Maximum Contaminant Levels (MCLS) and State Water Quality Control Commission (WQCC) Regulation groundwater standards. As sources or the extent of ground water contamination have not yet been fully characterized, it is uncertain how the proposed construction will impact contamination sources and ground water quality at the site.

The GWQB recommends full characterization of source areas and ground water quality prior to additional construction at the Roswell International Air center. The GWQB also advises all parties involved in the project to be aware of discharge notification requirements contained in 20.6.2.1203 NMAC. Compliance with the notification and response requirements will ensure the protection of ground water quality in the vicinity of the project. Parties should also be aware of handling and disposal procedures for any material contaminated with hazardous substances that may be encountered in construction areas.

Air Quality Bureau
The New Mexico Environment Department-Air Quality Bureau has evaluated the proposal you have submitted with respect to the proposed Roswell International Air Center Airport Master Plan in the City of Roswell, Chaves County. Chaves County is currently considered to be in attainment with all New Mexico and National Ambient Air Quality Standards.

Construction activities identified in this proposal will create increases in pollutant emissions due to combustion-related construction equipment usage and the disruption of earth. It is important that all facilities, equipment and contractors utilized in the proposed project have the appropriate air quality permits. For more information on air quality permitting and potential modeling requirements, please refer to 20.2.72 NMAC.

For the duration of the project, dust associated with increased vehicular use will also impact local air quality. Dust control measures should be considered to minimize the release of particulates due to vehicular traffic and ground disturbances. Activities resulting in significant ground disturbance should be reclaimed to avoid long-term problems with soil erosion and fugitive dust.

Activities identified in this proposal will increase local emissions and will temporarily impact air quality in the area. It is important that all county and local ordinances are followed for the duration of this project. Negative impacts associated with construction activities identified in this proposal will be minimized if regulations and guidelines identified in this document are followed.

I hope this information is helpful to you.

Sincerely,

Julie Roybal
Environmental Impact Review Coordinator
NMED File #3642 ER

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 346-2525 Fax: (505) 346-2542

Thank you for your recent request for information on threatened or endangered species or important wildlife habitats that may occur in your project area. The New Mexico Ecological Services Field Office has posted lists of the endangered, threatened, proposed, candidate and species of concern occurring in all New Mexico Counties on the Internet. Please refer to the following web page for species information in the county where your project occurs: http://www.fws.gov/southwest/es/NewMexico/SBC_intro.cfm. If you do not have access to the Internet or have difficulty obtaining a list, please contact our office and we will mail or fax you a list as soon as possible.

After opening the web page, find New Mexico Listed and Sensitive Species Lists on the main page and click on the county of interest. Your project area may not necessarily include all or any of these species. This information should assist you in determining which species may or may not occur within your project area.

Under the Endangered Species Act of 1973, as amended (Act), it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with us further. Similarly, it is their responsibility to determine if a proposed action has no effect to endangered, threatened, or proposed species, or designated critical habitat. On December 16, 2008, we published a final rule concerning clarifications to section 7 consultations under the Act (73 FR 76272). One of the clarifications is that section 7 consultation is not required in those instances when the direct and indirect effects of an action pose no effect to listed species or critical habitat. As a result, we do not provide concurrence with project proponent's "no effect" determinations.

If your action area has suitable habitat for any of these species, we recommend that species-specific surveys be conducted during the flowering season for plants and at the appropriate time for wildlife to evaluate any possible project-related impacts. Please keep in mind that the scope of federally listed species compliance also includes any interrelated or interdependent project activities (e.g., equipment staging areas, offsite borrow material areas, or utility relocations) and any indirect or cumulative effects.

Candidates and species of concern have no legal protection under the Act and are included on the web site for planning purposes only. We monitor the status of these species. If significant declines are detected, these species could potentially be listed as endangered or threatened. Therefore, actions that may contribute to their decline should be avoided. We recommend that candidates and species of concern be included in your surveys.

Also on the web site, we have included additional wildlife-related information that should be considered if your project is a specific type. These include communication towers, power line safety for raptors, road and highway improvements and/or construction, spring developments and livestock watering facilities, wastewater facilities, and trenching operations.

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. We recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands. These habitats should be conserved through avoidance, or mitigated to ensure no net loss of wetlands function and value.

The Migratory Bird Treaty Act (MBTA) prohibits the taking of migratory birds, nests, and eggs, except as permitted by the U.S. Fish and Wildlife Service. To minimize the likelihood of adverse impacts to all birds protected under the MBTA, we recommend construction activities occur outside the general migratory bird nesting season of March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until nesting is complete.

We suggest you contact the New Mexico Department of Game and Fish, and the New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division for information regarding fish, wildlife, and plants of State concern.

Thank you for your concern for endangered and threatened species and New Mexico's wildlife habitats. We appreciate your efforts to identify and avoid impacts to listed and sensitive species in your project area.

Sincerely,

Wally Murphy
Field Supervisor

GOVERNOR
Susana Martinez

DIRECTOR AND SECRETARY
TO THE COMMISSION
James S. Lane, Jr.

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

One Wildlife Way
Santa Fe, NM 87507
Post Office Box 25112
Santa Fe, NM 87504
Phone: (505) 476-8008
Fax: (505) 476-8124

Visit our website at www.wildlife.state.nm.us
For information call: (505) 476-8000
To order free publications call: (800) 862-9310

February 27, 2012

Sara D. McCook, C.M.
Armstrong Consultants, INC
861 Rood Avenue
Grand Junction, CO 81501

Re: Roswell International Air Center, Chaves County, NM; NMDGF Doc. No. 14912

Dear Ms. McCook,

In response to your notification of the availability of the environmental assessment dated January 31, 2012, regarding the above referenced project, the Department of Game and Fish (Department) does not anticipate significant impacts to wildlife or sensitive habitats. For your information, we have enclosed a list of sensitive, threatened and endangered species that occur in Chaves County. Burrowing owl is one species known to occur within Chaves County and could occur within the project area. We recommend that a preliminary survey be conducted during the times burrowing owls are likely to occur which is from April – September before any ground disturbing activities occur. We have enclosed a copy of our recommended survey protocol for your use. Should burrowing owls be documented in the project area we recommend you contact the Department or the USFWS for further recommendations regarding relocation or avoidance of impacts.

For more information on listed and other species of concern, contact the following sources:

1. BISON-M Species Accounts, Searches, and County lists: http://www.bison-m.org
2. Habitat Handbook Project Guidelines: http://wildlife.state.nm.us/conservation/habitat_handbook/index.htm
3. For custom, site-specific database searches on plants and wildlife, go to http://nhnm.unm.edu, then go to Data, then to Free On-Line Data, and follow the directions
4. New Mexico State Forestry Division (505-476-3334) or http://nmrareplants.unm.edu/index.html for state-listed plants
5. For the most current listing of federally listed species always check the U.S. Fish and Wildlife Service at (505-346-2525) or http://www.fws.gov/southwest/es/NewMexico/SBC.cfm.

Thank you for the opportunity to review and comment on your project. If you have any questions, please contact George Farmer, Southeast Area Habitat Specialist at (575) 624-6135 or george.farmer@state.nm.us.

Sincerely,

Kenneth K. Cunningham
Assistant Chief, Technical Guidance Section
Conservation Services Division

KKC/gf

xc: USFWS NMES Field Office
Leon Redman, SE Area Operations Chief, NMDGF
George Farmer, SE Area Habitat Specialist, NMDGF

NEW MEXICO WILDLIFE OF CONCERN
CHAVES COUNTY

For complete up-dated information on federal-listed species, including plants, see the US Fish & Wildlife Service NM Ecological Services Field Office website at http://www.fws.gov/southwest/es/NewMexico/SBC.cfm. For information on state-listed plants, contact the NM Energy, Minerals and Natural Resources Department, Division of Forestry, or go to http://nmrareplants.unm.edu/. If your project is on Bureau of Land Management, contact the local BLM Field Office for information on species of particular concern. If your project is on a National Forest, contact the Forest Supervisor's office for species information. E = Endangered; T = Threatened; s = sensitive; SOC = Species of Concern; C = Candidate; Exp = Experimental non-essential population; P = Proposed

Common Name	Scientific Name	NMGF	US FWS	critical habitat
Mexican Tetra	Astyanax mexicanus	T		
Rio Grande Chub	Gila pandora	s		
Rio Grande Shiner	Notropis jemezanus	s	SOC	
Pecos Bluntnose Shiner	Notropis simus pecosensis	E	T	Y
Suckermouth Minnow	Phenacobius mirabilis	T		
Gray Redhorse	Moxostoma congestum	T	SOC	
Headwater Catfish	Ictalurus lupus	s	SOC	
Pecos Pupfish	Cyprinodon pecosensis	T	SOC	
Pecos Gambusia	Gambusia nobilis	E	E	
Greenthroat Darter	Etheostoma lepidum	T	SOC	
Bigscale Logperch	Percina macrolepida (Native pop.)	T		
Sand Dune Lizard	Sceloporus arenicolus	E	P	
Arid Land Ribbon Snake	Thamnophis proximus diabolicus	T		
Brown Pelican	Pelecanus occidentalis	E		
Neotropic Cormorant	Phalacrocorax brasilianus	T		
Bald Eagle	Haliaeetus leucocephalus	T		
Northern Goshawk	Accipiter gentilis	s	SOC	
Common Black-Hawk	Buteogallus anthracinus	T	SOC	
Peregrine Falcon	Falco peregrinus	T	SOC	
Lesser Prairie-Chicken	Tympanuchus pallidicinctus	s	C	
Piping Plover	Charadrius melodus circumcinctus	T	T	
Mountain Plover	Charadrius montanus	s	SOC	
Least Tern	Sterna antillarum	E	E	
Black Tern	Chlidonias niger surinamensis		SOC	
Common Ground-Dove	Columbina passerina	E		
Yellow-billed Cuckoo	Coccyzus americanus	s	SOC	
Mexican Spotted Owl	Strix occidentalis lucida	s	T	Y
Burrowing Owl	Athene cunicularia		SOC	
Southwestern Willow Flycatcher	Empidonax traillii extimus	E	E	Y
Loggerhead Shrike	Lanius ludovicianus	s		
Bell's Vireo	Vireo bellii	T	SOC	
Baird's Sparrow	Ammodramus bairdii	T	SOC	
Sprague's Pipit	Anthus spragueii		C	
Least Shrew	Cryptotis parva	T		
Western Small-footed Myotis Bat	Myotis ciliolabrum melanorhinus	s		
Yuma Myotis Bat	Myotis yumanensis yumanensis	s		
Cave Myotis Bat	Myotis velifer	s		
Long-legged Myotis Bat	Myotis volans interior	s		

NEW MEXICO WILDLIFE OF CONCERN
CHAVES COUNTY

For complete up-dated information on federal-listed species, including plants, see the US Fish & Wildlife Service NM Ecological Services Field Office website at http://www.fws.gov/southwest/es/NewMexico/SBC.cfm. For information on state-listed plants, contact the NM Energy, Minerals and Natural Resources Department, Division of Forestry, or go to http://nmrareplants.unm.edu/. If your project is on Bureau of Land Management, contact the local BLM Field Office for information on species of particular concern. If your project is on a National Forest, contact the Forest Supervisor's office for species information. E = Endangered; T = Threatened; s = sensitive; SOC = Species of Concern; C = Candidate; Exp = Experimental non-essential population; P = Proposed

Common Name	Scientific Name	NMGF	US FWS	critical habitat
Fringed Myotis Bat	Myotis thysanodes thysanodes	s		
Long-eared Myotis Bat	Myotis evotis evotis	s		
Pale Townsend's Big-eared Bat	Corynorhinus townsendii pallescens	s	SOC	
Black-tailed Prairie Dog	Cynomys ludovicianus ludovicianus	s	SOC	
Pecos River Muskrat	Ondatra zibethicus ripensis	s	SOC	
Red Fox	Vulpes vulpes	s		
Swift Fox	Vulpes velox velox	s	SOC	
Ringtail	Bassariscus astutus	s		
Black-footed Ferret	Mustela nigripes		E	
Common Hog-nosed Skunk	Conepatus leuconotus	s		
Sandhill White-tailed Deer	Odocoileus virginianus texana	s		
Roswell Springsnail	Pyrgulopsis roswellensis	E	E	
Koster's Springsnail	Juturnia kosteri	E	E	
Pecos Assiminea Snail	Assiminea pecos	E	E	
Noel's Amphipod	Gammarus desperatus	E	E	

APPENDIX

E

AIR MARKET SERVICE STUDY

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING

Roswell International Air Center

Air Service Market Study and Airline Strategy

October, 2011

BoydGroup INTERNATIONAL
Aviation Forecasting & Strategic Solutions

Note:

This document is produced for the exclusive use of the Roswell International Air Center. No other use is authorized without the permission of the Roswell International Air Center. This document provides traffic and demand determinations as well as an air service strategy, along with projections based on known aviation dynamics for the future.

The data, analyses, and conclusions contained in this document are based on information and sources deemed reliable as of October 2011. However due to the dynamic nature of the subject matter, and the air transportation industry in general, they cannot be guaranteed.

Prepared by:

BoydGroup INTERNATIONAL
Aviation Forecasting & Strategic Solutions

Aviation DataMiner

78 Beaver Brook Canyon Road
Evergreen, Colorado 80439
(303) 674-2000 Fax: (303) 674-9995

www.AviationPlanning.com

October 2011

Table of Contents

I. Project Overview

Project Scope

The Boyd Group International, Inc. was retained by the Roswell International Air Center to complete an Air Service Market Study.

This is a two phase process, the first of which includes Traffic and Demand Determination in the Roswell International Air Center primary service area. To do this, the airport catchment area was defined, followed by a review of current air service at ROW, a review of current enplanements, load factors, air service use, and finally an analysis of the true market of the region.

The second phase was to review the airlines that passengers are using in the region and recommendations for the retention of or the possibility of increased air service at Roswell International Air Center.

Project Approach & Methodology

In order to truly asses the traffic and demand determination in a given market or region, a number of factors must be taken into consideration. These include population, demogrphics, location of community to other airports in the region, and airline strategies that pertain to the destination. From this, projected air travel demand in the region is forecast, and compared to the enplanements at the project airport.[1]

Additionally, the following factors impact each airport's true traffic generation and levels of traffic capture:

Service Area Geography and Access

The ability to easily access other regional airports within a market area directly impacts the levels of passenger traffic leakage that airports experience. For example, an airport within driving distance to another that has low-fare service, reasonably predictable weather, and good interstate highway access is likely to endure higher levels of leakage than an isolated market, such as an island or mountain market.

In the case of Roswell, the only air service alternatives are via relatively long drives to Albuquerque or El Paso. This tends to deter leakage. On the other hand, the relatively small size of the community and region population limits the levels of economic air service that can be supported.

[1] Boyd Group International maintains a comprehensive market forecast and business intelligence database as part of its AirportsUSA Forecast and Aviation DataMiner suite of data products. Additional information on these databases, as well as their analytical capabilities and forecasting methodologies is available at: **www.airportsusa.com**

Airline Capacity Trends and Current Air Service Levels

Another consideration is the distance/traffic factor. Simply put, the longer the distance to an airline connecting hub airport, the more expensive it is for the airline to access the traffic base at the outstation. Therefore, the smaller the market size, the more difficult it is for an airline system to provide service.[2]

When considering levels of air service in any region, there are a few main concepts which are of utmost importance.

The first is that there are not many airlines. There is no large choice of carriers for Roswell to pursue. It must be remembered that "air service" must mean "air service access" to and from the rest of the nation and the world. To achieve this, ROW must have service to a connecting hub of a major airline system.

Not only is there a limited number of airlines, there are a limited number of airline connecting hubs. Furthermore, the distance to such connecting operations is critical in an airline's decision to serve or not to serve a market. The smaller the market, the more important is it to be close to the carrier's connecting operation.

In the case of Roswell, connecting hubs in the region include: American/DFW (435 miles), US Airways/Phoenix (431 miles), Delta/Salt Lake City (659 miles) and United/Denver (453 miles).[3]

This is important to understand: the traffic and revenue aggregation at an airline connecting hub is critical to supporting service at ROW. The local traffic to even a large destination such as DFW is far insufficient alone to support the costs of the ROW-DFW flight. In fact, in 2010, the DFW O&D alone represented only a 19% load factor.

Airfare Differentials

Significant differences in fares between regional airports can impact the consumer's decision process when deciding what airport to utilize for their travels – or the decision to travel at all. If a neighboring airport consistently offers lower fare levels, it can result in consumers "leaking" to those airports. As note, because of its location and the long-distance to alternative airports, this is a dynamic at Roswell that affects price-sensitive leisure travel demand.[4]

[2] This is also moderated by the type of traffic that the market generates. Business travel demand (which is dominant at communities such as Roswell) is more attractive to airlines than leisure travel, which is far more fare sensitive.
[3] American has a low-density connecting operation at LAX with a distance of 799 miles. As will be outlined in this report, it was not an economically viable option for ROW.
[4] The 3 to 4 hour drives to ABQ and ELP tend to keep business travel at ROW.

Economic Factors

There is a significant correlation between income levels and air traffic generation, especially as the US economy has entered into a period of weak economic activity. Income levels are of particular importance at smaller airports due to the limited availability of low-fare service which is often in competition for discretionary dollars of the consumer. It is the opinion of The Boyd Group International that this trend has the potential to become more prominent if energy prices remain high and consumer confidence remains weak.

Each of these factors, along with the enplanement-to-population ratios methodology, have been applied to estimate the levels of traffic captured at Roswell International Air Center.

II. Summary of Findings

ROW Captures the Majority of Traffic Generated in Primary Service Area

Boyd Group International analysis shows that ROW captures approximately 92.1% of the passenger traffic generated in its primary service area.

The primary service area is defined as being within a one hour drive time of ROW. The 7.9% that is not captured likely lives on the outskirts of the service area and rationalizes using alternative airports due to availability of more nonstop destinations and lower fares.

Current ROW Service Is Viable, But With Limited Potential For Additional Capacity

Additional air service access could potentially generate additional demand, but at current load factors experienced by American Eagle (mid-60% of seats filled), there is not a compelling market demand that would entice another carrier to enter the market.

The Roswell International Air Center and its primary service area are well served with American Airlines air service access to DFW and beyond. DFW is a major US hub and allows for air travelers to connect to many domestic and international destinations on a nonstop basis. Given the population of the ROW service area and enplanement generation ability, the DFW access is a very strong service for the community.

It is noted that air access to points in the West and Northwest requires connections at DFW International, representing a back-tracking routing. This is a situation that is faced by a number airports in the Southwestern US. San Angelo and Abilene are just two examples. The problem revolves around the fact that the traffic generation at ROW is a challenge for a carrier seeking to access this Westbound traffic.[5]

Challenges To New Service Recruitment At ROW

Attracting additional scheduled air service at ROW faces a number of challenges:

<u>A Specific and Limited Number of Airline Candidates</u>

As noted earlier, there are only a very specific number of options for ROW to pursue for additional air service.

<u>Accelerated Retirement of Small Jets</u>

The current service to DFW with American Eagle is operated 44/50-seat ERJ airliners. Across the airline industry, this category of airliner is being retired. There are no new replacements. They are out of production.

[5] The ROW-LAX service is an example. It simply did not generate sufficient revenue to cover the cost of flying the nearly 800 miles to the AA hub at Los Angeles International.

In the past, the 50-seat jets were excellent for entering and building new markets. Today, because of economics, they are becoming economically problematic, not including the issue of airline systems operating fewer such units.

The reasons are dual. On one hand, the escalating price of jet fuel has reduced the number of airline missions where these aircraft can be profitable. The second is that they are out of production, and as they age, maintenance costs become onerous.[6]

The relatively short distance to DFW (435 miles) plays well into the new, albeit reduced, effective radius of 50-seat jets. From that perspective, it is felt that the ERJ service at ROW is viable into the foreseeable future.

This dynamic does play into the potential for attracting air service to additional hub gateways. The alternative carriers open to ROW – Delta, United, and US Airways – are all in the process of reducing the number of 50-seat jets. This makes the hurdle to convincing any of them to enter small markets much higher.

Current & Past Traffic Experience

While considered to be economically viable for the American Airlines system, the current service pattern do not indicate strong net-new passenger traffic potential to support additional air service.

On one hand, the ROW-LAX service was not economically viable. On the other the monthly load factors for the DFW have stabilized, even with the elimination of LAX flights. This is a disturbing trend that will likely need to be reversed in order to maintain such solid levels of air service.

ROW-DFW Load Factors

Jan-Jun Monthly Trend

	Jan	Feb	Mar	Apr	May	Jun	Total
2008	65.9%	72.3%	75.7%	68.3%	73.9%	76.5%	**72.1%**
2009	60.2%	62.1%	62.7%	60.8%	70.7%	75.6%	**65.3%**
2010	73.9%	76.0%	82.7%	64.7%	69.0%	72.7%	**73.2%**
2011	60.7%	63.0%	68.9%	57.1%	65.7%	63.6%	**63.2%**

As the table indicates, a 63% average load factor is well below previous year's performance. Of note is that the increased capacity in 2011 vs. 2010 has not resulted in equal load factors, which indicates that the service levels in 2010 were adequate to support the demand of the ROW primary service area.

[6] SkyWest's president noted at the Boyd Group International Aviation Forecast Summit in August 2011 that as these aircraft near 40,000 hours, they get too expensive to operate. SkyWest has over 190 of these aircraft in its fleet.

Therefore, the retention of DFW air service should be the first consideration of any air service enhancement program at Roswell International Air Center. Initiatives such as the enhancement of the current air service incentive plan, advertising and marketing the DFW air service within the community, and potential for government grants are all avenues ROW should explore.

Conclusions & Recommendations

Based on the data compiled in this project, Boyd Group International suggests the following:

- The current AA/AA Eagle service to DFW is clearly viable, but with increasing fuel and other costs, the community's first priority is to assure that ridership does not decline. While it is true that alternative airports are an onerous drive time away, any leakage of business travel needs to be monitored.

- Air service is dependent on connectivity to the rest of the nation and the world. Therefore, flights to an airline's connecting hub are absolutely necessary for ROW. This easily defines the opportunities open to ROW.[7]

- While the current service captures the majority of local traffic demand, roughly 50% of all passengers now on American Eagle are in-bound generated. In short, they are visitors, not residents. As a result, contact and liaison with targeted new carriers – in this case United/Denver, US Airways/Phoenix, and Delta/Salt Lake City should continue in regard to interest in serving ROW.[8]

  This is not to imply that such efforts do not face strong hurdles, but there are no guarantees in regard to air service. Having these carrier systems at least aware of ROW is positive, but as noted in this report, the potential to attract an additional air carrier is low.

[7] "Interline" connections – from, for example, an independent commuter to major carriers – simply do not generate traffic. This is particularly true of consumers seeking to come to small markets such as ROW.
[8] Frontier and Southwest operate connecting operations at Denver. Frontier, however operates nothing smaller than 100-seat airliners at DEN, and is not in an expansion mode. Southwest has specifically expressed no interest in small community air service.

III. Roswell Market Area and Data

Primary Service Area

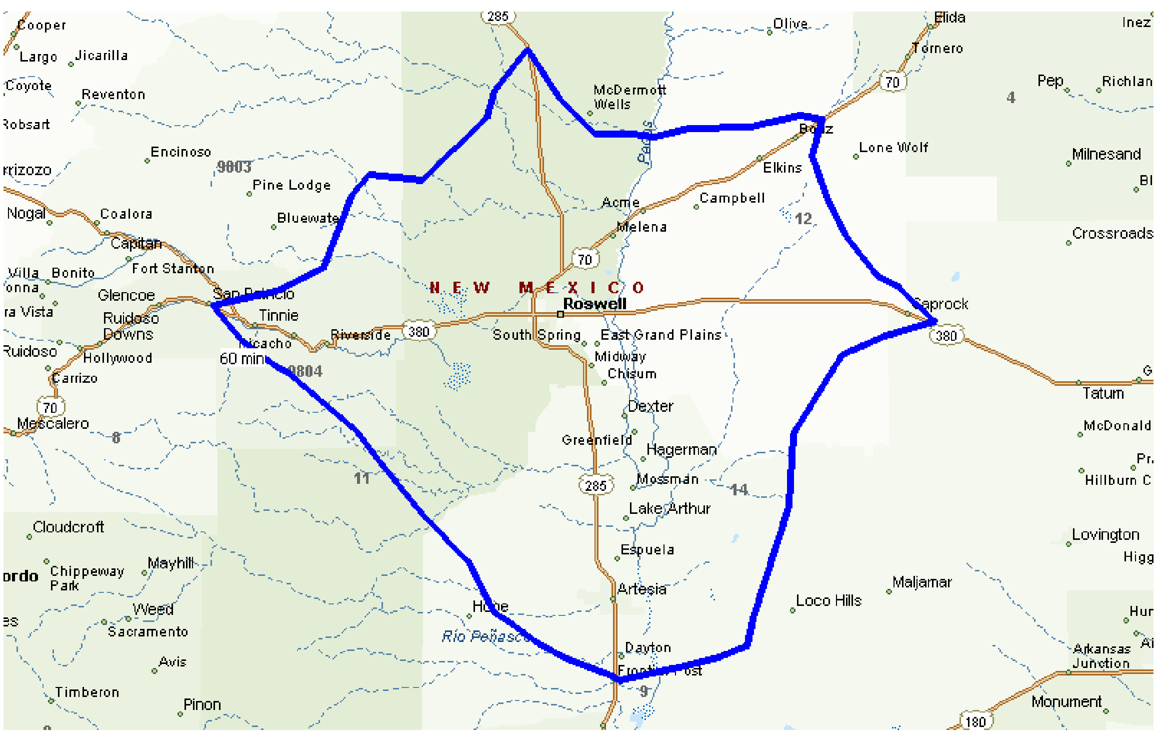
The primary service area of an airport is defined as the geographic region in which the majority of the populace typically finds it more convenient to utilize Roswell International Air Center versus other regional airport options.

This implies that in order for air travelers to use an alternative airport to ROW, specific and compelling market driven factors must exist. These factors include lower fares, ease of accessibility, or better air service with more nonstop flights and destinations. In the case of Roswell, the main alternative options are ABQ, LBB, MAF and ELP, which are not convenient nor time-efficient for most consumers.

In today's airline industry, the reality is that an airport has a consumer reach based on the local service levels and the presence of alternative options in the region. Boundaries in regard to what airport different consumer segments (business vs. leisure) will use are not static and vary based on the aforementioned factors. Boyd Group International refers to this as an "air service influence area."

Roswell International Air Center

Primary Service Area



In general, a one-hour drive time to ROW includes an area of approximately 90,000 in population with total personal income of about $1.4 billion. Average per capita income equates to approximately $14,990 annually.[9] A one hour radius was used to estimate a reasonable projection of the population that would tend to use ROW because of the close proximity of several airports that offer greater levels of service than ROW.

Other Airports in the Region

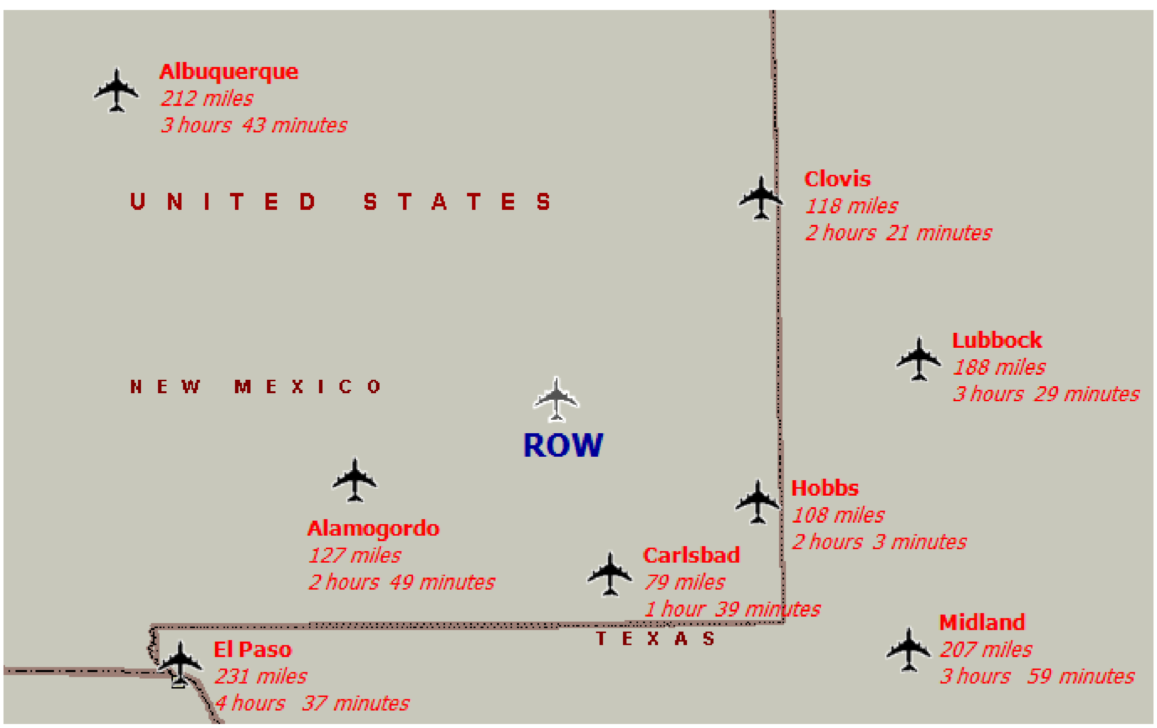
Simply stated, there are no "neighboring" airports in the ROW region. Any potential alternative to ROW represents a near half-workday drive.

There are four major airports, however, within that half-workday radius that offer alternatives for some portion of the ROW air traffic base – both inbound and outbound. These are Albuquerque International Sunport (ABQ), Lubbock Preston Smith International Airport (LBB), Midland International Airport (MAF), and El Paso International Airport (ELP).

While there are several smaller regional airports in close proximity to ROW, there is really only one that can compete with ROW due to connectivity via a major US hub, and that is Lea County Regional Airport (HOB) service on United/Continental Airlines to Houston (IAH). This nonstop service is offered on 50 seat regional jets, similar to the ROW-DFW service on American Airlines. It has no qualitative advantage over ROW.

Roswell International Air Center

Proximity to Other Commercial Service Airports



[9] Population based on United States Census Bureau data derived from Microsoft MapPoint software and a one hour drive time from ROW; personal income and per capita income based on Chaves County estimates from 2010 United States Census

While it is true that the four major airports are generally three to four hours drive time from ROW, incentives may exist for consumers choosing to utilize these airports versus ROW. For example, any potential savings offered to the business traveler by flying out of ABQ rather than ROW are potentially insufficient to offset the lost productivity and hassle associated with the 3.75-hour drive (7.5 hours roundtrip). Conversely, a family of five travelers on vacation would evaluate the trip differently, facing less time pressure and the prospect of hundreds, if not thousands, of dollars in savings. Fare issues are further discussed later in this section.

The ROW Catchment Area: Finite and Limited

After examining the other regional airports and levels of air service that exists at these larger airports in the region, it is clear that the ROW catchment, or service area, is finite and limited. The larger airports blanket the region in every direction from ROW, so consumers truly have a choice when deciding what airport to fly to and from. The Boyd Group International believes that anyone living over 90 minutes from ROW will choose an alternative airport, and those living between 60-90 minutes from ROW will have to seriously weigh the cost/benefits of using ROW vs. an alternative within the region.

IV. ROW True Market and Traffic Generation

An important aspect when evaluating the level of air service in any given region is the ability for that region to generate passenger traffic. There are several aspects that impact traffic generation, including size of population, income levels, and alternative airports within or close to the region.

Boyd Group International used two ratios to estimate the total traffic generated at the Roswell International Air Center and compared it to reported enplanements:

- Enplanement-to-population (Metropolitan Statistical Area would be used, but since Roswell is not included in a MSA, a population within a one hour drive time was used); and
- Enplanement-to-personal income.

Using this methodology, low ratios are indicative of air service deficiencies and significant leakage of actual passengers to another nearby airport.

Roswell International Air Center had 38,842 enplanements in the year 2010.

Using the methodology below, it is estimated that ROW is not suffering any significant traffic leakage generated with the primary service area.

In this analysis, we have compared ROW to five markets of comparable population, income levels, and air service levels.

Enplanement Generation: ROW Relative to Comparable Markets

Market Data	Golden Triangle, Mississippi	Dothan, Alabama	Albany, Georgia	Columbia, Missouri	Brunswick, Georgia	Market Averages	Roswell, New Mexico
Population	80,380	137,916	165,440	173,083	103,841	132,132	90,094
Personal Income ($ Millions)	$1,247	$2,833	$2,755	$3,033	$1,356	$1,603	$1,351
Per Capita Personal Income	$15,513	$20,539	$16,652	$17,521	$13,062	$16,657	$14,990
2010 Enplanements	36,329	41,453	35,494	38,293	30,059	36,326	38,842
Enplanements-per-Capita	0.45	0.30	0.21	0.22	0.29	0.27	0.43
Enplanements-per-$ Million Personal Income	29.13	14.63	12.88	12.63	22.16	22.66	28.76
ROW Enplanement Generation Using Enplanements/Population Ratio:							24,769
ROW Enplanement Generation Using Enplanements/PI Ratio:							59,609
Average of Two Methodologies:							*42,189*
Traffic Capture							92.1%

SOURCE: Microsoft MapPoint software, FAA data, US Census data, and T-100 filings via Aviation Dataminer ®

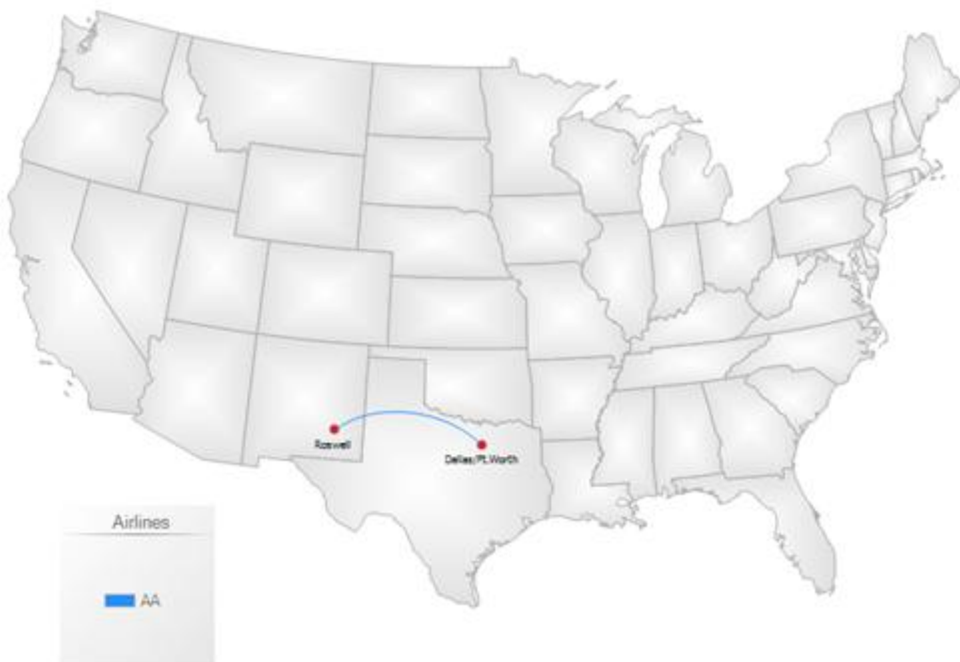
The analysis indicates that the ROW primary service area should generate 42,189 enplanements per year. Since ROW generated 38,842 in 2010, they captured 92.1% of all enplanements. A mere 7.9%, or 3,347 passengers, utilized other alternative airports.

V. Air Service at Roswell International Air Center

When evaluating the current air service at any airport, while it is important to measure available seats and passenger numbers, it is also critical to evaluate availability of access to and from ROW. In general, this is measured by the number of airline connecting hubs from which a community has service.

Air Carrier Service at ROW

Q4 2011



The current service to the American Airlines hub at DFW provides outstanding connectivity to and from points across the US, not to mention Europe, Latin America, and Asia. Access to points in the West and Northwest require circuitous routings – flying east to connect west, but this is a factor inherent in air service at many small communities in the United States.

For a market with the population of the size of Roswell, the four daily flights to DFW International represent what is outstanding connectivity. Furthermore, DFW International over the past five years completed a facility renovation that has made it one of the easiest airports in the country at which to make connections.

The connectivity to destinations beyond the Dallas-Fort Worth airline hub is extensive, as is evidenced by the map below. While the current air service situation calls for ROW passengers to fly approximately 60 minutes to the east in order to reach all US destinations, the presence of an extensive airline route network does exist at DFW.

American Airlines Air Service at DFW

Q4 2011

Current Scheduled Air Service at ROW

When comparing 2011 vs. 2010, there is an 8.8% increase in departures and a 10.9% increase in seats offered. However, the most notable change is the discontinuation of the LAX service that was offered by American Airlines through August of 2010.

ROW Scheduled Air Service

2011 vs 2010

Carrier	Dest	Departures				Seats			
		CY 2011	CY 2010	Change	% Change	CY 2011	CY 2010	Change	% Change
American	DFW	1,266	963	303	31.5%	60,761	45,960	14,801	32.2%
	LAX	-	201	-201	-100.0%	-	8,844	-8,844	-100.0%
Total		1,266	1,164	102	8.8%	60,761	54,804	5,957	10.9%

Overview Of Market Performance

A quarterly review of the ROW market for the past year by quarter indicates a stable air service situation.

	2010Q2	2010Q3	2010Q4	2011Q1	2011Q2	Total	% Change
Psgr.	19,409	20,998	19,008	15,298	18,587	93,300	-4.2 %
Net One Way Fare	$222.43	$223.05	$224.99	$250.66	$235.77	$230.38	6.0 %

Note that fares have remained steady, with a slight upward trend. Comparing the second quarter of 2010 with that of 2011 shows a slight decline in O&D passengers, but this is likely due to the deletion of LAX flights.

This clearly shows a stable market. The increase in fares (expressed here net of federal fees and taxes, and reflective of the average one-way ticket) is to be considered as a positive for the future of the service. While consumers would prefer to see fares drop, the real-world reality is that airlines are seeing increased costs and small markets that cannot contribute are dropped.

The majority of the data developed in this project clearly indicate that ROW-DFW is a reasonably safe market in regard to continuing service from American/American Eagle.[10]

Review of Los Angeles Service

It is instructive to understand the reasons that the American service to Los Angeles did not provide an adequate return. The LAX air service, which ran from September 2009 through August 2010, didn't carry enough passengers for American Airlines to continue offering this nonstop destination. The LAX traffic simply was a loser for American Airlines.

[10] Note, however, that route profitability is only one of many criteria airlines use to stay in a market.

First, we can compare the contribution that LAX was making (or, perhaps more correctly, was not making) to the AA system compared to the DFW flights. A key reason that an airline has flights into a smaller market such as ROW is the amount of traffic and revenue it can feed across its system, helping fill flights to and from the connecting hub.

Dest	Passengers	PDEW	Ticket Yield
DFW Total Cnx	47,737	65.4	19.21¢
DCA	1,983	2.7	18.91¢
IAH	1,878	2.6	26.79¢
ORD	1,650	2.3	17.58¢
DEN	759	1.0	15.88¢
AUS	1,485	2.0	25.82¢

Dest	Passengers	PDEW	Ticket Yield
LAX Total Cnx	4,216	5.8	14.54¢
SAN	830	1.1	16.50¢
LAS	744	1.0	15.69¢
SFO	530	0.7	11.59¢
FAT	371	0.5	19.03¢
SEA	288	0.4	11.75¢

The data above are for all flights operated in 2010. While LAX service was ended in August of that year, the data is clear: LAX simply did not feed sufficient passengers to the AA system, and, worse, it did so at average per-mile fares that were almost 25% below the average at DFW – 14.54 cents per mile at LAX vs. 19.21 cents at DFW. Furthermore, the carrier had to fly much farther to LAX to get that revenue.

To be sure, variances in schedule patterns and frequency between the ROW-DFW and the ROW-LAX routes certainly were a reason that the Los Angeles service fed fewer passengers to the AA system. The much smaller size of the AA connecting operation at LAX was certainly also a factor. Nevertheless, the fact remains that the passengers fed to AA by the ROW flights were much lower in terms of fare per mile than at DFW.

The bottom line, however, is the data regarding the cost of flying these two routes vs. the total revenues they provided American.

Taking the known feed revenues for 2010 (shown above) and the known local ROW-DFW and ROW-LAX revenues, and comparing each to the costs of flying the routes during that period, the data is clear: American was unable to find black ink in the ROW-LAX market.

Route	Route Miles	Local O&D Revenue	Connect Revenue	Total Revenue	Load Factor	Esimated Route Cost	Contruibtion
DFW	435	$2,457,738	$12,267,454	$14,725,192	74.3%	$9,092,744	$3,174,710
LAX	799	$873,843	$865,629	$1,739,472	55.2%	$2,960,460	-$2,094,831
Source: Airline filings as analysed by AviationDataMiner							

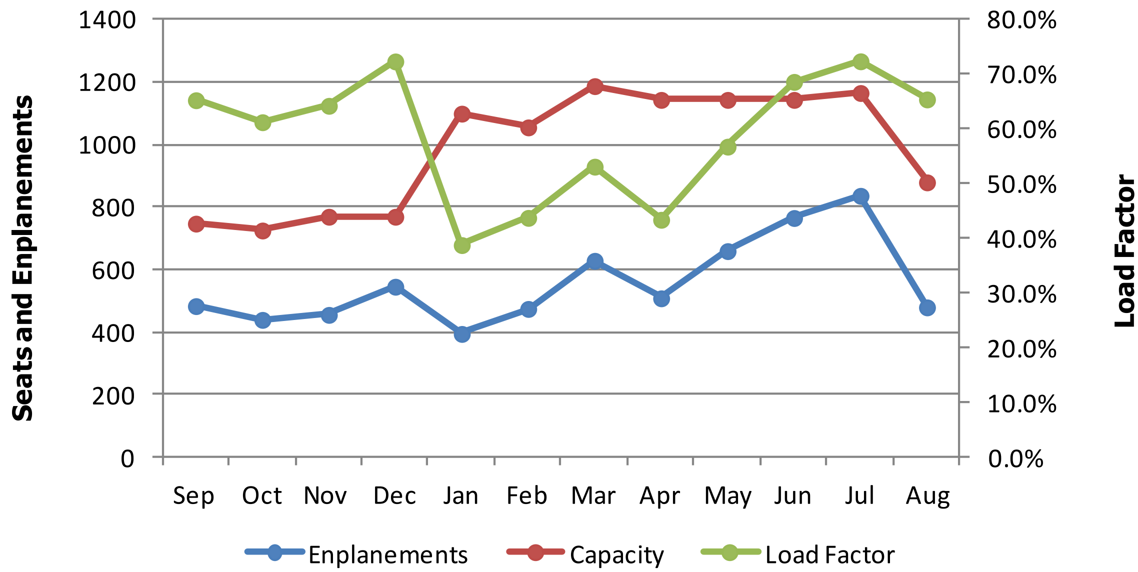
The estimated route costs are the total seats operated by AA in each market, based on 21.0 cents for the DFW route, and 20.0 cents for the longer LAX route.[11]

[11] These are conservative for ERJ-140/145 flights.

BoydGroup INTERNATIONAL

A high-level graphic review of enplanements, capacity, and load factors by month for the last 12 months of ROW-LAX operations underscores the data above:

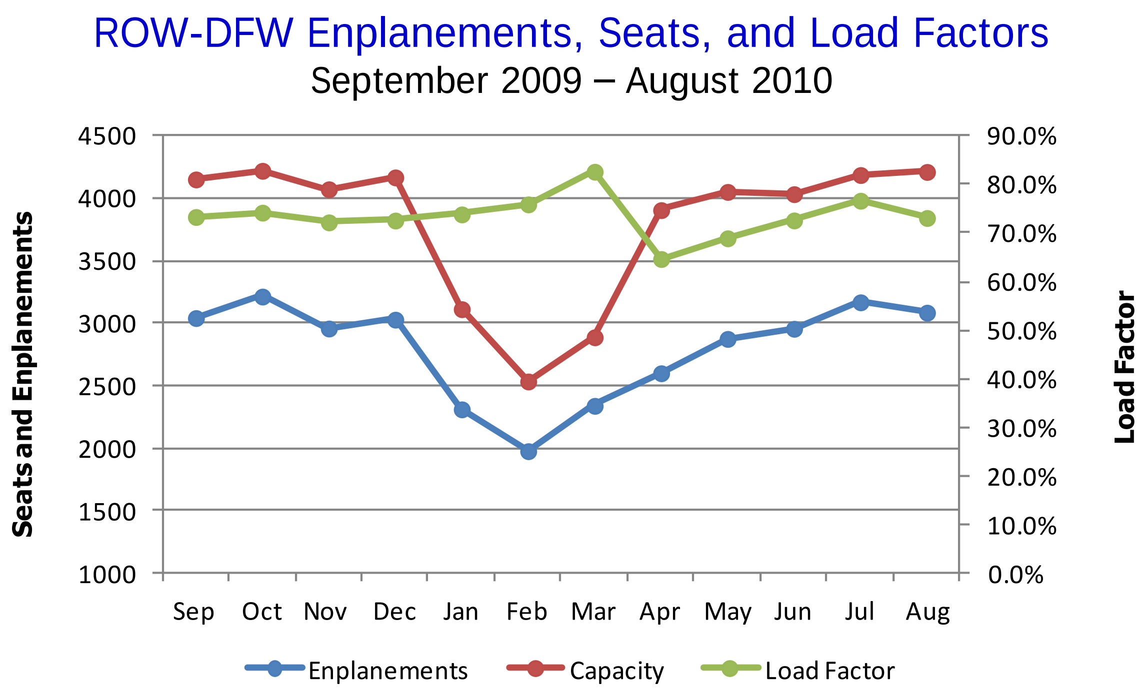
ROW-LAX Enplanements, Seats, and Load Factors
September 2009 – August 2010



As the graph indicates, the load factors for the 12 month period rarely reached over 70%, and were in the 50-60% range in many months. This is a challenging scenario for the network planning department at any airline, and often times difficult decisions need to be made with regard to viability of a market. Another major factor affecting the ROW-LAX service is the distance of the segment – 799 miles – and the amount of traffic that the route fed to the rest of the AA system.

Review of DFW Service

As a comparison, the ROW-DFW market performed markedly better, and it is notable that American added a fourth daily flight subsequent to the decision to drop ROW-LAX. The data shown above indicate that ROW should be solidly profitable for the American system. Below are the same metrics for the ROW-DFW route during the same time period:



Note that the demand consistently has been in the 65% - 80% range for the period shown. This indicates a healthy traffic demand.

Air Service Comparison With Other Airports

When analyzing the current air service at any airport, it is critical to examine the alternative options for air travelers in the ROW primary service area.

On a general basis, there are three main factors that incite travelers to use alternative airports. These include:

- Fare levels compared to those offered at other, reasonably-accessible airports in the region.
- Local service "options" - the levels of nonstop access to key airline connecting hubs. Not only do the cities where such hub operations are placed represent additional gateways, but they are also major passenger O&D points as well.
- A third factor is quantitative levels of service – the number of departures in and out that the consumer can choose from. This encompasses both numbers of flights and the size of the aircraft. The more seats per departure (i.e., the larger the aircraft) the more diversity of fares offered, and by extension, more discount seats.

In point of geographical reality, Roswell has limited competition from other airports in the Texas – New Mexico region. This section it intended to provide a comparison of flight options at these airports.

Scheduled Air Service Comparison
vs. Nearby Small Regional Airports
2011: Departures and Seats

		ROW		HOB		CNM		ALM		CVN	
Carrier	Dest	Deps	Seats	Deps	Seats	Deps	Seats	Deps	Seats	Deps	Seats
AA	DFW	1,266	60,761								
UA/CO	IAH			310	15,500						
LW	CNM			888	7,992			261	2,349		
LW	ABQ					627	5,643	627	5,643		
LW	HOB					888	7,992				
LW	ALM					261	2,349				
ZK	ABQ									627	11,913
TOTAL		**1,266**	**60,761**	**1,198**	**23,492**	**1,776**	**15,984**	**888**	**7,992**	**627**	**11,913**

Comparing the Roswell International Air Center to the four small, regional airports it is clear that the only airport that even remotely has a semblance of similar service is Hobbs (HOB). Because Hobbs has only two flights from a network carrier (Continental/United to IAH) it is unlikely that it represents any leakage from the ROW service area.

The other nearby airports (CNM, ALM, and CVN) all have service with smaller, independent commuter carriers, mostly supported by federal Essential Air Service subsidies. Pacific Wings Airlines and Great Lakes Airlines serve these airports, and do so with 9 seat and 19 seat turboprop aircraft. This type of service merely fills the letter of the Essential Air Service program, instead of providing meaningful air service.

Scheduled Air Service Comparison vs. Nearby Midsize/Large Airports

2011: Departures and Seats

		ROW		ABQ		MAF		LBB		ELP	
Carrier	**Dest**	**Deps**	**Seats**	**Deps**	**Seats**	**Deps**	**Seats**	**Deps**	**Seats**	**Deps**	**Seats**
AA	DFW	1,266	60,761	2,895	405,300	1,803	91,503	2,743	140,720	2,854	399,560
AA	LAX			797	42,140					542	23,848
AA	ORD			794	55,580					731	51,170
UA/CO	IAH			1,977	121,145	2,059	116,227	1,337	66,850	2,035	124,556
UA/CO	DEN			2,206	137,316	725	36,250	525	26,250	1,173	59,002
UA/CO	IAD			365	45,978						
UA/CO	LAX			912	47,968					664	33,200
UA/CO	ORD			376	26,268					689	45,474
UA/CO	SFO			490	25,524						
DL	ATL			977	160,364					733	101,174
DL	MEM							991	49,550		
DL	MSP			530	78,700						
DL	SLC			1,736	105,930						
F9	DEN			1,408	123,584						
LW	ALM			627	5,643						
LW	CNM			627	5,643						
US	PHX			1,894	153,704					1,912	137,888
ZK	CVN			627	11,913						
ZK	SVC			627	11,913						
WN	ABQ					366	49,497	366	50,052	611	83,692
WN	AUS							647	88,414	1,183	160,616
WN	BWI			578	79,186						
WN	DAL			2,729	371,053	1,912	260,069	1,996	272,012	2,392	327,044
WN	DEN			1,040	142,090						
WN	ELP			607	83,159						
WN	HOU			1,000	135,905	668	90,496			1,013	136,651
WN	LAS			1,953	265,806	366	48,807	367	49,694	1,087	148,214
WN	LAX			1,362	184,884					999	135,393
WN	LBB			366	50,142						
WN	MAF			366	49,692						
WN	MCI			378	51,741						
WN	MCO			377	51,199						
WN	MDW			725	98,185						
WN	OAK			922	123,224						
WN	PDX			366	49,362						
WN	PHX			2,985	407,610					2,018	274,921
WN	SAN			858	117,381					366	49,497
WN	SEA			727	98,579					963	131,031
WN	SLC			366	49,782						
WN	STL			365	49,885						
WN	TUS			702	95,619						
TOTAL		**1,266**	**60,761**	**38,637**	**4,119,097**	**7,899**	**692,849**	**8,972**	**743,542**	**21,965**	**2,422,931**

Furthermore, and of extreme importance, is the fact that to most cities from these larger regional airports - a connection at an airline hub is necessary, which somewhat levels the qualitative service playing field with ROW.

Nevertheless, these airports do offer more flights and generally lower fares. ABQ is by far the largest of the four, with 30+ nonstop destinations and over four million seats offered.

The three Texas airports (MAF, LBB, ELP), while 3.5 - 4.5 hour drive time from ROW, would certainly attract a portion of the very sparse population on the eastern and southern edges of the ROW primary service area.

ROW Top 10 O&D

When considering new or additional air service at any airport, it is crucial to understand where the local population is traveling to and from. For example, if a community has a corporate headquarters in Los Angeles and a plant in Roswell, there may be significant business travel between the two cities.

Below is a listing of ROW Top 10 O&D and a full listing of the ROW O&D for the 12 months ending March 31, 2011 is included in the appendix.

ROW Top 10 O&D

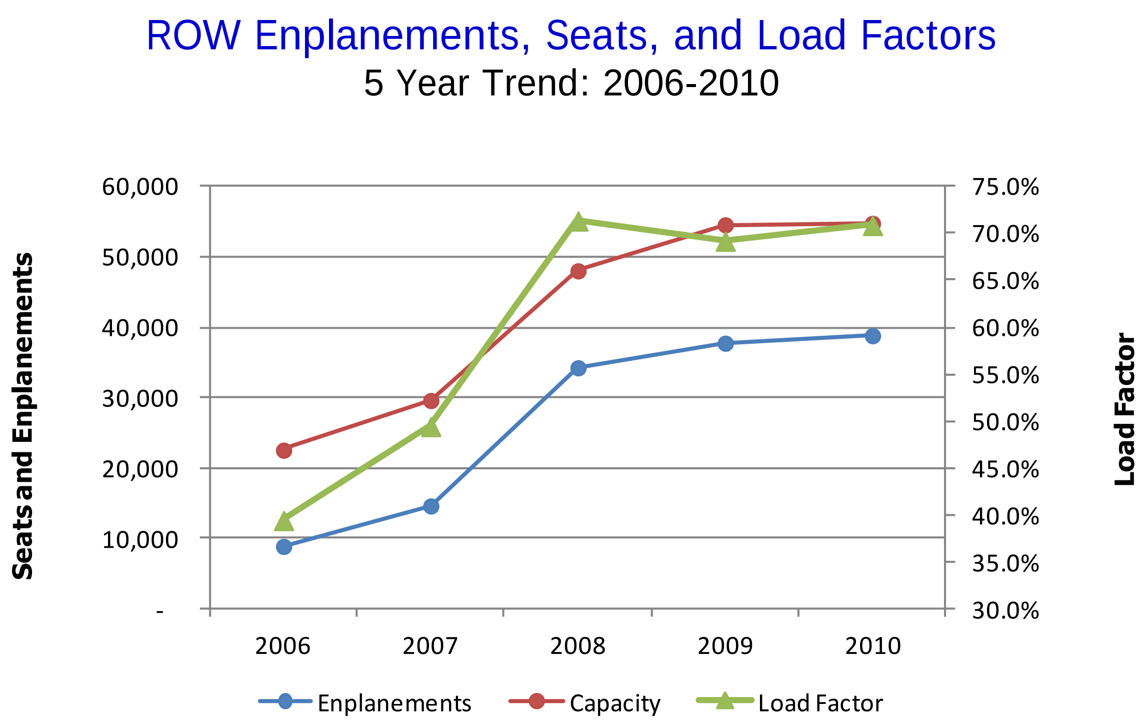
12 Months Year Ending March 31, 2011

Rank	Market	Psgr	PDEW
1	DFW	17,608	24.1
2	LAX	4,985	6.8
3	IAH	2,248	3.1
4	DCA	1,969	2.7
5	ORD	1,830	2.5
6	SEA	1,495	2.0
7	AUS	1,407	1.9
8	SAN	1,404	1.9
9	ATL	1,277	1.7
10	TUL	1,276	1.7
	TOTAL	**35,500**	**48.6**

As noted earlier, none of the top O&D locations have sufficient passenger traffic to warrant a nonstop flight to and from ROW. This is typical of most small and mid-size communities in the US.

Enplanements, Load Factors, and Capacity Trends at ROW

Air service at ROW changed in September 2007 when American Airlines began operating flights to DFW on its regional affiliate, American Eagle. As is evidenced below, capacity increased markedly between 2006 and 2007, and again between 2007 and 2008. As capacity increased during this time period, so did the enplanements and the load factors, indicating that the market demand existed for this nonstop service to DFW.

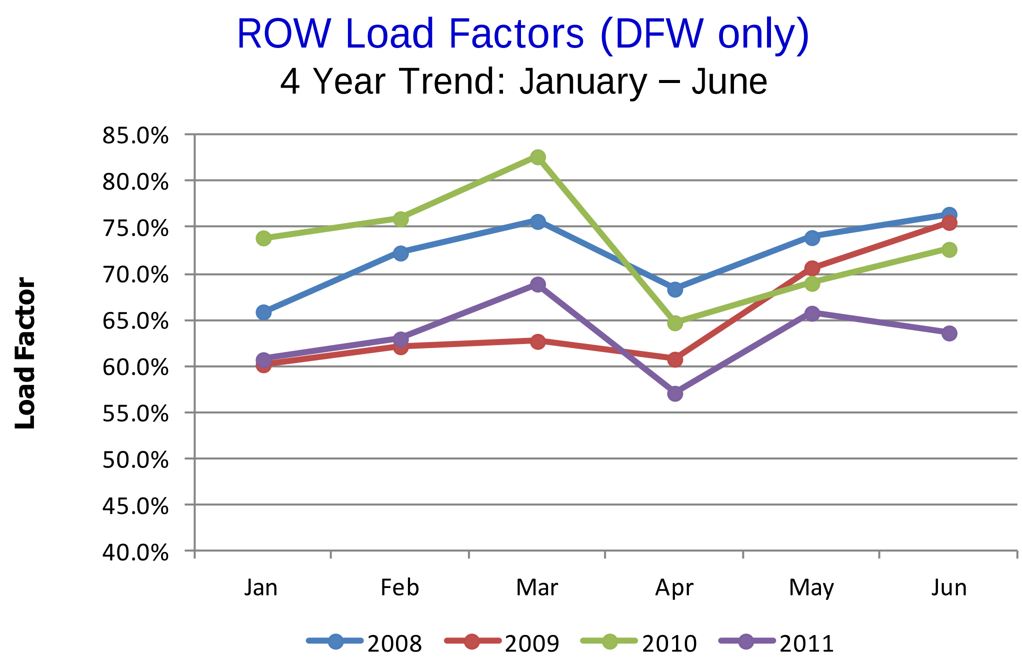


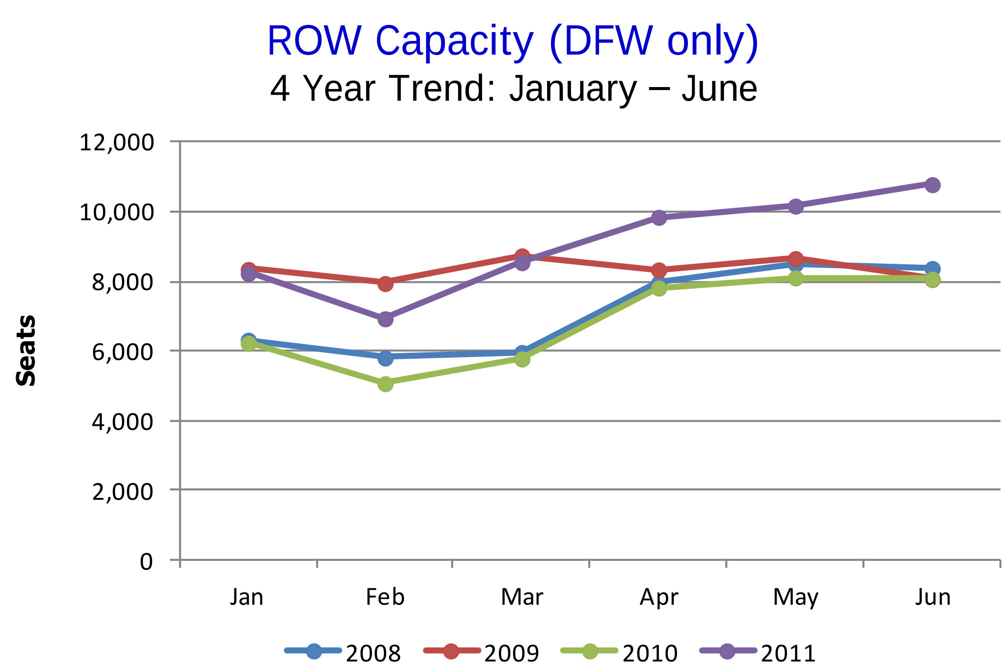
It is noted that since 2008, the ROW market has apparently reached a state of equilibrium – a steady set of metrics for capacity, passengers and load factors.

Data through April 2011 further indicates that 2008-2010 is a good indication of what the ROW market can support in terms of DFW service. Through the first four months of 2011, the load factor was 62.2% between ROW-DFW. In 2009, when capacity offered was 0.5% less than the first four months of 2011, the load factor was 61.4%. This trend illustrates the rather uniform seasonal demand that can be expected at ROW.

Based on the load factor trend, the Boyd Group International believes the appropriate amount of capacity is currently being offered at ROW for the demand the region can generate. Based on the population and reach of the primary air service, any significant increase in capacity – by AA or a new entrant to another gateway connecting hub - would likely have a negative impact on the load factor performance, and by extension the financial performance of the American service.

However, to further illustrate this point, a comparison of current data is shown below to compare the ROW performance between January and June of the last four years. Four years is used because capacity changed significantly between 2007 and 2008, thus rendering 2007 inapplicable for comparison purposes.





The data indicates that while capacity is much higher in the first half of 2011 vs. 2010, the load factor performance is much lower. While the seasonality in travel is generally the same, the additional capacity in 2011 thus far has not attracted additional travelers, and therefore it is reasonable to believe that the market was "right sized" prior to the addition of the extra DFW segment in 2011. This also indicates that the ROW market may have a difficult time supporting any meaningful amount of additional capacity from another airline entrant.

ROW Fares vs. Regional Airports

When faced with various options for any service, a consumer often bases the decision on price. As the US economy has faltered over the last few years, this is single factor is as important as ever when looking at air service options in the ROW service region. The table below compares the ROW Top 25 O&D with the same markets at the four larger airports in the region.

Average One-Way Fares: ROW vs. Other Regional Airports
12 Months Year Ending March 31, 2011

		ROW		ABQ		LBB		MAF		ELP	
Rank	Market	Psgr	Avg Fare	Psgr	Avg Fare	Psgr	Avg Fare	Psgr	Avg Fare	Psgr.	Avg Fare
1	DFW	17,608	$175.97	90,608	$182.79	49,403	$129.25	35,330	$114.17	91,133	$190.64
2	LAX	4,985	$174.87	232,355	$168.20	15,277	$230.97	15,377	$245.76	122,695	$169.67
3	IAH	2,248	$224.13	55,289	$216.82	46,225	$156.37	73,977	$179.02	41,823	$228.66
4	DCA	1,969	$354.02	63,306	$283.51	9,469	$261.86	3,842	$339.80	46,309	$237.75
5	ORD	1,830	$259.47	77,069	$199.10	12,194	$187.25	5,509	$257.95	72,538	$226.68
6	SEA	1,495	$311.77	124,992	$201.92	8,891	$288.90	8,352	$254.98	47,055	$231.66
7	AUS	1,407	$212.49	71,243	$194.12	99,280	$129.18	29,859	$158.90	148,115	$153.16
8	SAN	1,404	$240.91	131,250	$166.91	10,240	$251.40	7,423	$239.14	64,268	$196.23
9	ATL	1,277	$308.12	66,365	$275.43	12,681	$254.41	9,365	$230.55	39,166	$321.64
10	TUL	1,276	$235.29	21,636	$211.57	6,634	$170.76	15,833	$202.39	10,876	$221.23
11	SAT	1,265	$204.16	67,755	$172.39	30,126	$167.62	14,274	$182.92	118,109	$169.71
12	MCO	1,215	$261.09	85,326	$215.18	16,751	$219.40	12,819	$240.09	57,290	$205.00
13	DTW	1,197	$255.44	50,880	$188.75	6,807	$194.21	3,294	$308.17	42,911	$223.32
14	LGA	1,175	$329.75	98,392	$213.73	9,510	$275.15	7,327	$296.42	46,930	$208.45
15	LAS	1,115	$216.27	217,705	$153.98	51,824	$189.85	56,246	$195.61	138,732	$168.94
16	MSP	996	$269.83	67,386	$216.29	7,488	$226.31	3,843	$260.07	27,176	$206.65
17	HOU	954	$227.18	97,768	$193.26	70,185	$164.24	108,836	$167.45	103,463	$195.25
18	JAX	936	$351.37	14,443	$271.13	3,611	$238.27	3,579	$260.77	10,126	$297.49
19	IAD	874	$380.72	69,623	$304.54	2,869	$273.17	2,170	$313.35	26,293	$250.19
20	BWI	824	$311.60	122,705	$235.42	10,028	$257.45	7,139	$259.42	39,180	$254.14
21	SFO	821	$209.66	67,154	$187.18	4,759	$261.37	4,641	$287.93	27,125	$204.22
22	HNL	818	$408.61	23,621	$353.95	2,322	$471.57	2,570	$497.62	16,120	$360.00
23	BNA	804	$305.13	38,529	$198.61	9,216	$235.04	7,014	$264.94	23,618	$236.03
24	MCI	793	$242.36	63,599	$176.84	8,934	$215.00	5,667	$212.79	26,781	$194.27
25	BOS	726	$430.28	68,515	$240.81	6,980	$273.26	4,082	$300.23	24,318	$277.84
Total		**50,012**	**$232.20**	**2,087,514**	**$202.52**	**511,704**	**$180.80**	**448,369**	**$194.64**	**1,412,151**	**$201.99**
ROW Avg Fare Premium					**14.7%**		**28.4%**		**19.3%**		**15.0%**

ROW's average one way fare is 14.7% higher than ABQ, and the difference are even greater when comparing to LBB, MAF, and ELP. This is typical of small markets – the cost of serving them exclusively with small airliners is much higher than the larger aircraft and greater frequencies supported by big population centers such as ABQ.

Of particular note, however, is the fare *advantage* that ROW has over ABQ to DFW. ROW has a fare of $175.97 vs. ABQ's fare of $ 182.79. This is a critical piece of data to consider, as it appears that price would not play a large role when travelers are deciding which airport to use between ROW and ABQ, as those living in the ROW primary service area have no incentive to use ABQ. This would lead one to conclude that ROW is not likely losing much passenger traffic to DFW, which accounts for 24% of all ROW passengers as of the year ending March 31, 2011.[12]

However, this is unfortunately not the case with LBB and MAF, who enjoy a $45 and $60 price advantage over ROW, respectively. This would certainly be incentive for a family of four to utilize one of these two airports over ROW, as that would equate to a $360 - $480 savings. Any fuel expense that would be required to drive the further distance to these airports would surely be offset by the fare savings. Given the physical distance and the number of DFW O&D passengers at LBB and MAF, it is estimated the lost traffic to these two airports from the ROW primary service area is in the 5-10% range.

ABQ does not hold a fare advantage over ROW when it comes to the next two markets, LAX and IAH. Again, there is very little incentive for those in the ROW primary service area to utilize ABQ in this instance based purely on price. In fact, LAX O&D have no incentive to use any airport but ROW in the primary service area, as ROW's one way fare is significantly lower. Once again, however, we do see some price variance with LBB and MAF for IAH travelers. In similar fashion as DFW passengers, there is incentive to make the extra drive for the fare savings for a family of four.

When it comes to business travelers, the picture is more obscured. Often times the price savings does not offset the lack of productive time while in the car driving. This is on a case by case basis, however, and likely some business travelers will still use the alternative airports.

[12] Fares shown are one-way average, including federal fees and taxes.

VI. Recommendations for Air Service

For a region such as the Roswell International Air Center air service access revolves squarely around the connecting airline hubs. Airline hubs allow for access to and from Roswell for literally the entire world, and in general the more hubs a community has access to the better in terms of service and competitive balance.

In the case of Roswell International Air Center, there are three geographically logical new airline hubs that would provide increased access. They are Denver, Phoenix, and Salt Lake City.

Unfortunately, given the realities of today's airline economics and the penchant for airlines to decrease capacity in the face of increased expenses and economic uncertainty, it is unlikely that ROW has a realistic opportunity to attract a carrier to and from these three hubs.

Denver: United / Frontier

From a geographical standpoint as well as distance, United/Denver makes sense for consideration for additional air service at ROW.

However, there are other factors at play which make it difficult for United to pursue. First, United is actually shrinking its Denver hub. It is also cutting back on the number of small jets it has in its fleet, and has shown no interest in expanding Denver flights into small communities.

Frontier also has a hub at Denver, but its smallest aircraft is a 100 seat Embraer 190. Simply put, ROW does not have the population or demand to support a 100 seat aircraft.

Phoenix: US Airways

Again, from a geographical standpoint, Phoenix makes sense as an additional air service option for ROW. It would provide good westbound connectivity without the circuitous routings that DFW service offers. The challenge for US Airways is that it, too, is looking to reduce spokes to smaller communities, not add them.

Salt Lake City: Delta Airlines

Another major airline hub that would provide westbound access is Delta's Salt Lake City hub. However, Delta has already begun flying fewer regional jets and has indicated they will cease operations at 24 smaller Essential Air Service markets due to lack of profitability. ROW-SLC service will not be on Delta's radar at this time.

ROW Job #1: Retention of DFW Service

The Boyd Group International believes that the primary focus for the Roswell International Air Center going forward should concentrate on the retention of American Airlines DFW service. While there is not much the community can do to instantly increase its population base, there are some options which may entice American Airlines to continue to serve the community. These include the following:

- Enhancement of Current Air Service Incentive Plan: An air service incentive plan can be a valuable tool for attracting and retention of air service. Of course, it generally implies the forfeiture of certain revenues such as landing fees and terminal rent for a period of time, but it may be deemed necessary to continue to have viable air service at Roswell International Air Center.

- Marketing/Advertising Campaign: A marketing and advertising campaign within the community can be a valuable tool in making the population aware of the DFW service and the need for them to utilize it in order to ensure commercial air service remains a mainstay within the region.

- Small Community Air Service Grant Application: The Small Community Air Service Development program offers grants to communities who suffer from a lack of and have the need for commercial air service. While the 2011 grants have already been awarded in September, the next application cycle will likely be July of 2012, if the program is approved. Also of concern is that the 2011 awards were clearly driven in many cases by political, not air service, considerations.

These are some options smaller communities with the enplanement generation equivalent to that at ROW have to attract and retain air service. However, there truly is no replacement for filling the capacity already offered at ROW. If the flights that are currently being offered are unprofitable, then that generally will be the deciding factor for any airline on whether or not to offer air service at any airport.

VII. Appendix

ROW Origin and Destination Passengers

12 Months Year Ending March 31, 2011

Rank	Market	Psgr	PDEW	% Originating at ROW
1	DFW	17,608	24.1	48.03%
2	LAX	4,985	6.8	59.85%
3	IAH	2,248	3.1	41.06%
4	DCA	1,969	2.7	59.18%
5	ORD	1,830	2.5	46.79%
6	SEA	1,495	2.0	57.66%
7	AUS	1,407	1.9	34.96%
8	SAN	1,404	1.9	51.03%
9	ATL	1,277	1.7	55.08%
10	TUL	1,276	1.7	54.33%
11	SAT	1,265	1.7	53.95%
12	MCO	1,215	1.7	73.55%
13	DTW	1,197	1.6	42.06%
14	LGA	1,175	1.6	60.67%
15	LAS	1,115	1.5	65.59%
16	MSP	996	1.4	45.47%
17	HOU	954	1.3	41.01%
18	JAX	936	1.3	43.05%
19	IAD	874	1.2	59.77%
20	BWI	824	1.1	50.00%
21	SFO	821	1.1	67.83%
22	HNL	818	1.1	91.27%
23	BNA	804	1.1	57.51%
24	MCI	793	1.1	53.14%
25	BOS	726	1.0	34.69%
26	TPA	713	1.0	45.08%
27	SLC	684	0.9	45.54%
28	FAT	671	0.9	37.98%
29	OKC	662	0.9	39.38%
30	PHL	653	0.9	55.47%
31	MIA	643	0.9	45.31%
32	IND	585	0.8	69.07%
33	MSY	582	0.8	89.66%
34	MKE	555	0.8	41.79%
35	FLL	552	0.8	59.94%
36	PIT	538	0.7	46.85%
37	RDU	522	0.7	55.78%
38	STL	513	0.7	66.68%
39	LIT	507	0.7	42.12%
40	EWR	503	0.7	51.96%
41	SMF	434	0.6	41.96%
42	PDX	423	0.6	71.56%
43	CMH	423	0.6	47.64%
44	CRP	393	0.5	36.04%
45	SNA	341	0.5	52.93%

Rank	Market	Psgr	PDEW	% Originating at ROW
46	MFE	312	0.4	22.64%
47	CLE	312	0.4	38.64%
48	SDF	304	0.4	66.76%
49	CVG	293	0.4	41.19%
50	MEM	291	0.4	44.91%
51	SJC	275	0.4	37.04%
52	LFT	275	0.4	10.99%
53	OMA	262	0.4	61.57%
54	CAE	255	0.3	64.19%
55	TYR	252	0.3	23.94%
56	GRR	250	0.3	59.40%
57	CLT	242	0.3	58.36%
58	BUF	234	0.3	17.93%
59	SAV	231	0.3	52.24%
60	JAN	222	0.3	54.69%
61	BHM	221	0.3	54.50%
62	CHS	212	0.3	76.25%
63	ONT	210	0.3	28.52%
64	BTR	201	0.3	74.95%
65	ORF	201	0.3	30.03%
66	AGS	194	0.3	52.22%
67	BDL	191	0.3	73.58%
68	ICT	171	0.2	23.49%
69	TYS	151	0.2	33.37%
70	SJU	151	0.2	46.68%
71	CLL	143	0.2	49.93%
72	MSN	143	0.2	43.44%
73	RIC	141	0.2	42.80%
74	SGF	141	0.2	57.16%
75	PBI	131	0.2	69.37%
76	MYR	131	0.2	69.11%
77	GSP	131	0.2	46.24%
78	CID	121	0.2	25.04%
79	PSC	115	0.2	63.40%
80	BQK	112	0.2	45.12%
81	LEX	112	0.2	27.30%
82	BRO	112	0.2	45.69%
83	VPS	111	0.2	27.31%
84	BUR	110	0.2	54.55%
85	BJI	103	0.1	0.00%
86	ANC	102	0.1	100.00%
87	GGG	101	0.1	39.71%
88	HSV	100	0.1	39.86%
89	PQI	100	0.1	0.00%
90	AEX	94	0.1	22.36%

Rank	Market	Psgr	PDEW	% Originating at ROW
91	PWM	94	0.1	57.32%
92	BIS	94	0.1	45.73%
93	LCH	93	0.1	21.39%
94	GRB	93	0.1	77.53%
95	ROC	92	0.1	78.33%
96	FSM	91	0.1	88.78%
97	SHV	91	0.1	33.52%
98	FWA	90	0.1	77.82%
99	RSW	90	0.1	55.64%
100	CHA	90	0.1	44.36%
101	BGR	90	0.1	55.54%
102	BIL	89	0.1	29.47%
103	PIH	87	0.1	76.54%
104	LRD	83	0.1	24.16%
105	SYR	82	0.1	26.40%
106	FAY	80	0.1	50.27%
107	DAY	80	0.1	37.50%
108	PVD	80	0.1	12.50%
109	GSO	80	0.1	75.00%
110	RNO	73	0.1	84.82%
111	GPT	72	0.1	70.43%
112	KOA	72	0.1	100.00%
113	MRY	72	0.1	29.67%
114	DSM	71	0.1	28.64%
115	GTF	71	0.1	14.39%
116	MGM	71	0.1	85.86%
117	ACT	71	0.1	85.82%
118	LIH	70	0.1	85.67%
119	BOI	63	0.1	65.76%
120	EYW	61	0.1	100.00%
121	PIA	60	0.1	33.76%
122	BTV	53	0.1	60.92%
123	MDT	52	0.1	100.00%
124	JFK	51	0.1	100.00%
125	DLH	51	0.1	59.22%
126	DVL	50	0.1	59.41%
127	SPS	50	0.1	39.86%
128	GRK	50	0.1	39.86%
129	GEG	50	0.1	40.00%
130	FAR	42	0.1	74.80%
131	AVP	42	0.1	51.88%
132	RAP	41	0.1	0.00%
133	STT	41	0.1	75.50%
134	XNA	40	0.1	0.00%
135	ELM	40	0.1	0.00%

Rank	Market	Psgr	PDEW	% Originating at ROW
136	ALB	40	0.1	50.22%
137	OGG	40	0.1	100.00%
138	RKS	40	0.1	100.00%
139	CWA	40	0.1	0.00%
140	RST	40	0.1	50.00%
141	MLI	40	0.1	0.00%
142	ACV	34	0.0	100.00%
143	YKM	34	0.0	100.00%
144	CRW	33	0.0	34.58%
145	MSO	32	0.0	100.00%
146	PNS	31	0.0	33.91%
147	STX	31	0.0	64.97%
148	HPN	31	0.0	100.00%
149	AVL	31	0.0	66.30%
150	EVV	30	0.0	66.40%
151	RDD	26	0.0	100.00%
152	KTN	23	0.0	100.00%
153	AOO	22	0.0	0.00%
154	GTR	22	0.0	0.00%
155	SBP	21	0.0	100.00%
156	OAJ	21	0.0	100.00%
157	ABE	21	0.0	0.00%
158	IDA	21	0.0	100.00%
159	MBS	20	0.0	100.00%
160	MLU	20	0.0	100.00%
161	BMI	20	0.0	0.00%
162	PHF	20	0.0	0.00%
163	ROA	20	0.0	100.00%
164	BHB	20	0.0	100.00%
165	DBQ	20	0.0	100.00%
166	FSD	20	0.0	100.00%
167	MFR	20	0.0	100.00%
168	ITO	20	0.0	100.00%
169	CHO	20	0.0	100.00%
170	ISP	20	0.0	100.00%
171	TXK	20	0.0	50.00%
172	HLN	20	0.0	0.00%
173	LAN	20	0.0	100.00%
174	LSE	20	0.0	100.00%
Total		**73,351**	**100.5**	**51.57%**

Note: These data are compiled and analyzed from US DOT 10% sample data. Therefore, any market showing less than @ 100 passengers is not necessarily a reliable indicator of traffic patterns.

APPENDIX

F

GLOSSARY OF TERMS

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

GLOSSARY OF TERMS

Above Ground Level (AGL)	A height above ground as opposed to MSL (height above Mean Sea Level).
Advisory Circular (AC)	Publications issued by the FAA to provide a systematic means of providing non-regulator guidance and information in a variety of subject areas.
Airport Improvement Program (AIP)	The AIP of the Airport and Airways Improvement Act of 1982 as amended. Under this program, the FAA provide funding assistance for the design and development of airports and airport facilities.
Aircraft Mix	The number of aircraft movements categorized by capacity group or operational group and specified as a percentage of the total aircraft movements.
Aircraft Operation	An aircraft takeoff or landing.
Airport	An area of land or water used or intended to be used for landing and takeoff of aircraft, includes buildings and facilities, if any.
Airport Elevation	The highest point of an airport's useable runways, measured in feet above mean sea level.
Airport Hazard	Any structural or natural object located on or near a public airport, or any use of land near such airport, that obstructs the airspace required for flight of aircraft on approach, landing, takeoff, departure, or taxiing at the airport.
Airport Land Use Regulations	Are designed to preserve existing and/or establish new compatible land uses around airports, to allow land use not associated with high population concentration, to minimize exposure of residential uses to critical aircraft noise areas, to avoid danger from aircraft crashes, to discourage traffic congestion and encourage compatibility with non-motorized traffic from development around airports, to discourage expansion of demand for governmental services beyond reasonable capacity to provide services and regulate the area around the airport to minimize danger to public health, safety, or property from the operation of the airport, to prevent obstruction to air navigation and to aid in realizing the policies of a County Comprehensive Plan and Airport Master Plan.
Airport Layout Plan (ALP)	A graphic presentation, to scale, of existing and proposed airport facilities, their location on the airport and the pertinent applicable standards. To be eligible for AIP funding assistance, an airport must have an FAA-approved ALP.

Airport Master Record, Form 5010	The official FAA document, which lists basic airport data for reference and inspection purposes.
Airport Reference Code (ARC)	The ARC is a coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport.
Airport Reference Point (ARP)	The latitude and longitude of the approximate center of the airport.
Airspace	Space above the ground in which aircraft travel; divided into corridors, routes and restricted zones.
Air Traffic	Aircraft operating in the air or on an airport surface, excluding loading ramps and parking areas.
Approach Surface	A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.
Automated Weather Observing System (AWOS)	This equipment automatically gathers weather data from various locations on the airport and transmits the information directly to pilots by means of computer generated voice messages over a discrete frequency.
Based aircraft	An aircraft permanently stationed at an airport.
Building Restriction Line	A line, which identifies suitable building area locations on airports.
Ceiling	The height above the earth's surface of the lowest layer of clouds or other phenomena which obscure vision.
Conical Surfaces	A surface extending outward and upward form the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.
Controlled Airspace	Airspace in which some or all aircraft may be subject to air traffic control to promote safe and expeditious flow of air traffic.
Critical/Design Aircraft	In airport design, the aircraft which controls one or more design items such as runway length, pavement strength, lateral separation, etc., for a particular airport. The same aircraft need not be critical for all design items.

Day Night Level (DNL)	24-hour average sound level, including a 10 decibel penalty for sound occurring between 10:00 PM and 7:00 AM
Decibel	Measuring unit for sound based on the pressure level.
Design Type	The design type classification for an airport refers to the type of runway that the airport has based upon runway dimensions and pavement strength.
Federal Aviation Administration (FAA)	The federal agency responsible for the safety and efficiency of the national airspace and air transportation system.
FAR Part 77	A definition of the protected airspace required for the safe navigation of aircraft.
Fixed Base Operator (FBO)	An individual or company located at an airport and providing commercial general aviation services.
Fuel Flowage Fees	A fee charged by the airport owner based upon the gallons of fuel either delivered to the airport or pump at the airport.
General Aviation (GA)	All aviation activity in the United States, which is neither military nor conducted by major, national or regional airlines.
Glider	A heavier-than-air aircraft that is supported in flight by the dynamic reaction of the air against its lifting surfaces and whose free flight does not depend principally on an engine (FAR Part 1),
Global Positioning System (GPS)	The global positioning system is a space based navigation system, which has the capability to provide highly accurate three-dimensional position, velocity and time to an infinite number of equipped users anywhere on or near the Earth. The typical GPS integrated system will provide: position, velocity, time, altitude, groundspeed and ground track error, heading and variation. The GPS measures distance, which it uses to fix position, by timing a radio signal that starts at the satellite and ends at the GPS receiver. The signal carries with it, data that discloses satellite position and time of transmission and synchronizes the aircraft GPS system with satellite clocks.
Hazard to Air Navigation	An object which, as a result of an aeronautical study, the FAA determines will have a substantial adverse effect upon the safe and efficient use of navigable airspace by aircraft, operation of air navigation facilities or existing or potential airport capacity.
Horizontal Surface	A horizontal plane 150 feet above the established airport elevation, the perimeter which is constructed by swinging arcs of specified radii form the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs.

Imaginary Surfaces	Surfaces established in relation to the end of each runway or designated takeoff and landing areas, as defined in paragraphs 77.25, 77.28 and 77.29 of FAR Part 77, *Objects Affecting Navigable Airspace*. Such surfaces include the approach, horizontal, conical, transitional, primary and other surfaces.
Itinerant Operations	All operations at an airport, which are not local operations.
Jet Noise	The noise generated externally to a jet engine in the turbulent jet exhaust.
Knots	Nautical miles per hour, equal 1.15 statute miles per hour.
Large Airplane	An airplane of more than 12,500 pounds maximum certified takeoff weight.
Local Operations	Operations by aircraft flying in the traffic pattern or within sight of the control tower, aircraft known to be arriving or departing from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.
Location Identifier	A three-letter or other code, suggesting where practicable, the location name that it represents.
Maneuvering Area	That part of an airport to be used for the takeoff and landing of aircraft and for the movement of aircraft associated with takeoff and landing, excluding aprons.
Master Plan	A planning document prepared for an airport, which outlines directions and developments in detail for 5 years and less specifically for 20 years. The primary component of which is the Airport Layout Plan.
Mean/Maximum Temperature	The average of all the maximum temperatures usually for a given period of time.
Mean Sea Level (MSL)	Height above sea level.
Medium Intensity Runway Lights (MIRL)	For use on VFR runways or runway showing a nonprecision instrument flight rule (IFR) procedure for either circling or straight-in approach.
Minimum Altitude	That designated altitude below which an IFR pilot is not allowed to fly unless arriving or departing an airport or for specific allowable flight operations.

National Airspace System	The common network of United States airspace, navigation aids, communications facilities and equipment, air traffic control equipment and facilities, aeronautical charts and information, rules, regulations, procedures, technical information and FAA manpower and material.
National Plan of Integrated Airport Systems (NPIAS)	A plan prepared annually by the FAA which identifies, for the public, the composition of a national system of airports together with the airport development necessary to anticipate and meet the present and future needs of civil aeronautics, to meet requirements in support of the national defense and to meet the special needs of the Postal Service. The plan includes both new and qualitative improvements to existing airports to increase their capacity, safety, technological capability, etc.
NAVAID	A ground based visual or electronic device used to provide course or altitude information to pilots.
Noise	Defined subjectively as unwanted sound. The measurement of noise involve understanding three characteristics of sound: intensity, frequency and duration.
Noise Contours	Lines drawn about a noise source indicating constant energy levels of noise exposure. DNL is the measure used to describe community exposure to noise.
Noise Exposure Level	The integrated value, over a given period of time of a number of different events of equal or different noise levels and durations.
Non-Precision Instrument	A runway having an existing instrument approach procedure utilizing air navigation facilities with only horizontal guidance for which a straight-in nonprecision instrument approach procedure has been approved.
Notice to Airmen (NOTAM)	A notice containing information (not known sufficiently in advance to publicize by other means concerning the establishment, condition or change in any component (facility, service, or procedure) of or hazard in the National Airspace System, the timely knowledge of which is essential to personnel concerned with flight operations.
Object	Includes, but is not limited to, above ground structures, NAVAIDs, people, equipment, vehicles, natural growth, terrain and parked aircraft.
Object Free Area (OFA)	A two-dimensional ground area-surrounding runways, taxiways and taxilanes which is clear of objects except for object whose location is fixed by function.

Obstacle Free Zone (OFZ)	The airspace defined by the runway OFZ and, as appropriate, the inner-approach OFZ and the inner-transitional OFZ, which is clear of object penetrations other than frangible NAVAIDs.
Obstruction	An object which penetrates an imaginary surface described in the FAA's Federal Aviation Regulations (FAR), Part 77.
Parking Apron	An apron intended to accommodate parked aircraft.
Pattern	The configuration or form of a flight path flown by an aircraft or prescribed to be flown, as in making an approach to a landing
Precision Approach Path Indicators (PAPI)	The visual approach slope indicator system furnishes the pilot visual slope information to provide safe descent guidance. It provides vertical visual guidance to aircraft during approach and landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that they are "on path" if they see red/white, "above path" if they see white/white and "below path" if they see red/red.
Primary Surface	A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway, but when the runway has no specially prepared hard surface, or planned hard surface, the primary surface ends at each end of that runway.
Rotating Beacon	A visual navaid operated at many airports. At civil airports, alternating white and green flashes indicate the location of the airport.
Runway	A defined rectangular surface on an airport prepared or suitable for the landing or takeoff of airplanes.
Runway End Identifier Lights (REIL)	REILs are flashing strobe lights which aid the pilot in identifying the runway end at night or in bad weather conditions.
Runway Gradient	The average gradient consisting of the difference in elevation of the two ends of the runway divided by the runway length may be used provided that no intervening point on the runway profile lies more than five feet above or below a straight line joining the two ends of the runway. In excess of five feet the runway profile will be segmented and aircraft data will be applied for each segment separately.
Runway Lighting System	A system of lights running the length of a system that may be either high intensity (HIRL), medium intensity (MIRL), or low intensity (LIRL).
Runway Orientation	The magnetic bearing of the centerline of the runway.

Runway Protection Zone (RPZ)	An area off the runway end used to enhance the protection of people and property on the ground.
Runway Safety Area (RSA)	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion form the runway.
Segmented Circle	A basic marking device used to aid pilots in locating airports and which provides a central location for such indicators and signal devices as may be required.
Small Aircraft	An airplane of 12,500 pounds or less maximum certified takeoff weight.
Taxiway	A defined path established for the taxiing of aircraft from one part of an airport to another.
Terminal Area	The area used or intended to be used for such facilities as terminal and cargo buildings, gates, hangars, shops and other service buildings, automobile parking, airport motels, restaurants, garages and automobile services and a specific geographical area within which control of air traffic is exercised.
Threshold	The beginning of that portion of the runway available for landing.
Touch and Go Operations	Practice flight performed by a landing touch down and continuous takeoff without stopping.
Traffic Pattern	The traffic flow that is prescribed for aircraft landing at, taxiing on or taking off form an airport. The usual components are the departure, crosswind, downwind, and base legs; and the final approach.
Transitional Surface	These surfaces extend outward and upward at right angles to runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces.
Universal Communications (UNICOM)	A private aeronautical advisory communications facility for purpose other than air traffic control. Only one such station is authorized in any landing area. Service available are advisory in nature primarily concerning the airport services and airport utilization. Locations and frequencies of UNICOMs are listed on aeronautical charts and publications.
Visual Flight Rules (VFR)	Rules that govern flight procedures under visual conditions.
Visual Runway	A runway intended for visual approaches only with no straight-in instrument approach procedure either existing or planned for that runway.

APPENDIX

G

ACRONYMS

ROSWELL INTERNATIONAL AIR CENTER
ROSWELL, NEW MEXICO
AIRPORT MASTER PLAN UPDATE

ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING

COMMONLY USED ACRONYMS

AC	Advisory Circular
AD	Airport Design
ADG	Airplane Design Group
AGL	Above Ground Level
AIP	Airport Improvement Program
ALP	Airport Layout Plan
ALS	Approach Lighting System
ARC	Airport Reference Code
ARP	Airport Reference Point
ARTCC	Air Route Traffic Control Center
ASDA	Accelerate Stop Distance
ASDE	Airport Surface Detection Equipment
ASR	Airport Surveillance Radar
ASV	Annual Service Volume
ATC	Air Traffic Control
ATCT	Airport Traffic Control Tower
AWOS	Automated Weather Observation system
BRL	Building Restriction Line
CAT	Category
CFR	Code of Federal Regulations
CWY	Clearway
CY	Calendar Year
DME	Distance Measuring Equipment
EL	Elevation
EMT	Emergency Medical Technician
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FBO	Fixed Base Operator
FSS	Flight Service System
FY	Fiscal Year
GA	General Aviation
GPS	Global Positioning System
HIRL	High Intensity Runway Lights
IEMT	Intermediate Emergency Medical Technician
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
LDA	Landing Distance Available
LOC	Localizer
MALS	Medium Intensity Approach Lighting System
MALSF	Medium Intensity Approach Lighting System
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
ME	Multi-Engine
MIRL	Medium Intensity Runway Lights
MITL	Medium Intensity Taxiway Lights
MLS	Microwave Landing System
MOA	Military Operating Area
MSL	Mean Sea Level
NAVAID	Navigational Aid
NDB	Nondirectional Beacon
NM	Nautical Mile
NPIAS	National Plan of Integrated Airport Systems
ODALS	Onmnidirectional Approach Lighting System
OFA	Object Free Area
OFZ	Obstacle Free Zone
PAPI	Precision Approach Path Indicator
PAR	Precision Approach Radar
RAIL	Runway Alignment Indicator Lights
REIL	Runway End Identifier Lights
ROFA	Runway Object Free Area
RPZ	Runway Protection Zone
RSA	Runway Safety Area
RVR	Runway Visual Range
RW	Runway
SWY	Stopway
TERPS	Terminal Instrument Procedures
TH	Threshold
TL	Taxilane
TODA	Takeoff Distance Available
TOFA	Taxiway Object Free Area
TORA	Takeoff Run Available
TSA	Taxiway Safety Area
TVOR	Very High Frequency Omnirange on an Airport
TW	Taxiway
USGS	United States Geological Society
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VOR	Very High Frequency Omnirange
WAAS	Wide Area Augmentation System

ARMSTRONG CONSULTANTS, INC.

New Mexico Office
2000 Randolph Road S.E., Suite 102
Albuquerque, NM 87106
(505) 508-2192

Arizona Office
28 West Juniper Avenue, Suite 201
Gilbert, AZ 85233
(602) 803-7079

Corporate Office
861 Rood Avenue
Grand Junction, Colorado 81501
(970) 242-0101
www.armstrongconsultants.com