Airport Master Plan

AIRPORT MASTER PLAN
for
PHOENIX-MESA GATEWAY AIRPORT
Mesa, Arizona

FINAL REPORT

Prepared for the
WILLIAMS GATEWAY AIRPORT AUTHORITY
by
Coffman Associates, Inc.

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PhxMesa Gateway Airport

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Mesa, Arizona

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PhxMesa Gateway Airport

INTRODUCTION

Introduction

This update of the Phoenix-Mesa Gateway Airport (IWA) Master Plan has been undertaken to evaluate the airport's capabilities and role, to review forecasts of future aviation demand, and to plan for the timely development of new or expanded facilities that may be required to meet that demand. The ultimate goal of the master plan is to provide systematic guidelines for the airport's overall development, maintenance, and operation.

The master plan is intended to be a proactive document which identifies and then plans for future facility needs well in advance of the actual need for the facilities. This is done to ensure that the Williams Gateway Airport Authority (WGAA) can coordinate project approvals, design, financing, and construction to avoid experiencing detrimental effects due to inadequate facilities.

An important result of the master plan is reserving sufficient areas for future facility needs. This protects development areas and ensures they will be readily available when required to meet demand. The intended result is a development concept which outlines the proposed uses for all areas of airport property.

The WGAA recognizes the importance of air transportation to the community, as well as the unique challenges operating an airport presents. The investment in an airport yields many benefits to the community and the region. With a sound and realistic master plan, the Phoenix-Mesa Gateway Airport can maintain its important link to the national air transportation system for the community and maintain the existing public and private investments in its facilities.

MASTER PLAN GOALS AND OBJECTIVES

The primary objective of the master plan is to provide the community and its leadership with guidance for operating the airport in a safe and efficient manner while planning for future demand levels. Accomplishing this objective requires a comprehensive evaluation of the existing airport and a determination of what actions should be taken to maintain a safe and reliable airport facility while meeting the aviation needs of the region. This master plan will provide a vision for the airport covering the next 20 years and, in some cases, beyond. With this vision, the WGAA will have advance notice of potential future airport funding needs so that appropriate steps can be taken to ensure that adequate funds are budgeted and planned.

Specific objectives of the Phoenix-Mesa Gateway Airport Master Plan Update are:

- To preserve and protect public and private investments in existing airport facilities;
- To enhance the safety of aircraft operations;
- To be reflective of community and regional goals, needs, and plans;
- To ensure that future development is environmentally compatible;
- To establish a schedule of development priorities designed to meet forecast aviation demand;
- To develop a plan that is responsive to air transportation demands;
- To develop an orderly plan for use of the airport;
- To meet Federal Aviation Administration (FAA) airport design standards;
- To coordinate this master plan with local, regional, state, and federal agencies, and;
- To develop active and productive public involvement throughout the planning process.

The master plan will accomplish these objectives by carrying out the following:

- Determining projected needs of airport users through the year 2026;
- Analyzing socioeconomic factors likely to affect air transportation demand for the airport;
- Identifying potential existing and future land acquisition needs;
- Evaluating future airport facility development alternatives which will optimize airport capacity and aircraft safety;

- Developing a realistic, common-sense plan for the use and/or expansion of the airport;
- Present environmental considerations associated with recommended development alternatives;
- Produce current and accurate airport base maps and Airport Layout Plans.

MASTER PLAN ELEMENTS AND PROCESS

The Phoenix-Mesa Gateway Airport Master Plan Update is being prepared in a systematic fashion following FAA and Arizona Department of Transportation – Aeronautics Division (ADOT) guidelines and industry-accepted principles and practices, as shown on **Exhibit IA**. The master plan has six chapters that are intended to assist in the discovery of future facility needs and provide the supporting rationale for their implementation.

Chapter One - Inventory summarizes the inventory efforts. The inventory efforts are focused on collecting and assembling relevant data pertaining to the airport and the area it serves. Information is collected on existing airport facilities and operations. Local economic and demographic data is collected to define the local growth trends. Planning studies which may have relevance to the master plan are also collected.

Chapter Two - Forecasts examines the potential aviation demand at the airport. The analysis utilizes local socioeconomic information, as well as national air transportation trends, to quantify the levels of aviation activity which can reasonably be expected to occur at Phoenix-Mesa Gateway Airport through the year 2026. The results of this effort are used to determine the types and sizes of facilities which will be required to meet the projected aviation demand at the airport through the planning period.

Chapter Three - Facility Requirements comprises the demand capacity and facility requirements analyses. The intent of this analysis is to compare the existing facility capacities to forecast aviation demand and determine where deficiencies in capacities (as well as excess capacities) may exist. Where deficiencies are identified, the size and type of new facilities to accommodate the demand are identified. The airfield analysis focuses on improvements needed to safely serve the type of aircraft expected to operate at the airport in the future, as well as navigational aids to increase the safety and efficiency of operations. This element also examines the general aviation terminal, hangar, apron, and support needs.

Chapter Four - Alternatives considers a variety of solutions to accommodate the projected facility needs. This element proposes various facility and site plan configurations which can meet the projected facility needs. An analysis is completed to identify the strengths and weaknesses of each proposed development alternative, with the intention of determining a single direction for development.

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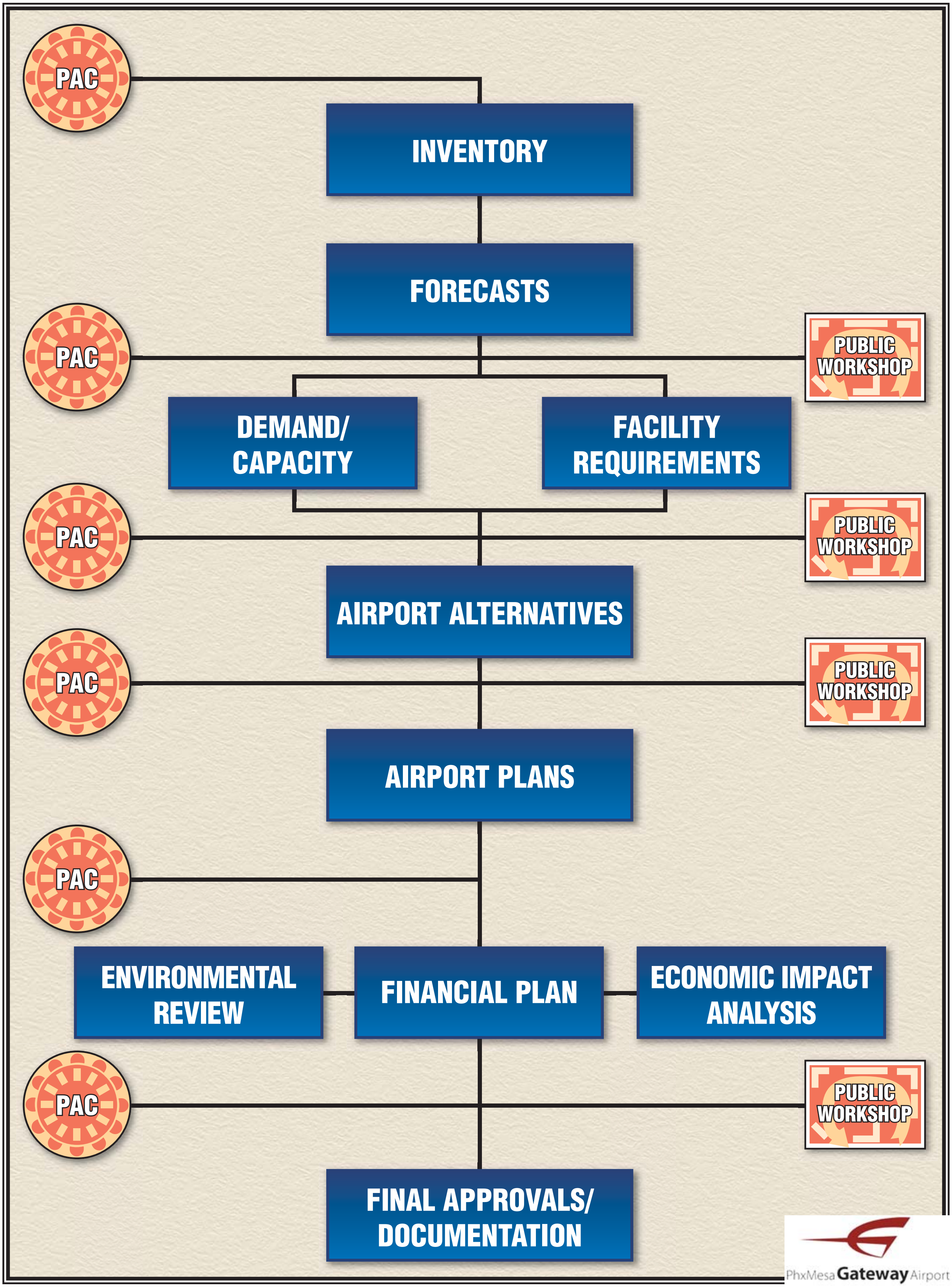

Exhibit IA
MASTER PLAN PROCESS

Chapter Five – Recommended Master Plan Concept provides both a graphic and narrative description of the recommended plan for the use, development, and operation of the airport. An environmental overview is also provided. The master plan also includes the Airport Layout Plan (ALP) and detailed technical drawings depicting related airspace, land use, and property data. These drawings are used by the FAA and ADOT in determining grant eligibility and funding.

Chapter Six - Financial Plan focuses on the capital needs program which defines the schedules, costs, and funding sources for the recommended development projects.

COORDINATION

The Phoenix-Mesa Gateway Airport Master Plan Update is of interest to many within the local community. This includes local citizens, community organizations, airport users, airport tenants, area-wide planning agencies, and aviation organizations.

As an important component of the regional, state, and national aviation systems, the Phoenix-Mesa Gateway Airport is of importance to both state and federal agencies responsible for overseeing air transportation.

To assist in the development of the master plan, the WGAA has identified a group of community members and aviation interest groups to act in an advisory role in the development of the master plan. Members of the Planning Advisory Committee (PAC) will review phase reports and provide comments throughout the study to help ensure that a realistic, viable plan is developed.

To assist in the review process, draft chapters will be prepared at the various milestones in the planning process. The production of draft chapters allows for timely input and review during each step within the master plan to ensure that all master plan issues are fully addressed as the recommended program develops.

BASELINE ASSUMPTIONS

A study such as this typically requires some baseline assumptions that will be used throughout the analysis. The baseline assumptions for the Phoenix-Mesa Gateway Airport Master Plan are listed below:

- Phoenix-Mesa Gateway Airport currently operates as a reliever airport in the greater Phoenix metropolitan area.
- Phoenix-Mesa Gateway Airport will continue to pursue commercial service opportunities.
- Phoenix-Mesa Gateway Airport will continue to pursue air cargo opportunities.
- Phoenix Sky Harbor International Airport will continue to be the primary commercial service airport with limited general aviation activity.

- The other publicly owned general aviation airports in the Phoenix metropolitan area will remain open for the foreseeable future.

- The airport will operate under the direction of the Phoenix-Mesa Gateway Airport Authority throughout the planning period.

- Phoenix-Mesa Gateway Airport intends to seek general aviation and corporate business aviation based tenants and transient operations.

- The aviation industry on the national level will grow as forecast by the FAA in its annual Aerospace Forecasts.

- Population and employment in the Phoenix-Mesa Gateway Airport service area will continue to grow as forecast by the Maricopa Association of Governments (MAG).

CONCLUSION

The master plan is evidence that the Williams Gateway Airport Authority is committed to maintaining a first-class aviation facility providing passenger, cargo, and general aviation service. The Authority recognizes the importance of Phoenix-Mesa Gateway Airport to the community and the region, as well as the associated challenges inherent in providing for aviation needs in a growing regional environment. Maintaining a sound, flexible Master Plan will facilitate continued growth of the airport as a major economic asset for the community.

PhxMesa Gateway Airport

Chapter One

INVENTORY

Chapter One

Inventory

The initial step in the preparation of the airport master plan update for Phoenix-Mesa Gateway Airport is the collection of information that will provide a foundation for the analysis to be completed in subsequent chapters. For the master plan, information is gathered regarding the airport and the region it serves. This chapter will begin with an overview discussion of regional setting for the airport, including the proximity and impact of other airports. A discussion of relevant local and regional planning and aviation studies is also presented. A comprehensive overview of the national aviation system and the role of Phoenix-Mesa Gateway Airport in the national system are also presented. Finally, an inventory of the existing conditions at the airport will be discussed.

The information outlined in this chapter was obtained through on-site inspections of the airport, including interviews with airport management, airport tenants, and representatives of various government agencies. Information was also obtained from existing studies. Additional information and documents were provided by Federal Aviation Administration (FAA), Maricopa Association of Governments (MAG), Arizona Department of Transportation - Aeronautics Division (ADOT), the City of Phoenix - Aviation Department, and the Cities of Mesa, Queen Creek, Gilbert, and Chandler.

AIRPORT HISTORY

The U.S. Army Air Corps broke ground for its Advanced Flight School

on July 16, 1941, in order to train pilots for the combat demands of World War II. In February 1942, the military base's name was changed to Williams Field to honor Charles Linton Williams, an Arizona-born pilot. The facility provided pilot training for both fighter and bomber aircraft including the AT-9, AT-17, P-38, AT-6, B-17, B-24, P-51, P-47, F-86, F-100, T-37, and T-38. The facility was designated as Williams Air Force Base (WAFB) in January 1948.

Williams Air Force Base was recommended for closure in 1991 by the Base Closure and Realignment Commission (BRAC). Public officials were facing the loss of 3,800 jobs and $300 million in economic activity. The governor at the time created the Economic Reuse Advisory Board to develop a long range plan for reuse of the air force base. The resulting plan determined the base to be developed as an aerospace center with an educational, research and training facility, and the airport serving as a reliever to Phoenix Sky Harbor International Airport. Aviation uses identified included commercial passenger service, aircraft manufacturing, maintenance, modification, air cargo, and flight training.

To work toward ownership and operation of the airport, an Intergovernmental Agreement Group (IGA) was established in October 1992. The IGA developed legislation to create the Williams Gateway Airport Authority (WGAA) under the Joint Powers Airport Authority Agreement. The airport officially opened in March 1994, and WGAA was established in May 1994. The deed to the airport property was transferred to WGAA in 1998.

AIRPORT ADMINISTRATION

Phoenix-Mesa Gateway Airport is owned and operated by the Williams Gateway Airport Authority. The WGAA Board consists of the mayors of the City of Mesa, the City of Phoenix, the Towns of Gilbert and Queen Creek, and the Governor of the Gila River Indian Community. This five-member board provides policy direction for the Authority. An executive director and professional staff conduct the day-to-day activities of the airport.

DEVELOPMENT AND FUNDING HISTORY

This is the second update to the original airport master plan completed in 1993. Since the completion of the first master plan update in 1999, more than $49.5 million has been invested in the airport. The vast majority of this total, more than $47.2 million, has been funded through various federal and state grants. This has included funding for planning studies, engineering and construction projects, and marketing activities. The WGAA has contributed more than $2.2 in matching funds for these grants. In addition, WGAA has invested approximately eight million dollars in projects not associated with federal or state grants. **Table 1A** summarizes the grant history for the airport since the last update was undertaken.

TABLE 1A
WGAA Grant History (1999-2007)
Phoenix-Mesa Gateway Airport

Funding Source/Project Description	Year	Grant Number	Grant Amount	WGAA Match
Federal Aviation Administration				
Part 15 - Noise Study	Jan-99	3-04-0078-05	$227,650	$11,175
Rehabilitation of Interim Terminal	Jul-99	3-04-0078-06	$2,668,570	$130,996
Taxiway A Reconstruction	Sep-99	3-04-0078-07	$3,068,855	$150,646
Taxiway A Reconstruction (Cargo Apron)	Aug-00	3-04-0078-08	$2,875,000	$141,129
Cargo Apron Construction	May-01	3-04-0078-09	$4,060,188	$199,309
Taxiway A/B Reconstruction	Jul-02	3-04-0078-10	$150,000	$7,363
Cargo Apron Construction	Sep-02	3-04-7800-11	$1,357,600	$66,643
Taxiway F Construction	Aug-03	3-04-0078-12	$1,275,000	$62,588
RSA & Taxiway A/P Fillet Reconstruction	Aug-04	3-04-0078-13	$2,430,285	$63,957
Rwy 12C-30C & Rwy 12R-30L Reconstruct	Aug-05	3-04-0078-14	$4,181,713	$110,048
Taxiway B Ph. II & Fire Code (MAP) Projects	Aug-05	3-04-0078-15	$5,137,500	$135,202
Parking Lot Construction (MAP Projects)	Aug-06	3-04-0078-16	$2,276,417	$59,905
Airport Master Plan Update	Aug-06	3-04-0078-17	$515,000	$13,553
Taxiway B Phase III	Sep-06	3-04-0078-18	$2,400,000	$63,160
Service Road Reconstruct	Jul-07	3-04-0078-19	$1,162,582	$61,189
Taxiway "B" (H to G) Phase IV	Jul-07	3-04-0078-19	$3,204,783	$168,673
SUBTOTAL			**$36,991,143**	**$1,445,536**
Arizona Department of Transportation - Aeronautics Division (ADOT)				
FY '00 - Remainder of Programmed Funds	Aug-99	E0109	$108,000	$12,000
Matches of FAA Grant Numbers (05-18)	99-06	Various	$1,215,674	$0
FY '05 - North Tract Security Lighting	Jul-04	E5S03	$535,031	$59,448
FY '05 - EA for Land Acquisition	Jul-04	E5S01	$22,500	$2,500
FY '05 - South Central Fire Protection System	Sep-04	E5S38	$714,975	$79,442
FY '06 - Security Fencing Installation	Jul-05	E6S31	$613,575	$68,175
Taxiway G Construction	Jul-05	E6S33	$378,000	$42,000
Compass Rose Construction	Jul-05	E6S32	$20,000	$2,222
ILS Study	Jul-05	E6S42	$135,000	$15,000
Taxiway L Construction (Design Only)	Jul-05	E6S34	$450,000	$50,000
Apron Drainage Improvements	Jul-06	E7S07	$810,000	$90,000
Construct Access Road, Drainage, etc.	Aug-06	E7S37	$908,280	$100,920
Survey & Design ILS Installation Runway 30R	Sep-06	E7S65	$70,875	$7,875
Taxiway G Construction (2nd grant)	Nov-06	E7S67	$160,000	$17,778
APMS FY06	Jul-07	E6S11	$620,735	$68,971
Perimeter Road Relocation	Jul-07	E8S33	$382,725	$42,525
Drainage Improvements	Jul-07	E8S34&E8S01	$1,617,275	$179,697
SUBTOTAL			**$8,762,645**	**$838,553**
Arizona Department of Commerce				
Marketing Grants	'99-'01	-	$1,050,000	$0
SUBTOTAL		-	**$1,050,000**	**$0**
Miscellaneous Grants				
Sky Harbor Cooperative Marketing Grant	Apr-04	-	$100,000	$0
Sky Harbor Cooperative Marketing Grant	Apr-05	-	$130,000	$0
Sky Harbor Cooperative Marketing Grant	Apr-06	-	$130,000	$0
MAG PM-10 Sweeper	Aug-05	-	$127,305	$7,695
SUBTOTAL		-	**$487,305**	**$7,695**

TABLE 1A (Continued) WGAA Grant History (1999-2007) Phoenix-Mesa Gateway Airport				
Funding Source/Project Description	**Year**	**Grant Number**	**Grant Amount**	**WGAA Match**
CUMULATIVE TOTAL		-	**$47,291,093**	**$2,291,784**
COMBINED TOTAL			**$49,582,877**	

Note: Grant totals include amendments to date
Source: WGAA

CURRENT PROJECTS

The airport is constantly addressing needs brought on by increasing aviation demand. **Table 1B** presents a list of those projects currently taking place and scheduled for completion during the timeframe of the master plan development. Many of these projects are infrastructure related and necessary to accommodate ongoing landside development. Several airfield improvements are also in progress, particularly drainage-related issues and an instrument landing system for Runway 30L.

TABLE 1B
Current Projects
Phoenix-Mesa Gateway Airport

Airport Project Number	Description	Estimated Completion Date
1	North Apron Drainage for GA Area	May-07
2	North Airfield Drainage: Detention Basin and Underground Piping	Mar-08
3	South Airfield Drainage	Mar-08
17	Airport Master Plan	Aug-08
51	Design Taxiway B Between Taxiways G and H: Group V Taxiway	Mar-08
57	Taxiway G: Taxilane (50'x350') to North Development Area	May-07
119	N. Sossaman Parking Lot Improvements between Buildings 46 and 74	Dec-07
175	Airfield Perimeter Road: North and East Perimeter Road	Mar-08
263	AFFF Detention Basin	May-07
353	South Central Apron Fire Protection: Extend Fire Suppression Piping	Jul-07
356	Construct Sossaman Road Parking Lots: Hangars 32 and 37	Dec-07
410	North GA Roadway: Entrance Cul-de-sac for GA Development Areas	Dec-07
414	Taxiway L from Runway 30C into South Tract (75'x3,950')	Mar-07
424	Code Upgrades Hangar 31	Dec-07
435	Instrument Landing System (ILS) Design: Runway 30C	Dec-07
458	ILS Location Study on Rwy 30L and moving Rwy 30C ILS to Rwy 30R	Sep-06
459	Signage Improvements along Sossaman Road	Aug-07
460	Revenue Controls for Lot 30: Passenger Terminal Parking Lot	Apr-07
466	Design Demo and Salvage Plan for Old Fuel Farm	Dec-07
488	Construction of 25,000 s.f. Hangar for Lease to ASU	May-07
541	North GA Fire Suppression Line Extension	Jun-07

Source: WGAA April 1, 2007

REGIONAL SETTING AND LAND USE

This section will provide a discussion of the regional setting, ground transportation network, on-and-off airport land use, area zoning, and various planning studies that potentially affect Phoenix-Mesa Gateway Airport. It is important to synthesize this background material with the future development program for the airport.

AIRPORT LOCATION

As depicted on **Exhibit 1A**, Phoenix-Mesa Gateway Airport is located on approximately 3,020 acres of property on the southeast edge of the City of Mesa, Arizona. This is also the south east portion of Maricopa County, with Pinal County located approximately six miles south and three miles east of the airport. Although the airport is located entirely within the City of Mesa, immediately adjacent to the west is the Town of Gilbert; to the south is the Town of Queen Creek; to the east and north is the City of Mesa.

The City of Phoenix is located approximately 25 miles northwest of the airport. Phoenix is the capital of the State of Arizona and is home to Phoenix Sky Harbor International Airport (PHX). In 2006, PHX ranked as the seventh busiest airport in the country, as measured by passenger boardings.

The immediate vicinity of the airport is characterized by flat, undeveloped terrain, particularly to the east and south. With the recent opening of major portions of the Santan Freeway has come significant pressure for both residential and commercial/industrial development.

To the immediate west, approximately 734 acres of the former Air Force Base are currently utilized by the Williams Educational, Research, and Training (ERT) Campus. This campus is primarily owned by Arizona State University (ASU) and the Maricopa Community College District. Education providers located on the campus include the ASU Polytechnic Campus and the Chandler-Gilbert Community College. The Air Force Research Lab is located on the site.

Phoenix-Mesa Gateway Airport is directly accessed via South Sossaman Road which connects to Power Road (via Ray Rd.) to the immediate northwest of the airport. South Sossaman Road extends south to East Pecos Road. The airport is bordered on the west by Sossaman Road, to the south by the East Pecos Road, to the east by South Ellsworth Road and to the north by the 202 Loop (Santan Freeway) which was recently completed.

REGIONAL CLIMATE

Weather conditions must be considered in the planning and development of the airport, as daily operations are affected by local weather patterns. Temperature is a significant factor in determining runway length needs, while local wind patterns (both direction and speed) dictate the optimal orientation of the runway.

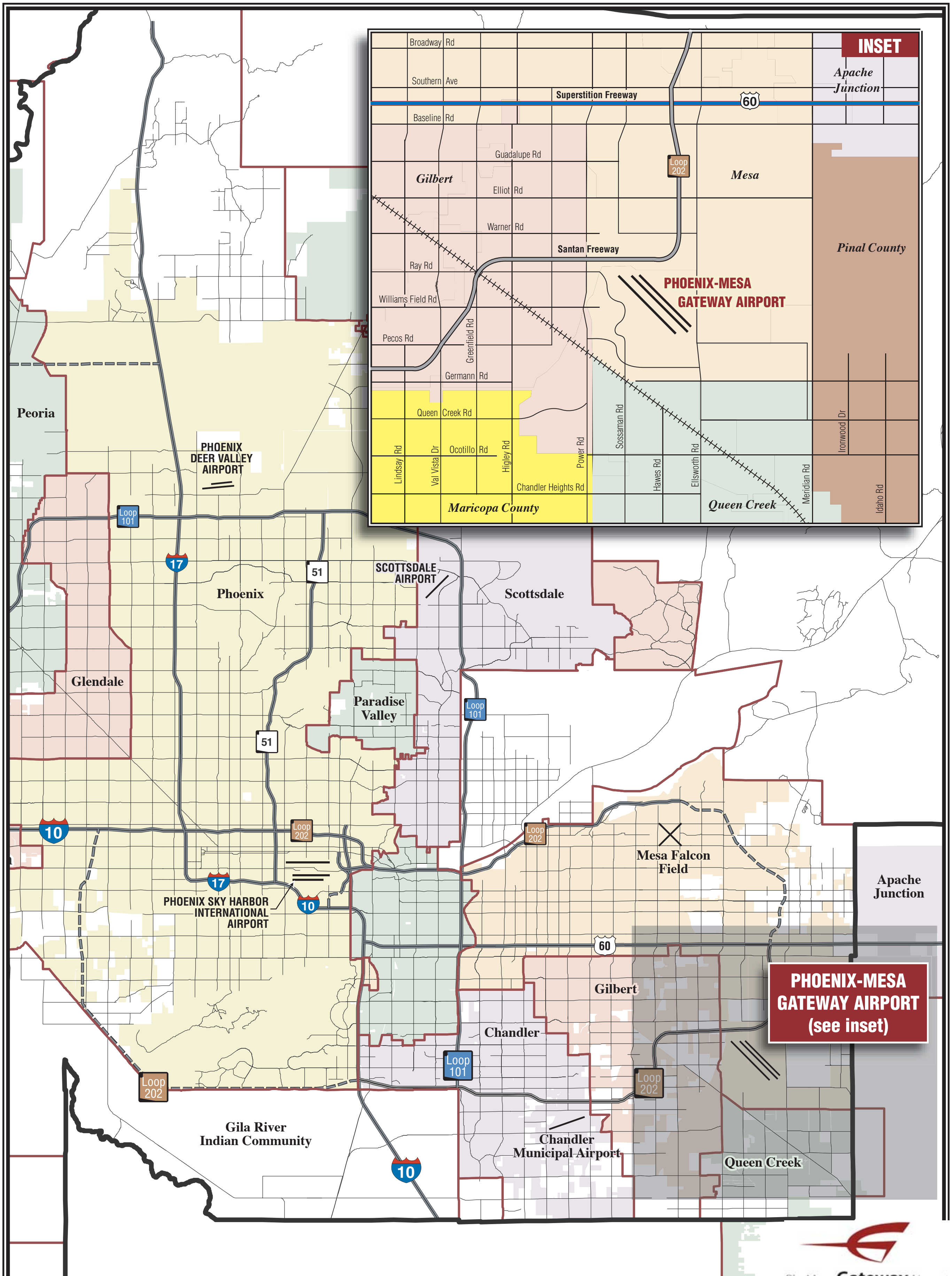

Exhibit 1A
AIRPORT VICINITY MAP

The regional climate is typical of the desert southwest, warm and dry. The normal daily minimum temperature ranges from 40 degrees in December to 77 degrees in July. The normal daily maximum temperature ranges from 67 degrees in December and January to 106 degrees in July. The Mesa area averages approximately 9 inches of precipitation annually. Calm wind conditions between zero and three knots are experienced at the airport 43.5 percent of the time on average. Winds registering between four and 13 knots are experienced 56 percent of the time on average. The monthly average wind speed is 5.37 knots (6.2 miles per hour). A summary of climactic data is presented in **Table 1C**.

TABLE 1C
Climate Summary
Mesa, Arizona

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
High Temp. Avg. (F)	67	71	77	85	94	104	106	104	99	89	75	67
Low Temp. Avg. (F)	41	45	49	54	61	70	77	76	70	59	47	40
Precip. Avg. (in.)	1.01	0.99	1.19	0.33	0.17	0.06	0.89	1.14	0.89	0.81	0.77	0.98
Wind Speed (mph)	5.2	5.8	6.5	6.9	7.0	6.9	7.0	6.7	6.2	5.8	5.2	5.0
Sunshine (%)	77	80	83	89	93	94	86	85	89	88	83	77

Source: www.weather.com and www.city-data.com

REGIONAL TRANSPORTATION

The ground transportation network in the vicinity of the airport is substantial and is rapidly improving. A significant portion of Loop 202 (Santan Freeway) was recently completed and is open from Interstate 10 to US Highway 60 (Superstition Freeway). This high-speed freeway passes less than a mile north of the airport. By 2008, the final section of Loop 202 is expected to be open to traffic from Highway 60 to the northern terminus of Loop 202.

The Williams Gateway Freeway (State Road 802) is a planned new freeway that will extend from Loop 202 on the northeast side of Phoenix-Mesa Gateway Airport, then southeast between the airport and the General Motors proving ground site before heading eastward. The Williams Gateway Freeway is planned to connect to US Highway 60 or SR 79 in Pinal County. The alignment for Maricopa County has been determined, but the Pinal County alignment is under study. The project is forecast to be completed in the 2016-2020 timeframe.

The City of Mesa has an extensive transportation plan that provides a blueprint for future transportation improvements. In the vicinity of the airport, the major north-south and east-west roads are planned as six-lane arterial roads. The north-south roads include Power, Hawes and Ellsworth. Power Road is currently a four-lane arterial, while the other roads are two-lane arterials. Both Power and Ellsworth Roads are currently undergoing improvements. Pecos Road, Ray Road, and Warner Road are all planned as six-lane arterial roads as well.

Union Pacific rail lines traverse from the northwest to the southeast, crossing Power Road just south of Pecos Road, approximately 1,200 feet from the southwest corner of airport property. There are currently no rail spurs extending onto the airport. This rail line is currently used for freight rail only, as passenger rail service is not available in the Phoenix Metropolitan Area.

The Maricopa Association of Governments completed the High Capacity Transit study in 2003. This report recommends an extensive commuter rail mass transit system. The study recommends utilizing the existing Union Pacific rail line that passes to the southwest of the airport.

The first phase of a light rail system in the Phoenix area is currently under construction and is scheduled to open in 2008. The initial light rail line is approximately 20 miles long and extends from Montebello and 19^{th} Avenue (northwest of downtown Phoenix) south to Phoenix Sky Harbor International Airport and then east to Mesa at Sycamore and Main Street. A two-mile long extension is planned in 2015 for the Mesa end of the light rail line, which would reach Mesa Town Center.

Valley Metro provides bus service in the greater Phoenix metropolitan area including the City of Mesa. The closest bus stop is located on the ASU/CGCC campus immediately west of the airport.

Local transportation service includes several taxi companies, some of which cater to customers with special needs. There are directional signs to the airport on the major arterials and highways in the vicinity of the airport.

AREA LAND USE AND ZONING

Current and planned land uses in the vicinity of the airport can have a significant impact on airport operations and growth. The following section identifies baseline information relating to both existing and future land uses in the vicinity of Phoenix-Mesa Gateway Airport. By understanding the land use issues surrounding the airport, more appropriate recommendations can be made for the future of the airport.

Generalized existing land uses that surround the airport are presented on **Exhibit 1B**. To the south in Mesa, agricultural land uses are prominent on both sides of Pecos Road. Slightly further south is some residential development. To the east are the General Motors (GM) proving grounds. This property has been sold by GM and private developers are currently working with City of Mesa planning officials for planning approval for mixed-use development. The area to the immediate west of the airport is reserved for educational purposes. Arizona State University Polytechnic and Chandler-Gilbert Community College occupy the majority of this property. To the west of Power Road, in the Town of Gilbert, are residential and agricultural uses. To the north is

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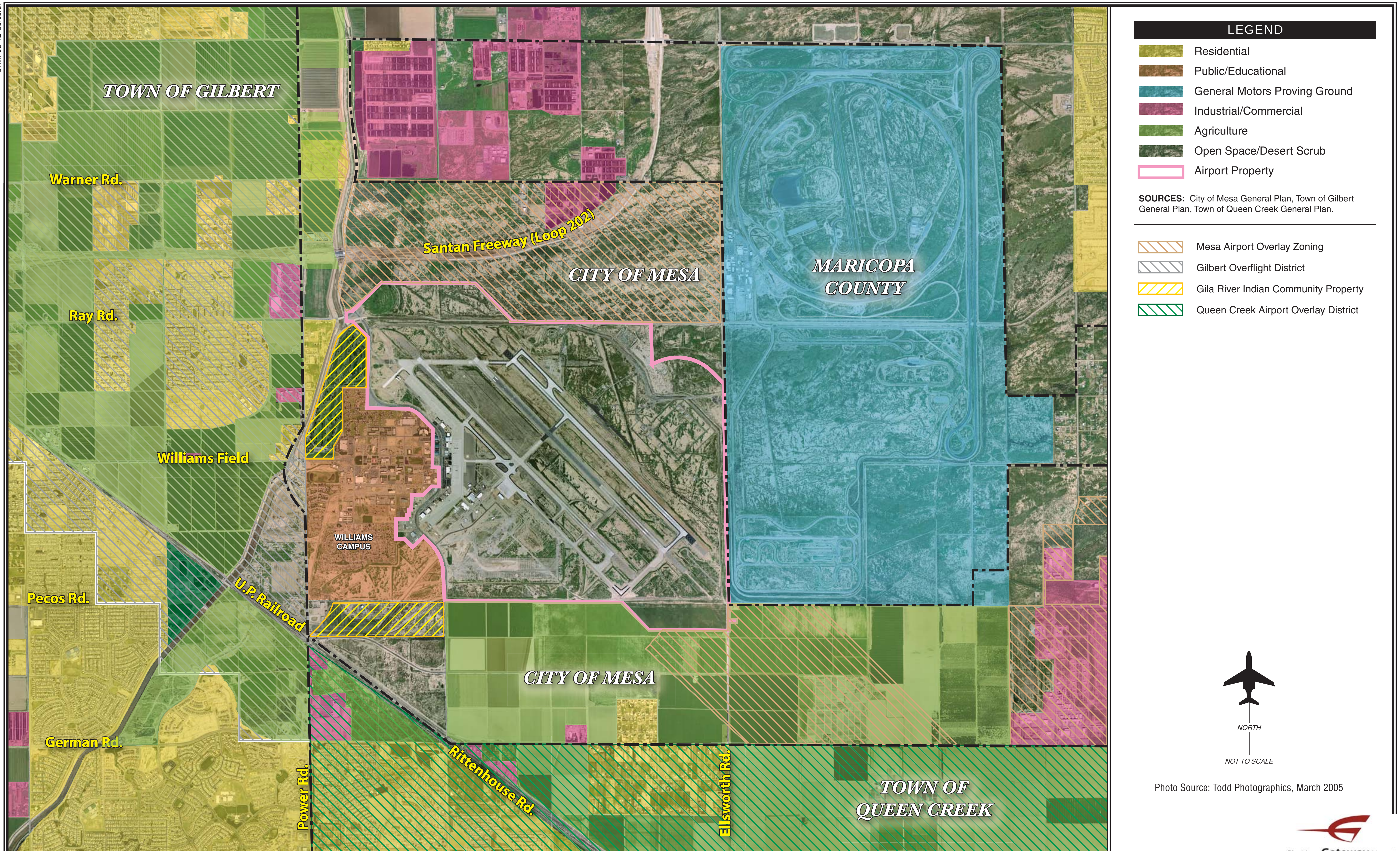

Exhibit 1B
EXISTING LAND USE

predominantly undeveloped land in the City of Mesa and Maricopa County. The development pressure on the agricultural or vacant lands surrounding the airport is significant.

Arizona Revised Statute (ARS) 28-8486, Public Airport Disclosure, requires public airport owners to publish a map depicting the "territory in the vicinity of the airport." This area is defined as the traffic pattern airspace and property that experiences a 60 day-night noise level (DNL) or higher in counties with a population of more than 500,000, and 65 DNL or higher in counties with less than 500,000 residents. The DNL is calculated for a 20-year forecast condition. ARS 28-8486 requires the State Real Estate Office to prepare a disclosure map in conjunction with the airport owner that is recorded with the county. The Phoenix-Mesa Gateway Airport public disclosure boundary is depicted on **Exhibit 1C**.

In addition, the Town of Gilbert has implemented the Phoenix-Mesa Gateway Airport Overlay Zoning District into their development code. The purpose of the overlay zoning is to designate those areas that may be impacted by noise generated from airport activity. Further zoning regulations within this area are defined by three Overflight Areas.

The City of Mesa has also applied an Airport Overlay District to many areas surrounding the airport. These areas are identified on **Exhibit 1B**. The Airport Overlay District was created to promote public health and safety in the vicinity of the airport by minimizing exposure to crash hazards and high noise levels that may be generated by airfield operations. It is intended to encourage future development which is compatible with the continued operation of the airfield.

The *Queen Creek General Plan* recognizes the recommended land use planning scenario from the 1999 Airport Noise Compatibility Program. The land within the planning area is zoned for compatible uses.

Under ideal conditions, the development immediately surrounding the airport can be controlled and limited to compatible uses. Compatible uses would include light and heavy industrial development and some commercial development.

There are a number of methods by which governmental entities can ensure that land uses in and around airports are developed in a compatible manner. The objective of enforcing land use restrictions is to protect designated areas for the maintenance of operationally safe and obstruction-free airport activity. In addition, the impact of aircraft noise on the public can be reduced.

Land use zoning is the most common land use control. Zoning is the exercise of the jurisdictional powers granted the state and local governments to designate permitted land uses on each parcel. Typically, zoning is developed through local ordinances and is often included in comprehensive plans. The primary advantage of zoning is that it can promote compatibility with the airport while leaving the

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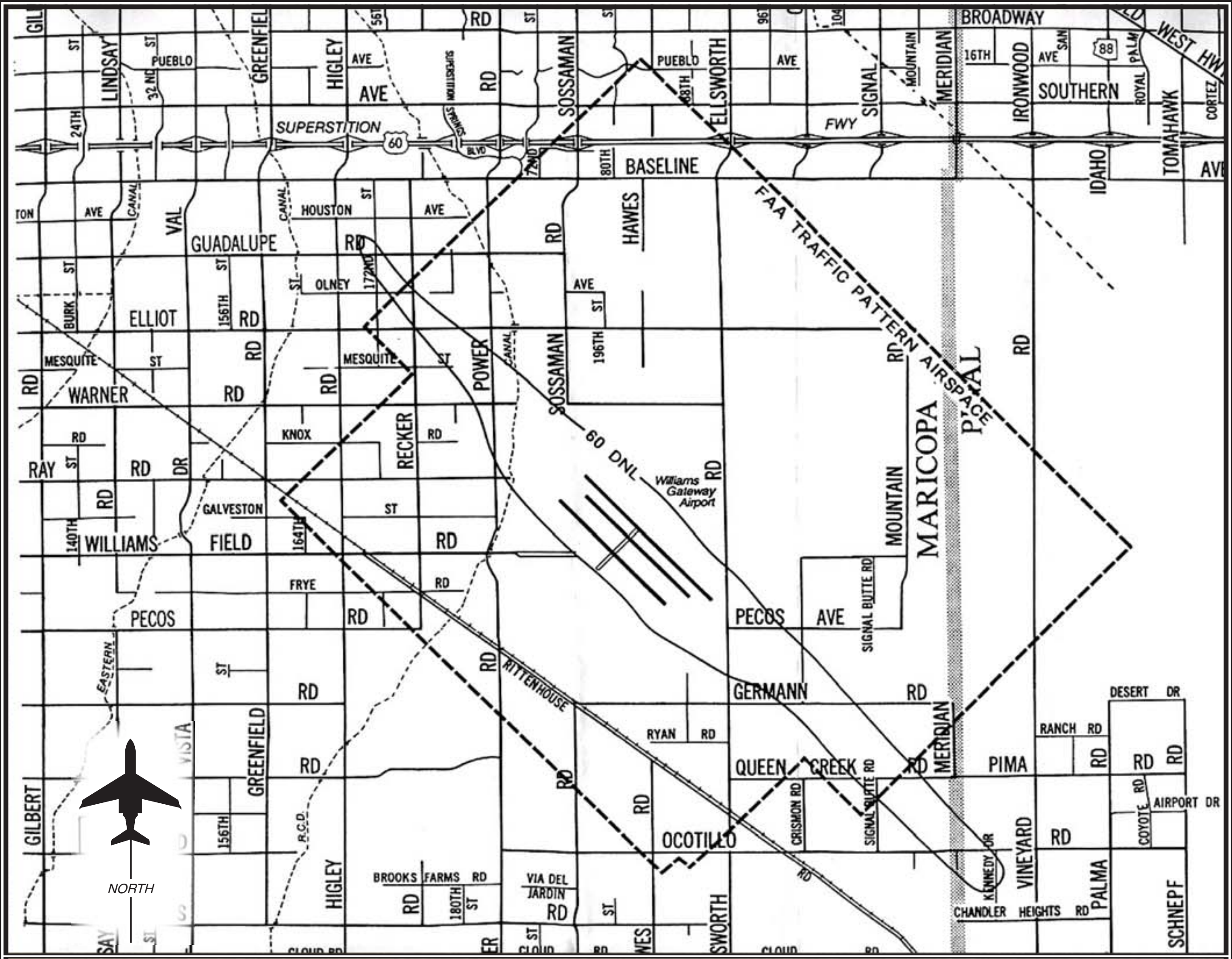

Notes:

1. This map has been prepared in accordance with the Arizona Revised Statutes, Section 28-8486, relating to Public Disclosure.
2. Traffic Pattern Airspace Boundaries have been established in accordance with the guidelines provided in the FAA Order 7400.2D.
3. One Nautical mile = 6,076 feet or 1.1508 statute miles.

Legend:

▬ ▬ ▬ ▬ ▬ ▬ TRAFFIC PATTERN AIRSPACE

65 — NOISE CONTOURS - DAY/NIGHT LEVEL

Electronic USGS Map base Edited and Published by Sylvan Ascent Inc. Map base used by permission (license agreement) of Sylvan Ascent Inc. Transportation and Hydrography Source data from U.S. Census Bureau Coordinate System: Arizona central......202

PhxMesa Gateway Airport

Exhibit 1C
TRAFFIC PATTERN
AIRSPACE MAP

land in private ownership. Zoning is subject to change; therefore, any potential alterations to the zoning code near the airport should be monitored closely for compatibility.

The Phoenix-Mesa Gateway Airport Area (WGA) office was created in 2001 by the Mesa City Council. This office has responsibility for economic development and marketing within the Phoenix-Mesa Gateway area. The area is defined on the north by Guadalupe Road, on the east by Meridian Road, on the south by Queen Creek Road, and to the west by Higley Road. This organization undertook a formal study of the area and produced the Urban Land Institute Advisory Services Panel Report in late 2006. **Exhibit 1D** presents the future land use of the area. This map represents material combined from the general plans of the City of Mesa, and Towns of Gilbert and Queen Creek.

Height restrictions are necessary to insure that objects will not impair flight safety or decrease the operational capability of the airport. Title 14 of the Code of Federal Regulations (CFR) Part 77, *Objects Affecting Navigable Airspace*, defines a series of imaginary surfaces surrounding airports. The imaginary surfaces consist of the approach zone, conical zones, transitional zones, and horizontal zones. Objects such as trees, towers, buildings, or roads, which penetrate any of these surfaces, are considered by the FAA to be an obstruction to air navigation. Currently, the City of Mesa and Towns of Gilbert and Queen Creek apply height restrictions within the vicinity of the airport as a part of their zoning. Height restrictions can be accomplished through height and hazard zoning, avigation easements, or fee simple acquisition.

ECONOMIC IMPACTS

The last formal economic impact study of the airport was completed by ADOT in 2002. This study analyzed the direct, indirect, and induced economic impact of all public-use airports in Arizona, including Phoenix-Mesa Gateway Airport. At the time, it was estimated that Phoenix-Mesa Gateway Airport had an impact of $251.4 million annually on the local economy.

The total economic impact of the airport includes the direct-effect employment, payroll, and sales. Indirect benefits include visitor spending, which leads directly to off-airport employment, payroll, and sales. The cumulative economic benefit of an airport includes a multiplier effect which is essentially the recycling of money within the local economy to create more jobs in nearly every economic sector.

In 2002, on-airport direct economic benefits included 659 jobs, with a direct payroll of $30.1 million and sales of $78.2 million. Visitor spending accounted for 176 additional jobs, $3.5 million in payroll, and $8.6 million in sales. When the multiplier effect is applied, economic activity generated by Phoenix-Mesa Gateway Airport accounted for 1,975 local jobs, $71.1 million in payroll, and $180.3 million in sales.

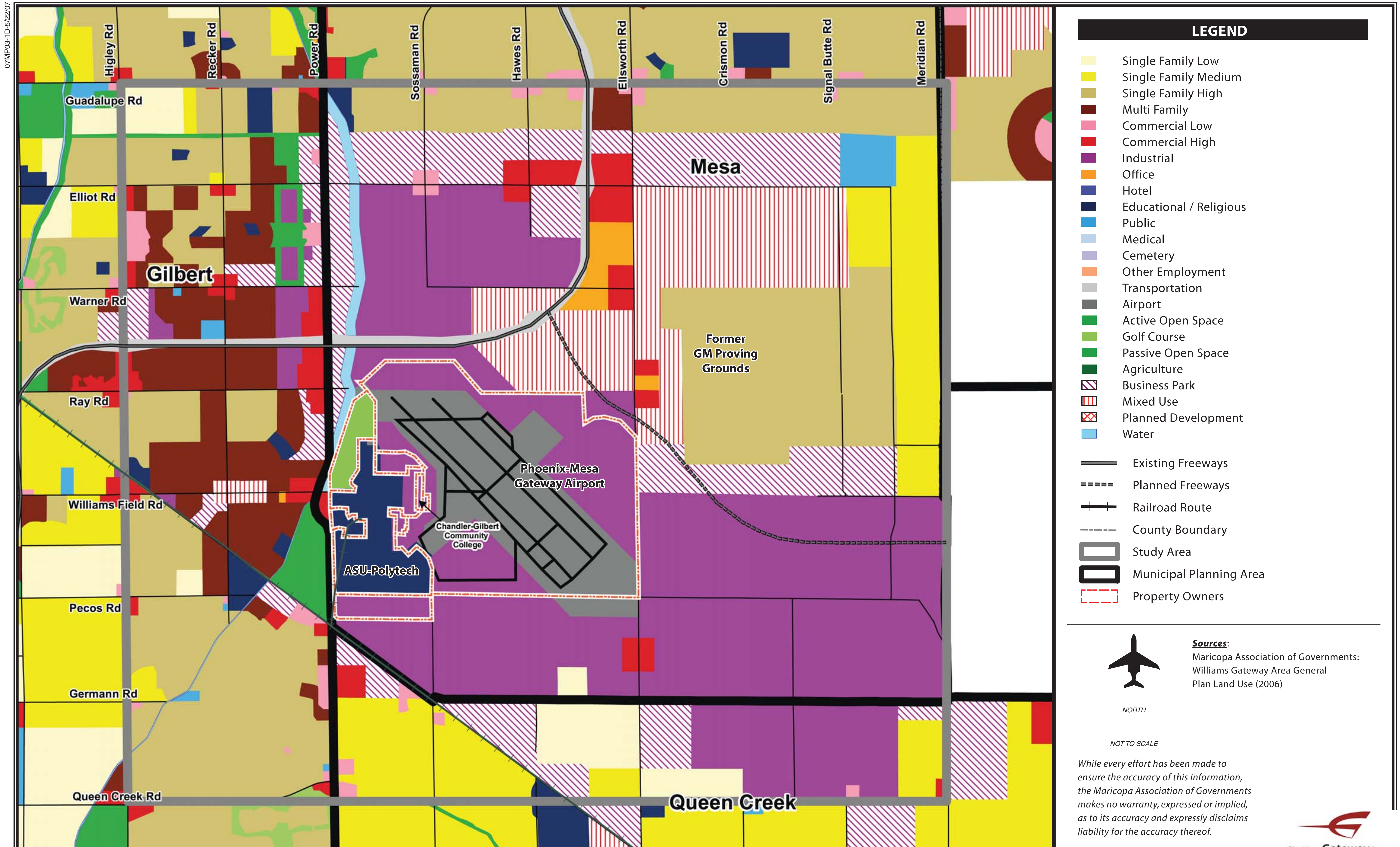

Exhibit 1D
FUTURE LAND USE

AIRPORT SYSTEM PLANNING ROLE

Airport planning exists on four primary levels: local, regional, state and national. Each level has a different emphasis and purpose. An airport master plan is the primary local airport planning document. This master plan will provide a vision of both the airfield and landside facilities over the course of the next twenty years.

At the regional level, Phoenix-Mesa Gateway Airport is included in the MAG *Regional Aviation System Plan* (RASP). The RASP evaluates the region's capacity and ability to meet aviation demand. Phoenix-Mesa Gateway Airport is one of 16 airports included in the RASP which MAG considers important to meeting the region's demand for aviation services.

At the state level, the airport is included in the *Arizona State Aviation System Plan* (SASP). The purpose of the SASP is to ensure that the State has an adequate and efficient system of airports to serve its aviation needs well into the 21st century. The SASP defines the specific role of each airport in the State's aviation system and establishes funding needs. Through the State System Planning Process, the SASP is updated every five years. The most recent update to the SASP is the 2000 *Arizona State Aviation Needs Study* (SANS). The purpose of the SANS is to provide policy guidelines that promote and maintain a safe aviation system in the State, assess the State's airports' capital improvement needs, and identify resources and strategies to implement the plan. Phoenix-Mesa Gateway Airport is one of 88 public-use airports within the state's aviation system plan. The 2000 SANS included all public and private airports and public heliports in Arizona, including American Indian and recreational airports.

At the national level, the airport is included in the *National Plan of Integrated Airport Systems* (NPIAS). The NPIAS includes a total of 3,344 airports which are significant to national air transportation. The NPIAS plan is used by the FAA in administering the Airport Improvement Program (AIP). The NPIAS supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility by identifying specific airport improvements. An airport must be included in the NPIAS to be eligible for federal funding assistance through the AIP program.

Phoenix-Mesa Gateway Airport is classified by the FAA as a general aviation reliever airport to Phoenix Sky Harbor International Airport. Reliever airports are high-capacity general aviation airports in major metropolitan areas. These specialized airports serve as attractive alternatives to using congested hub airports for general aviation aircraft. The NPIAS includes estimates on the total development needs of the nation's airports which are eligible for federal funding assistance. For the years 2007-2011, the NPIAS identifies over $108 million in project needs for Phoenix-Mesa Gateway Airport.

Since the master plan was begun, the airport has initiated regularly scheduled commercial service. This service commenced in October of 2007 and the airport realized more than 21,000 enplanements through December 2007. Through June of 2008 the airport has experienced over 95,000 enplanements. With this level of enplanements, the airport may now be classified as a Primary Nonhub Commercial Service Airport. The next classification level is Small Hub Primary Commercial Service Airport. These airports account for between 0.05 percent and 0.25 percent of national enplanements, or at least 392,000 enplanements in 2007. Medium Hub airports account for at least 0.25 percent but less than one percent of the national enplanements. Large Hub airports are those that account for one percent or more of the national enplanements.

PREVIOUS MASTER PLAN

The previous master plan was completed in June 1999. This master plan was designed to facilitate the evolution of the airport from a former U.S. Air Force Base to a reliever airport, and ultimately to a commercial passenger and air cargo facility. The airport was also intended to accommodate on-going military activity, general aviation activity, and commercial and industrial uses. The Master Plan provided the following recommendations for future airport development:

- The east side of the airfield was identified as the ultimate location for a passenger terminal building to accommodate scheduled commercial service operations.

- The airfield would be designed to accommodate the largest passenger and cargo aircraft up to and including those that are represented by FAA airport reference code (ARC) D-V, such as the Boeing 747.

- Runway 12L-30R was planned as the primary runway which would be located closest to a new passenger terminal building. To accomplish this, the runway was planned to be extended 2,650 feet to the north and 550 feet to the south, providing a total length of 12,500 feet.

- Both ends of Runway 12L-30R would then be outfitted with a medium intensity approach lighting system with runway alignment indicator lights (MALSR) in order to accommodate Category I instrument approaches. This sophisticated approach lighting system is required in order to provide a Category I (CAT-I) approach such as is provided on Runway 30C. CAT-I approaches can extend the availability of the runway into periods of poor visibility, down to ½ mile, and low cloud ceilings, down to 200 feet.

- A full length parallel taxiway, Taxiway C, is also planned in order to provide access to the new eastside terminal area.
- Taxiway G was planned to be closed and replaced by an extended Taxiway H.

- Several additional entrance/exit taxiways were planned for capacity and efficiency improvement.

- A new parallel westside taxiway was also planned for circulation purposes.

- Landside development planning included improvements to a building located central to the middle apron, to serve as an interim passenger terminal building.

- The northwest side of the airfield was reserved for general aviation development.

- The southwest side was identified for aviation uses along the flight line and non-aviation industrial commercial uses away from the flight line.

- Several alternatives were considered for a cargo/sort facility during the previous planning process. The current cargo building location off of Velocity Way was one of the alternative locations.

AIRPORT ACTIVITY

The following provides a historical summary of aircraft operations, based aircraft, air cargo activity, and fuel sales at the airport since the completion of the previous master plan. This information will serve as a baseline for the aviation demand forecasts and is presented graphically on **Exhibit 1E**.

AIRCRAFT OPERATIONS

Table 1D provides a summary of aircraft operations (takeoffs and landings) from 1998 through 2006. Aircraft operations are categorized as either local or itinerant. Those operations occurring within the airport terminal area are typically characterized as local and are usually associated with training activity or "touch-and-go" operations.

Operations are further reported as air carrier, air taxi, general aviation, or military. Air carrier operations include nearly all large transport-type aircraft. These include regularly scheduled commercial service passenger planes, charter planes with more than 60 seats, or cargo aircraft. Aircraft with fewer than 60 seats, some fractional aircraft, and some charter operations are reported as air taxi operations. General aviation includes any aircraft operations other than commercial and military activity. Military activity can be both local and itinerant. For example, KC-135 tankers based at Phoenix Sky Harbor Airport will often fly to Phoenix-Mesa Gateway Airport (itinerant), perform several touch-and-go operations (local) and then return to Sky Harbor (itinerant).

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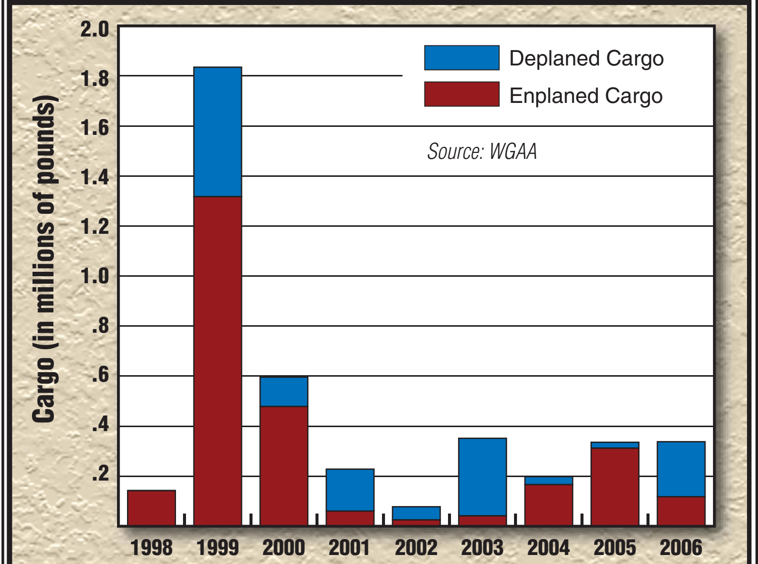
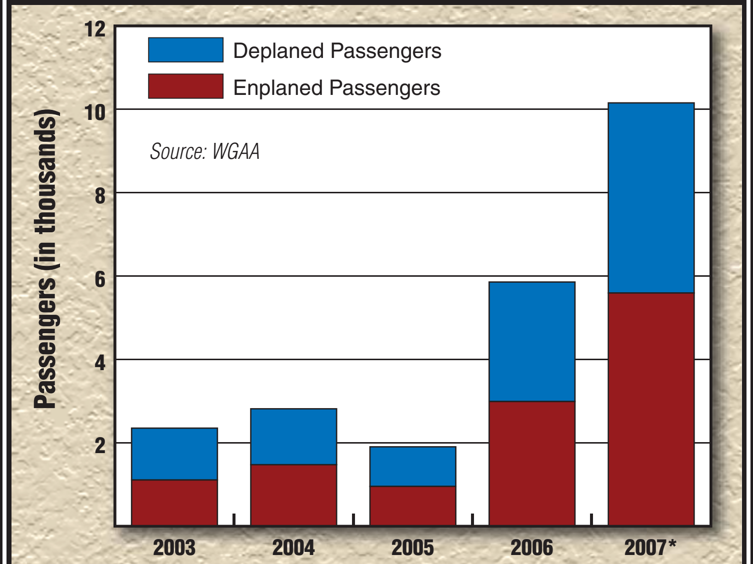
ENPLANED VS. DEPLANED CARGO



Year	Enplaned	Deplaned	Total Pounds	Total Tons
1998	142,074	817	142,891	71
1999	1,317,263	517,641	1,834,904	917
2000	478,447	117,690	596,137	298
2001	60,485	167,866	228,351	114
2002	25,295	52,668	77,963	39
2003	41,524	310,063	351,587	176
2004	166,314	32,018	198,332	99
2005	312,177	23,523	335,700	168
2006	118,006	219,939	337,945	169

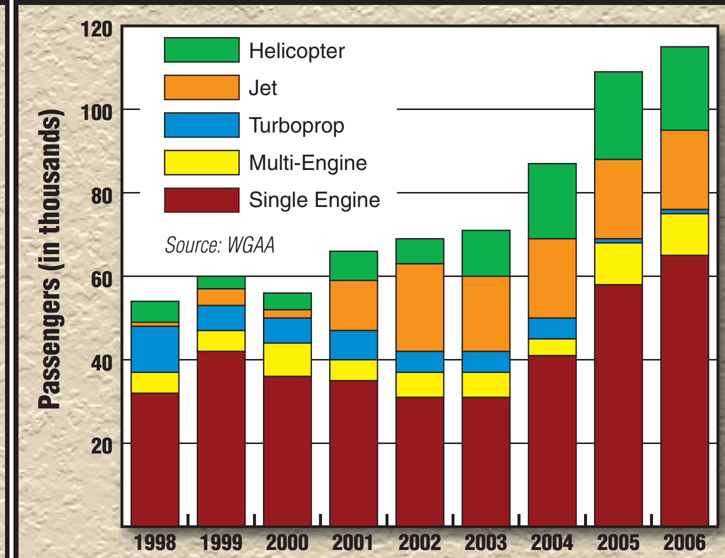
ENPLANED VS. DEPLANED PASSENGERS



Year	Enplaned	Deplaned	Total
2003	1,109	1,244	2,353
2004	1,476	1,341	2,817
2005	955	950	1,905
2006	2,991	2,866	5,857
2007*	5,594	4,559	10,153

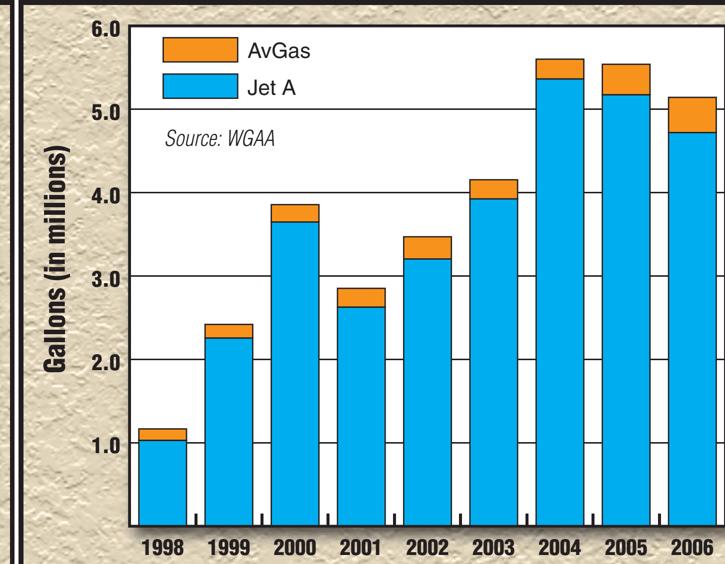
*January - March 2007

BASED AIRCRAFT BY TYPE



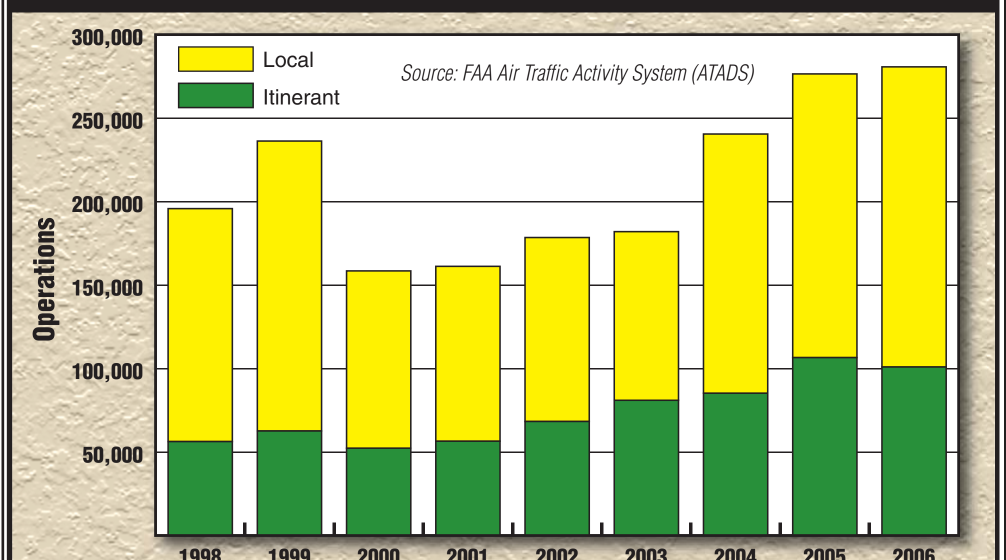
Year	Single Engine Piston	Multi-Engine Piston	Turboprop	Jet	Helicopter	Total
1998	32	5	11	1	5	54
1999	42	5	6	4	3	60
2000	36	8	6	2	4	56
2001	35	5	7	12	7	66
2002	31	6	5	21	6	69
2003	31	6	5	18	11	71
2004	41	4	5	19	18	87
2005	58	10	1	19	21	109
2006	65	10	1	19	20	115

FUEL SALES BY TYPE



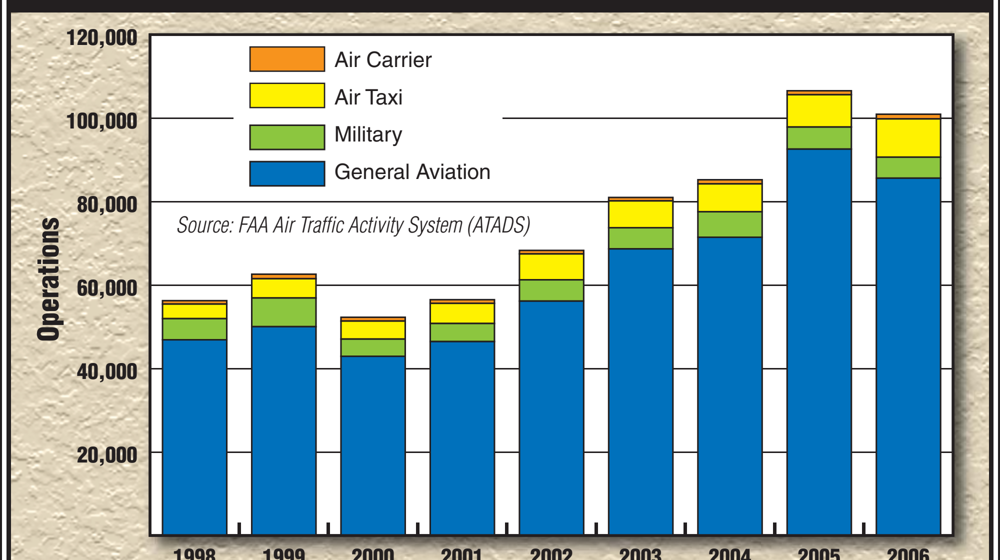
Year	Jet A	AvGas	Total
1998	1,028,952	138,366	1,167,318
1999	2,256,102	164,071	2,420,173
2000	3,648,017	208,309	3,856,326
2001	2,626,745	226,146	2,852,891
2002	3,204,822	266,141	3,470,963
2003	3,924,861	229,758	4,154,619
2004	5,363,010	237,716	5,600,726
2005	5,173,062	366,245	5,539,307
2006	4,720,361	422,187	5,142,548

TOTAL ANNUAL OPERATIONS



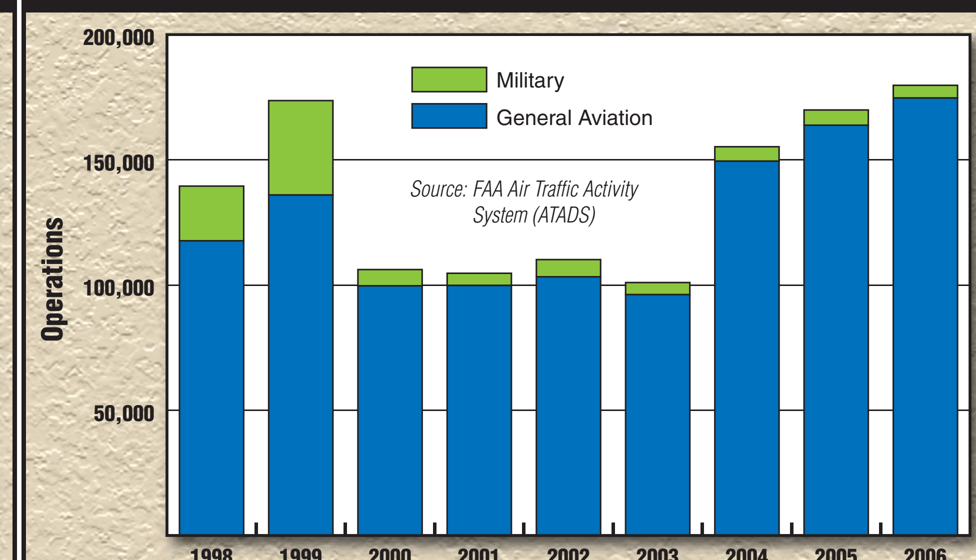
Year	Itinerant	Local	Total
1998	56,268	139,534	195,802
1999	62,610	173,668	236,278
2000	52,290	106,199	158,489
2001	56,501	104,721	161,222
2002	68,310	110,179	178,489
2003	80,996	101,013	182,009
2004	85,235	155,248	240,483
2005	106,561	169,928	276,489
2006	100,941	179,778	280,719

ITINERANT OPERATIONS BY TYPE



Year	GA	Military	Air Taxi	Air Carrier	Total
1998	46,891	5,069	3,491	817	56,268
1999	50,039	6,872	4,618	1,081	62,610
2000	42,933	4,128	4,319	910	52,290
2001	46,466	4,335	4,826	874	56,501
2002	56,161	5,100	6,207	842	68,310
2003	68,674	5,065	6,434	823	80,996
2004	71,459	6,115	6,679	982	85,235
2005	92,579	5,288	7,749	945	106,561
2006	85,618	5,031	9,171	1,121	100,941

LOCAL OPERATIONS BY TYPE



Year	GA	Military	Total
1998	117,682	21,852	139,534
1999	135,954	37,714	173,668
2000	99,701	6,498	106,199
2001	99,861	4,860	104,721
2002	103,300	6,879	110,179
2003	96,188	4,825	101,013
2004	149,492	5,756	155,248
2005	163,839	6,089	169,928
2006	174,702	5,076	179,778

PhxMesa Gateway Airport

Exhibit 1E
HISTORICAL AIRPORT ACTIVITY

TABLE 1D Historical Aircraft Operations by Category Phoenix-Mesa Gateway Airport									
		Itinerant				Local			
Year	Air Carrier	Air Taxi	General Aviation	Military	Subtotal	General Aviation	Military	Subtotal	Total
1998	817	3,491	46,891	5,069	56,268	117,682	21,852	139,534	**195,802**
1999	1,081	4,618	50,039	6,872	62,610	135,954	37,714	173,668	**236,278**
2000	910	4,319	42,933	4,128	52,290	99,701	6,498	106,199	**158,489**
2001	874	4,826	46,466	4,335	56,501	99,861	4,860	104,721	**161,222**
2002	842	6,207	56,161	5,100	68,310	103,300	6,879	110,179	**178,489**
2003	823	6,434	68,674	5,065	80,996	96,188	4,825	101,013	**182,009**
2004	982	6,679	71,459	6,115	85,235	149,492	5,756	155,248	**240,483**
2005	945	7,749	92,579	5,288	106,561	163,839	6,089	169,928	**276,489**
2006	1,121	9,171	85,618	5,031	100,941	174,702	5,076	179,778	**280,719**

Sources: FAA Air Traffic Activity System (ATADS)

As can be seen from the table, 2006 was the busiest year since 1998, and in fact was the busiest year since the airport reopened in 1994. Local operations have consistently represented approximately two-thirds of the overall annual operations at the airport.

BASED AIRCRAFT

Table 1E presents a summary of annual based aircraft counts by aircraft type. The majority of based aircraft are represented by single-engine piston-powered aircraft. This is common for an airport that is available for general aviation activity. There are 20 helicopters based at the airport, the majority of which are owned and operated by an active helicopter flight school. There are 19 jets based at the airport. Of this total, 12 are privately-owned single-engine A-4 military training aircraft. The remaining five are based multi-engine jet aircraft.

TABLE 1E Historical Based Aircraft Fleet Mix Phoenix-Mesa Gateway Airport						
Year	Single-Engine Piston	Multi-Engine Piston	Turboprop	Jet	Helicopter	Total
1998	32	5	11	1	5	54
1999	42	5	6	4	3	60
2000	36	8	6	2	4	56
2001	35	5	7	12	7	66
2002	31	6	5	21	6	69
2003	31	6	5	18	11	71
2004	41	4	5	19	18	87
2005	58	10	1	19	21	109
2006	65	10	1	19	20	115

Source: WGAA

AIR CARGO

Currently, air cargo service at Phoenix-Mesa Gateway Airport consists of unscheduled charter flights. **Table 1F** summarizes historical enplaned (outbound) and deplaned (inbound) air cargo from 1998 through 2006. As can be seen from the table, annual air cargo levels have fluctuated from a low of 78,000 pounds in 2002 to a high of 1.8 million pounds in 1999.

TABLE 1F
Historical Air Cargo (1998-2006) In Pounds
Phoenix-Mesa Gateway Airport

Year	Enplaned (Outbound)	Deplaned (Inbound)	Total Pounds	Total Tons
1998	142,074	817	142,891	71
1999	1,317,263	517,641	1,834,904	917
2000	478,447	117,690	596,137	298
2001	60,485	167,866	228,351	114
2002	25,295	52,668	77,963	39
2003	41,524	310,063	351,587	176
2004	166,314	32,018	198,332	99
2005	312,177	23,523	335,700	168
2006	118,006	219,939	337,945	169

Source: WGAA

FUEL SALES

Table 1G summarizes fuel sales at the airport. Gateway Aviation Services is the sole fuel provider on the airfield, and is owned and operated by Williams Gateway Airport Authority. Fuel sales have steadily increased over the years, with noticeable drops in Jet A sales between 2000 and 2001, which is likely due to the economic effects of the terrorists' attacks of 9/11. Another drop in Jet A sales occurred between 2004 and 2006. This is primarily attributable to military deployments worldwide that have reduced the need for domestic military jet training.

TABLE 1G
Historical Fuel Sales in Gallons
Phoenix-Mesa Gateway Airport

Year*	Jet A	AvGas	Total
1998	1,028,952	138,366	1,167318
1999	2,256,102	164,071	2,420,173
2000	3,648,017	208,309	3,856,326
2001	2,626,745	226,146	2,852,891
2002	3,204,822	266,141	3,470,963
2003	3,924,861	229,758	4,154,619
2004	5,363,010	237,716	5,600,726
2005	5,173,062	366,245	5,539,307
2006	4,720,361	422,187	5,142,548

*Fiscal Year July-June
Source: WGAA

PASSENGER ACTIVITY

With the announcement of the closing of Williams Air Force Base in 1991, the Governor of Arizona appointed the Williams AFB Economic Reuse Planning Advisory Committee. Through a public process, the committee developed the Williams Economic Reuse Plan, which was approved by the Governor and the Air Force in 1992. That plan called for the creation of an educational consortium, now called the Williams Campus, and a commercial reliever airport. All major planning studies including the 1992 Williams AFB Economic Reuse Plan, 1993 Airport Master Plan, 1996 Williams Regional Planning Study, 1997 Williams Area Transportation Plan, 1999 Airport Master Plan Update, 1999 FAR Part 150 Noise Compatibility Study, 2001 Town of Gilbert General Plan, 2002 Queen Creek General Plan, 2002 Mesa General Plan, and 2006 Phoenix-Mesa Gateway Airport Area – Urban Land Institute Study, recognize the passenger service goal for the airport.

The airport is a full-service reliever airport to Phoenix Sky Harbor International Airport. This designation includes the potential to accommodate passenger service. Airport security fencing was completed in 1998, and the airport received its Federal Aviation Regulations (FAR) Part 139 certificate to permit passenger service in 2001. The passenger terminal building went into service in 2003. The inaugural passenger flight was by Allegiant Air to Laughlin/Bullhead International Airport in Bullhead City, Arizona.

In 1997, the airport completed an aviation service study titled *Arizona's Emerging Airport, Phoenix-Mesa Gateway Airport*. The study analysis concluded that charter operators serving groups, package tours, and international and domestic markets without existing scheduled service provided the best opportunity for the airport to initially position itself as a commercial service airport.

Following this model, several charter operators have provided service to and from Phoenix-Mesa Gateway Airport. Allegiant Air currently provides charter service to both Reno, NV and Laughlin/Bullhead, Arizona. Allegiant Air accounts for approximately 20 departures per year. Vision Airlines is a scheduled charter operator providing service between Phoenix-Mesa Gateway Airport and Las Vegas (VGT) on Fridays and Sundays. SkyValue provided service three times per week to the greater Chicago area (Gary, Indiana) but has ceased operations as of May 2007. Western Airlines has provided service at the airport in the past as well. **Table 1H** presents total passenger enplanements (boardings) since 2003.

TABLE 1H
Annual Passenger Enplanements (Calendar Year)
Phoenix-Mesa Gateway Airport

Year	Enplanements	Deplaned	Total
2003	1,109	1,244	2,353
2004	1,476	1,341	2,817
2005	955	950	1,905
2006	2,991	2,866	5,857
2007*	5,594	4,559	10,153

*Jan-March 2007
Source: WGAA

EXISTING AIRPORT FACILITIES

Airport facilities can be functionally classified into two broad categories: airside and landside. The airside category includes those facilities which are needed for the safe and efficient movement of aircraft, such as runways, taxiways, lighting and navigational aids. The landside category includes those facilities necessary to provide a safe transition from surface to air transportation and support aircraft servicing, storage, maintenance, and operational safety on the ground.

AIRSIDE FACILITIES

Existing airside facilities are identified on **Exhibit 1F**. **Table 1J** summarizes airside facility data for Phoenix-Mesa Gateway Airport.

Runways

Phoenix-Mesa Gateway Airport supports three parallel runways oriented from northwest to southeast. The longest of the three is Runway 12R-30L measuring 10,401 feet long by 150 feet wide. This runway is constructed entirely of concrete. This runway pavement has been strength rated at 55,000 pounds single wheel loading (SWL), 95,000 pounds dual wheel loading (DWL), 185,000 dual tandem wheel loading (DTW), and 550,000 pounds double dual tandem (DDTW). These strength ratings refer to the configuration of the aircraft landing gear. For example, SWL indicates an aircraft with a single wheel on each landing gear. Both ends of the runway provide 1,000-foot long paved overrun areas. This runway has available instrument approaches utilizing GPS technology.

Runway 12C-30C measures 10,201 feet long by 150 feet wide. The center 5,700 feet is constructed of asphalt, while the remaining portions are constructed of concrete. The strength ratings are the same as Runway 12R-30L. Both ends of the runway have 1,000-foot paved overruns. This runway provides the most sophisticated instrument approach offered at the airport, with an instrument landing system (ILS) approach to Runway

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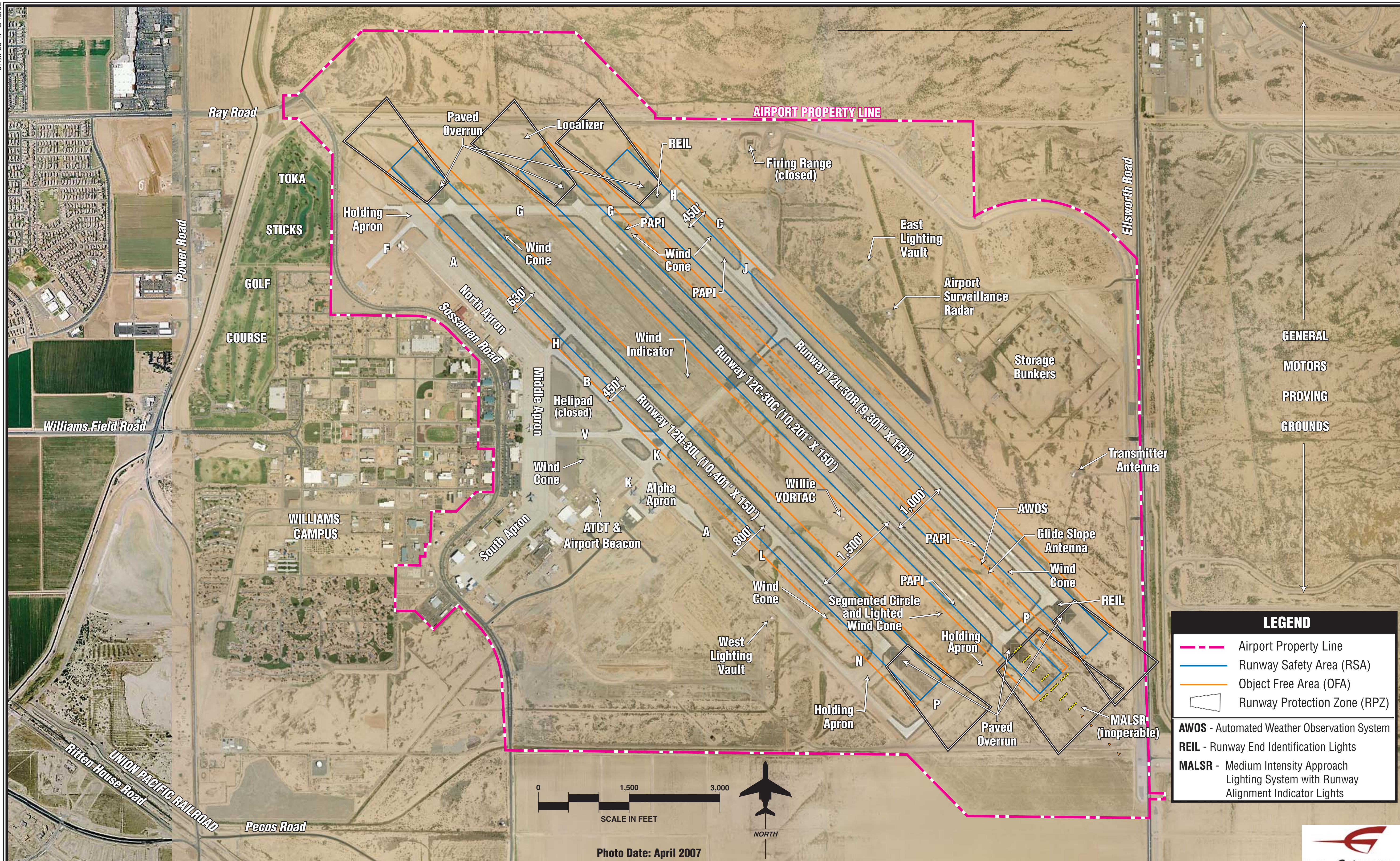

PhxMesa Gateway Airport

Exhibit 1F
EXISTING AIRFIELD FACILITIES

30C. Several other instrument approaches are available to both runway ends. This runway was reconstructed beginning in 2005.

TABLE 1J
Airside Facility Data
Phoenix-Mesa Gateway Airport

	RUNWAY 12L-30R	RUNWAY 12C-30C	RUNWAY 12R-30L
Runway Length (feet)	9,301	10,201	10,401
Runway Width (feet)	150	150	150
Runway Surface Material	Concrete	Asphalt/Concrete	Concrete
Condition	Good	Good	Good
Pavement Markings	Precision	Precision	Precision
Runway Strength (pounds)			
Single Wheel (S)	75,000	55,000	55,000
Dual Wheel (D)	210,000	95,000	95,000
Double Tandem (DT)	590,000	185,000	185,000
Dual-Double Tandem (DDT)	850,000	550,000	550,000
Runway Lighting	High Intensity (HIRL)	Medium Intensity (HIRL)	Medium Intensity (MIRL)
Traffic Pattern	Left (12L)/Right(30R)	Left (12C)/Left (30C)	Right (12R)/ Left (30L)
Approach Aids	REIL PAPI-4L	PAPI-4L MALSR (30C)	NA NA
Instrument Approach Aids	Visual Only	ILS Rwy 30C RNAV (GPS) Rwy 12C GPS Rwy 30C VOR/DME or TACAN Rwy 30C	RNAV (GPS) Rwy 12R RNAV (GPS) Rwy 30L
Taxiway Lighting	MITL	MITL	MITL
Weather and Navigational Aids	Automated Weather Observation System (AWOS) Lighted Wind Cones Rotating Airport Beacon Airport Traffic Control Tower (ATCT) Airport Surveillance Radar (ASR-8) Segmented Circle Localizer and Glideslope Antennas		

PAPI - Precision Approach Path Indicator
GPS - Global Positioning System
RNAV - Area Navigation
ILS - Instrument Landing System
VOR/DME - Very High Frequency Omni-directional Range/Distance Measuring Equipment
TACAN - Tactical Air Navigation System
REIL - Runway End Identification Lights
MALSR - Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights

Source: Airport/Facility Directory - Southwest (May 10, 2007)

Runway 12L-30R is 9,301 feet long and 150 feet wide and is constructed entirely of concrete. This runway provides the greatest strength ratings with 75,000 pounds SWL, 210,000 DWL, 590,000 pounds DTW, and 850,000 pounds DDTW. This runway currently accommodates visual approaches only. This runway is intended to serve as the primary heavy aircraft runway. Runway 12L-30R provides 400-foot paved overrun areas beyond each runway end. This runway was reconstructed beginning in 2005.

Paved shoulders are provided for all runways.

Taxiways

Taxiways A and B operate as a dual parallel taxiway system providing primary access between the runways and the west side apron areas and facilities. Taxiway A is not a full parallel taxiway as the planned section between Taxiways V and H has not been constructed yet. The northern section of Taxiway A extends from Taxiway G to Taxiway H and is located 612 feet from Runway 12R-30L, centerline to centerline. Taxiway A continues from Taxiway V to Taxiway P at a separation distance of 787.5 feet. Both sections of Taxiway A are 75 feet wide. Taxiway B is 75 feet wide and located 450 feet from the Runway 12R-30L centerline.

Taxiway G runway extends from west to east, intersecting with each Runway 12 end. The segment from Taxiway B to Runway 12C is 150 feet wide. The portion from Runway 12 C to Runway 12L is 75 feet wide. Taxiway H is 100 feet wide and extends from Runway 12R-30L to the north apron. Taxiway V is 100 feet wide and extends from the center portion of Runway 12R-30L to the middle apron. Taxiway K extends from Taxiway A to Runway 12L-30R. This taxiway is 150 feet wide except for that portion between Runway 12C-30L and Runway 12L-30R which is 100 feet wide. Taxiway L is 75 feet wide extending from Taxiway A to Runway 12R-30L. Taxiway N provides access from Taxiway A to the Runway 30L threshold. This taxiway is 225 feet wide and has a hold apron. Taxiway P extends from Taxiway A to the Runway 30C and Runway 30R thresholds. Taxiway P has a hold apron prior to the Runway 30 C threshold and is 75 feet wide. Taxiway C is the eastside partial parallel that is 2,200 feet long and 450 feet from the Runway 12L-30R centerline. Taxiway J provides acute-angled access from Runway 12L-30R to Taxiway C. Taxiway W is located on the eastern portion of the middle apron. This taxiway is 75 feet wide. Taxiway T traverses the southeast portion of the south apron and is also 75 feet wide.

Pavement Markings

Pavement markings aid in the movement of aircraft along airport surfaces and identify closed or hazardous areas on the airport. All three runways provide precision instrument pavement markings which identify the runway designations, centerline, edges, touchdown point, touchdown zones, and landing thresholds. Taxiway markings include aircraft holding positions and centerline markings.

Airfield Signage

Airfield identification signs assist pilots in identifying their location on the airfield and direct them to their desired location. The airfield signs, including the runways, taxiways, and distance-to-go markings, are lighted at Phoenix-Mesa Gateway Airport. The airfield signage is illuminated at night.

Airfield Lighting

Airfield lighting systems extend an airport's usefulness into periods of darkness and/or poor visibility. A variety of lighting systems is installed at the airport for this purpose. These lighting systems, categorized by function, are summarized as follows:

Identification Lighting: The location of the airport at night is universally identified by a rotating beacon. The rotating beacon projects two beams of light, one white and one green, 180 degrees apart. The rotating beacon at Phoenix-Mesa Gateway Airport is located on the top of the airport traffic control tower (ATCT).

Runway and Taxiway Lighting: Runway and taxiway lighting utilizes light fixtures placed near the edge of the pavement to define the lateral limits of the pavement. This lighting is essential for safe operations during night and/or times of low visibility in order to maintain safe and efficient access to and from the runway and aircraft parking areas.

Runway 12R-30L and Runway 12C-30C are outfitted with medium intensity runway lighting (MIRL). Runway 12L-30R has high intensity runway lighting (HIRL). These are lights set atop a pole that is approximately one foot above the ground. The light poles are frangible, meaning if one is struck by an object, such as an aircraft wheel, they can easily break away, thus limiting the potential damage to an aircraft.

Medium intensity taxiway lighting (MITL) is associated with the taxiways. These lights are mounted on the same type of structure as the runway lights.

Visual Approach Lighting: On the left side of Runway 12L and Runway 30R is a four-box precision approach path indicator (PAPI-4L). The PAPI displays two sets of lights designed so that viewing from above a specific approach angle will indicate to the pilot whether he or she is on the correct glide slope. An approach lighting system is currently being considered for Runway 30R.

Both ends of Runway 12L-30R are equipped with runway end identification lighting (REIL). REILs provide a visual identification of the runway end for landing aircraft. The system consists of two flashing light assemblies located approximately 40 feet to either side of the runway landing threshold.

Runway 12C-30C also provides the PAPI-4L glide slope indicator lights. In addition, the approach to Runway 30C has a medium intensity approach lighting system with runway alignment indicator lights. This sophisticated lighting system is a required component of the instrument landing system (ILS).

There are currently no visual approach aids to Runway 12R-30L.

Weather and Communication Aids

Phoenix-Mesa Gateway Airport has seven windsocks, six of which are lighted. Windsocks provide information to pilots regarding wind conditions, such as direction and speed. There is a lighted windsock located near each runway end. An unlighted windsock is located just south of Taxiway V close to the middle apron. The windsock nearest Runway 30C is also surrounded by a segmented circle that provides visual traffic pattern information to pilots. Having several wind cones spread out around the airfield is advantageous because wind indications can be determined from anywhere along the runway and taxiway system.

Phoenix-Mesa Gateway Airport is equipped with an Automated Weather Observation System (AWOS). An AWOS will automatically record weather conditions such as wind speed, wind gust, wind direction, temperature, dew point, altimeter setting, visibility, precipitation, and cloud height. This information is then transmitted at regular intervals (usually once per hour) via the Automated Terminal Information Service (ATIS). Aircraft in the vicinity can receive this information if they have their radio tuned to the correct frequency (133.5 MHz). Pilots and individuals can also call a published telephone number and receive the information via an automated voice recording.

Phoenix-Mesa Gateway Airport provides an automated terminal information service (ATIS), which is a recorded message updated hourly, and broadcast on 133.5 MHz. ATIS broadcasts are used by airports to notify arriving and departing pilots of the current surface weather conditions, runway and taxiway conditions, communication frequencies, and other information of importance to arriving and departing aircraft. The ATIS broadcast includes the AWOS information and is accessed on the same frequency.

Phoenix-Mesa Gateway Airport also utilizes a universal integrated communication frequency or UNICOM (122.85 MHz) to provide a direct air to ground communication link with the general aviation service provider (Gateway Aviation Service). A common traffic advisory frequency (CTAF) is also available. This radio frequency (120.6 MHz) is used by pilots in the vicinity of the airport to communicate with each other about approaches to or takeoffs from the airport when the ATCT is closed.

The airport has an airport traffic control tower (ATCT) that is located adjacent to the cargo apron. The tower can be reached for approach control at 120.60 MHz for approaches from the west and at 124.75 MHz for approaches from the east. Ground control can be reached via 128.25 MHz during tower hours (6:00 a.m. to 9:00 p.m. daily). Clearance delivery is available on 118.80 MHz.

Navigational Aids

Navigational aids are electronic devices that transmit radio frequencies, which pilots of properly equipped aircraft can translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft flying in the vicinity of Phoenix-Mesa Gateway Airport include a very high frequency omni-directional range (VOR) facility, the Global Positioning System (GPS), the ILS, and a Tactical Air Navigation (TACAN) system.

The very high frequency omni-directional range (VOR), in general, provides azimuth readings to pilots of properly equipped aircraft transmitting a radio signal at every degree to provide 360 individual navigational courses. Frequently, distance measuring equipment (DME) is combined with a VOR facility (VOR/DME) to provide distance as well as direction information to the pilot. Military tactical air navigation aids (TACANs) and civil VORs are commonly combined to form a VORTAC. The VORTAC provides distance and direction information to both civil and military pilots.

The Willie VORTAC is located on the airfield. The Phoenix VORTAC is located approximately 22 nm to the northwest at Phoenix Sky Harbor International Airport. The Stanfield VORTAC is 27 nm to the southwest of Phoenix-Mesa Gateway Airport.

GPS is an additional navigational aid for pilots. GPS was initially developed by the United States Department of Defense for military navigation around the world. GPS differs from a VOR in that pilots are not required to navigate using a specific ground-based facility. GPS uses satellites placed in orbit around the earth that transmit electronic radio signals, which pilots of properly equipped aircraft use to determine altitude, speed, and other navigational information. With GPS, pilots can directly navigate to any airport in the country and are not required to navigate using a ground-based navigational facility.

Loran-C is another point-to-point navigation system available to pilots. Where GPS utilizes satellite-based transmitters, Loran-C uses a system of ground-based transmitters, but it does not require a pilot to travel to a specific station. Instead, like GPS, pilots can use Loran-C to navigate directly to their destination.

There are two non-directional beacons (NDBs) in the vicinity of Phoenix-Mesa Gateway Airport. One is located at Mesa Falcon Field, eight miles to the northwest, and the other is located at Chandler Municipal Airport, approximately seven miles to the west. The NDB transmits nondirectional radio signals whereby the pilot can determine the bearing to or from the NDB facility and then track to or from that facility. Pilots flying to or from the greater Phoenix area can utilize these NDB facilities.

Area Airspace

The Federal Aviation Administration (FAA) Act of 1958 established the FAA as the responsible agency for the control and use of navigable airspace within the United States. The FAA has established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe environment for civil, commercial, and military aviation. The NAS is defined as the common network of U.S. airspace, including air navigational facilities; airports and landing areas; aeronautical charts; associated rules, regulations, and procedures; technical information; and personnel and material. System components shared jointly with the military are also included as part of this system.

To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the National Airspace System. The U.S. airspace structure provides for categories of airspace, controlled and uncontrolled, and identifies them as Classes A, B, C, D, E, and G, as described below. **Exhibit 1G** generally illustrates each airspace type in three-dimensional form.

- Class A airspace is controlled airspace and includes all airspace from 18,000 feet mean sea level (MSL) to Flight Level 600 (approximately 60,000 feet MSL).

- Class B airspace is controlled airspace surrounding high-activity commercial service airports (i.e., Phoenix Sky Harbor International Airport).

- Class C airspace is controlled airspace surrounding lower-activity commercial service (i.e., Tucson, AZ) and some military airports.

- Class D airspace is controlled airspace surrounding low-activity commercial service and general aviation airports with an airport traffic control tower (ATCT), such as Phoenix-Mesa Gateway Airport.

All aircraft operating within Classes A, B, C, and D airspace must be in constant contact with the air traffic control facility responsible for that particular airspace sector.

- Class E airspace is controlled airspace surrounding an airport that encompasses all instrument approach procedures and low-altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with air traffic control when operating in Class E airspace. While aircraft conducting visual flights in Class E airspace are not required to be in radio contact with air traffic control facilities, visual flight can only be conducted if better than minimum visibility and cloud ceilings exist.

- Class G airspace is uncontrolled airspace that does not require communication with an air traffic control facility.

Airspace within the vicinity of Phoenix-Mesa Gateway Airport is depicted

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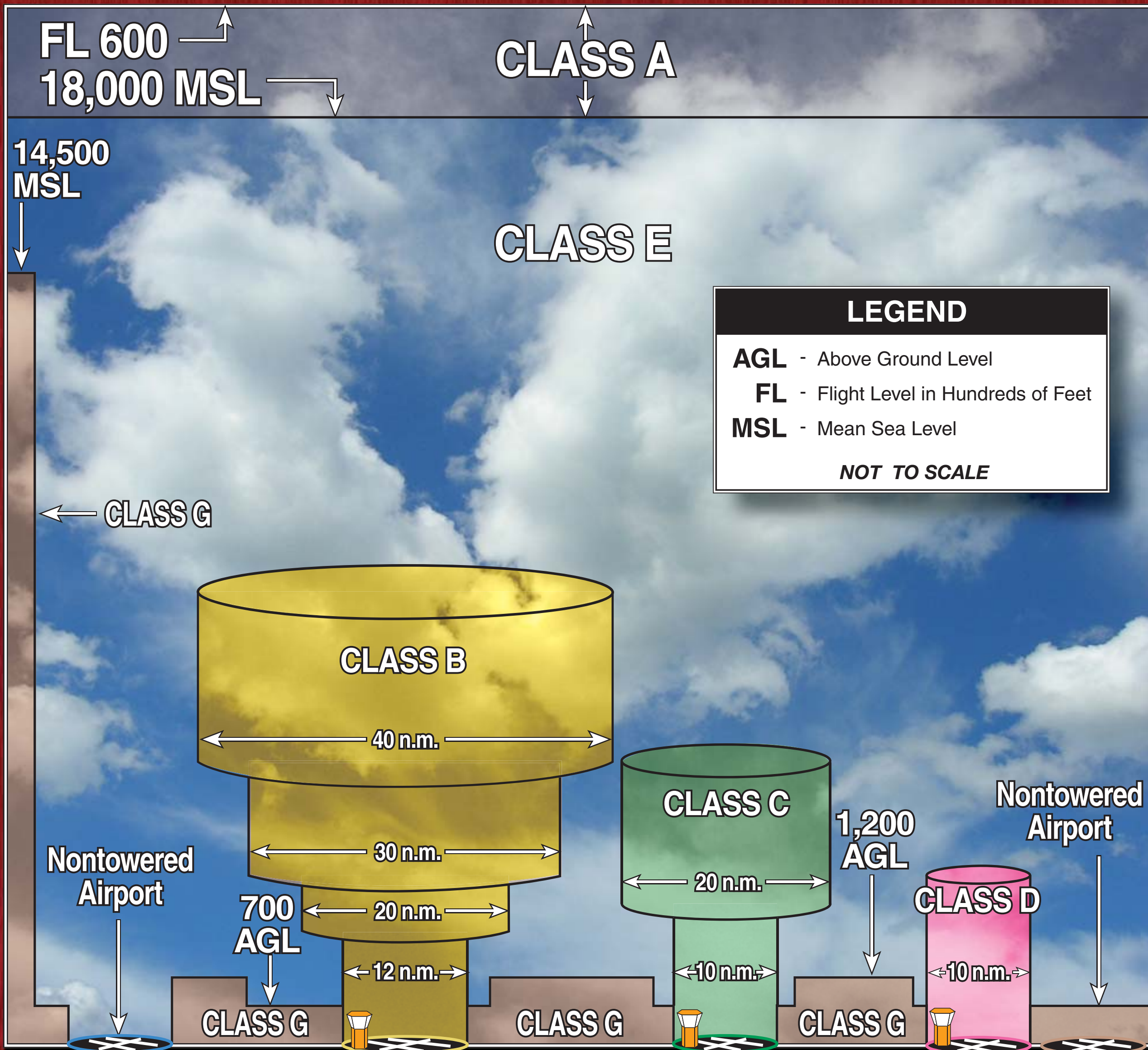


CLASSIFICATION	*DEFINITION*
CLASS A	Generally airspace above 18,000 feet MSL up to and including FL 600.
CLASS B	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports.
CLASS C	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control.
CLASS D	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports.
CLASS E	Generally controlled airspace that is not Class A, Class B, Class C, or Class D.
CLASS G	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E.

Source: "Airspace Reclassification and Charting Changes for VFR Products," National Oceanic and Atmospheric Administration, National Ocean Service. Chart adapted by Coffman Associates from AOPA Pilot, January 1993.

PhxMesa Gateway Airport

Exhibit 1G
AIRSPACE CLASSIFICATION

on **Exhibit 1H**. When the ATCT is open from 6:00 a.m. to 9:00 p.m., the airport is located under Class D airspace. Class D airspace extends to a five-nautical-mile radius from the ATCT and to an elevation of 3,900 feet above ground level (AGL).

When the tower is closed, the airport operates in Class G airspace with a ceiling of 700 feet AGL. Class E airspace then extends from 700 feet AGL to where Class B airspace begins. The western portion of this airspace overlaps and supersedes the Chandler Municipal Airport Class D airspace.

Victor Airways

Victor Airways are designated navigational routes extending between VOR facilities. Victor Airways have a floor of 1,200 feet above ground level and extend upward to an altitude of 18,000 feet MSL. Victor Airways are eight nautical miles wide.

As previously discussed, there are a number of VOR facilities within the airport region. V16 runs from the Phoenix VORTAC to the southeast and is located approximately 16 nautical miles to the south of the airport. V190 extends from the Phoenix VORTAC to the northeast and is located approximately 17 nautical miles to the northwest of Phoenix-Mesa Gateway Airport. Nine other Victor Airways lead to and from the Phoenix VORTAC.

Military Operations Areas (MOAs)

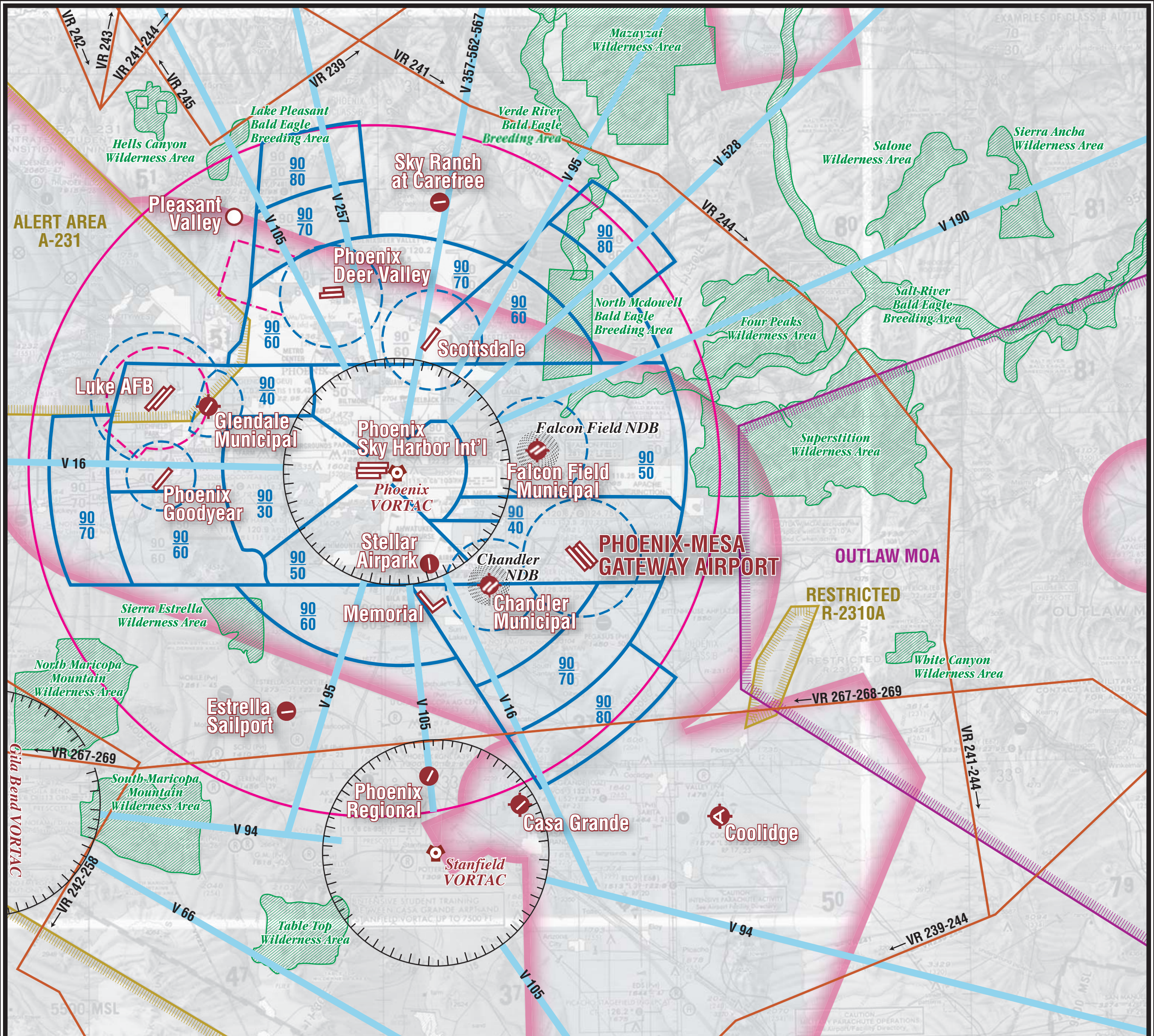
Phoenix-Mesa Gateway Airport is located near military operations areas (MOAs). A MOA is an area of airspace designated for military training use. This is not restricted airspace; pilots can use the airspace, however, they should be on alert for the possibility of military traffic. A pilot may need to be aware that military aircraft can be found in high concentrations, conducting aerobatic maneuvers, and possibly operating at high speeds at lower elevations. The activity status of an MOA is advertised by a *Notice to Airmen* (NOTAM) and noted on Sectional Charts.

To the east is the Outlaw MOA which typically has activity from 8,000 feet AGL to 18,000 feet above mean sea level (MSL). It is published in use Monday-Friday 6:00 a.m. to 7:00 p.m., and is normally extended to 11:30 p.m. by NOTAM. The Jackal MOA is adjacent and east of the Outlaw MOA.

Restricted Airspace

Restricted airspace is a volume of airspace in which the FAA and the local controlling authorities (usually the military) have determined that air traffic must be restricted (if not prohibited) for safety or security reasons. According to the FAA, "Restricted areas denote the existence of unusual, often invisible, hazards to aircraft such as artillery firing, aerial gunnery, or guided missiles."

06MP17-1H-9/2/08



LEGEND

- Airport with other than hard-surfaced runways
- Airport with hard-surfaced runways 1,500' to 8,069' in length
- Airports with hard-surfaced runways greater than 8,069' or some multiple runways less than 8,069'
- VORTAC
- Non-Directional Radiobeacon (NDB)
- Compass Rose
- Military Operations Area (MOA)
- Prohibited, Restricted, Warning and Alert Areas
- Wilderness Areas
- Mode C
- Military Training Routes
- Victor Airways
- Class B Airspace
- Class C Airspace
- Class D Airspace
- Class E Airspace with floor 700' above surface

NORTH

NOT TO SCALE

Source:
Phoenix Sectional Charts, US Department of Commerce, National Oceanic and Atmospheric Administration 7/03/08

PhxMesa Gateway Airport

Exhibit 1H
VICINITY AIRSPACE

Restricted Area R-2310A is located approximately 17 nautical miles to the east-southeast of the airport.

Alert Areas

Although there are no Alert Areas in the immediate vicinity of Phoenix-Mesa Gateway Airport, those flying to the northwest should be aware of Alert Area A-231. This Alert Area is located approximately 33 nautical miles away and is primarily associated with Luke Air Force Base. Within the boundaries of the Alert Area, there are likely to be large concentrations of military jet aircraft performing training maneuvers. The military activity in this area will be at lower altitudes, up to 6,500 feet AGL, and may occur anytime of the day or night. General aviation flights are not restricted within this Alert Area, but pilots are strongly cautioned to be alert for high-speed military training aircraft.

Military Training Routes

A Military Training Route, or MTR, is a specified training route for military pilot proficiency. Aircraft operate on the MTR at speeds in excess of 250 knots and up to 10,000 feet MSL. There are several MTRs within a short distance of Phoenix-Mesa Gateway Airport. General aviation pilots should be aware of the locations of the MTRs and exercise special caution if they need to cross them.

Exhibit 1H further identifies the local airspace area, restricted areas, Victor Airways, military training routes, obstructions, and the Class E airspace under which Phoenix-Mesa Gateway Airport falls.

Instrument Approach Procedures

Instrument approach procedures are a series of predetermined maneuvers established by the FAA using electronic navigational aids to assist pilots in locating and landing at an airport during low visibility and cloud ceiling conditions. The capability of an instrument approach is defined by the visibility and cloud ceiling minimums associated with the approach. Visibility minimums define the horizontal distance that the pilot must be able to see to complete the approach. Cloud ceilings define the lowest level a cloud layer (defined in feet above the ground) can be situated for a pilot to complete the approach. If the observed visibility or cloud ceiling is below the minimums prescribed for the approach, the pilot cannot complete the instrument approach.

Detail regarding the instrument approaches to Phoenix-Mesa Gateway Airport is presented in **Table 1K**. Instrument approaches are available to all properly equipped general aviation and commercial aircraft.

Arrival and Departure Procedures

Because of the possibility of congested airspace over the greater Phoenix Metropolitan area, the FAA has established a series of Standard Terminal Arrival (STAR) and Departure Procedures. The STAR is a preplanned air traffic control arrival procedure designed to provide for the transition from the enroute phase of the flight to an outer fix or an instrument approach fix in the terminal area. The four published STARs are: ARLIN THREE, BLYTHE FOUR, SUNSS FIVE, and JCOBS TWO.

TABLE 1K
Instrument Approach Data
Phoenix-Mesa Gateway Airport

	WEATHER MINIMUMS BY AIRCRAFT TYPE							
	Category A & B		Category C		Category D		Category E	
	CH	VIS	CH	VIS	CH	VIS	CH	VIS
HI-ILS RWY 30C								
ILS Straight	-	-	200	0.75	200	0.75	200	0.75
LOC Straight	-	-	320	1	320	1	320	1
Sidestep 30R	-	-	318	1.5	318	2	318	2
Circling	-	-	458	1.5	558	2	558	2
ILS RWY 30C								
ILS Straight	200	0.75	200	0.75	200	0.75	200	0.75
LOC Straight	500	1	500	1.25	500	1.5	500	1.75
Circling	500	1	498	1	558	2	558	2
DME MINIMUMS								
LOC Straight	320	1	320	1	320	1	320	1
Circling	418	1	458	1.5	558	2	558	2
RNAV (GPS) RWY 12C								
LPV	250	1	250	1	250	1	250	1
LNAV/VNAV	327	1.25	327	1.25	327	1.25	327	1.25
LNAV MDA	382	1	382	1	382	1.25	382	1.25
Circling	418/458	1.25	458	1.5	558	2	558	2
RNAV (GPS) RWY 12R								
LNAV MDA	347	1	347	1	347	1.25	347	1.25
Circling	418/458	1	458	1.5	558	2	558	2
PHX ALTIMETER SETTING MINIMUM								
LNAV MDA	427	1	427	1.25	427	1.5	427	1.5
Circling	498/538	1	538	1.5	558	2	618	2.25
RNAV (GPS) RWY 30L								
LNAV MDA	347	1	347	1	347	1.25	347	1.25
Circling	418/458	1	458	1	558	2	558	2
PHX ALTIMETER SETTING MINIMUM								
LNAV MDA	427	1	427	1.25	427	1.5	427	1.5
Circling	498/538	1	538	1.5	558	2	618	2.25
GPS RWY 30C								
Straight	502	1	205	1.5	502	1.5	502	1.75
Circling	500	1	500	1.5	560	2	560	2
PHX ALTIMETER SETTING MINIMUM								
Straight	582	1	582	1.5	582	1.75	582	2
Circling	580	1	580	1.5	580	2	620	2.25
HI-VOR/DME or TACAN RWY 30C								
Straight	-	-	320	0.75	320	0.75	320	1.25
Sidestep 30R	-	-	318	1.5	218	2	318	2
Circling	-	-	458	1.5	558	2	558	2

TABLE 1K (Continued)
Instrument Approach Data
Phoenix-Mesa Gateway Airport

	WEATHER MINIMUMS BY AIRCRAFT TYPE							
	Category A & B		Category C		Category D		Category E	
	CH	VIS	CH	VIS	CH	VIS	CH	VIS
VOR/DME or TACAN RWY 30C								
Straight VOR	680	1	680	2	680	2.25	680	2.5
Sidestep 30R	678	1	678	2	678	2.25	678	2.5
Circling	678	1	678	2	678	2.25	678	2.5
DME MINIMUMS								
Straight	320	1	320	1	320	1	320	1
Sidestep 30R	318	1	318	1.5	318	2	318	2
Circling	418/458	1	458	1.5	558	2	558	2

Aircraft Categories are based on 1.3 times the stall speed in landing configuration as follows:
Category A/B: 0-120 knots
Category C: 121-140 knots
Category D: 141-166 knots
Category E: Greater than 166 knots
CH - Cloud Height (in feet above ground level)
VIS - Visibility Minimums (in miles)

Source: U.S. Terminal Procedures, Southwest (May 10, 2007)

A Departure Procedure is a preplanned air traffic control pattern that provides for the transition from the terminal area to the enroute phase of the flight. For aircraft departing to the southeast utilizing Runway 12, they are to climb to 2,500 feet mean sea level (MSL) utilizing the Willie VORTAC radial R-122, then turn right on a heading toward to the PXR VORTAC. Aircraft taking off on Runway 30 should make a climbing right turn to 4,000 MSL until they intersect with radial R-122, then they are to proceed in a climbing right turn toward the PXR VORTAC.

Local Operating Procedures

Phoenix-Mesa Gateway Airport is situated at 1,382 feet MSL. The traffic pattern altitude for fixed-wing piston-powered aircraft is 1,218 feet above ground level (AGL), (2,600 feet MSL). The traffic pattern for high-performance aircraft including jet-powered aircraft is 1,718 feet AGL (3,100 feet MSL). The helicopter traffic pattern is designated at 718 feet AGL (2,100 MSL). The traffic pattern for aircraft utilizing Runways 30R and 12R is to the right. All other runways utilize a standard left traffic pattern.

Voluntary noise abatement procedures are in effect in the vicinity of the airport. Low overflight of noise sensitive areas surrounding the airport should be avoided. The airport has a high concentration of helicopter activity that pilots should be alert for as they approach the vicinity of the airport. Crop dusting activity is known to take place at or below 2,000 feet MSL, approximately two to three miles from the approach ends of Runway 30L, 30C, 30R and 12R. On occasion there can be wildlife in the vicinity of the airport.

Air Traffic Control

The airport traffic control tower (ATCT) is located to the southeast of the middle apron, approximately 1,600 feet from the Runway 12R-30L centerline. The ATCT is owned by Williams Gateway Airport Authority and its operation is contracted to Serco, Inc. by FAA. The tower operates from 6:00 a.m. to 9:00 p.m. daily. Tower personnel provide an array of control services, including approach and departure clearances and ground control.

The operation of the ATCT is funded through the FAA Contract Tower Program. This program was begun in 1982 and represents a partnership between the public and private sectors for the provision of air traffic control services. There are approximately 230 contract towers nationwide, representing 45 percent of all towers in the U.S. Contract towers manage approximately 25 percent of all aircraft operations in the country. Every other year, the FAA conducts a benefit/cost analysis for determining the level of FAA funding for contract towers. When that ratio is above 1.0, the operation of the tower is fully funded by the FAA. When that ratio falls below 1.0, the FAA and the airport sponsor may enter into a cost-sharing arrangement. In 2006, Phoenix-Mesa Gateway Airport represented the busiest contract tower in the country and consistently maintains a benefit cost ratio above 1.0.

The tower was constructed in 1970 by the Air Force, stands 127 feet high, and has visibility to all runways and taxiways. There are several locations on the ramp areas that are obstructed from the view of tower personnel due to the location of hangar facilities. From the tower to the farthest point on the airfield (Runway 30R threshold) is approximately 7,750 feet.

Aircraft arriving and departing the Phoenix Metropolitan area are controlled by the Albuquerque Air Route Traffic Control Center (ARTCC). The Albuquerque ARTCC controls aircraft in a large multi-state area.

On the east side of the airfield is located an Airport Surveillance Radar (ASR-8) which provides regional radar coverage. This ASR is primarily utilized by Phoenix-Mesa Gateway Airport, Scottsdale Airport, and Phoenix Sky Harbor Airport tower personnel. Tower personnel utilize the ASR-8 for departure clearance from Phoenix-Mesa Gateway Airport, primarily because the ASR-9 located at Phoenix Sky Harbor Airport is obstructed by mountainous terrain up to approximately 300 feet AGL. The tower at Phoenix-Mesa Gateway Airport also has a Standard Terminal Automation Replacement System (STARS). This system allows the Gateway tower personnel to utilize several long-range radar stations in the greater Phoenix metropolitan area.

LANDSIDE FACILITIES

Landside facilities are the ground-based facilities that support the aircraft and pilot/passenger handling functions. These facilities typically include the passenger terminal building, the general aviation service providers, aircraft storage hangars, aircraft maintenance hangars, aircraft parking aprons, and support facilities such as fuel storage, automobile parking, roadway access, and aircraft rescue and firefighting. The building and lot inventory is presented on **Exhibit 1J** and the terminal area landside facilities are presented on **Exhibit 1K**.

AIRPORT BUSINESSES

The follow is a list of the major airport businesses. This is not a complete list but does include all businesses with need for access to the runway and taxiway system.

Advanced Training System International (ATSI)
ATSI is a privately-owned company that provides fighter training to pilots of the U.S. military and its allied forces under government contract. ATSI specializes in tactical air services, military flight training, and professional test services. ATSI maintains 12 A-4 fighter jets for these services. There are currently 10 employees, but in the recent past there have been as many as 100 employees. ATSI has accounted for over 3,000 annual flight hours of training in the recent past and currently account for approximately 1,200 annual hours. ATSI occupies a large conventional hangar and the adjacent administration building located on the south apron.

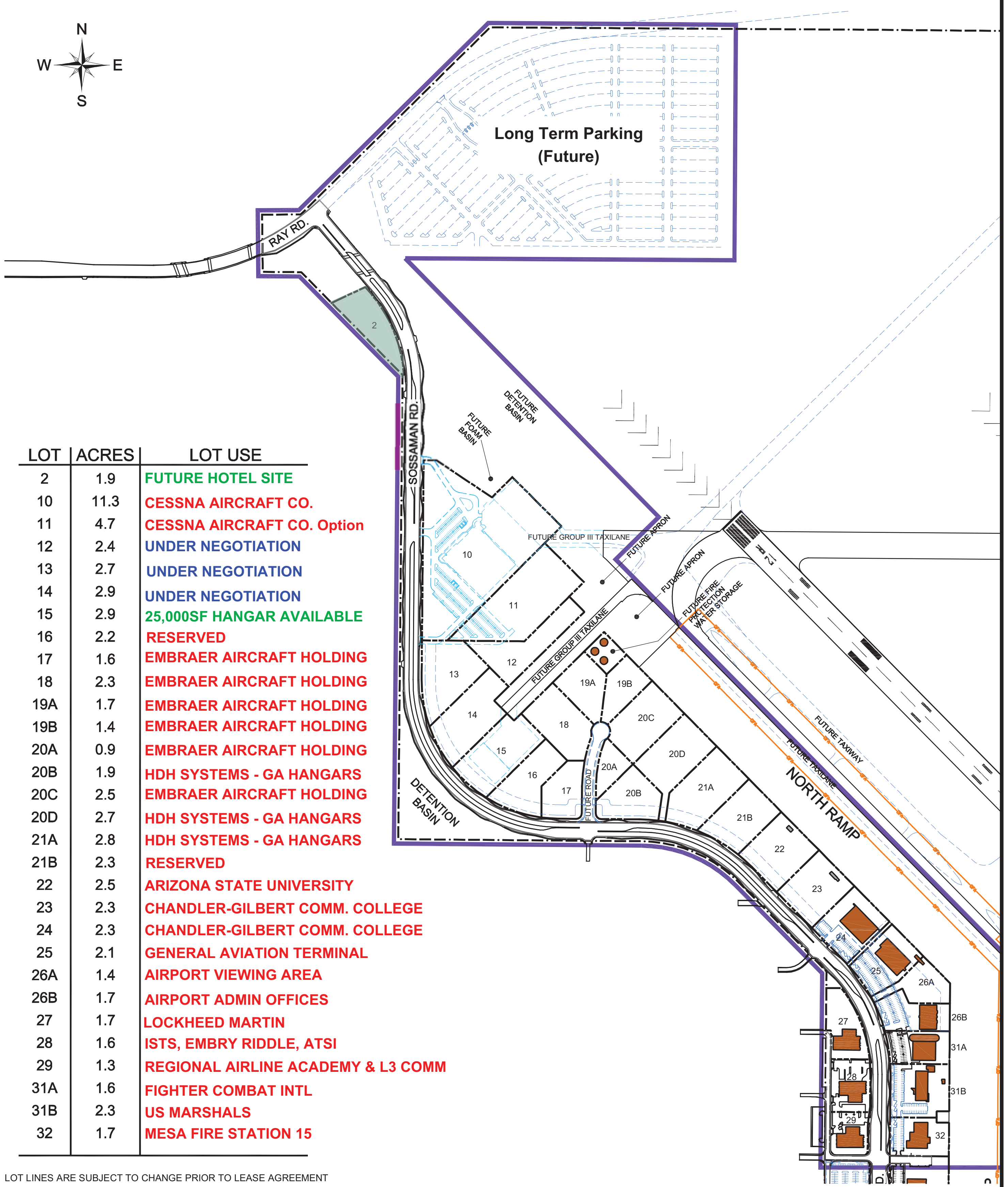
Air Evac Services
Air Evac provides a range of medical transport services. Air Evac bases an Aerospatiale AS350 turbo-helicopter at the airport. Air Evac's offices are located in the general aviation center.

Airline Transport Professionals
Airline Transport Professionals (ATP) provides transitional flight training for pilots moving into the private or commercial airline industry from various branches of the military. The company provides single and multi-engine flight training and type ratings. The company will have four to ten Cessna 172s and five to nine twin-engine Piper Seminoles at the airport at any given time, based on student enrollment. These aircraft will rotate to other locations as well. There are currently 17 employees and 53 students. On a monthly average, they will provide 1,500 hours of flight training. ATP's primary offices are located in the general aviation center.

Arizona Aircraft Accessories
Arizona Aircraft Accessories overhauls aircraft accessories and is an FAA repair station. They are also approved by the European Aviation Safety Agency. Additionally, they test turboprop engines and systems, and utilize one of the engine test cells at the airport.

07MP03-1J-5/23/07

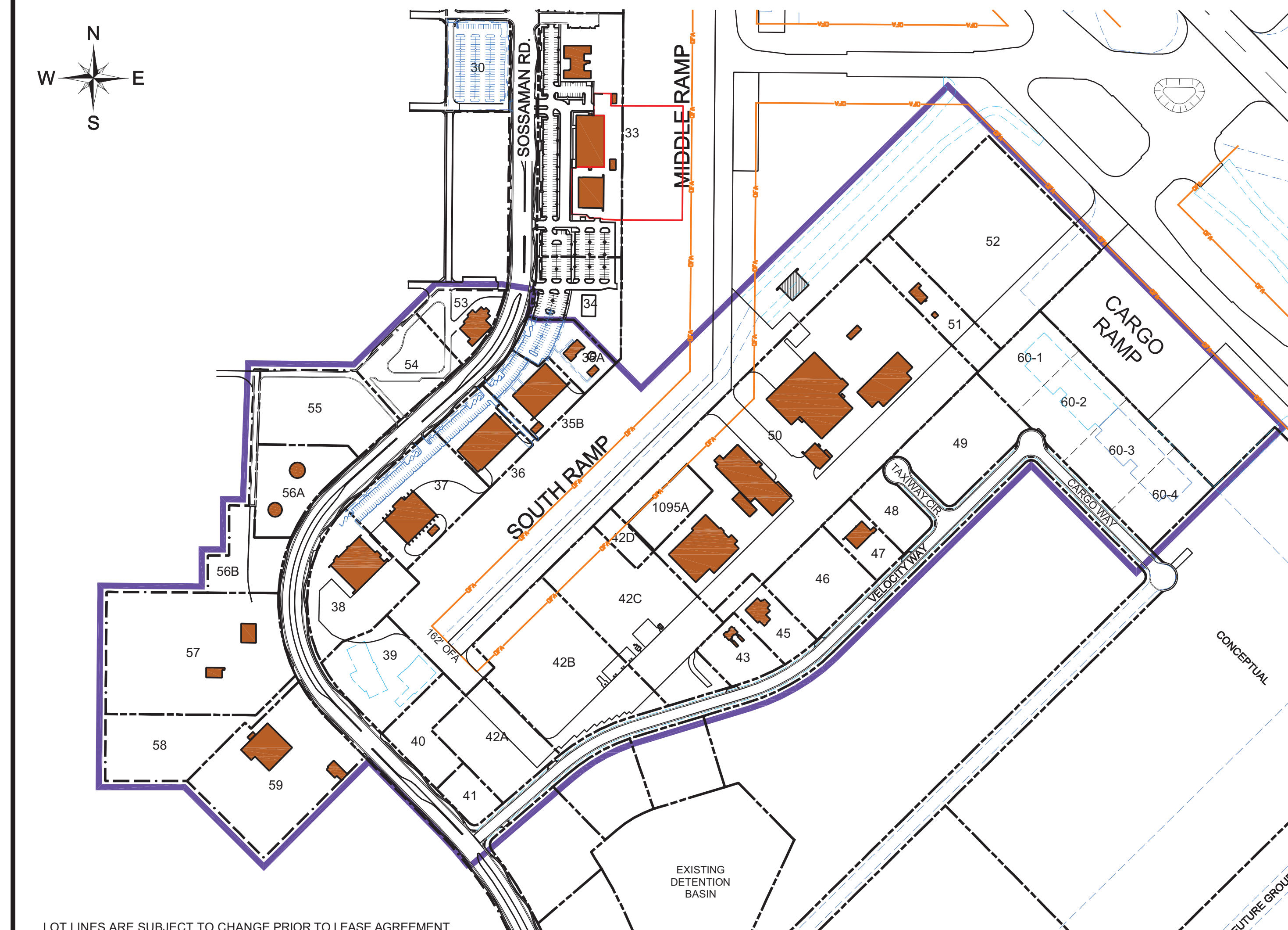
Airport Leasing Map - North General Aviation Area (Nov. 1, 2006)



LOT	ACRES	LOT USE
2	1.9	FUTURE HOTEL SITE
10	11.3	CESSNA AIRCRAFT CO.
11	4.7	CESSNA AIRCRAFT CO. Option
12	2.4	UNDER NEGOTIATION
13	2.7	UNDER NEGOTIATION
14	2.9	UNDER NEGOTIATION
15	2.9	25,000SF HANGAR AVAILABLE
16	2.2	RESERVED
17	1.6	EMBRAER AIRCRAFT HOLDING
18	2.3	EMBRAER AIRCRAFT HOLDING
19A	1.7	EMBRAER AIRCRAFT HOLDING
19B	1.4	EMBRAER AIRCRAFT HOLDING
20A	0.9	EMBRAER AIRCRAFT HOLDING
20B	1.9	HDH SYSTEMS - GA HANGARS
20C	2.5	EMBRAER AIRCRAFT HOLDING
20D	2.7	HDH SYSTEMS - GA HANGARS
21A	2.8	HDH SYSTEMS - GA HANGARS
21B	2.3	RESERVED
22	2.5	ARIZONA STATE UNIVERSITY
23	2.3	CHANDLER-GILBERT COMM. COLLEGE
24	2.3	CHANDLER-GILBERT COMM. COLLEGE
25	2.1	GENERAL AVIATION TERMINAL
26A	1.4	AIRPORT VIEWING AREA
26B	1.7	AIRPORT ADMIN OFFICES
27	1.7	LOCKHEED MARTIN
28	1.6	ISTS, EMBRY RIDDLE, ATSI
29	1.3	REGIONAL AIRLINE ACADEMY & L3 COMM
31A	1.6	FIGHTER COMBAT INTL
31B	2.3	US MARSHALS
32	1.7	MESA FIRE STATION 15

LOT LINES ARE SUBJECT TO CHANGE PRIOR TO LEASE AGREEMENT

Airport Leasing Map - South Central Industrial Area (Nov. 1, 2006)



LOT LINES ARE SUBJECT TO CHANGE PRIOR TO LEASE AGREEMENT

LOT	ACRES	LOT USE
35A	1.6	Advanced Training Systems Intl
35B	1.8	Advanced Training Systems Intl
36	1.9	Native Air Services
37	3.7	Boeing
38	3.6	KMH Holdings
39	2.8	TWO 6,500SF HANGARS AVAILABLE
40	1.7	Cimarron
41	0.8	AVAILABLE
42A	3.0	Gateway Aviation Services
42B	6.3	AVAILABLE
42C	6.1	AVAILABLE
42D	0.6	AVAILABLE
43	1.3	Arizona Aircraft Accessories
45	1.5	Jet Strip
46	2.5	AVAILABLE
47	1.1	The Boeing Company
48	1.3	AVAILABLE

LOT	ACRES	LOT USE
49	3.3	AVAILABLE
50	20.0	The Boeing Company & WGAA
1095A	1.2	The Boeing Company
51	1.9	Federal Aviation Administration - Serco
52	8.4	U.S. Forest Service - Pending
53	1.5	L3 Communications
54	2.1	AVAILABLE
55	3.5	AVAILABLE
56A	2.4	WGAA Use
56B	1.7	AVAILABLE
57	8.0	WGAA Use
58	3.0	AVAILABLE
59	5.7	Fabricating Distributors, Inc.
60-1	1.9	RESERVED FOR CARGO EXPANSION
60-2	2.3	25,000SF BUILDING FOR CARGO AVAILABLE
60-3	2.3	AVAILABLE LOT FOR CARGO
60-4	1.9	RESERVED FOR CARGO EXPANSION

Exhibit 1J
BUILDING AND LOT INVENTORY

07MP03-1K-6/05/07

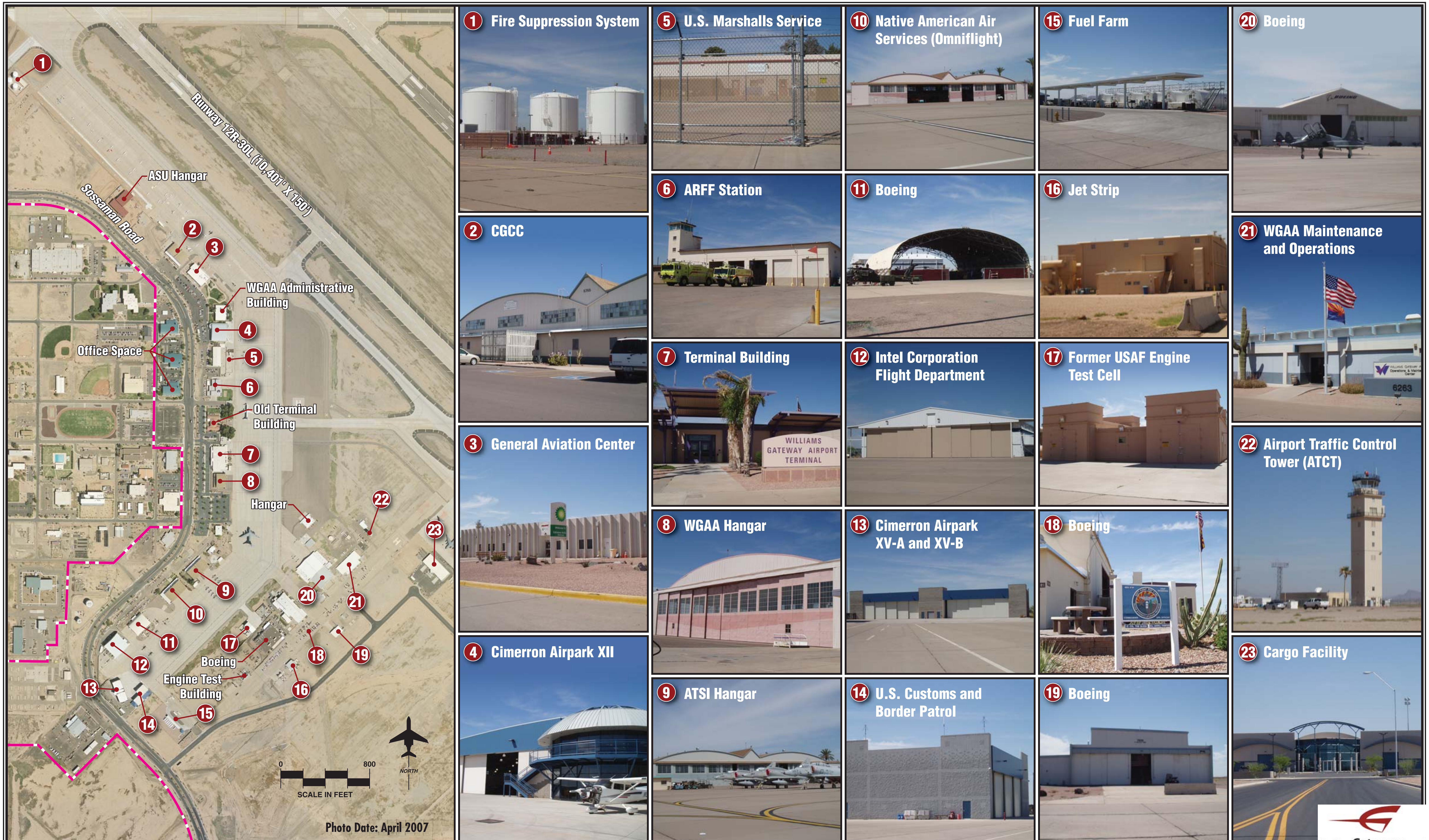


Exhibit 1K
TERMINAL AREA LAYOUT

Arizona State University Polytechnic Campus – Flight Training

Arizona State University's presence at the airport includes degree programs that include pilot certification. Mesa Pilot Development is the flight school contractor for the University and they maintain 11 Piper Warrior II PA-28-161 aircraft, five Beechcraft Bonanza A36 aircraft, and one Beech Baron 58 for flight training.

The Airport Authority is currently constructing a new hangar on the north apron that it will then lease back to Arizona State University. This hangar will encompass approximately 21,000 square feet, half of which will be offices and class room space.

ADI Shuttle Service, LLC.

ADI operates as the corporate flight department for Intel Corporation. Intel bases two Embraer 135 Regional Jets at the airport in a hangar on the south apron. Daily operations are made to San Jose and Hillsboro, Oregon, as well as other destinations.

The Boeing Company

Boeing conducts a variety of programs at the airport, including repetitive heavy-weight flight testing and training operations for the Apache attack helicopter, based on program needs at different times. One effort -- the T-38 Avionics Upgrade program -- was at the airport for more than 10 years and completed its deliveries of 458 upgraded T-38s in August 2007.

Another Boeing program is the F/A-18 Structural Repair Facility. The program located at the airport in 1997 and repairs components such as flight controls, trailing edges, leading edge flaps, horizontal stabilizers, outer wing panels and tail hooks.

Work was completed in September 2007 for the Boeing Apache Reset Program for the U.S. Army, which operated out of the open air hangar on the south apron area. Apache helicopters that were deployed to the Middle East were repaired and cleaned, including complete structural rebuild over the course of 60 days.

Cessna Aircraft Company

Cessna is currently constructing a 94,000-square-foot Citation Service Center near the north end of the north ramp. Of this total, approximately 65,000 square feet will be open hangar space, with the remaining for office space, warehousing and manufacturing activities. This service center will ultimately replace the existing service center located in Long Beach, California. The facility is planned to open in 2008, and will potentially employ over 200 people.

Chandler-Gilbert Community College

The Maricopa Community College District, through the Chandler-Gilbert Community College Aircraft Flight Technology Program, offers pilot certifications and ratings and associate degrees in airway science technology and aviation maintenance technology. CGCC has partnerships with the University of North Dakota, ASU-Polytechnic, and various corporate partners.

There are approximately 50 students enrolled in the programs offered. At any one time, there will be between three and nine aircraft (Piper Cadets, Warriors, Seminoles) at the airport for flight training.

The CGCC is currently designing a new hangar facility to be constructed on the north apron adjacent the new ASU hangar. This hangar will encompass approximately 19,500 square feet, with approximately 4,000 square feet for classrooms and offices.

Embraer

Embraer is beginning construction on the Phenom Executive Service Center, which will be completed in 2008. This facility will provide maintenance and support for the Phenom 100 and 300 business jets. This facility will encompass approximately 45,000 square feet, of which 13,000 will be for offices and shops. Embraer anticipates employing 60 people.

Fighter Combat International

Fighter Combat International is an aerial adventure company. They are located in the hangar immediately south of the WGAA administration building. They maintain three high-performance Extra 300 aerobatic aircraft and a Super Decathlon sport aircraft.

Flight Deck Café

The Flight Deck Café is located in the general aviation center where it occupies approximately 3,300 square feet.

Jetstrip, Inc.

Jetstrip provides a full range of aircraft paint stripping services utilizing non-abrasive dry paint stripping techniques. All stripping materials are recycles. Jetstrip also provides aircraft painting services. Jetstrip occupies two hangars at the airport on the south apron.

L-3 Communications

L-3 provides laboratory research supporting the aviation industry and builds flight simulators. The company conducts research in aircrew training and testing of hardware and software for flight simulators.

Native American Air Services

Native American is a provider of 24-hour air ambulance services throughout North America. They base four Pilatus P-12 single-engine turboprops, three Jetstream 31s, a Cessna 340A, two Eurocopter A350 B2 ASTARs, and five Bell L-3 206 long-range helicopters. Native American occupies a large hangar on the south ramp.

Ratts Air Service

Ratts is an aircraft painting and stripping company, which uses an environmentally safe non-toxic method of removing paint from all types of aircraft. Ratts occupies two hangars on the south apron area and has four employees.

U.S. Customs and Border Protection

The U.S. Customs Border Protection and Cargo Inspection division provides inspection and clearance for all cargo entering the U.S. through Phoenix-Mesa Gateway Airport. The U.S. Customs Service bases two Cessna 210R Centurion aircraft at the airport. They occupy the 8,000-square-foot hangar located on Lot 39 at the south end of the south apron.

U.S. Marshals Service
The Air Operations Division of the U.S. Marshals Service provides transport and processing services for the Department of Immigration and Naturalization. Two MD-83 aircraft are utilized for repatriation operations. These aircraft are based on the middle apron.

U.S. Forest Service
The U.S. Forest Service utilizes the airport during the summer forest fire-fighting season. They utilize the cargo apron as a staging ground. The Forest Service is considering constructing a 24,000-square-foot facility on Lot 52, to the immediate north of the cargo facility. Typically, the Forest Service will operate P3-Orion and C-130 tanker aircraft.

FIXED BASE OPERATORS (FBO)

Gateway Aviation Services is the only FBO serving Phoenix-Mesa Gateway Airport. It is owned and operated by the Williams Gateway Airport Authority. Gateway Aviation Services provides essential services to the general aviation community. Gateway Aviation Services operates from the general aviation center located immediately adjacent and north of the WGAA administration building on the west side of the airfield. Services provided include aircraft fueling, line services, and transient aircraft parking. Some of the amenities provided include a pilots' lounge, and flight planning station. The building was constructed in 1974, remodeled in 2005, and encompasses approximately 22,700 square feet with approximately 12,300 square feet dedicated to Gateway Aviation Services. Gateway Aviation Services also occupies approximately 8,700 square feet of the 22,400-square-foot Chandler-Gilbert Community College hangar to the immediate north of the general aviation center.

PASSENGER TERMINAL FACILITY

From 1998 to 2001, a 23,800-square-foot building facing the middle apron was redeveloped into the passenger terminal building. This building was originally constructed in 1968. **Exhibit 1L** provides a floor plan of the existing terminal building. The building provides space for ticketing, airline offices, security screening, secure passenger hold room, baggage claim, rental car facilities, a retail snack shop, and a mechanized baggage carousel. **Table 1L** presents the approximate square footage of the functional areas of the terminal building.

This terminal building was originally designed to process approximately 250,000 annual enplanements. WGAA is considering potential redesign of this facility in order to increase capacity to 350,000 enplanements. These improvements are considered necessary on an interim basis until a larger, state-of-the-art passenger terminal complex is developed on the east side of the airport.

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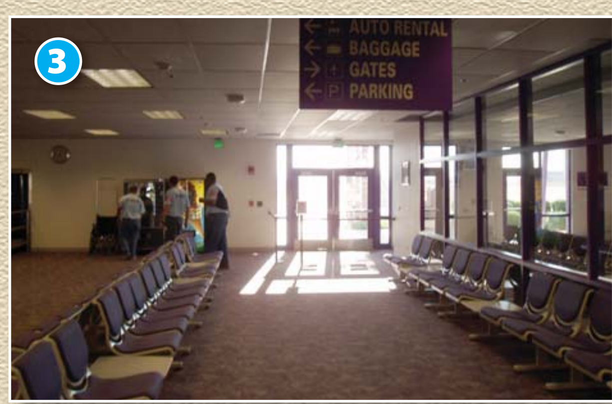

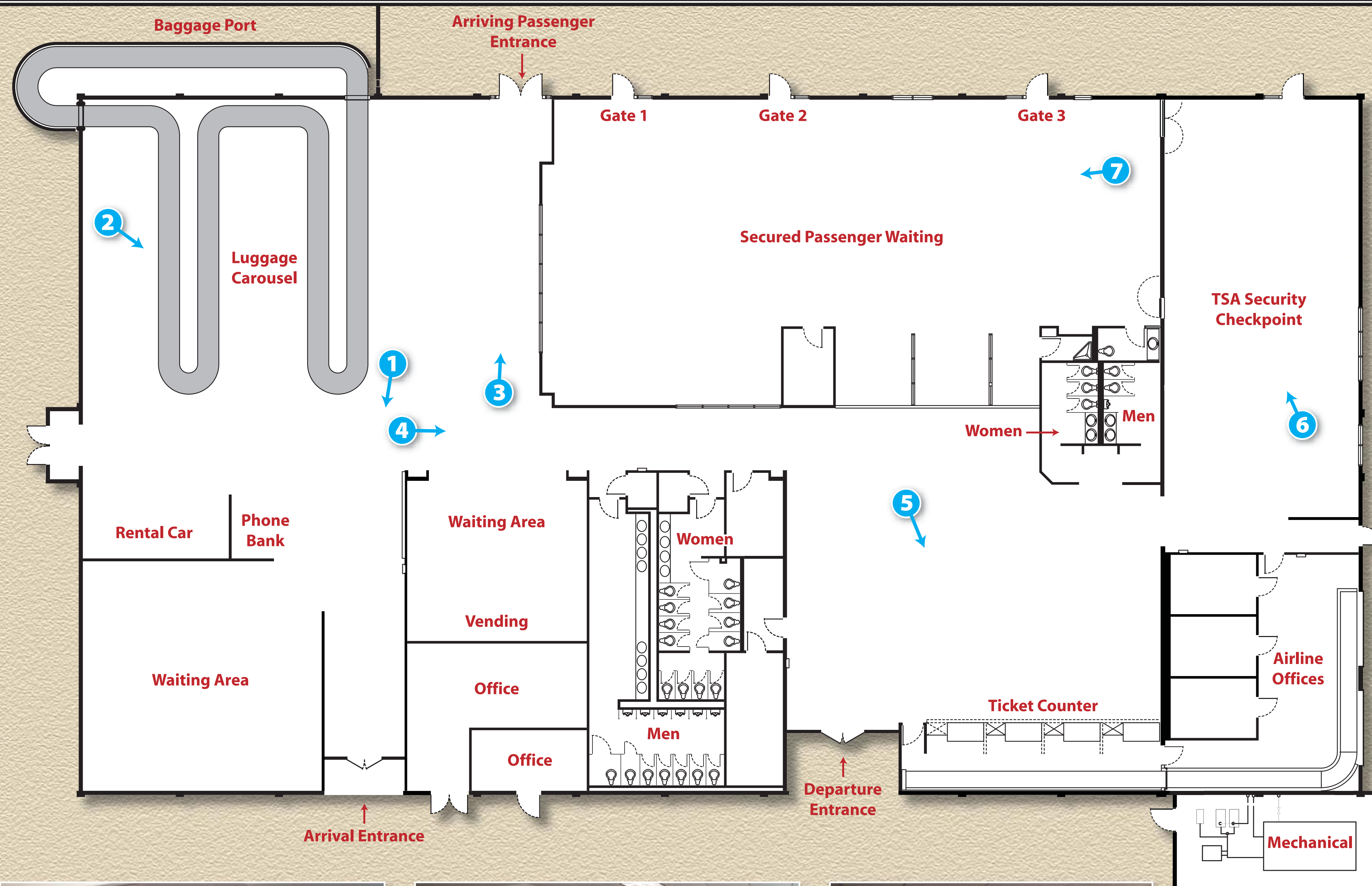

PhxMesa Gateway Airport

Exhibit 1L
TERMINAL BUILDING LAYOUT

Rental Car Businesses

Three rental car agencies lease space in the passenger terminal building – Enterprise, Hertz, and Alamo/National. They utilize the ready/return parking spaces immediately north of the terminal building.

TABLE 1L
Passenger Terminal Building Square-Footage
Phoenix-Mesa Gateway Airport

Area Description	Square-Footage
Ticket Lobby	1,320
Ticket Counter	440
Airline Offices	420
Baggage Makeup	800
Rental Car Counter	220
Secured Passenger Waiting	4,760
TSA Security Screening	2,176
Public Waiting Area	2,652
Restrooms	1,664
Mechanical	448
Baggage Claim	4,232
Vending	150
Misc. Offices	1,240
Circulation	3,307
Total	**23,829**

Source: CAD Solutions and Coffman Associates

AIRPORT MAINTENANCE

The airport maintenance and operations building is located on the south apron area adjacent the ATCT. This building was constructed in 1968 and encompasses approximately 23,500 square feet. This building is utilized for office space, shops, and storage. Equipment and material are stored in several smaller buildings throughout the airport environs.

AIRCRAFT PARKING APRON

The main aircraft parking apron at Phoenix-Mesa Gateway Airport totals approximately 233,000 square yards of concrete pavement and is categorized in three sections as identified on **Exhibit 1K**. The north apron is approximately 89,000 square yards and primarily serves as a tie-down location for locally based aircraft. The middle apron is approximately 90,000 square yards and primarily serves the passenger terminal area, ARFF functions, and U.S. government functions. When commercial passenger aircraft are on the ramp, a restricted area of approximately 12,000 square yards is in effect, which encompasses the immediate ramp area fronting the terminal building and the hangar to the south. The south apron is approximately 54,000 square yards and primarily serves existing industrial and commercial tenants, as well as several corporate aviation hangars.

AUTOMOBILE PARKING

Vehicle parking for the passenger terminal area includes public, employee, and rental car ready/return space. Immediately to the west of the terminal building and east of Sossaman Road are 79 vehicle spaces. To the south of the terminal building are an additional 204 spaces. To the immediate north of the terminal building are 21 spaces reserved for rental car ready/return. To the west of the old terminal are an additional 50 spaces. Overflow parking and employee parking is located to the west of Sossaman Road, where 155 spaces are provided. Excluding the rental car spaces, there are a total of 908 terminal parking spaces available for passengers, visitors, and employees. In 2007, an overflow public parking lot providing 420 spaces was developed on the middle ramp.

In general, vehicle parking lots are available for airport users to the east of Sossaman Road. Parking is either existing or planned from the existing Chandler-Gilbert Community College (CGCC) hangar (north of the general aviation center) south to the Boeing Apache Reset open air hangar on the south apron. New hangars being constructed for use by CGCC, Arizona State University, Cessna, and Embraer, will also have dedicated parking lots. An additional long term parking lot is planned for the corner of Ray and Sossaman Roads.

Facilities located on the east side of the south apron also have surface parking available. There are 418 spaces available with an additional 36 available at the cargo facility. An additional 115 spaces are planned to accompany cargo facility expansion. Overall, there are a total of 1,946 existing parking spaces. Of this total 908 are terminal area spaces, 21 are rental car spaces, 418 are east of the south apron, 36 serve the cargo facility, and the remaining 563 serve various airport businesses. A total of 498 spaces are planned with 71 of these to serve the terminal building, 115 to serve future cargo facilities, and 312 to serve general airport businesses and hangars. **Exhibit 1M** depicts existing and planned parking at the airport.

FUEL FACILITIES

In 2006, construction of the new fuel farm was completed. The fuel farm is located to the south of the south apron. There are six 25,000-gallon Jet A aboveground fuel tanks and one 12,000-gallon Avgas tank. The fuel farm is enclosed with a seven-foot-high masonry wall and chain link fence with three strands of barbed wire, angling outward at a 45 degree angle. The access gates to the fuel farm require a swipe card.

The airport maintains several fuel delivery vehicles. There are two 1,500-gallon and one 1,200-gallon Avgas fuel trucks. There are five operational Jet A fuel trucks, two of which have a capacity of 5,000 gallons, two have a capacity of 10,000 gallons, and the last one has a capacity of 3,000 gallons. There is no self-serve fuel available at the airport.

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Exhibit 1M
EXISTING AND
PLANNED PARKING

AIRCRAFT RESCUE AND FIREFIGHTING (ARFF)

Phoenix-Mesa Gateway Airport has on-airport ARFF services available as provided through agreement with the City of Mesa. The ARFF station is located adjacent and to the north of the passenger building facing the middle apron. Phoenix-Mesa Gateway Airport is currently classified as an Index B airport capable of serving an average of five or fewer daily departures by air carrier aircraft that are less than 126 feet in length. Index C is available upon request with 24-hour notification. Full-time Index C capability is planned beginning in 2009 with the addition of a new Oshkosh Striker firefighting vehicle. **Table 1M** lists the ARFF equipment and its capacity for various extinguishing agents.

There are two dedicated ARFF qualified firefighters on duty during air carrier operations. These firefighters are sufficient to operate the designated vehicles and equipment and meet the required response time for Index B. In addition, up to one additional City of Mesa Fire Station 215 vehicle (Engine 215) and four personnel, co-located with the ARFF unit, are available to respond to all aircraft emergencies.

All ARFF vehicles are equipped with two-way aviation radios, allowing direct communication with the airport traffic control tower and other emergency vehicles. In addition, ARFF vehicles “Foam 215”, “Attack 215”, and “Foam 225” are equipped with two-way radios, providing direct communication with the City of Mesa Fire Department.

The ARFF team has demonstrated the ability to respond to the mid-point of Runway 12L-30R, or a comparable distance, and begin applying foam or dry chemical within three minutes from the time of the alarm, as required under FAR Part 139. On an annual basis at a minimum, a live fire drill is conducted. All firefighters are additionally certified as Emergency Medical Technicians (EMT) and have been trained in basic emergency medical care.

In addition, the airport provides BC-type mobile fire extinguishers located every 100 yards on the interior edge of the main apron areas. These wheeled fire extinguishers are 150 pounds and are available for emergency use.

The City of Mesa is planning to replace the existing ARFF station with a new modern facility, possibly on the existing site, in the next several years.

FENCING AND SECURITY

The airport has adopted security procedures to meet the requirements of Transportation Security Regulations (TSR) Part 1542 Airport Security. The Airport Security Program outlines the methods and controls to prevent unauthorized and inadvertent entry of persons or vehicles onto the Air Operations Area (AOA).

TABLE 1M **Aircraft Rescue and Firefighting Equipment** **Station 215 - Williams Gateway Airport**	
1	"**Foam 215**" 2000 Oshkosh T-1500 4x4 (Airport owned) 1,500 gallons of water 200 gallons of AFFF 450 pounds of potassium based dry chemical (Purple K) Fire extinguishers include: One Halotron 1-2-A:10-B:C and one Purple K-120-B:C
2	"**Attack 215**" 1995 Ford 350 4x4 (Airport owned) 450 pounds of potassium based dry chemical (Purple K) 100 gallons of premixed 3% AFFF Fire extinguishers include: One 4-A:60-B:C; one carbon dioxide 10-B:C; and one combustible metals D, Amerex brand 30 lb. with no UL listing.
3	"**Foam 225**" 1986 Emergency One Titan T-1 4x4 (Airport owned) 1500 gallons of water 200 gallons of AFFF 450 pounds of potassium based dry chemical (Purple K) One MET-L-X model Mx-30-D fire extinguisher is on board.
4	**Planned additional vehicle (2009)** 2009 Oshkosh Striker 3000 3,000 gallons of water 400 gallons of AFFF 450 pounds of potassium based dry chemical (Purple K) Video camera system including infrared capability
Additional equipment that may respond when available:	
4	"**Engine 225**" 1999 Pierce Quantum structural pumper (Owned by the City of Mesa) 500 gallons of water 20 gallons of AFFF ALS medical equipment 35-foot extension ladder 14-foot roof ladder 200 feet of 1 inch boosterline 900 feet of 2.5 inch hose 800 feet of 5 inch hose Various rescue hand tools Fire extinguishers include: One 20A:120BC; and one carbon dioxide 10-B:C
5	"**Tanker 215**" 1986 Kenworth (Airport owned) 4,000 gallons of water 100 feet of 2.5 inch hose
Source: FAR Part 139 Airport Certification Manual	

The airport property is primarily enclosed with an eight-foot-high chain link fence with three strands of barded wire on top, mounted at a 45 degree outward angle. All perimeter fences, gates and doors are secured by lock and/or access control devices.

All visitors are required to properly sign-in with the airport administration office and are subsequently provided a visitor badge and escorted as necessary.

As part of the Security and Wildlife Hazard Management Plans for the airport, airport operations personnel make daily inspection of the perimeter fence.

PAVEMENT MANAGEMENT PROGRAM

Public Law 103-305 requires that airports requesting Federal Airport Improvement Program (AIP) funding for pavement rehabilitation or reconstruction have an effective pavement maintenance management system. Chapter 107 (E) of the Federal Aviation Act of 1994 requires that a grant for the construction, reconstruction, or replacement of an airport pavement may be approved only if the sponsor has provided assurances or certifications that they have implemented an effective pavement maintenance/ management program. To this end, Phoenix-Mesa Gateway Airport maintains the Pavement Management Program.

The Pavement Management Program has four basic 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 daily 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.

Concurrent with this airport master plan update, a new Pavement Maintenance Program is being developed which will include detailed analysis of the pavement condition and development of a pavement maintenance schedule.

OPERATING STANDARDS

The FAA contends that it is the prerogative of the airport owner to impose minimum standards to establish the threshold entry criteria for those wishing to engage in providing aeronautical services to the public on the airport. Airports receiving Federal funding provide the assurance that they will make the airport available for public use on fair and reasonable terms and without unjust discrimination to all types, kinds and classes of aeronautical use. This assurance is met through the adoption and enforcement of the Airport Minimum Standards dated September 1998.

In addition to addressing the threshold entry criteria for provision of aeronautical services, the Airport Minimum Standards also outline the leasing policy, application procedures, and minimum standards for any person, business, or organization that desires to 1) lease land or facilities from the Airport Authority or 2) operate any commercial operation on the airport.

In addition, every airport tenant and airport lease holder received the Airport Rules and Regulations.

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

Stormwater runoff is simply rainwater that runs off the land and into streams, rivers, and lakes. When stormwater runs through sites of industrial or construction activity, it may pick up pollutants and transport them into national waterways and affect water quality.

Mandated by Congress under the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) Stormwater Program is a comprehensive two-phased national program for addressing the non-agricultural sources of stormwater discharges which adversely affect the quality of our nation's waters. The program uses the NPDES permitting mechanism to require the implementation of controls designed to prevent harmful pollutants from being washed by stormwater runoff into local water bodies.

The State of Arizona has been delegated the authority to administer the NPDES program. Administratively, this is the responsibility of the Arizona Department of Environmental Quality (ADEQ). The ADEQ's Arizona Pollutant Discharge Elimination System (AZDES) program now has regulatory authority over discharges of pollutants to Arizona surface water.

Under the regulations, separate permits are required for construction activities that disturb one or more acres of land and for general stormwater permits. Airports are included as an industrial facility under the AZDES and must obtain a Multi-Sector General Permit. This permit requires the development of a Stormwater Pollution Prevention Plan (SWPPP).

The airport has a SWPPP in place. The SWPPP for the airport includes the other tenants on the airport, and the Airport Authority provides annual training and inspection services. The airport has an S-Sector General Permit which is for Air Transportation facilities. The SWPPP is reviewed annually and updated periodically.

SPILL PREVENTION PLAN

Phoenix-Mesa Gateway Airport has procedures in place to direct airport staff in case of a chemical or fuel spill. The current Spill Prevention Control and Counter Measures Plan (SPCC) is certified by a Practicing Engineer and provides for a Multi-Sector Group Permit 2000. The EPA has issued extension of the plan until 2009. The plan is currently being updated by the airport. Every employee of the airport received training on the SPCC, with information including where the plan is located, how to respond to spills, drain locations, location of oil dry material. In addition, spill prevention information is provided in the Rules and Regulations provided to every based aircraft owner and airport lease holder. Larger airport businesses such as Boeing have their own procedures in place for spill prevention.

WILDLIFE HAZARD MANAGEMENT

In accordance with Federal Aviation Regulation 139.337(b), the airport has developed a Wildlife Hazard Management Program (WHMP). In 2000, the airport entered into agreement with the U.S. Department of Agriculture-Wildlife Services to conduct an ecological survey. A Wildlife Hazard Assessment was prepared in 2001. As a result of this survey, the WHMP was developed to protect the traveling public from wildlife hazards. The WHMP is updated annually.

UTILITIES AND GENERATORS

Electricity, natural gas, water, and sanitary sewer services are available at the airport. Electrical service is provided by Salt River Project. Southwest Gas provides natural gas service. The City of Mesa provides water and sanitary sewer services. Telephone and communications services are provided by Qwest Communications. The existing utility lines at the airport are depicted on **Exhibit 1N**.

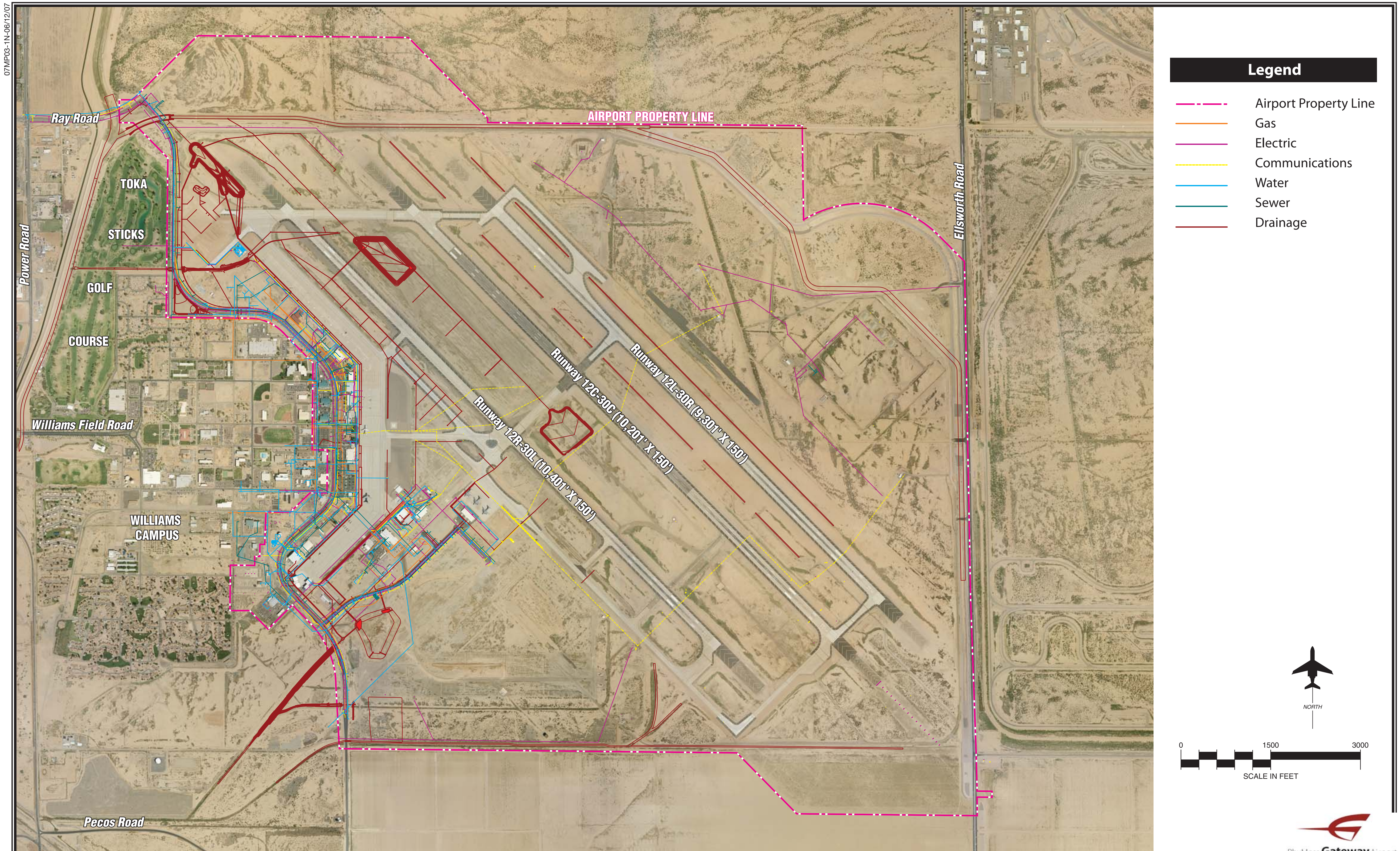
The airport is equipped with two airfield lighting emergency generators which have the ability to handle the electrical load for all runway and taxiway edge lighting. In addition, each component of the Instrument Landing System (glide slope and localizer antenna), the ATCT, terminal building, ARFF station and the VORTAC has its own backup generator. Capabilities of each generator are as follows:

West Lighting Vault - 150kW
East Lighting Vault - 300kW
Airport Traffic Control Tower - 150kW
Glide Slope and Localizer - 20kW
Terminal - 750kW
Airport Rescue and Firefighting - 45kW
Radio Transmitter Site - 20kW

FOREIGN TRADE ZONE

Mesa's General-Purpose Foreign Trade Zone No. 221 (FTZ) was designated to promote international trade and offer companies and importers a way to gain a financial edge in the global marketplace through reduction, deferral, or elimination of U.S. Customs duties. An onsite U.S. Customs Office offers additional advantages to businesses conducting international trade.

Located at Phoenix-Mesa Gateway Airport, FTZ No. 221 offers aviation-related industrial operations the advantage of airport or near-airport locations. Non-aviation related businesses involved in importing foreign or domestic goods can also take advantage



PhxMesa Gateway Airport

Exhibit 1N
UTILITIES

of the benefits through a subzone designation.

The boundaries of the FTZ approximate the existing airport property, excluding the runway and taxiway system, as well as the runway protection zones and various FAA-designated safety areas. Approximately 1,411 acres are airport property available for FTZ development.

The benefits to operating a business in a foreign trade zone are primarily the reduction or elimination of the payment of U.S. Customs duties or excise taxes on goods imported into the United States. At a minimum, a U.S. importer could store a shipment in the foreign trade zone and gradually import only what is needed, at the time it is needed, and thereby improve a company's cash flow by spreading the import duty payment over a longer period of time.

The FTZ is presented on **Exhibit 1P**.

MILITARY REUSE ZONE

The Military Reuse Zone Program (MRZ) was established by the state legislature in 1992, to lessen the impact of military base closures. This program offers aviation companies a significant financial edge in the global marketplace.

There are three primary benefits to developing businesses within the MRZ:

1. Transaction Privilege Tax Exemptions: Exemption from transaction privilege tax on contracts for certain types of construction;
2. Tax Credits: Arizona income/premium tax credits for up to five years for each net new job created, totaling up to $7,500 per non-dislocated employee and up to $10,000 per dislocated employee; and
3. Property Reclassifications: Both real and personal property can be reclassified from class one (25 percent assessment ratio) to class six (5 percent assessment ratio), which may result in property tax savings of up to 80 percent for a period of five years.

The MRZ designation for the Phoenix-Mesa Gateway Airport was renewed in 2006.

REGIONAL AIRPORTS

There are a number of airports of various sizes, capacities, and functions within the vicinity of Phoenix-Mesa Gateway Airport, as previously indicated on **Exhibit 1H**. In an urban/suburban setting, reliever airports within 20 nautical miles of each other will generally have some influence on the activity of the other airport. The influence of competing or complementary commercial service airports can extend well beyond a 20-mile radius. The airports described below are those within approximately 20 nautical miles of Phoenix-Mesa Gateway Airport or are important to the regional airspace environment. Information pertaining to each airport was obtained from the *MAG RASP Update*

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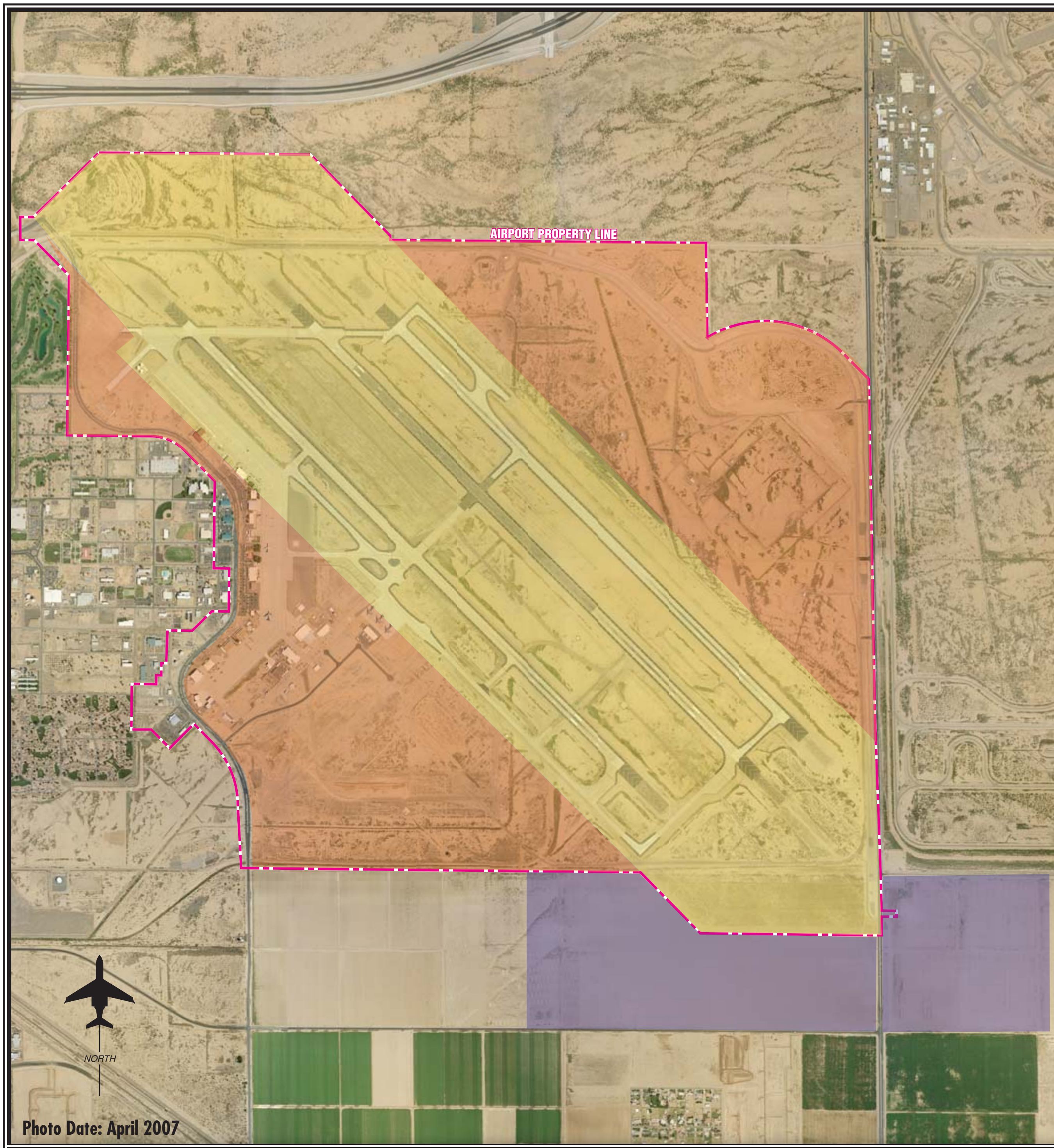

LEGEND

- 1,411 Acres In Zone
- 1,609 Acres Excluded
- 606.6 Acres to be Added To Zone

PhxMesa Gateway Airport

Exhibit 1P
FOREIGN TRADE
ZONE MODIFICATIONS

(2002) and FAA's *5010-Airport Master Record* forms.

Sky Harbor International Airport (PHX) is located 20 nautical miles (nm) west-northwest of Phoenix-Mesa Gateway Airport near downtown Phoenix. The airport is owned and operated by the City of Phoenix and is the largest air carrier airport within the State of Arizona. Sky Harbor is served by all of the major airlines, with Southwest and US Airways utilizing the airport as a hub. In 2007, the airport ranked as the eighth busiest domestic airport, with 20.8 million passenger enplanements.

Phoenix Sky Harbor International Airport is equipped with three parallel runways, two of which are over 10,000 feet in length; the third is 7,800 feet long. An array of instrument approach aids, including an instrument landing system (ILS), aid pilots on approach during inclement weather conditions. The airport is served by seventeen published instrument approaches, three of which provide Category I weather minimums (200-foot cloud ceiling and one-half-mile visibility).

Although the airport's primary role is to provide commercial service to the region, the airport also serves general aviation activity. The airport has approximately 117 based aircraft, including 28 jets and 22 helicopters. The 161st Air Refueling Wing of the Arizona Air National Guard bases approximately nine KC-135 refueling tanker aircraft at the airport. These aircraft often utilize Phoenix-Mesa Gateway Airport for training exercises. FBO services and aircraft tie-down and hangar storage are also available.

Mesa Falcon Field Airport (FFZ), located 10 nm northwest of Phoenix-Mesa Gateway Airport, is owned and operated by the City of Mesa. The airport is supported by parallel runways oriented in a northeast-southwest direction. Runway 04R-22L provides the greatest length at 5,100 feet. An estimated 988 aircraft are based at the airport, of which five are jets and 56 are helicopters. The airport is served by a control tower, an on-site NDB, and a full range of FBO services.

Chandler Municipal Airport (CHD) is located 8 nm west of Phoenix-Mesa Gateway Airport. Owned and operated by the City of Chandler, the airport is equipped with two parallel runways, the longest being 4,870 feet in length. Approximately 425 single and multi-engine aircraft are based at the airport, as well as 24 helicopters. There are no jets based at the airport. The airport is served by a control tower and a full-range of FBO services.

Scottsdale Airport (SDL), located 23 nm north, is owned and operated by the City of Scottsdale. The airport is served by Runway 3-21 (which is 8,249 feet long) and has a control tower. Approximately 471 aircraft, including 96 business jets, are based at the airport.

Stellar Airpark (P19) is a privately-owned airport open to public use. Located 13 nm west of Phoenix-Mesa Gateway Airport, the airport is served by

Runway 17-35, which is 3,913 feet long. Approximately 152 aircraft are based at the airport, including 86 single-engine, ten multi-engine, five jets, and three helicopters. The airport is primarily a residential community with direct airfield access from homes.

Luke Air Force Base (LUF) is located approximately 40 nm to the west of Phoenix-Mesa Gateway Airport and serves as a major tactical jet training base for the U.S. Air Force. Luke AFB is equipped with two parallel runways oriented in a northeast-southwest direction, with one runway measuring 10,000 feet in length. It is not unusual to have aircraft based at Luke Air Force Base utilize Phoenix-Mesa Gateway Airport and the military training areas to the east.

Phoenix Deer Valley Airport (DVT) is located 32 nm northwest of Phoenix-Mesa Gateway Airport. Owned and operated by the City of Phoenix, the airport is served by parallel runways, with Runway 7R-25L providing the greatest runway length at 8,208 feet. Approximately 1,252 aircraft are based at the airport, including 26 business jets and eight helicopters. The airport is served by an air traffic control tower and provides a full range of FBO services.

Phoenix Goodyear Airport (GYR) is located 36 nm to the west of Phoenix-Mesa Gateway Airport and is owned and operated by the City of Phoenix. Runway 3-21 is 8,500 feet long. Served by an ATCT, the airport is a base to 209 aircraft including three jets and four helicopters. The full range of FBO services is available.

Pegasus Airpark (5A23) is a private use airfield located approximately six miles to the south of Phoenix-Mesa Gateway Airport in the Town of Queen Creek. Runway 8-26 is 5,000 feet long. The airport currently supports approximately 56 based aircraft. There are no instrument approaches currently available. Pegasus is a master planned fly-in community where homeowners are able to have taxiway access from their home site. Approximately 180 home sites are available.

A number of private airports, typically with dirt landing strips, are within the vicinity of Phoenix-Mesa Gateway Airport. These landing strips are also presented on **Exhibit 1H**. **Table 1N** presents the relevant regional airport data in tabular format.

SOCIOECONOMIC CHARACTERISTICS

A variety of historical and forecast socioeconomic data has been collected for use in various elements of this master plan. This information provides essential background for use in determining aviation service level requirements. Aviation forecasts are related to the population base, economic strength of the region, and the ability of the region to sustain a strong economic base over an extended period of time. Historical and forecast data were primarily obtained from the Maricopa Association of Governments, which is the regional metropolitan planning organization, the City of Mesa and the Arizona Department of

Economic Security. Other resources included the U.S. Census Bureau, the Bureau of Labor Statistics, as well as pertinent internet sites.

TABLE 1N
Regional Airport Data
Phoenix-Mesa Gateway Airport

Airport Name	FAA Classification	Relational Location	Longest Runway	Based Aircraft	2006 Operations
Phoenix Sky Harbor	Commercial	20 nm WNW	11,489	117	500,000
Mesa Falcon Field	GA-Reliever	10 nm NW	5,100	988	231,000
Chandler	GA-Reliever	8 nm W	4,870	449	247,000
Scottsdale	GA-Reliever	23 nm N	8,249	471	181,000
Stellar Airpark	Non-NPIAS	13 nm W	3,913	152	40,000
Luke Air Force Base	Military	40 nm W	10,000	200+	Classified
Phoenix Deer Valley	GA-Reliever	32 nm NW	8,208	1,252	406,000
Phoenix Goodyear	GA-Reliever	36 nm W	8,500	209	142,000
Pegasus Airpark	Private	6 nm S	5,000	56	25,000

GA: General Aviation
Source: FAA Terminal Area Forecast (TAF); FAA Air Traffic Activity System (ATADS)

POPULATION

Population is one of the most important socioeconomic factors to consider when planning for future needs of an airport. Historical and forecast trends in population provide an indication of the potential of the region to sustain growth in aviation activity. Historical population data for the City of Mesa, Maricopa County, the State of Arizona, is shown in **Table 1P**. Statistical data for the United Stated is shown for comparative purposes.

TABLE 1P
Historical Population Statistics

	1990	2000	2005	2006	Average Annual Growth Rate
City of Mesa (MPA)	329,745*	441,800	486,296	492,657	2.54%
Maricopa County	2,122,101	3,072,149	3,700,516	3,792,670	3.70%
State of Arizona	3,665,228	5,130,632	5,829,839	6,166,318	3.30%
United States	248,709,873	281,421,906	296,507,061	299,398,484	1.17%

*Estimated MPA population
MPA: Metropolitan Planning Area
Source: MAG Projections April 2007; U.S. Census Bureau

The statistical data indicates that all three entities have grown at substantial rates since 1990. The City of Mesa has grown by nearly 50 percent (2.54 percent annually) adding more than 163,000 people since 1990. Maricopa County is growing at an even greater average annual rate of 3.7 percent. Maricopa County, as a whole, has realized an influx of over 1.67 million people since 1990. That translates to nearly 300 new residents per day over the course of 16 years. The State of Arizona is also growing at a substantial rate of 3.3 percent annually.

The Greater Phoenix metropolitan area is consistently recognized as one of the fastest growing metropolitan areas in the country. The East Valley area, in particular, is growing at a substantial rate. From June 2004 to June 2005, the Town of Gilbert grew by nearly 11 percent, going from 157,000 to 174,000 residents, according to the U.S. Census. This placed Gilbert number four on the list of growth cities larger than 100,000. Chandler was number nine on the list, growing from 224,000 to 235,000 or 4.93 percent.

In 2006, the overall U.S. population grew at 0.9 percent as a point of comparison. These positive growth trends have been attributed to the availability of affordable quality homes, excellent educational institutions, excellent employment opportunities, and enjoyable recreational amenities.

EMPLOYMENT

Analysis of a community's employment base can be valuable in determining the overall economic well-being of that community. In most cases, the community make-up and health are significantly impacted by the availability of jobs, the variety of employment opportunities, and the types of wages provided by local employers. **Table 1Q** provides historical employment characteristics from 1990 to 2005, in four analysis categories.

TABLE 1Q
Historical Employment Statistics

	1990	2000	2005	2006*	Average Annual Growth Rate
City of Mesa	145,080	200,781	229,909	237,075	3.12%
Maricopa County	1,076,794	1,542,696	1,766,496	1,825,764	3.36%
Phoenix-Mesa-Scottsdale MSA	1,119,837	1,609,059	1,848,368	1,911,161	3.40%
State of Arizona	1,707,287	2,404,916	2,727,003	2,813,483	3.17%

*Extrapolated
MSA: Metropolitan Statistical Area
Source: US Bureau of Labor Statistics; State of Arizona Department of Economic Security

Total employment in the region has kept pace with population growth. The City of Mesa has added jobs at a 3.12 annual percentage rate since 1990, while population growth has been 2.54 percent annually. Maricopa County and the City of Phoenix are also seeing job growth at greater than 3 percent annual rates. These statistics reveal a long-term, positive employment growth trend, not only for the City, but for the region and state.

Table 1R presents information related to employers in the City of Mesa. The single largest employer is the

Public School System. The second largest employer is Banner Health System which employs over 6,600 people. The Boeing Company has a large presence in the Mesa area, employing more than 4,700 people. Over 300 of these employees are working at facilities located at Phoenix-Mesa Gateway Airport.

TABLE 1R
Major Employers
City of Mesa

Employer	Description	Employees
Mesa Public Schools	Education	10,000
Banner Health System	Hospital Systems	6,600
The Boeing Company	Design/Manufacturing - Aerospace	4,700
City of Mesa	Government	3,700
Empire Southwest Machinery	Equipment Sales, Rental, Leasing	1,000
TRW Safety Systems	Automotive Safety Systems	800
Mesa Community College	Education	700
AMPAM Riggs Plumbing	Contractor - Plumbing Services	650
Mesa Fully Formed	Manufacturing – Plastics	600
United States Postal Service	Mail Service	520
Tribune Newspapers	Newspaper Service	500

Source: City of Mesa Economic Development

INCOME

Table 1S compares historical per capita personal income (PCPI) for Maricopa County, the Phoenix MSA, the State of Arizona, and the United States between 1990 and 2005. As indicated in the table, the PCPI growth trends have been in line with national trends. Income trends can often be an indicator of the growth potential of an airport.

TABLE 1S
Historical Per Capita Personal Income (PCPI) Statistics

	1990	2000	2005	2006*	Average Annual Growth Rate
Maricopa County	$18,998	$28,984	$33,178	$34,435	3.79%
Phoenix-Mesa-Scottsdale MSA	$18,645	$28,359	$32,414	$33,633	3.76%
State of Arizona	$17,005	$25,656	$30,019	$31,178	3.86%
United States	$19,477	$29,843	$34,471	$35,808	3.88%

* Extrapolated
MSA: Metropolitan Statistical Area
Source: Bureau of Economic Analysis

ENVIRONMENTAL INVENTORY

The protection and preservation of the local environment are essential concerns for the Master Planning process. An inventory of potential environmental sensitivities that might affect future improvements at Phoenix-Mesa Gateway Airport has been completed to ensure proper consideration of the environment through the planning process. To assist with defining the existing environmental resources, previous planning studies completed for the airport were reviewed and various resource agencies were consulted. Previous planning studies include the *1999 Williams Gateway Airport Master Plan Update*, the *Williams Gateway Airport Part 150 Study*, the *Williams Gateway Airport Wildlife Hazard Assessment*, and the *March 2006 Environmental Inventory*.

NATURAL RESOURCES

Natural resources are naturally occurring substances or habitat. The following subsections address the natural resource environmental categories identified in FAA Orders 1050.1E *Environmental Impacts: Policies and Procedures* and 5050.4B *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects*.

Air Quality

The U.S. Environmental Protection Agency (EPA) has adopted air quality standards that specify the maximum permissible short-term and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants which include: Ozone (O_3), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Nitrogen Oxide (NO), Particulate Matter (PM10), and Lead (Pb). Various levels of review apply within both National Environmental Policy Act (NEPA) and permitting requirements. For example, an air quality analysis is typically required during the preparation of a NEPA document if enplanement levels exceed 3.2 million enplanements or general aviation operations exceed 180,000.

Phoenix-Mesa Gateway Airport is located in Maricopa County which is in non-attainment for Ozone (both 8-hour and 1-hour) and Particulate Matter. The non-attainment area for both criteria pollutants is centered on the City of Phoenix.

Coastal Resources

The Coastal Zone Barrier resources system consists of undeveloped coastal barriers along the Atlantic and Gulf Coasts. These resources are well outside the vicinity of Phoenix-Mesa Gateway Airport.

Department of Transportation Act: Section 4(f)

These include publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or any land from a historic site of national, state, or local significance.

The Toka Sticks Golf Course, which is owned and operated by the Gila River Indian Community, is located just west of the northern portion of the airport. This golf course was formally known as the Williams Air Force Base Golf Course and consisted of nine holes which were built over 40 years ago. The remaining nine holes were built in the 1980s. The golf course is open to the public. Willie Park, a small public park, is located adjacent to the golf course to the south. Both of these resources have been designed and planned to co-exist with the airport.

Farmlands

The *Farmland Protection Policy Act* (FPPA) authorizes the Department of Agriculture to develop criteria for identifying the effects of federal programs on the conversion of farmland to nonagricultural uses. Farmland protected by the FPPA is classified as either unique farmland, prime farmland (which is not already committed to urban development or water storage), or farmland which is of state or local importance (as determined by the appropriate government agency and the Secretary of Agriculture).

Direct impacts to farmland are those which permanently remove the property from the potential for agriculture production. Indirect impacts are primarily considered to occur in those areas not being directly converted, but which would no longer be capable of being farmed because access would be restricted.

The undeveloped desert surrounding the airport would require significant levels of irrigation in order to be utilized as farmland. Therefore, the land is not recognized as farmland nor is it protected under FPPA.

Fish, Wildlife, and Plants

The Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) determines that a significant impact will result when the proposed action would likely jeopardize the continued existence of a species in question, or would result in the destruction or adverse modification of federally designated critical habitat in the area. Lesser impacts, as outlined by agencies and organizations having jurisdiction, may result in a significant impact.

Table 1T depicts federal threatened and endangered species and species of special concern listed for Maricopa County.

Two distinct biotic communities are present at the airport: Desert Scrub and Urban. The Desert Scrub community is located in the undisturbed areas of airport property and consists primarily of Creosote Bush. The Urban community is represented by pavement and maintained vegetation, primarily mowed grass. Neither of these communities is considered to be significant for their potential of quality wildlife habitat.

The Arizona Game and Fish Department (AGFD) has previously indicated that current records do not reveal the presence of any special status species in the airport vicinity (5-mile radius).

TABLE 1T
Threatened, Endangered, and Candidate Species
Maricopa County

Common Name	Scientific Name	Status
Arizona cliffrose	Purshia subintegra	Endangered
Bald eagle	Haliaeetus leucocephalus	Threatened
California Brown pelican	Pelecanus occidentalis californicus	Endangered
Desert pupfish	Cyprinodon macularius	Endangered
Gila topminnow	Poeciliopsis occidentalis occidentalis	Endangered
Lesser long-nosed bat	Leptonycteris curasoae yerbabuenae	Endangered
Mexican spotted owl	Strix occidentalis lucida	Threatened
Razorback sucker	Xyrauchen texanus	Endangered
Sonoran pronghorn	Antilocapra Americana sonoriensis	Endangered
Southwestern willow flycatcher	Empidonax traillii extimus	Endangered
Yuma clapper rail	Rallus longirostris yumanensis	Endangered
Gila chub	Gila intermedia	Endangered
Yellow-billed cuckoo	Coccyzus americanus	Candidate

Source: US Fish and Wildlife Service, Maricopa County Species List; July 2006

Floodplains

Floodplains are defined in *Executive Order 11988, Floodplain Management*, as "the lowland and relatively flat areas adjoining inland and coastal waters…including at a minimum, that area subject to a one percent or greater chance of flooding in any given year" (i.e., that area would be inundated by a 100-year flood). Federal agencies, including the FAA, are directed to "reduce the risk of loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains."

According to the Federal Emergency Management Agency (FEMA) Federal Insurance Rate Map (FIRM), Phoenix-Mesa Gateway Airport is located within Zone "D." This zone is identified as an area in which flood hazards are undetermined, but possible. As was discussed in the 1999 Master Plan, this determination is likely a result of the airport being a former federal facility, which makes it exempt from federal floodplain insurance policies.

As discussed previously, information received from the Maricopa County Flood Control District indicated that roadway improvements, including a reinforced concrete box culvert road crossing and a bermed area, are being constructed at Pecos Road and Ellsworth Road. This intersection falls partly within the southern approach for Runway 12L-30R. These improvements are being undertaken to divert flood water from Pecos Road under the new improved Ellsworth Road to the new Ellsworth flood control channel.

Hazardous Materials, Pollution Prevention, and Solid Waste

According to the Agency for Toxic Substances and Disease Registry (ATSDR) (an agency of the Department of Health and Human Services), the Air Force had identified 32 areas of potential concern at or near the airport resulting from its former use as a U.S. Air Force Base. These sites include landfills, fire protection training areas, pesticide burial areas, former skeet and firing ranges, and hazardous materials storage areas. During a site visit conducted in 1997 by ATSDR, all 32 areas were examined for potential exposure pathways. The only area identified as a potential exposure pathway of concern was exposure to contaminated soil at the former skeet range. This site is located on the Arizona State University Polytechnic campus. Based on a thorough evaluation, ATSDR determined that the soil at the former skeet range does not pose a public health hazard as the area is not accessible to the public. Furthermore, corrective actions were slated to occur and an operation and maintenance plan will outline provisions to ensure that the area remains capped. It was determined that the remaining 31 sites pose no public health hazard.

The Air Force had operated a landfill on its former property. This landfill is located to the southeast of the airport and is not located on current airport property. The inactive landfill has been capped with soil and rock and is not considered to pose a bird hazard.

Wetlands/Waters of the U.S.

The U.S. Army Corps of Engineers regulates the discharge of dredged and/or fill material into waters of the United States, including adjacent wetlands, under Section 404 of the Clean Water Act. Wetlands are defined in *Executive Order 11990, Protection of Wetlands*, as "those areas that are inundated by surface or groundwater 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 seasonably saturated soil conditions for growth and reproduction." Categories of wetlands include swamps, marshes, bogs, sloughs, potholes, wet meadows, river overflows, mud flats, natural ponds, estuarine areas, tidal overflows, and shallow lakes and ponds with emergent vegetation. Wetlands exhibit three characteristics: hydrology, hydrophytes (plants able to tolerate various degrees of flooding or frequent saturation), and poorly drained soils.

An Environmental Review was prepared in 1992 for the reconstruction of Runway 12L-30R, at which time a

Wetland/Waters of the U.S. survey was completed on airport property. It was determined in this survey that no wetlands exist on airport property. The U.S. Army Corps of Engineers concurred with the survey and determined that no jurisdictional wetlands occurred on airport property.

Wild and Scenic Rivers

The Verde River is the only designated Wild and Scenic River in Arizona. This river is located in northern Arizona.

CULTURAL RESOURCES

A number of both cultural and historic sites of national, state, or local significance are located at the airport and in close proximity to the airport.

Historical, Architectural, and Cultural Resources

Determination of a project's impact to historic and cultural resources is made in compliance with the *National Historic Preservation Act* (NHPA) *of 1966*, as amended for federal undertakings. Two state acts also require consideration of cultural resources. The NHPA requires that an initial review be made of an undertaking's *Area of Potential Effect* (APE) to determine if any properties on or eligible for inclusion in the National Register of Historic Places are present in the area. The NHPA describes the consultation process.

Prior to the transfer of the airport site to the Airport Authority, the Air Force completed surveys on undeveloped portions of the airport. During this survey, nine archaeological sites were identified as being eligible for listing on the national register. These sites include: Outer Limits, an unnamed ditch or canal (No Name), El Horno Grande, Radar, Ordnance, Will E. Coyote, In-Between, Southwest Germann, and Midvale. In addition, National Register eligible buildings (World War II era hangars) were identified. Three of these sites, the Outer Limits, In-Between, and No Name have been de-listed. The remaining six archaeological sites are listed on the National Register, as well as one of the hangars.

Information from the State Historic Preservation Office (SHPO) indicated that the area just north of the airport has been surveyed multiple times for various highway projects and contains an identified archaeological site. This site is known as the Berm Site and contains both prehistoric and historic-era materials. According to the SHPO, southeast of the airport is contiguous to the large prehistoric archaeological site (Will E. Coyote) identified during the survey completed by the Air Force for airport property.

DOCUMENT SOURCES

As mentioned earlier, a variety of different sources were utilized in the inventory process. The following listing reflects a partial compilation of these sources. This does not include data provided by airport management as part of their records, nor does it include airport drawings and photographs which were referenced for information. On-site inventory and interviews with staff and tenants contributed to the inventory effort.

Airport/Facility Directory, Southwest, U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, May 10, 2007 Edition

Phoenix Sectional Aeronautical Chart, U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, May 10, 2007

National Plan of Integrated Airport Systems (NPIAS), U.S. Department of Transportation, Federal Aviation Administration, 2007-2011

U.S. Terminal Procedures, Southwest U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, May 10, 2007

High Capacity Transit Study – Final Report 2003. Maricopa Association of Governments

City of Mesa Transportation Plan – A Shared Vision 2025, City of Mesa Arizona – 2003

City of Mesa General Plan – A Shared Vision 2025, City of Mesa – 2002

Urban Land Institute Advisory Services Panel Report, Phoenix-Mesa Gateway Airport Area Office – 2006

Town of Gilbert General Plan – 2006

Town of Queen Creek General Plan – 2001

A number of internet Web sites were also used to collect information for the inventory chapter. These include the following:

Phoenix-Mesa Gateway Airport
www.flywga.org

City of Mesa:
www.cityofmesa.org

Town of Gilbert
www.ci.gilbert.az.us

Town of Queen Creek
www.queencreek.org

FAA 5010 Airport Master Record Data
http://www.airnav.com

Maricopa Association of Governments
http://www.mag.maricopa.gov/display.cms

U.S. Census Bureau
http://www.census.gov

Maricopa County, Arizona
http://www.maricopa.gov/

Arizona Department of Economic Security
http://www.de.state.az.us/ASPNew/default.asp

Arizona Workforce Informer
http://www.workforce.az.gov/

Bureau of Economic Analysis, U.S. Department of Commerce
http://www.bea.gov/bea/regional/data.htm

PhxMesa Gateway Airport

Chapter Two

"UNCONSTRAINED" FORECASTS

Chapter Two

"Unconstrained" Forecasts

An important factor in facility planning involves a definition of demand that may reasonably be expected to occur during the useful life of the facility's key components. In airport master planning, this involves projecting potential aviation activity for a twenty-year timeframe. Forecasting for Phoenix-Mesa Gateway Airport will consider passengers, cargo, based aircraft, and operations (takeoffs and landings) which will serve as the basis for facility planning.

The Federal Aviation Administration (FAA) has oversight responsibility to review and approve aviation forecasts developed in conjunction with airport planning studies. The FAA reviews such forecasts with the objective of comparing them to its *Terminal Area Forecasts* (TAF) and the *National Plan of Integrated Airport Systems* (NPIAS). In addition, aviation activity forecasts are an important input to the benefit-cost analyses associated with airport development, and FAA reviews these analyses when federal funding requests are submitted.

As stated in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems* (NPIAS), dated December 4, 2004, forecasts should be:

- Realistic
- Based on the latest available data
- Reflect current conditions at the airport
- Supported by information in the study
- Provide adequate justification for airport planning and development

The forecast process for an airport master plan consists of a series of basic steps that can vary depending upon the issues to be addressed and the level of effort required to develop the forecast. The steps include a review of previous forecasts, determination of data needs, identification of data sources, collection of data, selection of forecast methods, preparation of the forecasts, and evaluation and documentation of the results.

The following forecast analysis for Phoenix-Mesa Gateway Airport was produced following these basic guidelines. Previous forecasts dating back to the previous master plan are examined and compared against current and historic activity. The historical aviation activity is then examined along with other factors and trends that can affect demand. The intent is to provide an updated set of aviation-demand projections for Phoenix-Mesa Gateway Airport that will permit the Airport Authority to make planning adjustments as necessary to maintain a viable, efficient, and cost-effective facility.

It should be noted that these forecasts are considered "Unconstrained" in that they reflect the level of demand that could be reasonably expected over the next 20 years. These forecasts are airport-specific and do not consider the constraints of the area airspace, hangar limitations, or airport policies on growth. These forecasts will be translated into planning horizon milestones and facility requirements will be developed to meet this unconstrained need in Chapter Three. Chapter Four - Alternatives will examine the feasibility of accommodating the unconstrained forecasts.

NATIONAL AVIATION TRENDS

Each year, the FAA updates and publishes a national aviation forecast. Included in this publication are forecasts for the large air carriers, regional/commuter air carriers, air cargo, general aviation, and FAA workload measures. The forecasts are prepared to meet budget and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the general public.

The current edition when this chapter was prepared was FAA *Aerospace Forecasts-Fiscal Years 2007-2020*, published in March 2007. The forecasts use the economic performance of the United States as an indicator of future aviation industry growth. Similar economic analyses are applied to the outlook for aviation growth in international markets.

In the seven years prior to the events of September 11, 2001, the U.S. civil aviation industry experienced unprecedented growth in demand and profits. The impacts to the economy and aviation industry from the events of 9/11 were immediate and significant. The economic climate and aviation industry, however, has, for the most part, recovered to pre-9/11 levels and the forecasts show continued growth.

The Office of Management and Budget (OMB) expects the U.S. economy to continue to grow in terms of Gross Domestic Product (GDP) at an average annual rate of 2.9 percent through 2020. This will positively influence the aviation industry, leading to passenger, air cargo, and general aviation growth throughout the forecast period (assuming there will be no new successful terrorists incidents against either U.S. or world aviation).

The FAA forecasts for commercial aviation project a return to growth and, over time, the industry is expected to grow significantly. National system capacity, the yard stick for measuring the health of the aviation industry, is projected to increase 2.8 percent in 2007, following a decline of 0.2 percent in 2006. In domestic markets, capacity is expected to increase 2.1 percent annually, as legacy network capacity stabilizes and low-cost carriers continue to grow. Regional carrier capacity is forecast to increase 2.9 percent annually, as legacy carriers transfer routes to regional partners and the regionals offer more point-to-point service. Revenue passenger miles (RPM) are forecast to increase 2.8 percent annually, while enplanements are expected to increase faster, up 3.6 percent annually.

U.S. airline passenger enplanements (combined domestic and international) have now exceeded pre-9/11 levels and are projected to grow at an average of 3.5 percent annually through 2020. Mainline air carriers are forecast to grow 3.7 percent annually, while the regional/commuter airlines are forecast to level off at 3.1 percent annually, after having experienced unprecedented 11.2 percent annual growth from 2000-2006.

Average aircraft size is expected to remain the same in 2007, but then grow slightly through 2020. This is attributable to the legacy carriers continuing to reconfigure their fleets, shed some routes to regional partner carriers, and regional carriers increasing their aircraft size. Average aircraft size in 2006 was 120.2 seats, and by 2020 is expected to be 121.4 seats. Overall passenger trip length is expected to continue to increase as low-cost and regional carriers offer longer-haul trips.

Growth in the general aviation sector is expected to continue to be strong, particularly with the introduction of very light jets (VLJs) to the fleet. These relatively inexpensive microjets may redefine "on-demand" air taxi service. In 2008, over 350 VLJs are forecast to enter the fleet, with that figure growing to 400-500 per year through 2020. Overall, general aviation hours flown are projected to increase an average of 3.4 percent per year through 2020. The number of active general aviation aircraft is expected to grow at 1.4 percent annually.

U.S. airline air cargo revenue-ton-miles (RTMs) are projected to grow at 5.6 percent annually.

COMMERCIAL PASSENGER AIRLINES

The passenger airlines in the United States are comprised of 33 mainline carriers and 81 regional carriers. The mainline carriers are airlines that primarily use passenger jets with over 90 seats, while the regional carriers are airlines that primarily use smaller propeller and jet aircraft with fewer than 90 seats. The mainline carriers have also emerged into two other groupings: legacy network carriers and low-cost carriers.

Legacy Network Carriers - This group includes the airlines established prior to deregulation in 1978 (e.g., American Airlines, Continental Airlines, Delta Airlines, Northwest Airlines, United Airlines, US Airways). The legacy airlines were the most impacted by 9/11, and now are undergoing restructuring efforts to redefine their business model in the new operating environment of the industry. These airlines operate primarily in hub-and-spoke networks and generally have higher operating costs. The legacy airlines have been downsizing and cost-cutting to become competitive with the low-cost carriers. The string of negative external events, out of the control of the airlines, has made it difficult for most legacy carriers to achieve profitability.

Low-Cost Carriers - This group is comprised of established low-cost carriers, new entrants, and a few restructured legacy carriers (American Trans Air (ATA), AirTran, Frontier Airlines, JetBlue Airways, Southwest Airlines, and Spirit Airlines). These carriers typically operate point-to-point and have lower operating costs than their legacy counterparts. Their post-9/11 strategy has seen growth in airports and city-pairs served, aircraft fleet, and longer-haul flights. The recent sharp increases in oil prices have impacted the profits of the low-cost airlines.

Regionals/Commuters - This group's operating strategy focuses around providing feeder traffic through code-sharing arrangements with mainline airlines. Some, like newly launched ExpressJet, are attempting point-to-point service in competition with the larger carriers. Since 9/11, the regionals and commuters have benefited from the route restructuring and cost-cutting of the legacy carriers, taking over service to thinner medium-haul and long-haul markets.

Three distinct trends have occurred over the past five years that have helped shape today's U.S. commercial air carrier industry: (1) major restructuring and downsizing among mainline network carriers; (2) rapid growth among low-cost carriers, particularly in non-traditional long-distance transcontinental markets; and (3) exceptional growth among regional carriers.

After two consecutive years of strong growth in 2004 and 2005, U.S. commercial air carrier system capacity and traffic (domestic and international service) grew at much slower rates in 2006. System capacity, as measured in available seat miles (ASMs), was down 0.2 percent, while system revenue passenger miles (RPMs) and enplanements showed gains of 2.1 and 0.4 percent, respectively. At the end of 2006, commercial air carrier enplanements exceeded pre-9/11 levels by 6.2 percent, while RPMs were 13.9 percent higher than in 2000.

Regional air carriers have benefited from capacity cuts and corporate restructuring made by mainline carriers since 2000. Regional carriers have more than doubled revenue passengers, growing from 82.8 million in 2000 to 156.8 million in 2006. This represented an average annual growth rate of 11.2 percent. Regional carriers are forecast to grow at 3.1 percent annually through 2020.

Capacity and demand growth are forecast in 2007 to rebound from the slowdown in 2006. Capacity is projected to grow 2.8 percent as the mainline carrier domestic market capacity stabilizes (after falling almost six percent in 2006), while low-cost carriers continue to add capacity in domestic markets and legacy carriers continue to grow in international markets. Legacy carrier capacity is projected to increase 2.8 percent, while regional carrier capacity rises 3.0 percent.

Passenger demand growth also rebounds, with RPMs forecast to increase 3.4 percent as passenger enplanements rise 3.7 percent. Growth is projected to accelerate in 2008 as RPMs and enplanements increase 4.2 and 3.4 percent, respectively, while capacity increases slightly faster at 4.3 percent. For the balance of the forecast, system capacity is projected to increase an average of 4.4 percent. System-wide RPMs are projected to grow 4.5 percent per year, with regional carriers (5.1 percent) growing faster than mainline carriers (4.4 percent). System passengers are projected to increase an average of 3.5 percent a year, with mainline carriers growing faster than regional carriers (3.7 vs.3.0 percent a year).

Domestic aircraft size (seat capacity) has been on the decline in recent years, primarily with the advent of the regional jet and the subsequent growth of the regional airlines. Domestic aircraft size declined in 2005 by 1.3 seats, to 120.4, and remained essentially flat at 120.2 in 2006, but is forecast to increase by 0.3 seats in 2007, to 120.5. Aircraft size is projected to increase through 2011 to 121.3 seats, then decline gradually through 2015 to 120.9 seats. Seat capacity will start to recover in 2016 and rise to 121.4 seats by 2020.

While mainline carriers have been reducing the size of aircraft flown domestically, regional carriers have been increasing the size of their aircraft. The most visible example of this trend is the great number of 70-90 seat regional aircraft that are entering the fleet and the on-going retrofitting of existing regional jets to add seats. The addition of these larger capacity aircraft is reflected in the FAA forecast, as regional carriers move from an average of 50 seats in 2006, to 59 seats in 2020. This changing aircraft fleet is narrowing the gap between the size of aircraft operated by the mainline and regional carriers.

By 2020, airplanes are forecast to become fuller as load factors increase from the record high of 78.8 percent in 2006, to 80.3 percent. Passenger trip length is also forecast to increase, which reflects the faster growth in the relatively longer international trips and longer domestic trips resulting from increased point-to-point service, especially by low-cost regional carriers.

Passenger trip length is also forecast to show substantial growth through 2020. In 2006, passenger trip length increased by 9.6 miles, to 871.4 miles, with gains recorded by both mainline and regional carriers. Trip length is projected to increase by an average of 6.5 miles after a slight decline in 2007, reaching 945.1 miles by 2020. Mainline carrier trip lengths are increasing, primarily because shorter length routes are continuing to be transferred to regional partner carriers and because of increased point-to-point service. Regional carrier trip lengths increase because of the use of larger regional jets which allow for longer haul lengths.

The number of passenger jets in the mainline carrier fleet fell by 39 aircraft in 2006, but is expected to increase by 92 aircraft in 2007, and 108 in 2008. Over the remaining 12 years of the FAA forecast, the mainline passenger fleet increases by an average of 163 aircraft per year, reaching a total of 6,041 aircraft in 2020. The narrow-body fleet (including the Embraer-190 at JetBlue and U.S. Airways) is projected to grow by 123 aircraft annually over the forecast period; the wide-body fleet grows by 31 aircraft a year, as the Boeing 787 and Airbus A350s enter the fleet.

The regional aircraft fleet has been transitioning away from turboprop aircraft to jet aircraft over the past decade. From 2000 to 2006, the number of regional jets has grown nearly 20 percent annually, from 570 in 2000, to 1,687 in 2006. Over the same period, non-jet regional aircraft have decreased 7.7 percent, from 1,704 to 1,056. This trend toward regional jets is expected to continue through 2020 with the addition of 1,002 jets and the loss of 51 non-jet regional aircraft. This represents a 7.7 percent average annual growth rate for regional jets. Turboprop aircraft will account for just over 27 percent of the regional fleet in 2020, down from a 38.5 percent share in 2006.

The national enplanement history and projections for mainline and regional carriers are depicted on **Exhibit 2A.**

AIR CARGO

There are 25 all-cargo carriers providing domestic and/or international air cargo service, which is comprised of freight/express and mail. Air cargo is moved either in the bellies of passenger aircraft or in dedicated all-cargo aircraft. FAA forecasts are measured in revenue-ton-miles (RTMs).

Air cargo activity has historically had a high correlation to Gross Domestic Product (GDP). Other factors that affect air cargo growth are real yields, improved productivity, and globalization. Ongoing trends that are and will continue to improve the air cargo market include the opportunities from open-skies agreements, decreasing costs from global airline alliances, and increasing business volumes from e-commerce. At the same time, trends that could limit air cargo growth include increased use of e-mail, decreased costs of sending documents by facsimile, and increased airline costs due to environmental and security restrictions.

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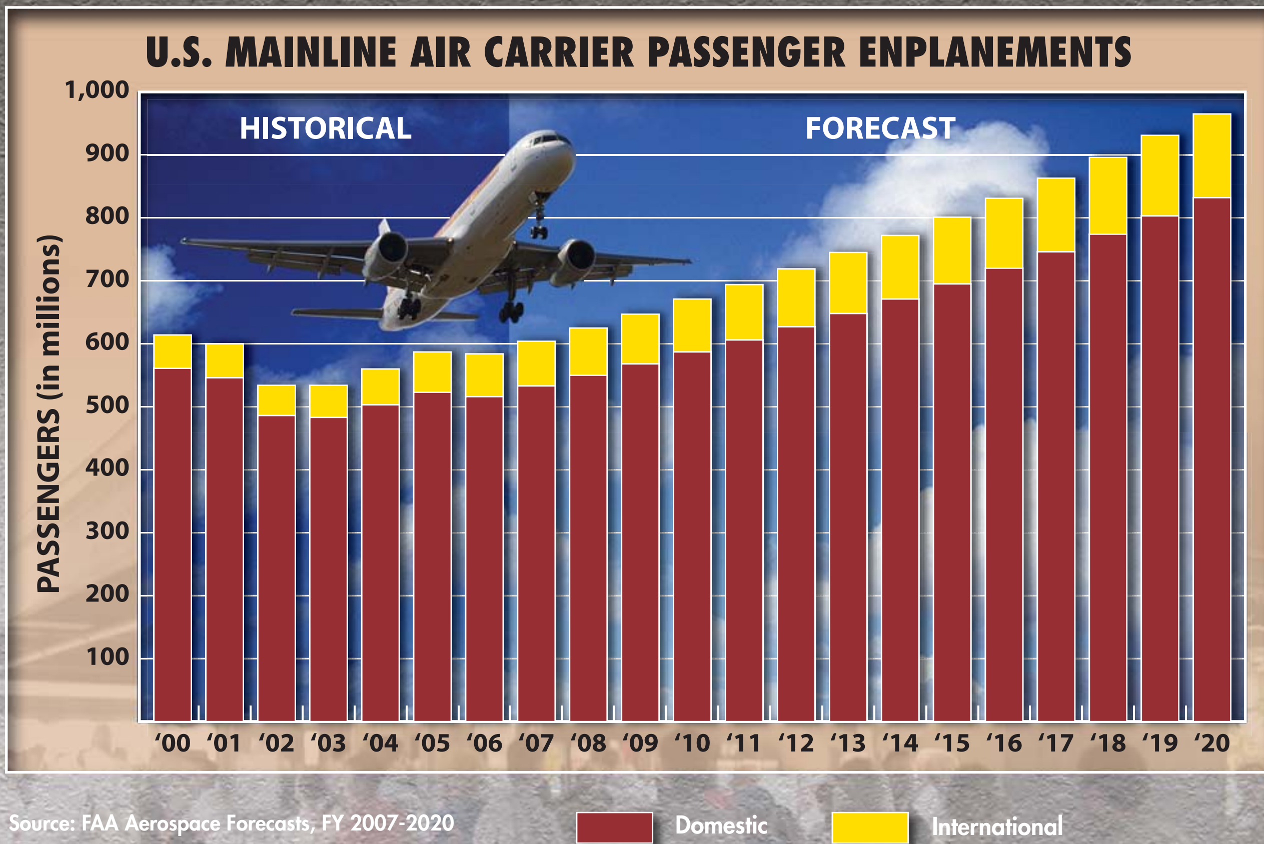
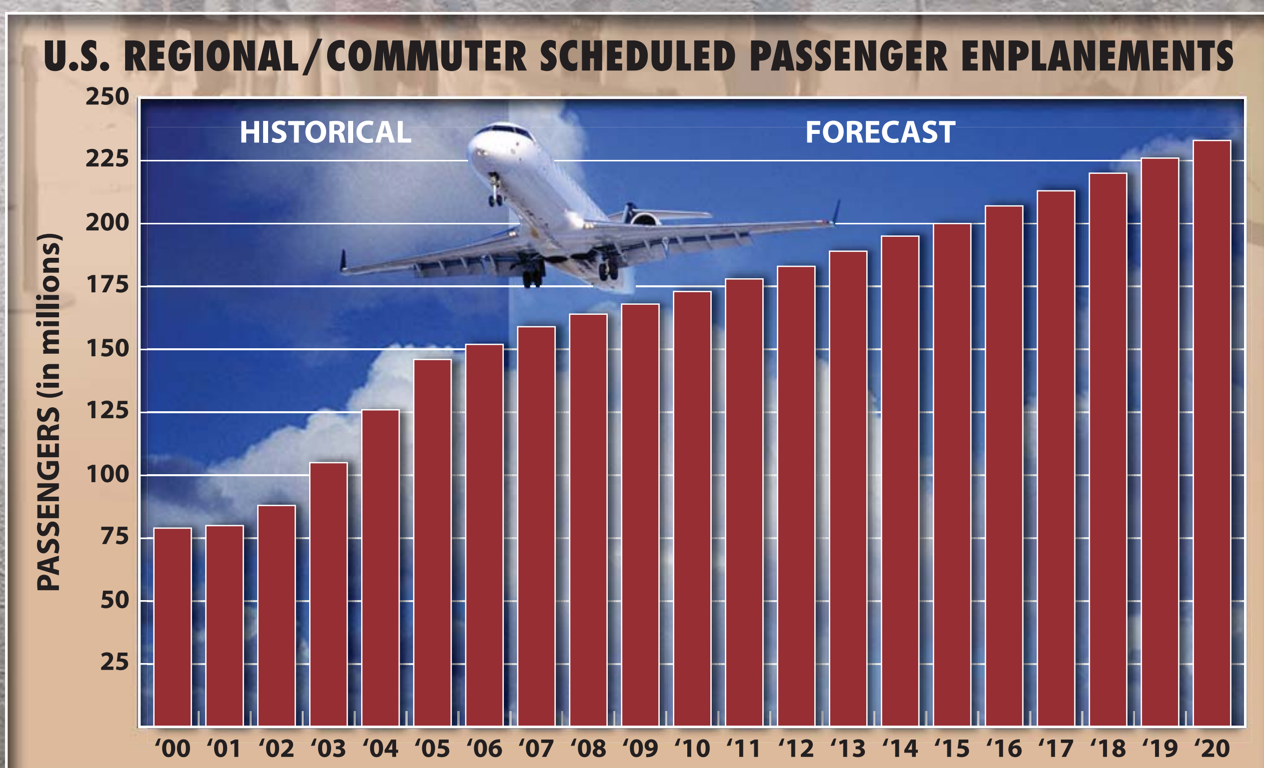


Source: FAA Aerospace Forecasts, FY 2007-2020



Source: FAA Aerospace Forecasts, FY 2007-2020

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Exhibit 2A
U.S. LARGE AIR CARRIER AND
REGIONAL/COMMUTER FORECASTS

Before 2001, air cargo was the fastest growing sector of the aviation industry. From 1994 through 2000, total tons and RTMs grew at annual average rates of 8.0 and 8.6 percent, respectively. An economic slowdown in the U.S., combined with the collapse of the high-tech industry and a slowing of imports, resulted in declines of 5.0 percent in tons and 3.9 percent in RTMs in 2001. Traffic began to recover in 2002, and is setting new record RTMs, especially in the international market.

The FAA notes there are several structural changes occurring within the air cargo industry. Among them are the following:

- **Security regulations** – Security regulations put in place shortly after 9/11 shifted much of the air cargo from the passenger airlines to the all-cargo airlines. Additional regulations have been put in place since. These include requiring the carriers to conduct random inspections, codifying and strengthening the "known shipper" program, and establishing a security program specifically for all-cargo operations by aircraft over 20,000 pounds.

- **Market maturation** – The express market in the United States has matured after dramatic growth over the last two decades. This is the majority of domestic air cargo activity.

- **Modal shift** – Modal shift from air to other modes (especially truck).

- **Increased USPS use of all-cargo carriers –** This initially resulted from the U.S. Postal Service's (USPS) need to improve control over delivery. The trend has continued due to security regulations.

- **Increased use of mail substitutes** – Substitutes such as e-mail affect mail volume. The residual fear of mail because of terrorism has also been a factor.

FAA's forecasts of air cargo RTMs are predicated on several assumptions:

1) security restrictions concerning air cargo transportation will stay in place;
2) there will be no additional terrorist attacks in the U.S.;
3) there will be continued domestic and international economic growth;
4) most of the modal shift from air to ground has occurred; and
5) in the long term, cargo activity will be tied to economic growth.

The number of RTMs flown by U.S. carriers grew by 1.2 percent in 2006 to 39.7 billion. Domestic cargo RTMs (15.7 billion) decreased 2.4 percent, while international RTMs (24.0 billion) were up 3.7 percent. The decrease in domestic RTMs reflects a continuation of the modal shift from air to ground shipments and the impact of fuel surcharges as well as a large (60 percent) reduction in RTMs by Atlas Air. The increase in international RTMs is attributable to increases in trade and military shipments to the Middle East.

Air cargo RTMs flown by all-cargo carriers were 71.0 percent of total RTMs in 2006. Total RTMs flown by all-cargo carriers increased 1.5 percent in 2006, from 27.8 billion to 28.2 billion. Total RTMs flown by passenger carriers were 11.5 billion in 2006, up 0.5 percent.

Total RTMs are forecast to increase 4.6 percent in 2007, and 6.1 percent in 2008. For the balance of the forecast period, total RTMs are forecast to increase at an average annual rate of 5.2 percent. The forecast of 81.3 billion RTMs in 2020 represents an average annual increase of 5.3 percent over the forecast period.

Between 1997 and 2006, the all-cargo carrier percentage of U.S. domestic RTMs grew from 65.4 percent to 79.4 percent in 2006. By 2020, this share is projected to increase to 83.6 percent based upon increases in wide-body capacity for all-cargo carriers and security considerations.

International cargos RTMs are forecast to increase 5.9 percent in 2007, and 7.0 percent in 2008. From 2009 through 2020, international cargo RTMs are forecast to increase an average of 6.3 percent a year. The forecast 56.4 billion RTMs in 2020 represents an average annual increase of 6.3 percent over the forecast period.

The all-cargo large jet aircraft fleet is expected to grow from 997 in 2006, to 1,468 by 2020. Narrow-body aircraft in the fleet are projected to decline by an average of four aircraft per year through 2020. The wide-body aircraft fleet utilized for air-cargo, including the Airbus A-380 jumbo jet, is projected to increase by more than 37 aircraft yearly.

Exhibit 2B presents U.S. historical and forecast air cargo RTMs through 2020.

GENERAL AVIATION

In the 13 years since the passage of the *General Aviation Revitalization Act of 1994* (federal legislation which limits the liability on general aviation aircraft to 18 years from the date of manufacture), it is clear that the Act has successfully infused new life into the general aviation industry. This legislation sparked an interest to renew the manufacturing of general aviation aircraft due to the reduction in product liability, as well as renewed optimism for the industry.

After the passage of this legislation, annual shipments of new aircraft rose every year between 1994 and 2000.

According to the General Aviation Manufacturers Association (GAMA), between 1994 and 2000, general aviation aircraft shipments increased at an average annual rate of more than 20 percent, increasing from 928 shipments in 1994, to 3,140 shipments in 2000. As shown in **Table 2A,** the growth in the general aviation industry slowed considerably after 2000, negatively impacted by the national economic recession and the events surrounding 9/11. In 2003, there were over 450 fewer aircraft shipments than in 2000, a decline of 14 percent.

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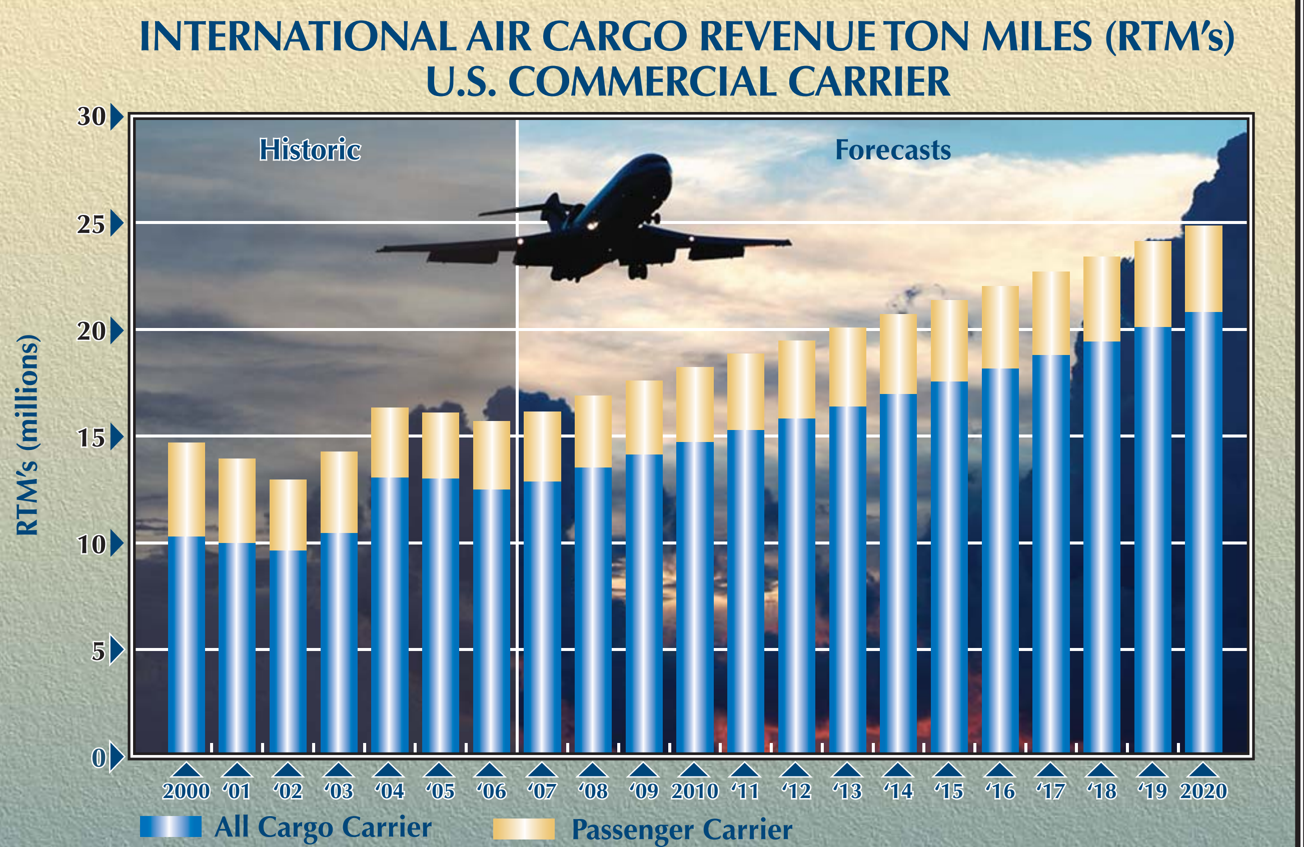

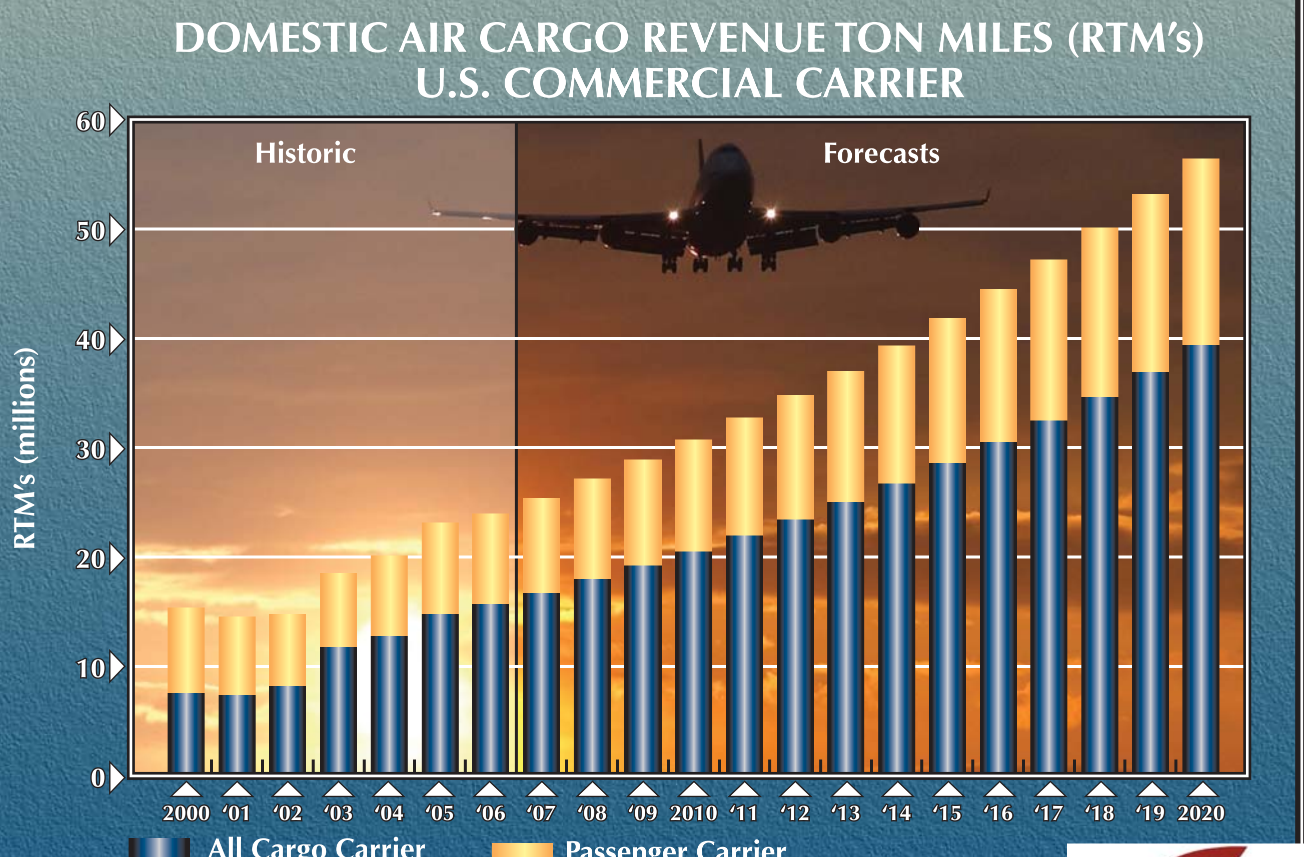

Source: FAA Aerospace Forecasts, Fiscal Years 2007-2020 Domestic figures prior to 2003 exclude Airborne Express Inc.

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Exhibit 2B
U.S. AIR CARGO FORECASTS

In 2004, general aviation production showed a significant increase, returning near pre-9/11 levels for most indicators. With the exception of multi-engine piston aircraft deliveries, deliveries of new aircraft in all categories increased. In 2005, total aircraft deliveries increased 17 percent over the previous year. The largest increase was in single engine piston aircraft deliveries that increased 14 percent or by over 300 aircraft. Turbojet deliveries increased 21 percent, growing by more than 159 aircraft to 750 total aircraft. As evidenced in the table, new aircraft deliveries exceed pre-9/11 levels. In 2006, these strong growth trends continued.

TABLE 2A
Annual General Aviation Airplane Shipments
Manufactured Worldwide and Factory Net Billings

Year	Total	SEP	MEP	TP	J	Net Billings ($ millions)
2000	3,140	1,862	103	415	760	13,497.00
2001	2,994	1,644	147	421	782	13,866.60
2002	2,687	1,601	130	280	676	11,823.10
2003	2,686	1,825	71	272	518	9,994.80
2004	2,963	1,999	52	321	591	11,903.80
2005	3,580	2,326	139	365	750	15,140.00
2006	4,042	2,508	242	407	885	18,793.00

SEP - Single Engine Piston; MEP - Multi-Engine Piston; TP - Turboprop; J - Turbofan/Turbojet
Source: GAMA

On July 21, 2004, the FAA published the final rule for sport aircraft: the *Certification of Aircraft and Airmen for the Operation of Light-Sport Aircraft* rules, which went into effect on September 1, 2004. This final rule establishes new light-sport aircraft categories and allows aircraft manufacturers to build and sell completed aircraft without obtaining type and production certificates. Instead, aircraft manufacturers will build to industry consensus standards. This reduces development costs and subsequent aircraft acquisition costs. This new category places specific conditions on the design of the aircraft to limit them to “slow (less than 120 knots maximum) and simple” performance aircraft. New pilot training times are reduced and offer more flexibility in the type of aircraft which the pilot would be allowed to operate.

Viewed by many within the general aviation industry as a revolutionary change in the regulation of recreational aircraft, this new rule is anticipated to significantly increase access to general aviation by reducing the time required to earn a pilot’s license and the cost of owning and operating an aircraft. Since 2004, there have been over 30 new product offerings in the airplane category alone. These regulations are aimed primarily at the recreational aircraft owner/operator. By 2017, there is expected to be 14,000 of these aircraft in the national fleet.

While impacting aircraft production and delivery, the events of 9/11 and economic downturn have not had the same negative impact on the business/corporate side of general aviation. The increased security measures placed on commercial flights have increased interest in fractional and corporate aircraft ownership, as well as on-demand charter flights. According to GAMA, the total number of corporate operators has increased every year since 1992. Corporate operators are defined as those companies that have their own flight departments and utilize general aviation airplanes to enhance productivity. **Table 2B** summarizes the number of U.S. companies operating fixed-wing turbine aircraft since 1991.

TABLE 2B
U.S. Companies Operating Fixed-Wing Turbine Aircraft and Number of Aircraft, 1991-2005

Year	Number of Operators	Number of Aircraft
1991	6,584	9,504
1992	6,492	9,504
1993	6,747	9,594
1994	6,869	10,044
1995	7,126	10,321
1996	7,406	11,285
1997	7,805	11,774
1998	8,236	12,425
1999	8,778	13,148
2000	9,317	14,079
2001	9,709	14,837
2002	10,191	15,569
2003	10,661	15,870
2004	10,735	16,369
2005	10,809	16,867

Source: GAMA/NBAA

The growth in corporate operators comes at a time when fractional aircraft programs are experiencing significant growth. Fractional ownership programs sell a share in an aircraft at a fixed cost. This cost, plus monthly maintenance fees, allows the shareholder a set number of hours of use per year and provides for the management and pilot services associated with the aircraft's operation. These programs guarantee the aircraft is available at any time, with short notice. Fractional ownership programs offer the shareholder a more efficient use of time (when compared with commercial air service) by providing faster point-to-point travel times and the ability to conduct business confidentially while flying. The lower initial startup costs (when compared with acquiring and establishing a flight department) and easier exiting options are also positive benefits.

Since beginning in 1986, fractional jet programs have flourished. **Table 2C** summarizes the growth in fractional shares since 1986. The number of aircraft in fractional jet programs has grown rapidly. In 2001, there were 696 aircraft in fractional jet programs. This grew to 776 aircraft in fractional jet programs at the end of 2002, and 826 in 2003. There were 949 aircraft at the end of 2005.

TABLE 2C
Fractional Shares and Number of Aircraft In Use

Year	Number of Shares	Number of Aircraft
1986	3	NA
1987	5	NA
1988	26	NA
1989	51	NA
1990	57	NA
1991	71	NA
1992	84	NA
1993	110	NA
1994	158	NA
1995	285	NA
1996	548	NA
1997	957	NA
1998	1,551	NA
1999	2,607	NA
2000	3,834	NA
2001	3,415	696
2002	4,098	776
2003	4,516	826
2004	4,765	865
2005	4,691	949

Source: GAMA

Very light jets (VLJs) entered the operational fleet in 2006. Also known as microjets, the VLJ is defined as a jet aircraft that weighs less than 10,000 pounds. There are several new aircraft under development, with the Eclipse 500, Cessna Mustang, Embraer Phenom 100, and Adams 700 jets expected to enter service in 2007. These jets cost between one and two million dollars, can takeoff on runways of less than 3,000 feet, and cruise at 41,000 feet at speeds in excess of 300 knots. The VLJ is expected to redefine the business jet segment by expanding business jet flying and offering operational costs that can support on-demand air taxi point-to-point service. This category of aircraft is expected to expand at 400 to 500 aircraft per year, reaching nearly 6,300 aircraft by 2020.

The FAA forecast assumes that the regulatory environment affecting general aviation will not change dramatically. The FAA recognizes that a major risk to continued economic growth is upward pressure on commodity prices, including the price of oil. However, the FAA economic models predict a 15 percent increase in oil prices in 2006, followed by a decline of 0.6 percent to 2.5 percent annually between 2007 and 2012, then rising by just over 2.0 percent annually for the balance of the forecast period.

The FAA projects the active general aviation aircraft fleet to increase at an average annual rate of 1.4 percent through 2020, increasing from 224,352 in 2005, to 274,914 in 2020. This growth is depicted on **Exhibit 2C**. FAA forecasts identify two general aviation economies that follow different market patterns. The turbojet fleet is expected to increase at an average annual rate of 6.0 percent, increasing from 9,823 in 2005, to 22,797 in 2020. Factors leading to this substantial growth include expected strong U.S. and global economic growth, the continued success of fractional-ownership programs, the introduction of the VLJ/microjet, and a continuation of the shift from commercial air travel to corporate/business air travel by business travelers and corporations. Piston-powered aircraft

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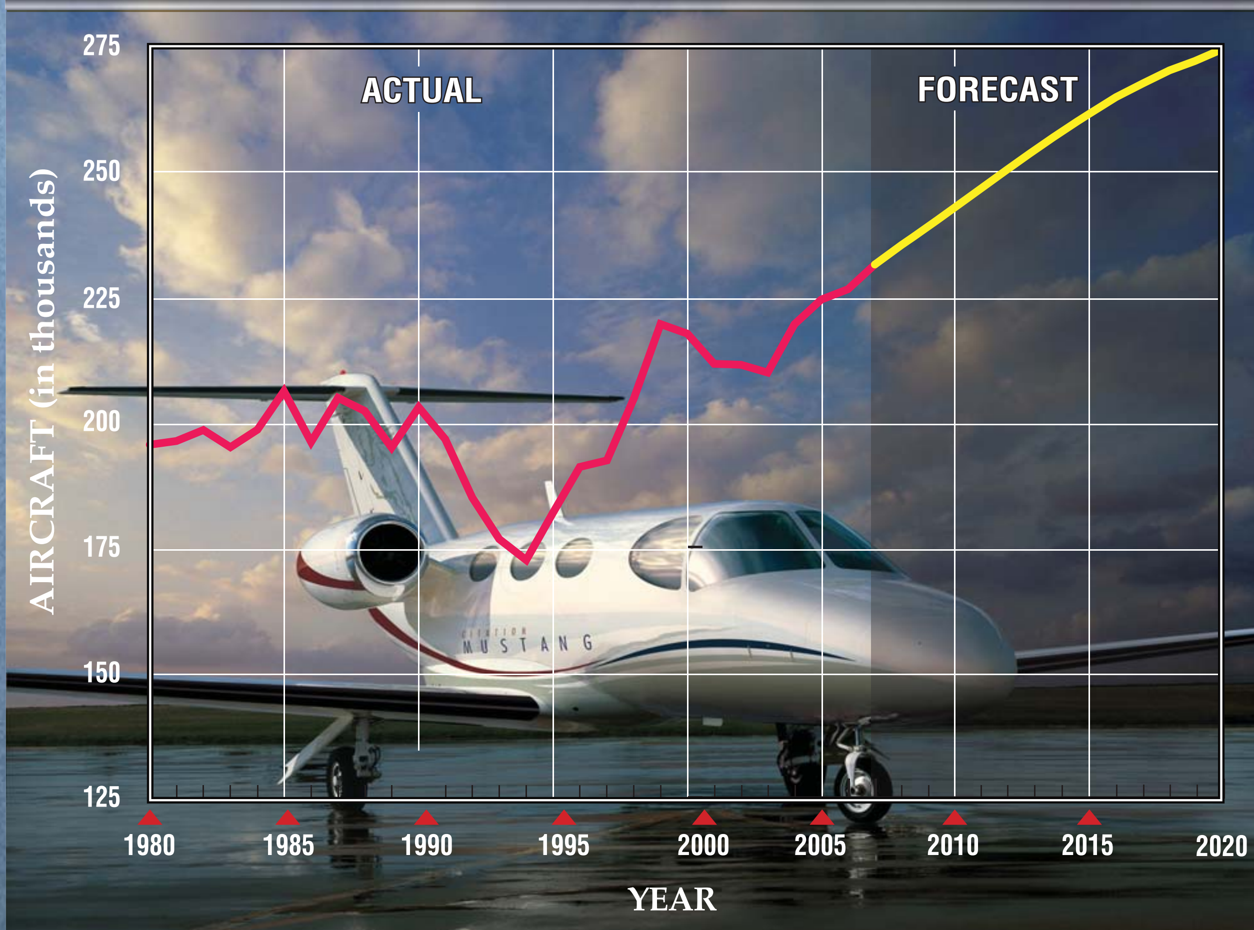
U.S. ACTIVE GENERAL AVIATION AIRCRAFT



U.S. ACTIVE GENERAL AVIATION AIRCRAFT (in thousands)

Year	FIXED WING				ROTORCRAFT		Experimental	Sport Aircraft	Other	Total
	PISTON		TURBINE							
	Single Engine	Multi-Engine	Turboprop	Turbojet	Piston	Turbine				
2006 (Est.)	148.2	19.4	8.0	10.0	3.4	5.9	24.5	0.4	6.6	226.4
2010	150.4	19.2	8.2	13.4	4.8	6.5	27.7	5.6	6.8	242.8
2015	154.0	19.0	8.5	18.0	6.3	7.2	31.1	10.5	6.7	261.4
2020	155.6	18.8	8.8	22.8	7.4	7.9	33.9	13.2	6.6	274.9

Source: FAA Aerospace Forecasts, Fiscal Years 2007-2020.

Notes: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

PhxMesa Gateway Airport

(single and multi-engine) are projected to grow at 0.3 percent annually. Piston powered helicopters are forecast to grow at 5.7 percent annually, while turbine helicopters are forecast to grow 2.1 percent annually.

Aircraft utilization rates are projected to increase through the year 2020. The number of general aviation hours flown is projected to increase at 3.4 percent annually. Similar to active aircraft projections, there is projected disparity between piston and turbine aircraft hours flown. Hours flown in turbine aircraft are expected to increase at 6.1 percent annually, compared with 1.3 percent for piston-powered aircraft. Jet aircraft are projected to increase at 9.4 percent annually, while fixed wing piston powered aircraft are projected to grow 1.0 percent annually through 2020.

The total pilot population is projected to increase by 38,000 through 2020, from an estimated 467,745 in 2005, to 506,097, which represents an average annual growth rate of .08 percent. The student pilot population is forecast to increase at an annual rate of 1.2 percent over the forecast period, reaching a total of 100,181 in 2020. Growth rates for the other pilot categories over the forecast period are as follows: airline transport pilots, up 0.2 percent; recreational pilots declining 0.1 percent annually; rotorcraft only, up 3.1 percent annually; commercial pilots up 0.8 percent annually, private pilots show a zero growth rate, and glider only, up 0.4 percent. The decline in recreational and private pilots is the result of the expectation that most new general aviation pilots will choose to obtain the Sport Pilot license instead.

Over the past several years, the general aviation industry has launched a series of programs and initiatives whose main goals are to promote and assure future growth within the industry. "No Plane, No Gain" is an advocacy program created in 1992 by the General Aviation Manufacturers Association (GAMA) and the National Business Aircraft Association (NBAA) to promote acceptance and increased use of general aviation as an essential, cost-effective tool for businesses. Other programs are intended to promote growth in new pilot starts and introduce people to general aviation. "Project Pilot," sponsored by the Aircraft Owners and Pilots Association (AOPA), promotes the training of new pilots in order to increase and maintain the size of the pilot population. The "Be a Pilot" program is jointly sponsored and supported by more than 100 industry organizations. The NBAA sponsors "AvKids," a program designed to educate elementary school students about the benefits of business aviation to the community and career opportunities available to them in business aviation. Over the years, programs such as these have played an important role in the success of general aviation and will continue to be vital to its growth in the future.

There are several active local programs designed to educate the public about aviation at Phoenix-Mesa Gateway Airport. One in particular is a program run by the Chandler-Gilbert Community College where they offer introductory flight training to local high school students.

SERVICE AREA

The service area of an airport is typically defined by the proximity of other airports providing a similar level of service. The availability of other modes of transportation, particularly the interstate highway system, will also contribute to the defined service area. Phoenix-Mesa Gateway Airport serves all facets of aviation activity including commercial service (charter and air taxi), general aviation (recreational and corporate), and military activity. As a reliever airport to Phoenix Sky Harbor International Airport, Phoenix-Mesa Gateway is planned for regularly scheduled commercial service activity.

COMMERCIAL SERVICE

Phoenix Sky Harbor International Airport (PHX) is a 28-mile drive to the northwest from Phoenix-Mesa Gateway Airport and is one of the busiest commercial service airports in the country. PHX has service from over 20 air carriers including most mainline carriers, several low-cost carriers, and several regional airlines. Over 90 non-stop destinations are served, including several international markets. In 2006, PHX enplaned 19.7 million passengers, ranking as the seventh busiest airport in the country.

The next closest airport that may have an influence on the commercial airline service area for Phoenix-Mesa Gateway Airport is Tucson International Airport (TUS). TUS is a 120-mile drive to the southeast, utilizing Interstate 10. TUS currently has 12 air carriers operating from the airport, providing over 80 daily non-stop flights to 24 destinations, with connections worldwide. In 2006, TUS enplaned nearly 2.1 million passengers.

The Phoenix-Mesa Gateway Airport is planned to play a key role in the commercial aviation activity in the greater Phoenix area. Review of the May 2007 FAA publication *Capacity Needs in the National Airspace System 2007-2025* indicates that PHX will need significant capacity improvements to accommodate forecast growth. One of the improvements planned is for Phoenix-Mesa Gateway Airport to absorb some commercial flights that may otherwise utilize PHX. In addition, low-cost and regional carriers not currently serving the greater Phoenix market will be attracted to Phoenix-Mesa Gateway Airport in order to avoid the congestion at PHX.

Many factors are considered by the flying public when choosing an airport from which to fly. The availability of flights, variety of destinations, and level of service offered by carriers at Phoenix-Mesa Gateway Airport are major considerations. Therefore, the defined commercial service area for commercial passenger activity at Phoenix-Mesa Gateway Airport should include all of Maricopa and Pinal Counties. The construction of the Gateway Freeway (planned by 2015) may extend the service area beyond Pinal County to the east.

Exhibit 2D presents an approximate commercial service area for Phoenix-Mesa Gateway Airport. As can be seen, a 60-mile radius around Phoenix-Mesa Gateway Airport encompasses most of Pinal County and Maricopa County. This includes the entire metropolitan Phoenix area. The

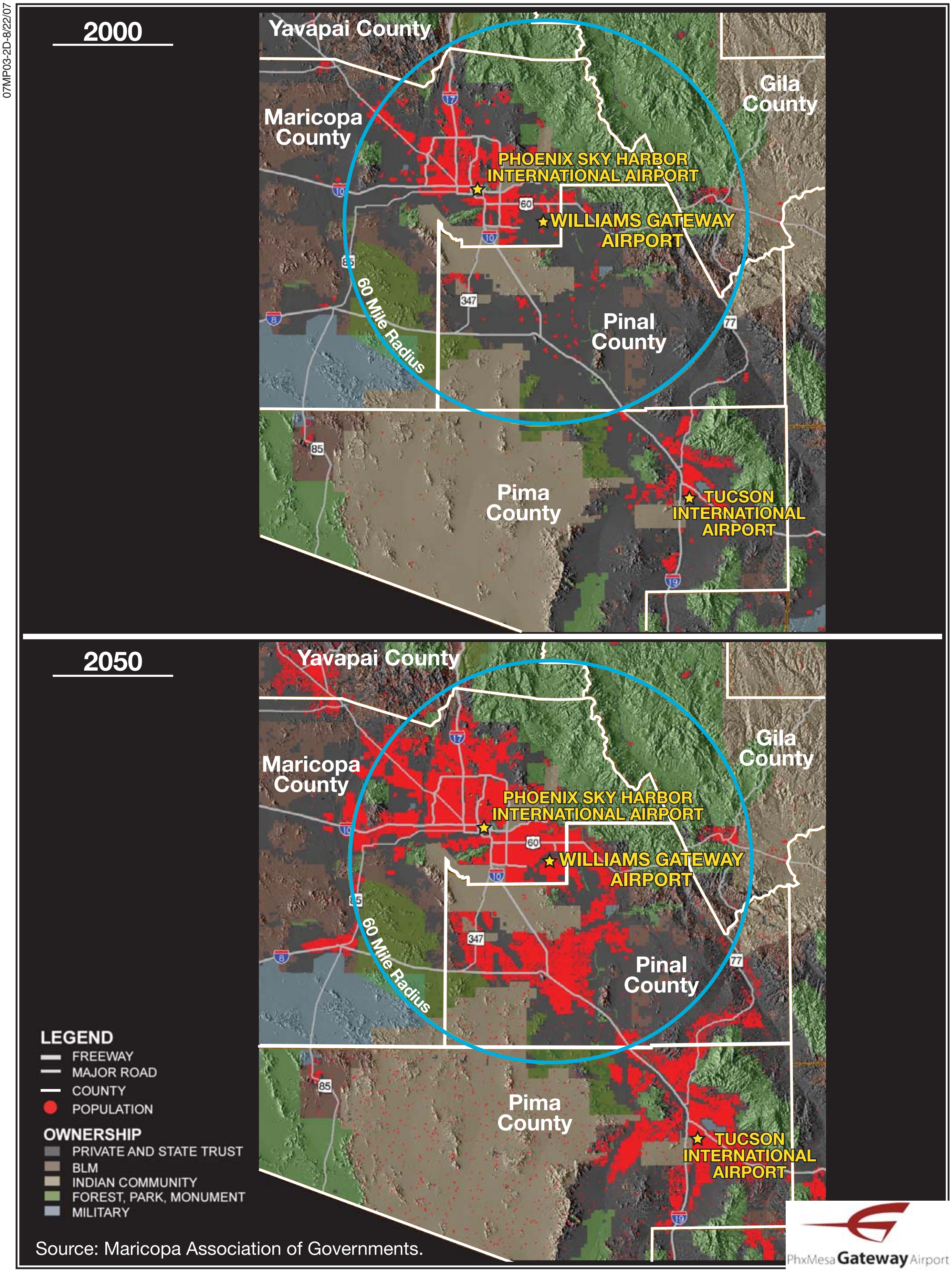


Exhibit 2D
POPULATION GROWTH AND
AIRPORT SERVICE AREA

exhibit also provides a visual representation of the population growth forecast by MAG between the year 2000 and 2050. Large portions of both Pinal and Maricopa Counties are forecast to become populated over this term. Also evident are the growth of Globe, Arizona to the east and the northern reaches of the Tucson metropolitan area.

GENERAL AVIATION

Many factors will contribute to where owners of general aviation aircraft will choose to base their aircraft. Runway length is one of the first considerations. Many small, single-engine piston, and some twin-engine aircraft can operate off runways with less than 2,500 feet of length. Cabin-class twin-engine piston aircraft and most small turboprops need 3,000 to 4,000 feet for regular operations. While some business jet aircraft can operate on less than 4,000 feet, lengths over 5,000 feet are typically necessary to be considered for regular operations by most business and corporate jet aircraft.

After airfield capability, the primary factor for basing an aircraft is convenience to home or business. Typically, urban or suburban general aviation airports will draw based aircraft from up to a 20-mile radius. There are five public airports within this approximate range that provide general aviation services. Those are Chandler Municipal Airport, Mesa Falcon Field, Stellar Airpark, Casa Grande Municipal Airport, and Scottsdale Airport.

While these airports likely limit the draw of owners of smaller aircraft, owners of larger turboprop and cabin-class business jets would be more likely to utilize Phoenix-Mesa Gateway due to the level of services offered, the lengths of the runways, and the relatively uncongested airfield. Data on area airports was previously presented in **Table 1N**.

The general aviation service area for Phoenix-Mesa Gateway Airport can be divided into two categories: light GA and heavy GA. The light GA (single and multi-engine piston aircraft) service area is confined to the immediate vicinity of the airport. There are several general aviation airports capable of accommodating light GA aircraft. Because of the limited capability of the other area airports, the heavy GA service area (aircraft over 12,500 pounds and business jets) extends to include the entire East Valley, downtown Phoenix, Scottsdale, Chandler, and Pinal County.

SOCIOECONOMIC FORECASTS

The socioeconomic conditions provide an important baseline for preparing aviation demand forecasts. Local socioeconomic variables such as population, employment, and income are indicators for understanding the dynamics of the community and, in particular, the trends in aviation growth. The following are projections of these socioeconomic indicators as compiled from three primary sources. The population and employment forecasts for the metropolitan planning areas are from the Maricopa Association of Governments – *2007 Draft Socioeco-*

nomic Projections. The employment and per capital personal income figures for both Pinal and Maricopa County are from Woods and Poole Economics 2006. Population figures for Pinal County are obtained from the August 2006, *Pinal County Small Area Transportation Study*.

POPULATION

In 2007, the Maricopa Association of Governments (MAG) published updated socioeconomic forecasts. The MAG forecasts present population, employment, and other statistical measures based on a defined Metropolitan Planning Area (MPA). The MPA is the municipal boundary plus estimated additional area that may be annexed within the long term planning timeframe.

Table 2D summarizes historical and forecast population estimates for the municipalities surrounding the airport. As previously discussed in Chapter One – Inventory, several municipalities in the East Valley area are among the fastest growing in the country. Both Mesa and Chandler have had a history of significant growth, particularly through the 1990s, but that growth is forecast to be tempered some, averaging 0.77 percent annually through 2027. Both Gilbert and Queen Creek are forecast to have very strong population average annual growth rates of 2.24 and 5.42 percent, respectively.

The total commercial service area surrounding the airport, which includes Maricopa and Pinal Counties, is forecast to add nearly 4.2 million people over the next 20 years. Pinal County alone is forecast to grow from 275,000 in 2006, to 2.4 million in 2027. Maricopa County is forecast to add nearly 2.1 million people over the next 20 years. The total service area is forecast to grow at an average annual rate of 3.44 percent or more than 103 percent.

EMPLOYMENT

Historical and forecast employment data for the commercial and general aviation service areas is also presented in **Table 2D**. Between 2006 and 2027, employment for the commercial service area, which includes all of Maricopa and Pinal Counties, is forecast to grow 3.31 percent annually. Employment in Pinal County alone is forecast to grow 13.27 percent annually and Maricopa County is forecast to grow 2.5 percent annually. Together, more than 1.9 million jobs are forecast to be created between 2006 and 2027.

The general aviation service area, which includes Mesa, Gilbert, Queen Creek and Chandler, is forecast to see employment grow by 2.93 percent annually. This represents the addition of more than 285,000 jobs in the immediate vicinity of the airport.

TABLE 2D
Socioeconomic Forecasts
Phoenix-Mesa Gateway Service Area

	HISTORICAL		FORECAST			Annual Growth Rate
	2000	2006	2012	2017	2027	2006 to 2027
City of Mesa (MPA)						
Population	441,800	492,657	527,974	551,243	579,047	0.77%
Employment	172,000	182,799	228,477	256,674	296,447	2.33%
Town of Gilbert (MPA)						
Population	119,200	185,996	230,143	263,515	295,877	2.24%
Employment	35,000	60,668	88,062	105,727	125,450	3.52%
Town of Queen Creek (MPA)						
Population	7,400	22,197	37,951	48,143	67,214	5.42%
Employment	1,700	4,791	11,403	17,299	30,626	9.24%
City of Chandler (MPA)						
Population	185,300	241,614	268,591	277,503	283,551	0.77%
Employment	71,000	93,789	135,383	155,018	175,062	3.02%
APPROXIMATE GA SERVICE AREA						
Population	753,700	942,464	1,064,659	1,140,404	1,225,689	1.26%
Employment	279,700	342,047	463,325	534,718	627,585	2.93%
Maricopa County						
Population	3,072,149	3,782,328	4,402,171	4,902,913	5,848,280	2.10%
Employment	1,564,900	1,897,387	2,270,963	2,581,645	3,189,527	2.50%
PCPI	$27,119	$27,583	$29,443	$31,097	$34,766	1.11%
Pinal County						
Population*	179,727	275,076	510,905	855,879	2,401,912	10.87%
Employment*	47,083	48,682	102,834	191,771	666,918	13.27%
PCPI	$16,529	$17,456	$19,041	$20,488	$23,811	1.49%
APPROXIMATE COMMERCIAL SERVICE AREA						
Population	3,251,876	4,057,404	4,913,076	5,758,792	8,250,192	3.44%
Employment	1,611,983	1,946,069	2,373,797	2,773,416	3,856,445	3.31%

MPA: Metropolitan Planning Area
PCPI: Per Capital Personal Income ($1996)
Interpolation by Coffman Associates

*Source: Maricopa Association of Governments 2007 Draft Socioeconomic Forecasts; PCPI - Woods and Poole CEDDS 2006; *Pinal County Population - Interpolated from August 2006 Pinal County Small Area Transportation Study. Historical MPA Information from 2003 MAG Interim Projections.*

These forecasts anticipate the East Valley area to be a very strong employment growth center over the next 20 years. Infrastructure improvements, such as the construction of the Santan Freeway and numerous arterial roads, are making the East Valley very attractive to business. Economic development data shows that the area is becoming a high-tech corridor with companies such as Intel and Microchip Technology making significant investment in East Valley operations.

PER CAPITA PERSONAL INCOME (PCPI)

Personal income can be an indicator of the sustained economic viability of a region. **Table 2D** presents per capita personal income (PCPI) statistics for Pinal and Maricopa County. As can be seen, PCPI is forecast to continue to grow for the region, although not at the same high rates as population and employment. This is an indicator that a mix of jobs are coming to the region ranging from entry-level, lower income positions, to high-income executive positions.

Pinal County has historically been primarily an agricultural area. Income is forecast to grow 1.49 percent annually while Maricopa County is forecast to grow 1.11 percent annually. This is an indicator that the employment base for Pinal County is transitioning to more higher paying jobs, which is a positive indicator to an increase in aviation activity, both commercial and general aviation.

FORECASTING APPROACH

The development of aviation forecasts proceeds through both analytical and judgmental processes. A series of mathematical relationships is tested to establish statistical logic and rationale for projected growth. However, the judgment of the forecast analyst, based upon professional experience, knowledge of the aviation industry, and assessment of the local situation, is important in the final determination of the preferred forecast.

The most reliable approach to estimating aviation demand is through the utilization of more than one analytical technique. Methodologies frequently considered include trend line projections, correlation/regression analysis, and market share analysis.

Trend line projections are probably the simplest and most familiar of the forecasting techniques. By fitting growth curves to historical demand data, then extending them into the future, a basic trend line projection is produced. A basic assumption of this technique is that outside factors will continue to affect aviation demand in much the same manner as in the past. As broad as this assumption may be, the trend line projection does serve as a reliable benchmark for comparing other projections.

Correlation analysis provides a measure of direct relationship between two separate sets of historic data. Should there be a reasonable correlation between the data; further evaluation using regression analysis may be employed.

Regression analysis measures the statistical relationship between dependent and independent variables yielding a "correlation coefficient." The correlation coefficient (Pearson's "r") measures association between the changes in a dependent variable and independent variable(s). If the r-squared (r^2) value (coefficient determination) is greater than 0.95, it indicates good predictive reliability. A value below 0.95 may be used with the understanding that the predictive reliability is lower.

Market share analysis involves a historical review of airport activity as a percentage, or share, of a larger regional, state, or national aviation market. A historical market share trend is determined providing an expected market share for the future. These shares are then multiplied by the forecasts of the larger geographical area to produce a market share projection. This method has the same limitations as trend line projections, but can provide a useful check on the validity of other forecasting techniques.

A wide range of factors is known to influence the aviation industry and can have significant impacts on the extent and nature of air service provided in both the local and national markets. Technological advances in aviation have historically altered, and will continue to change, the growth rates in aviation demand over time. The most obvious example is the impact of jet aircraft on the aviation industry, which resulted in a growth rate that far exceeded expectations. Such changes are difficult, if not impossible, to predict, and there is simply no mathematical way to estimate their impacts. Using a broad spectrum of local, regional and national socioeconomic and aviation information, and analyzing the most current aviation trends, forecasts are presented in the following sections.

The need for airport facilities at Phoenix-Mesa Gateway Airport can best be determined by accounting for forecasts of future aviation demand. Therefore, the remainder of this chapter presents the forecasts for airport users and includes the following:

COMMERCIAL SERVICE

- Annual Enplaned Passengers
- Operations and Fleet Mix
- Annual Instrument Approaches
- Enplaned/Deplaned Cargo

GENERAL AVIATION

- Based Aircraft
- Based Aircraft Fleet Mix
- Local and Itinerant Operations
- Annual Instrument Approaches

AIR TAXI AND MILITARY

- Local and Itinerant Operations
- Annual Instrument Approaches

COMMERCIAL SERVICE

To determine commercial service potential at Phoenix-Mesa Gateway Airport and the facilities necessary to accommodate demand, three basic elements of activity must be forecast. These forecast elements include annual enplaned passengers; aircraft fleet mix; and annual aircraft operations.

COMMERCIAL SERVICE POTENTIAL

Prior to developing a forecast of commercial service activity at Phoenix-Mesa Gateway Airport, an examination of commercial service in the region is necessary. Phoenix Sky Harbor International Airport (PHX) is the only primary commercial passenger service airport in the greater Phoenix Metropolitan area. In 2006, PHX was the seventh busiest airport in the country with 19.7 million enplanements (passenger boardings). Since

2003, PHX has been the third fastest growing airport in the country, as measured by passenger enplanements.

Table 2E presents enplanement data for the top 10 busiest commercial service airports in the country since 2003.

TABLE 2E
Top 10 U.S. Commercial Service Airports by Enplanements

Airport Name	2003	2004	2005	2006	AAGR ('03-'06)
Atlanta Hartsfield-Jackson	38,893,670	41,123,857	42,402,653	37,096,742	-1.18%
Chicago O'Hare	32,920,387	36,100,147	36,720,005	31,134,564	-1.38%
Dallas/Ft Worth International	24,976,881	28,063,035	28,079,147	25,959,086	0.97%
Denver International	17,969,754	20,407,002	20,799,886	21,838,797	5.00%
Los Angeles International	26,239,584	28,925,341	29,372,272	21,323,391	-5.05%
Las Vegas McCarran International	17,097,738	19,943,025	21,402,676	20,686,962	4.88%
Phoenix Sky Harbor International	18,252,853	19,336,099	20,315,544	19,692,416	1.92%
Houston Intercontinental	16,134,684	17,322,065	19,032,196	16,874,855	1.13%
Minneapolis St Paul International	16,022,988	17,482,627	17,971,771	15,862,917	-0.25%
Orlando International	13,375,162	15,270,347	16,592,133	15,726,586	4.13%

AAGR: Average Annual Growth Rate
Source: Bureau of Transportation Statistics; ACAI

Annual enplaned passengers serve as the most basic indicator of demand for commercial service activity. From a forecast of annual enplanements, operations and other activity indicators can be projected based upon behavioral factors characteristic of Phoenix-Mesa Gateway Airport or the airline industry as a whole.

The term “enplanement” refers to a passenger boarding an airline flight. Enplaning passengers are then described in terms of either “originating,” “transfer,” or “through.” Originating passengers are those who board and depart in a commercial service aircraft from an airport. Transfer passengers are those who have departed from another location and are using the airport as an intermediate stop.

Enplanement levels also correspond to the model utilized by the FAA to determine federal entitlement funding levels for commercial service airports. Airports with a minimum of 10,000 annual enplanements currently receive some level of entitlement funding for use on capital projects.

As of June 2007, PHX offered passengers a choice of 20 airlines that provide over 90 non-stop destinations in the United States, Canada, Mexico, and Costa Rica. Connections can be made to any major destination in the world. U.S. Airways (having recently merged with America West Airlines) utilizes PHX as a hub, as does Southwest Airlines.

In May 2007, the FAA published *Capacity Needs in the National Airspace*

System which presents analysis of the commercial service airports that may face significant capacity constraints between 2007 and 2025. As it pertains to PHX, significant capacity issues can be expected at the airport by 2015 if major capacity improvements are not undertaken. Further, even with capacity improvements, by 2025, PHX will still realize significant capacity issues. According to the study, "Additional runway capacity will be needed if demand continues to grow as forecast. The City of Phoenix Aviation Department is working with Phoenix-Mesa Gateway Airport (IWA), in nearby Mesa, to increase the use of this airport for scheduled commercial service."

The level of vehicular traffic in and around PHX could also contribute to a growth in commercial aviation at Phoenix-Mesa Gateway Airport. PHX is located near the confluence of Interstate 10, Interstate 17, State Highway 143, State Highway 51, and State Highways 101 and 202. The airport is also located near the downtown Phoenix central business district. Review of traffic volume maps produced by the Maricopa Association of Governments in 2003 and 2007 shows that traffic in and around PHX is becoming more and more congested. This could lead potential airline passengers to choose Phoenix-Mesa Gateway Airport over PHX for a flight in order to avoid the congestion experienced in getting to the airport.

The most recent study to identify the potential for commercial service at Phoenix-Mesa Gateway Airport is a 1997 study by the Kiehl Hendrickson Group titled *Arizona's Emerging Airport: Williams Gateway*. Many of the assumptions of this study remain valid in support of commercial service. The study notes that the large local origin-destination traffic in the region, driven by the rapidly growing population, positive economic outlook, availability of low fares, and the fact that Phoenix is a major leisure destination, provide the best opportunity for Phoenix-Mesa Gateway Airport to initiate and sustain commercial passenger service.

The study concluded that in the short term, the best opportunity for commercial service would be from charter operators serving groups, package tours, and domestic and international destinations without direct service. Carriers serving niche markets (such as commuters from the Los Angeles area to the East Valley) may also benefit from establishing service to Phoenix-Mesa Gateway Airport.

The study recognized the following strengths for Phoenix-Mesa Gateway Airport, which are still valid today:

- Location and proximity to population growth, solid potential for driving economic growth in the East Valley.

- Operating costs advantages versus PHX. While Southwest and US Airways have substantial investments in PHX, other carriers may be receptive to examining operating cost advantages, particularly charters and niche operators.

- The likelihood of increasing amounts of delay and noise-related constraints at PHX and the advantage of available capacity with little airside traffic congestion at Phoenix-Mesa Gateway Airport.

- Potential operating flexibility at Phoenix-Mesa Gateway Airport.

- A strong and growing base of academic and aviation-related commercial business.

Several additional strengths that would support the introduction of scheduled commercial service at Phoenix-Mesa Gateway Airport can be identified since the completion of this study. They include:

- The rapid growth of high-tech manufacturing in the East Valley.

- The completion of major portion of the Santan Freeway (Loop 202) near the airport.

- The planned construction of the Williams Gateway Freeway from the Santan Freeway to points east and into Pinal County.

- The ongoing improvements to arterial roads in the vicinity of the airport.

- The availability of developable land at the airport.

- The support of the City of Phoenix Aviation Department for commercial service to Phoenix-Mesa Gateway Airport as evidenced by participation on the Williams Gateway Airport Authority Board of Directors, shared marketing projects, and awarding of marketing grants to Williams Gateway Airport Authority.

- Growth in regional carriers in serving secondary airports in point-to-point markets.

- The availability of Foreign Trade Zone and Military Reuse Zone benefits.

The original 1997 study also identified several weaknesses for sustained commercial service at Phoenix-Mesa Gateway Airport including:

- Under-developed passenger facility. (The passenger facility has since been improved significantly to accommodate up to 250,000 annual enplanements. Current design projects are underway to increase the capacity of the existing terminal building to 350,000 enplanements. Long term plans call for a new state-of-the-art passenger terminal complex on the east side of the airfield.)

- Unfinished FAA Part 139 Certification. (The airport has received Part 139 certification and has maintained the highest standards for compliance.)

- Undeveloped passenger support services. (Passenger support services have been well established since the 1997 study.)

- The relative remote location of the airport and lack of readily-accessible and convenient freeway access. (No longer an issue with the opening of the Santan Freeway and arterial road improvements.)

- Little or confusing name recognition with potential air passengers, airlines, and travel managers. (Significant marketing efforts by Williams Gateway Airport Authority have helped to alleviate this issue, but this will be an on-going challenge.)

In the 10 years since the publication of the Kiehl Hendrickson Group air service study, nearly all of the strengths of the Phoenix-Mesa Gateway Airport have been enhanced while the weaknesses have been reduced, eliminated, or turned into strengths. With Phoenix-Mesa Gateway Airport well positioned to attract and sustain scheduled commercial service traffic, the following subsections will quantify what that potential may be through the 2027 planning period.

Origin & Destination

The U.S. Department of Transportation maintains a rolling quarterly survey of 10 percent of all airline tickets sold. This Origin & Destination (O&D) Survey provides information on passengers' starting and ending cities, and shows the volume of traffic between city pairs. The figures do not include through passengers, which account for approximately 40 percent of the traffic through PHX.

Carriers at Phoenix Sky Harbor International Airport currently provide direct non-stop service to each of the top 30 O&D destinations and 49 of the top 50. New York – LaGuardia is the only airport in the top 50 not directly served and it ranks 49th. **Table 2F** presents the top 20 origin and destination information for PHX. **Table 2G** presents those destinations in the top 100 that do not have non-stop service from PHX.

ENPLANEMENT HISTORY

Phoenix-Mesa Gateway Airport began receiving regular commercial charter air service in 2003, with the arrival of Allegiant Airlines. Allegiant operates 150-seat MD-80 series aircraft for flights to Reno, NV and Laughlin/Bullhead, AZ. These operations are charter flights sponsored by Harrah's Casinos. Allegiant Air schedules flights based on demand and have averaged nearly one outbound flight per month. Allegiant Airlines has indicated that they experience between 70 and 80 percent Boarding Load Factor (BLF), which is the ratio of seats sold to seats available.

In April 2006, Vision Airlines began regularly scheduled charter service to the North Las Vegas Airport. As of summer 2008, Vision offered twice weekly service to Laughlin/Bullhead, AZ utilizing the 30-seat twin-turboprop Dornier 328 aircraft. In the near future, Vision Airlines anticipates utilizing Dornier 328 jet aircraft. Vision Airlines has seen its BLF increase from 26 percent in 2006, to over 40 percent in 2007.

TABLE 2F
Top 20 Origin & Destination Markets
Phoenix Metropolitan Area

	2003		2006	
Rank	City Name	O&D Passengers	City Name	O&D Passengers
1	Chicago	1,226,040	Las Vegas	1,053,240
2	Las Vegas	913,650	Los Angeles	938,840
3	Los Angeles	888,060	Chicago O'Hare	933,170
4	New York/ Newark	767,680	Denver	896,060
5	San Diego	712,230	San Diego	808,280
6	Seattle/Tacoma	665,680	Seattle/Tacoma	765,320
7	Salt Lake City	571,640	Minneapolis/St. Paul	666,390
8	Denver	569,220	Santa Ana(Orange County)	651,450
9	Minneapolis/St. Paul	546,220	Salt Lake City	588,660
10	Oakland	539,200	Oakland	535,130
11	Orange County	483,850	Detroit	525,840
12	Albuquerque	474,260	Burbank	521,800
13	San Jose	443,090	New York/Newark	511,880
14	Dallas/Fort Worth	421,600	Portland	487,090
15	Portland	412,120	Albuquerque	471,220
16	Ontario, CA	411,910	Chicago Midway	467,240
17	Burbank	403,200	San Jose	457,880
18	Detroit	391,830	Ontario, CA	453,390
19	Baltimore	385,480	Dallas/Fort Worth	444,000
20	Sacramento	374,310	Sacramento	427,500
	Top 20 Total	11,601,270	Passenger Count	12,604,380

Source: WGAA and Department of Transportation O&D Survey

SkyValue (as operated by Xtra Airways) began scheduled charter service between Phoenix-Mesa Gateway Airport and Chicago/Gary International Airport in January 2007. From January through April, SkyValue offered Monday, Wednesday, and Friday service to Chicago/Gary utilizing the 174-seat Boeing 737-800 series aircraft. SkyValue saw its monthly BLF increase each month in 2007, reaching a peak of 78 percent in April. SkyValue ceased operations in May 2007.

Western (as operated by Xtra Airways) also began operations at Phoenix-Mesa Gateway Airport in January 2007 to Bellingham, Washington, utilizing a 150-seat Boeing 737-400 aircraft. Western offered four weekly flights and had an average BLF of 34 percent. In March, 2007, Western cancelled operations due to financial difficulties, primarily on other routes served.

Table 2H presents a summary of historical enplanement levels at Phoenix-Mesa Gateway Airport.

TABLE 2G
Most Active Phoenix Origin & Destination Markets without Non-Stop Service
Phoenix Region

Destination City/Airport Name	Airport Identifier	Top 100 Rank	Number of Passengers
New York LaGuardia	LGA	49	131,750
Manchester, NH	MHT	62	83,020
Jacksonville, FL	JAX	68	61,300
Norfolk, VA	ORF	70	60,210
Albany, NY	ALB	72	53,690
Grand Rapids, MI	GRR	74	48,920
Islip, NY	ISP	75	48,600
Syracuse, NY	SYR	76	42,250
Billings, MT	BIL	77	41,890
Fort Meyers, FL	RSW	78	41,570
West Palm Beach, FL	PBI	80	39,800
Madison, WI	MSN	82	36,450
Dallas Love Field, TX	DAL	85	34,470
Sioux Falls, SD	FSD	86	34,360
Rochester, NY	ROC	87	33,270
Fargo, ND	FAR	90	30,800
Richmond, VA	RIC	91	27,990
San Juan, PR	SJU	92	26,870
Moline/Quad Cities, IL	MLI	94	26,560
Cedar Rapids/Iowa City	CID	95	26,160
South Bend, IN	SBN	96	25,870
Jackson, MS	JAN	98	23,980
Knoxville, TN	TYS	99	22,170
Huntsville/Decatur, AL	HSV	100	21,830

Source: Airport Records for Top 100 Markets – 12 Months ended March 2006

PHOENIX-MESA GATEWAY AIRPORT FORECAST ENPLANEMENTS

Many cities across the country support more than one commercial service airport. The previously discussed Kiehl Hendrickson air service study originally identified several of these cities which were subsequently referenced in the previous airport master plan. The analysis of the cities offering two or more commercial service airports is updated here to include the two airports serving the Orlando, Florida area. Information was collected to update enplanements figures at these airports and is presented in **Table 2J**.

Future commercial passenger service at Phoenix-Mesa Gateway Airport will be influenced by many factors including travel time to PHX and the relative time savings for travelers using Phoenix-Mesa Gateway Airport, population density in the East Valley, air service options offered at Phoenix-Mesa Gateway Airport, and real or perceived congestion at PHX, which will increase delays and travel inconveniences.

TABLE 2H
Historical Enplanements
Phoenix-Mesa Gateway Airport

Airline	Enplanements	Landings	Boarding Load Factor# (BLF)	Aircraft Type/Seats	Destinations
2003					
Allegiant Air	1,109	10	74%	MD-80/150	RNO, IFP
2003 Total	**1,109**	10			
2004					
Allegiant Air	788	7	53%	MD-80/150	RNO, IFP
Other	688	Unknown			
2004 Total	**1,476**	7			
2005					
Allegiant Air	900	8	60%	MD-80/150	RNO, IFP
Other	55	Unknown			
2005 Total	**955**	8			
2006					
Allegiant Air	1,125	10	75%	MD-80/150	RNO, IFP
Vision Airlines	1,218	156	26%	Dornier 328/30	VGT
Other	648	Unknown			
2006 Total	**2,991**	166			
2007*					
Allegiant Air	450	4	75%	MD-80/150	RNO, IFP
Vision Airlines	514	43	40%	Dornier 328/30	VGT
SkyValue[1]	4,704	47	58%	737-800/174	GYY
Western Airlines[2]	705	14	34%	737-400/150	BLI
2007 Total	**6,373**	108			

*Through May, 2007
#BLF for Allegiant Air is an estimate based on WGAA press releases.
[1]Service Suspended May 1, 2007
[2]Service Discontinued March 1, 2007
RNO: Reno, NV; IFP: Laughlin/Bullhead, NV; VGT: Chicago/Gary, IN; BLI: Bellingham, WA
Source: WGA

Over the previous 10 years, enplanement levels as a share of regional enplanements has increased at most of the selected cities except for Colorado Springs, and St. Petersburg (Clearwater). Denver International Airport opened in 1995, and the next closest commercial service airport, Colorado Springs, has gone from 13.6 percent of the Denver area enplanements in 1996, to 4.7 percent in 2005. The decline relates to the fortunes of Western Pacific Airlines, which utilized Colorado Springs as a hub, but went out of business in 1998. Houston Hobby has gone from 25 percent to 17.2 percent of the Houston area enplanements, yet has remained fairly consistent at 4 million annual enplanements, which is related to the limited capacity of the facilities at Hobby. St. Petersburg International Airport has gone from 515,000 enplanements in 1996 to 281,000 in 2005, a drop in market share from 7.5 percent to 3.1 percent.

TABLE 2J Comparison of Enplanement Data (Selected Cities)	1996		2001		2005	
	Enplanements	% of Total	Enplanements	% of Total	Enplanements	% of Total
BOSTON						
Logan International	12,240,511	87.7%	11,739,553	73.0%	13,214,923	72.6%
Manchester, NH	486,128	3.5%	1,599,062	9.9%	2,149,035	11.8%
Providence, Rhode Island	1,234,271	8.8%	2,751,762	17.1%	2,846,002	15.6%
Total	13,960,910	100.0%	16,090,377	100.0%	18,209,960	100.0%
CHICAGO						
O'Hare International	32,270,478	87.8%	31,529,561	81.6%	36,720,005	81.4%
Chicago-Midway	4,492,269	12.2%	7,112,784	18.4%	8,383,698	18.6%
Total	36,762,747	100.0%	38,642,345	100.0%	45,103,703	100.0%
DALLAS/FORT WORTH						
DFW	27,433,782	88.6%	25,610,562	88.4%	28,079,147	90.5%
Love Field	3,540,643	11.4%	3,352,083	11.6%	2,949,256	9.5%
Total	30,974,425	100.0%	28,962,645	100.0%	31,028,403	100.0%
DENVER						
Denver International	15,508,873	86.4%	17,178,872	94.2%	20,799,886	95.3%
Colorado Springs	2,446,373	13.6%	1,050,344	5.8%	1,025,481	4.7%
Total	17,955,246	100.0%	18,229,216	100.0%	21,825,367	100.0%
HOUSTON						
Intercontinental	12,092,245	75.0%	16,173,551	79.7%	19,032,196	82.8%
Hobby	4,026,584	25.0%	4,128,980	20.3%	3,961,642	17.2%
Total	16,118,829	100.0%	20,302,531	100.0%	22,993,838	100.0%
LOS ANGELES						
LAX	28,653,975	75.2%	29,365,436	75.7%	29,372,272	70.2%
Burbank	2,425,504	6.4%	2,250,685	5.8%	2,761,184	6.6%
Ontario	3,161,063	8.3%	3,168,975	8.2%	3,458,935	8.3%
Orange County	3,630,269	9.5%	3,688,304	9.5%	4,791,786	11.4%
Long Beach	224,631	0.6%	297,130	0.8%	1,481,659	3.5%
Total	38,095,442	100.0%	38,770,530	100.0%	41,865,836	100.0%
MIAMI						
Miami International	16,338,062	74.7%	14,941,663	65.1%	15,092,763	58.4%
Fort Lauderdale	5,543,683	25.3%	8,015,055	34.9%	10,729,468	41.6%
Total	21,881,745	100.0%	22,956,718	100.0%	25,822,231	100.0%
NORFOLK, VIRGINIA						
Norfolk	1,394,658	89.1%	1,478,687	87.7%	1,953,003	79.2%
Newport News	171,367	10.9%	206,750	12.3%	514,361	20.8%
Total	1,566,025	100.0%	1,685,437	100.0%	2,467,364	100.0%
SAN FRANCISCO						
San Francisco International	18,584,321	65.7%	16,475,611	58.8%	16,070,133	56.5%
Oakland International	4,749,707	16.8%	5,566,100	19.9%	7,071,534	24.9%
San Jose International	4,944,026	17.5%	5,981,440	21.3%	5,309,992	18.7%
Total	28,278,054	100.0%	28,023,151	100.0%	28,451,659	100.0%

TABLE 2J (Continued) Comparison of Enplanement Data (Selected Cities)	1996		2001		2005	
	Enplanements	% of Total	Enplanements	% of Total	Enplanements	% of Total
TAMPA/ST. PETERSBURG						
Tampa International	6,370,260	92.5%	7,901,725	96.1%	9,297,643	96.9%
St. Petersburg International	515,385	7.5%	319,243	3.9%	298,647	3.1%
Total	6,885,645	100.0%	8,220,968	100.0%	9,596,290	100.0%
ORLANDO, FLORIDA						
Orlando International	12,261,366	97.8%	13,622,397	95.5%	16,592,133	95.5%
Orlando Sanford Intl.	279,077	2.2%	645,944	4.5%	789,795	4.5%
Total	12,540,443	100.0%	14,268,341	100.0%	17,381,928	100.0%

Bold: Served by a significant low-cost carrier

Source: FAA DOT/TSC ACAIS Database.

There is one predominant trend with nearly all of the secondary airports listed. Each of them has at least one low-cost carrier providing regular service. Only St. Petersburg (Clearwater) has regularly scheduled low-cost carrier service as offered by Allegiant Air. St. Petersburg is primarily served by group charters flying to and from northern destinations, transporting leisure passengers. Colorado Springs does not have service from a recognized low-cost carrier anymore, but they do have service from several mainline carriers. ExpressJet, a point-to-point regional carrier, recently began service at the airport, as well.

Southwest Airlines, the dominant low-cost carrier, provides competing service to secondary commercial service airports in Boston (Providence, RI), Chicago (Midway), Dallas (Love Field), Houston (Hobby), Los Angeles (Ontario, Burbank, Orange County), South Florida (Ft. Lauderdale), and San Francisco (Oakland, San Jose). In Tampa, Orlando, and Norfolk, however, Southwest Airlines provides service to the primary airports.

Newport News, Virginia, also has low-cost service, with AirTran Airways providing service to Atlanta, New York, Boston, and Orlando. Long Beach, California, has low-cost carrier service from JetBlue Airways. JetBlue provides service to Chicago, New York, Washington, D.C., Boston, Las Vegas, Oakland, Sacramento, and Salt Lake City.

Based on these trends, three scenarios of passenger enplanements for Phoenix-Mesa Gateway Airport were prepared by applying potential market shares based upon those experienced in other markets with more than one commercial service airport. The scenarios assume Phoenix-Mesa Gateway Airport will be able to capture a similar portion of local enplanements.

Scenario I reflects Phoenix-Mesa Gateway capturing a small portion of the local enplanement market, similar Orlando Sanford International (5 percent) or St. Petersburg International (4 percent). The second scenario represents Phoenix-Mesa Gateway Airport capturing approximately nine percent of the region's enplanements, similar to Burbank or Ontario, California. The third scenario considers the potential for Phoenix-Mesa Gateway Airport to capture approximately 15 percent of the regional enplanements, similar to Providence, RI (12 percent) or Chicago-Midway (19 percent).

Table 2K and Exhibit 2E present the enplanement forecast for Phoenix-Mesa Gateway Airport. Noted on the exhibit is an estimate of the level of enplanements anticipated by Allegiant Air over the course of the next year. In October 2007, Allegiant Air is beginning twice-weekly service to 13 destinations from Phoenix-Mesa Gateway Airport. Considering usage of 150-seat MD-83 aircraft and a boarding load factor of 70%, 142,000 enplanements are anticipated.

TABLE 2K
Passenger Enplanement Forecast
Phoenix-Mesa Gateway Airport

		Phoenix-Mesa Gateway Airport Enplanements							
Year	**PHX Enplanements***	**Scenario I**		**Scenario II**		**Scenario III**		**Planning Forecast**	
2012	23,438,534	1.0%	234,385	2.0%	468,771	4.0%	937,541	**1.5%**	**350,000**
2017	26,527,805	2.0%	530,556	4.3%	1,149,538	7.7%	2,033,798	**3.2%**	**850,000**
2027	33,981,694	4.0%	1,359,268	9.0%	3,058,352	15.0%	5,097,254	**6.5%**	**2,200,000**

*Source: *Forecast update completed by Leigh Fisher Associates, 2002 for use in the West Terminal Development Program (EIS). Interpolation and extrapolation by Coffman Associates.*

For Phoenix-Mesa Gateway Airport to make a transition from scenario I to either scenario II or III, several carriers would need to provide daily service, and at least one low-cost carrier would likely have to introduce service. Because of the unpredictable nature of establishing commercial service, the selected planning forecast is an average of scenarios I and II. In the long term, perhaps beyond the scope of this master plan, scenario III could be realized if several assumptions become reality.

First, if capacity and delay became a major economic issue at PHX for some airlines, a transfer of some service to Phoenix-Mesa Gateway Airport could be realized. Capacity is already a critical issue for the primary airports in Chicago, Boston, and Los Angeles. Second, a carrier not currently serving the region may want to begin service to Phoenix-Mesa Gateway Airport in order to establish a presence in the market. Third, a new low-cost carrier enters the market in the future looking to compete with the established low-cost carriers utilizing PHX. In the end, without the presence of mainline carriers or a major low-cost carrier, enplanement levels along the lines of those currently experienced by St. Petersburg (Clearwater) may be expected.

Although master planning typically takes a 20-year view of activity at the airport, at Phoenix-Mesa Gateway

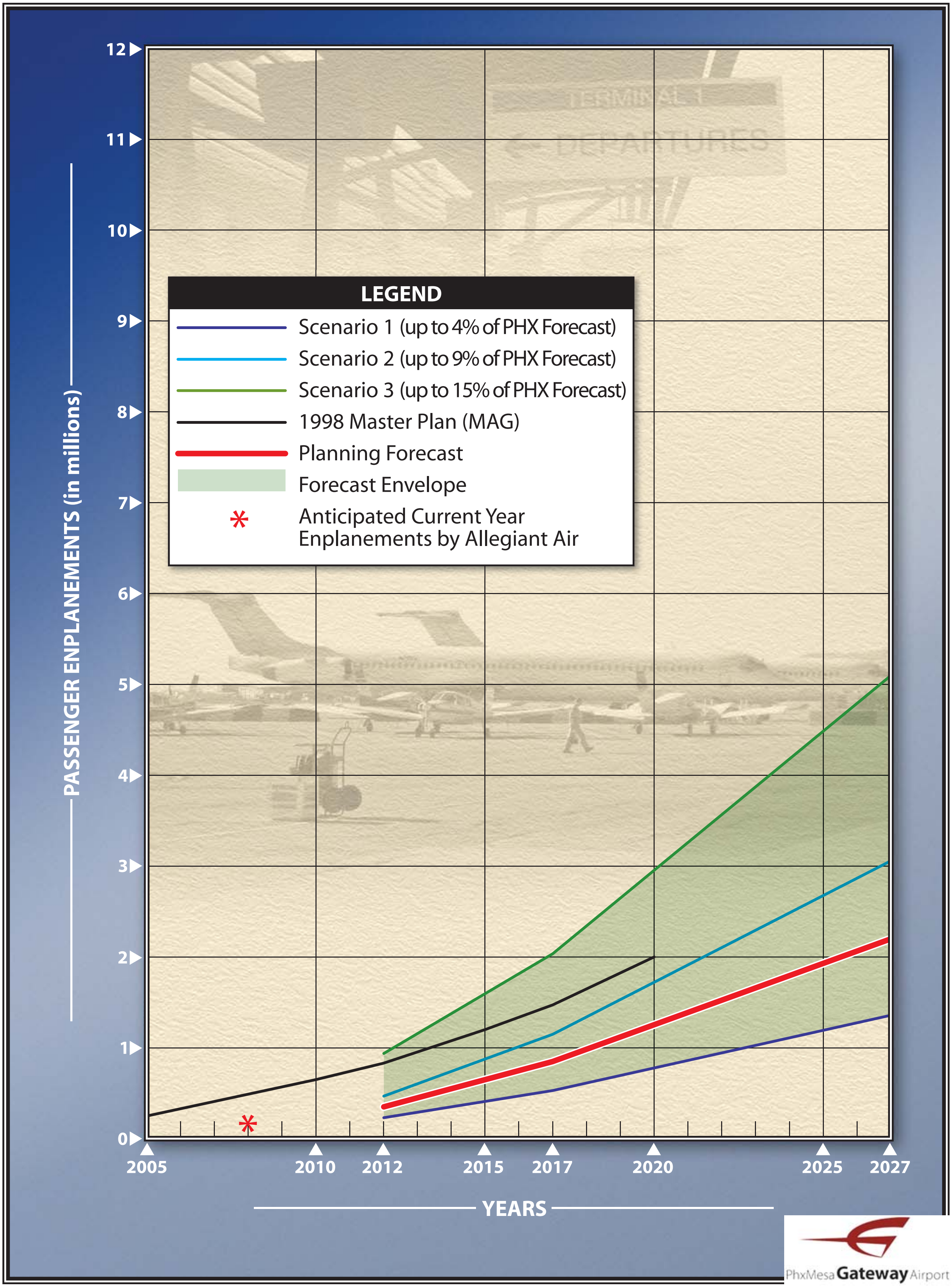


Exhibit 2E
PASSENGER ENPLANEMENT FORECAST

Airport it will be important to reserve space for critical airport functions if a high range forecast materializes. For passenger enplanements, the high range forecast is five million as shown in Scenario III in **Table 2K**. By identifying this high range forecast, appropriate space for a new terminal building, cargo facilities, parking, rental cars, and other airport elements, can be reserved.

The FAA requires planning forecasts to be compared to the FAA *Terminal Area Forecast* (TAF). FAA guidelines stipulate that the aviation demand forecasts be within 10 percent in the first five-year planning forecast period and 15 percent in the 10-year period. The master plan forecasts should only deviate from these guidelines if support information is provided.

The FAA TAF for Phoenix-Mesa Gateway Airport forecasts 1,066 annual enplanements for each year from 2006 through 2025. With a limited enplanement history at the airport, the FAA was unable to develop a reasonable forecast. This master plan will serve as the supporting material for updating the FAA TAF.

AIRLINE FLEET MIX AND OPERATIONS

The type of aircraft in the commercial airline fleet that could potentially serve the airport is an important component of airport planning. Not only is the commercial airline fleet mix helpful in determining the number of commercial airline operations at the airport, but it is also helpful in defining many of the key parameters used in airport planning; namely, the critical aircraft serving the airport (used for pavement design, ramp geometry and terminal complex layout) and the maximum stage length capabilities (which affects runway length evaluations). **Table 2L** presents the commercial aircraft fleet mix and operations forecast for Phoenix-Mesa Gateway Airport.

Determining the fleet mix of commercial aircraft that may utilize Phoenix-Mesa Gateway Airport requires an extensive understanding of the trends in aircraft utilization by the airlines. Several turboprop aircraft, including the 30 to 34-seat Saab 340, are utilized by airlines such as American Eagle, Mesaba, and Shuttle America (United Express and Delta Connection). These aircraft are typically utilized by these regional airlines to feed passengers to the hubs of mainline carriers. The trend has been for the airlines to phase out turboprops in favor of regional jets. Currently, Vision Airlines utilizes the 30-seat Dornier 328 turboprop for service to North Las Vegas.

The use of regional jets has grown exponentially over the past 10 years as the mainline carriers have shed some of their routes to the regional carriers while consolidating their hub and spoke systems. Initially, the 50-seat Canadair Regional Jet (CRJ) made the greatest impact in the regional market. Currently there are nearly 1,000 of these CRJs in service to airlines such as Air Wisconsin (70), Atlantic Southeast Airlines (112), Comair (149), Mesa Airlines (55), Pinnacle Airlines (139), and SkyWest Airlines (118). The Embraer 135 and 145 also fall in this class of regional jet.

TABLE 2L
Airline Fleet Mix and Operations Forecast
Phoenix-Mesa Gateway Airport

	FORECAST			
Fleet Mix by Seating Range	**2012**	**2017**	**2027**	**High Range**
> 200 (B-767)	2.0%	3.0%	4.0%	10.0%
161-200 (B-737-800, B-757)	2.0%	3.0%	4.0%	10.0%
135-160 (MD-80, Airbus 320)	35.0%	38.0%	40.0%	40.0%
105-134 (B-737, MD-80)	15.0%	18.0%	22.0%	20.0%
75-104 (Emb-190, CRJ-900)	15.0%	16.0%	18.0%	15.0%
60-79 (CRJ-700)	15.0%	11.0%	8.0%	5.0%
40-59 (CRJ-200)	8.0%	5.0%	2.0%	0.0%
0-39 (Dornier 328)	8.0%	6.0%	2.0%	0.0%
Total	100.0%	100.0%	100.0%	100.0%
Average Seats Per Departure	**105.8**	**113.5**	**121.8**	**136.8**
Boarding Load Factor	70.0%	72.0%	75.0%	77.0%
Enplanements Per Departure	**74.1**	**81.7**	**91.4**	**105.3**
Annual Enplanements	350,000	850,000	2,200,000	5,000,000
Annual Departures	4,725	10,403	24,083	47,467
Annual Air Carrier Operations	**9,449**	**20,806**	**48,166**	**94,934**

Source: Coffman Associates

The utilization of regional jets has been extremely popular with the flying public and has led the regional airlines to increase the seating capacity of their fleets by optioning for larger regional jets. The CRJ 700 typically provides 70 seats and is currently operated by American Eagle Airlines (25), Atlantic Southeast Airlines (35), Comair (27), Horizon Air (21), PSA Airlines (14), and SkyWest Airlines (57). The Embraer 170 class of aircraft provides 70 to 80 seats and is used by several regional carriers operating for US Airways Express, Frontier Airlines, Delta, and United.

The newest trend in regional jets has been toward even larger aircraft such as the CRJ 900 and the Embraer 190. The CRJ 900 provides seating for up to 86 passengers and the Embraer 190 provides seating for up to 114 passengers. One major carrier utilizing the Embraer 190 is JetBlue which has 20 aircraft, with firm orders for 80 more. Both Air Canada and U.S. Airways have firm orders for the Embraer 190 as well. The Embraer 190 competes with the regional jets as well as smaller mainline aircraft such as the Boeing 717 and 737.

The Boeing 737 is the most successful medium-range, narrow-body airliner in the world, with over 5,000 in active service and an additional 1,000 on order. Nearly every mainline and low-cost carrier in the U.S. utilizes this aircraft to some degree, with Southwest Airlines being the single largest customer with nearly 500 aircraft.

Allegiant Air has offered scheduled charter operations from Phoenix-Mesa Gateway Airport to Reno and Laughlin/Bullhead, since 2003. In 2007, Allegiant formally established Phoenix-Mesa Gateway Airport as one of five focus airports. The other focus airports are St. Petersburg-Clearwater, Orlando Sanford, Las Vegas McCarran, and Fort Lauderdale. Allegiant's aircraft fleet includes five McDonnell Douglas MD-81 aircraft, five MD-82s, and 16 MD-83s. Each of these aircraft is configured with 150 seats. Allegiant Air also operates three MD-87 aircraft, primarily on St. Petersburg-Clearwater routes, configured for 130 seats.

While there is limited historical fleet mix data for Phoenix-Mesa Gateway Airport, educated estimations of the commercial service fleet mix can be made. For example, Allegiant Air is introducing twice weekly flights to 13 destinations in the fall of 2007. As discussed, Allegiant utilizes the 150-seat MD-80 (and variants). As a result, aircraft in the 135-160 seat range are anticipated to be the dominant aircraft at the airport accounting for 35 percent through 2012. This aircraft configuration is forecast to realize up to 40 percent utilization through 2027.

With regional aircraft utilization growing nationally, Phoenix-Mesa Gateway Airport could expect to realize some activity in this area. It is estimated that regional aircraft may account for up to 38 percent of the fleet mix by 2012 with this figure gradually dropping through 2027 as older, smaller regional jets are retired and capacity (seats) are added with larger aircraft.

Phoenix-Mesa Gateway Airport is ideally suited to meet the needs of operators of medium-sized commercial aircraft such as the MD-80 and B-737. These aircraft are primarily utilized on short and medium domestic trips. It is estimated by 2012 that these aircraft will account for 50 percent of the fleet mix, and by 2027, for as much as 60 percent. Over time, the utilization of regional jets will drop off while utilization of larger narrow-body (B-757, B-737-800) and wide-body aircraft (B-767) will increase.

As can be seen from the table, by 2012 the average number of available seats per departure is estimated at 105.8. By 2027, seats per departure are projected to increase to 121.8. This is directly related to airlines increasing capacity (adding larger aircraft), and regional carriers retiring older and smaller 50-seat jets.

Table 2L also presents the High Range forecast of five million enplanements. This high range would represent the possibility of the airport following an enplanement capture level close to that presented as Scenario III in **Table 2K**. Scenario III projects Phoenix-Mesa Gateway Airport will capture up to 15 percent of enplanements forecast at Phoenix Sky Harbor. In a national aviation environment where commercial service airports across the country are heavily constrained from facility expansion, it is important to plan Phoenix-Mesa Gateway Airport beyond the 20-year scope of this master plan in order to protect available land area for appropriate future uses.

Over the course of the planning period, the average number of seats available per departure could be expected to increase, in line with national trends. Boarding load factors (BLF), the percentage of available seats occupied, can also be expected to increase. Overall operations are forecast to increase as enplanements increase through 2027.

The rebuilding and expansion of the commercial airline fleet continues. Driven by noise standards deadlines, most large air carriers are replacing aging aircraft to meet more stringent noise standards. Additionally, airlines are adding new aircraft to expand capacity. For the large air carriers, narrow-body deliveries and orders are outpacing deliveries and orders for wide-body aircraft.

Changes in equipment, airframes, and engines have always had a significant impact on airlines and airport planning. There are many ongoing programs by the manufacturers to improve performance characteristics. These programs continue to focus on improvements in fuel efficiency and noise reduction. Regional jets have also become a larger factor as the airlines look for ways to reduce costs. Many airlines have replaced larger commercial jets on smaller emerging routes with regional jets.

AIR CARGO

Air cargo is comprised of air freight and air mail. The air cargo industry includes the all-cargo airlines, passenger airlines, freight forwarders and customs brokers, and air freight truckers. Air freight is handled by both passenger airlines (belly freight) and all-cargo airlines. Air mail is now handled primarily by a contract carrier (currently FedEx through 2012) for the United States Postal Service, as air mail on passenger airlines is restricted to packages of 16 ounces or less.

In fact, security restrictions since 9/11 have affected all freight carried in the bellies of passenger airlines. The mail restriction, in addition to the “known shipper” requirements for carrying cargo on passenger airlines, has given the all-cargo airlines a competitive advantage, at least in the short term. How future long term requirements develop could affect the industry. Many airlines rely on cargo to generate incremental revenue. As restrictions on air freight are refined over time, airlines are likely to become competitive in air freight again.

The air cargo industry was deregulated in 1977, one year before passenger airline deregulation. Since, deregulation, the composition of the carrier group providing cargo services has changed dramatically. Most notable is the emergence of the integrated all-cargo airlines such as FedEx, UPS, and DHL. Integrated air carriers are so named because they integrate the functions of traditional all-cargo airlines (airport-to-airport service) and freight forwarders (pickup and delivery services).

During the 1990s, the air-cargo industry experienced unprecedented consolidation. Well-known cargo carriers such as Airborne Express and Emery Worldwide, as well as several others, were purchased by other air cargo carriers. The all-cargo carriers have developed a "hub and spoke" system similar to the passenger airlines. FedEx utilizes the Memphis International Airport as its main hub, while UPS utilizes Louisville International Airport for their main hub. Both of these all cargo carriers have a presence at most major airports in the country.

Freight forwarders are the intermediary between the shippers and cargo carriers, whether it is air, ground, rail, or water. They are an important part of the cargo system as they have the ability to organize cargo transportation efficiently and cost-effectively. The forwarder has the capability to pool shipments to effectively make use of the capacity available.

Obviously, belly freight is only handled at airports with passenger service. Airports with commuter or charter-only service generally have only minor belly freight volumes. The integrated carriers typically choose airports based upon what serves their system best. A regional or national sort facility is going to consider location with regards to the market it serves, as well as the presence of a sufficient work force. Today, there are over 18 air cargo carriers that operate regularly at Phoenix Sky Harbor International Airport. The carriers with daily flights include: ABX Air (DHL), Air Net Systems, Ameriflight, Capital Cargo International, FedEx, Kitty Hawk, and UPS.

Freight forwarders will generally prefer to have the most options available to them. That is why PHX has developed into a major hub for air cargo. With a wide range of domestic and international flights to chose from, and a similar selection in all-cargo carriers, the airport ships over 300,000 annual tons of air cargo. With the central location of the airport to the Phoenix area and Arizona in general, PHX has been the location of choice for the freight forwarders.

The capacity constraints facing PHX are going to affect cargo as much as passenger traffic, if not more. Space is at a premium at PHX for cargo carriers and freight forwarders. Currently these operators are spread throughout the airport environment, with some basing operations from the south apron and others taking place on the east and west aprons. Ideally these activities would be consolidated to a single location at the airport.

As capacity becomes an increasing concern at PHX, there is a possibility that some of the air cargo operations could be transferred to Phoenix-Mesa Gateway Airport. In the short term this could be a carrier such as FedEx transferring a few flights, but in the long term entire air-cargo operations may find Phoenix-Mesa Gateway Airport appealing primarily to avoid increased delay at PHX.

Table 2M presents historic air cargo operations at PHX. Since 2000, air freight has average 280,000 tons per year. U.S. mail has averaged 51,000 tons per year. Both air freight and air mail have remained fairly constant over the previous seven years.

TABLE 2M
Air Cargo by Tons
Phoenix Sky Harbor International Airport

	FREIGHT			U.S. MAIL			
Year	Enplaned	Deplaned	Subtotal	Enplaned	Deplaned	Subtotal	TOTAL TONS
2000	126,923	141,549	268,472	56,956	49,822	106,778	375,250
2001	112,532	131,637	244,169	37,386	30,833	68,219	312,388
2002	137,505	158,997	296,502	18,761	14,335	33,096	329,598
2003	135,701	151,986	287,687	18,394	11,905	30,299	317,986
2004	137,545	161,667	299,212	18,507	15,682	34,189	333,401
2005	131,532	157,933	289,465	23,629	20,190	43,819	333,284
2006	122,501	152,617	275,118	22,524	18,536	41,060	316,178

Source: Phoenix Sky Harbor Airport

Forecasts of annual air cargo tonnage at Phoenix-Mesa Gateway Airport involve consideration of many factors including the maturing high-tech manufacturing industry in the East Valley, the cost to the bottom line of delays at PHX for established air carriers, and the logistics of utilizing Phoenix-Mesa Gateway for ground transportation of air cargo. In addition, Phoenix-Mesa Gateway has a new air cargo building and apron available for immediate occupation.

The staff of Phoenix-Mesa Gateway Airport has had discussions with several air cargo companies that are currently based at PHX. The potential transfer of some operations to Phoenix-Mesa Gateway Airport has had some merit, primarily due to existing peak time and forecast delay at PHX. **Table 2N** presents historic air cargo activity at Phoenix-Mesa Gateway Airport.

In developing forecasts of air cargo activity at Phoenix-Mesa Gateway Airport, two distinct scenarios emerge. The first examines the expansion of existing specialty non-scheduled charter activities. The second scenario examines the possibility of a regional distribution station at the airport. Both of these potential air-cargo scenarios were introduced in the previous master plan and are still valid today.

TABLE 2N
Air Cargo by Tons
Phoenix-Mesa Gateway Airport

Year	Enplaned	Deplaned	Total Tons
2000	239.2	58.8	298.0
2001	30.2	83.9	114.1
2002	12.6	26.3	38.9
2003	20.8	155.0	175.8
2004	83.2	16.0	99.2
2005	104.7	8.1	112.8
2006	59.0	110.0	169.0

Source: WGAA

Specialty Cargo Scenario

The specialty cargo scenario includes non-scheduled charter-type activities of air cargo companies and freight forwarders. Phoenix-Mesa Gateway currently accommodates this type of air cargo service primarily to meet the just-in-time needs of local businesses. The forecast was developed assuming typical loading of a Boeing 737-200 aircraft with increasing frequency through the planning period.

Regional Distribution Station Scenario

Most of the integrated all-cargo airlines have established a network of primary and regional hubs. However, as conditions change in local markets, distributing air cargo activity to alternate airports is a possibility. For example, as traffic congestion at PHX increases, some of the smaller air cargo carriers may be inclined to relocate operations to Phoenix-Mesa Gateway or one of the larger operators may wish to transfer a portion of their activity to Phoenix-Mesa Gateway Airport.

Air Cargo Summary

The previous airport master plan presented a similar methodology for forecasting air cargo activity. These forecasts were then utilized in the 2001 MAG-RASP. At the time of the previous forecast development, Phoenix-Mesa Gateway Airport was not as well positioned to accommodate air cargo operators. Since then, the 20,000-square-foot cargo facility and the apron have been constructed.

Similar to passenger enplanements, future air cargo volumes at Phoenix-Mesa Gateway Airport will be driven by the expanding regional economy, regional infrastructure improvements, capacity constraints at PHX, and the support of the Phoenix Aviation Department for expansion of air cargo activities at Phoenix-Mesa Gateway Airport. With the limited history of scheduled air cargo activity, it is difficult to forecast air cargo volume with a high degree of accuracy; however, the forecasts presented in **Table 2P and Exhibit 2F** should provide an appropriate planning envelope. The planning envelope reflects a reasonable range for future enplaned air cargo levels at Phoenix-Mesa Gateway Airport.

TABLE 2P
Forecast Enplaned Air Cargo and Operations
Phoenix-Mesa Gateway Airport

Year	Enplaned Air Cargo (Tons)	Operations
2001 MAG-RASP (1999 Master Plan)		
2005	6,170	800
2010	8,225	1,100
2020	12,335	1,600
Specialty Cargo Scenario*		
2012	4,000	320
2017	8,000	640
2027	16,000	1,280
Regional Distribution Station Scenario*		
2012	25,000	2,000
2017	50,000	4,000
2027	100,000	8,000
Planning Forecast		
2012	10,000	800
2017	21,000	1,700
2027	44,000	3,500
High Range	100,000	8,000

**Operations assume approximately 25 tons per aircraft departure (727 to 767)*

While the planning forecast is an estimate, the airport should make plans to reserve an appropriate amount of space to accommodate a high range forecast. A high range forecast would be 100,000 enplaned tons of cargo as

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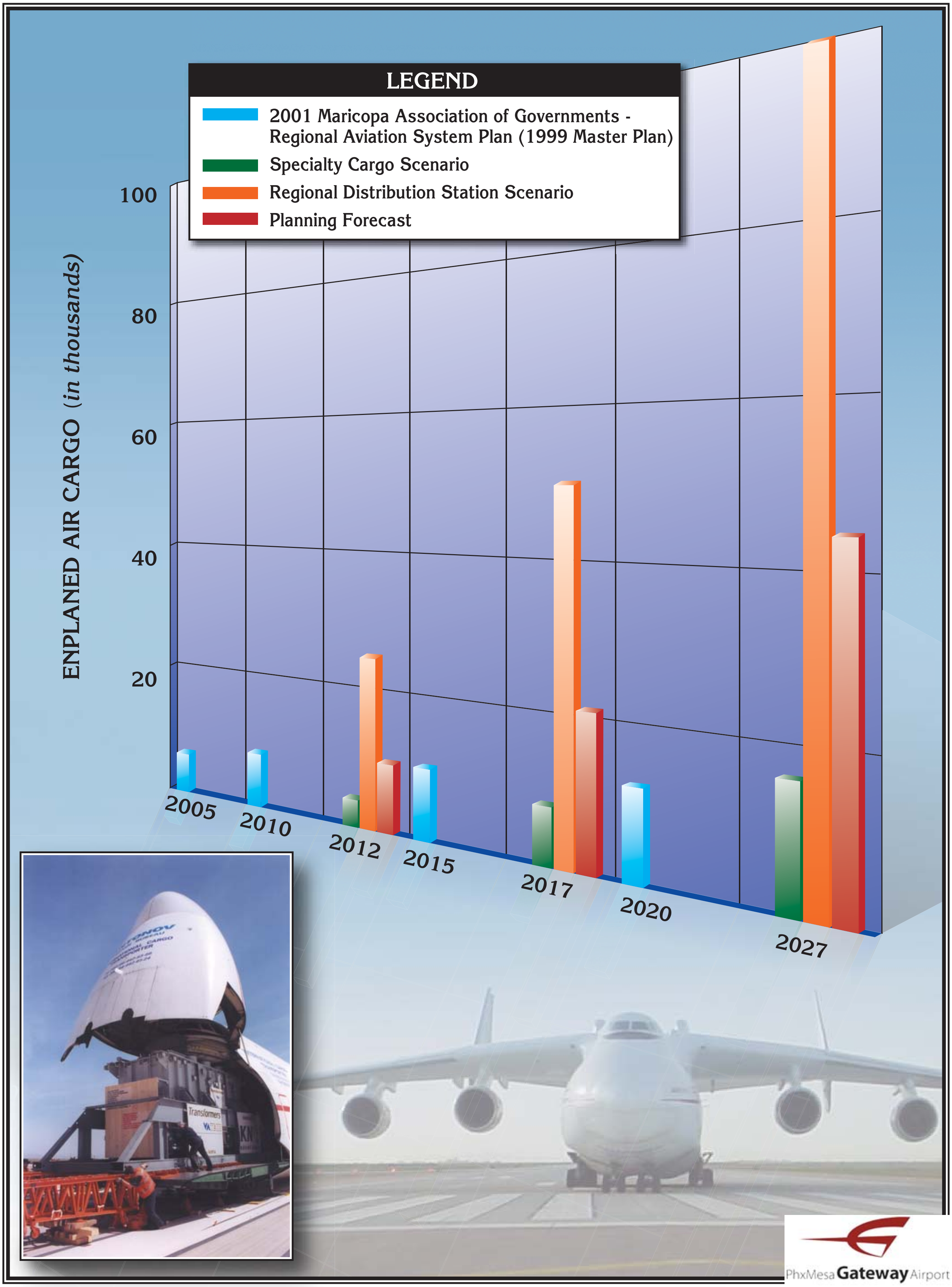

PhxMesa Gateway Airport

Exhibit 2F
ENPLANED AIR CARGO
FORECAST

shown as the high range for the Regional Distribution Station Scenario. Realizing this level of cargo activity would likely mean that one or more of the major air cargo operators will establish a regional hub at Phoenix-Mesa Gateway Airport. Facility planning will consider this potential high range possibility.

GENERAL AVIATION FORECASTS

General aviation encompasses all portions of civil aviation except military and commercial operations. To determine the types and sizes of facilities that should be planned to accommodate general aviation activity, certain elements of this activity must be forecast. These indicators of general aviation demand include based aircraft, aircraft fleet mix, and annual operations.

BASED AIRCRAFT

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft, the growth of other general aviation activities and demands can be projected. **Table 2Q** presents a history of based aircraft at Phoenix-Mesa Gateway Airport since 1994, the year it re-opened as a public-use airport. Over this time period the airport has grown from five based aircraft to 115.

TABLE 2Q
Based Aircraft History
Phoenix-Mesa Gateway Airport

Year	Total Aircraft
1994	5
1995	23
1996	42
1997	41
1998	54
1999	60
2000	56
2001	66
2002	69
2003	71
2004	87
2005	109
2006	115

Source: WGAA

Table 2R compares the based aircraft at each of the public use airports serving the East Valley. The total number of based aircraft at these airports has increased by 17 percent since 1998. Mesa Falcon Field has experienced the least amount of growth primarily because of a lack of new hangar development. The other East Valley airports have experienced strong growth in based aircraft.

The Maricopa Association of Governments (MAG) developed its Regional Aviation System Plan (RASP) in 2001. As can be seen from the table, the MAG-RASP short term forecast has proven very close to the actual based aircraft totals for Chandler, Stellar, and Phoenix-Mesa Gateway. The based aircraft forecast for Mesa Falcon Field was somewhat high compared to the actual based aircraft in 2006. The lack of new hangars affected Falcon Field's growth.

TABLE 2R
MAG-RASP 2001 Based Aircraft Forecasts
East Valley Airports

Year	Total	Chandler	Mesa	Stellar	Phoenix-Mesa Gateway
ACTUAL					
1998	1,416	337	900	125	54
2000	1,530	392	923	152	63
2006	1,675	468	919	174	115
% change	18%	39%	2%	39%	113%
AAGR	2.13%	4.19%	0.26%	4.22%	9.91%
FORECAST					
2005	1,791	450	1,062	170	109
2006*	1,842	465	1,086	175	116
2015	2,392	629	1,324	231	208
2025	2,985	807	1,586	291	301
AAGR	2.59%	2.96%	2.03%	2.72%	5.21%

AAGR: Average annual growth rate
* Interpolated
Source: MAG-RASP, Working Paper No.2, September 2001

The MAG-RASP forecast first projected the total based aircraft at public airports in Maricopa County, then distributed these aircraft to the airports within the county. A strong correlation was found between Maricopa County based aircraft and the County's population. Thus, the county-wide based aircraft forecasts were derived from a linear regression using the county population as the independent variable.

The population forecasts used by the MAG-RASP were originally prepared in 1997. Updated population forecasts were prepared in 2003 and again in 2007. **Table 2S** presents each of these forecasts. The 2007 updated population forecasts show that the 2006 population was approximately 2.44 percent higher than in the 2003 population forecasts. By 2025, the 2003 and 2007 population forecasts are nearly identical. By extrapolating from 2005 we can see that the 2003 forecasts for 2030 begin to significantly exceed the new 2007 population forecasts.

Since the MAG-RASP found such a high correlation ($r^2 = 0.97$) between population and based aircraft, the regression was updated with additional based aircraft and population data. The population data utilized is from the MAG 2007 forecasts and the based aircraft update for 2006 was derived from a combination of recent airport master plans, the FAA Terminal Area Forecast (TAF), and communications with other airports. The correlation coefficient of the expanded historic data decreased slightly with $r^2 = 0.96$.

TABLE 2S
MAG Population Forecasts

Year	County Pop. (2001 Forecast)	County Pop. (2003 Forecast)	County Pop. (2007 Forecast)	Percent Change From 2003 to 2007
2000	NA	3,072,149	3,072,149	NA
2001	3,029,150	3,194,580	3,188,645	-0.19%
2002	3,104,077	3,296,250	3,309,558	0.40%
2003	3,179,155	3,396,875	3,435,057	1.12%
2004	3,254,363	3,500,072	3,565,314	1.86%
2005	3,329,561	3,603,268	3,700,516	2.70%
2006	3,405,237	3,702,274	3,792,670	2.44%
2012	3,864,262	4,309,347	4,402,170	2.15%
2015	4,101,784	4,649,250	4,696,118	1.01%
2017	4,264,715	4,747,940	4,902,908	3.26%
2020	4,516,090	5,164,100	5,230,300	1.28%
2025	4,948,423	5,663,999	5,661,615	-0.04%
2027	5,148,339	5,948,091	5,848,277	-1.68%
2030	5,463,459	6,404,470	6,135,000	-4.21%
AAGR (2006-2030)	**1.99%**	**2.31%**	**2.02%**	**NA**

AAGR: Average Annual Growth Rate
Source: MAG

A new projection utilizing the updated county population forecast was then developed. This resulted in 7,269 based aircraft at public-use airports in the county by 2025 and 7,513 by 2027. The total based aircraft in the county for 2027 is 113 fewer than the 2001 MAG-RASP forecast. This is a difference of only 1.48 percent. **Table 2T** presents this analysis.

Exhibit 2G and **Table 2T** outline previous forecasts of based aircraft prepared for Phoenix-Mesa Gateway Airport. The MAG-RASP, having been prepared in 2001, is the oldest forecast. The most recent forecast is the FAA TAF, which was published in 2007.

The MAG-RASP forecast appears to provide a very close estimate of based aircraft at Phoenix-Mesa Gateway Airport. The MAG-RASP forecast 122 based aircraft in 2006, which is only slightly higher than the actual figure of 115. Overall, the MAG-RASP forecast an average annual growth rate for based aircraft at the airport of 4.87 percent, with 331 based aircraft being realized by 2027 (as extrapolated from 2025).

Although the FAA TAF is fairly reflective of the current based aircraft at the airport, it shows a very low growth rate that may be exceeded in the very short term due to the known development of 37 new T-hangars and 34 connected box hangars.

The 1998 Master Plan forecast 106 based aircraft for 2006. This is approximately 13 percent lower than the MAG-RASP. By 2020, the previous master plan forecast 210 based aircraft, which is 16 percent lower than the MAG-RASP.

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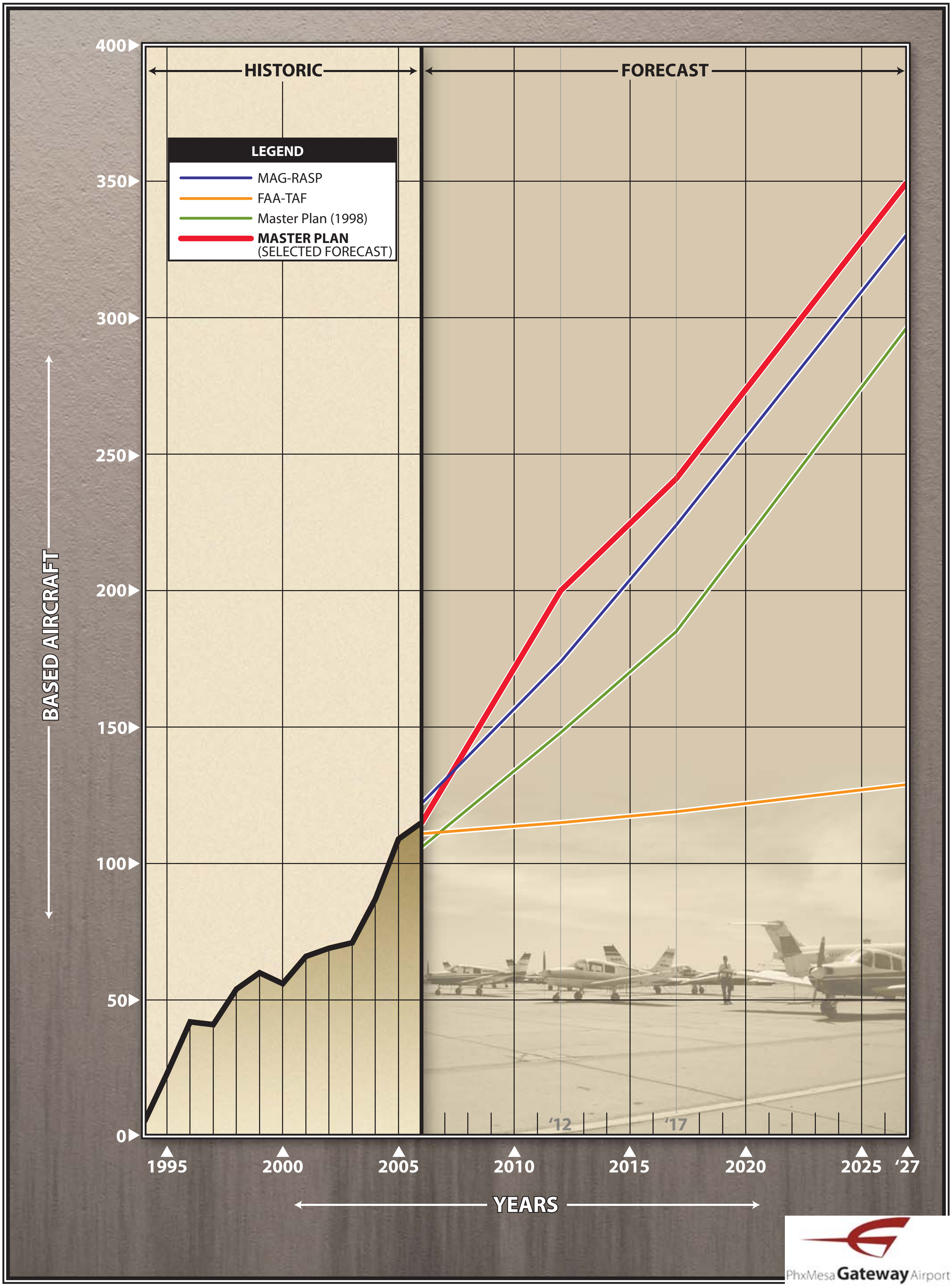


Exhibit 2G
BASED AIRCRAFT

TABLE 2T
Based Aircraft Forecasts
Phoenix-Mesa Gateway Airport

	2000	2006	2012	2017	2027	AAGR 2006-2027
Maricopa County Based Aircraft Forecasts						
MAG-RASP (2001)	4,133	4,741	5,540	6,208	7,626	2.29%
MAG-RASP Updated (2007)*	4,133	4,606	5,625	6,279	7,513	2.36%
Previous Based Aircraft Forecasts						
Actual	56	115	NA	NA	NA	NA
MAG-RASP (2001)	63	122	174	224	331	4.87%
FAA-TAF (2007)	63	111	115	119	129	0.72%
Master Plan (1998)	54	106	148	185	297	5.03%
Updated Forecast						
Master Plan Forecast	**56**	**115**	**200**	**241**	**350**	**5.44%**
% of Updated County Forecast	1.35%	2.50%	3.56%	3.84%	4.66%	

AAGR: Average annual growth rate
* Prepared by Coffman Associates to account for additional based aircraft history & 2007 MAG population forecasts.
All figures interpolated and extrapolated to plan years.

The selected master plan forecast is also reflected in **Table 2T**. This forecast reflects the fact that the MAG-RASP forecast is fairly consistent with what has happened since 2000. Even when the new 2007 population forecasts and new based aircraft data are applied, the total number of based aircraft in Maricopa County is within 2% of the MAG-RASP numbers.

Several additional factors were considered when making a final determination of the forecast based aircraft at Phoenix-Mesa Gateway Airport. First, the airport expects to have 37 T-hangar and 34 box hangar units constructed within the next year. The forecast reflects the addition of these aircraft by 2012 with a 9.66 percent growth rate. After 2012, a growth rate of 3.8 percent is carried forward, which is lower than the MAG-RASP growth rate of 4.87 percent. The overall growth rate in based aircraft at the airport is 5.44 percent from 2006 to 2027, slightly higher than the MAG-RASP forecast.

Additional factors include the fact that both Mesa Falcon Field and Chandler Municipal Airport are mature general aviation airports. Although they are both forecast by MAG to have growth in the number of aircraft, the annual growth rates are forecast to remain relative steady if not drop slightly. In addition, Pinal County is forecast by the MAG to grow significantly over the 20-year planning period. Much of this growth will likely impact Phoenix-Mesa Gateway Airport.

The following based aircraft forecast will be utilized to determine airport needs over the planning scope of this master plan:

- Short Term: 200
- Intermediate Term: 241
- Long term: 350

Based Aircraft Fleet Mix

The based aircraft fleet mix at Phoenix-Mesa Gateway Airport, as presented in **Table 2U**, was compared to the existing and forecast U.S. general aviation fleet mix trends as presented in FAA *Aerospace Forecasts Fiscal Years 2007-2020*. The FAA expects business jets will continue to be the fastest growing general aviation aircraft type in the future. The number of business jets in the national fleet is expected to nearly triple from 10,000 currently to 32,000 in 2027. Helicopters are also experiencing significant growth and are forecast to grow from 9,000 currently to nearly 19,000 by 2027.

Single-engine piston aircraft (including sport aviation and experimental aircraft), while forecast to grow in numbers, are expected to represent a lower percentage of the national fleet of general aviation aircraft. Multi-engine piston aircraft are declining in numbers and are not being replaced by a significant number of new multi-engine piston aircraft. Turboprop aircraft are growing in numbers but declining as a percentage of the national fleet.

The forecast fleet mix takes into account the potential influx of new single engine piston aircraft by 2012. This is primarily driven by the proposed construction of 71 new aircraft storage units. Although most of these new units will likely house single engine piston aircraft, some may be utilized by multi-engine, turboprop, and small jet aircraft owners. After an initial increase in single engine aircraft, the percentage of the airport fleet mix is forecast to decline through the remaining planning period.

TABLE 2U
Based Aircraft Fleet Mix Projection
Phoenix-Mesa Gateway Airport

	CURRENT		2012		2017		2027	
Aircraft Type	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Single Engine Piston	65	56.5%	136	68.0%	153	63.5%	215	61.4%
Multi-Engine Piston	10	8.7%	12	6.0%	14	5.8%	18	5.1%
Turboprop (S & ME)	1	0.9%	4	2.0%	8	3.3%	12	3.4%
Jet	19	16.5%	25	12.5%	35	14.5%	55	15.7%
Helicopter	20	17.4%	23	11.5%	31	12.9%	50	14.3%
Totals	**115**	**100.0%**	**200**	**100.0%**	**241**	**100.0%**	**350**	**100.0%**
U.S. Active Aircraft (FAA Aerospace Forecasts Fiscal Years 2007-2020)								
Single Engine Piston	173,177	76.5%	188,737	75.3%	199,099	74.4%	214,562	71.6%
Multi-Engine Piston	19,364	8.6%	19,101	7.6%	18,916	7.1%	18,444	6.2%
Turboprop	8,026	3.5%	8,352	3.3%	8,605	3.2%	9,301	3.1%
Jet	10,032	4.4%	15,304	6.1%	19,881	7.4%	32,393	10.8%
Rotorcraft	9,232	4.1%	12,308	4.9%	14,272	5.3%	18,551	6.2%
Other	6,592	2.9%	6,785	2.7%	6,698	2.5%	6,515	2.2%
Totals	**226,423**	**100.0%**	**250,587**	**100.0%**	**267,471**	**100.0%**	**299,766**	**100.0%**

Note: Experimental and sport aircraft are included under single engine piston.
Source: Airport Records; Coffman Associates Analysis

Jet aircraft based at the airport are forecast to increase in numbers but decrease as a percentage by 2012. From 2012 through 2027, the percent of jet aircraft is forecast to increase again and represent nearly 16 percent of the based aircraft by 2027. This represents a total of 55 based jets. This forecast considers the potential for several existing older jets to leave the airport and be replaced by new based business jets.

Helicopters are showing strong growth both nationally and at the airport. Currently Silverstate Helicopters operates a very busy flight school and they have plans for growth. There are also two air ambulance services based at the airport that operate helicopters. With the region and the airport being hospitable environments for helicopter activity, the number of based helicopters is forecast to grow to 50 by 2027.

GENERAL AVIATION OPERATIONS

General aviation (GA) operations are classified by the airport traffic control tower (ATCT) as either local or itinerant. A local operation is a take-off or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches or touch-and-go operations at the airport. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. Generally, local operations are characterized by training operations. Typically, itinerant operations increase with business and commercial use, since business aircraft are operated on a higher frequency.

Itinerant Operations

Table 2V depicts general aviation itinerant operations from 1998 through 2006. General aviation itinerant operations more than doubled from 42,933 in 2000, reaching a high of 92,579 in 2005. This growth trend (6.9 percent annually) is notable because national general aviation itinerant operations have steadily decreased over the same period. From 2000 to 2006, national itinerant operations have declined 3.2 percent annually. The FAA forecasts that 2007 will see a reversal of this trend, with annual growth through 2010 of 2.6 percent, then further growth of 2.0 percent from 2010 to 2020.

Two forecasts for itinerant operations at Phoenix-Mesa Gateway Airport were developed by comparing to national itinerant operations as forecast by the FAA. The first considers itinerant operations as a constant share of national itinerant operations. This forecast results in a long term total of 134,968 itinerant operations. This is an annual growth rate of 2.2 percent from 2006 through 2027.

A second forecast has been developed that presents an increasing market share of national itinerant operations, as has been the case historically. This forecast results in 174,407 itinerant operations by the long term planning period and represents an annual growth rate of 3.45 percent.

TABLE 2V
General Aviation Itinerant Operations Forecast
Phoenix-Mesa Gateway Airport

Year	GA Itinerant Ops	U.S. GA Itinerant Ops	Market Share Itinerant Ops	Based Aircraft	Itinerant Ops Per Based Aircraft
1998	46,891	22,086,500	0.2123%	54	868
1999	50,039	23,019,400	0.2174%	60	834
2000	42,933	22,844,100	0.1879%	56	767
2001	46,466	21,433,300	0.2168%	66	704
2002	56,161	21,450,500	0.2618%	69	814
2003	68,674	20,231,300	0.3394%	71	967
2004	71,459	20,007,200	0.3572%	87	821
2005	92,579	19,315,100	0.4793%	109	849
2006	85,618	18,751,900	0.4566%	115	745
Constant Market Share of Total U.S. Itinerant Operations					
2012	99,719	21,840,300	0.4566%	200	499
2017	110,281	24,153,600	0.4566%	241	458
2027	134,968	29,560,461	0.4566%	350	386
Increasing Market Share of Total U.S. Itinerant Operations					
2012	104,833	21,840,300	0.4800%	200	524
2017	123,183	24,153,600	0.5100%	241	511
2027	174,407	29,560,461	0.5900%	350	498
Selected Forecast					
2012	105,000	21,840,300	0.4808%	200	525
2017	123,000	24,153,600	0.5092%	241	510
2027	175,000	29,560,461	0.5920%	350	500

Source: FAA Aerospace Forecasts 2007-2020; Operations from tower count

While several factors lead to increasing national trends such as the improved national economic outlook, the lack of any aviation-related terrorist attacks since 9/11, and the upward trend in general aviation aircraft deliveries, the local conditions are particularly indicative of continued growth.

The East Valley is forecast to continue growing in terms of population and employment. Other East Valley airports such as Mesa Falcon Field and Chandler Municipal Airport are much more mature and limited in terms of future growth. For example, Chandler Municipal Airport is likely constrained to its current runway length due to various developments surrounding the airport. Mesa Falcon Field is limited in terms of developable land.

The increasing share forecast has been selected, with the figures rounded to the nearest thousand for use as a planning forecast. The selected forecast represents an annual growth rate of 3.46 percent. While this growth rate is substantial, it reflects a moderation of the annual growth rate experienced over the previous nine years. The selected forecast considers the fact that Phoenix-Mesa Gateway Airport is maturing itself and is not intended exclusively as a general aviation airport.

The selected forecast for 2012 is 105,000 itinerant operations, which is nearly identical to the FAA TAF forecast of 104,977. The selected forecast for 2017 is 123,000 itinerant operations, which is within 4.8 percent of the FAA TAF forecast of 116,942. The long range selected forecast is 175,000 operations, which is somewhat higher than the 2027 FAA TAF (as extrapolated from 2025) forecast of 137,846. The selected long range forecast is 27 percent higher that the FAA TAF.

The table also examines the relationship of annual itinerant operations to based aircraft. As based aircraft have increased so have itinerant operations, having averaged 819 annual itinerant operations per based aircraft since 1998. The selected forecast reflects the maturity of the airport and shows 500 annual itinerant operations per based aircraft through the long range planning period. For an urban/suburban reliever airport with active flight schools, this is well within a reasonable range.

Local Operations

A similar methodology was utilized to forecast local operations. **Table 2W** depicts the history of local operations at Phoenix-Mesa Gateway Airport, and examines its historic market share of general aviation local operations at towered airports in the United States. Local operations have also seen substantial increases since 2003, having recovered from a drop in operations from 1999 through 2001. From 2003 to 2006, local general aviation operations grew 22 percent annually from 96,188 to 174,702. This growth is attributable to positive growth by each of the flight schools at the airport since 2001.

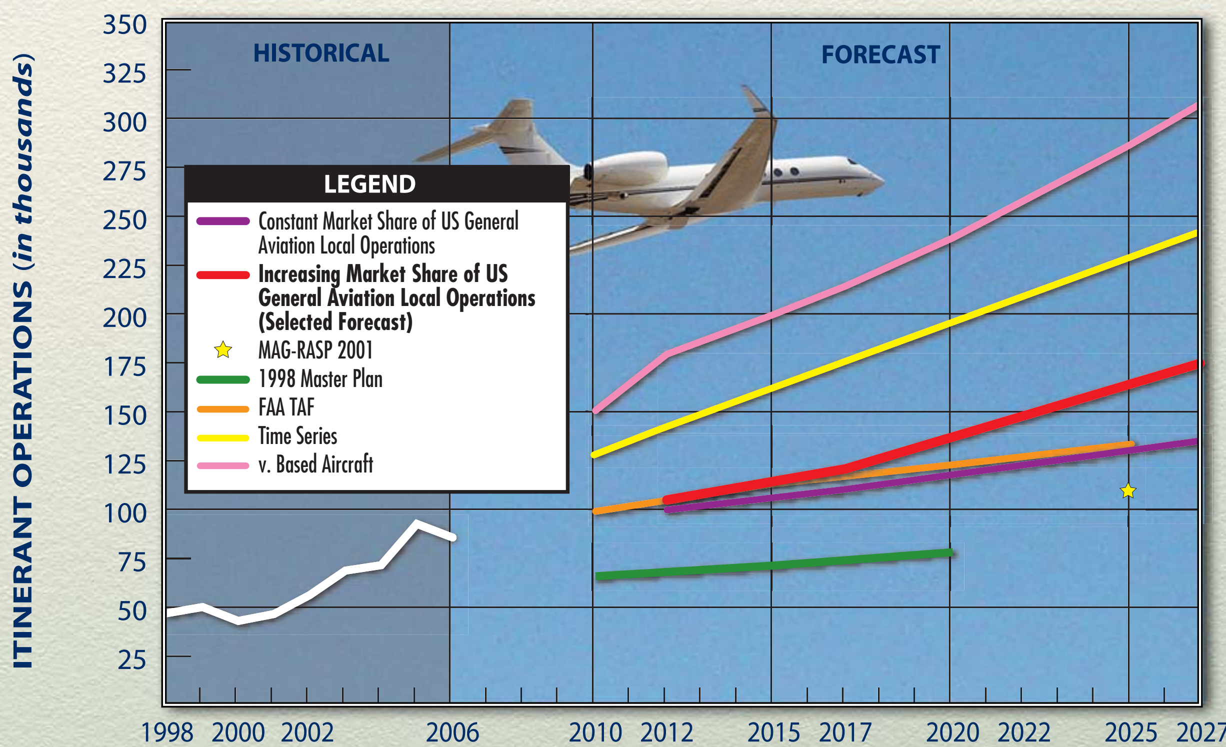
Two local general aviation forecasts have been developed. The first considers local operations remaining constant based on the 2006 percentage of national local general aviation operations at towered airports in the United States. This forecast results in 201,116 local operations in 2012, 215,245 local operations in 2017, and 243,353 local operations in 2027. This forecast represents an annual growth rate of 1.6 percent from 2006-2027.

The second forecast considers an increasing market share of total U.S. local operations. The increasing market share forecast represents an annual growth rate of 2.3 percent.

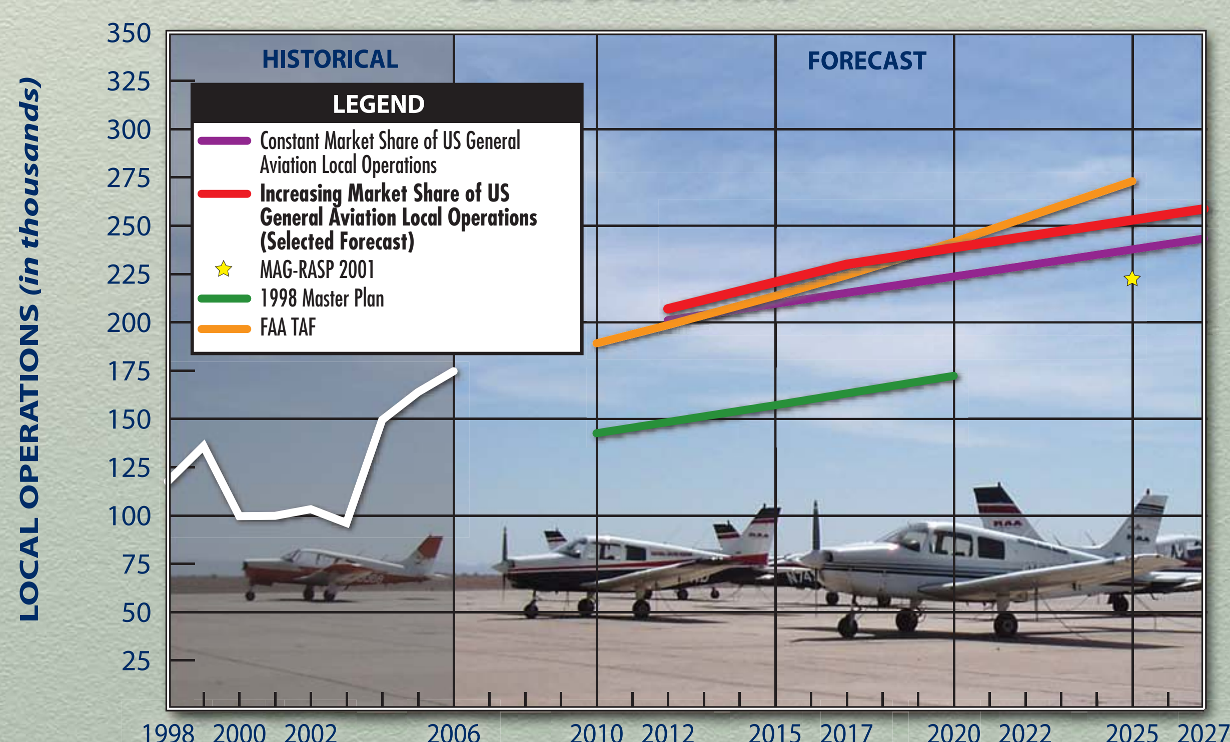
The selected forecast for 2012 is 207,000 local operations, which is 4.2 percent higher than the FAA TAF forecast of 198,597. The selected forecast for 2017 is 230,000 itinerant operations, which is within 2.4 percent higher than the FAA TAF forecast of 224,403. The long range selected forecast is 260,000 local operations, which is 9.3 percent lower than the 2027 FAA TAF (as extrapolated from 2025) forecast of 286,800. The local operations forecast are consistent with the FAA TAF. **Exhibit 2H** presents both local and itinerant general aviation operations forecasts for Phoenix-Mesa Gateway Airport.

07MP03-2H-8/29/07

ITINERANT OPERATIONS



LOCAL OPERATIONS



PhxMesa Gateway Airport

Exhibit 2H
GENERAL AVIATION
OPERATIONS FORECASTS

TABLE 2W
General Aviation Local Operations Forecast
Phoenix-Mesa Gateway Airport

Year	IWA GA Local Operations	U.S. GA Local Operations	IWA Market Share Local Operations	Based Aircraft	Local Ops Per Based Aircraft
1998	117,682	15,960,000	0.7374%	54	2,179
1999	135,954	16,980,200	0.8007%	60	2,266
2000	99,701	17,034,400	0.5853%	56	1,780
2001	99,861	16,193,700	0.6167%	66	1,513
2002	103,300	16,172,800	0.6387%	69	1,497
2003	96,188	15,292,100	0.6290%	71	1,355
2004	149,492	14,960,400	0.9993%	87	1,718
2005	163,839	14,845,900	1.1036%	109	1,503
2006	174,702	14,378,900	1.2150%	115	1,519
Constant Market Share of U.S. General Aviation Local Operations					
2012	201,116	16,552,900	1.2150%	200	1,006
2017	215,245	17,715,800	1.2150%	241	893
2027	243,353	20,029,200	1.2150%	350	695
Increasing Market Share of U.S. General Aviation Local Operations					
2012	206,911	16,552,900	1.2500%	200	1,035
2017	230,305	17,715,800	1.3000%	241	956
2027	260,380	20,029,200	1.3000%	350	744
Selected Forecast					
2012	207,000	16,552,900	1.2505%	200	1,035
2017	230,000	17,715,800	1.2983%	241	954
2027	260,000	20,029,200	1.2981%	350	743

Source: FAA Aerospace Forecasts 2007-2020; Operations from tower count

A final comparison of local operations per based aircraft was considered as a check on the validity of the selected forecast. In 2006, there were 1,519 local operations per based aircraft. This is a very high figure but is reflective of the current nature of the airport as a center for flight training. As more individually owned aircraft are based at the airport, the local operations per based aircraft can be expected to decline to a level more closely associated with an urban/suburban reliever airport.

OTHER COMPARATIVE FORECASTS

Several previous forecasts and other statistical measures were examined when analyzing general aviation operations forecasts for Phoenix-Mesa Gateway Airport. The MAG-RASP (2001) projected local and itinerant operations at Phoenix-Mesa Gateway Airport for their long term planning year of 2025. In 2006, itinerant operations were 78 percent of the long term MAG-RASP forecasts. The 1998 master plan forecast 78,100 itinerant operations by 2020. This figure was exceeded in 2006.

A time series linear regression resulted in an "r^2" value of 0.83. A regression comparing itinerant operations with forecast based aircraft resulted in an "r^2" value of 0.91. While both of these statistical methods resulted in "r^2" values slightly lower than the desired level of at least 0.94, they are presented in **Table 2X** and **Exhibit 2H** for comparative purposes.

The same comparative forecasts for local operations are also presented in **Table 2V**. The 2006 local operations figure of 174,702 is approximately 78 percent of the long range MAG-RASP forecast of 220,000 annual operations.

Two statistical regressions are also presented. The time series regression resulted in an r^2 value of 0.38. The regression comparing historic local operations with based aircraft resulted in an r^2 value of 0.69. Neither of these is considered statistically reliable and is presented for comparative purposes.

TABLE 2X
Comparative GA Operations Forecasts
Phoenix-Mesa Gateway Airport

	2010	2012	2015	2017	2020	2025	2027
ITINERANT OPERATIONS							
MAG-RASP 2001						109,300	
1998 MP	65,800		71,300		78,100		
FAA TAF	99,000	104,977	113,160	116,942	122,856	133,386	
Time Series (r^2=0.83)	127,870	141,234	161,281	174,645	194,691	228,102	241,467
v. Based Aircraft (r^2=0.91)	150,552	179,423	199,803	214,238	238,864	285,567	306,795
Constant Share of U.S. Itinerant Operations (previously presented)		99,719		110,281			134,968
Selected Forecast/ Increasing Share of U.S. Itinerant Ops.		**105,000**		**123,000**			**175,000**
LOCAL OPERATIONS							
MAG-RASP 2001						222,000	
1998 MP	144,200		158,700		173,900		
FAA TAF	189,148	198,597	213,690	224,403	241,514	273,058	
Time Series (r^2=0.38)	181,099	194,687	215,069	228,658	249,040	283,010	296,598
v. Based Aircraft (r^2=0.69)	227,041	265,070	291,915	310,930	343,367	404,885	432,848
Constant Share of U.S. Local Operations (previously presented)		201,116		215,245			243,353
Selected Forecast/ Increasing Share of U.S. Local Ops.		**207,000**		**230,000**			**260,000**

Source: Coffman Associates Analysis

OTHER AIR TAXI

Air taxi operations as reported by the ATCT include commuter passenger, commuter cargo, as well as some for-hire general aviation operations. Some operations by aircraft operated under fractional ownership programs are also counted as air taxi operations. Since the airline and cargo operations have been forecast, this section reviews the growth potential for the "other air taxi" operations.

Table 2Y presents the other air taxi operations since 1999. These operations have increased every year except in 2000 in a linear pattern. The statistical trend line results in an r^2 value of 0.92. For purposes of forecasting air taxi operations, the time-series forecast is the selected forecast as presented in **Table 2Y**.

A high range forecast for other air taxi operations is presented. Of all the general aviation operations, it is the air taxi operations that can grow exponentially, while local operations are much more dependent on elements such as aircraft storage availability, or other regional airport capabilities.

TABLE 2Y
Other Air Taxi Forecasts
Phoenix-Mesa Gateway Airport

Year	Other Air Taxi	U.S. Air Taxi/Commuter Operations	Percent
1999	4,618	9,316,500	0.050%
2000	4,319	10,760,600	0.040%
2001	4,826	10,882,100	0.044%
2002	6,207	11,029,400	0.056%
2003	6,434	11,426,000	0.056%
2004	6,679	12,243,900	0.055%
2005	7,749	12,551,700	0.062%
2006	9,171	11,967,600	0.077%
FORECAST			
2012	12,400	12,455,700	0.100%
2017	15,700	13,244,000	0.119%
2027	22,200	14,974,599	0.148%
High Range	30,097	14,974,599	0.200%

Source: ATADS

MILITARY ACTIVITY

Phoenix-Mesa Gateway Airport is utilized by the Arizona Air National Guard's 161st Air Refueling Wing. The 161st Air Refueling Wing operates up to ten KC-135 refueling aircraft that are based at Phoenix Sky Harbor (PHX). Because of the congestion at PHX, the Guard will utilize Phoenix-Mesa Gateway Airport for touch-and-go operations. In addition, test flights by Boeing are also considered military operations.

Phoenix-Mesa Gateway Airport has been an attractive airport for military operations because of the availability of a long runway with a diversity of approaches including the instrument landing system (ILS).

Table 2Z presents the annual military operations since 1998 at Phoenix-Mesa Gateway Airport. During that period, operations have averaged 16,284 annually. In both 1999 and 2000, local military operations were very high in comparison to years since then. When excluding those years, military activity has averaged 5,000 itinerant and 5,700 local operations. Because of the unpredictable nature of the military mission, traditional statistical analysis is not reliable for forecasting future military operations at the airport.

For planning purposes, military operations are forecast to remain constant at around 12,500 annual operations in the future. This includes 5,000 itinerant and 7,500 local operations. This is similar to the FAA TAF forecast of 5,161 itinerant and 5,508 local military operations annually. A high range of 15,000 annual military operations is also included.

TABLE 2Z
Military Operations Forecasts
Phoenix-Mesa Gateway Airport

Year	Itinerant	Local	Total
1998	5,069	21,852	26,921
1999	6,872	37,714	44,586
2000	4,128	6,498	10,626
2001	4,335	4,860	9,195
2002	5,100	6,879	11,979
2003	5,065	4,825	9,890
2004	6,115	5,756	11,871
2005	5,288	6,089	11,377
2006	5,031	5,076	10,107
FORECAST			
2010	5,000	7,500	12,500
2015	5,000	7,500	12,500
2025	5,000	7,500	12,500
High Range	6,000	9,000	15,000

Source: Historical data from ATADS

ANNUAL INSTRUMENT APPROACHES

Forecasts of annual instrument approaches (AIA) provide guidance in determining an airport's requirements for navigational aid facilities. An instrument approach is defined by FAA as "an approach to an airport with intent to land by an aircraft in accordance with an Instrument Flight Rule (IFR) flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude." Basically, to qualify as an AIA, the approach being flown has to occur in non-visual weather conditions.

Historical data on instrument approaches to Phoenix-Mesa Gateway Airport was not available as of this writing. Therefore forecasts of AIAs are developed by utilizing knowledge of other airports with similar characteristics to Phoenix-Mesa Gateway Airport. In the southwest, visual flight conditions are dominant. Typically, an airport in the region will experience no more than one percent of its itinerant operations in instrument conditions. Therefore, the forecast AIAs, as presented on **Table 2AA,** represent one percent of the total forecast itinerant operations.

TABLE 2AA
Annual Instrument Approach Forecasts
Phoenix-Mesa Gateway Airport

Year	Air Carrier/ Charter	Air Taxi	General Aviation Itinerant	Military Itinerant	Total
FORECAST					
2012	94	124	1,050	50	1,318
2017	208	157	1,230	50	1,645
2027	482	222	1,750	50	2,504

Source: Coffman Associates analysis

SUMMARY

This chapter has outlined the various activity levels that might reasonably be anticipated over the planning period. **Exhibit 2J** provides a summary of the aviation forecasts prepared in this chapter. Actual activity is included for 2006, which serves as the base year for these forecasts.

The exhibit shows an adjustment to the forecast operations for the airport. Operations for general aviation and air taxi activity were increased by approximately three percent to account for operations that occur at the airport when the tower is closed. The three percent adjustment is based on actual nighttime counts previously taken at other reliever airports in the Phoenix area. This adjustment is necessary to account for all airport activity, particularly when planning for facilities and environmental impacts.

The percent of local versus itinerant operations is an indicator of the evolution of the airport. Airports with a high percentage of local operations generally have several very active flight schools and high activity by smaller general aviation aircraft. **Table 2BB** presents a summary of local and itinerant operations for Phoenix-Mesa Gateway Airport.

In 2006, local general aviation operations at Phoenix-Mesa Gateway Airport accounted for approximately 65.1 percent of overall operations. As the airport transitions to a commercial service role, local operations can be expected to naturally decline. By 2027, local general aviation operations represent 58 percent of overall general aviation operations.

Conversely, itinerant general aviation operations are forecast to increase over the planning period. In 2006, itinerant general aviation operations represented 34.9 percent of all general aviation operations, while in 2027 this percent is forecast to increase to 42 percent.

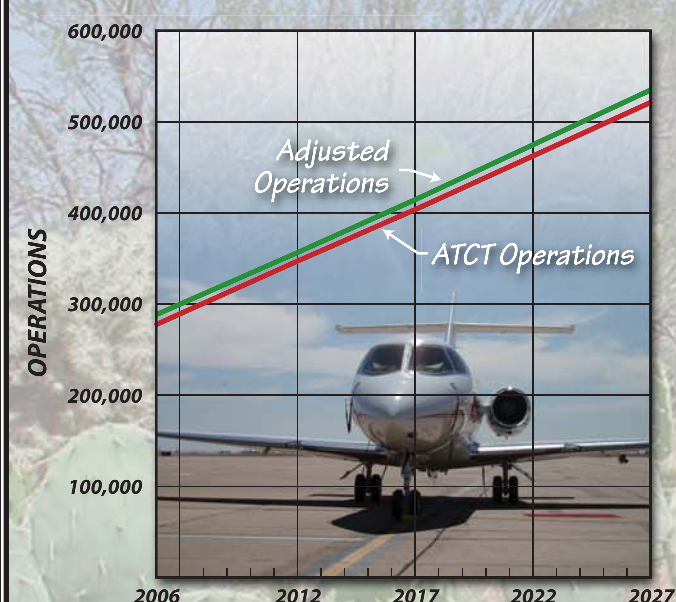
In 2006, itinerant operations were 37.8 percent of overall operations. As the airport evolves into a true commercial service reliever airport, the level of itinerant activity can be expected to increase. This is a natural trend experienced at commercial service airports across the country. As activity by large commercial aircraft

07MP03-2J-8/29/07

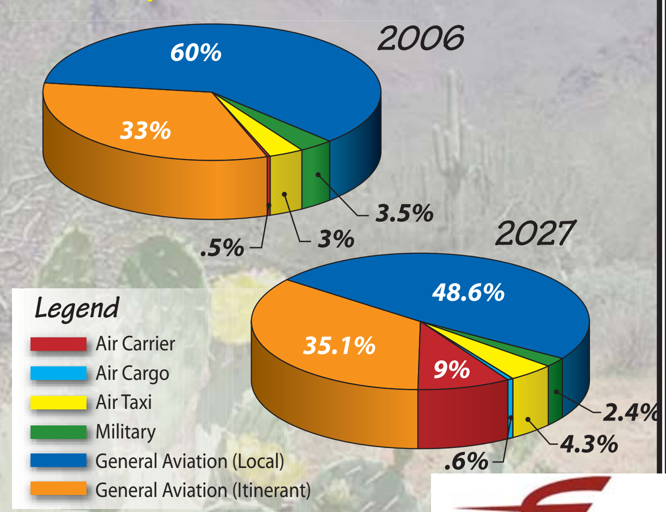
Forecast Summary

	ACTUAL	FORECAST		
	2006	2012	2017	2027
ATCT OPERATIONS				
Itinerant				
Air Carrier	1,121	9,449	20,806	48,166
Air Cargo	0*	800	1,700	3,500
Air Taxi	9,171	12,400	15,700	22,200
Military	5,031	5,000	5,000	5,000
General Aviation	85,618	105,000	123,000	175,000
Total Itinerant Operations	*100,941*	*132,649*	*166,206*	*253,866*
Local				
Military	5,076	7,500	7,500	7,500
General Aviation	174,702	207,000	230,000	260,000
Total Local Operations	*179,778*	*214,500*	*237,500*	*267,500*
Total ATCT Operations	***280,719***	***347,149***	***403,706***	***521,366***
* 2006 air cargo operations are included in air carrier operations				
ESTIMATED NIGHTTIME OPERATIONS (accounts for time ATCT is closed from 9 p.m.-6 a.m.)				
Air Taxi	275	372	471	665
General Aviation	8,006	9,479	10,823	12,969
Total Adjusted Operations*	***289,000***	***357,000***	***415,000***	***535,000***
* Rounded to nearest 1,000				
ANNUAL ENPLANEMENTS	**2,991**	**350,000**	**850,000**	**2,200,000**
ENPLANED CARGO (tons)	**59**	**10,000**	**21,000**	**44,000**
BASED AIRCRAFT				
Single-Engine Piston	65	136	153	215
Multi-Engine Piston	10	12	14	18
Turboprop	1	4	8	12
Jet	19	25	35	55
Helicopter	20	23	31	50
Total Based Aircraft	**115**	**200**	**241**	**350**

Operations Forecast



Total Operations Mix



PhxMesa Gateway Airport

Exhibit 2J
FORECAST SUMMARY

increases, local activity, training activity in particular, tends to decrease. By 2027, itinerant operations increase to 50 percent of overall operations.

Phoenix-Mesa Gateway Airport is intended to be a true reliever to Phoenix Sky Harbor International Airport in that scheduled commercial service is anticipated. The previous master plan indicated that the airport should pursue scheduled and non-scheduled charter airlines as a starting point. Several charter airlines pursued this opportunity and the airport proved it was able to manage such activity. Going forward, the airport seems well positioned to accommodate regularly scheduled commercial service. This could take many forms including a mix of flights being transferred from PHX to Phoenix-Mesa Gateway Airport, new regional airline point-to-point service, or new service to underserved markets.

In July 2007, Allegiant Air announced the introduction of regularly scheduled flights to 13 destinations. Although all destinations have not been identified, the business model experienced at their focus cities in Florida is to provide point-to-point service from northern cities with non-stop service to the region. Following this model some of the destinations being considered from Phoenix-Mesa Gateway Airport are Rockford, IL; Peoria, IL; Cedar Rapids, IA; Missoula, MT; Billings, MT; Bellingham, WA; Rapid City, SD; Sioux Falls, SD; Fargo, ND; Santa Maria, CA; Stockton, CA; and Fort Wayne, IN;

Forecasts for future passenger enplanement levels were analyzed from several perspectives. Analysis of the enplanement levels at other cities served by two commercial service airports was presented. Three enplanement forecast scenarios were developed providing a potential range of enplanement levels based on levels experienced at these cities served by two airports. A mid-range forecast was selected. It was noted that each of the secondary airports in these cities had service from a low-cost carrier such as Southwest Airlines, JetBlue, or AirTran. Those secondary airports that did not have low-cost carrier service were showing declining enplanement levels. Allegiant Air is an emerging low-cost carrier.

Low-cost carriers serving the Phoenix area are well established at Phoenix Sky Harbor and are unlikely to transition operations to Phoenix-Mesa Gateway Airport in the short term. As capacity and delay become more prominent at PHX, the possibility of a shift of some service to Phoenix-Mesa Gateway Airport becomes more feasible for the airlines.

Forecasts for air cargo activity are difficult as the airport does not have a consistent history of regularly scheduled air cargo activity. As a result, two air cargo scenarios were presented. The first examined total enplaned tons of cargo if charter and non-scheduled activity were to grow. The second scenario considered the possibility of a major all-cargo carrier locating a distribution center at Phoenix-Mesa Gateway Airport.

Air taxi operations typically include commuter passenger, commuter cargo, for-hire general aviation activity, and some operations by aircraft operated under fractional ownership programs. In 2006, there were over 9,000 air taxi operations. With the facilities offered by the airport, Phoenix-Mesa Gateway Airport is very attractive to air taxi operators. Air taxi operations are forecast to exceed 22,000 by 2027.

Phoenix-Mesa Gateway Airport based aircraft are expected to see growth over the planning period. The forecasts show a short term jump in based aircraft primarily because of new hangars currently being constructed. Through the long term, based aircraft are forecast to grow at 3.8 percent annually, reaching 350 aircraft by 2027. Of this total, 55 are forecast to be jet aircraft, with the majority being cabin class business jets.

Military activity will also continue to be a factor at Phoenix-Mesa Gateway Airport primarily because of the presence of Boeing as a military aircraft maintenance facility and the frequent use of the airport for training exercises by the Arizona Air National Guard's 161st Air Refueling Wing, which bases 12 KC-135 tanker aircraft at PHX. Because the mission of the military can change frequently and without notice, 12,500 annual military operations are forecast for each year through the planning period. This figure is based on historical averages.

The next step in the planning process is to assess the capabilities of the existing facilities to determine what facilities may be necessary to meet future demands. The forecasts developed here will be taken forward in the next chapter as planning horizon activity levels that will serve as milestones or activity benchmarks in evaluating facility requirements.

TABLE 2BB
Operations Summary
Phoenix-Mesa Gateway Airport

	2006	Percent	2012	Percent	2017	Percent	2027	Percent
GENERAL AVIATION OPERATIONS								
Total GA Itinerant Ops	93,624	34.9%	114,479	35.6%	133,823	36.8%	187,969	42.0%
Total GA Local Ops	174,702	65.1%	207,000	64.4%	230,000	63.2%	260,000	58.0%
Total GA Operations	**268,326**		**321,479**		**363,823**		**447,969**	
TOTAL OPERATIONS								
Total Itinerant Operations	109,222	37.8%	142,500	39.9%	177,500	42.8%	267,500	50.0%
Total Local Operations	179,778	62.2%	214,500	60.1%	237,500	57.2%	267,500	50.0%
Total Operations	**289,000**		**357,000**		**415,000**		**535,000**	

PhxMesa Gateway Airport

Chapter Three

"UNCONSTRAINED" FACILITY REQUIREMENTS

Chapter Three

"Unconstrained" Facility Requirements

To properly plan for the future at Phoenix-Mesa Gateway Airport, it is necessary to translate forecast aviation demand into the specific types and quantities of facilities that can adequately serve projected demand levels. This chapter uses the results of the forecasts conducted in Chapter Two, as well as established planning criteria, to determine the airfield (i.e., runways, taxiways, navigational aids, marking and lighting, and support facilities), and landside (i.e., terminal building, cargo buildings, hangars, aircraft parking apron, fueling, vehicle parking and access) facility requirements.

The objective of this effort is to identify, in general terms, the adequacy of the existing airport facilities, outline what new facilities may be needed, and when they may be needed to accommodate forecast demands. Having established these facility requirements, alternatives for providing the facilities will be evaluated in Chapter Four to determine the most cost-effective and efficient means for implementation.

PLANNING HORIZONS

Cost-effective, safe, efficient, and orderly development of an airport should rely more upon actual demand than a time-based forecast figure. Thus, in order to develop a master plan that is demand-based rather than time-based, a series of planning horizon milestones have been established that take into consideration the reasonable range of aviation demand projections.

It is important to consider that over time, the actual activity at the airport may be higher or lower than what the annualized forecast portrays. By planning according to activity milestones, the resultant plan can accommodate unexpected shifts, or changes in the area's aviation demand. It is important to plan for these milestones so that airport officials can respond to unexpected changes in a timely fashion. As a result, these milestones provide flexibility, while potentially extending this plan's useful life if aviation trends slow over the period.

The most important reason for utilizing milestones is to allow the airport to develop facilities according to need generated by actual demand levels. The demand-based schedule provides flexibility in development, as the schedule can be slowed or expedited according to actual demand at any given time over the planning period. The resultant plan provides airport officials with a financially responsible and need-based program. **Table 3A** presents the planning horizon milestones for each activity demand category.

TABLE 3A
Planning Horizon Activity Levels
Phoenix-Mesa Gateway Airport

	PLANNING HORIZONS			
ACTIVITY	**SHORT TERM**	**INTERMEDIATE TERM**	**LONG TERM**	**HIGH RANGE**
Annual Enplanements	350,000	850,000	2,200,000	5,000,000
Enplaned Cargo (Tons)	10,000	21,000	44,000	100,000
Based Aircraft	200	241	350	350
OPERATIONS				
Air Carrier	9,449	20,806	48,166	94,934
Air Taxi*	12,772	16,171	22,865	30,097
Air Cargo	800	1,700	3,500	8,000
General Aviation (Local)	207,000	230,000	260,000	260,000
General Aviation (Itinerant)*	114,479	133,823	187,969	187,969
Military	12,500	12,500	12,500	15,000
TOTAL OPERATIONS	**357,000**	**415,000**	**535,000**	**596,000**

* Includes nighttime adjustment when airport tower is closed.

The first three planning horizons relate to the activity forecasts of the previous chapter. A fourth horizon is also shown that relates to a high range potential for each type of activity. The high range figures were initially presented in the previous chapter and are carried forward here. A high range for general aviation activity is assumed to be the same as the long term planning horizon. This is based on the assumption that the growing commercial nature of the airport will naturally limit the growth of general aviation activity. In addition, there is not the critical need to forecast general aviation activity beyond the 20-year scope of the master plan.

In this chapter, existing components of the airport are evaluated so that the capacities of the overall system are identified. Once identified, the existing capacity is compared to the planning horizon milestones to determine where deficiencies currently exist or may be expected to materialize in the future. Once deficiencies in a component are identified, a more specific determination of the approximate sizing and timing of the new facilities can be made.

PEAKING CHARACTERISTICS

Many airport facility needs are related to the levels of activity during peak periods. The periods used in developing facility requirements for this study are as follows:

Peak Month - The calendar month when peak aircraft operations occur.

Design Day – The average day in the peak month. This indicator is easily derived by dividing the peak month operations by the number of days in a month.

Busy Day - The busy day of a typical week in the peak month.

Design Hour - The peak hour within the design day.

It is important to note that only the peak month is an absolute peak within a given year. All other peak periods will be exceeded at various times during the year. However, they do represent reasonable planning standards that can be applied without overbuilding or being too restrictive.

AIRLINE

Table 3B presents peaking characteristics for forecast airline activity at Phoenix-Mesa Gateway Airport.

Allegiant Air has announced twice-weekly departures to 13 cities beginning in October 2007. Due to this announcement, it is important to identify peaking characteristics for this activity. **Table 3B,** therefore, includes a column labeled 'Current' which is inclusive of the estimated first year activity by Allegiant Air.

Current airline enplanements are variable in nature because they are being conducted by charter companies. This leads to difficulty determining the current peaking characteristics, thus several assumptions are made based on the local factors and knowledge of airports with similar operations. For example, the design day will typically be the peak month divided by the number of days in the month (30 in this case as an average). The current design day is determined to be approximately 200 rather than 11.5 (345/30=11.5). This number is more reflective of the fact that the charters operate much larger aircraft such as the MD-83 with 150 seats (Allegiant Air) or 737-800 with 174 seats (SkyValue). An additional enplanement buffer is added in order to account for the potential for two aircraft at the same time.

TABLE 3B Airline Peak Activity Phoenix-Mesa Gateway Airport	Current	Short Term	Intermediate Term	Long Term	High Range
Airline Enplanements					
Annual	142,000	350,000	850,000	2,200,000	5,000,000
Peak Month	16,379	40,371	98,044	253,761	576,730
Design Day	546	1,346	3,268	8,459	19,224
Design Hour	164	404	719	1,015	2,307
Deplanements					
Design Hour	139	343	611	863	1,961
Total Passengers					
Design Day	1,092	2,691	6,536	16,917	38,449
Design Hour	278	686	1,222	1,726	3,922
Airline Operations					
Annual	1,456	9,449	20,806	48,166	94,934
Peak Month	160	1,039	2,081	4,817	9,493
Design Day	5	34	68	160	316
Design Hour	1	9	12	18	35
Departures					
Design Day	3	16	34	80	158
Design Hour	1	4	7	9	17
Arrivals					
Design Day	3	16	34	80	158
Design Hour	1	4	7	9	17

Forecast design hour enplanement levels are reflective of the introduction of regularly scheduled commercial air service. Airports with enplanement levels of 500,000 will typically see these operations cluster around the same time of day, because these times are the most desirable. For example, Phoenix-Mesa Gateway Airport may see initial service to Southern California (as an example) cluster around the mornings and evenings in order to attract the daytime business traveler. For this reason, the short term horizon design hour is estimated at 30 percent of the day's enplanements. As air service matures at the airport, the design hour enplanement level for the intermediate horizon is 24 percent, then 16 percent by the long term horizon.

Since enplanement and deplanement peaks typically do not occur during the same hour, the design hour for deplanements is calculated as 85 percent of design hour enplanements. Total passenger design day is calculated as twice the design day for enplanements, while the design hour is calculated as 180 percent of the enplanement design hour.

Table 3B also outlines peaking characteristics for airline operations. At established commercial service airports, it is possible to determine peaking characteristics for various airline types, such as commuter versus mainline. At Phoenix-Mesa Gateway Airport, there is no such history, thus commercial airline peaking characteristics are developed as a single statistical category.

Airline peak month operations in 2006 are estimated as 20 percent of annual operations. In the short term, the peak month is estimated as 11 percent of annual airline operations and by the long term, this is estimated at 10 percent. This trend is reflective of a maturing commercial service market in a city with a diverse economy. The design day and design hour airline operations are also estimated based on the possibility of two commercial aircraft on the ground at the same time.

Forecasts of peaking airline operations characteristics are reflective of other commercial airports with similar enplanement levels. In the short term, with 350,000 annual enplanements, the airport may anticipate 35 daily airline operations, or 18 daily departures. The design hour operations level in the short term is estimated at 27 percent of the design day. This translates into nine aircraft on the ground within the same one-hour period. As service matures at the airport, the design hour operations level is estimated as 18 percent of design day. This percentage is further reduced to 11 percent by the long term planning horizon.

GENERAL AVIATION

There is a much richer history of general aviation activity at Phoenix-Mesa Gateway Airport from which to generate peaking activity forecasts. General aviation peaking forecast levels are utilized in determining airport elements such as general aviation terminal building space, vehicle parking, and itinerant aircraft parking apron. **Table 3C** presents general aviation peaking characteristics based on itinerant general aviation and air taxi operations.

The average peak month of itinerant general aviation/air taxi operations at Phoenix-Mesa Gateway Airport has been 9.27 percent of annual itinerant general aviation/air taxi operations. The peak month for these operations is typically the late fall or early spring months. Certainly, this is reflective of the influx of seasonal travelers during the fall and the departure of these travelers in the spring.

TABLE 3C
General Aviation/Air Taxi Itinerant Operational Peak
Phoenix-Mesa Gateway Airport

	Current (2006)	Short Term	Intermediate Term	Long Term
Annual	103,070	127,251	149,994	210,835
Peak Month	8,395	11,799	13,908	19,549
Busy Day	329	480	565	795
Design Day	269	393	464	652
Design Hour	32	51	60	85

A determination of the busy day is necessary to forecast airport needs for itinerant aircraft parking. The busy day was calculated by taking the peak month operations in 2006 (November) and averaging the peak day within each week of the month. This percentage (17.4%) is then multiplied by seven (the number of days in a week) to get the busy day factor (1.22). The busy day factor is then multiplied by the design day to get the busy day, which in this case is 22 percent higher than the design day. The design hour is calculated as 13 percent of the design day.

TOTAL OPERATIONS

The total operations peak periods are utilized in examining the capacity of the airfield. The peak month of total operations has averaged 9.78 percent of annual operations over the last five years. According to the daily operational logs of the Phoenix-Mesa Gateway Airport Traffic Control Tower, peak hour operations averaged 11.33 percent of daily operations. **Table 3D** outlines the peak period forecasts for total airport operations.

TABLE 3D
Peak Total Operations
Phoenix-Mesa Gateway Airport

	Current (2006)	Short Term	Intermediate Term	Long Term	High Range
Annual	280,719	357,000	415,000	535,000	596,000
Peak Month	29,094	34,914	40,587	52,323	58,288
Design Day	970	1,164	1,353	1,744	1,943
Design Hour	110	129	147	183	204

AIRFIELD CAPACITY

Airfield capacity is measured in a variety of different ways. The **hourly capacity** measures the maximum number of aircraft operations that can take place in an hour. The **annual service volume (ASV)** is an annual level of service that may be used to define airfield capacity needs. **Aircraft delay** is the total delay incurred by aircraft using the airfield during a given timeframe. FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, provides a methodology for examining the operational capacity of an airfield for planning purposes. This analysis takes into account specific factors about the airfield. These various factors are depicted on **Exhibit 3A**. The following describes the input factors as they relate to Phoenix-Mesa Gateway Airport:

- **Runway Configuration** – The existing runway configuration consists of three parallel runways oriented in a northwest-southeast direction. Runway 12R-30L is 1,500 feet from the center runway. Center Runway 12C-30C is 1,000 feet from Runway 12L-30R. Instrument approaches are available to all runway ends except Runway 12L-30R. This would theoretically reduce airfield capacity during low

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Exhibit 3A
AIRFIELD CAPACITY FACTORS

visibility conditions because only a single runway could be utilized due to the separation distance between the instrument runways. During visual conditions, the existing runway system provides for maximum capacity by allowing simultaneous operations to different runways.

- **Runway Use** – Runway use is normally dictated by wind conditions. The optimal direction for take-offs and landings are determined by the speed and direction of the wind. It is generally safest for aircraft to take-off and land into the wind, avoiding crosswind (wind direction that is perpendicular to the travel of the aircraft) or tailwind components during these operations. Prevailing winds are from the southeast during the summer months and from the northwest during the winter months. Runway 30 is designed as the calm wind runway. In general, operations utilize Runway 12, 34 percent of the time with and Runway 30, 66 percent of the time.

- **Exit Taxiways** - Based upon the current mix, taxiways located between 2,000 and 4,000 feet from the landing threshold count in the exit rating for each runway. For operations utilizing Runways 30R and 30C, there are no qualifying exits. Runway 30L provides one qualifying exit. Runways 12L, 12C, and 12R provide one qualifying exit. For planning purposes, operations utilizing the Runway 30 ends consider zero (0) exits and operations utilizing the Runway 12 ends consider one (1) qualifying exit. By the intermediate planning horizon, taxiways between 3,000 and 5,000 feet from the landing threshold count in the exit rating calculation. Runways 12R, 12C, and 12L have one exit; Runway 30L has two exits, while Runways 30C and 30R have zero qualifying exits.

- **Weather Conditions** – The airport operates under visual meteorological conditions (VMC) 99 percent of the time. Instrument meteorological conditions (IMC) and poor visibility conditions (PVC) occur one percent of the time. The FAA allows a two percent margin of error when considering weather conditions; therefore, only VMC conditions will be analyzed for capacity determination.

- **Aircraft Mix** – Aircraft mix refers to the speed, size, and flight characteristics of aircraft operating at the airport. As the mix of aircraft operating at an airport increases to include larger aircraft, airfield capacity begins to diminish. This is due to the larger separation distances that must be maintained between aircraft of different speeds and sizes. Descriptions of the classifications and the percentage mix for each planning horizon are presented in **Table 3E**.

- **Percent Arrivals** – The percentage of arrivals as they relate to the total operations in the design hour is important in determining airfield capacity. Under most circumstances, the lower the arrival percentage, the higher the hourly capacity. Except in unique circumstances, the aircraft arrival/departure split is typically 50-50. At Phoenix-Mesa Gateway Airport, there is no indication of a deviation from this pattern; therefore, arrivals are estimated to account for 50 percent of design period operations.

TABLE 3E
Capacity Fleet Mix
Phoenix-Mesa Gateway Airport

	AIRCRAFT TYPE		
Planning Horizon	**Class A & B**	**Class C**	**Class D**
Current	91.0%	6.4%	2.6%
Short Term	88.0%	9.3%	2.7%
Intermediate Term	85.1%	12.3%	2.7%
Long Term	80.4%	17.0%	2.6%
High Range	71.8%	23.9%	4.3%

Class A: Small single-engine aircraft with gross weight of 12,500 pounds or less.
Class B: Small twin-engine aircraft with gross weight of 12,500 pounds or less.
Class C: Large aircraft with gross weights over 12,500 pounds up to 300,000 pounds.
Class D: Large aircraft with gross weights over 300,000 pounds.

- **Touch-and-Go Activity** – A touch-and-go operation involves an aircraft making a landing and an immediate take-off without coming to a full stop or exiting the runway. These operations are normally associated with training operations and are recorded by the tower as local operations. For capacity analysis, touch-and-go activity is estimated at 80 percent of local operations and includes military touch-and-go operations. A high percentage of touch-and-go traffic normally results in higher operational capacity because one landing and one take-off occurs within a shorter time than individual operations. Touch-and-go activity currently accounts for 52 percent of operations. By the long term planning period, these operations are forecast to account for 46 percent of operations.

- **Peak Period Operations –** For the airfield capacity analysis, average daily operations and average peak hour operations during the peak month, as previously calculated, are utilized. Typical operations activity is important in the calculation of an airport's annual service volume as "peak demand" levels occur sporadically. The peak periods used in the capacity analysis are representative of normal operational activity and can be exceeded at various times throughout the year.

CALCULATION OF ANNUAL SERVICE VOLUME

The preceding information was used in conjunction with the airfield capacity methodology developed by the FAA to determine airfield capacity for Phoenix-Mesa Gateway Airport.

Hourly Runway Capacity

The first step in determining annual service volume involves the computation of the hourly capacity of each runway configuration. The percentage use of each runway, the amount of touch-and-go training activity, and the number and location of runway exits become important factors in determining the hourly capacity of each runway configuration.

As presented in **Table 3E**, the mix of aircraft operating at the airport changes over the planning period to include a greater utilization of Class C and D aircraft. This has the effect of reducing overall capacity because larger and faster aircraft require greater separation and runway utilization is increased. This contributes to a slight decline in the hourly capacity of the runway system over time.

Annual Service Volume

Once the hourly capacity is known, the annual service volume can be determined. Annual service volume is calculated by the following equation:

Annual Service Volume = C x D x H
C = weighted hourly capacity
D = ratio of annual demand to average daily demand during the peak month
H = ratio of average daily demand to average peak hour demand during the peak month

Following this formula, the current (2006) annual service volume for Phoenix-Mesa Gateway Airport has been estimated at 524,000 operations. In the short term, ASV increases to 532,000; by the intermediate term, ASV increases to 572,000. By the long term planning period, ASV declines to 561,000 annual operations as more jet aircraft operate at the airport. Looking ahead, a high range ASV of 496,000 annual operations is calculated. Annual service volume calculations are presented in **Table 3F**. **Exhibit 3B** presents a graphic representation of the ASV compared to forecast operations.

TABLE 3F
Annual Service Volume
Phoenix-Mesa Gateway Airport

	Base Year (2006)	Short Term	Intermediate Term	Long Term	High Range
Annual Operations	289,000	357,000	415,000	535,000	597,000
Aircraft Mix (C+3D)	14.2%	17.33%	20.34%	24.87%	36.89%
Design Hour	110	129	147	183	204
Weighted Hourly Capacity	199	193	203	192	170
Annual Service Volume	**524,000**	**532,000**	**572,000**	**561,000**	**496,000**
Percent of Capacity	55.13%	67.08%	72.57%	95.40%	120.27%

Note: Assumes a three parallel runway system with two primary commercial runways.

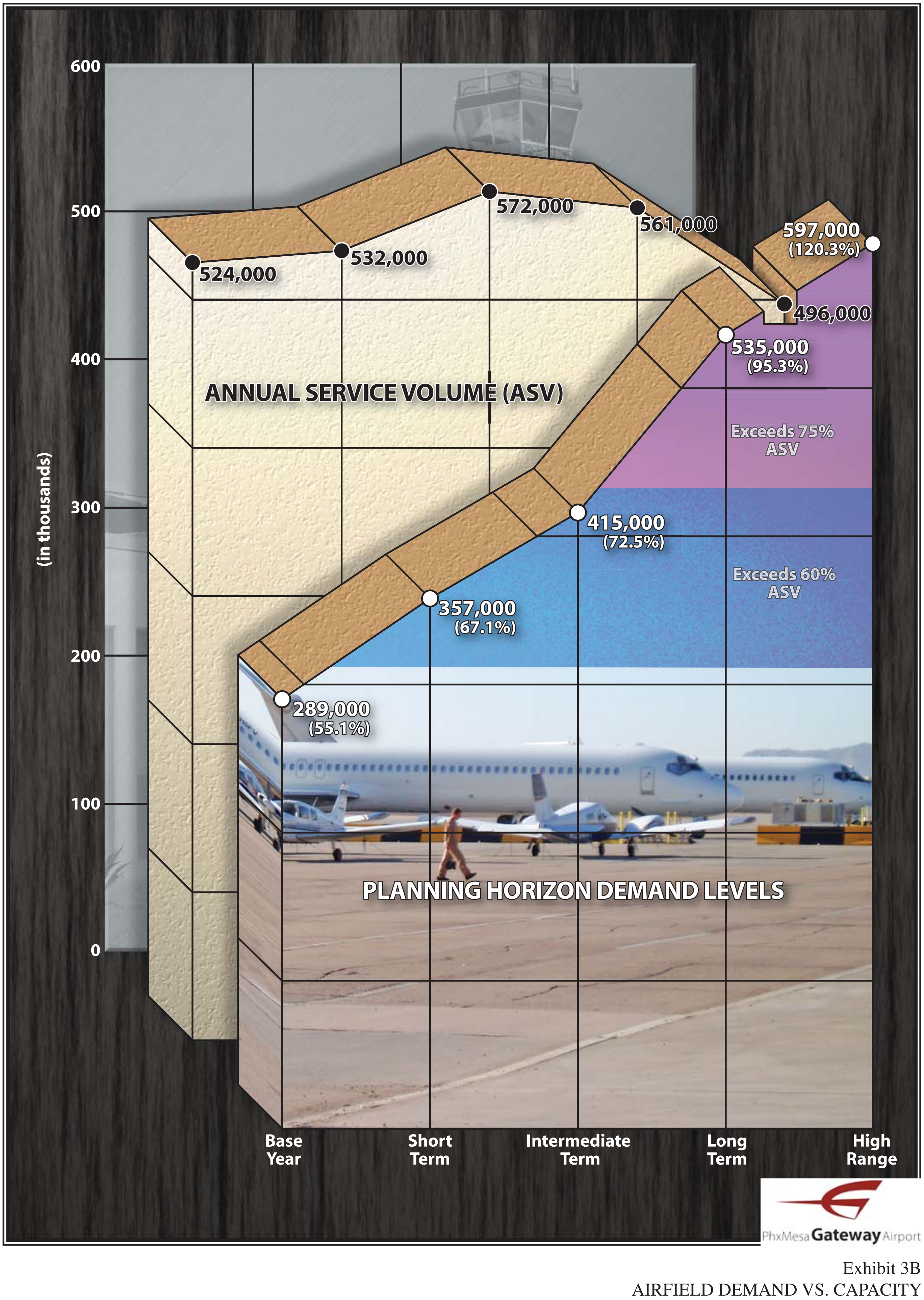

Exhibit 3B
AIRFIELD DEMAND VS. CAPACITY

It should be noted that operations at the airport can exceed the ASV threshold. The consequences are an exponential increase in the amount of delay per operation. Aircraft will have to hold on the ground for longer periods before takeoff and the landing pattern will be extended, delaying aircraft in the air prior to landing.

Delay

As the number of annual aircraft operations approaches the airfield's capacity, increasing amounts of delay to aircraft operations begin to occur. Delays occur to arriving and departing aircraft in all weather conditions. Arriving aircraft delays can result in aircraft holding outside the airport traffic area. Departing aircraft delays can result in aircraft holding at the runway end until released by the airport traffic control tower for take-off.

Currently, total annual delay at the airport is estimated at 1,927 hours, as presented in **Table 3G**. This translates into an average delay of 0.40 minutes per operation. Delays of five to ten times the average could be experienced by individual aircraft during peak periods, but most of the time aircraft are able to arrive and depart at their convenience. If no capacity improvements are made, annual delay can be expected to reach 16,050 hours by the long range planning horizon. This calculates to an average delay of 1.80 minutes per aircraft.

The FAA threshold for unacceptable delay is four minutes per operation on average. Delay will increase exponentially as operations reach and exceed the calculated ASV.

TABLE 3G
Annual Delay
Phoenix-Mesa Gateway Airport

	Total Annual Aircraft Delay (Hours)	Average Delay per Aircraft Operations (Minutes)
Base Year (2006)	1,927	0.40
Short Term	3,570	0.60
Intermediate Term	5,188	0.75
Long Term	16,050	1.80
High Range	64,567	6.50

Source: AC 150/5060-5, Airport Capacity and Delay

Conclusion

FAA Order 5090.3B, *Field Formulation of the National Plan of Integrated Airport Systems* (NPIAS), indicates that improvements for airfield capacity purposes should begin to be considered once operations reach 60 to 75 percent of the annual service volume. This is an approximate level to begin the detailed planning of capacity improvements. Actual implementation may be deferred until such time that the improvement is considered timely and cost-beneficial. As a general rule, as annual operations reach 80 percent of the ASV, improvements should be underway or completed.

It should be noted that the FAA capacity model is specifically designed to examine the local airfield and not a system of airports or airspace. It is this model that the FAA relies on to assist in determining the need for capacity improvements and the potential of funding of such improvements.

At Phoenix-Mesa Gateway Airport, annual operations are forecast to represent 67 percent of the ASV by the end of the short term planning period (approximately 5 years). By the end of the long term planning period, annual operations represent 95 percent of the ASV. Analysis will be conducted in the alternatives chapter of this master plan to examine airfield capacity improvements. Particular attention will be paid to optimally located exit taxiways which could provide a minimum increase of 25 percent in the ASV.

CRITICAL AIRCRAFT

The appropriate FAA design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using, or are expected to use the airport. The critical design aircraft is defined as the most demanding category of aircraft, or family of aircraft, which conducts at least 500 operations per year at the airport. Planning for future aircraft use is of particular importance since design standards are used to plan separation distances between facilities. These future standards must be considered now to ensure that short term development does not preclude the long range potential needs of the airport.

The FAA has established a coding system to relate airport design criteria to the operational and physical characteristics of aircraft expected to use the airport. This airport reference code (ARC) has two components: the first component, depicted by a letter, is the aircraft approach category and relates to aircraft approach speed (operational characteristic); the second component, depicted by a Roman numeral, is the airplane design group and relates to aircraft wingspan or tail height (physical characteristic), whichever is more demanding. Generally, aircraft approach speed applies to runways and runway-related facilities, while airplane wingspan or tail height primarily relates to separation criteria involving taxiways, taxilanes, and landside facilities.

According to FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, an aircraft's approach category is based upon 1.3 times its stall speed in landing configuration at that aircraft's maximum certificated weight. The five approach categories used in airport planning are as follows:

Category A: Speed less than 91 knots.

Category B: Speed 91 knots or more, but less than 121 knots.

Category C: Speed 121 knots or more, but less than 141 knots.

Category D: Speed 141 knots or more, but less than 166 knots.

Category E: Speed greater than 166 knots.

The airplane design group (ADG) is based upon either the aircraft's wingspan or tail height, whichever is greater. For example, an aircraft may fall in ADG III for wingspan at 95 feet, but ADG IV for tail height at 46 feet. This aircraft would be classified under ADG IV. The six ADGs used in airport planning are as follows:

ADG	Tail Height (ft)	Wingspan (ft)
I	<20	<49
II	20-<30	49-<79
III	30-<45	70-<118
IV	45-<60	118-<171
V	60-<66	171-<214
VI	66-<80	214-<262

Source: 150/5300-13, Change 10

Exhibit 3C summarizes representative aircraft by ARC.

In order to determine several airfield design requirements, the critical aircraft and critical ARC should first be determined. Appropriate airport design criteria can then be applied. This begins with a review of the type of aircraft using and expected to use Phoenix-Mesa Gateway Airport.

Phoenix-Mesa Gateway Airport currently accommodates a wide variety of civilian and military aircraft use. Aircraft using the airport include small single and multi-engine aircraft (which fall within approach categories A and B and airplane design group I), business turboprop, and jet aircraft (which fall within approach categories B, C, and D and airplane design group II). The airport is also used by large transport aircraft (such as MD-80 and 757 aircraft) for transporting cargo and for official duties of the U.S. Marshall Service. These aircraft fall within approach categories C and D and airplane design groups III and IV.

At commercial service airports, the critical aircraft typically comes from the passenger or cargo fleet. Allegiant Air will begin twice-weekly departures to 13 destinations in October 2007, utilizing their fleet of MD-80 aircraft. Monthly charters to resort destinations are anticipated to continue. This translates into nearly 3,000 annual operations by Allegiant Air. The MD-80 aircraft are within ARC C-III.

The U.S. Marshall Service also utilizes the MD-80 (ARC C-III) and has two aircraft based at the airport. These aircraft typically depart on a daily basis, conducting approximately 1,500 annual operations.

Although SkyValue no longer operates at the airport, as recently as April 2007, they used a Boeing 737-800 (ARC C-III) and 757 (ARC C-IV) for three-times-a-week service to the Chicago area.

Military aircraft using the airport range from helicopters and fighter aircraft to large refueling aircraft. The largest military aircraft using the airport on a regular basis are KC-135 aircraft from the Arizona Air National Guard 161st Refueling Wing based at Phoenix Sky Harbor International

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A-I

- Beech Baron 55
- Beech Bonanza
- Cessna 150
- Cessna 172
- Cessna Citation Mustang
- **Eclipse 500**
- Piper Archer
- Piper Seneca

C-I, D-I

- Beech 400
- **Lear** 25, 31, **35**, 45, 55, 60
- Israeli Westwind
- HS 125-400, 700

B-I *less than 12,500 lbs.*

- Beech Baron 58
- Beech King Air 100
- Cessna 402
- **Cessna 421**
- Piper Navajo
- Piper Cheyenne
- Swearingen Metroliner
- Cessna Citation I

C-II, D-II

- Cessna Citation III, VI, VIII, X
- **Gulfstream** II, III, **IV**
- Canadair 600
- ERJ-135, 140, 145
- CRJ-200, 700, 900
- Embraer Regional Jet
- Lockheed JetStar
- Super King Air 350

B-II *less than 12,500 lbs.*

- **Super King Air 200**
- Cessna 441
- DHC Twin Otter

C-III, D-III

- ERJ-170, 190
- Boeing Business Jet
- B727-200
- **B737-300 Series**
- MD-80, DC-9
- Fokker 70, 100
- A319, A320
- Gulfstream V
- Global Express

B-I, B-II *over 12,500 lbs.*

- Super King Air 300
- Beech 1900
- Jetstream 31
- Falcon 10, 20, 50
- Falcon 200, 900
- **Citation II**, III, IV, V
- Saab 340
- Embraer 120

C-IV, D-IV

- **B757**
- B767
- B787
- C-130
- DC-8-70
- DC-10
- MD-11

A-III, B-III

- DHC Dash 7
- **DHC Dash 8**
- DC-3
- Convair 580
- Fairchild F-27
- ATR 72
- ATP

D-V, D-VI

- **B747** Series
- B777
- A380-800

Note: Aircraft pictured is identified in bold type.

PhxMesa Gateway Airport

Exhibit 3C
AIRPORT REFERENCE CODES

Airport. These aircraft fall within ARC C-IV. It should be noted that military operations cannot be used in the critical aircraft determination for civilian airports.

The U.S. Forest Service utilizes Phoenix-Mesa Gateway Airport as a staging ground for its fleet of C-130 Hercules (ARC B-IV) and P3 Orion aircraft (ARC C-III). These military aircraft have been converted to air tankers for use in fighting forest fires. Currently, the operation of these aircraft is seasonal (summer months), but the Forest Service has plans to base these aircraft at the airport in the future.

The airport, on occasion, has accommodated aircraft operations leading to FAA certification from commercial turboprops to large aircraft such as the Boeing 777 (ARC D-V) and the MD-10 (a conversion of older DC-10 aircraft) which falls within ARC D-IV.

Several airlines utilize the airport for training and certification. In the recent past, this has included America West Airlines (now U.S. Airways) and Southwest Airlines. This has involved the use of Boeing 737, 757, and Airbus A320 aircraft. These aircraft fall within ARCs C-III and C-IV.

The airfield is currently capable of accommodating the largest aircraft in the commercial fleet including the Boeing 747, Boeing 777 (ARC D-V), and even the Airbus A-380 (ARC D-VI). Although these aircraft do not currently represent the critical aircraft, wide-body aircraft such as these are forecast to account for nearly 3,000 annual operations by the long term planning period.

Although there is no regularly scheduled air cargo service, the airport has accommodated occasional air cargo activity by aircraft such as the Boeing 767 and DC-10, as well as the largest air transport aircraft in the world, the Antonov-225 Mriya (ARC D-V). The airport should consider the airfield requirements for these type of aircraft as well.

The current critical aircraft for the airport, based on exceeding 500 annual operations, is the MD-80 (ARC C-III). While this is the actual ARC, the airport should continue to meet the FAA separation and safety area requirements for ARC D-V, as established in the previous master plan. The future critical aircraft is projected to be represented by wide-body commercial aircraft such as the B-747 or B-767. **Therefore, airfield elements should be planned to meet the requirements for ARC D-V.** While larger aircraft (A-380, B-747-800, Antonov-225) are not anticipated to qualify as the critical aircraft at Phoenix-Mesa Gateway Airport, where design standards differ from ARC D-V, additional discussion will be presented.

The design of taxiway and apron areas should consider the wingspan requirements of the most demanding aircraft to operate within that specific functional area on the airport. The terminal area should consider requirements for the range of commercial aircraft from smaller regional jets to large transport jets. General aviation areas should consider ADG III requirements to accommodate the full range of business jet aircraft. Future air cargo facilities should follow ADG V design standards to accommodate large cargo aircraft.

AIRFIELD REQUIREMENTS

The analyses of the operational capacity and the critical design aircraft are used to determine airfield needs. This includes runway configuration, dimensional standards, pavement strength, as well as navigational aids, lighting, and marking.

RUNWAY ORIENTATION

The airport is served by three parallel runways oriented in a northwest-southeast direction. For the operational safety and efficiency of an airport, it is desirable for the principal runway of an airport's runway system to be oriented as closely as possible to the direction of the prevailing wind. This reduces the impact of wind components perpendicular to the direction of travel of an aircraft that is landing or taking off (defined as a crosswind).

FAA design standards recommend additional runway orientations when the primary runway provides less than 95 percent wind coverage at specific crosswind components. The wind coverage is computed on the basis of crosswinds not exceeding 10.5 knots for small aircraft weighing less than 12,500 pounds and from 13 to 20 knots for aircraft weighing over 12,500 pounds.

According to wind data summarized on the current Airport Layout Plan (ALP) for Phoenix-Mesa Gateway Airport (dated October 12, 2005), the existing parallel runway alignment provides greater than 95 percent wind coverage for all crosswind conditions. Therefore, no additional runway orientations are needed. **Exhibit 3D** summarizes wind coverage for Phoenix-Mesa Gateway Airport.

RUNWAY DIMENSIONAL REQUIREMENTS

Runway dimensional standards include the length and width of the runway, as well as the dimensions associated with runway safety areas and other clearances. These requirements are based upon the design aircraft, or group of aircraft. The runway length must consider the performance characteristics of individual aircraft types, while the other dimensional standards are generally based upon the most critical airport reference code expected to use the runway. The dimensional standards are outlined for the planning period for each runway serving Phoenix-Mesa Gateway Airport.

Runway Length

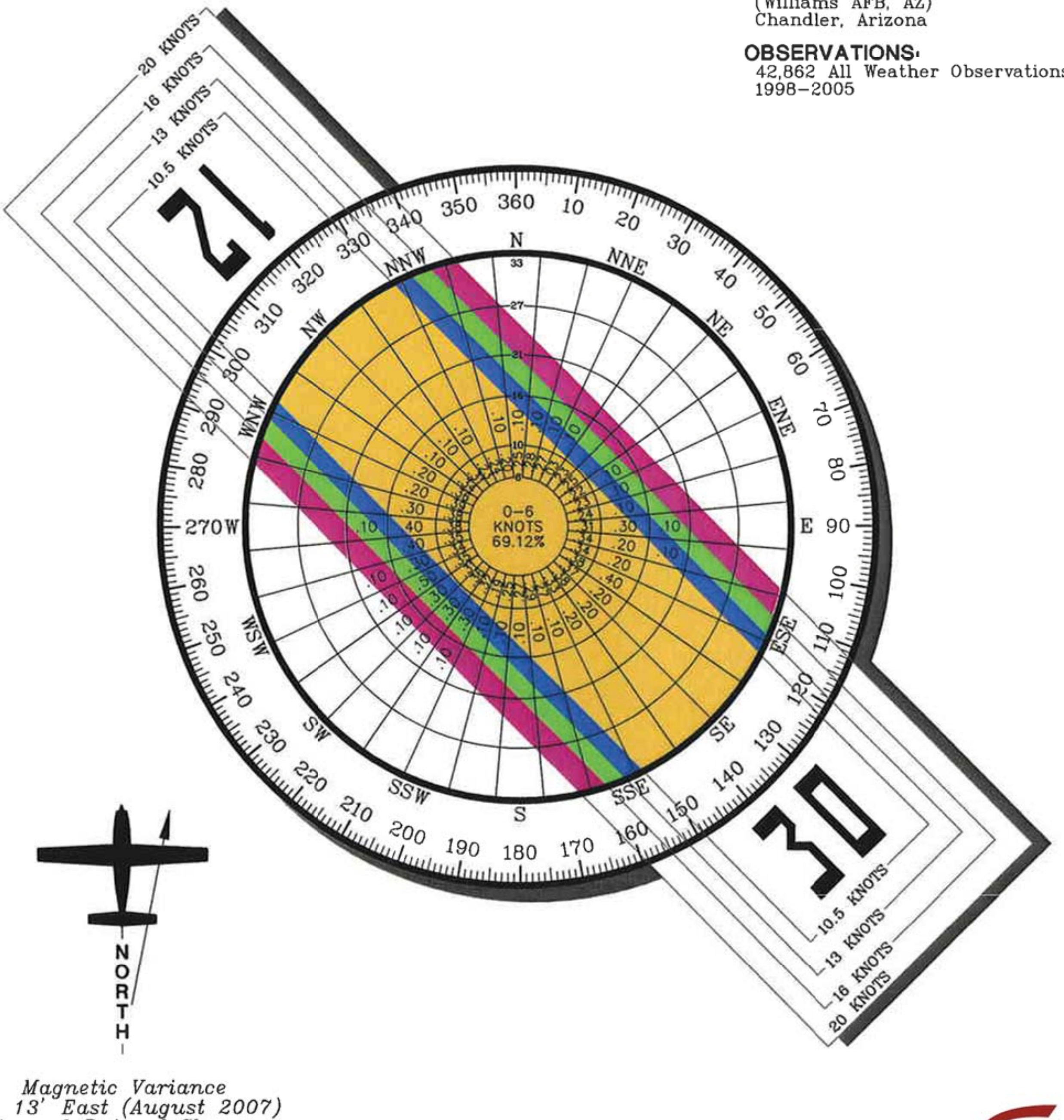
The aircraft performance capability is a key factor in determining the runway length needed for takeoff and landing. The performance capability and, subsequently, the runway length requirement of a given aircraft type can be affected by the elevation of the airport, the air temperature, the gra-

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 12-30	*96.22%*	*97.88%*	*99.61%*	*99.82%*

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Williams Gateway Airport (IWA)
(Williams AFB, AZ)
Chandler, Arizona

OBSERVATIONS:
42,862 All Weather Observations
1998–2005



Magnetic Variance
11° 13' East (August 2007)
Annual Rate of Change
00° 06' West (August 2007)

PhxMesa Gateway Airport

Exhibit 3D
WINDROSE

dient of the runway, and the operating weight of the aircraft. Aircraft performance declines as each of these factors increase.

The airport elevation at Phoenix-Mesa Gateway Airport is 1,382 feet above mean sea level (MSL). The temperature commonly used for design is the mean maximum daily temperature during the hottest month. According to the National Weather Service, that is 106 degrees Fahrenheit (F) in Mesa during the month of July. The change in runway elevation (gradient) varies by 33.2 feet along Runway 12R-30L (0.32 percent gradient), by 32.38 feet along Runway 12C-30C (0.32 percent gradient), and 27.7 feet along Runway 12L-30R (0.30 percent gradient). This information is utilized in the following runway length analyses.

At least one runway should have the capability to handle the most demanding aircraft with regards to runway length. Since the airport is planned to be a commercial reliever to Phoenix Sky Harbor International Airport (PHX), it should provide runways capable of accommodating the type of aircraft that PHX accommodates. This would include both cargo and passenger aircraft. The following discussion will first address the type of aircraft currently operating at the airport, then discuss aircraft operating at PHX as representative of what Phoenix-Mesa Gateway Airport may need to accommodate in the future.

The aircraft load is dependent upon the payload of passengers and/or cargo, plus the amount of fuel it has on board. For departures, the amount of fuel varies depending upon the length of the non-stop flight or trip length.

The most demanding civilian aircraft currently operating at the airport is an MD-80 utilized by Allegiant Air. The U.S. Marshall Service also utilizes MD-80 aircraft for daily flights to repatriate illegal aliens to Mexico. The flight to Reno is approximately 620 statute miles. It is estimated that the longest flight made by the U.S. Marshall Service is approximately 1,252 statute miles. SkyValue offered scheduled charter service to Chicago/Gary, Indiana utilizing a Boeing 737 and, at times, a Boeing 757. This flight is approximately 1,454 statute miles.

For planning purposes of this discussion, haul-length and aircraft utilization at PHX will be limited to domestic flights. The longest continental nonstop destination is to Boston Logan Airport (2,292 statute miles) and Providence, Rhode Island (2,271 statute miles). U.S. Airways utilizes Airbus A-320 while American utilizes MD-80 aircraft to Boston. Southwest Airlines utilizes Boeing 737 aircraft for nonstop flights to Providence. Service is also offered to Honolulu, which is 2,912 statute miles from PHX. Several carriers offer this service utilizing either Boeing 757 or 767 aircraft.

From an air cargo perspective, the full range of transport aircraft should be considered. Phoenix-Mesa Gateway Airport has experienced cargo activity ranging from small Cessna Caravans to the Antonov-225, the largest cargo aircraft in the world. Air cargo companies such as FedEx, UPS, and DHL utilize some of the more common large transport aircraft such as the DC-10 and the B-747.

Table 3H outlines the runway length requirements at maximum takeoff weight (MTOW) for key passenger and cargo aircraft for Phoenix-Mesa Gateway Airport. The still air range (no head or tail wind) in statute miles is also given for each aircraft listed. All regional and narrow-body aircraft are able to operate unrestricted except for the Boeing 757-200 the Boeing 737-800. These aircraft may have to take on less than a full load of fuel or fewer passengers and cargo weight in order to utilize the longest runway on the hottest days. The majority of the year, these aircraft will not be weight restricted. Wide-body aircraft are more likely to be weight-restricted under these same extreme conditions.

TABLE 3H
Takeoff Length Requirements
Phoenix-Mesa Gateway Airport

Aircraft	Runway Length at MTOW (ft.)	Still Air Range (mi.)	MTOW (lbs.)	Landing Gear Configuration
Regional Aircraft				
Dornier 328	6,500	852	30,840	D
CRJ200ER	8,300	1,795	57,500	D
CRJ700	7,400	1,939	82,300	D
CRJ900	8,400	1,837	92,750	D
ERJ 135 ER	7,800	1,500	46,500	D
ERJ 145 MP	9,500	1,380	46,500	D
ERJ 190 LR	8,600	2,630	114,000	D
Narrow Body Aircraft				
B717-200	8,300	2,060	121,000	D
B737-400	9,300	1,635	149,710	D
B737-800	10,500	3,383	174,200	D
B757-200	11,000	3,900	255,000	DT
A320-200	8,500	3,000	169,000	D
Wide Body Aircraft				
B767-300	10,800	4,675	350,000	DT
B747-400	14,100	7,260	875,000	DDT
B747-400F	13,500	4,445	910,000	DDT
B777-200	12,000	5,210	545,000	DDT
DC-10-30F	14,700	3,190	572,000	DDT
MD-11F	12,800	3,820	610,000	DDT
A380-800	13,200	8,000	1,235,000	DDT
A380-800F	13,200	6,500	1,300,000	DDT
Antonov An-225	16,200	8,700	1,320,000	DDT

Assumptions: Temperature: 106º F; Elevation: 1,382; Gradient: 0.32%
Note: Several larger aircraft have landing gear configurations that are different than noted but for weight bearing consideration fall into the listed category.
MTOW: Maximum Takeoff Weight
D: Dual Wheel Landing Gear
DT: Dual Tandem Wheel Landing Gear
DDT: Double Dual Tandem Wheel Landing Gear

Source: Aircraft operational manuals; FAA Central Region Runway Length Formula

The previous master plan reserved space for Runway 12L-30R to ultimately be extended to 12,500 feet in length. This extension was intended to accommodate long-haul cargo operations as typified by wide-body aircraft. To verify if this planned extension should be maintained in this master plan update, an analysis of the benefit to be gained was undertaken. The operating manuals for three common wide-body cargo aircraft were examined. These aircraft are the DC-10-30F, the MD-11F, and the B-747-400F. The B-747 would also be representative of the critical design aircraft for the airport falling in ARC D-V.

The runway length needed factors the airport elevation of 1,382 feet mean sea level (MSL), the runway elevation difference of 33 feet, and the average high temperature of the hottest month which is 106 degrees in July.

For cargo carriers, the ability to operate between 60 and 90 percent useful load is financially important. The more opportunity they have to reach 90 percent useful load on each flight results in more potential for maximizing revenue-ton miles and thus profit and viability will increase.

The limitation on these three cargo aircraft were determined for runways lengths of 12,500 feet (previous master plan), 11,500 feet (longest runway at PHX), and 10,400 feet (longest runway at Phoenix-Mesa Gateway Airport). It was determined that the B-747 can accommodate 62 percent useful load currently while the DC-10 and MD-11 can provide better than 80 percent. At 11,500 feet, a length comparable to the longest runway at Phoenix Sky Harbor, the B-747 provides 75 percent useful load while both the DC-10 and MD-11 provide more than 85 percent useful load. With a 12,500-foot runway, the B-747 has a useful load of 85 percent while the DC-10 and MD-11 both meet or exceed 90 percent useful load.

The chapters to follow will examine which of the three runways should accommodate a planned extension to 12,500 feet. Any potential extension will ultimately have to be justified by the needs of operators, likely long haul cargo operators, at the airport.

Table 3J outlines the runway length requirements for various groupings of general aviation aircraft. At a minimum, the FAA prefers a general aviation reliever airport to be able to accommodate 75 percent of the business jet fleet at 60 percent useful load. It is evident that all three runways currently provide adequate runway length for the general aviation fleet. In fact, large business jets of more than 60,000 pounds such as the Gulfstream V or Global Express will have no operational limitations and 100 percent of large business jets (60,000 pounds or less) can be accommodated at a 60 percent useful load.

TABLE 3J **General Aviation Runway Length Analysis** **Phoenix-Mesa Gateway Airport**	
AIRPORT AND RUNWAY DATA	
Airport Elevation	1,382 feet
Mean daily maximum temperature	106º F
Maximum difference in runway centerline elevation	33 feet
Haul length for airplanes of more than 60,000 pounds	2,000 miles
Dry runways	
RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	3,200 feet
95 percent of these small airplanes	3,800 feet
100 percent of these small airplanes	4,400 feet
Small airplanes with 10 or more passenger seats	4,800 feet
Large airplanes of 60,000 pounds or less	
75 percent at 60 percent useful load	5,600 feet
75 percent at 90 percent useful load	8,500 feet
100 percent at 60 percent useful load	7,300 feet
100 percent at 90 percent useful load	11,300 feet
Airplanes of more than 60,000 pounds approximately 8,400 feet	
Reference: Chapter Two of AC 150/5325-4A, Runway Length Requirements for Airport Design	

Runway Width

Each of the runways is currently 150 feet wide. These widths are adequate for aircraft through ADG V. Therefore, no additional runway width is required through the planning period. Paved shoulders that are 35 feet wide would be recommended for runways serving a critical aircraft in ADG V. All runways meet the runway width and shoulder width standards.

Pavement Strength

An important feature of airfield pavement is its ability to withstand repeated use by aircraft of significant weight. At Phoenix-Mesa Gateway Airport, pavement must be able to support multiple operations by large commercial and military jet aircraft on a daily basis.

The current strength rating on Runway 12R-30L and Runway 12C-30C is 55,000 pounds single wheel loading (SWL), 95,000 pounds dual wheel loading (DWL), 185,000 pounds dual tandem wheel loading (DTWL), and 550,000 pounds double dual tandem wheel loading (DDTWL).

Runway 12L-30R provides a strength rating of 75,000 pounds SWL; 210,000 pounds DWL; 590,000 DTWL; and 850,000 DDTWL.

All three runways are capable of supporting repeated operations by larger commercial passenger aircraft provided routine maintenance and periodic rehabilitation is undertaken. For heavy aircraft or cargo aircraft, the 12L-30R. It should be noted that the strength ratings for the runways apply to repeated use, not one-time or periodic use; therefore, the runway system at Phoenix-Mesa Gateway Airport is capable of supporting every aircraft to some degree. This capability should be maintained.

optimal runway would be Runway

Dimensional Design Standards

Runway dimensional design standards define the widths and clearances required to optimize safe operations in the landing and takeoff area. These dimensional standards vary depending upon the ARC for each runway. **Table 3K** outlines key dimensional standards for the airport reference codes most applicable to the airport now and in the future. As indicated earlier, the airfield should be planned to at least ARC D-V standards. The standards for D-III (large business jets) through ARC D-VI (A380) are included.

TABLE 3K
Airfield Design Standards
Phoenix-Mesa Gateway Airport

	Airport Reference Code			
Design Standard (feet)	**D-III**	**D-IV**	**D-V**	**D-VI**
Runway Width	100	150	150	200
Runway Shoulder Width	20	25	35	40
Runway Safety Area				
Width	500	500	500	500
Length Beyond End	1,000	1,000	1,000	1,000
Runway Object Free Area				
Width	800	800	800	800
Length Beyond End	1,000	1,000	1,000	1,000
Obstacle Free Zone				
Width	400	400	400	400
Length Beyond End	200	200	200	200
Runway Blast Pad				
Width	140	200	220	280
Length	200	200	400	400
Runway Centerline to:				
Hold Position (Precision)	264	264	294	294
Parallel Taxiway	400	400	450	500
Taxiway Width	50	75	75	100
Taxiway Centerline to:				
Fixed or Movable Object	93	130	160	193
Parallel Taxiway	152	215	267	324
Taxilane Centerline to:				
Fixed or Movable Object	81	113	138	167
Parallel Taxiway	140	198	245	298

Source: AC 150/5300-13, Airport Design; AC 150/5340-18D, Standards for Airport Sign Systems

TAXIWAYS

Taxiways are primarily constructed to facilitate aircraft movements to and from the runway system. Parallel taxiways greatly enhance airfield capacity and are essential to aircraft movement on the ground. Some taxiways are necessary simply to provide access to apron and terminal areas, while others are designed to facilitate the movement of aircraft to and from the runways. As activity increases, additional taxiways become necessary to provide safe and efficient use of the airfield. The taxiway system at IWA consists of a partial parallel taxiway serving Runway 12R-30L and Runway 12L-30R, exit taxiways, and access taxiways connecting the airfield to the various aircraft ramps.

The combination of Taxiways A and B are parallel to Runway 12R-30L. The northern portion of Taxiway A, between Taxiways H and G, is 630 feet from the runway, centerline to centerline. The southern portion of Taxiway A, between Taxiways V and P, is 800 feet from the runway. The middle portion of the parallel taxiway is designated as Taxiway B and is 450 feet from the runway.

The FAA provides guidance for runway/taxiway separation standards in AC 150/5300-*13, Airport Design*. For airports serving a critical aircraft in ARC D-V, such as Phoenix-Mesa Gateway Airport, and at an elevation between 1,345 feet and 6,560 feet, the separation standard is 450 feet. In addition, the parallel taxiway should be a uniform distance from the runway in order to reduce potential pilot confusion and to increase aircraft ground movement efficiency.

A portion of Taxiway C, between Taxiways G and J, is parallel to Runway 12L-30R. Based upon the previous master plan, this taxiway is planned to ultimately extend the full length of the runway to provide access to future east side landside development, including a passenger terminal building. This taxiway is 450 feet from the runway, which meets FAA standards.

The type and frequency of taxiway exits can affect the efficiency and capacity of the runway system. As discussed in the Airfield Capacity section of this chapter, the runway system does not provide the optimal number of taxiway exits. The FAA capacity model considers up to four taxiways as contributors to improved capacity. Currently, only one can be considered in the model. Therefore, the Alternatives chapter to follow will explore options for improvements to the taxiway system at the airport.

SAFETY AREA DESIGN STANDARDS

The FAA has established several safety surfaces to protect aircraft operational areas and keep them free from obstructions that could affect their safe operation. These include the runway safety area (RSA), object free area (OFA), obstacle free zone (OFZ), and runway protection zone (RPZ).

The entire RSA, OFZ, and OFA should be under the direct control of the airport sponsor to ensure these areas remain free of obstacles and can be readily accessed by maintenance and emergency personnel. It is not required that the RPZ be under airport ownership, but it is strongly recommended. An alternative to outright ownership of the RPZ is the purchase of avigation easements (acquiring control of designated airspace within the RPZ) or having sufficient land use control measures in place which ensure the RPZ remains free of incompatible development. The existing airport safety areas at Phoenix-Mesa Gateway Airport were previously depicted on Exhibit 1F.

Dimensional standards for the various safety areas associated with the runways are a function of the type of aircraft (ARC) expected to use the runways, as well as the approved instrument approach visibility minimums. Each runway can be designed to serve a different type of aircraft based on ARC. Currently, all three runways meet dimensional standards for ARC D-V. The previous master plan maintained the two outer runways to this standard while ultimately maintaining the middle runway to ARC D-III at a minimum.

Runway Safety Area (RSA)

The RSA is defined in FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, Change 11, as a "surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." The RSA is centered on the runway and dimensioned in accordance to the approach speed of the critical aircraft using the runway. The FAA requires the RSA to be cleared and graded, drained by grading or storm sewers, capable of accommodating the design aircraft and fire and rescue vehicles, and free of obstacles not fixed by navigational purpose.

The FAA has placed a higher significance on maintaining adequate RSAs at all airports. Under Order 5200.8, effective October 1, 1999, the FAA established the *Runway Safety Area Program*. The Order states, "The objective of the Runway Safety Area Program is that all RSAs at federally-obligated airports . . . shall conform to the standards contained in Advisory Circular 150/5300-13, *Airport Design*, to the extent practicable." Each Regional Airports Division of the FAA is obligated to collect and maintain data on the RSA for each runway at the airport, and perform airport inspections.

For runways serving a critical aircraft in approach categories D, as all runways at Phoenix-Mesa Gateway Airport do, the RSA must be 500 feet wide, centered on the runway, and extend 1,000 feet beyond the end of the runway.

Object Free Area (OFA)

The runway OFA is "a two-dimensional ground area, surrounding runways, taxiways, and taxilanes, which is clear of objects except for objects whose location is fixed by function (i.e., airfield lighting)." The OFA does not have to be graded and level as does the RSA; instead, the primary requirement for the OFA is that no objects in the OFA penetrate the lateral elevation of the RSA. The runway OFA is centered on the runway, extending out in accordance to the critical aircraft design category utilizing the runway.

For all runways with a critical aircraft in approach category D, the OFA must be 800 feet wide, centered on the runway, and extend 1,000 feet beyond the runway pavement end. The OFA surrounding each runway currently meets this standard.

Obstacle Free Zones (OFZ)

The OFZ is an imaginary surface which precludes object penetrations, including taxiing and parked aircraft. The only allowance for OFZ obstructions is navigational aids mounted on frangible bases which are fixed in their location by function such as airfield signs. The OFZ is established to ensure the safety of aircraft operations. If the OFZ is obstructed, the airport's approaches could be removed or approach minimums could be increased.

For all runways serving aircraft over 12,500 pounds, the OFZ is 400 feet wide, centered on the runway, and extends 200 feet beyond the runway ends. This standard will apply to all runways at Phoenix-Mesa Gateway Airport. Currently, there are no OFZ obstructions at Phoenix-Mesa Gateway Airport. Future planning should maintain the OFZ for the appropriate runway type.

Precision Obstacle Free Zone (POFZ)

For runways providing a vertically guided approach, a precision obstacle free zone (POFZ) is required. The POFZ is defined as "a volume of airspace above an area beginning at the runway threshold, at the threshold elevation, and centered on the extended runway centerline, 200 feet long by 800 feet wide." The POFZ is only in effect when the following operational conditions are met:

I. Vertically guided approach
II. Reported ceiling below 250 feet and/or visibility less than three-quarters-of-a-statute-mile
III. An aircraft on final approach within two (2) miles of the runway threshold

When these conditions are met, aircraft holding for take-off must hold in such a position so that neither the fuselage nor the tail of the aircraft penetrates the POFZ. The wings of the aircraft are allowed to penetrate the surface. Runway 30C provides a precision ILS approach, thus POFZ standards will apply to these runway ends when conditions are met. This runway currently meets POFZ requirements. Any future ILS approaches must consider the POFZ requirements.

Runway Protection Zones (RPZ)

The RPZ is a trapezoidal area centered on the runway, typically beginning 200 feet beyond the runway end. The RPZ has been established by the

FAA to provide an area clear of obstructions and incompatible land uses, in order to enhance the protection of approaching aircraft as well as people and property on the ground. The RPZ is comprised of the Central Portion of the RPZ and the Controlled Activity Area. The dimensions of the RPZ vary according to the visibility minimums serving the runway and the type of aircraft operating on the runway.

The Central Portion of the RPZ extends from the beginning to the end of the RPZ, is centered on the runway centerline, and is the width of the OFA. Only objects necessary to aid air navigation, such as approach lights, are allowed in this portion of the RPZ. The remaining portions of the RPZ, the Controlled Activity Areas, have strict land use limitations. Wildlife attractants, fuel farms, places of public assembly, and residences are prohibited. The AC specifically allows surface parking facilities but they are discouraged.

Runway 30C provides the lowest visibility minimums at three-quarters-mile in association with the ILS approach. The RPZ for this runway end has an inner width of 1,000 feet, an outer width of 1,510 feet, and a length of 1,700 feet. All other runway ends have the same size RPZ dimensions with an inner width of 500 feet, an outer width of 1,010 feet, and a length of 1,700 feet.

A corner of the Runway 30R RPZ, including a small corner of the Central Portion of the RPZ, extends across Ellsworth Road. As this is an existing condition, the FAA will likely not require any action be taken. The previous master plan recommended a 550-foot extension to the southeast of Runway 30R and a Category I (CAT I) approach, which provides for one-half mile visibility and 200-foot cloud ceilings. A CAT I approach would have an RPZ with an inner width of 1,000 feet, an outer width of 1,750 feet, and a length of 2,500 feet. This would place Ellsworth Road through the RPZ.

The previous master plan also recommended a 2,650-foot extension northwest of Runway 12R. This runway end is also planned for a CAT I approach, thus necessitating the larger RPZ. This planned RPZ would extend off airport property. The Santan Freeway (202) would pass through a portion of this RPZ as would the planned extension of Ray Road.

The RPZ currently serving the Runway 30C end also crosses airport property and Ellsworth Road. The previous master plan called for a reduction in visibility minimums for approaches to this runway, which would in turn shorten the RPZ bringing it entirely onto existing airport property.

INSTRUMENT AND VISUAL NAVIGATIONAL AIDS

A number of navigational aids are in place to assist pilots in locating and landing at Phoenix-Mesa Gateway Airport. As previously discussed in Chapter One – "Inventory", Runway 30C offers a precision instrument landing system (ILS) approach. Precision ILS approaches provide electronic descent, alignment (course), and position guidance based on the combination of a glideslope antenna, localizer antenna, and approach lights. The approach lights leading to Runway 30C are currently inoperable.

Runways 12R, 12C, 30C, and 30L provide non-precision approaches (no electronic descent guidance) utilizing VOR or GPS technology. Runway 12L-30R does not have instrument approach capability at this time; therefore, this runway can only be utilized in visual conditions (three-mile visibility and 1,000-foot cloud height ceilings).

The necessity of ILS equipment is usually determined by design standards predicated on safety considerations, operational needs, and predominant weather conditions. Commercial service airports should have the capability to remain operational, even in non-visual weather conditions. In the Phoenix area, visual conditions occur approximately 99 percent of the time. For these reasons, the primary commercial runway, Runway 12L-30R, should have CAT I capability to both ends.

In regions of the country where non-visual weather conditions occur more frequently, outfitting a second commercial runway with CAT I capability is common. For Phoenix-Mesa Gateway Airport, it is difficult to justify the expense of additional ILS equipment in order to provide CAT I approaches to a second runway. Instead, the best available GPS capability should be provided to Runway 12R-30L.

Runway 12R-30L currently provides non-precision GPS approach capability with one-mile visibility minimums. The FAA is currently approving GPS LPV (lateral precision with vertical guidance) approaches, with one mile visibility minimums, in order to provide the precision component. With a basic approach lighting system, the LPV approaches are being approved with visibility minimums not lower than three-quarters of a mile. In the near future, an approach lighting system may be all that is necessary for a precision CAT I GPS approach with one-half mile visibility minimums.

Based on the commercial service nature of the airport and the predominant meteorological conditions, both ends of Runway 12L-30R should have CAT I instrument approach capability. The Runway 30R end should have this capability through the full ILS. If feasible, Runway 12L should also have a full ILS but at least should have an approach lighting system and a three-quarter mile LPV approach. Runway 12R-30L should have LPV approaches but one mile visibility minimums should be adequate. Runway 12C-30C should have standard one mile GPS approaches.

Precision approach path indicator lights (PAPIs) are visual approach aids located to the side of the runway touchdown zone. These lights display a sequence of red and white lights that when interpreted by a pilot will indicate if the aircraft is on the correct approach path. Currently, both ends of Runway 12L-30R and Runway 12C-30C provide PAPIs. Runway 12R-30L should also be outfitted with PAPIs.

Runway end identification lights (REILs) are high intensity strobing lights located to both sides of the runway threshold. REILs provide rapid identification of the runway end to pilots from up to 20 miles in day and night conditions. REILs should be installed on those runway ends not served by an approach lighting system. Currently, only Runway 12L-30R provides REILS. The center and west runways should additionally be outfitted with REILs.

The airport beacon is located on top of the ATCT. The beacon provides pilots rapid identification of the airport location at night. A beacon should be maintained for the airport.

AIRFIELD LIGHTING, MARKING, AND SIGNAGE

The primary commercial runways, Runway 12L-30R and Runway 12C-30C, are outfitted with high intensity runway lights (HIRL). This is appropriate for these runways and should be maintained. The west runway has medium intensity runway lights (MIRLs). This is adequate and should be maintained.

Medium intensity taxiway lighting (MITL) is currently in place on all airfield taxiways. The current master plan calls for the development of an east side parallel taxiway and terminal apron. Ultimately those surfaces primarily servicing commercial aircraft should be upgraded to high intensity runway and taxiway lighting.

Lighted airfield signage currently conforms to FAR Part 139 standards. Precision runway markings are in place on all runways. The airfield signage should be maintained to Part 139 standards and the precision markings on all runways should be maintained. Distance-to-go markers are available on all runways. These should be maintained.

WEATHER AND COMMUNICATION INFORMATION

As discussed in Chapter One – "Inventory", Phoenix-Mesa Gateway Airport is equipped with six lighted wind cones and one supplemental wind cone. The lighted wind cones are located near each runway end. The supplemental wind cone is located adjacent the middle apron. The number and location of these wind cones provide adequate coverage of the airfield and should be maintained.

Phoenix-Mesa Gateway Airport is equipped with an Automated Weather Observation System (AWOS). An AWOS will automatically record weather conditions such as temperature, dew point, wind speed, altimeter setting, visibility, sky condition, and precipitation. The AWOS updates observations each minute 24-hours-a-day, and this information is transmitted to pilots in the airport vicinity via FAA VHF ground-to-air radio. Pilots can also receive these broadcasts via a local telephone number, where a computer-generated voice will present airport weather information. This system should be maintained.

Phoenix-Mesa Gateway Airport is served by the Automated Terminal Information Service (ATIS). ATIS broadcasts are updated hourly and provide arriving and departing pilots the current surface weather conditions, communication frequencies, and other important airport-specific information. The ATIS system should be maintained.

PASSENGER TERMINAL COMPLEX REQUIREMENTS

Components of the terminal area complex include the terminal building, gate positions, and aircraft apron area. This section identifies the facilities required to meet the airport's needs through the high range planning period.

The review of the capacity and requirements for various terminal complex functional areas was performed with guidance from FAA AC 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*. Facility requirements were updated to reflect the planning horizon milestones for enplanements. This included the enplanement levels of 350,000 in the short term, 850,000 in the intermediate term, two million in the long term, and five million as a high range.

Airline terminal capacity and requirements were developed for the following functional areas:

- Airline Ticketing and Operations
- Departure Facilities
- Baggage Claim
- Terminal Services
- Public Use Areas and Security
- Administration/Support

Since the airport is beginning regularly scheduled commercial service as of October 2007, it is important to assess the adequacy of the existing terminal building given these new conditions. From this baseline, the future terminal building needs can be assessed. An estimate of anticipated enplanement levels related to Allegiant Air's projected schedule is made.

Allegiant Air is offering non-stop service to 13 destinations utilizing 150-seat MD-80 aircraft. The service to each destination is offered twice a week. A board loading factor (BLF) of 70 percent is assumed based on national trends and previous BLFs experienced by Allegiant Air. It is estimated that Allegiant Air will account for 142,000 annual enplanements with this schedule.

Exhibit 3E presents the terminal building requirements for Phoenix-Mesa Gateway Airport. The exhibit shows the existing space followed by the current need. The current need column is based primarily on accommodating the influx of 142,000 annual enplanements. Short, intermediate, and long term planning horizons are then presented, and finally, a high range is presented.

TERMINAL GATE CAPACITY AND REQUIREMENTS

An airport terminal gate designates an aircraft parking position adjacent to a terminal building for the loading and unloading of passengers and baggage. The required number of aircraft gate positions will influence the selection of both the terminal concept (gate configuration) and the building design.

07MP03-3E-12/3/07

	Existing Space	Current Need	Short Term	Intermediate Term	Long Term	High Range
Enplanements	**2,991**	**142,000**	**350,000**	**850,000**	**2,200,000**	**5,000,000**
Ticketing/Check-in						
Airlines (no.)	3	2	4	7	11	16
Pax/Half Hr. Peak (no.)	105	115	283	503	711	1,615
Agent Positions (no.)	6	10	24	42	59	135
Counter Frontage (l.f.)	44	77	189	336	474	1,077
Ticket Lobby Queue (s.f.)	1,320	1,913	4,713	8,388	11,842	26,914
Airline Operations (s.f.)						
Counter Area	440	765	1,885	3,355	4,737	10,766
Airline Ops/Makeup	1,220	3,500	5,500	8,500	12,500	20,040
Subtotal Airline Operations	1,660	4,265	7,385	11,855	17,237	30,806
Gate Facilities						
Gates (no.)	3	2	6	10	18	30
Peak Occupants	150	164	404	719	1,015	2,307
Holdroom Area (s.f.)	4,760	3,608	8,888	15,818	22,330	50,752
Baggage Claim						
Pax Claiming Bags (no.)	77	83	206	367	518	1,177
Claim Display (l.f.)	250	139	343	611	863	1,961
Claim Display Floor Area (s.f.)	3,000	834	2,058	3,666	5,178	11,765
Claim Lobby Area (s.f.)	1,232	5,863	14,442	25,263	35,042	40,820
Total Bag Claim Area (s.f.)	4,232	6,697	16,500	28,929	40,220	52,585
Rental Car Counters						
Counter Frontage (l.f.)	22	55	91	138	182	376
Counter Office Area (s.f.)	220	1,092	1,812	2,757	3,645	7,521
Counter Queue Area (s.f.)	0	328	544	827	1,094	2,256
Total Rental Car Area (s.f.)	220	1,420	2,356	3,584	4,739	9,777
Concessions (s.f.)						
Food and Beverage	75	6,514	16,047	28,070	38,935	88,493
Gift Shops	75	814	2,006	3,509	4,867	11,062
Total Concessions	150	7,328	18,053	31,578	43,802	99,555
Public Waiting Lobby (s.f.)						
Public Lobby/Seating	2,120	2,606	6,419	11,228	15,574	35,397
Greeting Lobby	532	571	1,406	2,416	3,289	7,474
Total Public Waiting Lobby	2,652	3,176	7,825	13,644	18,863	42,872
TSA Security Area						
Stations (no.)	1	2	2	2	3	6
Security Queuing Area (s.f.)	2,176	1,954	4,814	8,421	11,681	26,548
Restrooms (s.f.)						
Men's/Women's	1,664	977	2,407	4,210	5,840	13,274
Administration Offices/Conf. (s.f.)						
Office, Conference	1,240	1,430	3,510	8,510	22,010	50,010
Total Square Footage	20,074	32,769	76,451	134,938	198,563	403,093
HVAC	448	3,277	7,645	13,494	19,856	40,309
Circulation	3,307	12,616	29,434	51,951	76,447	155,191
Gross Terminal Building Space (s.f.)	**23,829**	**48,662**	**113,530**	**200,383**	**294,866**	**598,593**

Exhibit 3E
TERMINAL BUILDING REQUIREMENTS

Similarly, the size and type of aircraft serviced at the airport and the airline parking arrangement and procedures will affect the apron area requirements and, ultimately, the size and layout of the terminal building.

The passenger terminal building at Phoenix-Mesa Gateway Airport supports ground level boarding only. There are three designated gates leading from the terminal building secure holding area to the aircraft apron area. The commercial aircraft apron encompasses approximately 12,000 square yards. This area can accommodate two MD-80 sized passenger jets at the same time.

Table 3L presents the gate requirements for Phoenix-Mesa Gateway Airport.

TABLE 3L
Airline Gate Requirements
Phoenix-Mesa Gateway Airport

	Available	Current	Short Term	Intermediate Term	Long Term	High Range
Daily Departures	2	3	17	34	80	158
Peak Hour Flights	2	2	9	12	18	17
Gate Requirements						
Commercial	3	2	5	7	10	22
Regional	0	0	1	3	8	8
Total Gates	3	2	6	10	18	30

At Phoenix-Mesa Gateway Airport, passenger jets are boarded utilizing mobile staircases. At airports with low enplanement levels or at airports where commuter flights are predominant, this is acceptable. At airports with regularly scheduled service utilizing jets, passengers have an expectation that they will not have to walk outside or up steps to board an aircraft. Where possible, loading bridges should be made available at all gates. Where this is not feasible, gates serving large commercial passenger airplanes should have priority in planning loading bridges and gates serving regional jets and turboprops can continue to require ground loading.

TICKETING AND AIRLINE OPERATIONS

The first destination for enplaning passengers in the terminal building is usually the airline ticket counter. The ticketing area consists of the ticket counters, queuing area for passengers in line at the counters, and the ticket lobby which provides circulation.

The ticket lobby should be arranged so that the enplaning passenger has immediate access and clear visibility to the individual airline ticket counters upon entering the building. Circulation patterns should allow the option of bypassing the counters with minimum interference. Provisions for seating should be minimal to avoid congestion and to encourage passengers to proceed to the gate area. Airline ticket counter frontage, counter area, counter queuing area, ticketing lobby, and airline office and operations area requirements for each potential enplanement level have been calculated.

The analysis of the airline ticketing lobby indicates that the area is currently inadequate based on projected enplanement levels primarily generated by the Allegiant Air schedule beginning in October 2007. Approximately 1,300 square feet of space is available while 1,900 square feet is necessary. By the long term planning horizon, approximately 11,800 square feet would be necessary.

The number of airline ticketing agent positions is a function of the number of enplaning passengers. The necessary number of agent positions is calculated as 115 enplaning passengers per half-hour peak enplanement. The half-hour peak enplanement is estimated as 0.7 percent of the peak hour enplanement level.

An estimate of the number of airline operators is also provided. This figure assumes that Phoenix-Mesa Gateway Airport will primarily be utilized as a "hub" rather than a "spoke" for airlines. Allegiant Air will be using Phoenix-Mesa Gateway Airport as a west coast hub. The number of airlines estimated is consistent with other airports with similar levels of enplanements.

An estimate for airline operations area needs is calculated. There is approximately 44 linear feet of counter frontage currently available. There is a current need for at least 77 linear feet. By the long term planning horizon, the counter area requirement is for approximately 500 linear feet. Total airline operations area includes the space behind the counter, office space, and baggage makeup area. There is a current need for approximately 4,300 square feet of space where 1,700 square feet is provided. By the long term planning horizon, more than 17,000 square feet is required.

DEPARTURE GATES AND HOLDROOMS

At the present time, there are three gate positions available in the terminal building. Each is a ground level gate. The aircraft parking apron is located immediately adjacent the terminal building and encompasses approximately 12,000 square yards of pavement. While this apron area is adequate to accommodate up to four small turboprop or regional jets, it can only accommodate two narrow-body passenger jets, such as the MD-80, operated by Allegiant Air. Since most of the operations will be conducted by this type of aircraft, the airport effectively provides two gates. Provided airline schedules are arranged in such a manner to avoid more than two narrow-body jets on the apron at the same time: two gates should be adequate to serve the current need. If airline scheduling overlaps to such an extent that more than two aircraft are at the terminal building at the same time, the ground apron dedicated to passenger operations can be expanded, primarily to the north.

By the short term enplanement level of 350,000 enplanements, the optimal number of gates rises to four. By this time, provisions should be made for a total of six gates from the terminal building. This would require doubling the ground apron area for aircraft parking. By the long term planning horizon, a total of 18 aircraft gate positions is required. The high range forecast of enplanements shows that 30 gates would be necessary.

The hold room is the waiting area for enplaning passengers once they have passed through security. This area should provide restroom facilities and concessions at a minimum. With enhanced security needs since 9/11, hold room facilities must be capable of accommodating not only passengers waiting for the next flight, but also a portion of the passengers arriving early for the subsequent flights.

The hold room area is calculated by providing 22 square feet of space per peak hour enplaning passenger. The secured hold room currently encompasses approximately 4,800 square feet of space. This hold room facility is adequate to serve the 142,000 enplanements generated by Allegiant Air beginning in October 2007. By the short term planning period, approximately 8,900 square feet of space would be required. By the long term, the hold room should provide approximately 22,300 square feet of space.

BAGGAGE CLAIM

Passenger baggage claim facilities are located on the north end of the terminal building. There is one baggage claim carousel providing 250 linear feet of claim display. The area immediately surrounding the baggage carousels provides approximately 3,000 square feet of space with an additional 1,200 square feet identified as baggage claim lobby space.

Requirements for baggage claim space are a function of peak hour deplaning passengers. Approximately six square feet of space per peak hour deplaning passenger is necessary as these passengers are typically standing for short periods of time waiting to pick up their checked luggage.

While the baggage claim area is adequate to serve the influx of passengers anticipated from the Allegiant Air schedule, the baggage lobby area is not. The baggage claim lobby area considers 18 square feet of space per peak hour passenger, plus space necessary to accommodate people arriving to pick up passengers at the terminal building.

There is a current need for approximately 6,700 square feet of space in the baggage claim area, where approximately 4,200 square feet is currently provided. At peak periods, people will naturally flow to circulation areas when claiming baggage but future planning should provide dedicated space for baggage claim.

By the long term planning horizon, approximately 40,200 square feet of space is required to accommodate passengers and visitors claiming baggage.

TERMINAL SERVICES

Similar to airline ticketing, rental car counter facilities include office, counter area, and queue areas. There are three counters identified for rental car services located in the bag claim lobby area. While the location of the rental car facilities near the bag claim area is appropriate, there is limited space for a line at the counter. When lines do form, they will occupy a portion of the bag claim lobby area.

The current need is for approximately 1,400square feet of rental car operations and passenger queue space. Approximately 220 square feet is provided. By the short term, as much as 2,400 square feet of dedicated space is required and by the long term 4,700 square feet is needed.

A small concessions stand is available at the terminal building. This facility is capable of providing beverages, snacks, and deli sandwiches. As enplanement levels rise, passenger needs for full restaurant and retail services should be planned. Calculations for concessions and retail space are a function of peak hour passenger enplanements and the number of visitors. To accommodate the enplanements generated by Allegiant Air, a current need exists for 7,300 square feet of space. In the short term planning horizon, more than 18,000 square feet are necessary.

PUBLIC USE AREA AND SECURITY SCREENING

The public lobby is where passengers or visitors may comfortably relax while waiting for arrivals or departures. In today's post 9/11 environment, visitors must remain outside the secure departure areas, so a public lobby is important. The terminal building provides approximately 2,700 square feet of space for this purpose. Public lobby area is calculated as eight square feet of space per peak hour passenger plus visitors.

A current need exists for approximately 3,200 square feet for the public lobby. As enplanements rise due to the new Allegiant Air service, passengers and visitors in the public area will begin to utilize space normally considered for circulation purposes. By the short term, 7,800 square feet are required and by the long term 18,900 square feet are required.

There is one security screening checkpoint located in a separate room on the south end of the terminal building. This room encompasses approximately 2,200 square feet of space. Approximately one-third of this space is dedicated to a passenger queue line. While facility calculations indicate that this total space for security functions meets the current need, the queue line could stretch into the ticketing lobby. To meet the current need for a security line, more of this room could be dedicated to this purpose. By the short term planning horizon, more than 4,800 total square feet are estimated to be required. Long term planning should provide for 11,700 square feet.

Restroom facilities should be provided in the secure hold area, in circulation areas, adjacent to the ticketing and bag claim areas, and in the public lobby area. Depending on the convenience to these areas, some restrooms may meet the needs of people in multiple areas. The existing total of 1,700 square feet of restroom space is adequate to meet the current need but as enplanement levels reach the short term horizon of 350,000, approximately 700 additional square feet are required. By the long term planning horizon, a total of 5,800 square feet of space are required.

BUILDING SUPPORT AND ADMINISTRATION

A common feature of modern terminal buildings is the availability of public conference room facilities. In a business environment where business people may visit many cities during a single day, the ability to meet clients or colleagues at the airport for private meetings can be an advantage. The needs of airport administration should also be considered when planning the airport terminal building. Office space is difficult to calculate as the needs of each airport will vary, but analysis indicates that additional administrative space may be necessary at Phoenix-Mesa Gateway Airport.

Currently, airport administration is located in a separate building. Terminal building planning may consider space for these functions in the future.

An attached addition to the southwest corner of the terminal building houses the majority of heating, ventilating, and air conditioning (HVAC) mechanics. The space needed for these functions is estimated at 10 percent of the building square footage before consideration of circulation needs. The HVAC facilities may currently be constrained.

Finally, the public circulation patterns should be addressed. At peak periods, congestion can build up in certain areas of the terminal building. At these congested areas, circulation areas (i.e., hallways, passage ways) will become congested as well. There is a need for greater circulation areas in the existing terminal building. As enplanement levels rise, these areas will be absorbed into other functions, such as ticketing, public lobby, and baggage claim, particularly at peak periods.

Effective circulation patterns will locate terminal services in such a manner as to avoid conflicting traffic patterns by people with differing destinations. For example, those entering the airport for departure should be able to flow from the entrance to the ticket counter to security screening and finally to the secure hold areas. Those waiting to greet arriving passengers should be able to do so without disrupting the flow of passengers going to the hold areas. From there, arriving passengers should be able to easily progress to baggage claim and then to the exit.

The layout of the existing terminal building is functionally appropriate.

Enplaning passengers enter the building near the ticket counters and can proceed directly to security screening and the hold room. These functions are all located in the south end of the terminal building. Deplaning passengers enter the building from the aircraft apron into the baggage claim lobby. Transportation services are located adjacent to the bag claim area. Restrooms are located in each of these functional areas of the terminal building, thus limiting crossing traffic patterns.

TERMINAL REQUIREMENTS SUMMARY

The primary factor contributing to terminal building space needs is the peak hour activity. The peak hour activity level considers the fact that initial flight offerings may cluster around the most desirable times (mornings and evenings). Over time, as more airlines begin service at the airport, these peak activity times can be expected to spread out through the day.

With the introduction of regularly scheduled service from Allegiant Air, consideration should be made to avoid clustering flights due to the constraints of the terminal building. Based on an estimated 142,000 passenger enplanements generated by Allegiant Air, nearly all terminal building functional areas will become constrained. Three of the most critical functional areas (the hold room, security area, and restroom facilities), meet the current need. By the short term planning horizon, all functional areas become inadequate.

The current terminal building provides a total of 23,829 square feet of space. There is a current need for a total of 48,700 square feet based on an anticipated annual enplanement level of 142,000 generated primarily by the new service offered by Allegiant Air to 13 destinations. By the short term horizon of 350,000 enplanements, a 114,000-square-foot terminal building is required. Long term enplanements of 2.2 million generate a need for a 295,000-square-foot building and a high range forecast of 5 million enplanements creates a need for a 600,000-square-foot terminal building.

Table 3M provides a point of comparison and a check on the validity of the projected terminal building needs. The primary factor influencing space needs is the design hour total passengers. By dividing this figure into the total square footage available in the terminal building, a comparative ratio can be derived.

A rule of thumb in FAA AC 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*, suggests a terminal building should provide at least 150 square feet per design hour passenger. With the enhanced security requirements since 9/11, it is generally accepted that a more reliable ratio is approximately 200 square feet per design hour passenger.

TABLE 3M
Comparison Airport Terminal Buildings
Phoenix-Mesa Gateway Airport

Airport	Enplanements	Building Size (s.f.)	Design Hour Total Passengers	Space per Design Hour Passenger (s.f.)
Phoenix-Mesa Gateway Airport (Current Need)	142,000	23,829	279	85
Cherry Capital Airport, Traverse City, MI	200,000	116,000	252	460
Lincoln Airport, NE	203,000	100,800	509	198
Rogue Valley International, Medford, OR	219,000	32,000	342	94
Hector International, Fargo, ND	221,000	76,000	270	281
Eastern Iowa Regional, Cedar Rapids, IA	441,000	106,480	529	201
Sioux Falls Regional, SD	358,000	97,300	360	270
Palm Springs International, CA	642,000	196,000	908	216
Wichita Mid-Continent Airport, KS	671,000	135,000	630	214
Des Moines International, IA	952,000	218,000	712	306
Little Rock National Airport, AR	1,115,000	168,000	560	300
Boise Airport, ID	1,297,000	172,000	1,127	153
Kona International, HI	1,522,000	324,000	953	340
Omaha-Eppley Airfield, NE	1,586,000	346,000	1674	207
Albuquerque International Sunport, NM	3,100,000	509,000	2,080	245

Source: Airport Master Plans

The existing Phoenix-Mesa Gateway Airport terminal building provides 85 square feet per passenger. This is well below the ratio experienced by other airports. This is a confirmation of the need for an expanded or replacement facility to serve the traffic anticipated to be generated by the 142,000 enplanements anticipated in the next year (current need).

The Alternatives chapter to follow will discuss the possibility of expanding the current terminal building to meet the immediate need. It appears clear that a replacement terminal building will be necessary to meet future needs. The previous master plan considered this eventuality by recommending a new terminal building located on the undeveloped east side of the airfield. This possibility will be reviewed in detail in the Alternatives chapter as well. Timing for the construction of a replacement terminal building will be discussed in the chapter covering the capital improvement program.

GROUND ACCESS REQUIREMENTS

The passenger terminal building serves as the primary interface between air and ground transportation. Ground access to the terminal area is an important consideration as access and convenience can positively influence the overall growth of an airport. The primary components to be examined are:

- Airport and Terminal Access Roadway
- Terminal Curb Frontage
- Terminal Vehicle Parking

AIRPORT AND TERMINAL ACCESS ROADWAY

In terminal facility planning, both on and off airport vehicle access is important. For the convenience of the traveler (and to provide maximum capacity), access to the terminal should include (to the extent practical) connections to the major arterial roadways near the airport.

The capacity of the airport access and terminal area roadways is the maximum number of vehicles that can pass over a given section of a lane or roadway during a given time period. It is normally preferred that a roadway operate below capacity to provide reasonable flow and minimize delay to the vehicles using it.

With all landside facilities currently located on the west side of the airfield, Sossaman Road is the primary airport access road. It is a four-lane divided roadway with dedicated turn lanes that runs along the west side of the airport terminal area. Sossaman terminates at Ray Road at the north end of the airport. Ray Road is a four lane arterial that runs to the west from the airport and intersects with Power Road.

Power Road is a major north-south arterial road with an interchange with the Santan Freeway just northwest of the airport. While Power Road provides the airport with access to the Santan Freeway, it does the same for Queen Creek and Gilbert. Power Road is currently four-lanes north of Williams Field Road, but narrows to two-lanes south of Williams Field.

To the south, Sossaman Road extends beyond the airport into Queen Creek. At the south end of the airport it narrows to a two lane roadway that intersects with Pecos Road which is also currently a two lane road. Pecos Road extends to the west into Gilbert and near the southern boundary of the airport. Ellsworth Road is a four-lane arterial located along the eastern boundary of the airport.

Exhibit 3F depicts the average weekday traffic (ADT) volumes for the key roadways in the vicinity of Phoenix-Mesa Gateway Airport. These were derived from the 2007 Traffic Volume Map prepared by the Maricopa Association of Governments (MAG) and represent counts conducted in 2006 and 2007.

The two-way daily volumes on Sossaman Road along the airport are 10,000 to the north and 12,000 to the south. A review of historic counts for this roadway suggests the volume on Sossaman Road increased significantly after the completion of the Santan Freeway. Prior to the completion of the Santan Freeway, the Road carried approximately 2,500 ADT. While a portion of this traffic growth can be attributed to the growth in activity at the airport and in the development of the Williams Campus, it appears that Sossaman is also being used by many to bypass a congested Power Road to reach the freeway. Power Road carries 25,000 to 29,000 ADT in the vicinity of the airport. Between the Santan Freeway and Ray Road, however, traffic on Power Road increases to 40,000 ADT.

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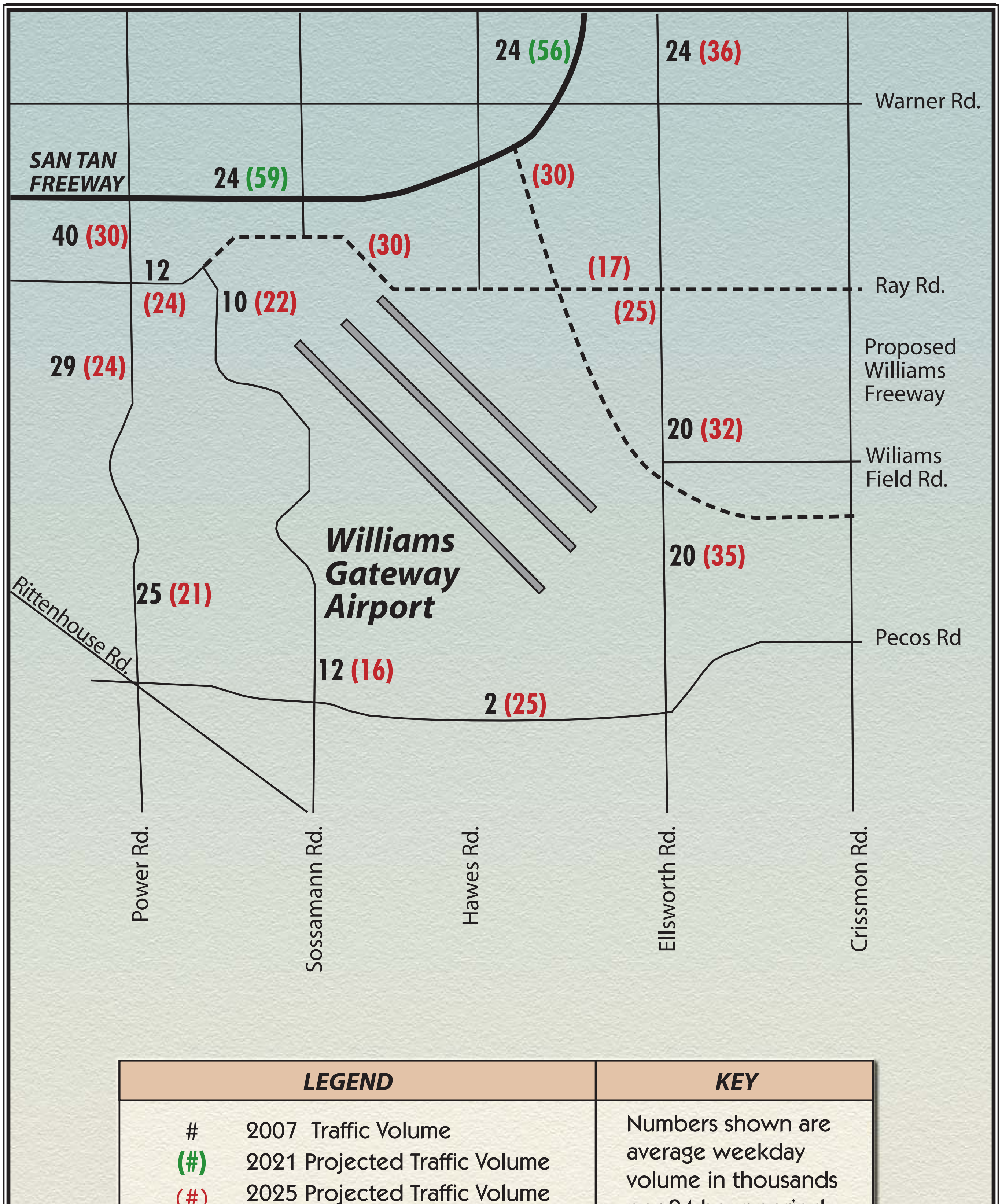


PhxMesa Gateway Airport

Exhibit 3F
AIRPORT VICINITY
TRAFFIC VOLUMES

As with the airfield, the means of describing the operational efficiency of a given roadway segment is defined in terms of six descriptive service levels. These levels of service (LOS) range from A to F and are defined as follows:

- **LOS A** – Free flowing traffic with minimal delays.
- **LOS B -** A stable flow of traffic, with occasional delays due to the noticeable presence of others in the traffic stream.
- **LOS C** – Still stable flow, but operations become more significantly affected by the traffic stream. Periodic delays are experienced.
- **LOS D** – Flow becomes more high density with speed and freedom to maneuver becoming severely restricted. Regular delays are experienced.
- **LOS E** – Maximum capacity operating conditions. Delays are extended and speeds are reduced to a low, relatively uniform level.
- **LOS F** – Forced flow with excessive delays. A condition where more traffic is approaching a point than can traverse the point.

Level of Service "D" is generally considered as the threshold of acceptable traffic conditions during peak periods in an urban area, and is used by MAG and the City of Mesa in ground transportation planning.

Table 3N outlines the LOS D and E volume thresholds as used in the *City of Mesa Transportation Plan*. The 25,000 ADT on the two-lane section of Power Road south of Williams Field Road indicates that it is already beyond the LOS E threshold. This would further suggest that Sossaman Road is being used as bypass relief for Power Road traffic. Sossaman Road ADT where it fronts the airport is still LOS C or higher, except at its intersection with Pecos Road where it narrows to two lanes at a four-way stop. At this point traffic can back up significantly during peak periods.

TABLE 3N
LOS D & LOS E Daily Volume Thresholds
Phoenix-Mesa Gateway Airport

Number of Lanes	LOS D Volume	LOS E Volume
2	11,100	14,500
4	27,700	36,200
4 land with 6 lane intersection*	31,800	41,600
6	37,900	49,600

*Street segment has four through lanes, but major intersections are improved to include six through lanes, dual left turn lands and right turn lanes on all approaches.
Source: Mesa 2025 Transportation Plan

Projected traffic levels for 2025 from the *City of Mesa Transportation Plan* completed in 2002 are also depicted on the exhibit. These projections took into account traffic projected in the previous master plan for Phoenix-Mesa

Gateway Airport. It also considers the connection of Ray Road across the north side of the airport, as well as the development of the proposed Williams Gateway Freeway (designated as State Route 802). This route would ultimately extend from the Santan Freeway east into Pinal County to U.S. Highway 60, and would also provide access for terminal facilities on the east side of the airport. The route from the Santan to Meridian Road is currently scheduled for 2016-2020 in the Regional Transportation Plan.

Assuming the passenger terminal is ultimately relocated to the east side, traffic on Sossaman was projected to reach 22,000 ADT by 2025. This would place the roadway in LOS D, thus still adequate for the long term, as long as improvements are made to the Pecos Road intersection. If the passenger terminal were to remain on the west side in its current location, the roadway could experience LOS E conditions by the intermediate planning horizon of 850,000 annual enplanements.

According to the *City of Mesa Transportation Plan*, Other arterial roadways on the perimeter of the airport are planned as six lane parkways. This would increase their LOS D threshold volumes to 37,900 ADT, meeting all of the projected traffic volumes.

The Williams Gateway Freeway was included as a six-lane parkway in the City's transportation plan, but is being considered for freeway development by the Arizona Department of Transportation. The roadway was projected to carry 25,000 ADT by the airport in 2025. This was based upon the previous master plan projection of 2.0 million annual enplanements. If the high range planning horizon level of 5.0 million annual enplanements were to be achieved, airport-generated traffic on the east side could increase by as much as 10,000 ADT from the 2.0 million levels accounted for by previous planning. The planned parkway design should still be adequate to be maintained just below the LOS D threshold.

The biggest concern for on-airport traffic will be the development of an adequate roadway system for the passenger terminal. At the current time, a terminal roadway off Sossaman Road provides access to the terminal curbfront. The limited separation between the terminal and Sossaman Road prohibits the development of a terminal loop system. Re-circulating traffic must either return through the parking lot immediately east of the terminal or enter Sossaman Road. While this is adequate for the current schedule of flights, as flights increase there will become an increasing circulation issue.

Table 3P presents the traffic volumes projected to be generated for each of the future planning horizon levels of enplanements. Using guidance provided in FAA AC 150/5360-13, *Design Guidelines for Airport Terminal Facilities*, the requirements for the future terminal loop road at the terminal curb were estimated.

The road directly in front of the terminal typically includes at least a curb lane for loading and unloading of passengers and baggage, and additional lanes as necessary to provide adequate traffic flow. As traffic increases, a median curb lane is often included for additional curb length. According to the Advisory Circular, the through lane closest to the curb lane can accommodate up to 300 vehicles per hour at LOS D while outer lanes can increase through put capacity up to 600 vehicles per hour.

TABLE 3P
Terminal Access Road Volumes
Phoenix-Mesa Gateway Airport

	Short Term	Intermediate Term	Long Term	High Range
Annual Enplanements	350,000	850,000	2,200,000	5,000,000
Terminal Road Projected Volume				
Design Day	1,995	4,155	9,777	19,309
Peak Hour	148	314	739	1,460
Through Lanes	1	2	3	6

Source: Institution of Transportation Engineers Trip Generation, 7th Edition, 2003.

As indicated earlier, a single through lane is adequate for the current level of activity. By the short term, however, a second lane will become necessary to avoid significant degradation of service level. In the long term, a third lane may need to be considered, or even the establishment of a median curb. The high range will need to consider a median curb and up to six lanes if not a two-level terminal roadway.

TERMINAL CURB FRONTAGE

The curb element is the interface between the terminal building and the ground transportation system. The length of curb required for the loading and unloading of passengers and baggage is determined by the type and volume of ground vehicles anticipated in the peak period on the design day.

A typical problem for terminal curb capacity is the length of dwell time for vehicles utilizing the curb. At airports where the curb front has not been strictly patrolled, vehicles have been known to be parked at the curb while the driver and/or riders are inside the terminal checking in, greeting arriving passengers, or awaiting baggage pickup. Since most curbs are not designed for vehicles to remain curbside for more than two to three minutes, capacity problems can ensue. Since the events of September 11, 2001, most airports police the curb front much more strictly for security reasons. This alone has reduced the curb front capacity problems at most airports.

The existing terminal building curb is approximately 300 feet in length. To access the terminal curb area, drivers access the terminal loop road from South Sossaman Road. As enplanement levels rise with the beginning of regularly scheduled service by Allegiant Air, a terminal curb length of 320 feet is estimated. The existing curb should be adequate to serve this traffic. At peak times congestion may be experienced at the terminal curb.

At the short term planning horizon nearly 800 feet of terminal curb is estimated. By the long term, nearly 2,000 feet should be made available for enplaning and deplaning passengers and visitors. As the airport matures, passengers are more likely to use rental cars, mass transit, or other transportation mode to arrive and depart the airport. Therefore, high range auto parking and terminal curb needs are calculated as 80 percent of enplanements. **Table 3Q** presents terminal curb needs through each planning horizon.

TABLE 3Q
Airline Terminal Automobile Requirements
Phoenix-Mesa Gateway Airport

	Existing	Current Need	Short Term	Intermediate Term	Long Term	High Range
Terminal Curb						
Enplane Curb (ft)	150	148	364	647	914	1,661
Deplane Curb (ft)	150	172	424	755	1,066	1,938
Total Curb (ft)	300	320	788	1,402	1,979	3,599
Auto Parking						
Total Public Parking	820	213	525	1,275	3,300	6,000
Employee	88	36	88	213	550	1,400
Rental car	21	50	123	298	770	1,000
Total All Parking	**929**	**299**	**736**	**1,786**	**4,620**	**8,400**

TERMINAL VEHICLE PARKING

Vehicle parking in the airline passenger terminal area of the airport includes those spaces utilized by passengers, visitors, rental car agencies, and employee parking for those working in the terminal complex. Parking spaces can be classified as public, employee, and rental car.

There are a total of 908 terminal building parking spaces for patrons and employees, with an additional 21 spaces for rental cars. For planning purposes, 88 of the terminal building spaces are assumed to be for employees only (in the lot to the west of Sossaman Road). An additional 71 public parking spaces are planned as an extension of the south terminal building parking lot.

As an airport located on the suburban ring, with limited mass transit options to the airport, it is common for most travelers to drive and park at the airport for the duration of their trip. Subsequently, the ratio of parking to enplaned passengers is higher than might be expected in large metropolitan settings. In addition, strict enforcement at the terminal curb for security purposes will eliminate extended curb parking and increase the need for parking.

Planning for terminal building vehicle parking is based on forecast enplanement levels. A planning ratio of 150 spaces per 100,000 enplanements is utilized. Rental car parking space needs are determined at a rate of 35 spaces per 100,000 enplanements, and employee parking was determined at a rate of 25 spaces per 100,000 enplanements. The factor for rental car spaces is higher than may normally be considered because the Phoenix-Mesa area is a destination attracting more tourists than just a business destination would attract. **Table 3Q** presents forecast terminal building vehicle parking needs.

There appears to be an adequate supply of public and employee parking to meet the projected demand generated by the Allegiant Air schedule. However, as the airport approaches 350,000 enplanements in the short term, the parking supply becomes constrained. At this level, 525 public spaces and 50 rental car spaces are needed. Employee parking is still adequate at this level.

By the intermediate planning horizon, vehicle parking needs are acute. Nearly 1,800 parking spaces would be needed at this juncture. By the long term planning horizon, more than 4,600 parking spaces would be needed. Additional consideration should be given to providing up to 8,400 parking spaces as a high range forecast.

The airport administration has been proactive in planning for adequate parking to accommodate increases in passenger traffic. Two areas have been identified for additional parking facilities. The first is located to the west of Sossaman Road in the proximity of the old fuel farm. The other is located to the north of the RPZ leading to Runway 12C-30C. This would be a long term lot accessible from the planned Ray Road extension. Both lots would require shuttle bus service.

AIR CARGO REQUIREMENTS

The two primary cargo-related facilities requiring analysis include cargo apron area and building space. The existing cargo apron area encompasses approximately 30,000 square yards. Space is reserved to double the size of this apron as demand grows. The cargo building is approximately 25,000 square feet. The cargo building has expansion capability to 80,000 square feet.

To examine cargo aircraft apron needs, the space requirements of individual aircraft common in air cargo use were reviewed. The B-727-200 requires an average ramp envelope of 5,900 square yards. The Boeing 757, Boeing 767, DC-8, and Airbus A300-600 require approximately 8,800 square yards of apron. The Boeing 747 requires up to 13,400 square yards of cargo apron area and circulation space. The Airbus A380 requires up to 18,000 square yards. A planning standard of 700 square yards of apron was used to determine feeder aircraft (i.e., Cessna Caravan) apron requirements.

The projection of future apron requirements considers the development of an air cargo distribution operation in the short term. This includes activity by two feeder aircraft and two jet aircraft (one B-727, and one B-767) in the short term. By the intermediate term, three feeder aircraft and six jets (two B-727s, three B-767s, and one B-747) are considered. The high range forecast considers the addition of cargo operations by the A380.

An industry planning standard of 500 pounds of enplaned cargo per square foot was used to determine building space requirements. In addition, consideration should be given to the need for staging activities and parking. Typically, an area that is three times the building size is provided for these activities. Air cargo facility requirements are summarized on **Table 3R**.

TABLE 3R
Air Cargo Facility Requirements
Phoenix-Mesa Gateway Airport

Aircraft Type	Apron Planning Standard (s.y.)	Existing	Short Term	Intermediate Term	Long Term	High Range
Feeder Aircraft (Caravan)	700		1,400	2,100	2,800	2,800
B-727	5,900		5,900	11,800	11,800	11,800
B-757, B-767	8,800		8,800	8,800	17,600	17,600
B-747	13,400		0	13,400	26,800	26,800
A-380	18,000		0	0	0	18,000
Total Cargo Apron (s.y.)		**30,000**	**16,100**	**36,100**	**59,000**	**77,000**
Enplaned Cargo (tons)		**59**	**10,000**	**21,000**	**44,000**	**100,000**
Cargo Building (s.f.)		**25,000**	**40,000**	**84,000**	**176,000**	**400,000**
Cargo Staging Area (acres)		**0.45**	**0.90**	**1.90**	**4.00**	**9.20**

GENERAL AVIATION FACILITIES

General aviation (GA) facilities are those necessary for handling general aviation aircraft and passengers while on the ground. This section is devoted to identifying future GA facility needs during the planning period for the following types of facilities normally associated with general aviation terminal areas:

- Hangars
- Aircraft Parking Apron
- General Aviation Terminal Services
- General Aviation Parking
- Support Facilities

HANGARS

Utilization of hangar space varies as a function of local climate, security, and owner preferences. The trend in general aviation aircraft, whether single or multi-engine, is toward more sophisticated aircraft (and consequently, more expensive aircraft); therefore, many aircraft owners prefer enclosed hangar space to outside tie-downs.

The demand for aircraft storage hangars is dependent upon the number and type of aircraft expected to be based at the airport in the future. For planning purposes, it is necessary to estimate hangar requirements based upon forecast operational activity. However, actual hangar construction should be based upon actual demand trends and financial investment conditions.

It is common in desert climates for a number of aircraft owners to prefer to tie-down their aircraft outside rather than rent or build an enclosed hangar. Of the 115 total based aircraft currently at the airport, it is estimated that 52 percent of them are regularly, based on visual observation and airport records, stored in a hangar. Over time, this percentage can be expected to increase. By the long term, 84 percent of based aircraft are estimated to be stored in a hangar.

T-hangars typically house small twin-engine or single-engine piston-powered aircraft. There are currently no T-hangar spaces but a general aviation hangar complex is currently being built that will provide 37 T-hangar positions. For determining future aircraft storage needs, a planning standard of 1,200 square feet per based aircraft is utilized for T-hangars.

Box hangars have become a popular aircraft storage hangar option. Box hangars are open-span facilities that can range in size from 40 feet by 40 feet to as large as 80 feet by 80 feet. This type of hangar typically has amenities such as running water, restrooms, and a small office area. Since a larger aircraft or multiple aircraft can be stored in a box hangar, a planning standard of 2,500 square feet per based aircraft is utilized.

There are several conventional hangars on the airfield. Conventional hangars are large open-span hangars typically measuring at least 80 feet by 80 feet. These hangars are often used to house airport businesses, FBOs, corporate flight departments, or bulk storage of multiple aircraft. While there are many conventional hangars at the airport, only a few can be considered as general aviation hangars. **Table 3S** presents the existing general aviation conventional hangars.

TABLE 3S
Existing General Aviation Conventional Hangars (2006)
Phoenix-Mesa Gateway Airport

GA Hangars	Hangar Space	Office Space	Positions
Chandler Gilbert Community College Hangar	10,000	800	2-4
Fighter Combat	13,000	5,000	3
Intel	20,000	4,000	2
Himovitz South	14,000	3,000	0-6
Total	**57,000**	**12,800**	**7-15**

Note: all area measurements in square feet.

Conventional hangars are capable of housing larger aircraft than either a T-hangar or a box hangar. A planning standard of 2,500 square feet of space per aircraft is used for storage capability. A portion of conventional hangars is often utilized for maintenance or for office space. At a typical GA airport, maintenance area requirements can be estimated at 175 square feet per based aircraft. **Table 3T** provides a summary of the aircraft storage needs through the long term planning horizon.

TABLE 3T
Aircraft Storage Hangar Requirements
Phoenix-Mesa Gateway Airport

		Future Requirements		
	Currently* Available	**Short Term**	**Intermediate Term**	**Long Term**
Total Based	115	200	241	350
T-hangar Positions	37	69	76	122
Box Hangar Positions	34	45	56	88
Conventional Hangar Positions	20-39	39	53	83
Hangar Area Requirements (s.f.)				
T-hangar Area	39,300	83,200	91,500	146,600
Box Hangar Area	80,000	112,000	140,900	219,100
Conventional Hangar Area	112,000	96,600	131,900	206,400
Maintenance Area	38,100	35,000	42,175	61,250
Total Hangar Storage Area (s.f.)*	**269,400**	**326,800**	**406,500**	**633,400**

*Includes hangars under construction

Based on assumptions of accommodating all forecast based aircraft at the airport, approximately 326,800 square feet of hangar storage space is needed in the short term. There are currently several hangar facilities under construction at the airport that will help meet this demand. **Table 3U** presents those general aviation hangar facilities that are currently under construction and should come online within the next year.

AIRCRAFT PARKING APRON

FAA Advisory Circular 150/5300-13, *Airport Design*, Change 11, suggests a methodology by which transient apron requirements can be determined from knowledge of busy-day operations. At Phoenix-Mesa Gateway Airport, the number of itinerant spaces required was determined to be approximately 13 percent of the busy-day itinerant operations. A planning criterion of 800 square yards per aircraft was applied to determine future transient apron requirements for single and multi-engine aircraft. For business jets, a planning criterion of 1,600 square yards per aircraft position was used. Locally based tie-downs typically will be utilized by smaller single engine aircraft; thus, a planning standard of 650 square yards per position is utilized.

Apron parking requirements are presented in **Table 3U**. Transient apron parking needs are divided between business jet and smaller piston-powered aircraft needs. For planning purposes, 60 percent of the transient GA apron space needs are attributable to business jets. The remaining 40 percent of apron space needs is assigned to single and multi-engine aircraft.

TABLE 3U
Aircraft Parking Apron Requirements
Phoenix-Mesa Gateway Airport

	Available	Short Term	Intermediate Term	Long Term
Transient Single, Multi-engine Aircraft Positions		10	13	15
Apron Area (s.y.)		8,000	10,100	12,400
Transient Business Jet Positions		15	19	23
Apron Area (s.y.)		23,900	30,200	37,100
Locally-Based Aircraft Positions		67	76	78
Apron Area (s.y.)		43,700	49,100	50,400
Total Positions	±100	92	107	116
Total Apron Area (s.y.)	89,000	75,600	89,400	99,900

The available apron encompasses 89,000 square yards of the north apron, where the majority of general aviation activity takes place. Currently, it is estimated that 100 parking spaces could be made available. Locally based apron needs include those aircraft that tie-down plus a buffer of 20 positions for various transitional activities such as bringing aircraft in and out of a hangar for maintenance purposes. This apron area is capable of accommodating all tie-down aircraft in the short term. In the intermediate and long terms, there may be a need to accommodate more tie-down aircraft. This will likely not be an urgent need as some spaces could be reclaimed from the 20 spaces used for transitional activities.

In the short term, 25 transient positions should be made available. Of this total, 15 are designated for business jets. By the long term, a total of 38 transient positions may be needed with 23 of these needed for business jets.

The total general aviation apron area needed through the long term planning period is approximately 100,000 square yards. While this analysis indicates a potential need for more general aviation apron area in the long term, only actual demand should be considered when expanding the general aviation apron.

GENERAL AVIATION TERMINAL FACILITIES

General aviation terminal facilities have several functions. Space is required for a pilots' lounge, flight planning, concessions, management, storage, and various other needs. This space is not necessarily limited to a single, separate terminal building, but can include space offered by fixed base operators (FBOs) for these functions and services. Currently, GA terminal services are provided by Gateway Aviation Services which is operated by the Airport Authority.

The methodology used in estimating general aviation terminal facility needs is based on the number of airport users expected to utilize general aviation facilities during the design hour. General aviation space requirements were then based upon providing 120 square feet per design hour itinerant passenger. Design hour itinerant passengers are determined by multiplying design hour itinerant operations by the number of passengers on the aircraft (multiplier). An increasing passenger count (from 2.8 to 3.2) is used to account for the likely increase in the number of passengers as a greater number of larger aircraft utilize the general aviation services at the airport. **Table 3V** outlines the general aviation terminal facility space requirements for Phoenix-Mesa Gateway Airport.

TABLE 3V
General Aviation/Air Taxi Terminal Area Facilities
Phoenix-Mesa Gateway Airport

	Current	Short Term	Intermediate Term	Long Term
Design Hour Operations	32	51	60	85
Design Hour Itinerant Operations	12	20	26	43
Multiplier (passengers per operation)	2.8	2.9	3.0	3.2
Total Design Hour Itinerant Passengers	34	59	77	136
General Aviation Building Spaces (s.f.)	±10,000	7,100	9,200	16,300

As can be seen from the table, the current facilities appear to be adequate through the intermediate planning period. By the long term, the general aviation terminal building may become constrained slightly.

An additional consideration for terminal space is the anticipated emergence of a new class of aircraft. A number of aircraft manufacturers are producing lower-cost microjets or very light jets (VLJs). The VLJs typically have a capacity of up to six passengers. A number of new companies are positioning themselves to utilize the VLJs for on-demand air taxi services. The air taxi businesses are banking on a desire by business travelers to avoid delays at major commercial service airports. Airports with appropriate general aviation terminal facilities are better positioned to meet the needs of this new class of business traveler. As presented in the table, the existing public spaces appear adequate through the intermediate term of the master plan.

AUTOMOBILE PARKING

General aviation parking needs fall into two categories: based aircraft owner needs and transient user or FBO needs. Automobile parking spaces required to meet general aviation itinerant demands were calculated by taking the design hour itinerant passengers and using a multiplier of 2.9, 3.0, and 3.2 for each planning period. This multiplier represents the increase in corporate operations, and thus, an increase in the number of passengers per itinerant operation due to the larger capacity of general aviation aircraft.

The existing FBO/itinerant user parking lot is to the immediate west of the general aviation service center building. This lot encompasses 185 spaces in total, but it also serves several businesses including a restaurant which lease space in the building. This lot is regularly full, particularly at peak times such as lunch. As a result of the dual use of this parking lot, 50 spaces are estimated to be for the exclusive use of FBO/itinerant users.

The parking requirements of based aircraft owners are also considered. Although some owners prefer to park their vehicles in their hangars, safety can be compromised when automobile and aircraft movements are intermixed. For this reason, separate parking requirements which consider a parking space for one-half of the based aircraft at the airport were applied to general aviation automobile parking space requirements.

The number of parking spaces appears to be adequate, but the location of those lots may not be convenient or efficient. While this analysis presents an overall number to plan for, it does not locate those facilities. For example, the GA hangar facilities at Phoenix-Mesa Gateway Airport are spread over a wide area. Several smaller lots may be appropriate in the future. All future facility planning will consider parking requirements. **Table 3W** presents general aviation vehicle parking needs.

TABLE 3W
GA Vehicle Parking Requirements
Phoenix-Mesa Gateway Airport

		Future Requirements		
	Available	Short Term	Intermediate Term	Long Term
Design Hour Itinerant Passengers	34	59	77	136
GA Itinerant Spaces	50	118	154	272
GA Based Spaces		100	121	175
Total GA Parking Area (s.f.)	20,000	87,200	109,800	178,800
Total Parking Spaces	50	218	275	447

SUPPORT FACILITIES

Various facilities that do not logically fall within classifications of airside or landside facilities have also been identified. These other areas provide certain functions related to the overall operation of the airport.

AVIATION FUEL STORAGE

Aviation fuel storage facilities at Phoenix-Mesa Gateway Airport are located in a consolidated fuel farm which is located south of the south apron. This fuel farm provides storage capacity for 150,000 gallons of Jet fuel and 12,000 gallons of Avgas. All fuel is transported via mobile trucks to waiting aircraft. There are three Avgas fuel trucks, two with a capacity of 1,500 gallons and one with a 1,200 gallon capability. There are five operational Jet A fuel trucks with a total capacity of 33,000 gallons. Fuel sales and delivery is managed by Gateway Aviation Services, the airport owned FBO.

The airport strives to maintain an eight day supply of fuel in order to avoid running low in case of an interruption in the delivery supply. Currently all fuel is delivered by truck. **Table 3X** presents the storage capacity necessary to meet this goal based on operational activity. As can be seen by the short term planning horizon, when the airport is forecast to have 350,000 annual enplanements, nearly 248,000 gallons of Jet A storage capability is necessary.

TABLE 3X
Fuel Storage Requirements
Phoenix-Mesa Gateway Airport

			Planning Horizon			
	Available	Current (2006)	Short Term	Intermediate Term	Long Term	High Range
Jet A Requirements						
Daily Usage (gal.)		12,000	31,000	57,000	118,000	219,000
Eight Day Storage (gal.)	150,000	96,000	248,000	456,000	944,000	1,752,000
Avgas Requirements						
Daily Usage (gal.)		4,786	5,671	6,301	7,123	7,123
Eight Day Storage (gal.)	12,000	38,000	45,000	50,000	57,000	57,000

Assumptions:
Jet A
700 gallons per airline and cargo operation.
100 gallons per air taxi operation.
25 gallons per itinerant general aviation operation.

Avgas
10 gallons per general aviation local operation.

With the introduction of regularly scheduled service by Allegiant Air, and the basing of at least four MD80s (Two by Allegiant and two by the U.S. Marshall Service) at the airport in addition to frequent itinerant jet activity, particular attention should be paid to the adequacy of fuel delivery to all aircraft. In interviews with the FBO management, it was indicated that there may be a need for more delivery vehicles before the fuel farm needs to be expanded.

Further interviews with FBO management brought to light the presence of fuel pipeline near the south border of the airport. This pipeline runs from Houston to Phoenix (called the El Paso line). The suggestion was made to tap this pipeline and avoid the need for truck delivery and the potential for an interruption in fuel supplies. The pipeline industry is further considering the construction of a new pipeline from El Paso to Las Vegas (called the Longhorn line).

To accommodate a direct fuel pipeline to the airport, appropriate off and on-airport right-of-way will need to be reserved. Since potential pipeline access points are located to the south of the airport, the shortest right-of-way would enter the airport from the south. Planning for an east side fuel farm should consider a southeast location in order to provide a more direct location for a potential direct fuel supply.

AIRCRAFT RESCUE AND FIREFIGHTING (ARFF)

Requirements for Aircraft Rescue and Firefighting (ARFF) services at an airport are established under *Federal Aviation Regulation (F.A.R.) Part 139*. F.A.R. Part 139.49 establishes an ARFF index determination. The ARFF facility at Phoenix-Mesa Gateway Airport is located to the immediate north of the passenger terminal building facing the middle apron. This location meets response time criteria for the current airfield.

The requirements for ARFF equipment at an airport are determined by the length of the air carrier aircraft with at least five daily departures a week. **Table 3Y** indicates the requirements for each ARFF Index and the associated equipment requirements.

Phoenix-Mesa Gateway is currently equipped for Index B requirements with Index C available with 24-hour notification. To meet Index B requirements, at least one vehicle able to carry 500 pounds of sodium-based dry chemical or halon 1211, and 1,500 gallons of water and the commensurate quantity of Aqueous Film-Forming Foams (AFFF) for foam production is required. If two ARFF vehicles are used, one must carry those agents listed for Index A requirements, and the other vehicle must carry 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.

TABLE 3Y
Aircraft Rescue and Firefighting Requirements
Phoenix-Mesa Gateway Airport

Airport Index	Aircraft Length	Example Aircraft	ARFF Vehicles	Extinguishing Agents (Combined capacities of all vehicles)
A	less than 90 feet	Dornier 328	1	500 lbs. of sodium-based dry chemical, or 450 lbs. of potassium-based dry chemical, plus 100 gal. of water/foam
B	90-125 feet	B-737	1-2	Index A with 1,500 gal. of water/foam
C	126-158 feet	MD-80	2-3	Index A with 3,000 gal. of water/foam
D	159-200 feet	B-757	3	Index A with 4,000 gal. of water/foam
E	over 200 feet	B-767	3	Index A with 6,000 gal. of water/foam

Source: Federal Aviation Regulations Part 139.

Allegiant Air operates MD-80 aircraft with a length of 147 feet. With more than 26 weekly departures anticipated, ARFF Index C should be in place on a full time basis at the airport. This level of ARFF service should be adequate through the short term planning horizon. By the intermediate planning horizon, a longer aircraft such as the B-757 (178 feet long) or the B-767 (201 feet long), could meet the FAA threshold activity level. The B-757 would require ARFF Index D and the B-767 would require ARFF Index E.

To meet Index C requirements, either two or three vehicles may be used. If three vehicles are used, one vehicle must meet those requirements for Index A, and the other two vehicles must carry an amount of water/foam so that the total quantity is at least 3,000 gallons. If two vehicles are used, one must meet the requirements previously listed for Index B, and the other vehicle must carry at least 3,000 gallons of water/foam.

Index D and E will require at least three dedicated vehicles. One of these must meet Index A requirements and the combination of the remaining vehicles must have a capacity for either 4,000 gallons of water/foam (Index D) or 6,000 gallons of water/foam (Index E).

Additional regulations include that each foam fire fighting and rescue vehicle carrying less than 4,000 gallons of water must be capable of discharging one complete tank capacity with appropriate foam concentrate in not more than 2 1/4 minutes, with all orifices open. Further regulations require that at least one vehicle must be capable of reaching the midpoint of the farthest runway within three minutes from the time of the alarm to the time of initial agent application.

PERIMETER FENCING

The entirety of Phoenix-Mesa Gateway Airport is enclosed by chainlink fencing. Fencing at the airport meets Title 14 CFR, Part 107 and TSAR Part 1542 requirements and will prevent inadvertent entry onto airport property by persons or vehicles. Signs restricting access are posted on all gates and at regular intervals around the perimeter. The airport has established procedures in the Airport Security Program for controlling access onto the air operations area through perimeter gates.

AIRPORT MAINTENANCE AND EQUIPMENT

The primary airport maintenance facility is located on the south apron area adjacent the ATCT. This building encompasses approximately 23,500 square feet. This building was constructed in 1968 and is utilized for office space, shops, and storage. Equipment and material are stored in several smaller buildings throughout the airport. The need for additional maintenance buildings will be a function of airfield development and airport management needs. All airfield maintenance facilities should be consolidated with direct and secure access to the airfield.

Phoenix-Mesa Gateway Airport is located in the desert southwest and rarely receives snow or ice conditions.

Therefore, no snow or ice removal equipment is maintained at the airport. Should such conditions occur the airport would close those movement areas affected.

UTILITIES

Access to appropriate utilities for future development is available to west side of the airport. Should development occur to the south of Velocity Way, additional utilities would need to be extended. The east side of the airport has limited electrical and communications lines supporting specific functions. There are no water, sewer, or gas lines in this area. When significant development occurs on the east side of the airport, further analysis of the utility needs will need to be undertaken.

AIRBUS A380 REQUIREMENTS

As part of this airport master plan, consideration is given to the facility requirements of the Airbus A380 aircraft. It is anticipated that Phoenix-Mesa Gateway Airport would serve as a back-up airport to PHX for the operation of the A380. This analysis includes dimensional standards, pavement strength, and terminal building requirements for the A380. A primary source for this analysis is *A380 - Airplane Characteristics for Airport Planning AC*, as published by Airbus in March 2006 and revised in April 2007.

The A380 is a double-deck aircraft with a payload capacity of 200,000 pounds (336,000 pounds for the freighter version) and a wingspan of 262 feet. Initial deliveries of the A380 passenger aircraft are expected in October of 2007. The A380 freighter model is not expected to enter into service until 2014. The A380 is the largest passenger aircraft in the world. Its maiden flight was April 27, 2005. The A380 can accommodate from 525 to 853 passenger seats depending on the configuration. **Table 3Z** presents technical specifications for the A380.

As of August 2007, there were 174 orders for the A380-800, of which 165 are firm orders. Emirates Airlines has placed the largest order of 55 A380-800 passenger aircraft. There are currently no United States based airlines with orders for the A380, however International Lease Finance Corporation (ILFC), which is based in Los Angeles, California has placed an order for 10 A380-800 aircraft. ILFC leases aircraft to airlines throughout the world including U.S. based American Airlines, Continental Airlines, and Delta Airlines. FedEx and UPS both had orders for the A380-800F freighter aircraft, but have since canceled those orders due to design and production delays.

TABLE 3Z
Airbus A380 Technical Specifications

Measurement	A380-800 Passenger	A380F Freighter
Cockpit Crew	Two (2)	
Seating Capacity	525 (3-class) 853 (1-class)	
Length	239 ft. 6 in.	
Span	261 ft. 10 in.	
Height	79 ft. 1 in.	
Wheelbase	99 ft. 8 in.	
Outside fuselage width	23 ft. 6 in.	
Cabin width, main deck	21 ft. 8 in.	
Cabin width, upper deck	19 ft. 6 in.	
Wing area	9,100 s.f	
Operating empty weight	610,200 lbs.	556,000 lbs.
Maximum takeoff weight (MTOW)	1,235,000 lbs.	1,300,000 lbs.
Maximum payload	200,000 lbs.	336,000 lbs.
Cruise speed	0.85 Mach	
Maximum speed	0.89 Mach	
Takeoff run at MTOW	9,020 ft. MSL	9,510 ft. MSL
Range in design load	8,200 nm	5,600 nm
Service ceiling	43,000 ft.	
Maximum fuel capacity	81,890 gal.	
Engines (4x)	GP7270 Trent 970	GP7277 Trent 977

MSL: Mean Sea Level

Source: A380 - Airplane Characteristics for Airport Planning AC, Airbus March 2006; Wikipedia: A380 accessed on September 8, 2007.

Airfield Design Requirements

The A380 has a wingspan 262 feet and an approach speed of 145 knots, making it an ARC D-VI aircraft. This approach speed is lower than that of the Boeing 747 and therefore the A380 can generally utilize the same runways as the B-747. The runway length necessary for the A380 to takeoff fully loaded at Phoenix-Mesa Gateway Airport would be 13,200 feet. This length takes into consideration an airport elevation of 1,382 feet, an average high temperature of 106 degrees in July, and the runway gradient.

The runway width design standard for Airplane Design Group (ADG) VI is 200 feet according to FAA design standards. In February of 2004, the FAA released Engineering Brief No. 65, *Minimum Requirements to Widen Existing 150-Foot Wide Runways for Airbus A380 Operations*. This memorandum summarized the specific conditions that would have to be met for an airport to convert shoulder pavement on an existing 150-foot wide runway to useable runway pavement for use by the A380.

The taxiway width standard for ADG VI is 100 feet. In April of 2006, Engineering Brief No. 63A *Revision - Use of Non-Standard 75-Foot-Wide Straight Taxiway Sections for Airbus 380 Taxiing Operations* was issued. This brief allows FAA Regional Division Managers to approve modifications to standards for A380 taxi routes using 75 foot wide straight taxiway sections under certain condition.

After years of study, both the FAA and the European Aviation Safety Agency (EASA) agreed that the A380 can operate on runways and taxiways designed to ADG V standards. This allows for the operation of the A380 on 150-foot wide runways and 75-foot taxiways. "This aircraft has been shown to be safely controllable and to be compliant with applicable airworthiness requirements when operating on runways with a width of 45 meters (150 feet) or more," stated James J. Ballough, director of the FAA's Flight Standards Service, in an official correspondence to Airbus dated July 19, 2007.

While the FAA has indicated that the A380 can safely operate on runways and taxiways designed to ADG V standards, airports should be sure that separation is maintained on runways and taxiways when two of the aircraft pass each other. Taxiway shoulders may be required to be paved to reduce the likelihood of foreign object damage caused to (or by) the outboard engines, which overhang more than 80 feet from the centre line of the aircraft. Any taxiway or runway bridge must be capable of supporting the A380's maximum weight.

Pavement Strength

The most important feature of airfield pavement is its ability to withstand repeated use by aircraft of significant weight. At Phoenix-Mesa Gateway, pavement must be able to support multiple operations of large commercial aircraft on a daily basis. The A380-800 is expected to have a maximum weight of up to 1.3 million pounds on 20 landing gear wheels which produce less weight per wheel than a Boeing 747 or 777. Runway 12L-30R provides the highest strength rating of 850,000 pounds for similar landing gear configurations. While this runway can accommodate occasional operations by a fully loaded A380, regular usage would necessitate an increase in runway strength.

Terminal Requirements

Passenger terminal facilities may also need to be upgraded to meet the design characteristics of the A380. With a much larger passenger capacity than traditional commercial airline aircraft, gate areas, jetways, restrooms, and baggage carousel areas will need to be expanded to handle the increased passenger and baggage flow.

A ramp area of 7,650 square yards at the terminal gate is needed to facilitate an A380 aircraft. Service vehicles and jetways will need to be able to reach the upper deck of the aircraft, and tractors will be needed that are capable of handling the A380's maximum ramp weight.

A380 Conclusion

Airports across the country began to assess the infrastructure improvements necessary to fully accommodate the A380 including widening and strengthening runways and taxiways. Several reports concluded that to meet design standards for the A380 at 18 U.S. airports would cost in excess of one billion dollars (Government Accounting Office August 2007). Nearly 80 percent of this total was identified for airfield improvements. In July 2007, the FAA approved the operation of the A380 at airports meeting ADG V standards for 150-foot wide runways and 75-foot wide taxiways.

With the airfield questions resolved, airports are focusing on terminal area improvements and ARFF needs. As discussed, the A380 has two decks and can accommodate up to 853 passengers. There may be a need for expanded passenger gate areas and possibly the need for two jetways to increase the boarding speed. With the large size of the A380 (and Boeing 747-800) there may be a need for additional equipment, personnel or training to improve the ability of ARFF to respond to super jumbo jet emergencies.

The A380 is capable of operating at Phoenix-Mesa Gateway Airport. There is the potential for weight restrictions on hot days due to the length of runway necessary for a fully loaded A380. Future terminal building planning may consider the needs of the A380 in terms of passenger gate area and aircraft apron area needs.

SUMMARY

The intent of this chapter has been to outline the facilities required to meet potential aviation demand projected for Phoenix-Mesa Gateway Airport. A summary of the airside and landside requirements is presented on **Exhibits 3G** and **3H**. These requirements have been developed to meet the projected "unconstrained" demand as presented in Chapter Two – Forecasts. The chapter to follow, Alternatives, will examine the possibility of meeting the requirements. Constraining or enhancing factors such as the defined role of the airport, land available for development, and Airport Authority policies will be addressed.

In this chapter the forecasts were converted to planning horizon milestones. By utilizing planning horizons rather than specific dates in time, the airport is able to better plan airport improvements based on actual demand levels. For example, the short term planning horizon reflects a forecast of 350,000 annual enplanements. When the airport exceeds this figure, improvements such as terminal building capacity should be undertaken whether it has been one year or ten since the master plan was completed.

The use of planning horizons provides airport administration a great deal of flexibility in planning airport improvements. As demand indicators such as enplanements, operations, and based aircraft reach each level, those necessary facilities can be programmed.

This chapter has been developed to take into consideration the anticipated

07MP03-3G-09/07/07

CATEGORY	AVAILABLE	SHORT TERM	INTERMEDIATE TO LONG TERM
RUNWAYS 	ARC D-V	ARC D-V	ARC D-V
	Runway 12L-30R	Runway 12L-30R	Runway 12L-30R
	9,301' x 150'	Same	Extend to 11,500 -12,500'
	Concrete	Same	Same
	210,000# D; 590,000# DT; 865,000# DDT	Same	Same
	Runway 12C-30C	Runway 12C-30C	Runway 12C-30C
	10,201' x 150'	Same	Same
	Concrete/Asphalt	Same	Uniform
	95,000# D; 185,000# DT; 550,000# DDT	Same	Same
	Runway 12R-30L	Runway 12R-30L	Runway 12R-30L
	10,401' x 150'	Same	Same
	Concrete	Same	Same
	95,000# D; 185,000# DT; 550,000# DDT	Same	Same
TAXIWAYS 	Runway 12L-30R	Runway 12L-30R	Runway 12L-30R
	75' Wide	Same	Same
	Partial Parallel	Full Length Parallel	Same
	One east exit; One west exit	Additional exits	Same
	MITL	Same	Same
	Runway 12C-30C	Runway 12C-30C	Runway 12C-30C
	No parallel, No exits	Additional exits	Same
	MITL	Same	Same
	Runway 12R-30L	Runway 12R-30L	Runway 12R-30L
	50'-75' Wide	Uniform 75' width	Same
	Full length parallel (staggered)	Full Length Parallel (uniform)	Same
	Three west exits; One west exit	Connecting taxiways	Same
	MITL	Same	Same
WEATHER AND NAVIGATIONAL AIDS 	ATCT, VORTAC, ATIS, AWOS, HIWAS, CTAF, ASR-8.	Add LLWAS; Add 2nd CATI approach Replacement ATCT	Same
	Runway 12L-30R	Runway 12L-30R	Runway 12L-30R
	Visual Approaches	GPS (1 mile)	GPS (1/2 mile)
	Runway 12C-30C	Runway 12C-30C	Runway 12C-30C
	ILS 30C (3/4 mile)	ILS 30C (1/2 mile)	GPS (1/2 mile)
	GPS (1 mile)	Same	Same
	VOR 30C (1 mile)	Same	Same
	HI-VOR 30C (3/4 mile)	Same	Same
	Runway 12R-30L	Runway 12R-30L	Runway 12R-30L
	GPS (1 mile)	Same	GPS (1/2 mile)
LIGHTING AND MARKING 	Rotating beacon, segmented circle, seven (7) windcones	Add MALSR Same	Same
	Runway 12L-30R	Runway 12L-30R	Runway 12L-30R
	Precision marking	Same	Same
	PAPI-4L	Same	Same
	HIRL	Same	Same
	REIL	Same	Same
	Runway 12C-30C	Runway 12C-30C	Runway 12C-30C
	Precision marking	Same	Same
	PAPI-4L	Same	Same
	MALSR 30C	Same	Same
	MIRL	Same	Same
	Runway 12R-30L	Runway 12R-30L	Runway 12R-30L
	Precision marking	Same	Same
	MIRL	Add REIL	Same
		Add PAPI-4L	Same

PAPI - Precision Approach Path Indicator
LLWAS - Low Level Windshear Alert System
GPS - Global Positioning System
REIL - Runway End Identification Lights
ASR-8 - Airport Surveillance Radar
VOR - Very high frequency Omnidirectional Range (includes variants)
MALSR - Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
HIRL/Medium - High/Medium Intensity Runway Lighting
ATIS - Automatic Terminal Information Services
HITL/MITL - High/Medium Intensity Taxiway Lighting
ATCT - Airport Traffic Control Tower

Exhibit 3G
AIRSIDE SUMMARY

07MP03-3H-09/07/07

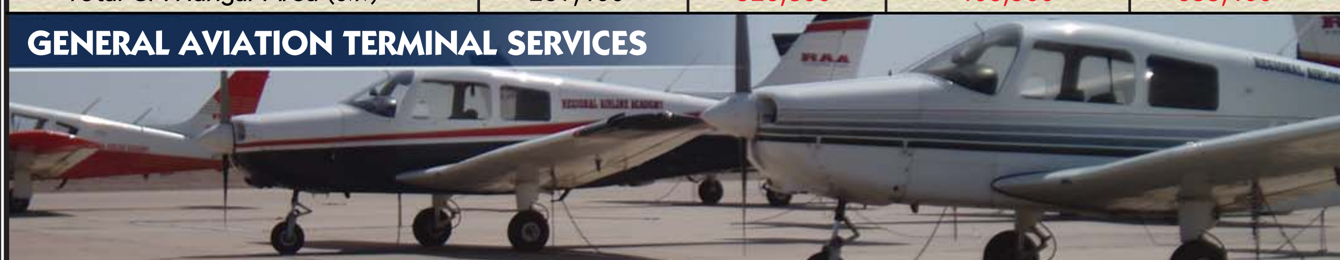
AIR CARGO

	Current Supply	Short Term	Intermediate Term	Long Term
Aircraft Apron (s.y.)	30,000	16,100	36,100	59,000
Cargo Building (s.f.)	20,000	40,000	84,000	176,000
Staging and Parking (acres)	0.45	0.90	1.90	4.00

AIRCRAFT STORAGE HANGARS

	Current Supply	Short Term	Intermediate Term	Long Term
T-hangar Positions	37	69	76	122
Box Hangar Positions	34	45	56	88
Conventional Hangar Positions	20-39	39	53	83
T-hangar Area (s.f)	39,300	83,200	91,500	146,600
Box Hangar Area (s.f)	80,000	112,000	140,900	219,100
Conventional Hangar Area (s.f.)	112,000	96,600	131,900	206,400
Maintenance Area (s.f.)	38,100	35,000	42,175	61,250
Total GA Hangar Area (s.f.)	269,400	326,800	406,500	633,400

GENERAL AVIATION TERMINAL SERVICES



	Current Supply	Short Term	Intermediate Term	Long Term
Terminal Service Building (s.f.)	±10,000	7,100	9,200	16,300
Parking				
Total GA Parking Spaces	50	218	275	447
Total GA Parking Area (s.f.)	20,000	87,200	109,800	178,800
Apron				
Total GA Apron Positions	±100	92	107	116
Total GA Apron Area (s.y.)	89,000	75,600	89,400	99,900

SUPPORT FACILITIES

	Current Supply	Short Term	Intermediate Term	Long Term
ARFF Index	Index B	Index C	Index D	Index E
Eight Day Fuel Storage (gal.)				
Jet A	150,000	248,000	456,000	944,000
Avgas	12,000	45,000	50,000	57,000

Exhibit 3H
CARGO/GA/SUPPORT
FACILITIES SUMMARY

level of enplanements to be generated by the introduction of regularly scheduled service by Allegiant Air. Allegiant Air has announced twice-weekly departures to 13 destinations beginning in October 2007. In addition, Allegiant Air will base at least two aircraft at Phoenix-Mesa Gateway Airport and will use the airport as a hub. Based on Allegiant filling 70 percent of their available seats (150-seat MD-83 aircraft), an enplanement level of 142,000 is estimated over the next year.

An understanding of the peak passenger activity levels is important in allocating appropriate resources and facilities. The first section of this chapter identified peaking figures for both airline operations and passengers for the year, month, day, and hour. While the peak month activity level is considered to be the highest month, the peak day and hour may be exceeded at times throughout the year.

Critical to airfield development is a determination of the operational capacity of the airfield. The yearly annual service volume provides a good summary of the current and future long term capacity constraints the airport may face. The FAA recommends that planning for airfield capacity improvements begin when the number of operations reaches 60-75 percent of the ASV. By the intermediate planning horizon this figures is forecast to be exceeded. By the end of the long range planning horizon the operational level is forecast to be 95 percent of the ASV. Therefore, the alternatives chapter will examine methods to improve airport capacity.

Airside needs were examined next. The airfield system at Phoenix-Mesa Gateway Airport is fully capable of serving commercial service currently. There are several areas where improvements can be made to meet future demand. Runway 12L-30R is planned as the primary commercial service runway. Runway 12C-30C should be planned as a commercial runway as well and Runway 12R-30C should be planned as a back up to commercial operations but primarily serve general aviation and industrial activity. As a commercial service airport, improvements to the existing instrument approach procedures will be considered.

An extensive examination of the adequacy of the current passenger terminal building was presented. This analysis assumed that approximately 142,000 annual enplanements would be generated by Allegiant Air beginning in October 2007. Nearly all functional areas of the airport terminal building were found to be deficient except the hold room and security screening area. By the short term planning horizon, all functional areas are significantly deficient. The alternatives chapter will examine the possibility of expanding the current facility or constructing a replacement facility.

Air cargo facility needs were also determined. As there is currently no major regularly scheduled cargo activity at the airport a planning envelope of activity levels was developed. This envelope considers the possibility of a cargo distribution center ultimately being located at the airport. Over time, the current facility may need to be expanded.

General aviation facility requirements were also determined. While this is a commercial service airport, it is appropriate for the airport to accommodate that general aviation demand in a localized service area. This demand was previously forecast and includes up to 55 based business jets and 295 smaller general aviation aircraft. Estimates on the need for hangar space, aircraft tie-down area, and transient aircraft apron area needs were determined.

The last section of this chapter presents the requirements for fuel storage, ARFF, perimeter fencing, utilities, and airport maintenance facilities. The airport currently meets Index B requirements and may be required to meet Index E requirements in the future. Fuel storage requirements were based on maintaining an eight day supply. By the short term planning horizon, more fuel storage will be needed.

Following the facility requirements determination, the next step is to determine a direction of development which best meets these projected needs through a series of airport development alternatives. The remainder of the master plan will be devoted to outlining this direction, its schedule, and its cost.

PhxMesa Gateway Airport

Chapter Four

AIRPORT DEVELOPMENT ALTERNATIVES

Chapter Four

Airport Development Alternatives

Prior to determining a recommended plan, it is beneficial to identify development alternatives and assess the advantages and constraints of each. In this chapter, a series of development scenarios is considered for the airport. The overall goal is to satisfy the projected demand through the long term planning period and to identify the highest and best uses for airport property. The alternatives take into consideration existing physical constraints and appropriate federal design standards, where applicable. The alternatives analysis is an important step in the planning process since it becomes the underlying rationale for any final master plan recommendations.

Any development proposed by a master plan evolves from an analysis of projected needs for a set period of time. Though the needs were determined by the best methodology available, it cannot be assumed that future events will not change these needs. The master planning process attempts to develop a viable concept for meeting the needs generated by projected demands through the planning period.

The possible combination of alternatives can be endless, so some professional judgment along with a thorough understanding of the various federal airport regulations must be used to identify the alternatives which have the greatest potential for implementation. The evaluation of alternatives is a process of deciding which options are

most compatible with the goals and objectives of the Airport Authority. After the evaluation process, a selected airport concept can be translated into a realistic development plan.

The development alternatives for the Phoenix-Mesa Gateway Airport can be categorized into two functional areas: The airside (runway and taxiway) system and landside (aprons, terminal, hangars, etc.) facilities. Within each of these areas, specific development is required or desired. In addition, the utilization of the remaining airport property to provide revenue support for the airport and to benefit economic development in the region must be considered.

The focus of this chapter is the identification of several development alternatives that can meet existing and/or future demand milestones. Often, at airports where the overall location or role of the airport is in question, non-development alternatives will be considered. Non-development alternatives include "no-build," transfer of services to another airport, and construction of a replacement airport. These alternatives do not meet the overall goals of the Airport Authority, as presented in the Introduction chapter of this plan, and will not be considered.

AIRPORT DEVELOPMENT OBJECTIVES

It is the overall objective of this effort to produce a balanced airside and landside complex to serve forecast aviation demand. However, before defining and evaluating specific alternatives, airport development objectives should be considered. The Airport Authority provides the overall guidance for the operation and development of Phoenix-Mesa Gateway Airport. It is of primary concern that the airport is marketed, developed, and operated for the betterment of its users. With this in mind, the following development objectives have been defined for this planning effort:

- Maintain an attractive, efficient, and safe aviation facility in accordance with federal safety regulations.

- Develop facilities necessary to accommodate expanding scheduled airline service.

- Develop facilities to accommodate future air cargo needs.

- Develop aviation facilities in support of area economic development. Encourage increased business use of the airport, particularly by operators of corporate aircraft, and encourage aviation-related employment.

- Provide sufficient airside and landside capacity through facility improvements which will meet the long term planning horizon level of demand of the area.

- Identify any future land acquisition needs.

- Ensure that any recommended future development is environmentally compatible.

- Identify and reserve airport property for specific future uses such as a replacement airport terminal building, vehicle parking, business park, and aviation business needs.

- Evaluate the surface transportation needs for access to the airport.

The remainder of this chapter will identify and describe various development alternatives for the airside and landside facilities. Within each of these areas, specific facilities are required or desired. Although each area is treated separately, planning must integrate the individual requirements so that they complement one another. **Exhibit 4A** presents both airside and landside planning issues that will be specifically addressed.

AIRSIDE PLANNING CONSIDERATIONS

Airfield elements such as the runway and taxiway system are, by nature, the focal point of the airport complex. Because of their primary role and the fact that they physically dominate airport land use, airfield facility needs are often the most critical factor in the determination of viable airport development alternatives. In particular, the runway system requires the greatest commitment of land area and often imparts the greatest influence on the identification and development of other airport facilities. Furthermore, aircraft operations dictate the Federal Aviation Administration (FAA) design criteria that must be considered when examining potential airfield improvements. These design standards can have a significant impact on the viability of various alternatives intended to meet airfield needs.

Several airfield topics will be discussed in detail and then applied to the various airport development alternatives. In the next chapter, a recommended alternative will be presented which may be one of these alternatives as presented or may be a combination of elements from these alternatives.

DESIGN STANDARDS

The design of airfield facilities includes not only the pavement areas, but also the surrounding areas designed to protect safe operation of aircraft at the airport. These areas include the runway safety area (RSA), the object free area (OFA), the obstacle free zone (OFZ), the precision obstacle free zone (POFZ), and the runway protection zone (RPZ), as previously presented on Exhibit 1F. The RSA and OFA dimensions are the same for all three runways. The POFZ only applies to runway ends with vertically guided precision approaches, such as Runway 30C. The RPZ applies to each runway end and is dimensioned based on the critical aircraft utilizing that runway and the type of instrument approaches available.

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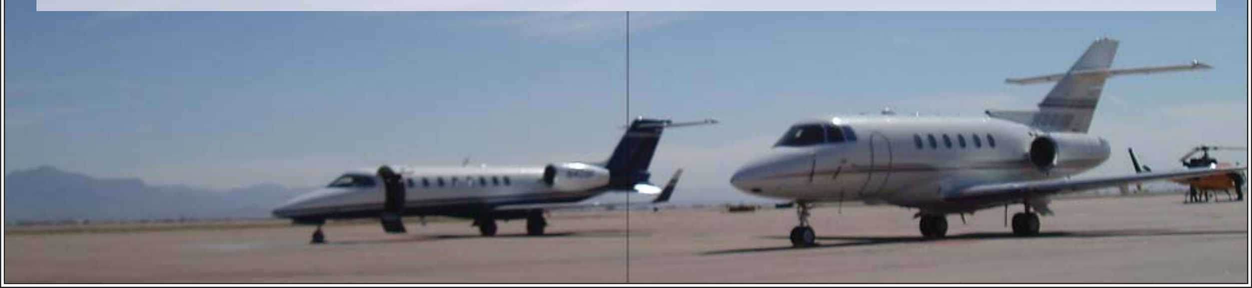
AIRSIDE PLANNING ISSUES

- Maintain FAA design standards for the Runway Safety Area (RSA), Object Free Area (OFA), Obstacle Free Zone (OFZ), Precision Obstacle Free Zone (POFZ), and the Runway Protection Zones (RPZs).
- Provide capacity enhancement with additional taxiway exits.
- Examine the possibility of extending at least one runway to 12,500 feet to accommodate future air cargo demand.
- Examine optimal instrument approach capability.



LANDSIDE PLANNING ISSUES

- Identify general airport land uses.
- Provide alternatives for development of the southwest property.
- East side terminal complex development.
- Air cargo facility development.
- East side airport access points and on-airport infrastructure.
- Replacement Airport Rescue and Fire Fighting and Airport Traffic Control Tower siting.
- Additional fuel storage capacity to serve a future east side terminal complex.

PhxMesa Gateway Airport

Exhibit 4A
PLANNING ISSUES

Runway Safety Area and Object Free Area

The RSA should be 500 feet wide and extend 1,000 feet beyond the far end of the runway and 600 feet prior to the landing threshold. Since arrivals and departures occur to all runway ends at Phoenix-Mesa Gateway Airport, the RSA is effectively 1,000 feet beyond all runway ends. The OFA is 800 feet wide and extends beyond the runway ends in the same manner as the RSA. There are currently no RSA or OFA deviations from standard.

Obstacle Free Zone

The OFZ extends 200 feet beyond each runway end and is 400 feet wide and centered on the extended runway centerline. The OFZ precludes taxiing and parked aircraft and object penetrations, except for necessary navigation aids on frangible bases. There are no OFZ deficiencies at the airport currently. Any improvements to the runways should further consider the requirements of the OFZ.

Precision Obstacle Free Zone

The POFZ is an area 800 feet wide and 200 feet long, located immediately off each runway end that is served by an instrument landing system (ILS). The POFZ is only in effect when the following conditions are met:

1) Vertically guided approach

2) Reported ceiling is below 250 feet and/or visibility less than ¾ of a statute mile.

3) An aircraft is on final approach within two (2) miles of the runway threshold.

The ILS approach to Runway 30 is vertically guided and allows for cloud ceilings down to 200 feet. Therefore, when an aircraft is on final approach in these conditions, the POFZ is in effect.

Hold lines on Taxiway P to either side of the Runway 30C threshold are located 400 feet from the runway centerline. This location meets the standard for the POFZ.

Runway Protection Zone

The RPZs are trapezoidal areas beginning 200 feet from each runway end and extending in accordance to the types of approved instrument approaches for the runway. The function of the RPZ is to enhance the protection of people and property on the ground. Land uses prohibited in the RPZ include residences, places of public assembly (e.g. churches, schools, office buildings, shopping centers, etc.), wildlife attractants, and fuel farms.

The FAA strongly recommends fee-simple ownership of the RPZ by the airport. In cases where outright ownership is not feasible, other land use control measures can be pursued, such as avigation easements or land use zoning.

The RPZ has two components: the Central Portion of the RPZ and the Controlled Activity Area. The Central Portion of the RPZ extends from the beginning to the end of the RPZ and is the same width as the extended OFA. The Controlled Activity Area includes those areas of the RPZ to the sides of the Central Portion of the RPZ.

Only objects essential to aid air navigation, such as approach lights, are allowed in the Central Portion of the RPZ. The FAA says that some uses, such as automobile parking, while discouraged, are permitted in the Controlled Activity Area.

In addition, the Western Pacific Region of the FAA has interpreted the RPZ restrictions to mean that roads are not allowed in the RPZ. If roads that traverse the RPZ are an existing condition, then they are typically grandfathered and are allowable, but new roads or improvements to the airfield (such as a runway extension) that introduce a road (or other non-compatible land use) into the RPZ have not been supported. There is some indication from the FAA that roads traversing the Controlled Activity Area may be allowable.

As can be seen on **Exhibit 4B**, the RPZs serving all runway ends are currently on airport property with the exception of Runway 30R. A small portion of the RPZ traverses Ellsworth Road to the southeast. This portion of the RPZ is very small and would likely never be able to support an incompatible land use as it is mostly roadway easement. This should be considered an existing condition and no action would be necessary.

In the future, if any runways are changed in length or with an improved instrument approach procedure, the RPZs will change accordingly. The changes may require property acquisition in the future.

AIRFIELD CAPACITY

The annual service volume (ASV), a primary measure of airfield capacity, was determined in Chapter Three. It was shown that if operational activity at the airport reaches forecast levels, then significant delay could be experienced. In fact, the forecast operational levels would exceed the ASV by the long term of the 20-year planning horizon.

The addition of a parallel runway provides the greatest potential improvement to the ASV. Phoenix-Mesa Gateway Airport already provides three parallel runways; therefore, it was determined that improvements other than an additional runway should be explored.

One of the contributing factors to the FAA capacity model for determining ASV is the number and location of taxiway exits. The current taxiway system allows for only one exit to be counted in the capacity model. The maximum number of exits that can be

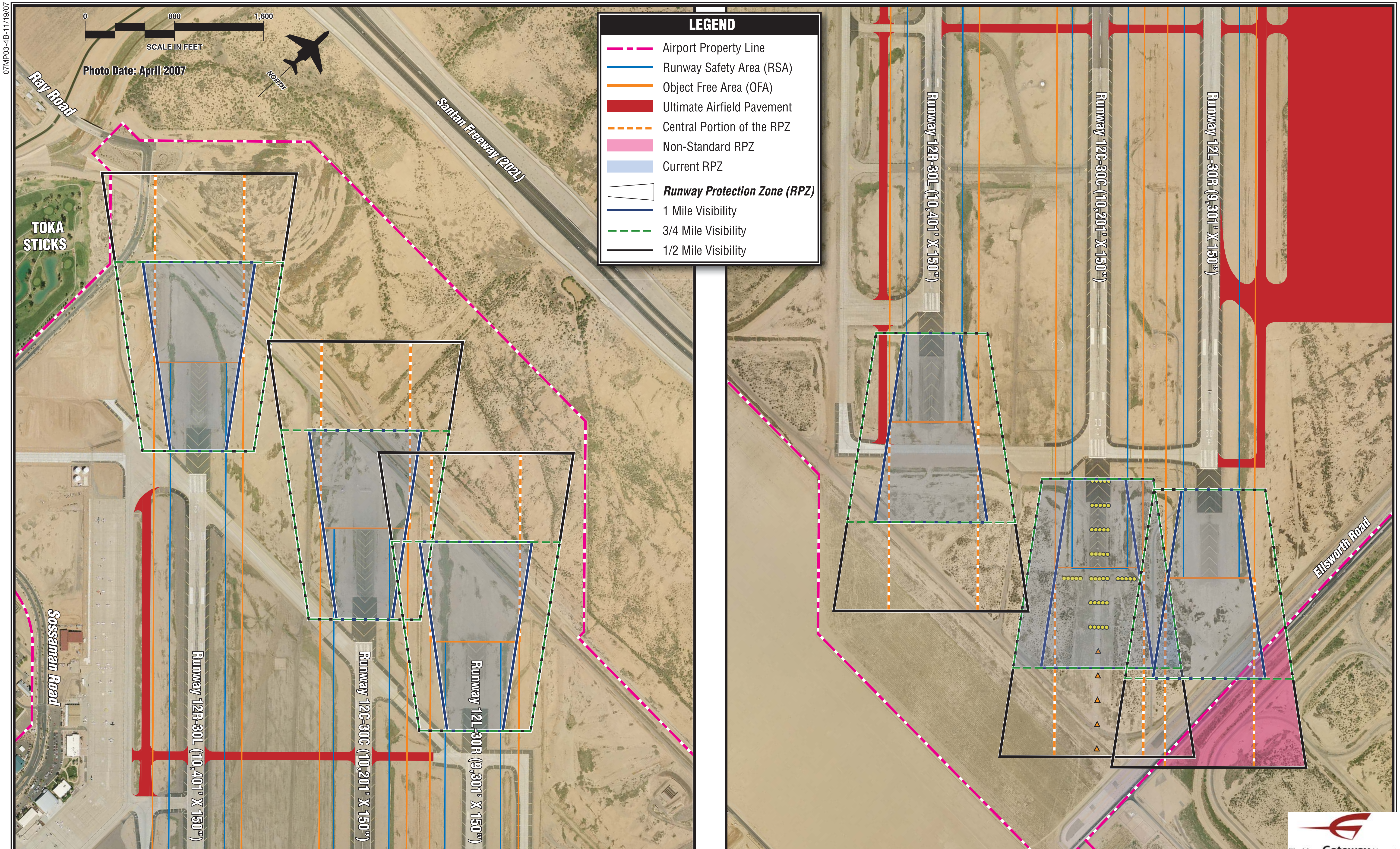


Exhibit 4B
RUNWAY PROTECTION ZONE IMPACTS

counted in the model is four. The capacity model was run under the assumption that four properly located taxiway exits would be made available.

Were there properly located taxiway exits today, the airport would realize an increase of nearly 19 percent in its ASV from 524,000 annual operations to 798,000 annual operations. By the high range forecast, the airport could realize a 33.7 percent increase in its ASV were more exit taxiways made available.

The airfield alternatives to follow will include more strategically placed taxiway exits. For Phoenix-Mesa Gateway Airport, this means optimizing taxiways between 5,000 and 7,000 feet from the landing threshold and separating them by at least 750 feet. In addition, acute angled exits or high-speed exits allow for landing aircraft to exit the runway earlier, thus improving airfield capacity. Therefore, high-speed exits will be examined in the alternatives.

RUNWAY LENGTH

As discussed in the previous chapter, the runways at Phoenix-Mesa Gateway Airport are capable of accommodating all commercial and cargo aircraft in the world. The facility requirements indicate that the current length will be adequate for most flights, but international cargo flights could ultimately create a need for a longer runway. To accommodate this potential, the possibility of providing one runway up to an ultimate length of 12,500 feet will be considered.

In addition, there may be a need to consider extending a runway purely from an airfield layout perspective. An example of this at Phoenix-Mesa Gateway Airport is the area of Runway 30L and Taxiway P. Taxiway P was designed as an end-around taxiway to access the center and east runways. It was designed at a time when such end-around taxiways needed only to remain outside of the runway OFA. Changes in design standards have since directed that end-around taxiways must remain outside the RPZ as well. Therefore, it would make sense to extend Runway 30L approximately 1,275 feet to the intersection with Taxiway P.

It is important to identify any areas immediately adjacent to airport property that should be protected or acquired for airport use, even if the need for that area might not arise until beyond the long term planning period. As has been experienced at most commercial service airports serving large population centers, once property is lost to development, it is extremely difficult and expensive to acquire the necessary property. Therefore, the airfield alternatives will not only identify current property needs to meet standard, but also those associated with maintaining the long range viability of the airport.

TAXIWAY LAYOUT

Parallel taxiways provide important circulation functions. The first phase of Taxiway B between Taxiways H and K has been completed. Taxiway B is planned as a full-length parallel serving Runway 12R-30L. Taxiway B is located 450 feet to the west of the runway, thus meeting design standards. Planning for the completion of the Taxiway B parallel is essential to reduce the potential for pilot confusion. Currently, to transition along Taxiway A or Taxiway B parallel to the runway, aircraft must make several turning maneuvers. A straight-line parallel taxiway is safer and more efficient.

The east side of the airfield has long been considered as the ultimate location for a replacement passenger terminal building when necessary. To accommodate east side development, a full-length parallel to Runway 12L-30R would be necessary. The partial parallel Taxiway C on the east side was the first phase of this concept. The alternatives will plan for the extension of Taxiway C as well as construction of a parallel taxilane to provide circulation in the terminal area.

Each airport alternative will also consider parallel taxiways between the runways. These taxiways would be primarily for improved aircraft ground movement efficiency. All taxiways, including the parallels, will be planned to a width of 75 feet in order to meet the standard for the critical aircraft. It should be noted, however, that a parallel taxiway between the two east runways would require the relocation of several airport sensors, including the glide slope antenna, automated weather observation system (AWOS), and wind cone.

Taxiway G is the diagonal taxiway extending between Taxiway H to Taxiway A. Angled taxiways at runway thresholds or crossings may impair the pilot's view of activity on the runway and increase the potential for incursions. In order to eliminate this potential, Taxiway G should be considered for removal. Right-angle taxiway access to the runway thresholds should then be planned.

DEVELOPMENT ALTERNATIVES

Now that several baseline assumptions and considerations have been made with regard to the airport development alternatives, the remaining airfield options have been developed. During the alternatives identification process, it became evident that changes planned for one runway can have a direct impact on each of the other two runways, as well as on the optimal location for cargo facilities and the east side terminal complex. Three airfield alternatives are outlined, each showing the extension of a different runway to 12,500 feet in length. From this starting point, potential improvements flow logically based on design standards.

PREVIOUS MASTER PLAN CONCEPT

The previous master plan, as approved in June of 1999, is depicted on **Exhibit 4C**. The plan featured extending Runway 12L-30R to a total length of 12,500 feet. To accomplish this, the Runway 12L end would be extended 2,650 feet, and the Runway 30R end

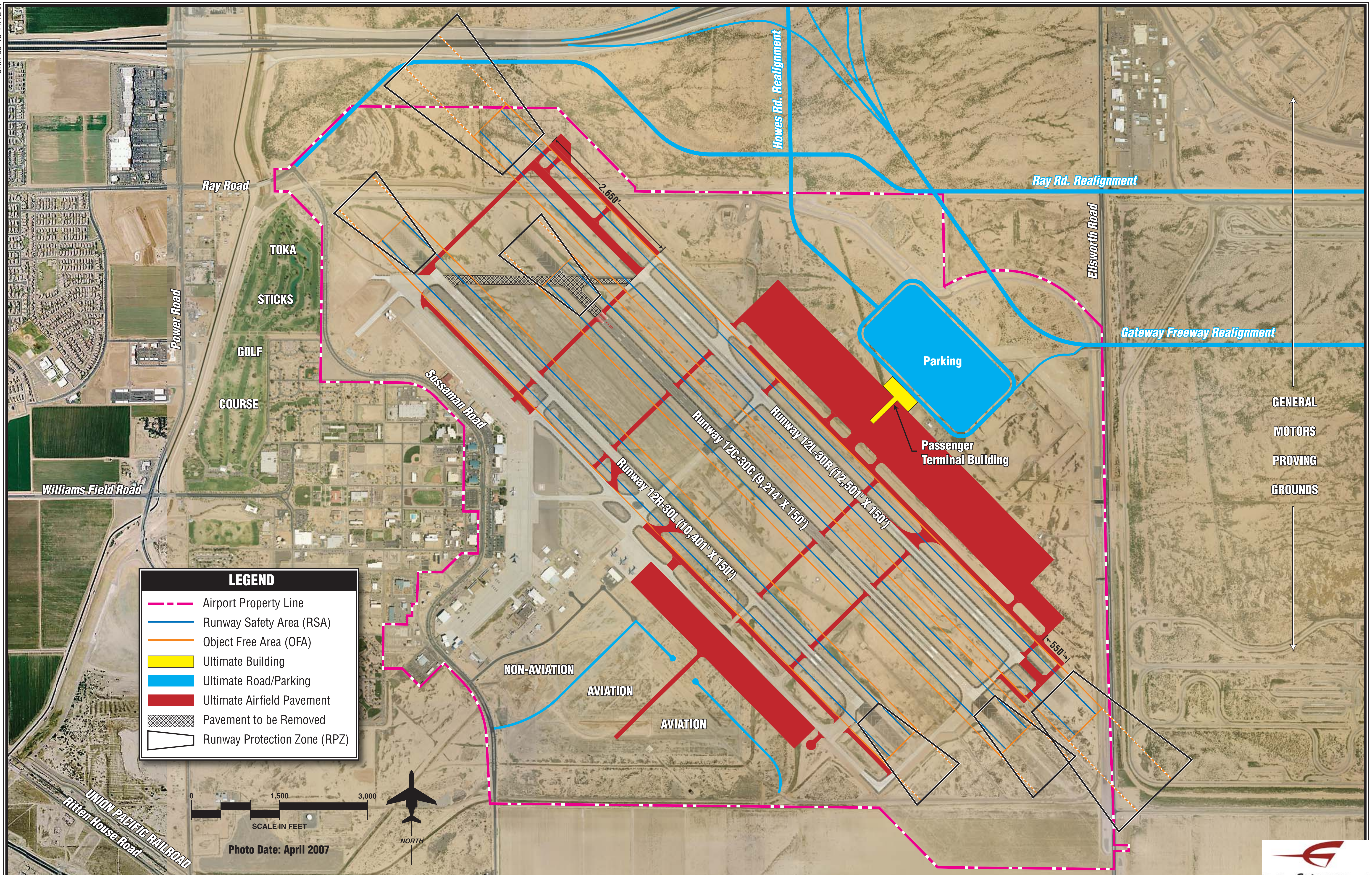


Exhibit 4C
PREVIOUS MASTER PLAN CONCEPT

would be extended an additional 550 feet.

Runway 12C-30C was planned to be reduced to 9,214 feet by removing 987 feet from the north end. This action would have facilitated the removal of diagonal Taxiway G and the development of an end-around taxiway to connect the Runway 12 thresholds for the two outboard runways. Runway 12R-30L was to remain at its present length of 10,401 feet.

The previous master plan designated a cargo facility to the south of Taxiway K with expansion capability. The undeveloped property in the southwest corner of the airport was intended for both aviation and non-aviation related businesses.

As commercial service began to develop at the airport, the previous master plan called for developing the east side of the airport for commercial operations. A new terminal building was planned, as was surface level parking. The south portion of the east side commercial apron was identified as a location for air cargo operators to facilitate "belly freight" to the commercial passenger aircraft.

At the time of the previous master plan, belly freight was primarily comprised of mail from the U.S. Postal Service. The events of 9/11 have led to greater security requirements for cargo being transported on passenger aircraft as belly freight. The USPS has since entered into an exclusive agreement with all-cargo carrier FedEx to transport mail. As a result, belly freight on passenger aircraft has declined across the country. Therefore, the need for a facility specifically to address belly freight needs is substantially reduced.

Finally, access to the airport was planned from Hawes Road from the north and Ellsworth Road from the east. One possible alignment for the Williams Gateway Freeway (802) was presented. This alignment has since been modified by local and regional transportation planning agencies and is included on the alternatives to follow.

AIRFIELD ALTERNATIVE ONE

Airfield Alternative 1, as presented on **Exhibit 4D**, considers the extension of Runway 12R-30L to 12,500 feet. The Runway 30L end is planned to be extended 1,275 to intersect with Taxiway P. This extension should be considered regardless of whether Runway 12R-30L ever is extended to the full 12,500 feet in order to eliminate Taxiway P traversing the RPZ. To ultimately reach 12,500 feet, Runway 12R is extended 825 feet to the northwest. The RSA associated with these runway extensions will need to be graded to meet standards.

When considering the west runway for extension to 12,500 feet, it is ideal to maintain air cargo operations on the west side, as the extension would primarily be needed to serve international cargo operators. At the same time, smaller general aviation aircraft will continue to utilize the west runway, which would place the largest and smallest operators at the airport on the same runway.

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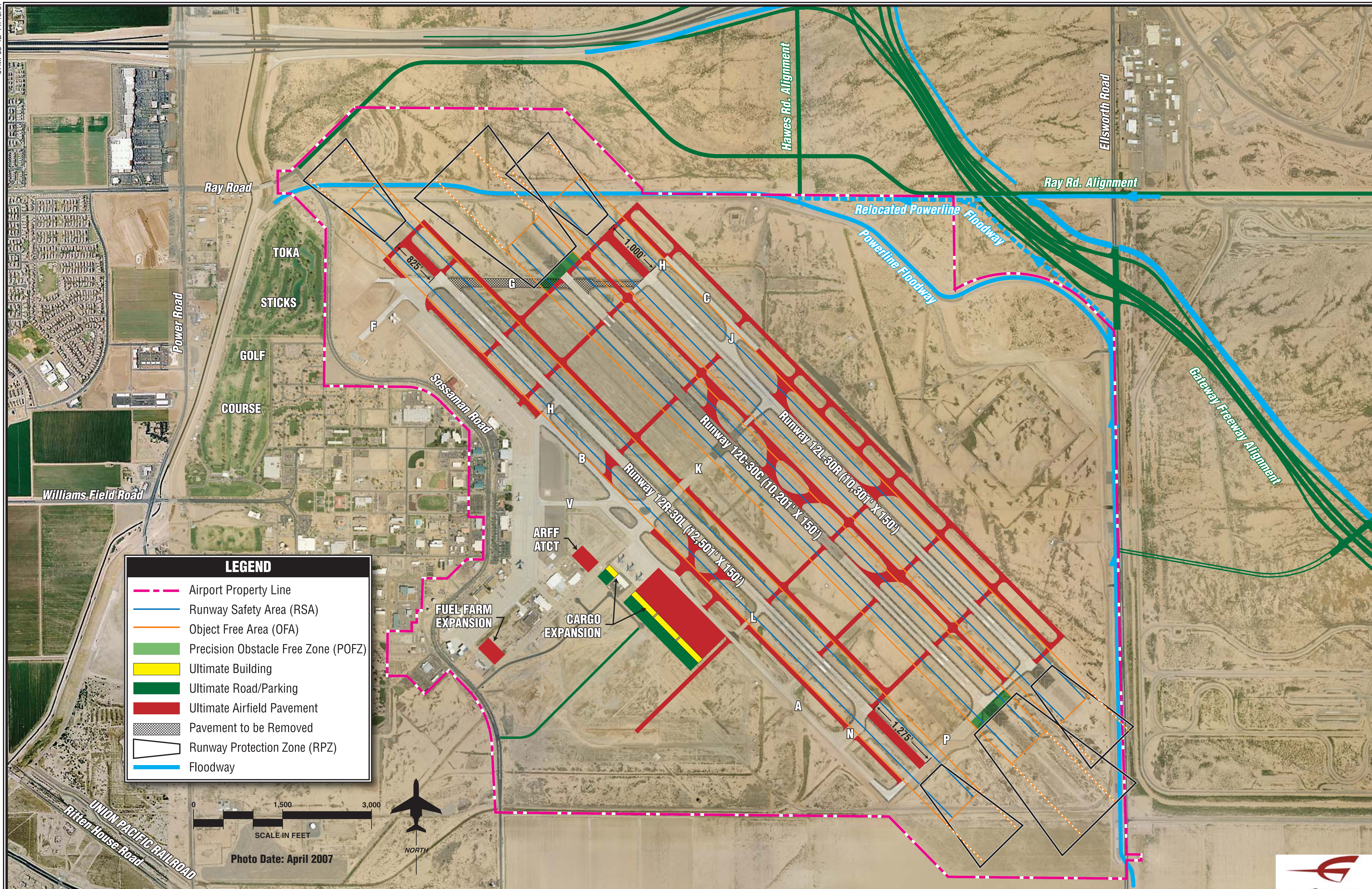

Exhibit 4D
AIRFIELD ALTERNATIVE 1

A new parallel taxiway is located 450 feet to the east of the Runway 12R-30L centerline. This taxiway would provide for increased capacity and efficiency of aircraft movements. It would also allow aircraft moving from the east side of the airfield to the Runway 12R threshold to do so without having to first cross Runway 12R.

Two high-speed exits are between the runway and Taxiway B. The first is located between Taxiways V and H, approximately 5,200 feet from the Runway 12R threshold. A second high speed exit is located approximately 6,900 feet from the threshold. This taxiway exit is planned to intersect with an extended Taxiway B. One high-speed exit is planned for exiting when landing on Runway 30L. This exit is located approximately 5,000 from the Runway 30L threshold.

Runway 12C-30C would see no length changes and remains at 10,201 feet in this alternative. A parallel taxiway is planned 500 feet to the east of the runway centerline, equidistant from Runway 12L-30R. Four high-speed exits are shown from the runway onto the parallel taxiway.

Runway 12L-30R is planned for a 1,000-foot extension to the northwest. The primary purpose of this extension is to provide for a more efficient runway and taxiway layout. By extending the runway 1,000 feet, the threshold would align with the threshold for Runway 12C. This layout promotes the right angle entrance to the runway threshold and would allow for the removal of diagonal Taxiway G.

The proposed extension to Runway 12L would ultimately provide for a runway length of 10,301 feet. This would provide additional departure length from the runway closest to the proposed east side terminal complex.

Four high-speed exit taxiways are strategically planned from Runway 12L-30R leading to parallel Taxiway C. Cross-over taxiways then lead directly to the terminal area apron. This type of layout would reduce the amount of time an aircraft remains on the runway and increases efficiency as aircraft can proceed directly to their gate without an extended taxi time.

Instrument Approaches

The allowable extent of potential airfield improvements is dependent upon the instrument approach procedures planned and the impacts to the area airspace. In each alternative, the center runway is considered the primary arrival runway, while the outboard runways are considered primarily for departures. This operational design would increase overall airfield efficiency as departing aircraft would not have to hold for arriving aircraft. Airfield Alternative 1 provides for an instrument landing system (ILS) on both ends of Runway 12C-30C.

There is currently an ILS serving Runway 30C with three-quarter mile visibility minimums. If feasible, the visibility minimums would be planned to be reduced to one-half mile. The Controlled Activity Area of the RPZ associated with a one-half mile approach would slightly cross over Ellsworth Road. According to FAA standards, this is allowable as long as the Central Portion of the RPZ remains clear.

A medium intensity approach lighting system with runway alignment indicator lights (MALSR) or similar approach lighting system is required for a Category (CAT) I approach. In addition, a localizer and a glide slope antenna are currently required equipment and are in place on Runway 30C.

Runway 12C is ultimately planned for an ILS approach. Due to current airspace conflicts with approaches to Phoenix Sky Harbor (PHX), technological advancements, such as the improved positional accuracy of the global positioning system (GPS), would likely be necessary before approval of an approach from the northwest with CAT I minimums. These types of advancements would also eliminate the need for an additional localizer and glideslope antenna, therefore only a MALSR is planned for Runway 30C.

Both outer runways would be planned for instrument approaches with one-mile visibility minimums. These approaches would also be GPS, but would not require an approach lighting system and can be implemented at minimal cost to the airport.

As can be seen from **Exhibit 4D**, a small portion of the RPZ associated with Runway 30R extends over Ellsworth Road. As this is an existing condition, no adjustments are necessary. The RPZ associated with Runway 30C would also extend over Ellsworth Road but not into the Controlled Activity Area of the RPZ; therefore, this is allowable. The Controlled Activity Area of the RPZ associated with Runway 12R would cross South Sossaman Road. This is allowable as well. All other RPZs remain entirely on airport property and meet FAA standards.

An additional consideration when examining airfield development alternatives is analysis of the various airport airspace surfaces. Preliminary analysis of the airport airspace has been conducted to determine if any of the airfield alternatives would have any significant airspace obstructions.

This preliminary analysis included the impact of planned airfield improvements to the Federal Aviation Regulation (FAR) Part 77 surfaces, the Threshold Siting Surface (TSS), the Departure Surface, and the One-Engine Inoperable (OEI) surface. When determining the height of a potential obstruction, some features will require a buffer above the actual height of the feature. Railroads require an additional 23 feet, dirt roads require an additional 10 feet, two-lane roads require an additional 15 feet, and highways and freeways require an additional 17 feet. A taxiway would require an additional height equal to the tail height of the design aircraft. At Phoenix-Mesa Gateway Airport, an additional 65 feet is added for end-around Taxiway P. **Table 4A** presents the various airport airspace surfaces and the applicable slope ratio based on each airfield alternative.

TABLE 4A
Airspace Summary
Phoenix-Mesa Gateway Airport

	Best Approach Visibility Minimum	Primary Surface Width (ft.)	Part 77 Approach Slope	TSS	Departure Surface	OEI Surface
CURRENT CONDITION						
Runway 12R	1 mi. GPS	500	34:1	20:1	40:1	62.5:1
Runway 12C	1 mi. LPV	1,000	34:1	20:1	40:1	62.5:1
Runway 12L	Visual	500	20:1	20:1	40:1	62.5:1
Runway 30L	1 mi. GPS	500	34:1	20:1	40:1	62.5:1
Runway 30C	3/4 mi. ILS	1,000	50:1	34:1	40:1	62.5:1
Runway 30R	Visual	500	20:1	20:1	40:1	62.5:1
ALTERNATIVES 1 and 2						
Runway 12R	1 mi. GPS	500	34:1	20:1	40:1	62.5:1
Runway 12C	**1/2 mi. GPS**	1,000	**50:1**	**34:1**	40:1	62.5:1
Runway 12L	**1 mi. LPV**	500	**34:1**	20:1	40:1	62.5:1
Runway 30L	1 mi. GPS	500	34:1	20:1	40:1	62.5:1
Runway 30C	**1/2 mi. ILS**	1,000	50:1	34:1	40:1	62.5:1
Runway 30R	**1 mi. LPV**	500	**34:1**	20:1	40:1	62.5:1
ALTERNATIVE 3						
Runway 12R	1 mi. GPS	500	34:1	20:1	40:1	62.5:1
Runway 12C	1 mi. LPV	500	34:1	20:1	40:1	62.5:1
Runway 12L	**1/2 mi. ILS**	**1,000**	**50:1**	**34:1**	40:1	62.5:1
Runway 30L	1 mi. GPS	500	34:1	20:1	40:1	62.5:1
Runway 30C	**1 mi. LPV**	**500**	**34:1**	**20:1**	40:1	62.5:1
Runway 30R	**1/2 mi. ILS**	**1,000**	**50:1**	**34:1**	40:1	62.5:1

Bold: Indicates an approach change from the current condition.
TSS: Threshold Siting Surface
OEI: One Engine Inoperable
GPS: Global Positioning System
LPV: Localizer Performance with Vertical Guidance
ILS: Instrument Landing System

The most critical of these surfaces is the TSS. For non-precision instrument approaches, any penetration to this surface must be removed or lowered. For precision instrument approaches, the object penetration is further tested against the Glidepath Qualification Surface (GQS). Object penetration to the GQS must be removed or lowered.

Taxiway P presents a penetration to all surfaces leading to the Runway 30L end. Because this is a controlled airport surface, hold lines can be placed outside of the lateral extent of the widest surface to prevent an object penetration. A solution considered in the airfield alternatives is to extend Runway 30L to the intersection with Taxiway P.

Airfield Alternative 1 has TSS penetrations leading to Runways 30R and 12L. These penetrations are presented by the dirt service roads around the runway system. On-airport service road penetrations within the controlled airport operations areas are not nearly as critical as public road penetrations. Some service roads are required to access navigation aids, others can be rerouted as necessary.

AIRFIELD ALTERNATIVE TWO

Airfield Alternative 2, as presented on **Exhibit 4E**, considers the possibility of extending Runway 12C-30C to an ultimate length of 12,500 feet. Under this scenario, Runway 12C is extended 1,500 feet to the northwest. At this length, a CAT I RPZ will remain within the planned alignment of Ray Road. This extension would align the Runway 12C and 12R thresholds, thus leading to an improved taxiway layout and the removal of diagonal Taxiway G. Runway 30C is planned with an extension of 800 feet, bringing the total runway length to 12,500 feet.

As with all the alternatives, a full-length parallel taxiway is planned 500 feet to the east of Runway 12C-30C. The northernmost portion of the parallel taxiway would cross the Powerline floodway. The floodway would thus need to be bridged or relocated. Two high speed exists are planned leading to this parallel taxiway.

Runway 12R-30L is also planned to be extended by 1,275 feet on the south end to the intersection with Taxiway P. This runway extension will allow for full use of Taxiway P, as it currently does not meet the requirements for an end-around taxiway. The ultimate length of Runway 12R-30L in this alternative is 11,676 feet.

Two high speed exits are planned for Runway 12R. These exits lead to the extended Taxiway B and ultimately the current cargo facility and proposed southwest landside development.

Runway 12L-30R is planned to remain at its current length. Taxiway C is extended to provide full parallel capability, and a parallel terminal area taxiway is also planned. Several high-speed exits are planned as well.

Instrument Approach Procedures

Airfield Alternative 2 considers the center runway as the primary arrival runway and is thus planned for a CAT I approach to both runway ends. The same issues that applied to a CAT I approach in Airfield Alternative 1 will apply here. Airspace conflicts with PHX may prohibit a traditional CAT I approach to Runway 12C, but this reserves the capability should technological improvements to the airspace system make this approach more feasible.

The CAT I approach planned for Runway 30C would extend the RPZ over Ellsworth Road. Due to the FAA's standard that, at the very least, the Central Portion of the RPZ remains clear of objects, Ellsworth Road is depicted as being relocated. While it is permissible to have a road through the Controlled Activity Area of the RPZ, when given the opportunity of undeveloped land, the road should entirely clear the RPZ as depicted. Both outer runways are then planned for approaches with one-mile visibility minimums.

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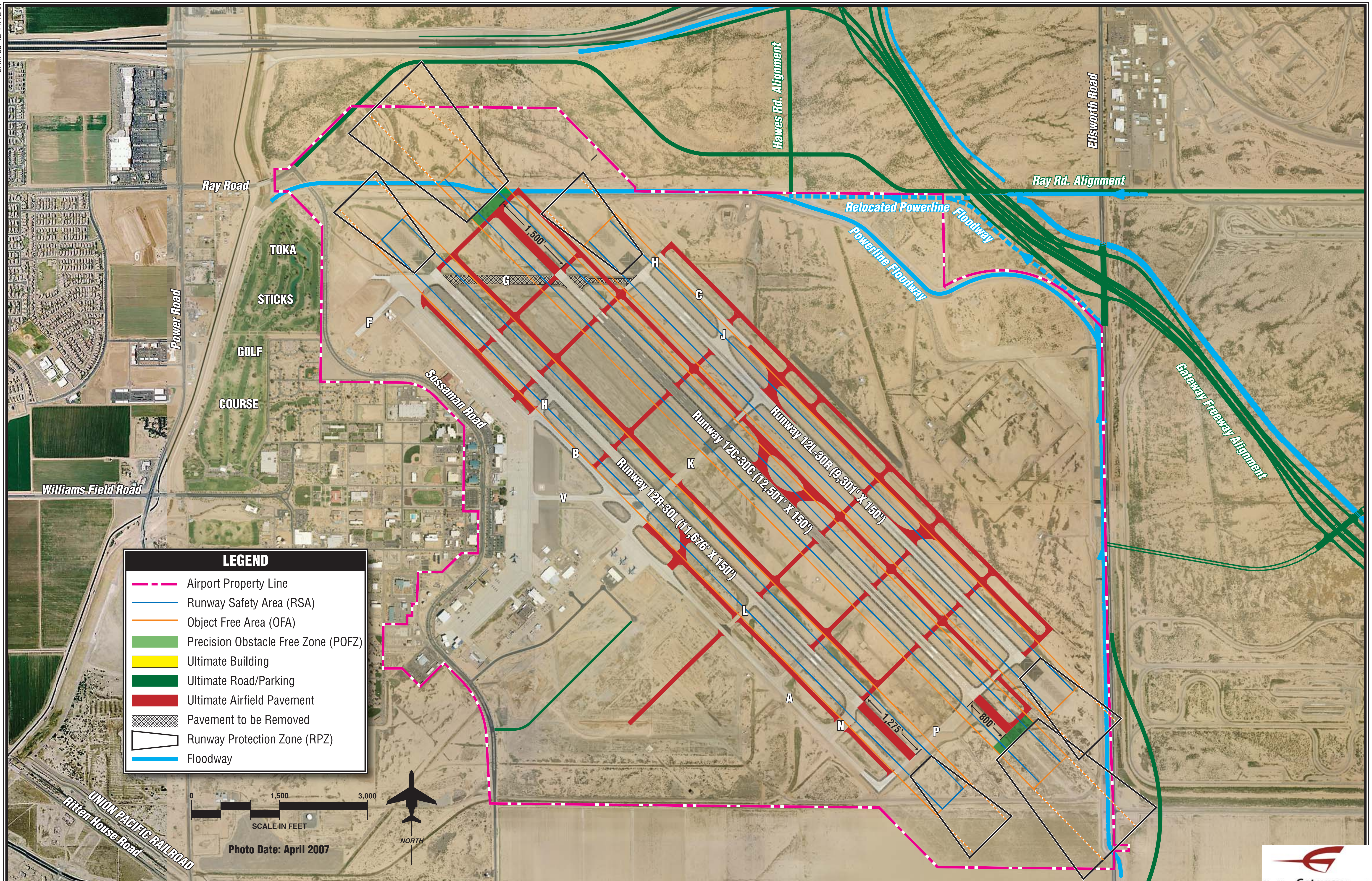

Exhibit 4E
AIRFIELD ALTERNATIVE 2

Airfield Alternative 2 has a service road penetration to the TSS leading to Runway 30R. This is the same penetration as in the previous alternative. This is a controlled, on-airport service road; if feasible, it should be rerouted outside of the TSS.

AIRFIELD ALTERNATIVE THREE

Airfield Alternative 3, as presented on **Exhibit 4F**, considers the possibility of extending Runway 12L-30R to an ultimate length of 12,500 feet. This was also the recommended concept from the previous master plan. Since completion of the previous master plan, the FAA's definition and position on what is allowed in an RPZ has changed substantially. No longer are roads allowed in the RPZ, except for the Controlled Activity Area of the RPZ, as recently defined. Because of this limitation, the runway extensions in the previous master plan can no longer be considered.

Runway 12L is planned to be extended 1,950 feet to the northwest. Space is left for the possibility of a CAT I approach to this runway. The Controlled Activity Area of the RPZ would extend over the Ray Road alignment, but the Central Portion of the RPZ would remain clear of objects, thus meeting FAA standards.

Both Taxiway C and a future parallel taxiway between Runway 12C-30C and 12L-30R would be extended to meet the new threshold. Several high-speed taxiway exits are strategically planned to enhance access to the terminal area.

The Runway 30R end would then be planned for a 1,250-foot extension, bringing the total runway length to 12,500 feet. Again, associated taxiways are extended to provide threshold access from both sides of the airfield.

The extension of Runway 12L-30R would necessitate bridging or relocating the Powerline Floodway channel.

Runway 12C-30C is planned to remain in its current configuration. Right-angled threshold taxiways are introduced, thus eliminating the need for diagonal Taxiway G. Several high-speed taxiway exits are planned allowing for rapid exit from the runway system to the planned parallel taxiway to the east.

Runway 30L is planned for a 1,275-foot extension to the intersection with Taxiway P. As in the previous alternatives, this extension will allow for full utilization of Taxiway P. Three high-speed taxiway exits and a full-length parallel taxiway to the east are also planned.

Instrument Approach Procedures

Airfield Alternative 3 considers CAT I approaches to Runway 12L-30R and one-mile approaches to all remaining runway ends. As previously mentioned, the RPZ for Runway 12L would extend over the Ray Road alignment, but the Central Portion of the RPZ

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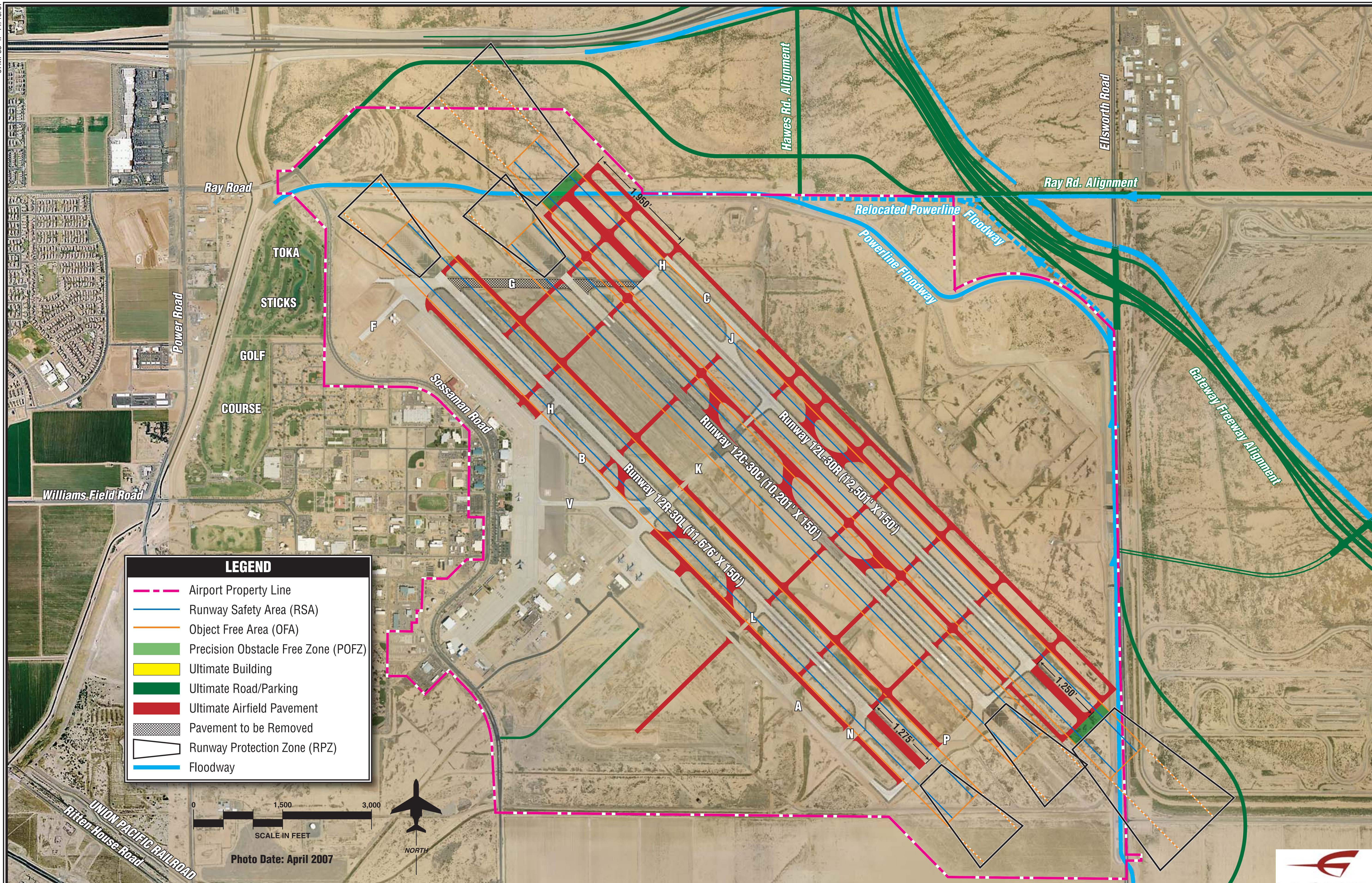

Exhibit 4F
AIRFIELD ALTERNATIVE 3

would remain clear. Approximately 20 acres of undeveloped property would need to be acquired to ensure airport control of the RPZ. The RPZ serving approaches to Runway 30R would extend across Ellsworth Road necessitating property acquisition and rerouting of the road. All other RPZs remain on airport property.

In addition to the RPZ crossing Ellsworth Road, the TSS would be penetrated by the road. As a result, Ellsworth road is shown being rerouted in this alternative.

Airspace Summary

Each alternative has considered the potential impact to the various airspace surfaces leading to the runway system. This includes the impact to the FAR Part 77 approach surface, the TSS, the departure surface, and the OEI surface. Penetrations to the TSS are the critical measure.

Most penetrations to these surfaces are presented by existing unpaved service roads. Some of these roads are required to provide access to navigational aids and cannot be relocated. Where feasible, service roads should be rerouted to provide clearance to the surfaces. Those that cannot be rerouted should have controlled access through clearance from the tower.

Some airspace penetrations are specifically addressed in the alternatives. Runway 30L is recommended to be extended to the intersection with Taxiway P in order to eliminate the penetration an airplane tail would create to all surfaces. This extension will also provide greater usability of this taxiway since its current design as an end-around taxiway does not meet standard.

Two of the three airfield alternatives would require the rerouting of a portion of Ellsworth Road. This action would provide clear airspace surfaces and clear RPZs to the Runway 30R and 30C ends.

There are no fatal flaws presented by obstruction of the airspace surfaces leading to the runways for any of the alternatives. Detailed CAD drawings of each of these airspace surfaces will be included in the next chapter of this master plan.

LANDSIDE ALTERNATIVES

The Airport Authority has been proactive in ensuring that activity at the airport is appropriately separated and that adjacent land uses are compatible. This has led to the airport being a viable community asset for the foreseeable future. Allowing development of airport property that does not follow a strategic plan can lead to a functionally inefficient and constrained facility.

The major activity centers of the airport, such as the general aviation ramp and the commercial passenger terminal building area, are all distinct and separate from each other. The existing development has followed recommended strategies to ensure the long term efficiency of the airport.

Exhibit 4G presents general land use definitions for airport property.

The north ramp on the west side of the airfield has long been identified for general aviation purposes. The Airport Authority owned fixed base operator (FBO) is located in this area, as are aircraft tie-downs, and both Arizona State University and Chandler-Gilbert Community College have their flight schools in this area.

A new complex of 37 T-hangar units and 34 box hangars is currently under construction and will be completed in 2008. In addition, both Cessna and Embraer have begun construction on business jet service centers in this location. These will be completed in 2009.

The south ramp may also be considered for general aviation activity, but to date has been limited to aircraft maintenance operations and corporate aviation. In order to limit the interaction of smaller single engine aircraft and large business and commercial jets, the south apron should continue to be developed in this manner.

The middle ramp serves a limited general aviation function, accommodating the U.S. Marshals Service operations and the hangar immediately south of the administration building. The current passenger terminal area occupies the southern portion of the middle apron. The terminal building is recognized as the incubator building until traffic is sufficient to justify a new facility on the east side of the airfield.

Occurring concurrently with this master plan study is a study on the feasibility of expanding the existing passenger terminal facilities to accommodate real and forecast growth in passenger activity. These expansion alternatives are intended to accommodate up to 700,000 annual enplanements. An expansion of this kind would allow between five and ten years of usage before a new terminal complex would be needed, should forecasts hold true to form.

This master plan will include the selected alternative for expanding the existing terminal building once it becomes available. In the interim, three alternatives for an east side terminal complex are presented. The purpose of these alternatives is to locate facilities to allow for maximum efficiency. The actual design of the interior terminal space will be undertaken by the airport architect and engineer when the need arises.

The entire apron frontage on the west side of the airport as well as that property to the west of Velocity Way has been platted and is intended for aviation-related uses. Exhibit 1J previously depicted this platting. This master planning effort will consider these platted areas facing the north and south ramps as appropriate general aviation development areas.

The landside planning efforts should maximize existing property in an efficient manner that will serve demand well beyond the 20-year planning period, as well as provide flexibility for

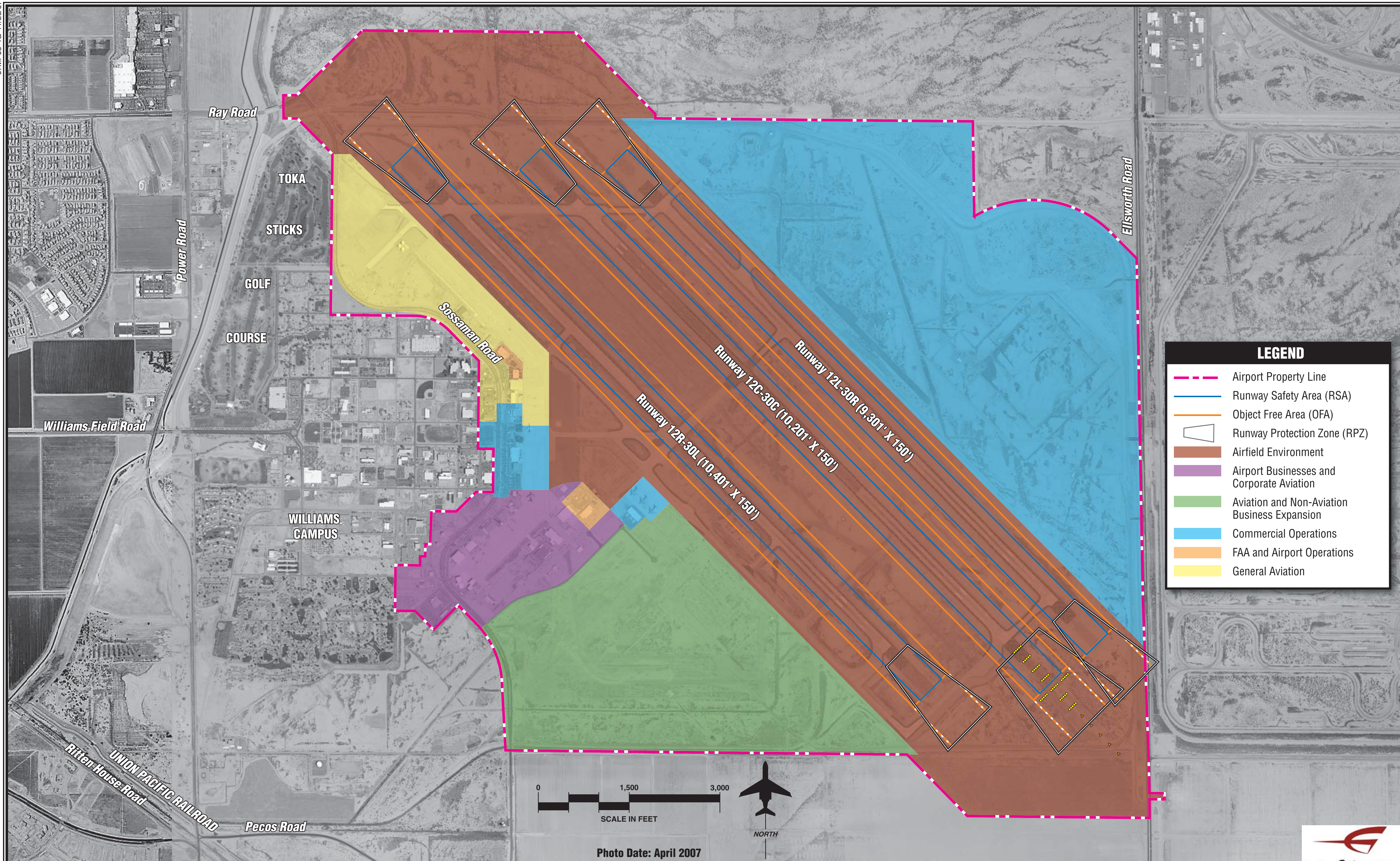

Exhibit 4G
GENERALIZED LAND USE

marketing and development. In order to provide a functional facility which meets potential development needs, areas best suited for specific development should be identified. First, essential development elements to serve airfield, passenger airline, general aviation, and airport business must be considered. This also includes support functions such as airport maintenance, airport rescue and firefighting (ARFF), and fuel storage. Then areas for other land uses can be considered such as aviation-related commercial development and non-aviation revenue enhancement areas.

Other landside issues to be discussed include the potential east side passenger terminal complex, the location and size of air cargo facilities, and alternatives for the undeveloped southwest airport property. Support functions, including potential locations for a future replacement airport traffic control tower, will also be discussed.

In addition to the functional compatibility of the airport land uses, the proposed development concept should provide a first-class appearance for Phoenix-Mesa Gateway Airport. Consideration to aesthetics should be given high priority in all public areas, as the airport often serves as the first impression a visitor may have of the community.

Phoenix-Mesa Gateway Airport is first and foremost a commercial service airport. These functions must be suitably accommodated prior to development of additional general aviation facilities. Fortunately, the airport has extensive land reserves and can likely accommodate both commercial operations as well as the needs of local and transient general aviation users.

SOUTHWEST AIRPORT PROPERTY

In today's environment of airports becoming constrained from further development, the southwest parcel at Phoenix-Mesa Gateway Airport provides unique opportunities. This area encompasses approximately 300 acres. At a minimum, the portion of this property that provides frontage to the runway and taxiway system should be reserved for aviation-related purposes. A minimum depth to reserve would be 1,000 feet from the taxiway centerline to allow for ramp and hangar construction.

Beyond the initial reservation of flight line property and assurance that the long term aviation needs can be accommodated, the airport may consider use of excess property for revenue enhancement. Recognizing this opportunity, the airport has previously identified this large parcel for both aviation and non-aviation related purposes. In fact, previous planning efforts have identified an extension of Taxiway L into this area to increase the amount of property available for aviation uses. The extension of Taxiway L is included on each of the alternatives for this area.

The road network has begun to be planned and developed in this area as well. Velocity Way provided the first access point to the flight line and recently developed cargo facilities. Cargo Way extends parallel to the taxiway system and provides an eastern boundary separating aviation and non-aviation land uses. A road extending from the end of Cargo Way to Sossaman Road has long been planned and is included in each alternative. These roads create a loop into this property, enclosing some property and making it available for business development possibilities that do not require airfield access.

Exhibit 4H presents the first concept for the southwest parcel. The theme of this alternative is to provide as much airfield access as possible and to provide large parcels. This combination is very rare in urban markets and at airports with commercial service.

As can be seen, seven large parcels are identified. These parcels range in size from 15 acres to 46 acres. Aviation-related parcels of this size can accommodate activities such as major aircraft maintenance or manufacturing facilities. These parcels could be subdivided as well, should the need arise.

The road system into the area considers a new road extending from Sossaman Road, along the south border of airport property. Two roads extending from airport property would connect with Pecos Road approximately one mile to the south.

Alternative 2, as shown on **Exhibit 4J**, provides for medium size development parcels and non-aviation development. It should be noted that non-aviation means that the business does not need runway access; however, the business itself could be aviation-related. The aviation-related parcels range in size from eight to 16 acres. These parcels would be excellent for specialty aviation businesses or corporate aviation.

Several non-aviation development areas are identified for the remaining airport property. Two roads extending from Pecos Road also provide access to the parcels, as does a Sossaman Road entrance.

The theme of Alternative 3, depicted on **Exhibit 4K**, is to provide a mix of large parcels and to accommodate the possibility of a corporate aviation center. The parcels to the north and south of Taxiway L are the large parcels ranging in size from 20 to 26 acres. Should there be a desire to provide parcels slightly smaller in size, any of these could be subdivided.

This alternative specifically considers maintaining air cargo activity to the southwest of the airport. The flight-line area to the east of Cargo Way and extending south to the extension of Taxiway L is reserved for cargo facilities. A linear design concept, similar to the existing cargo facility, is continued.

The southeast corner of this area is presented as a corporate aviation center. There are 14 corporate parcels shown, each approximately three to four acres in size. Two airplane design group (ADG) III taxiways (50 feet wide) extend into the area, making more parcels available. Access to the runway and taxiway system is fairly immediate and the interaction with smaller aircraft is limited. The re-

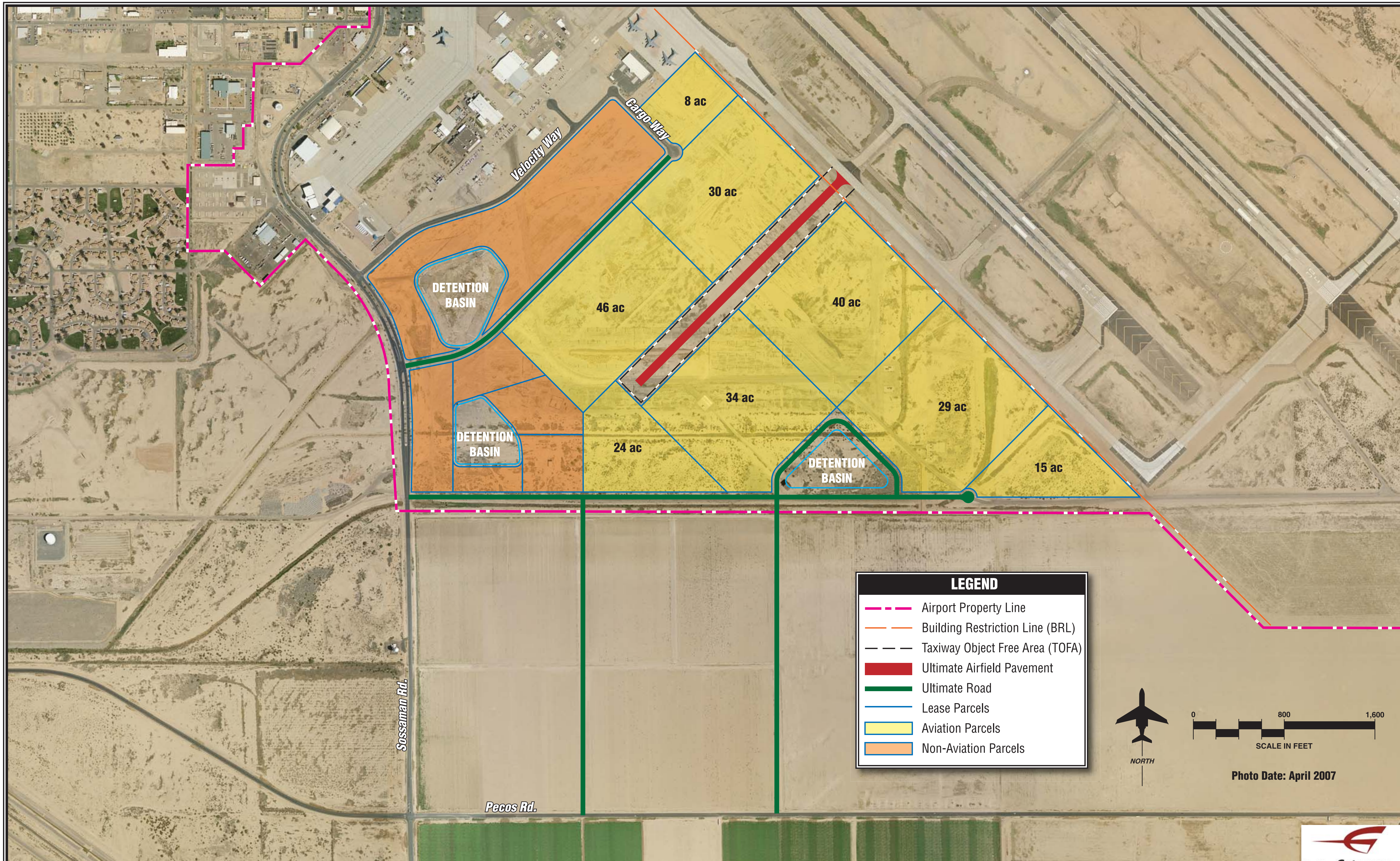

Exhibit 4H
SOUTHWEST LANDSIDE ALTERNATIVE 1

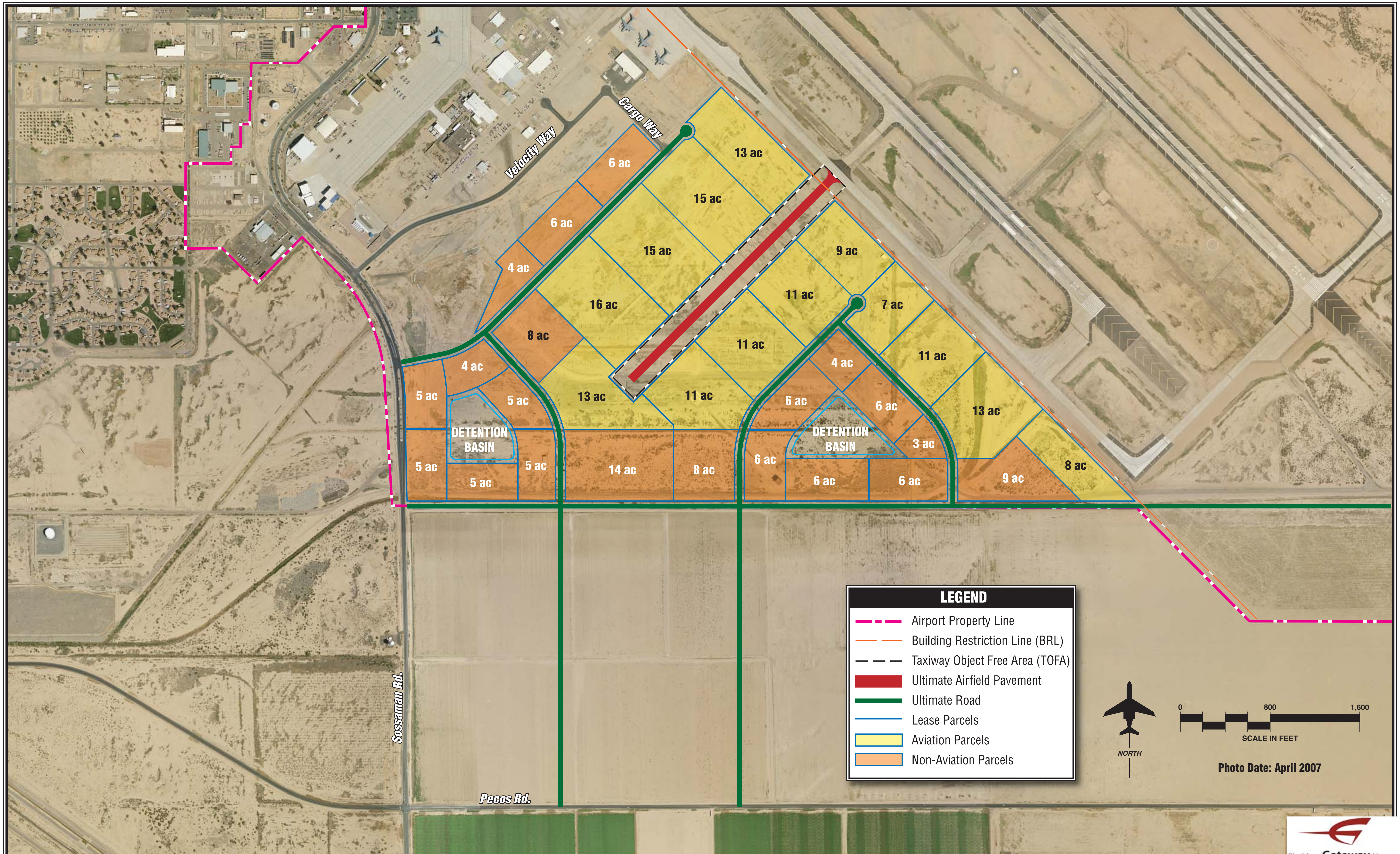

Exhibit 4J
SOUTHWEST LANDSIDE ALTERNATIVE 2

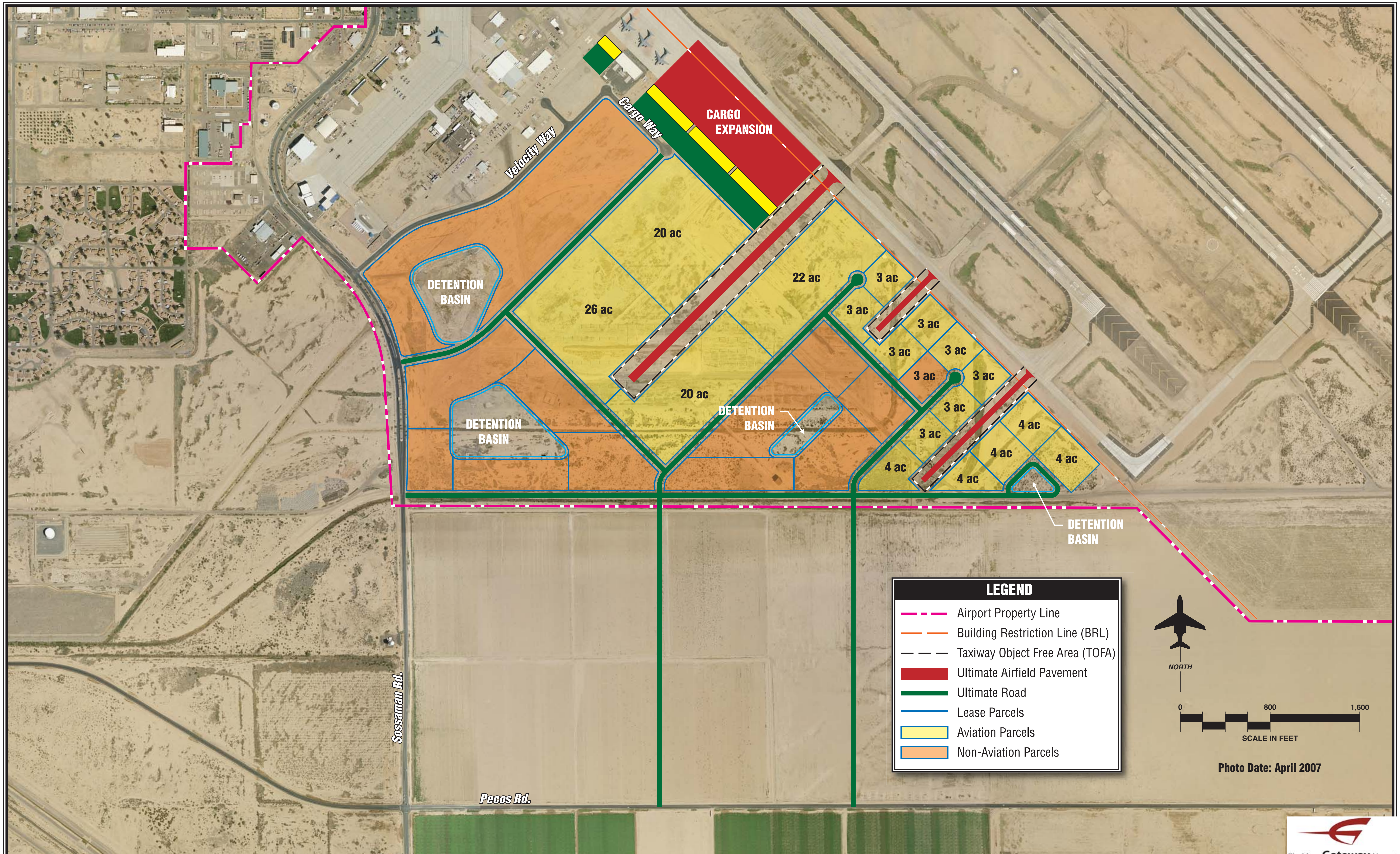

Exhibit 4K
SOUTHWEST LANDSIDE ALTERNATIVE 3

maining property is identified for non-aviation revenue enhancement.

This road system provides an access road from Pecos Road as well as one from Sossaman Road.

EAST SIDE AIRPORT ACCESS

A recommended alignment for the future Williams Gateway Freeway (State Route 802) has been presented in the *Williams Gateway Freeway Alignment and Environmental Overview Study* (March 2006). The selected alignment, as generally depicted on each of the alternative exhibits, provides for two primary airport access points and three interchanges near the airport.

The alignment would extend from the Santan Freeway (202) immediately to the east of Hawes Road in a southeast manner, crossing the alignments for Ray, Williams Field, and Crismon Roads and ultimately assuming the Frye Road alignment east to the county border. The freeway itself would not cross airport property.

Airport access from the north could be via Hawes Road where an interchange directly from the Santan Freeway is located. Interchanges are also planned at the intersection with Ellsworth, Williams Field, and Crismon Roads. Both Ellsworth and Williams Field are planned as full service interchanges with services available at the intersections. Williams Field Road could serve as the east entrance to the future east side terminal building.

While Hawes and Williams Field Roads are planned as the airport access points, the layout of the roadway system on airport property and into the terminal area has not been determined. This master planning effort will help to provide direction on a terminal area road layout.

NEW PASSENGER TERMINAL COMPLEX

A description of the current terminal building was previously presented in Chapter Three. While the functional layout of the building is appropriate, the total area of approximately 24,000 square feet will quickly become congested once air service begins to reach forecast levels. For this reason, two primary options exist: immediately move forward on an east side terminal complex or expand the existing facilities and ultimately plan a move to the east side.

Options for expanding the west terminal building are currently being examined by the airport architect. East side terminal options will follow a discussion on basic terminal design concepts.

Terminal Design Concepts

Guidance on terminal design is provided in AC 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*. There are several basic terminal design concepts: simple, linear, pier finger, satellite, and transporter. A simple terminal design concept involves a single building accommodating all passenger processing functions (ticketing, bag claim, departure lounges). Aircraft parking is adjacent to the airside portion of the building and normally involves ground level boarding. A simple terminal design concept offers the advantage of close-in parking and reduced walking distances to the terminal. Additionally, walking distances within the terminal are minimal. With a single departure area, security screening is usually achieved through a single location. The existing terminal building is considered a simple terminal design.

A linear terminal design concept builds upon the simple terminal design concept by providing for a lengthened building to provide for aircraft parking along the entire length of the building. A linear terminal design is distinguished from a simple terminal design as common facilities (such as departure areas, ticket counters, etc.) are duplicated throughout the building. A linear terminal design can be easily expanded on either end to provide for additional space if needed.

The pier finger terminal design concept builds upon the simple terminal design by providing for aircraft gate and departure areas along a pier extending onto the apron from the building. In contrast to the linear terminal design, the pier finger terminal design has the advantage of providing for centralized ticketing and bag claim functions without having to duplicate these features in other portions of the terminal. This offers operating efficiencies for the airlines and easier aircraft movements along the apron. Walking distances become a factor in this design as some aircraft gates can be located at a considerable distance from the main terminal. Apron design is an important component of the pier finger design as the apron must allow for the development of the pier finger while providing for adequate taxiway areas.

In contrast to a pier finger, a satellite terminal design has aircraft gates located at the end of the concourse rather than being spaced along the concourse in the pier finger design. The satellite concourse does not lend itself to expansion as the entire concourse must be constructed at once. A pier finger offers more flexibility as additional gates can be added as needed.

A transporter terminal design concept involves a simple terminal design with passengers transported to aircraft via a mobile vehicle. In comparison to other terminal design concepts, the transporter concept is labor intensive and more costly to operate. This design does allow for excellent aircraft maneuvering on the apron and less congestion at the terminal gate.

A pier finger terminal design has been selected for the alternatives analysis. A pier finger requires the largest apron area when compared with other terminal design concepts, but offers the greatest flexibility for the future construction and operation of a terminal at Phoenix-Mesa Gateway Airport. While a pier finger terminal can be easily expanded first from a simple or linear terminal to add a pier concourse as additional aircraft gates are needed, the forecast growth in enplanements at the airport will likely lead to a pier concourse terminal as a starting point. A comparison of the terminal building concepts to forecast enplanement levels is presented in **Table 4B**.

TABLE 4B
Terminal Building Concepts Related to Enplanement Levels
Phoenix-Mesa Gateway Airport

Airport Size by Annual Enplanements	Design Concept	Simple	Linear	Pier	Satellite	Transporter	Physical Concepts	Single Level Curb	Multi-Level Curb	Single Level Terminal	Multi-Level Terminal	Single Level Connector	Multi-Level Connector	Apron Level Boarding	Aircraft Level Boarding
Feeder under 25,000		X	X					X		X				X	
Secondary 25,000-75,000		X	X					X		X				X	
75,000-200,000		X	X					X		X		X		X	
200,000-500,000		X	X	X				X		X		X		X	
Primary Over 75% PAX O/D; 500,000-1,000,000		X	X	X	X			X		X		X	X	X	X
Over 25% PAX Transfer; 500,000-1,000,000		X	X	X	X			X		X		X	X	X	X
Over 75% PAX O/D; 1,000,000-3,000,000				X	X	X		X	X		X	X	X	X	X
Over 25% PAX Transfer; 1,000,000-3,000,000				X	X			X	X		X	X	X	X	X
Over 75% PAX O/D; Over 3,000,000				X	X	X		X	X		X	X	X	X	X
Over 25% PAX Transfer; Over 3,000,000				X	X			X	X		X	X	X		X

Source: AC 150/5360-13, Planning and Design Guidelines for Airport Terminal Facilities

Each alternative considers a long term scenario with a 300,000 square-foot terminal building, 12 second-level boarding gates, 5,800 public parking spaces, 200 rental car ready/return spaces, and 400 terminal employee parking spaces. The high range forecast considered in Chapter Three – Facility Requirements, indicated an ultimate need for a 600,000 square-foot building, 30 boarding gates, and 8,400 total parking spaces. Space will be reserved in each alternative to accommodate this ultimate growth plan.

Several potentially constraining factors are also considered for each alternative. First, the Airport Surveillance Radar (ASR) is located in this area. The ASR is owned and operated by the FAA and is used in regional air traffic control to provide controllers information on the position and altitude of aircraft. The FAA has been notified of the intent by the airport to construct a terminal complex on the east side of the airport. The alternatives will assume that the ASR will be relocated off of airport property.

A second consideration is the location of the Powerline floodway. Proposed development may require bridging or rerouting the floodway. One of the features of the Williams Gateway Freeway alignment is a relocation of the Powerline floodway closer to the freeway. This would open up more east side developable land. Thirdly, a former ordnance site and abandoned underground bunkers are located in the northwest corner of this area. This site may need special dispensation prior to construction.

A final consideration is the location of several archaeological sites. The "El Horno Grande," "Radar," and "Ordnance" sites are located along the eastern airport property line. Additional study of these sites may be required prior to construction.

Terminal Complex Alternatives

The east side of the airfield is an undeveloped brownfield. This allows many factors to be considered when determining the optimal location for the passenger terminal complex. Locating the terminal central to the runway system is often considered a logical starting point. This allows for aircraft to taxi an equal distance to the terminal complex regardless of the runway used for take-off or landing. This can also allow for symmetrical terminal building expansion in the future. This concept is the first of three terminal complex alternatives and is presented on **Exhibit 4L**.

The initial terminal building considers a single pier with 12 available gates. The gates are designed around a passenger aircraft represented by the 108-foot wingspan of the MD-80. At least 25 feet of clearance is available between wing tips while aircraft are parked at the gate. If the airport realizes operations by aircraft with greater wingspans, then adjustments will have to be made to the gate area and the number of gates.

This first alternative considers a terminal complex to be centered on the primary commercial runway, Runway 12L-30R. The total apron area provided is 107,000 square yards. Ultimately, this apron is planned for expansion to 284,000 square yards. Two additional piers are also shown for high range planning purposes, which would bring the total number of gates available to 36.

This alternative considers two entrance points to the airport: Hawes Road from the north and Williams Field Road from the east. Both entrance roads would intersect with a one-way terminal loop road. The interior of the terminal loop road would have short and long term public parking as well as employee and rental car spots. Upon exiting the terminal complex, vehicles can either exit the airport via Williams Field Road or circle around the terminal loop to reconnect with Hawes Road going north or return to the terminal area.

One primary advantage of this terminal complex layout is the ease of

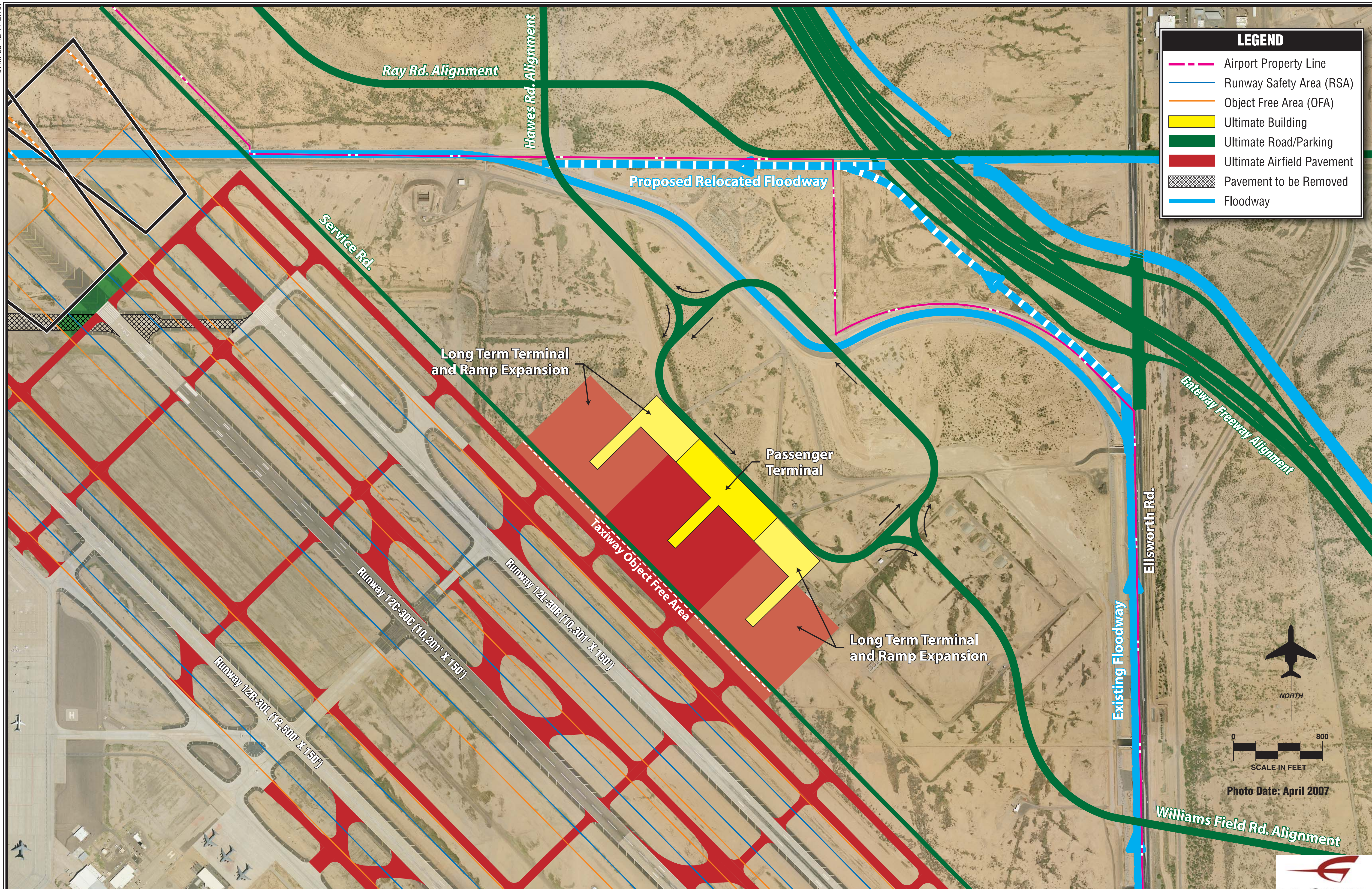

Exhibit 4L
TERMINAL ALTERNATIVE 1

access. Drivers from the Santan Freeway can easily access the airport via Hawes Road. Drivers from the south can easily access the airport from Williams Field Road. Another advantage is the consolidation of all airport functions within a short distance of the terminal complex.

One disadvantage is the distance from the back of the surface parking area to the terminal building, which is approximately 1,400 feet. This is considered a long distance and may require the availability of shuttle busses to transport patrons to the terminal building. A more reasonable distance is between 600 and 800 feet for short term parking. Long term and employee parking is more appropriately set back and can be at a greater distance.

The location of the surface parking lot as presented would require bridging or relocating a portion of the Powerline floodway, unless the Williams Gateway Freeway project includes relocation of the floodway. This alternative also considers the primary cargo facilities to remain on the southwest side of the airport. The cargo facilities in this alternative would continue the linear design concept adopted by the current cargo facility.

The second terminal complex alternative, presented on **Exhibit 4M**, considers locating the terminal building slightly to the northwest of the midpoint of the runway. This location would provide for quicker access to the airport from Hawes Road. The main cargo facilities would also be located on the east side of the airport to the south of the terminal building.

A single entrance to the airport is considered from Hawes Road to the north, which would transition into a one-way terminal loop road. Vehicles traveling south from the intersection of Hawes and Ray Roads would be in the airport environment and would have to utilize the terminal loop road to exit the airport. As with each alternative, parking is available on the interior of the terminal loop road.

An advantage of this entrance road layout is that pass-through traffic would be eliminated. The terminal loop feature is a common terminal area design intended to eliminate pass-through traffic that can hinder passenger loading and unloading activities. In addition, the passenger terminal activities are entirely separated from air cargo activities, which would have a separate entrance from Ellsworth Road.

A disadvantage of this alternative may be that airport users coming from the south via the future Williams Gateway Freeway will have to utilize Ellsworth Road north to Ray Road west to Hawes Road south.

The third terminal area layout, shown on **Exhibit 4N**, considers the possibility of locating the terminal complex slightly to the southeast of the midpoint of the runway. The main cargo facilities are then located on the northeast side of the airport. This design layout would allow for both the terminal area and cargo facilities to expand toward the center as needed.

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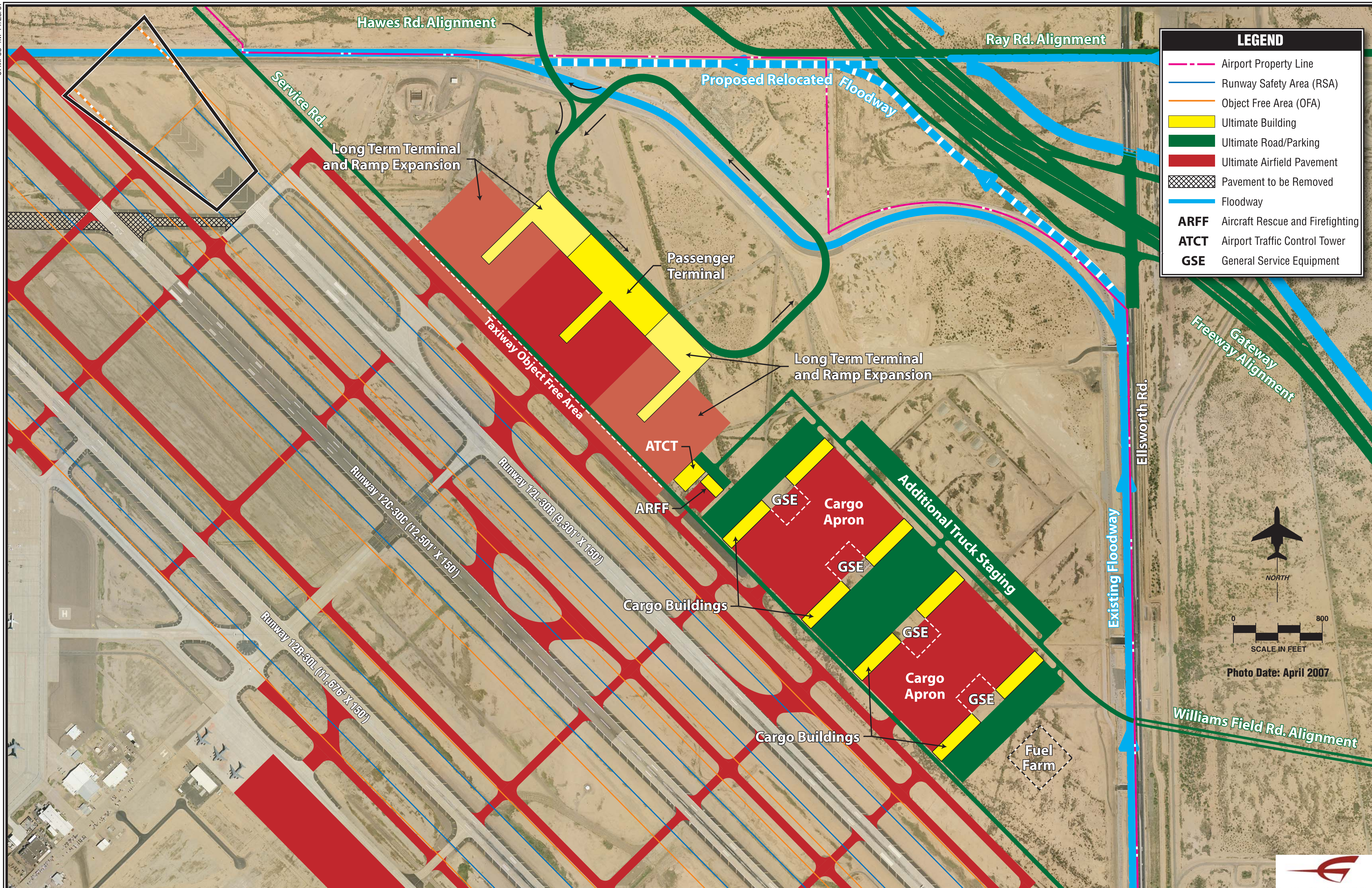

PhxMesa Gateway Airport

Exhibit 4M
TERMINAL ALTERNATIVE 2

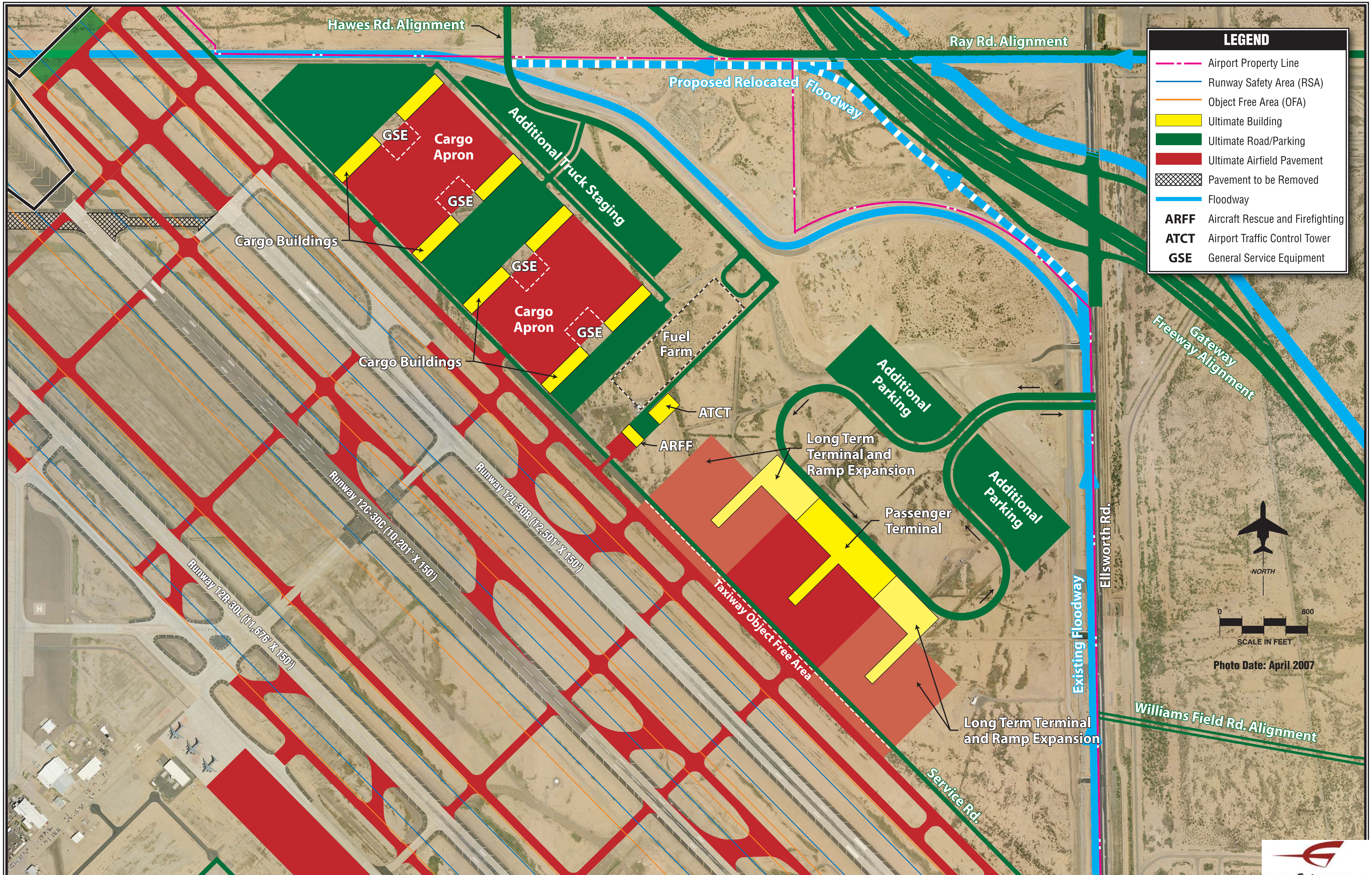

Exhibit 4N
TERMINAL ALTERNATIVE 3

Hawes Road from the north would provide access to the future cargo facilities. The main access to the passenger terminal complex would be via Ellsworth Road. Short term and rental car parking would be located on the interior of the terminal loop road with employee and long term lots located outside the loop.

There are several advantages to this type of terminal complex layout. First, the terminal building is located in an area where there is ample undeveloped land, and no existing roads or floodways would be impacted. Second, air cargo and passenger terminal functions are completely separated, eliminating truck traffic through the terminal area. Third, the air cargo location is adjacent to areas currently zoned for commercial/industrial uses.

A disadvantage may be the lack of an entrance road from Hawes Road to the north. Instead, drivers would have to exit Hawes Road from the Santan Freeway, go east at Ray Road, and then south at Ellsworth Road.

CARGO ALTERNATIVES

The optimal location of cargo facilities is dependent on both the runway environment and the surface transportation environment. When considering the runway environment, it is preferred to locate cargo facilities adjacent to the runway that is most likely to be utilized by cargo aircraft. Under Airfield Alternative 1, with Runway 12R-30L ultimately extended to 12,500 feet, the cargo facilities are planned to remain in their current location to the southwest. In this alternative, the linear design concept is maintained and duplicated along the flight line.

A disadvantage of this location for expanded cargo activity is the surface transportation system. Currently, heavy trucks coming from or going to the north have to utilize Velocity Way, Sossaman Road, Ray Road, and Power Road to access the freeway system. A back way might take them south on Sossaman to east Pecos Road to north Ellsworth Road. Either of these directions requires several turns and stops. In addition, truck traffic would be mixed with airport terminal traffic for as long as the Sossaman Road terminal building is in use.

An advantage of this location is a cargo facility has already been established on-site. This facility has a large ramp and is readily expandable. In addition, road improvements to Sossaman, Power, and Ellsworth Roads make these roads better able to accept truck traffic.

The expansion of the southeast cargo facility is shown to provide 400,000 square feet of building space and 80,000 square yards ramp. This cargo facility alternative was previously shown on Airfield Alternative 1, **Exhibit 4D**.

Two east side cargo complex alternatives are presented. The first is depicted on **Exhibit 4M**, Terminal Alternative 2, and presents a "pod" design concept. This design concept is desirable when depth from the flight line is available. The two "pods" shown would accommodate the high range forecast need for both building space and apron area. Truck and automobile parking is available adjacent to the sort buildings, and additional truck staging ground is available to the east of the cargo area entrance road.

This location would allow for access to the freeway system via Williams Field Road. This access point would also avoid truck traffic on the terminal access road. The former GM Proving Grounds area to the east of Ellsworth Road is being considered for mixed use development. Although not incompatible, heavy truck traffic is better situated with similar land uses, such as warehousing or manufacturing.

The air cargo facility included on Terminal Alternative 3, as depicted on **Exhibit 4N**, is planned for the area to the northeast of Runway 12L-30R. Again, the "pod" concept is depicted. Primary access would extend off Hawes Road.

This location works well with the airport alternative that considers extending Runway 12L-30R to 12,500 feet. With most arrivals occurring from the southeast, cargo aircraft could be directed to Runway 30R and then exit the runway to the east, leading directly to the cargo ramp. In addition, this location is adjacent to lands that are currently zoned for similar industrial or commercial uses.

AVIATION SUPPORT FACILITIES

Aviation support facilities are those functions that do not logically fall into airside or landside classification. Facilities such as aircraft rescue and firefighting, airport maintenance, and fuel farms are essential to maintaining a safe and efficient operating environment.

Airport Rescue and Firefighting Facility (ARFF)

The current ARFF facility is located on the west side middle ramp. This facility is being considered for replacement by the Airport Authority and the City of Mesa, which staffs the facility. This facility currently can house vehicles to meet Index B standards. With the likely increase in the size of the commercial aircraft, Index C, D, and ultimately E are forecast. Each of these levels requires greater vehicle storage capacity. The current ARFF facility is unlikely to be able to accommodate the vehicle requirements to meet increasing index standards.

The Airport Authority and the City of Mesa have been engaged in discussions to either replace the ARFF facility in its current location or to construct a new facility somewhere else on the airport.

The primary consideration for locating an ARFF facility is the ability for the responders to demonstrate an emergency response time of three minutes or less to a simulated accident. At Phoenix-Mesa Gateway Airport, the ARFF vehicles must arrive at the midpoint of Runway 12L-30R and begin applying suppression agents within the allotted time. Currently, the ARFF team meets this requirement from the current location.

A second location for consideration of a new ARFF facility would be in the general vicinity of the existing control tower. This location would allow response time to be maintained. There is adequate space for a new facility, and road access is convenient via Velocity Way. Both sides of the airport would be readily accessible.

A third potential location would be on the east side of the airport. Optimally, an east side ARFF facility should be located central to the runway system. Potential sites are associated with each of the terminal complex alternatives.

Airport Traffic Control Tower (ATCT)

The current control tower located southeast of the middle apron was constructed in 1970. This tower is aged and cramped. An increase in operations, especially air carrier operations, may lead to extended hours of operation and a need for more controllers. The space available in the tower cab will become severely constrained. This master plan considers the possibility of replacing this tower with a new, modern facility that is capable of accommodating the forecast growth at the airport. The first site for consideration is immediately adjacent the current site. This site has positive visibility to all runways and taxiways. Visibility is obstructed by several hangars, but due to the location of hangars on both sides of the south apron, any location for a tower will likely have obstructed views to this area. In an effort to reduce the non-visibility areas, this replacement tower is shifted to the north, which would allow greater visibility of the south and north ramps.

Another consideration for a replacement tower is to move to the east side of the airfield. Like the location of ARFF facilities, tower facilities should be central to the runway system to allow maximum visibility of the runway and taxiway environment. An east side location would likely increase the non-visibility areas. This is acceptable as long as all runways and taxiways (the primary movement areas) are visible.

As shown on the terminal complex alternatives, a potential east side replacement tower is generally located in the same vicinity as the replacement ARFF facilities.

Fuel Storage

The new fuel farm located on the south ramp provides for 150,000 gallons of jet fuel and 12,000 gallons of

Avgas. As activity increases, additional storage capability will be needed. This fuel farm is capable of being expanded, and planning should consider doubling capacity over the next five to ten years.

When the east side terminal plan begins moving forward, consideration should be given to an east side fuel farm primarily intended to service commercial aircraft. The fuel farm should be located away from high traffic areas, often near the ends of the flight line or set back from the flight line complex. The ability for tanker trucks to access the fuel farm without needing to pass through the passenger terminal complex is also preferred.

Two east side sites are considered. The first is depicted on **Exhibit 4M** and is located to the southeast of the cargo complex. This location would provide access for tanker trucks to enter from the cargo entrance off Ellsworth Road. The second location is depicted on **Exhibit 4N** and is located between the passenger terminal complex and the cargo area. The fuel farm would only be accessible via the cargo entrance. Either of these sites should be capable of expansion to a million gallons.

Some airports provide hydrant fuelling capability, which means that fuel lines are under the ramp with flat hydrants at each gate. A small vehicle that transfers fuel from the hydrant to the aircraft is also located at the gate. The advantage to this type of fueling operation is that refueling trucks do not need to be scheduled for each arriving aircraft. Any leak would require a portion of the ramp to be excavated, which can lead to disruptions in aircraft movements or gate utilization. A hydrant system would require the same precautions and detection systems as an underground storage system. In addition, the longer the distance between the fuel farm and the gates, the higher the piping costs.

Maintenance Facilities

Currently, maintenance vehicles and equipment are stored in several building at the airport. This can be advantageous in that specific equipment for specific areas of the airport can be stored in close proximity to those areas. Conversely, a consolidated maintenance facility can lead to greater utilization of space and better management of resources.

A consolidated maintenance facility could work on any airport parcel. Particular attention should be paid to insuring the security of the airfield.

SUMMARY

The alternatives chapter has been divided into functional sections for evaluation purposes. Several airfield alternatives have been considered, including the recommended concept from the previous master plan. Each airfield alternative considers extending at least one runway to an ultimate length of 12,500 feet.

The next focus area was the undeveloped property to the southwest of the airfield. Three alternatives were considered, each of which provided for expanded airfield access with the extension of Taxiway L, as well as some area for parcels that do not need airfield access.

The east side of the airfield has long been considered a logical location for a future passenger terminal complex. The alternatives presented here considered three locations for the terminal building complex. Each alternative also considered potential on-airport roadway alignments. The finalization of the Williams Gateway Freeway alignment has led to the possibility of two separate entrances to the airport.

The remaining chapters will be dedicated to refining these basic concepts into a final plan with recommendations to ensure proper implementation and timing for a demand-based program.

PhxMesa Gateway Airport

Chapter Five

RECOMMENDED MASTER PLAN CONCEPT

Chapter Five

Recommended Master Plan Concept

The airport master planning process has evolved through several analytical efforts in the previous chapters intended to estimate future aviation demand, establish airside and landside facility needs, and evaluate options for future development needs. The planning process, thus far, has included the development of three sets of working papers which were presented to the Planning Advisory Committee (PAC) and discussed at several coordination meetings. A master plan concept has evolved, with input from these groups and individuals.

The PAC is comprised of several constituencies with an investment or interest in the Phoenix-Mesa Gateway Airport. Groups represented on the PAC include the Federal Aviation Administration (FAA), the Arizona Department of Transportation - Department of Aeronautics (ADOT), the Maricopa Association of Governments, the Arizona Military Airspace Working Group, the Arizona Air National Guard, the City of Phoenix - Aviation Department, the City of Mesa and surrounding cities and towns, airport management, airport traffic control tower personnel, airport businesses, pilot associations, neighboring airports, Chandler-Gilbert Community College, Arizona State University, and citizen and neighborhood groups. This diverse group has provided extremely valuable input into this recommended plan.

In the previous chapter, several development alternatives were analyzed to explore options for the future growth

and development of Phoenix-Mesa Gateway Airport. The development alternatives were refined into a single concept. This chapter describes, in narrative and graphic form, the recommended future development of Phoenix-Mesa Gateway Airport.

RECOMMENDED MASTER PLAN CONCEPT

The recommended master plan concept, as presented on **Exhibit 5A**, presents an ultimate configuration for the airport that meets FAA design standards, increases overall airport capacity, and provides a variety of aircraft storage options. A phased program to implement the recommended development configuration will be presented in Chapter Six – Financial Plan. The following subsections will describe the recommended master plan concept in detail.

AIRFIELD DESIGN STANDARDS

The FAA has established design criteria to define the physical dimensions of runways and taxiways, as well as the imaginary surfaces surrounding them, which protect the safe operation of aircraft at the airport. These design standards also define the separation criteria for the placement of landside facilities.

As discussed previously, FAA design criteria primarily center on the airport's critical design aircraft. The critical aircraft is the most demanding aircraft or family of aircraft which currently, or are projected to, conduct 500 or more operations (take-offs and landings) per year at the airport. Often the critical aircraft can also be determined by the largest commercial aircraft with regularly scheduled service to the airport whether or not this aircraft performs 500 annual operations. Factors included in airport design are an aircraft's wingspan, approach speed, and tail height, coupled with the instrument approach visibility minimums for each runway. The FAA has established the Airport Reference Code (ARC) to relate these critical aircraft factors to airfield design standards.

Analysis conducted in Chapter Three – Facility Requirements indicated that the three parallel runways should be planned to meet the requirements for ARC D-V. Some smaller commercial service airports with a significant general aviation component will apply different design standards to each runway based on usage. Analysis conducted in the previous chapters indicates that Phoenix-Mesa Gateway Airport should plan to accommodate up to five million annual enplanements as well as a significant air cargo component. Because of this forecast growth, all three runways should be fully capable of accommodating commercial jets. **Table 5A** presents the design standards to be applied to the runway system.

While the design standards for the airfield should meet ARC D-V, the separation standards for facilities can be adjusted to accommodate the appropriate aircraft. For example, T-hangars should be separated at a distance to accommodate small general aviation aircraft, not large commercial aircraft.

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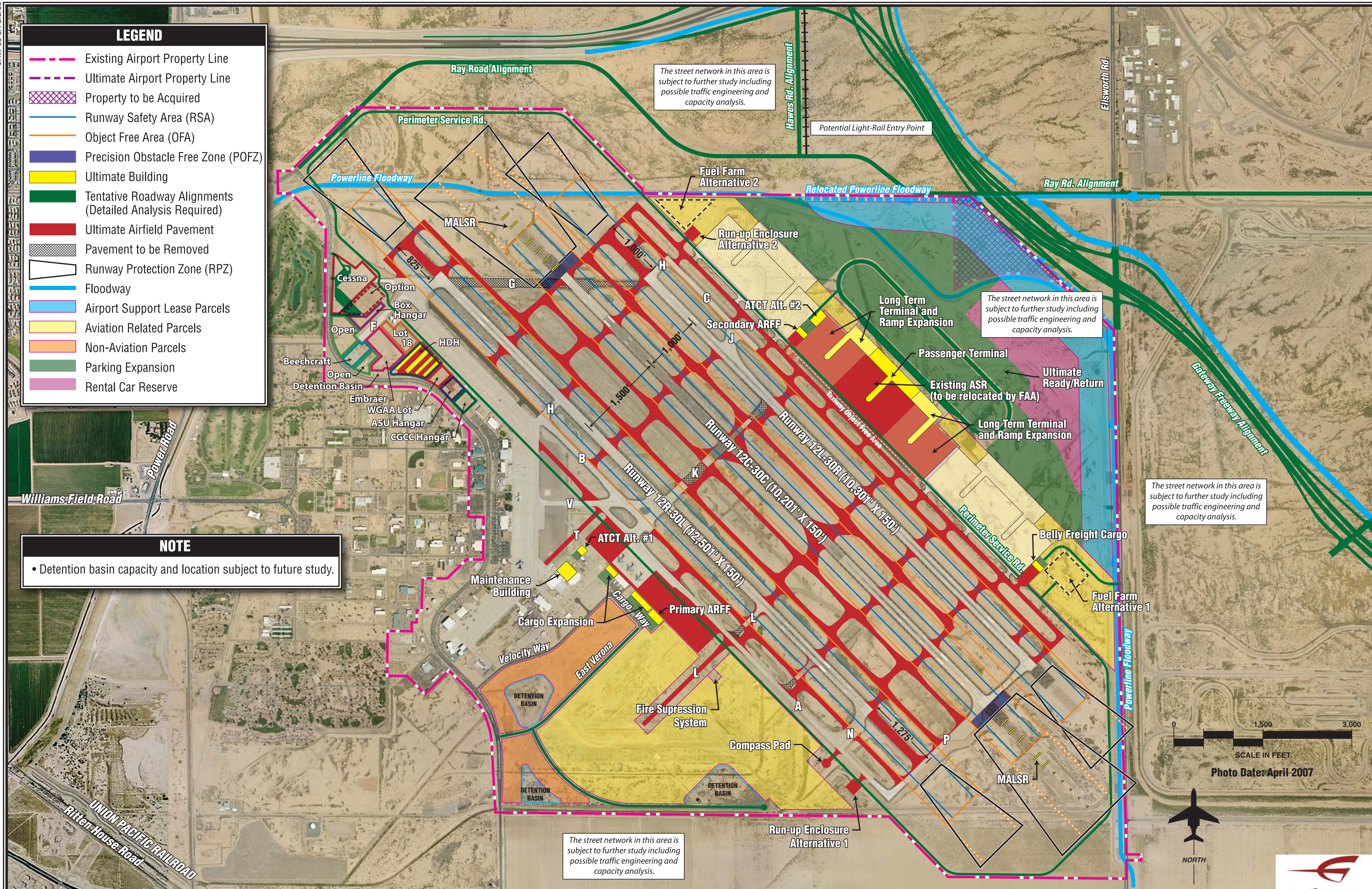

Exhibit 5A
MASTER PLAN CONCEPT

TABLE 5A **Airfield Planning Design Standards (Ultimate)** **Phoenix-Mesa Gateway Airport**			
Airport Reference Code	**D-V (All Runways)**		
Runways			
Width	150		
Shoulder Width	35		
Runway Safety Area			
Width	500		
Length Beyond End	1,000		
Object Free Area			
Width	800		
Length Beyond End	1,000		
Obstacle Free Zone			
Width	400		
Length Beyond End	200		
Precision Obstacle Free Zone*			
Width	800		
Length Beyond End	200		
Runway Centerline to:			
Hold Position	264		
Parallel Taxiway Centerline	450		
Edge of Aircraft Parking Area	500		
Taxiways			
Width	75		
Shoulder Width	35		
Safety Area Width	214		
Object Free Area Width	320		
Edge Safety Margin	15		
Taxiway Centerline to:			
Fixed or Movable Object	267		
Parallel Taxiway/Taxilane (Centerline)	160		
Taxilanes			
Object Free Area Width	276		
Taxilane Centerline to:			
Fixed or Movable Object	138		
Parallel Taxiway/Taxilane (Centerline)	245		
Runway Protection Zones	12R-30L	12C-30C	12L-30R
Visibility Minimum	1-mile	1/2-Mile	1-Mile
Inner Width	500	1,000	500
Outer Width	1,010	1,750	1,010
Length	1,700	2,500	1,700
Note: All measurements in feet. *Runway 12C-30C only.			
Source: FAA AC 150/5300 - 13, Change 11, Airport Design			

AIRSIDE RECOMMENDATIONS

The recommended airfield layout is presented on **Exhibit 5A**. The issue related to the airfield system that is of primary concern is the potential capacity constraint of the airfield. As presented in Chapter Three – Facility Requirements, operations may exceed 60 percent of the annual service volume

(ASV) in the short term planning period. By the long term planning period, operations may exceed 95 percent of the ASV. Without capacity improvements, the airfield could experience an unacceptable level of delay and congestion.

In Chapter Four – Alternatives, it was demonstrated that capacity could be increased between 19 and 34 percent with improvements to the taxiway system. As shown on the exhibit, each runway is outfitted with parallel taxiways. The outboard runways are additionally outfitted with parallel terminal area taxilanes. The terminal area taxilanes will improve circulation and efficiency. Three parallel taxiways are also planned for the areas between the runways.

The exhibit also depicts four acute-angled taxiway exits, commonly referred to as "high-speed" exits. These exits help improve capacity by allowing aircraft to exit the runway sooner than a traditional right angled exit would allow. This design element has already been undertaken at the airport with the construction of Taxiway J as a high-speed exit leading to partial parallel Taxiway C. These taxiway exits are planned for the central portion of Runway 12C-30C, the primary arrival runway.

Other taxiway improvements include construction of Taxiway T between Taxiway A and the south ramp area, adjacent to the airport traffic control tower (ATCT). In addition, Taxiway L is shown extending approximately 2,000 feet into the undeveloped southwest area. This taxiway will open up more than 144 acres for potential aviation-related development. All taxiways are planned at a width of 75 feet to meet ARC D-V standards.

The FAA has made it a high priority to support means for airports to reduce or eliminate runway incursions. A runway incursion is defined as "Any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and take off of aircraft." To this end, on November 19, 2007, the FAA published Engineering *Brief No. 75: Incorporation of Runway Incursion Prevention into Taxiway and Apron Design*.

At Phoenix-Mesa Gateway Airport with a need for many new taxiways, the opportunity exists to both improve airfield capacity and reduce potential runway incursions through taxiway layout planning. According to Engineering Brief 75, avoid taxiway layouts that provide straight direct access onto a runway. Instead the pilot should be forced to consciously make turns to promote situational awareness.

To meet these recommendations, the new taxiways stretching from the west side to the east are offset in order to prevent straight access to any runway. The pilots must make slight turns in order to proceed across a runway.

Exhibit 5A presents the recommended improvements to the runway system. Runway 12R-30L is planned to an ultimate length of 12,500 feet. This length is the optimum recommended to reserve the capability to ultimately accommodate long range international cargo flights. To meet this ultimate length, an extension is planned for each end of the runway.

On the Runway 30L end, an extension of 1,275 feet is planned. This extension serves several purposes. Currently, Taxiway P does not meet the standard for an end-around taxiway, and all approach surfaces to Runway 30L would be penetrated by a D-V aircraft. By extending the runway to the intersection with Taxiway P, both of these problems are solved. In addition, this extension will improve airfield capacity and circulation by providing additional ground movement areas. This extension should be considered regardless of the future runway length needs. In the interim, the hold lines on Taxiway P should be maintained to prevent a possible runway incursion.

The northwest end of the runway is planned for an 825-foot extension, bringing the total runway length to 12,500 feet. This extension would only be necessary if a carrier demonstrated a need such as a long haul cargo operator. Runway 12R-30L would also be most convenient to the designated all-cargo area of the airport.

Runway 12C-30C is planned to remain at its current length of 10,201 feet. This length meets the needs of all passenger aircraft expected to operate at the airport. As presented in the previous chapter, this runway would be used primarily for arrivals, while the outboard runways would be used primarily as departure runways. Air traffic control, however, would still utilize the runways as traffic conditions warrant.

The exhibit shows parallel taxiways to Runway 12C-30C. With the two east side runways primarily identified for commercial operations, the parallel taxiway to the east should be planned for construction prior to the west side parallel taxiway. The west side parallel taxiway to Runway 12C-30C is planned, but is likely a long range project beyond the 20-year scope of this master plan.

With Runway 12C-30C being the primary commercial arrival runway, both ends are considered for improved instrument approaches. The instrument landing system (ILS) approach to Runway 30C currently provides for visibility minimums not lower than ¾-mile. While poor visibility conditions are rare in the region, as a potentially busy commercial service airport, at least one runway should have all-weather capability with at least Category I (CAT-I) minimums. Therefore, both ends of the center runway are planned for CAT I instrument approaches with visibility not lower than one-half mile and cloud ceilings as low as 200 feet.

The CAT I approaches would ultimately be Global Positioning System (GPS) approaches. The FAA is making significant advances on approving this type of approach. Initially, CAT I GPS approaches were being approved as overlays onto existing ILS approaches. In the past year, the FAA has begun approving stand-alone CAT I GPS approaches. This means that qualifying airports no longer have to have a localizer or glide slope antenna. Any approach below one-mile still requires, in most cases, an approach lighting system. Therefore, a medium intensity approach lighting system with runway alignment indicator lights (MALSR) would be needed on the approach to Runway 12C prior to approval of a CAT I GPS approach. The inoperable

MALSR on the approach to Runway 30C would need to be replaced.

Runway 12L-30R is planned for a 1,000-foot extension to the northwest. This extension is necessary for airfield layout and circulation improvement. By extending the runway 1,000 feet, the threshold would align with the threshold for Runway 12C. This extension would provide additional departure length from the runway closest to the future east side terminal area. Since Runway 12L-30R is identified as the primary commercial departure runway, the additional 1,000 feet of length would meet the needs of longer haul flights during summer months.

Runway 12L-30R is currently a visual runway with no instrument approaches. This runway should be equipped with instrument approaches with visibility minimums not lower than one mile.

Consideration was given to the optimal role for each runway. While each runway can be utilized for commercial or general aviation activity, typical operational procedures will favor one runway over another. With all of the general aviation landside facilities planned to remain on the west side of the airfield, it is logical for Runway 12R-30L to accommodate most of this activity, especially when commercial activity transitions to the east side.

In consultation with the PAC and airport administration, it was recommended to maintain and develop air cargo facilities in their current location in the southwest portion of the airport. This decision is supported by the airfield layout. Runway 12R-30L can most easily be extended to 12,500 feet to meet the potential needs of air cargo operators. Extension of either of the other runways would require additional property acquisition or road relocations. Therefore, the runway closest to the air cargo facilities can be extended, and the existing investment in the air cargo facilities can be maintained for their intended purpose.

The pavement strength of the runways is also a consideration. Runway 12L-30R is the strongest runway, providing a strength rating of 850,000 pounds for double-dual tandem (DDT) aircraft. The two westerly runways provide a strength rating of 550,000 pounds for DDT aircraft. Runway 12C-30C is planned for strengthening up to 850,000 pounds DDT. Runway 12R-30L should also be strengthened to 850,000 pounds DDT if operations, particularly cargo operations, justify it in the future.

Throughout the development of the recommended concept, particular attention has been paid to maintaining design standards. All runways currently and in the future condition meet design standards for runway safety area (RSA), object free area (OFA), Obstacle Free Zone (OFZ), Precision Obstacle Free Zone (POFZ), and Runway Protection Zone (RPZ). Separation standards are also met.

LANDSIDE PLANNING RECOMMENDATIONS

The Airport Authority has been proactive in ensuring that activity at the airport is appropriately separated and that adjacent land uses are compatible. This has led to the airport being a viable community asset for the foreseeable future. By following a strategic plan for development that provides for a separation of activity levels, the airport is able to maintain maximum efficiency of development.

The major activity centers are relatively separate and distinct from each other. The north ramp on the west side of the airfield is utilized for general aviation activity. The airport fixed base operator (FBO) is located in this area. Much of the flight training activity takes place here, and most aircraft tie-down positions are located here. Over the last few years, several general aviation hangar developments have taken shape in this area.

Embraer, Cessna, and Hawker Beechcraft are all constructing business jet service centers. Arizona State University and Chandler-Gilbert Community College have both constructed or are constructing hangars intended to support their flight training operations. Fleming West Building Company has constructed a 25,000 square-foot conventional hangar that was recently leased to Hawker Beechcraft. A complex of T-hangars and box hangars is also being constructed in the north ramp area.

The middle ramp supports some general aviation activity, including the U.S. Marshals Service that bases two MD-80 aircraft here. The current commercial service passenger terminal building is also facing the middle ramp. The south ramp is also utilized for general aviation activity, but to date has been used for maintenance operations and corporate aviation.

In the short term, the majority of the middle ramp is planned to support commercial service operations. The terminal building forecasts indicated a need for up to six aircraft gate positions in the short term planning period. This would require an expansion of the existing building as only three gates are currently available. The Airport Authority is currently contracted with an architectural firm to design expanded terminal facilities on the west side. Connected modular buildings are planned in the fall of 2008 in order to meet the immediate need for more terminal space.

Ultimately, when commercial operations move to the planned east side terminal building, the middle ramp can be converted to general aviation uses. The remaining west side ramp parcels should continue to be designated for general aviation uses and "in-fill" hangar development should be encouraged.

The southwest portion of the airport encompasses approximately 300 undeveloped acres. A portion of this area is planned to be bounded by Velocity Way, Cargo Way, East Verona, and Sossaman Road, making this area available for commercial/industrial uses that do not require airfield access. A second portion, at the corner of Sossaman Road and the Old Pecos Road alignment, is also intended for commercial/industrial development without airfield access.

The area surrounding the existing cargo facility is identified for further air cargo expansion. The alternatives analysis considered the potential for shifting primary cargo activities to the east side of the airfield, but it was determined to maintain air cargo operations in the current location and allow for expansion. As discussed, this was based on a desire to maintain the existing cargo building and to optimize the runway system by providing for the potential of Runway 12R-30L to be extended to 12,500 feet.

The remaining property, approximately 191 acres, is made available for businesses requiring airfield access. Taxiway L is planned to be extended into this area to provide this access. This area may attract specialized aviation-related businesses requiring large parcels with airfield access. The large parcel area also provides the airport administration with flexibility in leasing as the large parcel can be subdivided to respond to market demands.

The layout of the surface road system in this area is important. While the area is intended to cater to industrial/commercial uses, these uses often introduce more truck traffic. Additional truck traffic should be discouraged from utilizing Sossaman Road going north to access the highway system. The mixing of trucks and cars near the passenger terminal complex is not desirable. Instead, the road system should encourage truck traffic to exit to the south then east to Ellsworth Road or west to Power Road.

A replacement aircraft rescue and firefighting (ARFF) station is also depicted on **Exhibit 5A**. The planned ARFF station is located at the south end of Cargo Way. This location was selected because this station is expected to serve both the airport and the City of Mesa. Responders will be able to quickly access Sossaman Road via East Verona, once it is constructed. This location is also centrally located to the runway system, allowing responders to meet FAA guidelines for response time on the airport.

The proposed development of the southwest side of the airfield also includes expanding the airport operations and maintenance building and providing space for a replacement ATCT. The proposed maintenance building is adjacent to the current building and would allow for consolidation of many operations and maintenance activities.

The location of the current ATCT is excellent for runway visibility, but the facility is 38 years old, the tower cab space is limited, and it does not meet current standards. Tower management has indicated that expanded commercial activity would lead to a need for more controllers and thus more space. Therefore, two locations are identified for a replacement tower, one of which is immediately adjacent to the existing facility. The second location is on the east side of the airfield to the north of the passenger terminal building. FAA requirements for land area for towers may eliminate the current site from consideration. A tower siting study should be undertaken to determine the best location.

East Side Complex

Phoenix-Mesa Gateway Airport is forecast to reach 2.2 million enplanements within the 20-year planning scope of the master plan. The master plan is also considering a high range forecast of 5.0 million annual enplanements. The existing passenger terminal facilities will be unable to accommodate this growth. As a result, the airport administration has long considered ultimate development of the east side of the airfield for a replacement passenger terminal complex. **Exhibit 5A** presents the east side terminal complex.

The initial terminal building considers a single pier with 12 available gates. The gates are designed around a passenger aircraft represented by the 108-foot wingspan of the MD-80. At least 25 feet of clearance is available between wing tips while aircraft are parked at the gate. If the airport realizes operations by aircraft with greater wingspans, then adjustments can be made to the gate area and the number of gates.

The terminal complex is located central to the runway system. The initial apron size is 113,000 square yards. Ultimately, this apron is planned for expansion to 202,000 square yards with an additional pier. The distance between the piers is 900 feet, which would allow for dual taxilanes leading to the gates. As a rule of thumb, according to the FAA, dual taxilane access to terminal piers is useful when there are five or more gates on each side of the pier. In some cases where the gates are very active, such as if the gates serve an airline hub operation, then as few as three gates per pier side can be justified.

The initial terminal building is approximately 150,000 square feet including the aircraft gate pier. To each side of the initial terminal building, ultimate additions are planned. The first addition is approximately 144,000 square feet, bringing the total long term building size to 294,000 square feet. This would meet the forecast long term need. The ultimate terminal building would encompass 600,000 square feet meeting the minimum area requirements for accommodating 5.0 million enplanements – the high range forecast.

The flight line space to either side of the initial terminal building should be reserved for direct aviation-related purposes. As shown in the exhibit, further terminal building expansion is considered. The building footprint for each of these future terminal buildings is 510,000 square feet.

To the immediate north of the initial terminal building is space for a replacement ATCT and additional ARFF facilities. The ATCT is the second potential location with the first being adjacent to the current tower. The ARFF facility depicted could either be a primary ARFF location or a secondary location with the west side facility being the primary location. As the east side terminal area grows, it will be important to have a facility for ARFF personnel on the east side. A small cargo facility is provided to the south of the planned terminal building to allow freight operators quick access to aircraft for transfer of belly freight.

Two sites are identified for an east side fuel farm. The location to the southeast provides ready access for delivery vehicles from Ellsworth Road. This location is also more directly accessible for a future direct fuel pipeline from the south. The southeast location has a 500-foot set-back from Ellsworth Road to allow for landscaping or berming. The north location would be separated from other land uses by the floodway and the adjacent zoning is for industrial uses. A final determination on the location of the fuel farm will be made in the future.

Several factors helped define the recommended east side terminal concept. The north entrance to the airport is considered fixed at the Hawes Road alignment. The Powerline floodway is planned to be relocated to the outside edges of airport property as shown, which is included in the ADOT final alignment plans for the Gateway Freeway. A triangle-shaped parcel is considered to be acquired by the airport. Providing for airport access from both the north and southeast is also a goal, as was utilizing the existing bridges from Ellsworth Road to the airport. Finally, it was a goal to provide leasable commercial space intended for airport support businesses such as a hotel and conference center.

The actual access road layout on airport property has not been determined at this time. The airport has indicated a need for a separate study to analyze potential access to the airport and traffic impacts. As can be seen on **Exhibit 5A**, this includes access from all sides of the airport.

One roadway element that is included in the master plan is the development of a dedicated terminal loop road to serve the planned east side terminal complex. Precise access to the terminal loop would be determined in the traffic access study.

Planning of the land uses on the east side of the airport can help direct development and preserve areas for long term growth that is efficient for airport users. As shown on the exhibit, a flight line depth of approximately 1,000 feet from the terminal taxilane is reserved for aviation related uses such as additional ramp space and terminal building development.

The terminal loop road is planned to enclose initial vehicle parking development including rental cars, short term and long term parking. As the airport grows, additional areas, in proximity to the terminal building, are identified for parking expansion. Ultimately a dedicated location for rental car services may be needed. This space is also reserved.

Once space is reserved for current and future direct airport needs, leasable space can be made available. On the edge of the parking and rental car areas is property with the potential for commercial uses. The airport should encourage businesses that could benefit from and that cater to airport users. Some uses may include hotels, conference facilities, restaurants, and shops. There may be some opportunities to create synergy with planned development on the east side of Ellsworth Road.

Southeast Mesa is a rapidly growing and developing area. Consideration of the planned land uses in the vicinity of the airport has been given high priority. Several factors, including future land uses contained in the Mesa General Plan, the Master Plan for the education campus to the west of Sossaman Road, and the development plans of several private developers adjacent to the airport, have been considered.

The continued growth in this area, not only in Mesa, but also in Queen Creek, Gilbert, and Pinal County, will impact land uses and the transportation system on Airport property and in the region. Additional land use and transportation that successfully provides economic development opportunities for employment lands outside the Airport should be sufficiently considered with future studies and be coordinated with Mesa, Gilbert, Queen Creek, and Pinal County on transportation planning, including the area south of Germann Road. **Exhibit 5B** presents the recommended master plan concept at a smaller scale in order to better relate it to the surrounding property and access system.

SUMMARY

The recommended master plan concept has been developed in conjunction with the Planning Advisory Committee, airport management, and various airport stakeholders, and is designed to assist in making decisions on future development and growth of the Phoenix-Mesa Gateway Airport. This plan provides the necessary development to accommodate and satisfy forecast demand over the next 20 years and beyond.

Flexibility will be very important to future development at the airport. Activity projected over the next 20 years may not occur as predicted. The plan has attempted to consider demands that may be placed on the airport even beyond the 20-year planning horizon to ensure that the facility will be capable of handling a wide range of circumstances. The recommended plan provides the airport stakeholders with a general guide that, if followed, can maintain the airport's long term viability and allow the airport to continue to provide air transportation service to the region.

07MP03-5B-10/6/08

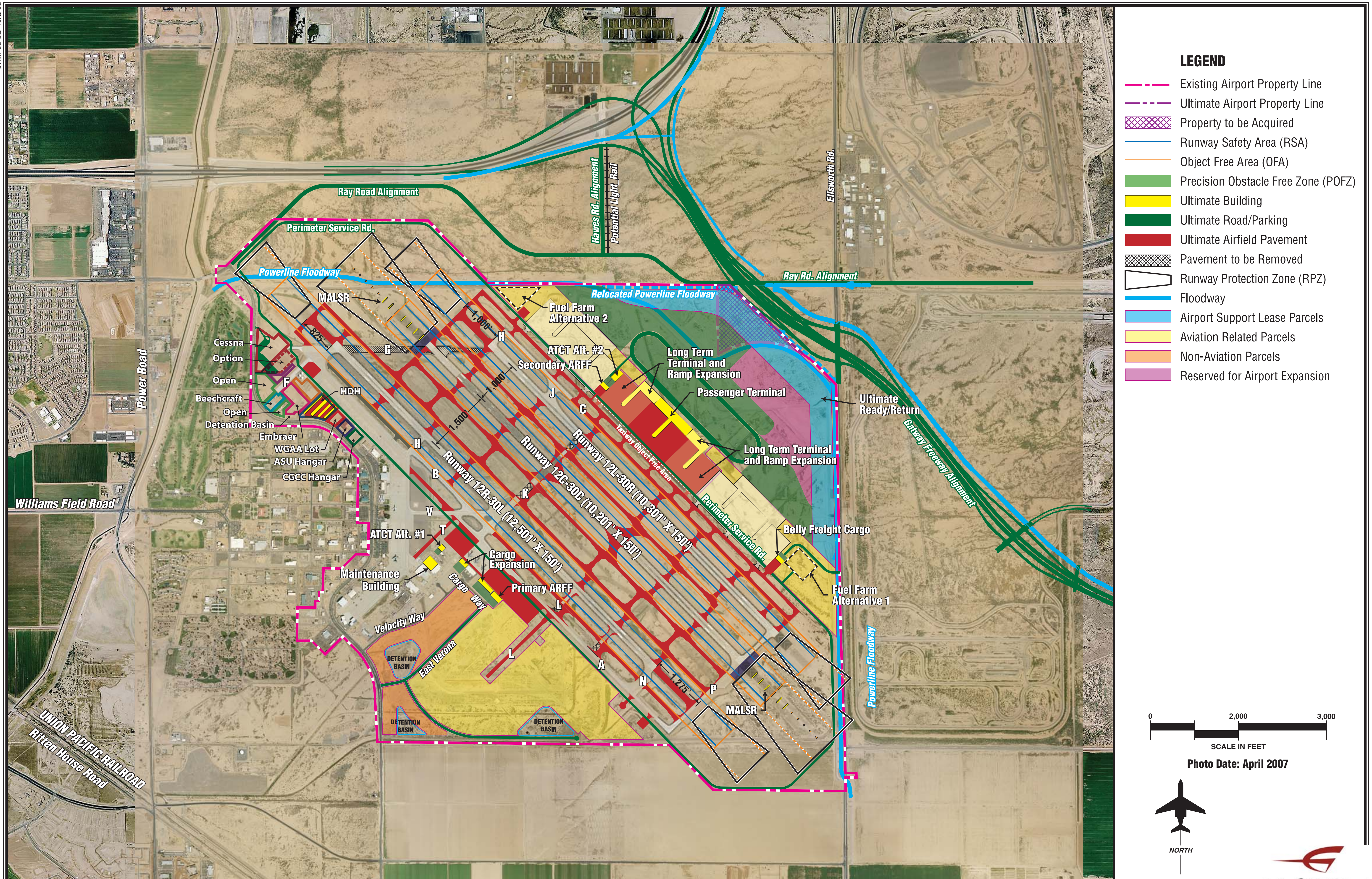

Exhibit 5B
MASTER PLAN CONCEPT (SMALLER SCALE)

PhxMesa Gateway Airport

Chapter Six

FINANCIAL PLAN

Financial Plan

The analyses completed in previous chapters evaluated development needs at the airport over the next 20 years and beyond, based on forecast activity and operational efficiency. The next step is the development of a capital improvement plan. The capital improvement plan is developed under the assumption that various demand based indicators, such as annual operations, annual passenger enplanements, and based aircraft grow as forecast. Since forecasts rarely follow a straight line growth pattern, attention should be placed on growth trends, and facility development should only follow demand that has materialized.

The presentation of the capital improvement plan is organized into two sections. The first is the airport development schedule and cost summaries which are presented in graphic and narrative form. The second is a discussion on the various capital improvement funding sources on the federal, state, and local levels.

DEMAND-BASED PLAN

The master plan for Phoenix-Mesa Gateway Airport has been developed according to a demand-based schedule. Demand-based planning refers to the intention to develop planning guidelines for the airport based upon airport activity levels, instead of guidelines based on points in time. By doing so, the levels of activity derived from the demand forecasts can be related to the actual capital investments needed to safely and efficiently accommodate the level of demand being experienced at the airport. More specifically, the intention of this master plan is that the facility improvements needed to serve new levels of demand should only be implemented when the levels of demand experienced at the airport justify their implementation.

For example, the aviation demand forecasts projected that commercial aircraft operations could be expected to grow significantly through the year 2027. This forecast is supported by the local area's growing economy, population, households, and historical trends showing growth in commercial service.

The forecasts noted, however, that future commercial operations will be dependent upon a number of economic factors, such as rising fuel costs. These factors could slow or accelerate commercial operations differently than projected in the aviation demand forecasts. Since changes in these factors cannot be realistically predicted for the entire forecast period, it is difficult to predict, with the level of accuracy needed to justify a capital investment, exactly when an improvement will be needed to satisfy demand level.

For these reasons, the Phoenix-Mesa Gateway Airport master plan has been developed as a demand-based plan. The master plan projects various activity levels for short, intermediate, and long term planning horizons. When activity levels begin to reach or exceed the level of one of the planning horizons, the master plan suggests planning begin to consider the next planning horizon level of demand. This provides a level of flexibility in the master plan as the development program can be accelerated or slowed to meet demand. This allows the airport sponsor to effectively utilize the master plan for a longer period of time.

A demand-based master plan does not specifically require implementation of any of the demand-based improvements. Instead, it is envisioned that implementation of any master plan improvement would be examined against demand levels prior to implementation. In many ways, this master plan is similar to a community's general plan. The master plan establishes a plan for the use of the airport facilities consistent with potential aviation needs and the capital needs required to support that use. However, individual projects in the plan are not implemented until the need is demonstrated and the project is approved by Williams Gateway Airport Authority.

AIRPORT DEVELOPMENT SCHEDULES AND COST SUMMARIES

Now that the specific needs and improvements for the airport have been established, the next step is to determine a realistic schedule and the associated costs for implementing the plan.

A short term capital improvement plan, programmed by years, has been developed to cover the first five years of the plan as well as the current fiscal 2009 year. The remaining projects will be grouped into intermediate (years 6-10) and long (years 11-20) term planning horizons. By utilizing planning horizons instead of specific years for intermediate and long term development, the airport will have greater flexibility to adjust capital needs as demand dictates. Each year, the Airport Authority will need to re-examine the priorities for funding on a rolling five year-schedule, adding or removing projects as priorities and demand change. **Table 6A** summarizes the key milestones for each of the planning horizons.

TABLE 6A
Planning Horizon Milestone Summary
Phoenix-Mesa Gateway Airport

	BASE YEAR	**PLANNING HORIZONS**		
	2006	**2012**	**2017**	**2027***
Air Carrier/Cargo Activity				
Enplaned Passengers	2,991	350,000	850,000	2,200,000
Enplaned Cargo (Tons)	59	10,000	21,000	44,000
Annual Operations	1,121	10,249	22,506	51,666
General Aviation Activity				
Based Aircraft	115	200	241	350
Annual Operations				
Itinerant	85,618	105,000	123,000	175,000
Local	174,702	207,000	230,000	260,000
Nighttime Adjustment (Approx. 3%)	8,006	9,479	10,823	12,969
Total General Aviation Operations	268,326	321,479	363,823	447,969
Other/Air Taxi Activity				
Itinerant	9,171	12,400	15,700	22,200
Nighttime Adjustment (Approx. 3%)	275	372	471	665
Total Other/Air Taxi Operations	9,446	12,772	16,171	22,865
Military Activity				
Itinerant	5,031	5,000	5,000	5,000
Local	5,076	7,500	7,500	7,500
Total Military Operations	10,107	12,500	12,500	12,500
Total Airport Operations	289,000	357,000	415,000	535,000

* A High Range forecast of 5 million annual passenger enplanements is also considered.
Source: Coffman Associates Analysis

While some projects will be demand-based, others will be dictated by design standards, safety, or rehabilitation needs. Projects related to safety and meeting design standards are considered high priority and are programmed as soon as reasonably feasible.

Exhibit 6A summarizes capital needs for Phoenix-Mesa Gateway Airport through the planning period of this master plan. An estimate has been included with each project of federal and state funding eligibility, although this amount is not guaranteed. The total project costs are $244 million for the short term, $251 million for the intermediate term, and $259 million for the long term. The total CIP represents $755 million of future investment in the airport.

Often, single projects or associated projects can only be partially funded in any single fiscal year. Both the Federal Aviation Administration (FAA) and Arizona Department of Transportation (ADOT) are coping with more funding requests than there are funds available. In order to reflect this reality, many short term projects

07MP03-6A-07/10/08

#	PROJECT DESCRIPTION	PROJECT COST	FAA ELIGIBLE	ADOT ELIGIBLE	LOCAL
	FY 2009 Projects				
1	Parking Lots Building 46 to 74 - Construct	$2,010,000	$0	$0	$2,010,000
2	North/Middle Apron Drainage - Construct	$1,678,000	$1,594,100	$41,950	$41,950
3	West Terminal Expansion Phase I - Modular	$3,000,000	$0	$0	$3,000,000
4	Access Road/East Verona (by others) - Construct*	$1,632,000	$0	$0	$0
5	Traffic Engineering and Roadway Study - North, East, South	$140,000	$0	$0	$140,000
6	Pavement Maintenance	$250,000	$237,500	$6,250	$6,250
	2009 Total	**$7,078,000**	**$1,831,600**	**$48,200**	**$5,198,200**
	FY 2010 Projects				
1	Taxiway B from Txy L to Txy N - Prep/Drainage/Construct	$10,800,000	$10,260,000	$270,000	$270,000
2	Environmental Documentation for Short Term Project	$500,000	$475,000	$12,500	$12,500
3	Alpha Apron Phase 1 (South) - Prep/Drainage/Construct	$6,141,000	$5,833,950	$153,525	$153,525
4	Drainage: Verona Channel, West Detention, Txy L	$979,000	$930,050	$24,475	$24,475
5	Fire Protection Phase II - North Expansion	$752,000	$714,400	$18,800	$18,800
6	Self-Serve Fuel/Self Aircraft Maintenance Facility - Design/Construct	$800,000	$0	$0	$800,000
7	Easement RPZ Property Acquisition	$100,000	$95,000	$2,500	$2,500
8	Relocate ASR-8 - Design*	$200,000	$0	$0	$0
9	Taxiway L from Rwy 30L to Rwy 30R - Design	$861,000	$817,950	$21,525	$21,525
10	Drainage: South Apron Edge	$2,479,000	$2,355,050	$61,975	$61,975
11	Taxiway P Hold Apron Reconstruct	$828,000	$786,600	$20,700	$20,700
12	Taxiway P Reconstruct	$5,358,000	$5,090,100	$133,950	$133,950
13	Taxiway V Reconstruct/Strengthening	$717,000	$681,150	$17,925	$17,925
14	ARFF Facility (25,000 sf) - Design	$818,000	$777,100	$20,450	$20,450
15	Compass Rose - Design/Construct	$850,000	$807,500	$21,250	$21,250
16	Taxiway H Reconstruct	$232,000	$220,400	$5,800	$5,800
17	Pavement Maintenance	$250,000	$237,500	$6,250	$6,250
	2010 Total	**$32,465,000**	**$30,081,750**	**$791,625**	**$1,591,625**
	FY 2011 Projects				
1	Taxiway L from Txy A to SW - Construct	$10,000,000	$9,500,000	$250,000	$250,000
2	Drainage: Taxiway T, Sossaman Rd., South Detention	$1,873,000	$1,779,350	$46,825	$46,825
3	Alpha Apron Phase 2 (North) - Design	$537,000	$510,150	$13,425	$13,425
4	East Side Terminal Area Master Plan - Preliminary Design Study	$500,000	$475,000	$12,500	$12,500
5	Wash Rack - Design/Construct	$445,000	$422,750	$11,125	$11,125
6	Relocate ASR-8 - Construct (not pictured/location TBD)*	$2,000,000	$0	$0	$0
7	Taxiway L from Rwy 30L to Rwy 30R - Prep/Drainage	$1,094,000	$1,039,300	$27,350	$27,350
8	Runway 12C-30C Center Reconstruct/Rehabilitation	$2,694,000	$2,559,300	$67,350	$67,350
9	Runway 30C Threshold Reconstruct	$4,067,000	$3,863,650	$101,675	$101,675
10	Runway 30C 2,000' Section Strengthening/Reconstruction	$7,747,000	$7,359,650	$193,675	$193,675
11	Runway 12C Threshold Strengthening/Reconstruction	$4,648,000	$4,415,600	$116,200	$116,200
12	GA Center Exterior Improvements	$700,000	$0	$630,000	$70,000
13	Fuel Farm Expansion West Side	$1,736,000	$0	$0	$1,736,000
14	AFFF Foam Basin (MAP)	$500,000	$475,000	$12,500	$12,500
15	Fuel Farm Apron Reconstruction (MAP)	$730,000	$693,500	$18,250	$18,250
16	ARFF Facility - Construct	$8,708,000	$8,272,600	$217,700	$217,700
17	West Terminal Expansion Phase 2 - Design	$3,403,000	$3,232,850	$85,075	$85,075
18	Taxiway C Extension Southeast - Design	$1,499,000	$1,424,050	$37,475	$37,475
19	Pavement Maintenance	$250,000	$237,500	$6,250	$6,250
	2011 Total	**$51,131,000**	**$46,260,250**	**$1,847,375**	**$3,023,375**
	FY 2012 Projects				
1	East Side Master Drainage Plan	$350,000	$332,500	$8,750	$8,750
2	East Side Infrastructure/Utility/Road Plan	$400,000	$380,000	$10,000	$10,000
3	EIS East Terminal Development (not pictured)	$1,500,000	$1,425,000	$37,500	$37,500
4	Drainage: Detention SE, Velocity Way Lateral	$2,150,000	$2,042,500	$53,750	$53,750
5	West Side Apron Rehabilitation (North/Middle)	$6,031,000	$5,729,450	$150,775	$150,775
6	Taxiway G/B Intersection Reconstruct	$847,000	$804,650	$21,175	$21,175
7	Taxiway K Reconstruct/Strengthening	$6,700,000	$6,365,000	$167,500	$167,500

#	PROJECT DESCRIPTION	PROJECT COST	FAA ELIGIBLE	ADOT ELIGIBLE	LOCAL
	FY 2012Projects (continued)				
8	Taxiway A South End Reconstruct	$8,000,000	$7,600,000	$200,000	$200,000
9	Taxiway N and Hold Apron Reconstructv	$3,500,000	$3,325,000	$87,500	$87,500
10	Airfield Access Road Improvements Between 12C/30C and 12L/30R - Prep/Design/Construct	$2,209,000	$2,098,550	$55,225	$55,225
11	Fire Protection - South	$8,000,000	$7,600,000	$200,000	$200,000
12	Alpha Apron Phase 2 (North) - Prep/Drainage	$686,000	$651,700	$17,150	$17,150
13	Taxiway L between Rwy 30L & Rwy 30R - Construct	$8,094,000	$7,689,300	$202,350	$202,350
14	Acquire 1,500 Gallon ARFF Vehicle - Replacement	$900,000	$855,000	$22,500	$22,500
15	Noise Compatibility Study	$500,000	$475,000	$12,500	$12,500
16	ATCT Site Selection/Evaluation	$250,000	$237,500	$6,250	$6,250
17	GA Center Apron Expansion	$1,200,000	$1,140,000	$30,000	$30,000
18	Apron Rehabilitate in Front of Hangars 31 and 32	$1,200,000	$1,140,000	$30,000	$30,000
19	West Terminal Expansion Phase 2 - Prep/Drainage	$2,340,000	$2,223,000	$58,500	$58,500
20	Demolish ARFF and Building 75	$627,000	$595,650	$15,675	$15,675
21	Perimeter Road - Prep/Drainage/Construct	$5,892,000	$5,597,400	$147,300	$147,300
22	Expand North Apron to Txy F - Design	$189,000	$179,550	$4,725	$4,725
23	Taxiway C Extension Southeast - Prep/Drainage	$1,856,000	$1,763,200	$46,400	$46,400
24	Pavement Maintenance	$250,000	$237,500	$6,250	$6,250
	2012 Total	**$63,671,000**	**$60,487,450**	**$1,591,775**	**$1,591,775**
	FY 2013 Projects				
1	Alpha Apron Phase 2 (North) - Construct	$5,041,000	$4,788,950	$126,025	$126,025
2	Drainage: Verona Storm Drain	$2,134,000	$2,027,300	$53,350	$53,350
3	Runway 12R Threshold Reconstruct	$3,889,000	$3,694,550	$97,225	$97,225
4	Runway 30L Threshold Reconstruct	$4,063,000	$3,859,850	$101,575	$101,575
5	Runway 30L 1,300' Section Strengthening/Reconstruct	$5,035,000	$4,783,250	$125,875	$125,875
6	REIL Runway 12R-30L	$50,000	$47,500	$1,250	$1,250
7	PAPI Runway 12R-30L	$80,000	$76,000	$2,000	$2,000
8	West Parking 1,500 Positions (garage, surface, remote-TBD) - Design	$336,000	$0	$0	$336,000
9	West Terminal Expansion Phase 2 - Construct	$34,864,000	$0	$0	$34,864,000
10	Taxiway W Rehabilitate	$53,000	$50,350	$1,325	$1,325
11	Southwest Access Road - Design	$303,000	$0	$0	$303,000
12	Expand North Apron to Txy F - Prep/Drainage	$240,000	$228,000	$6,000	$6,000
13	Taxiway C Extension Southeast - Construction	$14,129,000	$13,422,550	$353,225	$353,225
14	Pavement Maintenance	$250,000	$237,500	$6,250	$6,250
	2013 Total	**$70,467,000**	**$33,215,800**	**$874,100**	**$36,377,100**
	FY 2014 Projects				
1	West Parking 1,500 Positions - Prep/Drainage/Construct	$3,584,000	$0	$0	$3,584,000
2	Drainage: Taxiway T - Phase II	$2,123,000	$2,016,850	$53,075	$53,075
3	East Terminal Building Phase 1 - Design	$8,872,000	$0	$0	$8,872,000
4	Relocate Powerline Floodway (by others) - Design*	$1,599,000	$0	$0	$0
5	East Terminal Roadways and Loop On-Airport - Design	$810,000	$769,500	$20,250	$20,250
6	East Parking 3,400 Positions - Design	$773,000	$0	$0	$773,000
7	East Hydrant Fueling System and Fuel Farm - Design	$848,000	$0	$0	$848,000
8	East Terminal Apron - Design	$2,258,000	$2,145,100	$56,450	$56,450
9	Southwest Access Road - Prep/Drainage	$650,000	$0	$0	$650,000
10	Jet Run-up Enclosure - Design/Construct	$8,938,000	$8,491,100	$223,450	$223,450
11	Taxiway A Between Txy V and Middle Apron - Design	$224,000	$212,800	$5,600	$5,600
12	Property Acquisition Northeast Triangle	$3,100,000	$2,945,000	$77,500	$77,500
13	Expand North Apron to Txy F - Construct	$1,778,000	$1,689,100	$44,450	$44,450
14	Runway 12L Extension - Design	$345,000	$327,750	$8,625	$8,625
15	Taxiway C Extension Northwest - Design	$317,000	$301,150	$7,925	$7,925
16	Taxiway L between Txy A and Rwy 30L Rehabilitate	$183,000	$173,850	$4,575	$4,575
17	Pavement Maintenance	$250,000	$237,500	$6,250	$6,250
	2014 Total	**$35,053,000**	**$19,309,700**	**$508,150**	**$15,235,150**
	SHORT TERM TOTAL	***$259,865,000***	***$191,186,550***	***$5,661,225***	***$63,017,225***

ASR-8: Airport Surveillance Radar **ARFF**: Airport Rescue and Fire Fighting **ATCT**: Airport Traffic Control Tower **REIL**: Runway End Identification Lights **PAPI**: Precision Approach Path Indicator
MAP: Military Aiport Program * - Cost incurred by others not included in totals.

Exhibit 6A
CAPITAL IMPROVEMENT PROGRAM

	PROJECT DESCRIPTION	PROJECT COST	FAA ELIGIBLE	ADOT ELIGIBLE	LOCAL
	Intermediate Term Projects				
1	Environmental Documentation for Intermediate Term Projects	$500,000	$475,000	$12,500	$12,500
2	West Parking 2,000 spaces (as needed)	$5,208,000	$0	$0	$5,208,000
3	Taxiway A Between Txy V and Middle Apron - Prep/Drainage/Construct	$2,347,000	$2,229,650	$58,675	$58,675
4	Taxiway G from Txy B to Rwy 12L	$5,240,000	$4,978,000	$131,000	$131,000
5	Remove Angled Txy G from Rwy 12C to Rwy 12L	$747,000	$709,650	$18,675	$18,675
6	Airport Traffic Control Tower	$10,000,000	$9,500,000	$250,000	$250,000
7	Southwest Access Road - Construct	$2,582,000	$0	$0	$2,582,000
8	MALSR Rwy 30C	$1,500,000	$1,425,000	$37,500	$37,500
9	Relocate Powerline Floodway - Prep/Drainage/Construct*	$17,057,000	$0	$0	$0
10	Detention Basin Southeast	$1,000,000	$950,000	$25,000	$25,000
11	East Side Master Drainage Plan	$400,000	$380,000	$10,000	$10,000
12	East Terminal Utilities - Construct	$37,000,000	$0	$0	$37,000,000
13	East Terminal Access and Loop On-Airport - Prep/Drainage/Construct	$8,640,000	$8,208,000	$216,000	$216,000
14	East Terminal Apron - Prep/Drainage/Construct	$24,138,000	$22,931,100	$603,450	$603,450
15	East Hydrant Fueling System and Fuel Farm - Prep/Drainage/Construct	$9,050,000	$0	$0	$9,050,000
16	East Terminal Building Phase I - Prep/Drainage/Construct	$94,635,000	$0	$0	$94,635,000
17	East Parking 3,400 Positions - Prep/Drainage/Construct	$8,243,000	$0	$0	$8,243,000
18	Taxiway T from Txy A to the South Ramp	$2,791,000	$2,651,450	$69,775	$69,775
19	Alpha Apron Phase 3 (South)	$8,087,000	$7,682,650	$202,175	$202,175
20	Taxiway K and L Connectors to Txy C	$1,747,000	$1,659,650	$43,675	$43,675
21	Airport Master Plan	$800,000	$760,000	$20,000	$20,000
22	Runway 12L Extension -Prep/Drainage/Construct	$3,682,000	$3,497,900	$92,050	$92,050
23	Taxiway C Extension Northwest - Prep/Drainage/Construct	$3,392,000	$3,222,400	$84,800	$84,800
24	Taxiway H Reconstruct	$1,500,000	$1,425,000	$37,500	$37,500
25	East Side Air Cargo Apron	$1,200,000	$1,140,000	$30,000	$30,000
26	Pavement Maintenance	$1,000,000	$950,000	$25,000	$25,000
	Intermediate Total	**$235,429,000**	**$74,775,450**	**$1,967,775**	**$158,685,775**
	Long Term Projects				
1	Environmental Documentation for Long Term Projects	$1,000,000	$950,000	$25,000	$25,000
2	Alpha Apron Phase 4 (South)	$8,263,000	$7,849,850	$206,575	$206,575
3	Terminal Support Facilities East (Maintenance, Catering)	$1,413,000	$0	$0	$1,413,000
4	Extend Runway 30L to Txy P	$5,049,000	$4,796,550	$126,225	$126,225
5	Extend Taxiway B from Txy N to Txy P	$2,903,000	$2,757,850	$72,575	$72,575
6	East Parking Expansion 5,000 Positions	$13,048,000	$0	$0	$13,048,000
7	East ARFF	$7,533,000	$7,156,350	$188,325	$188,325
8	West Side Apron Reconstruct (North/Middle)	$15,000,000	$14,250,000	$375,000	$375,000
9	East Terminal Building - Phase II	$95,502,000	$0	$0	$95,502,000
10	East Aircraft Apron Expansion	$20,658,000	$19,625,100	$516,450	$516,450
11	East Fuel Farm Expansion	$6,916,000	$0	$0	$6,916,000
12	Taxiway J from Txy B to Rwy 12L	$9,683,000	$9,198,850	$242,075	$242,075
13	Taxiway M from Txy A to Txy C	$6,339,000	$6,022,050	$158,475	$158,475
14	Partial Parallel East of Rwy 12C-30C	$10,264,000	$9,750,800	$256,600	$256,600
15	Partial Parallel West of Rwy 12C-30C	$10,264,000	$9,750,800	$256,600	$256,600
16	High Speed Taxiway Exits (2) from Rwy 12C-30C	$7,998,000	$7,598,100	$199,950	$199,950
17	Runway 12R-30L Reconstruction	$35,000,000	$33,250,000	$875,000	$875,000
18	Pavement Maintenance	$2,500,000	$2,375,000	$62,500	$62,500
	Long Term Total	**$259,333,000**	**$135,331,300**	**$3,561,350**	**$120,440,350**
	CIP TOTAL	***$754,627,000***	***$401,293,300***	***$11,190,350***	***$342,143,350***

MAP: Military Airports Program eligible

* - Cost incurred by others not included in totals.

PhxMesa Gateway Airport

Exhibit 6A (continued)
CAPITAL IMPROVEMENT PROGRAM

have been divided into three phases: a design phase, a site preparation and drainage phase, and a construction phase. Owing to the more fluid nature of intermediate and long term needs, the elements of these project costs are combined into a single line item.

Individual project cost estimates account for engineering, design, construction administration, and other contingencies unless specifically called out. All project costs are in current (2008) dollars. Due to the conceptual nature of a master plan, implementation of capital improvement projects should occur only after further refinement of their design and costs through engineering and/or architectural analyses. Nevertheless, these estimates are considered sufficient for planning purposes and order-of-magnitude comparisons.

The projects listed in the capital program are derived from several different sources. First, projects were developed based on the need generated by the airport reaching demand indicators as forecast in this master plan over the course of the next 20 years. Second, the current five-year Airport Capital Improvement Program (ACIP), as submitted to FAA and ADOT, was analyzed for coordination with the master plan conclusions. Third, an updated pavement management program, including pavement condition evaluation, was developed at the same time, but separately from the master plan. Recommendations for pavement reconstruction and rehabilitation are included in the master plan CIP. Lastly, an architectural firm separately analyzed the potential expansion of the west passenger terminal complex during the master plan development. Where applicable, that information has been utilized.

PAVEMENT MAINTENANCE

Maintaining existing usable pavements on the airfield is of critical importance for the airport. Over time, these surfaces will deteriorate due to heavy use and the impact of natural elements. The pavement management report includes cost estimates for the repair and maintenance of these surfaces. Cost estimates for major rehabilitation or reconstruction are also included.

Typically, concrete construction has a 20-year useful life provided regular joint sealing and selective section replacement is undertaken. Asphalt construction has a useful life of seven to ten years. Periodic milling, overlaying, and sealing can extend the useful life of airfield pavements.

Exhibit 6B presents the functional condition of the existing pavement at the airport based on the pavement condition index (PCI) visual inspections taken in the fall of 2007. Each pavement section is rated on a scale from 1-100 with 100 representing perfect pavement with no signs of distress.

As can be seen from the PCI map, the runways are generally in excellent condition. Runway 12L-30R has PCI values exceeding 85. The south 1,000 feet of Runway 12C-30C and both ends of Runway 12R-30L returned PCI values ranging from 41-55. These areas

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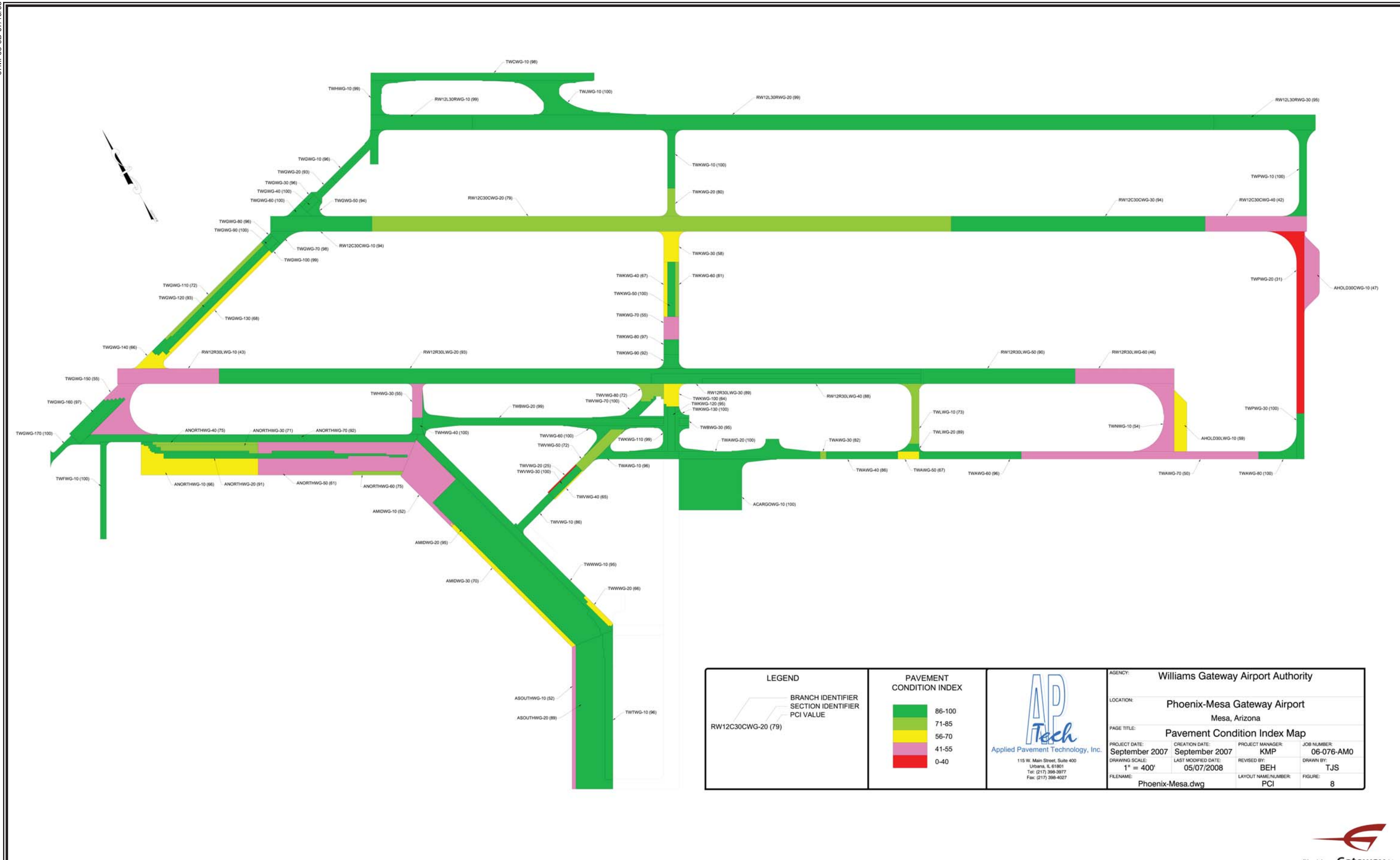

PhxMesa Gateway Airport

Exhibit 6B
PAVEMENT CONDITION INDEX MAP

will be in need of maintenance in the near term.

Most of the taxiways are in good condition. Some areas of concern include portions of Taxiways K, P, N, A, and H. These areas should be scheduled for maintenance in the near term as well.

The north general aviation ramp is showing signs of distress. This pavement is a high activity area and should be scheduled for major rehabilitation. A small stretch of the eastern edge of the middle and south aprons is also in need of replacement.

Where preventative maintenance is recommended, the PCI values have not dropped below the airport's standards to warrant any major rehabilitation project. In the CIP, these areas are included in the annual preventative maintenance budget. If a pavement surface drops below a PCI value of 70 for runways, 65 for taxiways, and 60 for ramps and aprons, then major rehabilitation or reconstruction is recommended. These projects are called out individually in the CIP.

The pavement evaluation included an assessment of the strength of the runways and taxiways. There were several surfaces that, while structurally sound, returned pavement strengths that are lower than expected. **Exhibit 6C** shows the areas recommended for strengthening. For example, a section of Runway 30C is structurally sound but returns a strength rating below 95,000 dual-wheel load bearing (DWL). This section is recommended for reconstruction and strengthening up to 210,000 DWL.

The costs presented for major pavement reconstruction are derived from the Draft Pavement Management Program as developed by Applied Pavement Technologies in June 2008.

SHORT TERM IMPROVEMENTS

The capital program is based on the airport's fiscal year (July 1 through June 30). The airport is currently into fiscal year 2009. Many projects intended for FY 2009 have already been approved and are moving toward construction. Some projects desired in FY 2009 may still be funded at some point while others may not be funded this year. Therefore, the short term capital plan includes those projects in process for FY 2009. Recognizing that some of these projects may shift to FY 2010, the short term plan includes yearly capital projects through FY 2014.

Short term improvements are divided into yearly timeframes and are further prioritized based on the needs of the airport. Some projects can extend over several years; therefore, some elements associated with a single project such as design, site preparation and drainage, and construction, may be called out in separate years. Other projects combine these elements into a single year where it is anticipated funding can be obtained in a single year.

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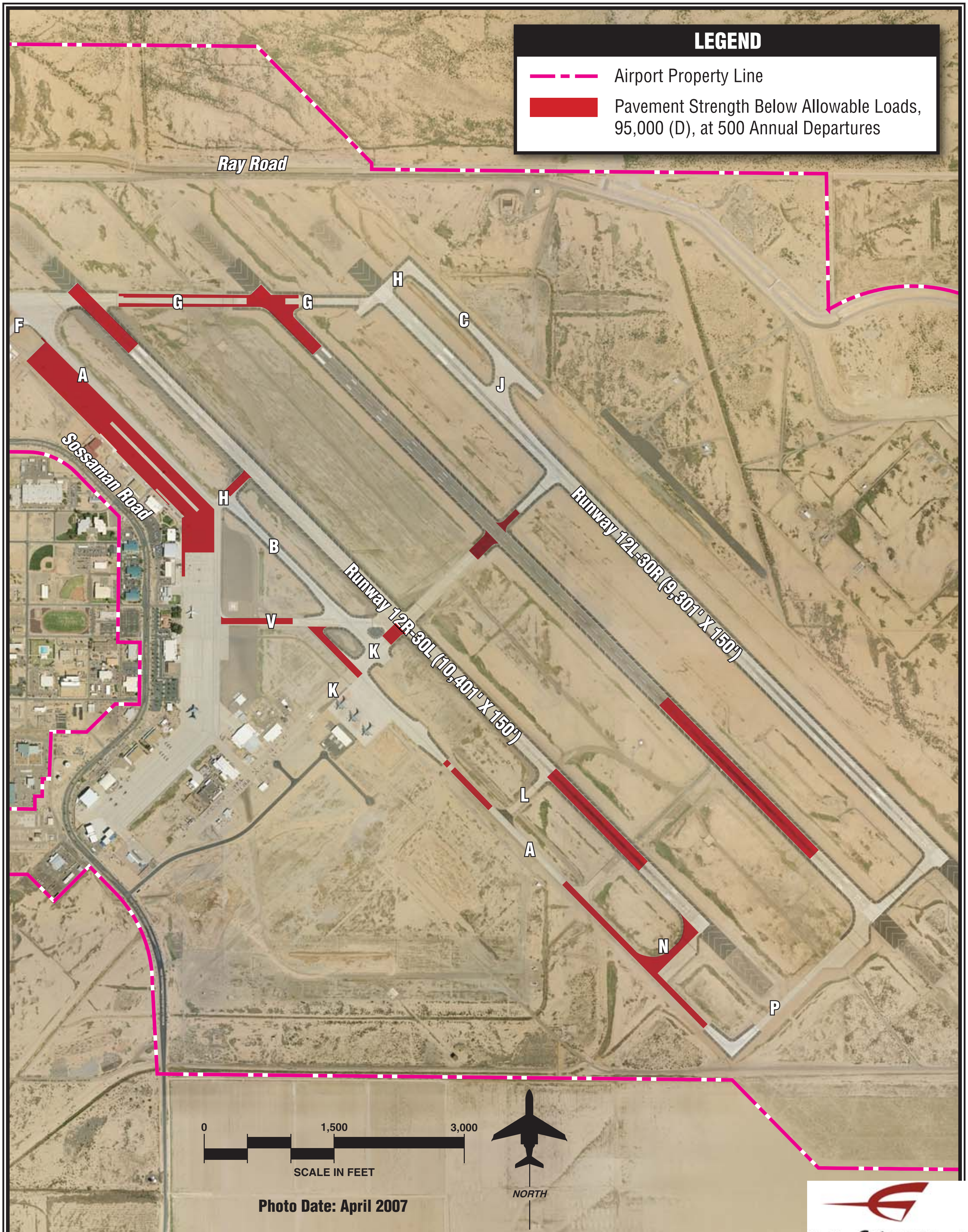

PhxMesa Gateway Airport

Exhibit 6C
LOW STRENGTH PAVEMENTS

FY 2009 Projects

In October 2007, Allegiant Air began regularly scheduled service to 13 destinations from Phoenix-Mesa Gateway Airport. While the airline's schedule has fluctuated, the enplanement levels being realized are in line with the master plan projections. As a result, there is a need to expand the passenger terminal facility. The 2009 CIP, depicted on **Exhibit 6D**, includes the construction of approximately 10,000 square feet (s.f.) of space through the use of prefabricated modular buildings. This will bring the total terminal building space to approximately 33,000 square feet.

Also contracted for the fall of 2009 is the reconstruction of the parking lots extending from building 46 to building 74. This area extends from the Chandler Gilbert Community College hangar, south past the General Aviation Center and slightly south of the airport administration building.

Another project taking place in FY 2009 is drainage improvements to the western edge of the north and middle apron. This is the first of several projects, phased over several years, intended to improve the drainage along the eastern edge of the apron.

The construction of East Verona connecting Sossaman to Cargo Way is anticipated to commence in 2009. This project is being undertaken by a private land developer with lease holdings between East Verona and Velocity Way.

The Airport Authority is planning to participate in a traffic engineering study. Through this study, the optimal roadway network leading to the airport, especially to the east terminal area and the southwest area, will be planned and coordinated. Because traffic engineering studies have previously been conducted for Sossaman Road, this study is intended to recommend a roadway network for the future east terminal complex, as well as airport access points to the north, east, and south.

As a condition for federal grants for apron, runway, and taxiway construction, the airport is obligated to maintain these surfaces for their useful life, which is typically 20 years. An estimate of the annual maintenance cost is considered in each year of the CIP.

FY 2010 Projects

The first project in the 2010 fiscal year is the construction of the final phase of Taxiway B between Taxiways L and N. This section of taxiway will provide near complete dual parallel taxiway service on the west side of the airfield. **Exhibit 6E** presents the 2010 projects overlaid on an aerial photograph of the airport.

A place holder for environmental documentation is included in the 2010 project list. All federally funded airport projects require some environmental documentation, ranging from a Categorical Exclusion to a full Environmental Assessment. The airport

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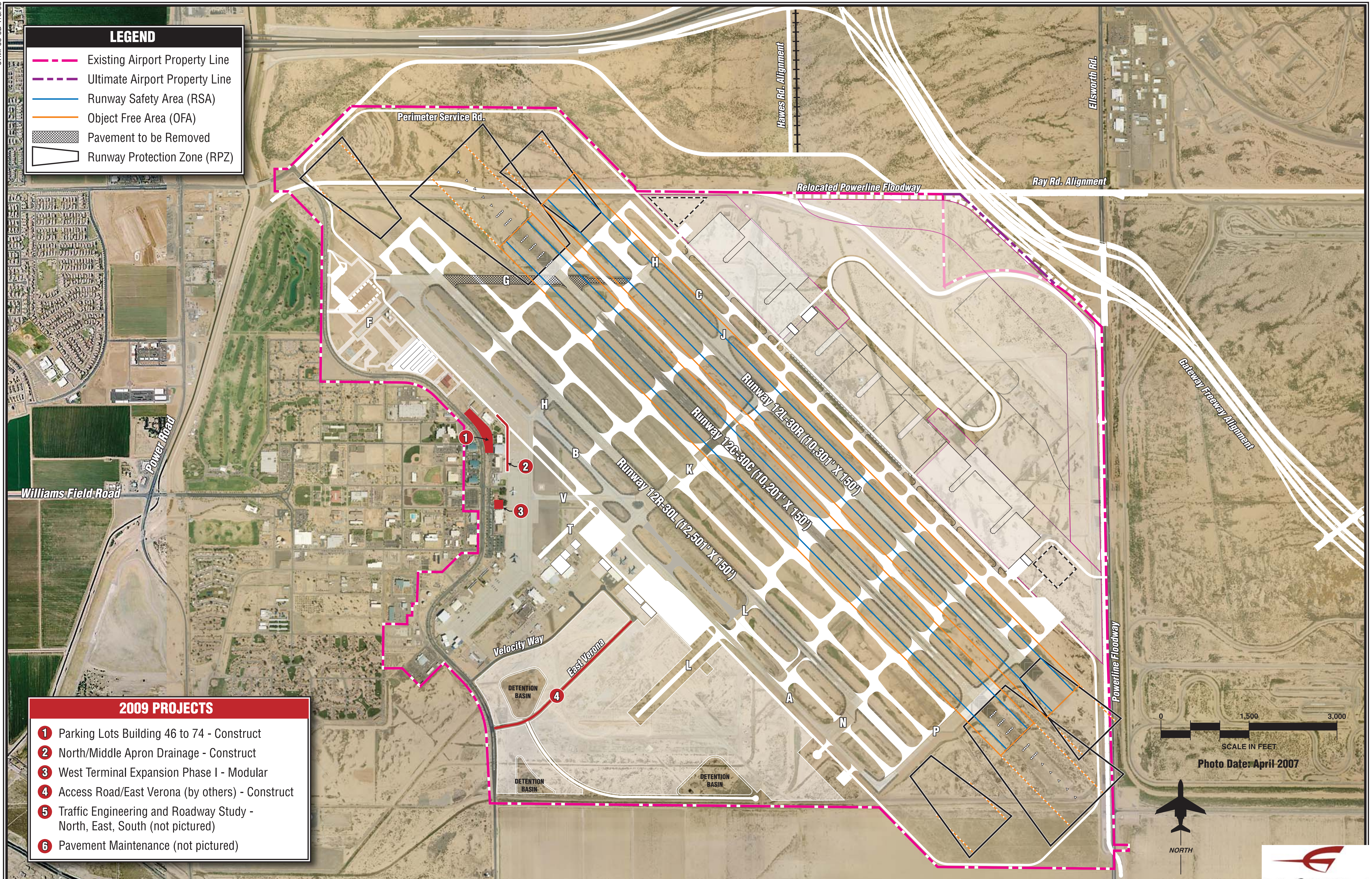

Exhibit 6D
FISCAL YEAR 2009 PROJECTS

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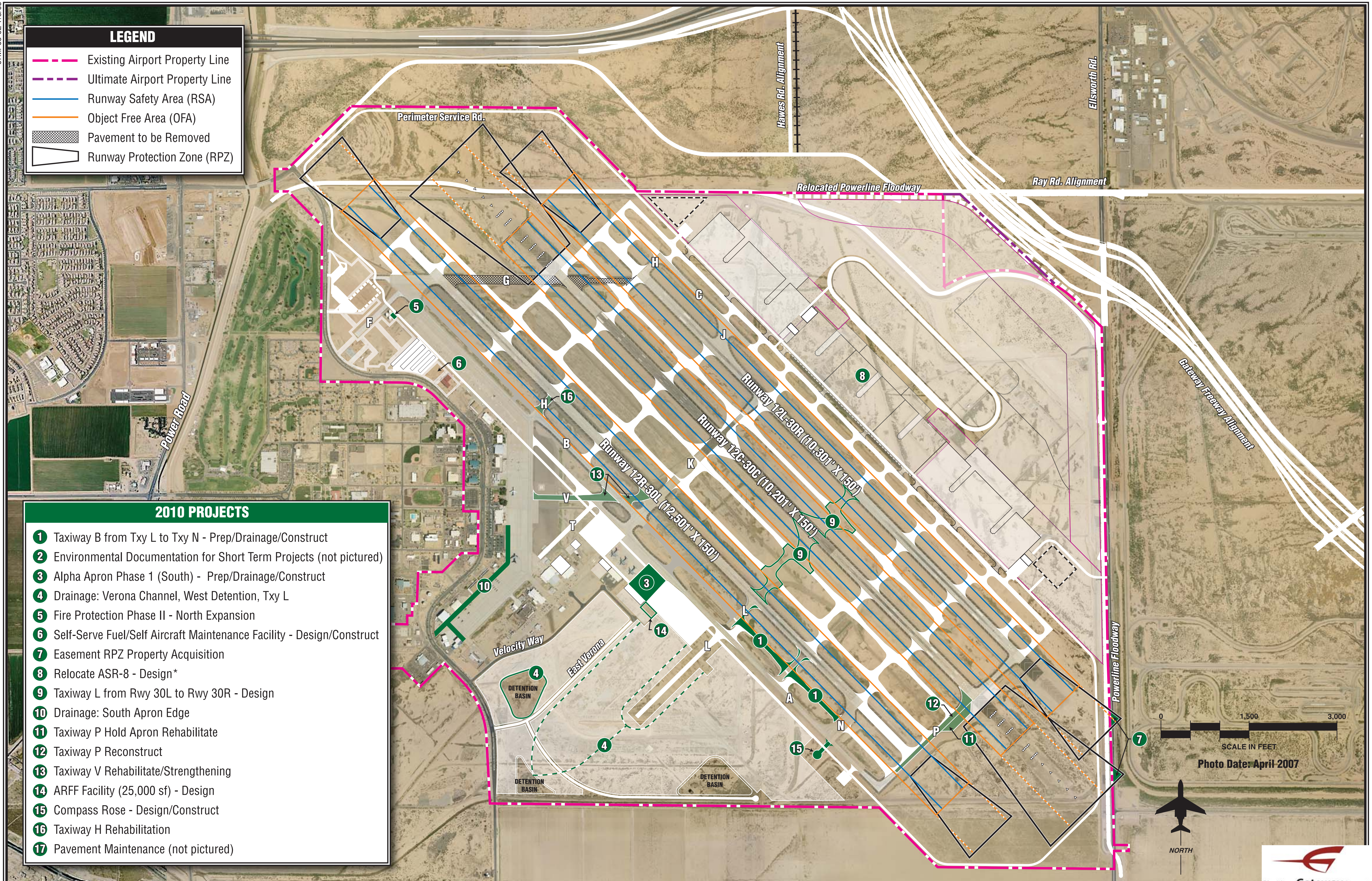

Exhibit 6E
FISCAL YEAR 2010 PROJECTS

should be aware of this potential expense and budget accordingly. Environmental documentation is typically valid for three years.

Additional developable space is available to the immediate east of Cargo Way. This area does not currently have airfield access. Design has been undertaken to develop a public apron to provide this access. This apron is designated Alpha Apron and is planned to be developed in several phases throughout the master plan.

A significant drainage project planned for 2010 is in the southwest area. This project will drain from the southwest airfield, including planned Taxiway L and the southern portion of Taxiway A to the southwest detention basin.

The north fire protection facility is scheduled for final expansion in 2010. This project will include the construction of a fourth storage tank.

The airport has tentatively identified an open parcel immediately north of the ASU hangar for general aviation services, including self-serve fueling and a self-maintenance facility, and an aircraft wash rack. The wash rack would provide a concrete area with drainage collection to meet EPA standards. The wash rack is planned for construction in 2011, while the self-serve fuel and self-maintenance facility are planned for 2010.

The planned runway protection zones on the Runway 30R and 30C ends extend slightly beyond airport property. The FAA recommends that the airport have ownership of the RPZs if possible. This section of the RPZs encompasses less than an acre of land, and that land is immediately adjacent to Ellsworth Road. While the likelihood of any significant incompatibility being located in the RPZs is remote, avigation easements are recommended. With an avigation easement, the airport has a certain level of control over the airspace in order to protect the airport from obstructions.

The next project on the airport CIP is the design and relocation of the ASR-8 radar facility currently located on the east side of the airfield. This radar facility is owned and operated by the FAA and provides critical radar coverage for the East Valley. The ASR needs to be relocated prior to any heavy activity on the east side of the airport; therefore, its relocation is the first step toward east side development. In 2010, a design phase is planned with relocation taking place the following year. It should be noted that the new ASR site could be entirely off airport property, provided coverage is not interrupted. The cost of relocation should be undertaken by FAA Facilities & Equipment Program, not through airport improvement grants.

One critical airfield element identified in the Facility Requirements chapter is the negative impact the existing taxiway layout has on the efficiency of ground movements and the constraining impact the layout has on future airfield capacity. In order to alleviate both of these problems, many taxiway improvements are planned. The first is the extension of Taxiway L from Runway 30L to Runway 30R.

Extending Taxiway L across the airfield is of critical importance. There are no runway exits from the center and east from Taxiways K to the Runway 30 thresholds, a distance of over 6,000 feet. This means that aircraft landing on Runways 12C and 12L have to run out to the end of the runway, thereby occupying the runway for longer periods of time. This leads to greater aircraft delay and reduces airfield capacity. Taxiway L will provide much needed exit capability.

The edge of the south ramp is scheduled for drainage improvements in 2012. Taxiway P from Runway 30C to Runway 30L as well as the hold apron is planned for reconstruction in this timeframe. This portion of Taxiway P represents pavement currently showing the greatest distress.

Portions of Taxiway V are in need of repair. This is a high activity area of the taxiway system and is a high priority. The Airport Authority may want to fund this project immediately and either request AIP reimbursement or forgo grant funding in order to accelerate this project.

With the planned expansion of the west side terminal area, the need arises for expansion space. The existing Airport Rescue and Fire Fighting (ARFF) station, immediately north of the existing terminal building, currently occupies some of this potential expansion space. This station is over 50 years old and does not meet modern standards for a commercial service ARFF facility. A new location has been sited on Cargo Way. The design of this facility is planned in FY 2010. A compass calibration pad is also planned for design at this time. The compass calibration pad allows pilots to properly calibrate their avionics. This will be particularly useful at Phoenix-Mesa Gateway Airport with the introduction of service centers for Cessna, Hawker Beechcraft, and Embraer. The compass calibration pad is eligible for federal grant funding.

Another pavement preservation project in this fiscal year is the reconstruction of Taxiway H. This stub taxiway provides access to the south end of the north ramp.

The last project listed for FY 2010 is a place holder for pavement maintenance.

FY 2011 Projects

The first project in 2011, as shown on **Exhibit 6F**, is the construction of Taxiway L from Taxiway A into the southwest undeveloped area. This taxiway will open up much of the area for aviation-related development. This developable land is needed since nearly all west side developable land at the airport is currently leased.

Several drainage projects are planned for FY 2011. The first group of these projects includes drainage improvements on the southeast edge of the south apron. The construction of south runoff detention basin is also planned.

The expansion of Alpha Apron is continued in 2011 with a design phase of a ramp area to the north of the exist-

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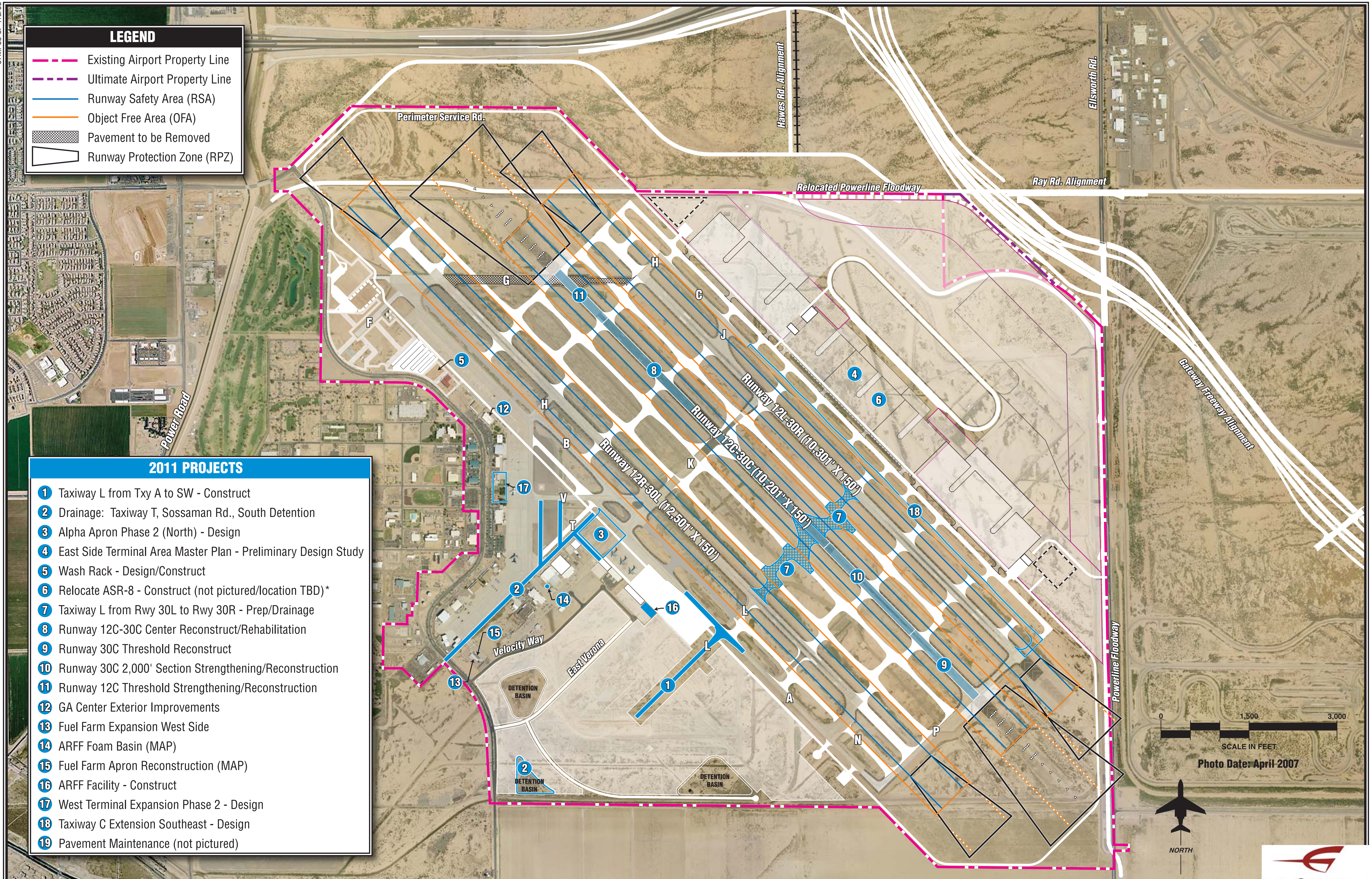

Exhibit 6F
FISCAL YEAR 2011 PROJECTS

ing apron. This project will make a large, centrally located parcel available for development. It should be noted that continued expansion of Alpha Apron should continue to be justified by the needs of airport users. If the need is not immediate, then the airport can choose to delay further expansion of this apron.

A focused preliminary design study for the east side passenger terminal complex is planned in 2011. This study should include a complete survey of the area and more detailed planning of the aircraft aprons, terminal building, parking, and roadway network. This study would represent a detailed area mini-master plan.

To serve the general aviation users of the airport, the administration is intending to construct a designated aircraft wash rack. This area would be specially designed and constructed to meet EPA standards for the containment of cleaning chemicals and used aircraft oil. An un-leased flight-line lot facing the north general aviation ramp is identified for this purpose. This lot is also anticipated for other general aviation service including a self-serve fuel pump.

In the previous fiscal year, determining an appropriate site for the ASR was planned. Physical relocation of the ASR is planned for 2011. It should be noted that while this project appears on the airport capital improvement program, funding is expected to come from the FAA Facility and Equipment Division and not grants from the Airport Improvement Program.

Preliminary work on extending Taxiway L to the east side of the airfield continues in 2011 with site preparation and drainage improvements.

The pavement management report indicated low pavement values on portions of the center runway, as well as the thresholds of the west runway. In an effort to minimize the potential down time for either runway, projects associated with one runway have been grouped in the same year.

To this end, repairs and reconstruction of the center asphalt portion of Runway 12C-30C are coordinated with the work planned for the thresholds. In addition, the portion of the runway between the center section and the Runway 30C threshold section falls below the desired pavement strength (95,000 lbs. DWL) of the runway. Reconstruction of this runway is planned to bring its strength rating to 210,000 pounds DWL, to serve as the primary arrival runway for commercial aircraft.

As part of a commitment to maintaining a first class entry to the region for airport users, the exterior of the General Aviation Center is slated for maintenance and improvements.

Additional fuel storage capacity on the west side may be needed by FY 2011. An additional 100,000 gallons of Jet A capacity is planned, and an additional 24,000 gallons of Avgas capacity is planned. This added capacity should accommodate west side fuel storage needs well into the future provided passenger terminal activities ultimately relocate to the east side in accordance with the master plan. The expansion is planned to take place on the parcel currently occupied by the existing fuel farm.

Two projects have been identified in FY 2011 that are planned to be funded through the Federal Military Airports Program (MAP). The first is the construction of an AFFF Foam Basin adjacent to the former Boeing hangars. The second is the reconstruction of the pavement surrounding the west side fuel farm. This pavement needs to be able to withstand repeated use by heavy trucks.

The replacement ARFF facility located on Cargo Way would enter a construction phase if design is completed, as planned, in the previous year. This project assumes that site preparation and drainage can take place in the same year as construction.

Growth in passenger numbers will indicate a need to begin design work on a second addition to the west terminal building (the first addition being the construction of modular units in 2009). As presented in the CIP, this second addition would encompass approximately 90,000 square feet. This would bring the west terminal building to approximately 123,000 square feet. As presented in the Facility Requirements chapter, this size structure can accommodate up to 350,000 annual enplanements and six airline gates.

The success of Allegiant Air at Phoenix-Mesa Gateway Airport has necessitated planning for expansion of passenger terminal facilities on the east side of the airport. To this end, the last project considered in 2011 is the design of the completion of Taxiway C, the parallel taxiway on the east side of the airport.

A place holder has been included for ongoing pavement maintenance at the airport.

FY 2012 Projects

Exhibit 6G graphically shows the 2012 CIP. East side planning projects continue in fiscal year 2012. In this timeframe, if passenger growth progresses as forecast, several studies are planned. A master east side drainage study and an infrastructure/utility plan should follow the completion of the east side mini-master plan scheduled for 2011.

As planning progresses on the east side terminal complex, significant environmental documentation, up to and including the possibility of an Environmental Impact Statement (EIS), could be required. If, through consultation with the FAA an EIS is not required, then the estimated cost for environmental documentation could be significantly less.

Two drainage-specific projects are identified in the FY 2012 timeframe. This includes construction of the southeast detention basin and construction of lateral drainage channels leading to Velocity Way.

Several projects indentified in the Draft Pavement Management Program report are scheduled for 2012. This includes rehabilitation of the

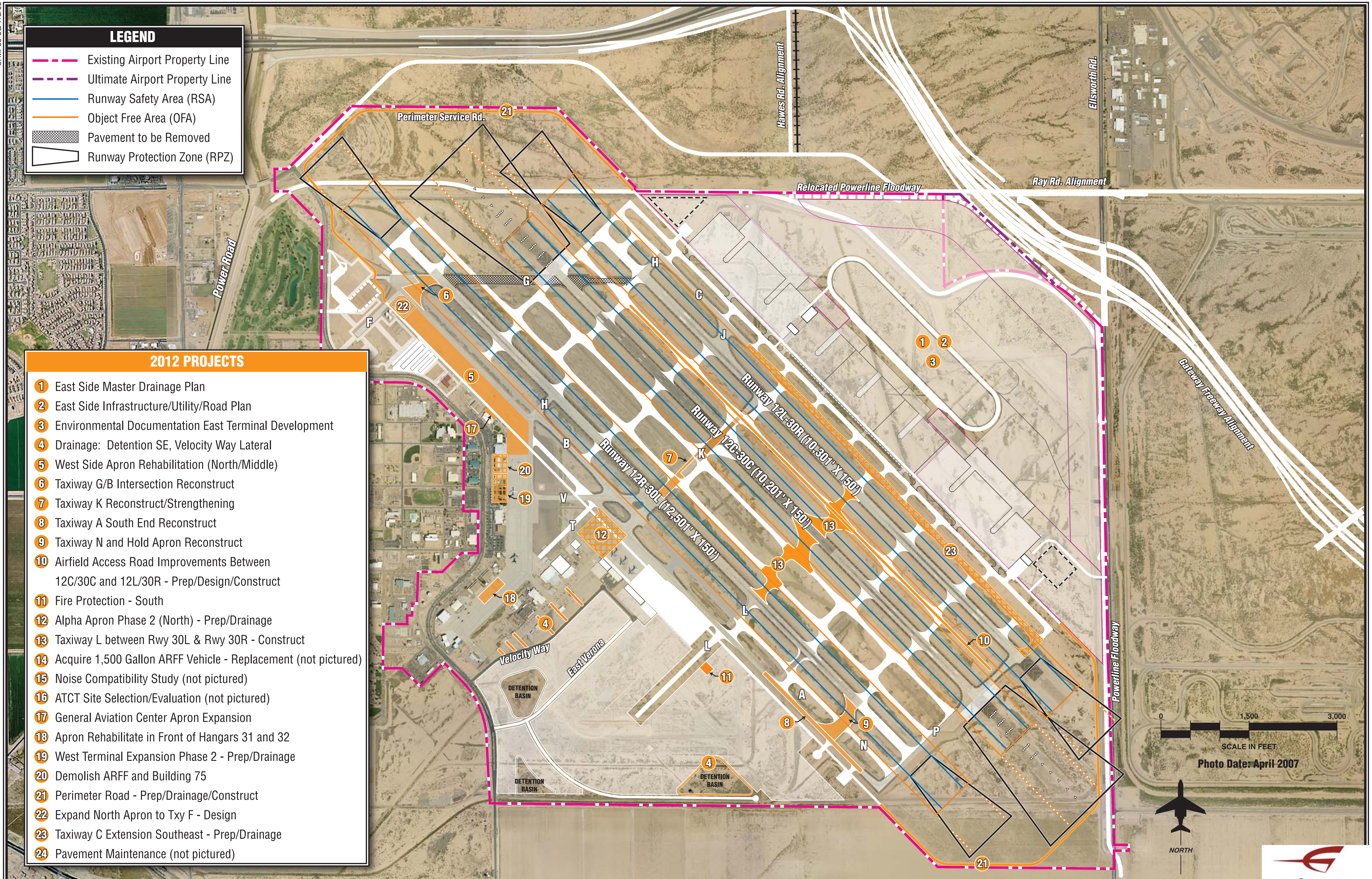

Exhibit 6G
FISCAL YEAR 2012 PROJECTS

north general aviation ramp. This ramp is the primary movement area for all transient general aviation aircraft visiting the area. In addition to the need to maintain ramp areas, it is important to present a first class introduction to visitors.

The next pavement preservation projects include the reconstruction of the intersection of Taxiways G and B. Portions of Taxiway K are in need of reconstruction and strengthening. The southern portion of Taxiway A needs to be reconstructed as does a portion of Taxiway N and the adjacent hold apron.

The next project is related to improving the service road access to the airfield. This project provides a paved surface between the easterly runways. This service road is located outside the runway object free areas so operations on both runways can continue while service vehicles are on the service road. Ultimately, this service road would be replaced by a parallel taxiway.

The next step toward opening the southwest area to aviation-related development is the construction of a fire suppression system. This system is centrally located near Taxiway L and will be capable of serving the southwest portion of the airport.

Expansion of the northern portion of Alpha Apron continues with site preparation and drainage improvements.

In FY 2012, the construction of Taxiway L from Runway 30L to Runway 30R is planned. Progress continues on expanding Alpha Apron to the north with site preparation and drainage.

The airport is planning the purchase of a replacement ARFF vehicle with a capacity of 1,500 gallons. It is projected that this vehicle will be needed in 2012.

By 2012, it will have been 12 years since the airport conducted a noise compatibility study. Since the previous study was completed, many changes have occurred related to aircraft noise levels and the airport itself has changed significantly. Even the sensitivity of the noise models used to map noise impacts has changed. The airport should undertake a formal update to the noise compatibility program in this timeframe.

The airport traffic control tower (ATCT) does not meet today's standards and there is no room to add additional controllers, a need that will evolve as airport operations increase. A tower study is programmed that will evaluate the current tower condition and evaluate tower siting. The master plan shows two possible locations based on minimum visual needs: one in the current location and one on the east side. This will be subject to the full FAA tower siting process.

The ramp area dedicated to transient general aviation users entering the community through the General Aviation Center needs to be expanded. This ramp expansion considers utilizing available space between the current aircraft ramp and the building. This represents approximately 8,000 square yards of new pavement.

A portion of the south apron is planned for reconstruction in 2012. This area is in front of Hangars 31 and 32, which are currently leased by Native Air and ATSI.

The site preparation and drainage improvements necessary to expand the west terminal building are planned. The site preparation would include the demolition of the existing ARFF building. In order for this project to move forward in this timeframe, the replacement ARFF building will need to have been completed, as well as the design work for the terminal building expansion.

The perimeter service road for the airport should be paved and located outside any critical runway or taxiway safety areas. A project is planned to complete the perimeter service road to accomplish these goals.

The airport should consider expanding the general aviation apron to the north if demand dictates. A 9,200 square yard area is available for this expansion immediately to the east of the north fire suppression system.

The development of Taxiway C on the east side of the airfield continues in 2012 with the site preparation and drainage improvements necessary.

FY 2013 Projects

The first project in FY 2013 is the construction of the northern portion of Alpha Apron. This and other 2013 CIP projects are shown on **Exhibit 6H**.

Drainage-specific projects continue in FY 2013. A storm drain is planned to extend from the intersection of Cargo Way and East Verona to the south detention basin. This project will directly support business expansion into the southwest area.

The next five projects address rehabilitation and reconstruction needs for Runway 12R-30L. These include reconstruction of approximately the last 1,000 feet of each threshold. Since portions of this runway will be closed for these repairs at this time, the installation of precision approach path indicator lights (PAPIs) and runway end identification lights (REILs) are planned at the same time.

As enplanement levels grow, the need for additional west side parking will become acute. In 2013, up to 1,500 additional parking positions could be necessary. Discussions with the Airport Authority indicate that there are several options for providing additional parking. These include building a parking structure near the existing terminal building or developing remote surface parking. Possible remote parking sites include southwest of Sossaman in the general location of the old fuel farm or to the north between the Powerline Floodway and the planned Ray Road alignment.

The second phase of expansion of the west terminal is planned for construction in 2013. This phase will bring the total terminal building size up to approximately 123,000 square feet.

A small segment of Taxiway W at the east corner of the middle and south

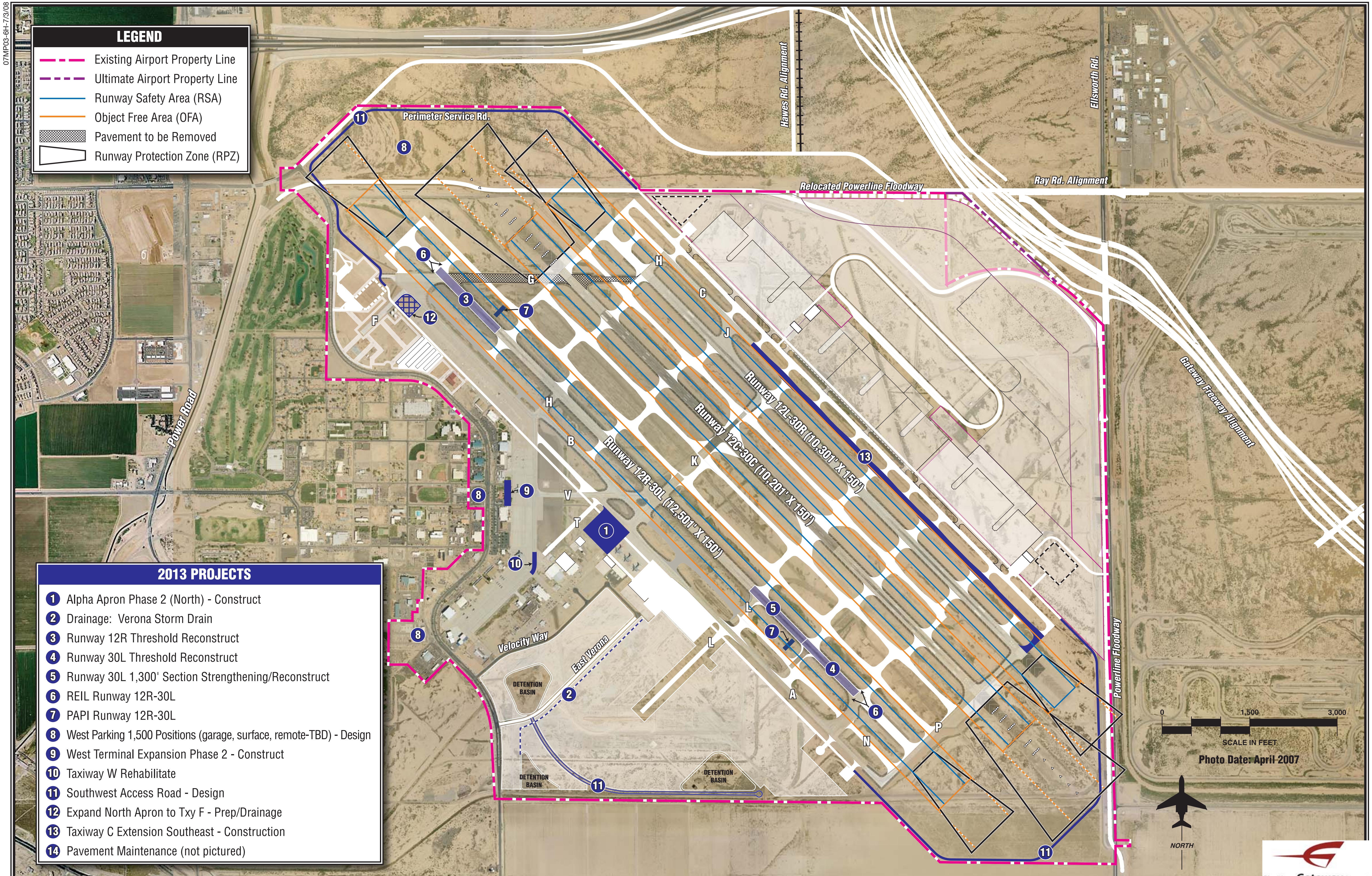

Exhibit 6H
FISCAL YEAR 2013 PROJECTS

aprons is in need of reconstruction. This is planned for the 2013 timeframe.

A new project beginning in FY 2013 is the design of the southwest access road. This planned road will provide access to the aviation-related parcels to the south of Taxiway L. While **Exhibit 6H** shows this road ending in a cul-de-sac, area roadway standards limit the allowable length of a cul-de-sac. Current planning would bring a road from Pecos Road onto airport property to connect with the southwest access road. The details of this roadway network should be part of the traffic study considered in FY 2009.

The potential expansion of the north general aviation apron would enter a site preparation and drainage phase in this timeframe.

In 2013, the construction of parallel Taxiway C is planned. Completion of this taxiway will allow for efficient aircraft ground movements and make the east side available to passenger aircraft once terminal services are made available.

The last project considered in 2013 is the airport's commitment to on-going routine pavement maintenance. Once again, an annual placeholder is utilized to identify funds for pavement maintenance.

FY 2014 Projects

The last year of the short term CIP, as depicted on **Exhibit 6J**, considers the construction of additional parking for the west side terminal complex. Once again, the precise location of this 1,500 stall parking development is yet to be determined.

Additional drainage improvements will be necessary in the area adjacent to the planned Taxiway T. This project is considered in FY 2014.

Projects related to development of the east side terminal complex also continue in this timeframe. These include the design of the east side terminal building, access roads, parking, aircraft apron, relocation of the floodway, and the hydrant fuel delivery system.

The current plans for the Gateway Freeway call for relocating the floodway closer to the freeway alignment in order to increase its effectiveness in controlling water runoff. The design of this relocation is planned for FY 2014. It is anticipated that funding for this project will come from sources other than the airport.

The fuel delivery system includes design of an east side fuel farm capable of initially storing at least 220,000 gallons of Jet A. Expansion possibilities should be considered when designing the fuel farm.

The southwest access road is planned to enter the site preparation and drainage phase in 2014. As discussed, this road will provide access to the remaining southwest parcels for aviation development.

A new project considered at the end of the short term planning period is the

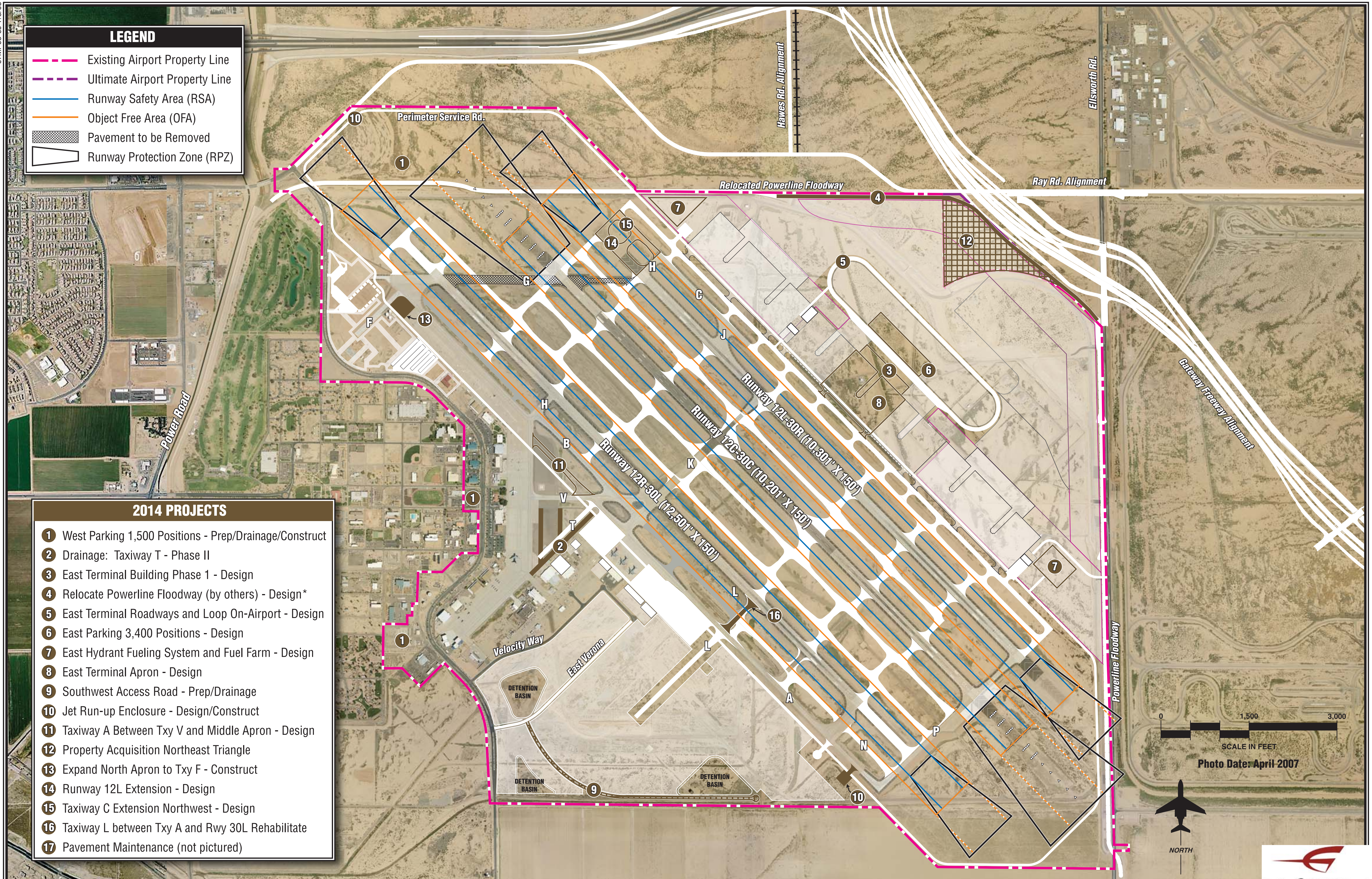

Exhibit 6J
FISCAL YEAR 2014 PROJECTS

construction of a sound-insulated large aircraft jet engine test enclosure. The facility included in the CIP can accommodate up to a Boeing 747. As the need for the enclosure draws near, new design specifications should take into consideration the type of aircraft that would actually use the facility.

Another new project in this timeframe is the design of Taxiway A between Taxiway V and the middle apron. This project would complete the dual parallel taxiway system on the west side and would increase ground movement efficiencies.

On the east side, there is a 31-acre triangular shaped parcel that should be acquired to accommodate east side airport development.

The expansion of the north general aviation apron is planned to enter the construction phase.

A major project in the 2014 timeframe is the extension of Runway 12L. This runway will be the primary departure runway for commercial service operations when the east terminal opens. Prior to construction of the runway extension, an environmental assessment (EA) will need to be conducted. Associated with this project is the extension of Taxiway C both to the north and to the south.

A small portion of Taxiway L between Taxiway A and Runway 30L is projected to be in need of reconstruction by 2014. The final project is the placeholder for annual maintenance.

Short Term Summary

The short term capital needs for the airport total $259.9 million. Of this total, it is estimated that $191.2 million is reasonably eligible for federal grant funding. Through ADOT's aviation funding programs, $5.7 million is eligible. The remaining $63.0 million would be the responsibility of local resources.

INTERMEDIATE TERM IMPROVEMENTS

The fluid nature of the aviation industry makes yearly capital project projections very difficult beyond the short term planning period. Therefore, capital needs in the intermediate planning period are not segmented by years. Instead, intermediate term projects should be considered based on previous project phasing and on demand. As such, the projects are prioritized according to need and demand based on the aviation forecasts. This organizational method gives the Airport Authority the greatest flexibility to continue to prioritize projects into the future. **Exhibit 6K** presents the intermediate term projects.

The projects listed in the intermediate term are not divided into phases unless the design and/or site preparation phases were planned in prior years individually. Any new projects planned for the intermediate planning horizon will consider design, engineering, drainage, site preparation, and construction within that project line item.

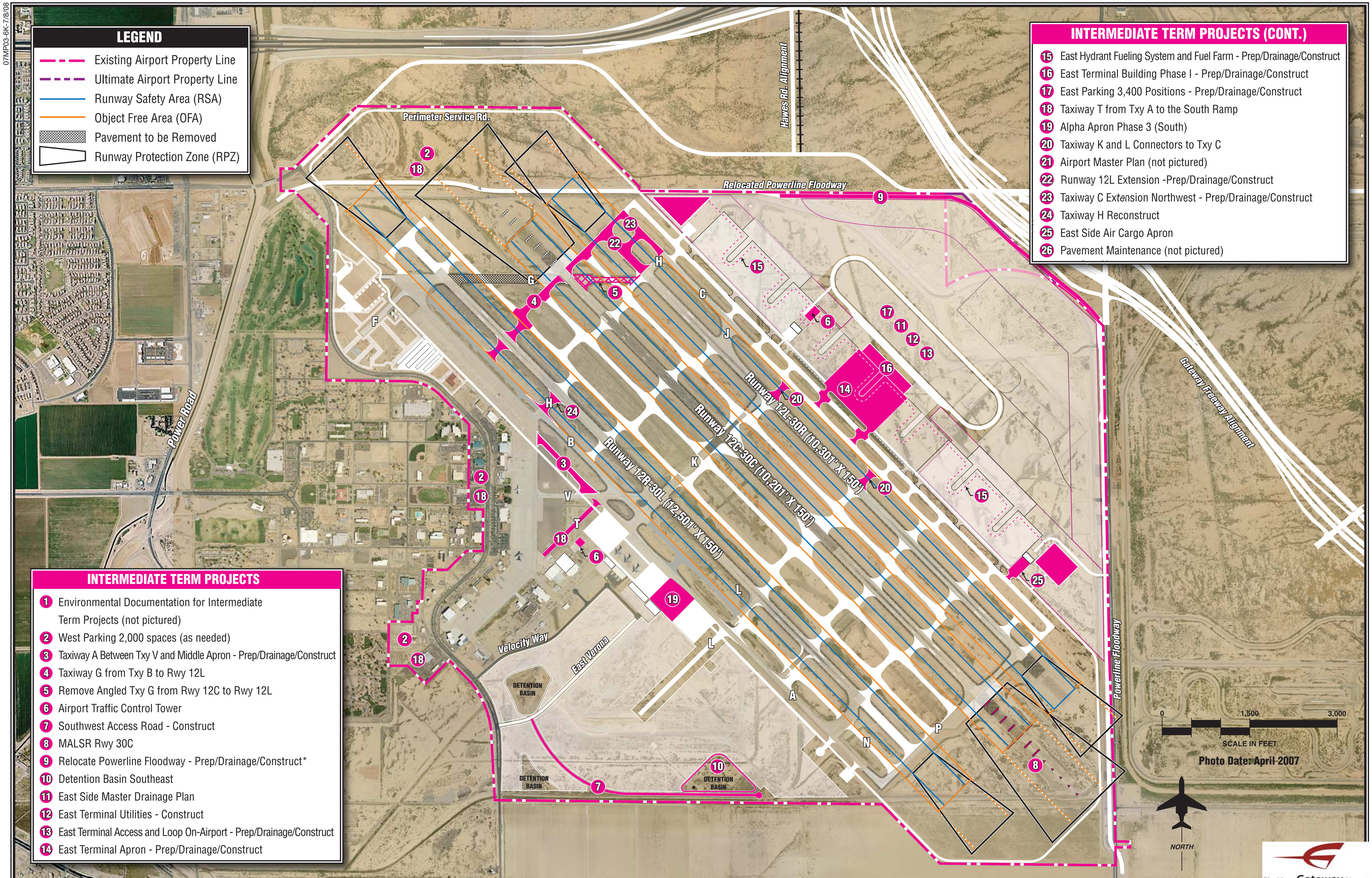

Exhibit 6K
INTERMEDIATE TERM PROJECTS

The first item listed in the intermediate term is environmental documentation. Projects receiving federal funding require environmental documentation. This placeholder is intended to cover any environmental documentation needs in the intermediate term.

Consideration of additional west side automobile parking may be necessary in the intermediate term. This will be contingent on the progress of the east side terminal complex, passenger levels, and capacity of the existing terminal building. There are two line items that each plan for the possibility of 2,000 additional parking stalls. The location and design (garage v. surface) of the parking facility has not been determined.

Some projects begun in the short term are planned to be completed in the intermediate term. This includes construction of Taxiway A to the middle ramp; the relocation of the Powerline Floodway; the east terminal area drainage, utilities, and roads; the east terminal building; the aircraft apron; the fuel delivery system; and the parking.

The next project is the design and construction of a new Taxiway G. This project would include the removal of the existing angled portion of Taxiway G, which is important for safety reasons. The FAA recommends 90-degree intersections when possible, except for high-speed runway exits.

In 2012, a tower evaluation and site selection study was scheduled. If the recommendation is to construct a replacement tower, this should occur in the intermediate planning horizon. If the recommended location for the replacement tower is on the east side of the airport, then tower design and construction should take place concurrently in case there is an opportunity to integrate east side development with tower development, especially utility infrastructure.

While Phoenix-Mesa Gateway Airport does have an Instrument Landing System (ILS) on Runway 30C, the approach lights are currently inoperable. Installation of a new MALSR approach lighting system is planned for the intermediate term. The new lights will make the airport eligible for lower visibility minimums and near all-weather operational capability.

Two projects related to development of the southwest area are planned to be completed in the intermediate term. These are the construction of a third detention basin and paving of the access road.

Taxiway T from Taxiway A to the south apron is planned for construction in the intermediate term to improve efficiency. Taxiway V currently supports all aircraft travelling to/from both the middle and south aprons, but Taxiway T can provide a second and often more direct route.

As demand warrants, continued expansion of Alpha Apron is planned in the intermediate term. This portion of the apron would serve not only an airport user or business, but would also provide ARFF access to the airfield.

An update to this master plan is also scheduled in the intermediate term. It is recommended that the airport revisit the assumptions in the master plan every five to seven years and update the forecasts. With the commencement of regularly scheduled commercial service, a review of the forecasts will be especially important.

The next project is the construction of the taxiway connectors from Taxiway C to Runway 12L-30R. The extension of Runway 12L and Taxiway C to the northwest is also planned. A small portion of Taxiway H is planned for reconstruction in this timeframe as well.

As commercial service begins to locate to the east side of the airport, a need for a belly freight staging area may develop. A small apron and sort facility is planned for construction adjacent to the southeast portion of Taxiway C in the intermediate term.

The last project listed in the intermediate planning horizon is continued pavement maintenance. This placeholder would cover fiver years of annual maintenance.

Intermediate Term Summary

The intermediate term projects total more than $235.4 million. Of this total, $74.8 million is FAA eligible. Approximately $2.0 million is eligible for ADOT grant matching, and the remaining $158.7 million would be the responsibility of the local airport sponsor. More than $156.7 million of the local costs would be for revenue producing facilities such as parking and the east terminal complex.

LONG TERM IMPROVEMENTS

Long term projects are presented on **Exhibit 6L**. Once again the need for environmental documentation will be necessary prior to implementing many of these projects, and a place holder is provided.

The next phase of the expansion of Alpha Apron is planned for the long term planning horizon. This expansion would be from the already completed apron to Taxiway L.

There are various services that may become necessary to fully support commercial service. Two such projects include a catering facility and a maintenance facility planned for the long term planning period.

Runway 30L and Taxiway B are planned to be extended in this timeframe. This runway extension would be justified by the introduction of a long haul cargo carrier that needs more runway length. In addition, this extension would bring the runway/taxiway layout into FAA design standards by removing Taxiway P from the Runway 30L RPZ.

As passenger enplanements grow, the need for more parking will become more acute. A single long term place holder representing the construction of 5,000 parking spaces is shown. In actuality, the number of spaces constructed will depend on actual need and may be phased in over several years. The master plan CIP plans for a total of 8,400 east side parking spaces. This total should meet the needs beyond the 20-year planning horizon.

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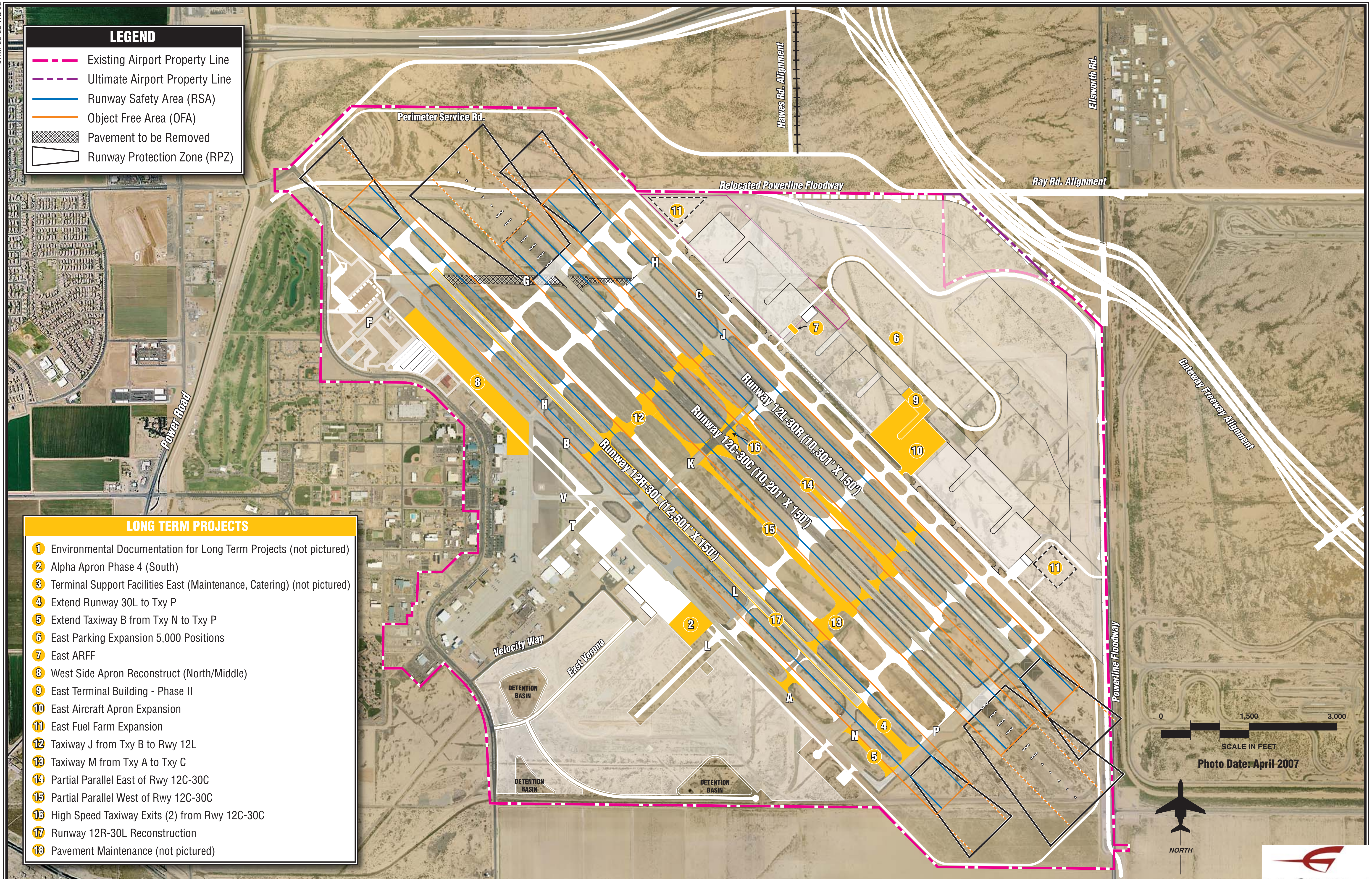


Exhibit 6L
LONG TERM PROJECTS

The next project is the construction of an east side ARFF facility. While the west side ARFF facility can likely meet the initial response needs for the airport through the intermediate planning horizon, a need may arise for a dedicated east side facility. ARFF personnel not only respond to airfield accidents but also to other on-airport emergencies such as those within the terminal building. Therefore, a facility in closer proximity to east side facilities would be useful.

The north general aviation apron is a high activity area. Previously in 2012, a significant rehabilitation of this apron was planned. In the long term, a reconstruction of this apron is planned. Of course, the airport should provide routine maintenance to all airport surfaces, but especially those high use areas in order to extend the useful life as long as feasible.

A potential expansion of the east terminal complex, including the passenger building, aircraft apron, and vehicle parking area is planned in the long term. The terminal building expansion is 144,000 square feet. This addition would bring the total east terminal building to approximately 294,000 square feet. This size terminal building could accommodate the 2.2 million enplanements forecast for the long term planning period. This terminal building addition should be specifically justified by growing passenger demand, trending toward the long term forecast.

An expansion of the east side fuel farm is planned for the long term. This expansion includes the addition of 470,000 gallons of Jet A storage and 24,000 gallons of Avgas storage. Upon completion of this project, the east side fuel farm will have a total capacity of 690,000 gallons of Jet A and 36,000 gallons of Avgas. This total, along with an east side capacity of 250,000 gallons of Jet A and 36,000 gallons of Avgas, will meet the long term forecast need.

Several taxiway improvements are considered in the long term, including extension of Taxiways J and M across the airfield. Partial parallel taxiways are planned to the east and west of the center runway and high speed exits are planned. High-speed exists from the center runway leading to the east are also planned at this time.

The last specific project of the long term planning horizon is the potential need for reconstruction of Runway 12R-30L. If the forecasts hold true, this runway will see a sharp increase in activity. Today, this runway is in excellent condition, but in 20 years it could be in need of reconstruction.

A place holder for ten years of pavement maintenance is the last item in the long term CIP.

Long Term Summary

The long term projects total more than $259.3 million. Of this total, $135.3 million is FAA eligible. Approximately $3.6 million is ADOT eligible under their federal grant matching program. The remaining $120.4 million would be the responsibility of the local airport sponsor. Approximately $117 million of the sponsor total is represented by revenue producing facilities.

CAPITAL IMPROVEMENT SUMMARY

The capital program for the airport demonstrates the progressive planning necessary to meet demand and make improvements at the airport. Many of the projects are considered multi-year and multi-phased projects. By prioritizing these projects, the airport administration can better plan for the needs of the airport and plan for growth.

This capital program is intended to provide a road map, based on the aviation demand forecasts, for the airport to grow and improve systematically. With the advent of scheduled commercial service and the forecast growth in passenger numbers, it is necessary for the airport to plan to both accommodate immediate passenger needs on the west side and to plan for an ultimate move to the east side of the airport.

In the short term, the expansion of the west terminal building is planned in two phases. Initially, 10,000 square feet of space is planned to be added in 2009. By 2013, a 90,000 square-foot expansion is planned. In the intermediate planning horizon, a 150,000 square-foot east side terminal building is planned. The west side terminal building should ultimately be planned to revert to general aviation uses. Numerous airfield improvements are also considered. Of particular note is the construction of new taxiways. The airport is currently constrained by its lack of taxiways. Without significant taxiway improvement, forecast operations and activity cannot be realized.

The development of the east terminal complex is estimated to cost $334.8 million. This includes all planning studies, aircraft aprons, vehicle parking, roadways, utility design and extension, and the passenger terminal building itself. Of this total, approximately $271 million is considered the responsibility of the airport sponsor.

The 20-year investment total is approximately $754.6 million, with $342.1 million of that total being the responsibility of the airport sponsor. FAA eligible projects total $401.3 million. $11.2 million is eligible for ADOT grants.

CAPITAL IMPROVEMENT FUNDING SOURCES

Financing capital improvements at the airport will not rely solely on the financial resources of the airport. Capital improvement funding is available through various grant-in-aid programs on both the state and federal levels. The following discussion outlines key sources of funding potentially available for capital improvements at Phoenix-Mesa Gateway Airport.

FEDERAL GRANTS

Through federal legislation over the years, various grant-in-aid programs have been established to develop and maintain a system of public airports across the United States. The purpose of this system and its federally based funding is to maintain national defense and to promote interstate commerce. The most recent comprehensive legislation affecting federal funding was enacted in late 2003 and was titled *Century of Aviation Reauthorization Act*, or *Vision 100*.

The four-year bill covered FAA fiscal years 2004, 2005, 2006, and 2007. (This bill presented similar funding levels to the previous bill - *Air 21*.) Airport Improvement Program (AIP) funding was authorized at $3.4 billion in 2004, $3.5 billion in 2005, $3.6 billion in 2006, and $3.7 billion in 2007. This bill provided the FAA the opportunity to plan for longer term projects versus one-year re-authorizations.

Vision 100 expired at the end of fiscal year 2007. A series of continuing resolutions was passed in order to carry the program through June 2008 at 75 percent of authorized funding levels. In December 2007, AIP was included in the omnibus appropriation act and authorized $3.5 billion in 2008 for airport improvements. While this one-year bill provided AIP funding, it did not provide the legislative authority to continue the program. This issue was temporarily solved with legislation that provided AIP authority through the end of fiscal year 2008. As of July 2008, a new multi-year AIP authorization and authority bill had not been passed.

The source for airport improvement funds from the federal government is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities and equipment, and research and development). The Aviation Trust Fund also finances the operation of the FAA. It is funded by user fees, including taxes on airline tickets, aviation fuel, and various aircraft parts.

Funds are distributed each year by the FAA from appropriations by Congress. A portion of the annual distribution is to commercial service airports based upon enplanement (passenger boarding) levels. Airports with qualifying levels of air cargo shipments can receive additional entitlements. After all specific entitlements are distributed, the remaining AIP funds are disbursed by the FAA based upon the priority of the project through discretionary apportionments. A national priority system is used to evaluate and rank each airport project. Those projects with the highest priority are given preference in funding.

Under the AIP program, examples of eligible development projects include the airfield, public aprons, and access roads. Additional buildings and structures may be eligible if the function of the structure is to serve airport operations in a non-revenue generating capacity, such as maintenance facilities. Some passenger terminal building improvements (such as bag claim and public waiting lobbies) are also eligible for FAA funding. Improvements such as fueling facilities, utilities (with the exception of water supply for fire prevention), hangar buildings, airline ticketing, and airline operations areas are not typically eligible for AIP funds.

Under *Vision 100* and the current continuation bill, Phoenix-Mesa Gateway

Airport is eligible for 95 percent funding assistance from AIP grants.

Should passenger traffic reach or exceed 0.25 percent of the total U.S. enplanements (currently 2.0 million annually), the airport would be classified as a medium hub. At that time, the FAA share of AIP grants would be reduced to 75 percent.

Entitlement Funds

AIP provides funding for eligible projects at airports through an entitlement program. Primary commercial service airports receive a guaranteed minimum of federal assistance each year, based on their enplaned passenger levels and Congressional appropriation levels. A primary airport is defined as any commercial service airport enplaning at least 10,000 passengers annually. *Vision 100* and the previous bill, *AIR-21*, adjusted allocation formulas to increase entitlements over previous levels and to establish special set-asides for noise programs, general aviation and non-primary airports, and other special programs.

Under the entitlement formula, airports enplaning 10,000 or more passengers annually will receive the higher of $1.0 million or an amount based upon the entitlement formula. The entitlement formula is based upon $15.60 per enplaned passenger for the first 50,000 enplanements, and $10.40 per enplanement for the next 50,000 enplanements. The next 400,000 enplanements provide $5.20 each, and an airport receives $1.30 each of the next 500,000 enplanements. For each annual enplanement above one million, the airport will receive $1.00. Entitlement amounts can be reduced proportionally if Congress does not annually appropriate the full amount authorized by the enabling legislation.

A primary airport will receive the minimum entitlement level until annual enplanements exceed 71,154. The Phoenix-Mesa Gateway Airport should receive approximately $1 million in FAA Fiscal Year 2009 based on an enplanement level of approximately 30,475 for calendar year 2007. In FAA Fiscal Year 2010, the airport should receive approximately $1.2 million based on projected 2008 calendar year enplanements of 96,545 (extrapolated from January thru June actual figures). Provided the entitlement formula remains the same throughout the next 20 years, the Phoenix-Mesa Gateway Airport entitlement funding levels will continue to grow as presented in **Table 6B**.

In addition, airports that have over 100 million pounds of annual landed weight by all-cargo carriers receive an air cargo entitlement. The national cargo entitlement fund is established at 3.5 percent of the annual AIP appropriation. The airport cargo entitlement is based upon the airport's percentage of total landed weight at all eligible airports. In the long term planning period, Phoenix-Mesa Gateway Airport is forecast to land 44,000 tons of cargo annually, which is 88 million pounds; therefore, air cargo activity is not anticipated to exceed the federal threshold for entitlement funds through the planning period.

A general aviation airport may also be eligible for entitlement funding. If Congress appropriates the full amount authorized for AIP funding, then general aviation airports included in the NPIAS (*National Plan of Integrated Airport Systems*) are eligible for up to $150,000.

Discretionary Funds

In a number of cases, airports face major projects that will require funds in excess of the airport's annual entitlements. Thus, additional funds from discretionary apportionments under AIP become desirable. The primary feature about discretionary funds is that they are distributed on a priority basis. These priorities are established by the FAA utilizing a priority code system. Under this system, projects are ranked by their purpose. Projects ensuring airport safety and security are ranked as the most important priorities, followed by projects maintaining current infrastructure development, mitigating noise and other environmental impacts, meeting standards, and increasing system capacity.

It is important to note that competition for discretionary funding is not limited to airports in the State of Arizona or those within the FAA Western Pacific Region. The funds are not distributed to all airports in the country and, as such, are more difficult to obtain. High priority projects will often fare favorably, while lower priority projects usually will not receive discretionary grants.

Military Airport Program (MAP)

The military airport program (MAP) is a component of the Federal AIP and is a discretionary funding set-aside, meaning the MAP funds are taken off the top of the discretionary pool of funds. The MAP set-aside was established to assist current and former military airports located in congested metropolitan areas in converting to viable civilian airports. Currently, the MAP set-aside is authorized at 4.0 percent of the airport improvement program allocation. For Fiscal Year 2007, the amount was $18,512,311.

There are three conditions for an airport to be eligible for MAP funds:

1) the airport must be a former or current military airport;
2) the airport must have the potential for conversion either to a public use commercial service or reliever airport; and
3) the conversion of the airport would, in whole or part, enhance airport and air traffic control system capacity in major metropolitan areas and reduce current and projected flight delays.

Airports meeting these criteria are eligible for inclusion in the MAP for five years. Eligible projects include (in addition to other eligible airport improvement program projects), terminals, fuel farms, utility systems, parking lots, and hangars (which are generally not eligible for AIP funds).

Phoenix-Mesa Gateway Airport has participated in the MAP since 1995. Grants from the MAP provided much of the federal funding for the reconstruction of Runway 12L-30R. The airport is completing an application for continued participation in the program. Future MAP funding is expected to reimburse the airport for the completion of the reconstruction of Runway 12L-30R, upgrades to the airport traffic control tower console, and air cargo apron construction along Taxiway K.

PASSENGER FACILITY CHARGES

The *Aviation Safety and Capacity Expansion Act of 1990* contained a provision for airports to levy passenger facility charges (PFCs) for the purposes of enhancing airport safety, capacity, security, or to reduce noise or enhance competition. PFCs are collected by the airlines as an additional fee attached to the purchase of a ticket. The airline then directs these fees to the airport less a collection and processing fee.

14 CFR, Part 158, of May 29, 1991, establishes the regulations that must be followed by airports choosing to levy PFCs. Passenger facility charges may be imposed by public agencies controlling a commercial service airport with at least 2,500 annual passengers with scheduled service. The current cap is $4.50 per passenger. Prior approval is required from the Department of Transportation (DOT) before an airport is allowed to levy a PFC. The DOT must find that the projected revenues are needed for specific, approved projects. Any AIP-eligible project, whether development or planning related, is eligible for PFC funding. Gates and related areas for the movement of passengers and baggage are eligible, as are on-airport ground access projects. Any project approved must preserve or enhance safety, security, or capacity; reduce/mitigate noise impacts; or enhance competition among carriers.

PFCs may be used only on approved projects. However, PFCs can be utilized to fund 100 percent of a project. They may also be used as matching funds for AIP grants or to augment AIP-funded projects. PFCs can be used for debt service and financing costs of bonds for eligible airport development. These funds may also be commingled with general revenue for bond debt service. Before submitting a PFC application, the airport must give notice and an opportunity for consultation with airlines operating at the airport.

PFCs are to be treated similar to other airport improvement grants, rather than as airport revenues, and are administered by the FAA. Airlines retain up to 11 cents per passenger for collecting PFCs. It should also be noted that only revenue passengers pay PFCs. Non-revenue passengers, such as those using frequent flier rewards or airline personnel, are counted as enplanements but do not generate PFCs.

Phoenix-Mesa Gateway Airport plans to submit an application to the FAA to begin collecting a $4.50 PFC in the near future. The PFC is planned to be used to reimburse the airport for nine AIP projects completed between 1999 and 2007. The total of the grants in the PFC application is expected to be $3,858,511.

Table 6B presents a summary of potential entitlement and PFC funding levels.

FAA FACILITIES AND EQUIPMENT PROGRAM

The Airway Facilities Division of the FAA administers the national Facilities and Equipment (F&E) Program. This annual program provides funding for the installation and maintenance of various navigational aids and equipment for the national airspace system and airports. Under the F&E program, funding is provided for FAA air traffic control towers, enroute navigational aids such as VORs (very-high omni-directional radar), and on-airport navigational aids such as PAPIs (precision approach path indicator) and approach lighting systems. As activity levels and other development warrant, the airport may be considered by the FAA Airways Facilities Division for the installation and maintenance of navigational aids through the F&E program.

TABLE 6B
Projected Annual Entitlement and Passenger Facility Charge (PFC) Funding
Phoenix-Mesa Gateway Airport

Period	Passenger Enplanement Forecast	Potential Annual AIP Entitlements	Potential Annual PFCs[1]	Potential Annual PFCs And Entitlements
Calendar 2008	191,158*	$1,774,001	$755,265	$2,529,266
Short Term	350,000	$2,600,000	$1,382,850	$3,982,850
Intermediate Term	850,000	$3,835,000	$3,358,350	$7,193,350
Long Term	2,200,000	$5,230,000	$8,692,200	$13,922,200
High Range	5,000,000	$8,030,000	$19,755,000	$27,785,000

* Extrapolated estimated based on data from 1/08-6/08.
[1] Assumes $4.50 PFC, 90 percent revenue passengers, $0.11 to air carrier for administrative costs.
Source: FAA Order 5100.38C, Airport Improvement Handbook

One project that is planned to be undertaken through this program is the relocation of the ASR-8 radar currently located on the east side of the airport. Relocation of this facility will be necessary prior to construction of the east side terminal complex.

All on-airport navigational aids are currently owned by the airport.

STATE FUNDING PROGRAMS

In support of the state aviation system, the State of Arizona also participates in airport improvement projects. The source for state airport improvement funds is the Arizona Aviation Fund. Taxes levied by the state on aviation fuel, flight property taxes, aircraft registration taxes, and registration fees (as well as interest on these funds) are deposited in the Arizona Aviation Fund.

Under the State of Arizona's grant program, an airport can receive funding for one-half (currently 2.5 percent) of the required local share of projects receiving federal AIP funding. The state also provides 90 percent funding for certain projects which are typically not eligible for federal AIP funding or have not received federal funding. The maximum amount the state can grant for any single airport project is 10 percent of the annual Aviation Fund amount. In recent history the total annual Aviation Fund amount was approximately $20 million.

State Airport Loan Program

The Arizona Department of Transportation (ADOT) - Aeronautics Division's Airport Loan Program was established to enhance the utilization of state funds and provide a flexible funding mechanism to assist airports in funding improvement projects. The loan program is intended to provide funding assistance for those projects that will contribute to the economic well-being of the airport. Some examples are hangars, utility improvements, fuel farms, terminals, revenue generating auto parking, terminal building restaurants, and recreational improvements.

Unlike the Federal AIP funding mechanism, revenue-generating improvements, such as hangars and fuel storage facilities, are eligible under the State Airport Loan Program. Projects which are not currently eligible for the State Airport Loan Program may be reconsidered if the project can be shown to enhance the airport's ability to be financially self-sufficient.

There are three ways in which the loan funds can be used: Grant Advance, Matching Funds, or Revenue-Generating Projects. The Grant Advance loan funds are provided when the airport can demonstrate the ability to accelerate the development and construction of a multi-phase project. The project(s) must be compatible with the airport master plan and be included in the ADOT Five-Year Airport Development Program. The Matching Funds are provided to meet the local matching fund requirement for securing federal airport improvement grants or other federal or state grants. The Revenue-Generating funds are provided for airport-related construction projects that are not eligible for funding under another program.

The airport has utilized this funding source in the past, most notably for a $3.0 million dollar loan to construct the new hangar to be occupied by Arizona State University on the north general aviation apron. The revenue generated from the lease will be used to pay the loan balance.

Historically, the state loan program did not have a cap on the amount for a single loan. In 2008, a cap was placed on the loan program limiting the maximum amount for a loan on a single project to 10 percent of the Arizona Aviation Fund.

Pavement Maintenance Program

The airport system in Arizona is a multi-million dollar investment of public and private funds that must be protected and preserved. State aviation fund dollars are limited, and the State Transportation Board recognizes the need to protect and extend the maximum useful life of the airport system's pavement. The Arizona Pavement Preservation Program (APPP) has been established to assist in the preservation of the Arizona airport system infrastructure through regular airport inspections.

Public Law 103-305 requires that airports requesting Federal AIP funding for pavement rehabilitation or reconstruction have an effective pavement maintenance management system. To this end, ADOT-Aeronautics maintains an Airport Pavement Management System (APMS). Access to this system is available to all airports in Arizona, but is commonly utilized by non-commercial service airports. This system requires monthly airport inspections, which are conducted by airport management and supplied to ADOT.

In contrast, commercial service airports must make daily inspections, including the condition of the pavement. Therefore, most commercial service airports will maintain their own pavement maintenance inspection reports. The Phoenix-Mesa Gateway Airport Pavement Management Program (PMP) meets the requirements for federal AIP eligibility.

A new PMP has been developed separately but concurrently with this master plan. Details of the PMP were presented earlier in this chapter.

LOCAL FUNDING

The balance of project costs, after consideration has been given to grants, must be funded through local resources. There are several local finance options for future development at the airport, including airport revenues, bonds, and leasehold financing.

Williams Gateway Airport Authority receives long-term loans from the member governments to provide funds for the airport's operating revenue and capital expenditures. Based on the Joint-Powers Airport Authority Agreement entered into by the members of Williams Gateway Airport Authority, all payments made to Williams Gateway Airport Authority by the members are considered loans to be repaid to the members. The intent of the members in providing funds to Williams Gateway Airport Authority is to invest in the operation and development of the airport for the benefit of the citizens of their communities.

The FAA has established a "six year rule" limiting retroactive reimbursement of contributions unless appropriate documented agreements are in place. In order to maintain Williams Gateway Airport Authority's right to eventually repay contributions made by its members, Williams Gateway Airport Authority and its member governments have drawn up formal promissory notes stating that previous and future payments are to be repaid on specified dates or at such later time as Williams Gateway Airport Authority's Board of Directors deems appropriate, with 3 percent interest. As of the end of fiscal year 2007, current loans totaled $62.7 million including accrued interest.

As a condition of joining the Airport Authority, the City of Phoenix agreed to make available to Williams Gateway Airport Authority $5 million toward capital needs of the airport, in addition to its share of annual funding. During fiscal year 2007, Williams Gateway Airport Authority received $741,000 of the $5 million. Ultimately, revenues from the airport's operations are expected to pay back the member loans and fund ongoing capital improvement financing.

Revenue bonds have become a common form of financing airport improvements. The local share of passenger terminal building development, for example, is commonly financed, in part, through revenue bonds.

Leasehold financing refers to a developer or tenant financing improvements under a long-term ground lease. The obvious advantage of such an arangement is that it relieves the WGAA of all responsibility for raising the capital funds for improvements. Much of the future industrial/commercial and hangar development on the airport is expected to be developed in this manner.

REVENUE AND EXPENSES

Operating revenue for the Phoenix-Mesa Gateway Airport includes sales from fueling, building and land leases, services offered by the FBO, and airport usage fees. Operating expenses fall in several categories, including personnel costs, professional services, wholesale fuel costs, and other expenses related to facilities. As shown on **Table 6C**, the expenses generated by the airport have exceeded the revenues over the last five years.

TABLE 6C
Historic Operating Revenue and Expenses
Phoenix-Mesa Gateway Airport

	2003	2004	2005	2006	2007
Revenue Center	OPERATING REVENUE				
Fueling Operations	$6,206,267	$9,936,502	$12,535,780	$14,031,048	$12,313,072
Lease Income	2,033,298	2,069,647	2,268,373	2,532,710	2,702,719
Maintenance Services	155,487	119,429	208,261	325,856	467,940
Airport Usage Fees	208,503	199,797	243,523	261,583	266,794
TOTAL REVENUE	**$8,603,555**	**$12,325,375**	**$15,255,937**	**$17,151,197**	**$15,750,525**
Expense Center*	OPERATING EXPENSES				
Personnel Costs	$4,769,755	$5,221,227	$5,350,193	$5,549,231	$5,900,980
Professional Services	808,814	1,108,133	1,112,363	1,051,078	1,231,214
Cost of Goods Sold (Fuel)	4,096,924	6,910,027	9,082,974	10,475,076	8,427,295
Cost of Maintenance Services Sold	41,127	26,835	27,140	28,169	36,413
Repair and Maintenance	469,917	464,462	505,076	494,191	723,747
Utilities	264,976	284,424	295,068	320,436	342,013
Insurance	200,492	239,122	241,475	243,933	273,149
Other Expenses	859,762	797,377	978,518	971,118	1,181,828
TOTAL EXPENSES	**$11,511,767**	**$15,051,607**	**$17,592,807**	**$19,133,232**	**$18,116,639**
OPERATING INCOME/(LOSS)	**($2,908,212)**	**($2,726,232)**	**($2,336,870)**	**($1,982,035)**	**($2,366,114)**

*Source: Airport Records; *Does not include depreciation.*

The largest revenue source for the airport is profit made on fueling operations. The next largest income source is from building and land leases. These two categories account for 95 percent of the airport operating revenue. These figures do not include additional funds from member government loans, or from state and federal grants and loans.

The largest expense category is personnel costs. The next largest is the wholesale cost of fuel. These two categories represent 77 percent of the expenses. Other expenses such as utilities, insurance, and professional services make up the bulk of the remaining expenses.

As can be seen, the airport is not currently self-sufficient. Over the last five years, the airport has shown a net operating loss of between two and three million annually. The economic impact of the airport to the region is presented in Appendix C of this master plan.

SUMMARY

The best means to begin implementation of the recommendations in this master plan is to first recognize that planning is a continuous process that does not end with completion and approval of this document. Rather, the ability to continuously monitor the existing and forecast status of airport activity must be provided and maintained. The issues upon which this master plan is based will remain valid for a number of years. The primary goal is for the airport to best serve the air transportation needs of the region, provide a regional economic stimulus, and ultimately become economically self-sufficient.

The actual need for facilities is most appropriately established by airport activity levels rather than a specified date. For example, projections of based aircraft have been translated into a determination of when additional hangars may be needed at the airport. In reality, however, the timeframe in which the development is needed may be substantially different. Actual demand may be slower to develop than expected. On the other hand, high levels of demand may establish the need to accelerate the development. Although every effort has been made in this master planning process to conservatively estimate when facility development may be needed, aviation demand will dictate when facility improvements need to be delayed or accelerated.

The real value of a usable master plan is in keeping the issues and objectives in the minds of the managers and decision-makers so that they are better able to recognize change and its effect. In addition to adjustments in aviation demand, decisions made as to when to undertake the improvements recommended in this master plan will impact the period that the plan remains valid. The format used in this plan is intended to reduce the need for formal and costly updates by simply adjusting the timing. Updating can be done by the manager, thereby improving the plan's effectiveness.

In summary, the planning process requires the airport management to consistently monitor the progress of the airport in terms of aircraft operations and based aircraft. Analysis of aircraft demand is critical to the timing and need for new airport facilities.

The information obtained from continually monitoring airport activity will provide the data necessary to determine if the development schedule should be accelerated or decelerated.

PhxMesa Gateway Airport

Appendix A

GLOSSARY OF TERMS

Glossary of Terms

A

ABOVE GROUND LEVEL: The elevation of a point or surface above the ground.

ACCELERATE-STOP DISTANCE AVAILABLE (ASDA): See declared distances.

ADVISORY CIRCULAR: External publications issued by the FAA consisting of nonregulatory material providing for the recommendations relative to a policy, guidance and information relative to a specific aviation subject.

AIR CARRIER: An operator which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week, and places between which such flights are performed; or (2) transports mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

AIRCRAFT: A transportation vehicle that is used or intended for use for flight.

AIRCRAFT APPROACH CATEGORY: A grouping of aircraft based on 1.3 times the stall speed in their landing configuration at their maximum certificated landing weight. The categories are as follows:

- Category A: Speed less than 91 knots.
- Category B: Speed 91 knots or more, but less than 121 knots.
- Category C: Speed 121 knots or more, but less than 141 knots.
- Category D: Speed 141 knots or more, but less than 166 knots.
- Category E: Speed greater than 166 knots.

AIRCRAFT OPERATION: The landing, takeoff, or touch-and-go procedure by an aircraft on a runway at an airport.

AIRCRAFT OPERATIONS AREA (AOA): A restricted and secure area on the airport property designed to protect all aspects related to aircraft operations.

AIRCRAFT OWNERS AND PILOTS ASSOCIATION: A private organization serving the interests and needs of general aviation pilots and aircraft owners.

AIRCRAFT RESCUE AND FIRE FIGHTING: A facility located at an airport that provides emergency vehicles, extinguishing agents, and personnel responsible for minimizing the impacts of an aircraft accident or incident.

AIRFIELD: The portion of an airport which contains the facilities necessary for the operation of aircraft.

AIRLINE HUB: An airport at which an airline concentrates a significant portion of its activity and which often has a significant amount of connecting traffic.

AIRPLANE DESIGN GROUP (ADG): A grouping of aircraft based upon wingspan. The groups are as follows:

- Group I: Up to but not including 49 feet.
- Group II: 49 feet up to but not including 79 feet.
- Group III: 79 feet up to but not including 118 feet.
- Group IV: 118 feet up to but not including 171 feet.
- Group V: 171 feet up to but not including 214 feet.
- Group VI: 214 feet or greater.

AIRPORT AUTHORITY: A quasi-governmental public organization responsible for setting the policies governing the management and operation of an airport or system of airports under its jurisdiction.

AIRPORT BEACON: A navigational aid located at an airport which displays a rotating light beam to identify whether an airport is lighted.

AIRPORT CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

AIRPORT ELEVATION: The highest point on the runway system at an airport expressed in feet above mean sea level (MSL).

AIRPORT IMPROVEMENT PROGRAM: A program authorized by the Airport and Airway Improvement Act of 1982 that provides funding for airport planning and development.

AIRPORT LAYOUT DRAWING (ALD): The drawing of the airport showing the layout of existing and proposed airport facilities.

AIRPORT LAYOUT PLAN (ALP): A scaled drawing of the existing and planned land and facilities necessary for the operation and development of the airport.

AIRPORT LAYOUT PLAN DRAWING SET: A set of technical drawings depicting the current and future airport conditions. The individual sheets comprising the set can vary with the complexities of the airport, but the FAA-required drawings include the Airport Layout Plan (sometimes referred to as the Airport Layout Drawing (ALD), the Airport Airspace Drawing, and the Inner Portion of the Approach Surface Drawing, On-Airport Land Use Drawing, and Property Map.

AIRPORT MASTER PLAN: The planner's concept of the long-term development of an airport.

AIRPORT MOVEMENT AREA SAFETY SYSTEM: A system that provides automated alerts and warnings of potential runway incursions or other hazardous aircraft movement events.

AIRPORT OBSTRUCTION CHART: A scaled drawing depicting the Federal Aviation Regulation (FAR) Part 77 surfaces, a representation of objects that penetrate these surfaces, runway, taxiway, and ramp areas, navigational aids, buildings, roads and other detail in the vicinity of an airport.

AIRPORT REFERENCE CODE (ARC): A coding system used to relate airport design criteria to the operational (Aircraft Approach Category) to the physical characteristics (Airplane Design Group) of the airplanes intended to operate at the airport.

AIRPORT REFERENCE POINT (ARP): The latitude and longitude of the approximate center of the airport.

AIRPORT SPONSOR: The entity that is legally responsible for the management and operation of an airport, including the fulfillment of the requirements of laws and regulations related thereto.

AIRPORT SURFACE DETECTION EQUIPMENT: A radar system that provides air traffic controllers with a visual representation of the movement of aircraft and other vehicles on the ground on the airfield at an airport.

AIRPORT SURVEILLANCE RADAR: The primary radar located at an airport or in an air traffic control terminal area that receives a signal at an antenna and transmits the signal to air traffic control display equipment defining the location of aircraft in the air. The signal provides only the azimuth and range of aircraft from the location of the antenna.

AIRPORT TRAFFIC CONTROL TOWER (ATCT): A central operations facility in the terminal air traffic control system, consisting of a tower, including an associated instrument flight rule (IFR) room if radar equipped, using air/ground communications and/or radar, visual signaling and other devices to provide safe and expeditious movement of terminal air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER: A facility which provides en route air traffic control service to aircraft operating on an IFR flight plan within controlled airspace over a large, multi-state region.

AIRSIDE: The portion of an airport that contains the facilities necessary for the operation of aircraft.

AIRSPACE: The volume of space above the surface of the ground that is provided for the operation of aircraft.

AIR TAXI: An air carrier certificated in accordance with FAR Part 121 and FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

AIR TRAFFIC CONTROL: A service operated by an appropriate organization for the purpose of providing for the safe, orderly, and expeditious flow of air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC): A facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the en route phase of flight.

AIR TRAFFIC CONTROL SYSTEM COMMAND CENTER: A facility operated by the FAA which is responsible for the central flow control, the central altitude reservation system, the airport reservation position system, and the air traffic service contingency command for the air traffic control system.

AIR TRAFFIC HUB: A categorization of commercial service airports or group of commercial service airports in a metropolitan or urban area based upon the proportion of annual national enplanements existing at the airport or airports. The categories are large hub, medium hub, small hub, or non-hub. It forms the basis for the apportionment of entitlement funds.

AIR TRANSPORT ASSOCIATION OF AMERICA: An organization consisting of the principal U.S. airlines that represents the interests of the airline industry on major aviation issues before federal, state, and local government bodies. It promotes air transportation safety by coordinating industry and governmental safety programs and it serves as a focal point for industry efforts to standardize practices and enhance the efficiency of the air transportation system.

ALERT AREA: See special-use airspace.

ALTITUDE: The vertical distance measured in feet above mean sea level.

ANNUAL INSTRUMENT APPROACH (AIA): An approach to an airport with the intent to land by an aircraft in accordance with an IFR flight plan when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude.

APPROACH LIGHTING SYSTEM (ALS): An airport lighting facility which provides visual guidance to landing aircraft by radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his final approach and landing.

APPROACH MINIMUMS: The altitude below which an aircraft may not descend while on an IFR approach unless the pilot has the runway in sight.

APPROACH SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 which is longitudinally centered on an extended runway centerline and extends outward and upward from the primary surface at each end of a runway at a designated slope and distance based upon the type of available or planned approach by aircraft to a runway.

APRON: A specified portion of the airfield used for passenger, cargo or freight loading and unloading, aircraft parking, and the refueling, maintenance and servicing of aircraft.

AREA NAVIGATION: The air navigation procedure that provides the capability to establish and maintain a flight path on an arbitrary course that remains within the coverage area of navigational sources being used.

AUTOMATED TERMINAL INFORMATION SERVICE (ATIS): The continuous broadcast of recorded non-control information at towered airports. Information typically includes wind speed, direction, and runway in use.

AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS): A reporting system that provides frequent airport ground surface weather observation data through digitized voice broadcasts and printed reports.

AUTOMATED WEATHER OBSERVATION STATION (AWOS): Equipment used to automatically record weather conditions (i.e. cloud height, visibility, wind speed and direction, temperature, dew point, etc.)

AUTOMATIC DIRECTION FINDER (ADF): An aircraft radio navigation system which senses and indicates the direction to a non-directional radio beacon (NDB) ground transmitter.

AVIGATION EASEMENT: A contractual right or a property interest in land over which a right of unobstructed flight in the airspace is established.

AZIMUTH: Horizontal direction expressed as the angular distance between true north and the direction of a fixed point (as the observer's heading).

B

BASE LEG: A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. See "traffic pattern."

BASED AIRCRAFT: The general aviation aircraft that use a specific airport as a home base.

BEARING: The horizontal direction to or from any point, usually measured clockwise from true north or magnetic north.

BLAST FENCE: A barrier used to divert or dissipate jet blast or propeller wash.

BLAST PAD: A prepared surface adjacent to the end of a runway for the purpose of eliminating the erosion of the ground surface by the wind forces produced by airplanes at the initiation of takeoff operations.

BUILDING RESTRICTION LINE (BRL): A line which identifies suitable building area locations on the airport.

C

CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute Airport Improvement Program funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

CARGO SERVICE AIRPORT: An airport served by aircraft providing air transportation of property only, including mail, with an annual aggregate landed weight of at least 100,000,000 pounds.

CATEGORY I: An Instrument Landing System (ILS) that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 100 feet above the horizontal plane containing the runway threshold.

CATEGORY II: An ILS that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 50 feet above the horizontal plane containing the runway threshold.

CATEGORY III: An ILS that provides acceptable guidance information to a pilot from the coverage limits of the ILS with no decision height specified above the horizontal plane containing the runway threshold.

CEILING: The height above the ground surface to the location of the lowest layer of clouds which is reported as either broken or overcast.

CIRCLING APPROACH: A maneuver initiated by the pilot to align the aircraft with the runway for landing when flying a predetermined circling instrument approach under IFR.

CLASS A AIRSPACE: See Controlled Airspace.

CLASS B AIRSPACE: See Controlled Airspace.

CLASS C AIRSPACE: See Controlled Airspace.

CLASS D AIRSPACE: See Controlled Airspace.

CLASS E AIRSPACE: See Controlled Airspace.

CLASS G AIRSPACE: See Controlled Airspace.

CLEAR ZONE: See Runway Protection Zone.

COMMERCIAL SERVICE AIRPORT: A public airport providing scheduled passenger service that enplanes at least 2,500 annual passengers.

COMMON TRAFFIC ADVISORY FREQUENCY: A radio frequency identified in the appropriate aeronautical chart which is designated for the purpose of transmitting airport advisory information and procedures while operating to or from an uncontrolled airport.

COMPASS LOCATOR (LOM): A low power, low/medium frequency radio-beacon installed in conjunction with the instrument landing system at one or two of the marker sites.

CONICAL SURFACE: An imaginary obstruction- limiting surface defined in FAR Part 77 that extends from the edge of the horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

CONTROLLED AIRPORT: An airport that has an operating airport traffic control tower.

CONTROLLED AIRSPACE: Airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows:

- **CLASS A**: Generally, the airspace from 18,000 feet mean sea level (MSL) up to but not including flight level FL600. All persons must operate their aircraft under IFR.

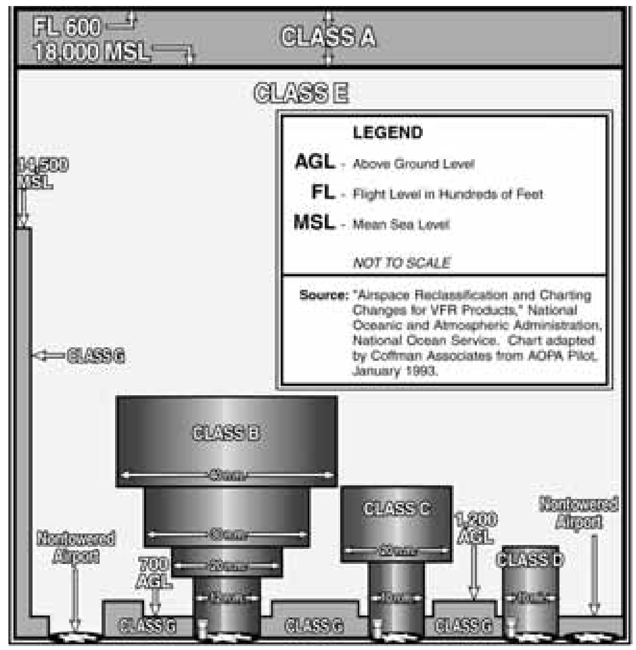
- **CLASS B**: Generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of air space and is designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.

- **CLASS C**: Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical mile (nm) radius and an outer area with a 10 nautical mile radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.

- **CLASS D**: Generally, that airspace from the surface to 2,500 feet above the air port elevation (charted as MSL) surrounding those airports that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach procedure . Unless otherwise authorized, all persons must establish two-way radio communication.

- **CLASS E**: Generally, controlled airspace that is not classified as Class A, B, C, or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communication with air traffic control.

- **CLASS G**: Generally, that airspace not classified as Class A, B, C, D, or E. Class G airspace is uncontrolled for all aircraft. Class G airspace extends from the surface to the overlying Class E airspace.



CONTROLLED FIRING AREA: See special-use airspace.

CROSSWIND: A wind that is not parallel to a runway centerline or to the intended flight path of an aircraft.

CROSSWIND COMPONENT: The component of wind that is at a right angle to the runway centerline or the intended flight path of an aircraft.

CROSSWIND LEG: A flight path at right angles to the landing runway off its upwind end. See "traffic pattern."

D

DECIBEL: A unit of noise representing a level relative to a reference of a sound pressure 20 micro newtons per square meter.

DECISION HEIGHT: The height above the end of the runway surface at which a decision must be made by a pilot during the ILS or Precision Approach Radar approach to either continue the approach or to execute a missed approach.

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DECLARED DISTANCES: The distances declared available for the airplane's takeoff runway, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are:

- **TAKEOFF RUNWAY AVAILABLE (TORA)**: The runway length declared available and suitable for the ground run of an airplane taking off.

- **TAKEOFF DISTANCE AVAILABLE (TODA)**: The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA.

- **ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)**: The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff.

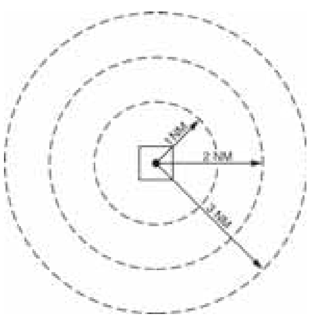
- **LANDING DISTANCE AVAILABLE (LDA)**: The runway length declared available and suitable for landing.

DEPARTMENT OF TRANSPORTATION: The cabinet level federal government organization consisting of modal operating agencies, such as the Federal Aviation Administration, which was established to promote the coordination of federal transportation programs and to act as a focal point for research and development efforts in transportation.

DISCRETIONARY FUNDS: Federal grant funds that may be appropriated to an airport based upon designation by the Secretary of Transportation or Congress to meet a specified national priority such as enhancing capacity, safety, and security, or mitigating noise.

DISPLACED THRESHOLD: A threshold that is located at a point on the runway other than the designated beginning of the runway.

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.



DNL: The 24-hour average sound level, in Aweighted decibels, obtained after the addition of ten decibels to sound levels for the periods between 10 p.m. and 7 a.m. as averaged over a span of one year. It is the FAA standard metric for determining the cumulative exposure of individuals to noise.

DOWNWIND LEG: A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg.
Also see "traffic pattern."

E

EASEMENT: The legal right of one party to use a portion of the total rights in real estate owned by another party. This may include the right of passage over, on, or below the property; certain air rights above the property, including view rights; and the rights to any specified form of development or activity, as well as any other legal rights in the property that may be specified in the easement document.

ELEVATION: The vertical distance measured in feet above mean sea level.

ENPLANED PASSENGERS: The total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and nonscheduled services.

ENPLANEMENT: The boarding of a passenger, cargo, freight, or mail on an aircraft at an airport.

ENTITLEMENT: Federal funds for which a commercial service airport may be eligible based upon its annual passenger enplanements.

ENVIRONMENTAL ASSESSMENT (EA): An environmental analysis performed pursuant to the National Environmental Policy Act to determine whether an action would significantly affect the environment and thus require a more detailed environmental impact statement.

ENVIRONMENTAL AUDIT: An assessment of the current status of a party's compliance with applicable environmental requirements of a party's environmental compliance policies, practices, and controls.

ENVIRONMENTAL IMPACT STATEMENT (EIS): A document required of federal agencies by the National Environmental Policy Act for major projects are legislative proposals affecting the environment. It is a tool for decision-making describing the positive and negative effects of a proposed action and citing alternative actions.

ESSENTIAL AIR SERVICE: A federal program which guarantees air carrier service to selected small cities by providing subsidies as needed to prevent these cities from such service.

F

FEDERAL AVIATION REGULATIONS: The general and permanent rules established by the executive departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are the aviation subset of the Code of Federal Regulations.

FEDERAL INSPECTION SERVICES: The provision of customs and immigration services including passport inspection, inspection of baggage, the collection of duties on certain imported items, and the inspections for agricultural products, illegal drugs, or other restricted items.

FINAL APPROACH: A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. See "traffic pattern."

FINAL APPROACH FIX: The designated point at which the final approach segment for an aircraft landing on a runway begins for a non-precision approach.

FINDING OF NO SIGNIFICANT IMPACT (FONSI): A public document prepared by a Federal agency that presents the rationale why a proposed action will not have a significant effect on the environment and for which an environmental impact statement will not be prepared.

FIXED BASE OPERATOR (FBO): A provider of services to users of an airport. Such services include, but are not limited to, hangaring, fueling, flight training, repair, and maintenance.

FLIGHT LEVEL: A designation for altitude within controlled airspace.

FLIGHT SERVICE STATION: An operations facility in the national flight advisory system which utilizes data interchange facilities for the collection and dissemination of Notices to Airmen, weather, and administrative data and which provides pre-flight and in-flight advisory services to pilots through air and ground based communication facilities.

FRANGIBLE NAVAID: A navigational aid which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.

G

GENERAL AVIATION: That portion of civil aviation which encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity, and large aircraft commercial operators.

GENERAL AVIATION AIRPORT: An airport that provides air service to only general aviation.

GLIDESLOPE (GS): Provides vertical guidance for aircraft during approach and landing. The glideslope consists of the following:

1. Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or

2. Visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.

GLOBAL POSITIONING SYSTEM (GPS): A system of 24 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude.

GROUND ACCESS: The transportation system on and around the airport that provides access to and from the airport by ground transportation vehicles for passengers, employees, cargo, freight, and airport services.

H

HELIPAD: A designated area for the takeoff, landing, and parking of helicopters.

HIGH INTENSITY RUNWAY LIGHTS: The highest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

HIGH-SPEED EXIT TAXIWAY: A long radius taxiway designed to expedite aircraft turning off the runway after landing (at speeds to 60 knots), thus reducing runway occupancy time.

HORIZONTAL SURFACE: An imaginary obstruction- limiting surface defined in FAR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.

I

INITIAL APPROACH FIX: The designated point at which the initial approach segment begins for an instrument approach to a runway.

INSTRUMENT APPROACH PROCEDURE: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR): Procedures for the conduct of flight in weather conditions below Visual Flight Rules weather minimums. The term IFR is often also used to define weather conditions and the type of flight plan under which an aircraft is operating.

INSTRUMENT LANDING SYSTEM (ILS): A precision instrument approach system which normally consists of the following electronic components and visual aids:

1. Localizer.
2. Glide Slope.
3. Outer Marker.
4. Middle Marker.
5. Approach Lights.

INSTRUMENT METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions that are less than the minimums specified for visual meteorological conditions.

ITINERANT OPERATIONS: Operations by aircraft that are not based at a specified airport.

K

KNOTS: A unit of speed length used in navigation that is equivalent to the number of nautical miles traveled in one hour.

L

LANDSIDE: The portion of an airport that provides the facilities necessary for the processing of passengers, cargo, freight, and ground transportation vehicles.

LANDING DISTANCE AVAILABLE (LDA): See declared distances.

LARGE AIRPLANE: An airplane that has a maximum certified takeoff weight in excess of 12,500 pounds.

LOCAL AREA AUGMENTATION SYSTEM: A differential GPS system that provides localized measurement correction signals to the basic GPS signals to improve navigational accuracy integrity, continuity, and availability.

LOCAL OPERATIONS: Aircraft operations performed by aircraft that are based at the airport and that operate in the local traffic pattern or within sight of the airport, that are known to be departing for or arriving from flights in local practice areas within a prescribed distance from the airport, or that execute simulated instrument approaches at the airport.

LOCAL TRAFFIC: Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument approach procedures. Typically, this includes touch and-go training operations.

LOCALIZER: The component of an ILS which provides course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA): A facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.

LONG RANGE NAVIGATION SYSTEM (LORAN): Long range navigation is an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for en route navigation.

LOW INTENSITY RUNWAY LIGHTS: The lowest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

M

MEDIUM INTENSITY RUNWAY LIGHTS: The middle classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

MICROWAVE LANDING SYSTEM (MLS): An instrument approach and landing system that provides precision guidance in azimuth, elevation, and distance measurement.

MILITARY OPERATIONS: Aircraft operations that are performed in military aircraft.

MILITARY OPERATIONS AREA (MOA): See special-use airspace

MILITARY TRAINING ROUTE: An air route depicted on aeronautical charts for the conduct of military flight training at speeds above 250 knots.

MISSED APPROACH COURSE (MAC): The flight route to be followed if, after an instrument approach, a landing is not affected, and occurring normally:

1. When the aircraft has descended to the decision height and has not established visual contact; or
2. When directed by air traffic control to pull up or to go around again.

MOVEMENT AREA: The runways, taxiways, and other areas of an airport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports with a tower, air traffic control clearance is required for entry onto the movement area.

N

NATIONAL AIRSPACE SYSTEM: The network of air traffic control facilities, air traffic control areas, and navigational facilities through the U.S.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS: The national airport system plan developed by the Secretary of Transportation on a biannual basis for the development of public use airports to meet national air transportation needs.

NATIONAL TRANSPORTATION SAFETY BOARD: A federal government organization established to investigate and determine the probable cause of transportation accidents, to recommend equipment and procedures to enhance transportation safety, and to review on appeal the suspension or revocation of any certificates or licenses issued by the Secretary of Transportation.

NAUTICAL MILE: A unit of length used in navigation which is equivalent to the distance spanned by one minute of arc in latitude, that is, 1,852 meters or 6,076 feet. It is equivalent to approximately 1.15 statute mile.

NAVAID: A term used to describe any electrical or visual air navigational aids, lights, signs, and associated supporting equipment (i.e. PAPI, VASI, ILS, etc.)

NAVIGATIONAL AID: A facility used as, available for use as, or designed for use as an aid to air navigation.

NOISE CONTOUR: A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.

NON-DIRECTIONAL BEACON (NDB): A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his or her bearing to and from the radio beacon and home on, or track to, the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a Compass Locator.

NON-PRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB, or LOC.

NOTICE TO AIRMEN: A notice containing information concerning the establishment, condition, or change in any component of or hazard in the National Airspace System, the timely knowledge of which is considered essential to personnel concerned with flight operations.

O

OBJECT FREE AREA (OFA): An area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

OBSTACLE FREE ZONE (OFZ): The airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be kept clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance for aircraft landing or taking off from the runway, and for missed approaches.

ONE-ENGINE INOPERABLE SURFACE: A surface emanating from the runway end at a slope ratio of 62.5:1. Air carrier airports are required to maintain a technical drawing of this surface depicting any object penetrations by January 1, 2010.

OPERATION: The take-off, landing, or touch-and-go procedure by an aircraft on a runway at an airport.

OUTER MARKER (OM): An ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline, indicating to the pilot that he/she is passing over the facility and can begin final approach.

P

PILOT CONTROLLED LIGHTING: Runway lighting systems at an airport that are controlled by activating the microphone of a pilot on a specified radio frequency.

PRECISION APPROACH: A standard instrument approach procedure which provides runway alignment and glide slope (descent) information. It is categorized as follows:

- **CATEGORY I (CAT I)**: A precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than 1/2 mile or Runway Visual Range (RVR) 2400 (RVR 1800) with operative touchdown zone and runway centerline lights.

- **CATEGORY II (CAT II)**: A precision approach which provides for approaches with a decision height of not less than 100 feet and visibility not less than 1200 feet RVR.

- **CATEGORY III (CAT III)**: A precision approach which provides for approaches with minima less than Category II.

PRECISION APPROACH PATH INDICATOR (PAPI): A lighting system providing visual approach slope guidance to aircraft during a landing approach. It is similar to a VASI but provides a sharper transition between the colored indicator lights.

PRECISION APPROACH RADAR: A radar facility in the terminal air traffic control system used to detect and display with a high degree of accuracy the direction, range, and elevation of an aircraft on the final approach to a runway.

PRECISION OBJECT FREE AREA (POFA): An area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFA is a clearing standard which requires the POFA to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for frangible NAVAIDS). The POFA applies to all new authorized instrument approach procedures with less than 3/4 mile visibility.

PRIMARY AIRPORT: A commercial service airport that enplanes at least 10,000 annual passengers.

PRIMARY SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 that is specified as a rectangular surface longitudinally centered about a runway. The specific dimensions of this surface are a function of the types of approaches existing or planned for the runway.

PROHIBITED AREA: See special-use airspace.

PVC: Poor visibility and ceiling. Used in determining Annual Service Volume. PVC conditions exist when the cloud ceiling is less than 500 feet and visibility is less than one mile.

R

RADIAL: A navigational signal generated by a Very High Frequency Omni-directional Range or VORTAC station that is measured as an azimuth from the station.

REGRESSION ANALYSIS: A statistical technique that seeks to identify and quantify the relationships between factors associated with a forecast.

REMOTE COMMUNICATIONS OUTLET (RCO): An unstaffed transmitter receiver/facility remotely controlled by air traffic personnel. RCOs serve flight service stations (FSSs). RCOs were established to provide ground-to-ground communications between air traffic control specialists and pilots at satellite airports for delivering en route clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/landing times.

REMOTE TRANSMITTER/RECEIVER (RTR): See remote communications outlet. RTRs serve ARTCCs.

RELIEVER AIRPORT: An airport to serve general aviation aircraft which might otherwise use a congested air-carrier served airport.

RESTRICTED AREA: See special-use airspace.

RNAV: Area navigation - airborne equipment which permits flights over determined tracks within prescribed accuracy tolerances without the need to overfly ground-based navigation facilities. Used en route and for approaches to an airport.

RUNWAY: A defined rectangular area on an airport prepared for aircraft landing and takeoff. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees. For example, a runway with a magnetic heading of 180 would be designated Runway 18. The runway heading on the opposite end of the runway is 180 degrees from that runway end. For example, the opposite runway heading for Runway 18 would be Runway 36 (magnetic heading of 360). Aircraft can takeoff or land from either end of a runway, depending upon wind direction.

RUNWAY ALIGNMENT INDICATOR LIGHT: A series of high intensity sequentially flashing lights installed on the extended centerline of the runway usually in conjunction with an approach lighting system.

RUNWAY END IDENTIFIER LIGHTS (REIL): Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.

RUNWAY GRADIENT: The average slope, measured in percent, between the two ends of a runway.

RUNWAY PROTECTION ZONE (RPZ): An area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape. Its dimensions are determined by the aircraft approach speed and runway approach type and minima.

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 from the runway.

RUNWAY VISIBILITY ZONE (RVZ): An area on the airport to be kept clear of permanent objects so that there is an unobstructed line of- site from any point five feet above the runway centerline to any point five feet above an intersecting runway centerline.

RUNWAY VISUAL RANGE (RVR): An instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

S

SCOPE: The document that identifies and defines the tasks, emphasis, and level of effort associated with a project or study.

SEGMENTED CIRCLE: A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

SHOULDER: An area adjacent to the edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface; support for aircraft running off the pavement; enhanced drainage; and blast protection. The shoulder does not necessarily need to be paved.

SLANT-RANGE DISTANCE: The straight line distance between an aircraft and a point on the ground.

SMALL AIRPLANE: An airplane that has a maximum certified takeoff weight of up to 12,500 pounds.

SPECIAL-USE AIRSPACE: Airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Special-use airspace classifications include:

- **ALERT AREA**: Airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.

- **CONTROLLED FIRING AREA**: Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.

- **MILITARY OPERATIONS AREA (MOA)**: Designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.

- **PROHIBITED AREA**: Designated airspace within which the flight of aircraft is prohibited.

- **RESTRICTED AREA**: Airspace designated under Federal Aviation Regulation (FAR) 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.

- **WARNING AREA**: Airspace which may contain hazards to nonparticipating aircraft.

STANDARD INSTRUMENT DEPARTURE (SID): A preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.

STANDARD INSTRUMENT DEPARTURE PROCEDURES: A published standard flight procedure to be utilized following takeoff to provide a transition between the airport and the terminal area or en route airspace.

STANDARD TERMINAL ARRIVAL ROUTE (STAR): A preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.

STOP-AND-GO: A procedure wherein an aircraft will land, make a complete stop on the runway, and then commence a takeoff from that point. A stop-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

STOPWAY: An area beyond the end of a takeoff runway that is designed to support an aircraft during an aborted takeoff without causing structural damage to the aircraft. It is not to be used for takeoff, landing, or taxiing by aircraft.

STRAIGHT-IN LANDING/APPROACH: A landing made on a runway aligned within 30 degrees of the final approach course following completion of an instrument approach.

T

TACTICAL AIR NAVIGATION (TACAN): An ultrahigh frequency electronic air navigation system which provides suitably-equipped aircraft a continuous indication of bearing and distance to the TACAN station.

TAKEOFF RUNWAY AVAILABLE (TORA):
See declared distances.

TAKEOFF DISTANCE AVAILABLE (TODA):
See declared distances.

TAXILANE: The portion of the aircraft parking area used for access between taxiways and aircraft parking positions.

TAXIWAY: A defined path established for the taxiing of aircraft from one part of an airport to another.

TAXIWAY SAFETY AREA (TSA): A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

TERMINAL INSTRUMENT PROCEDURES: Published flight procedures for conducting instrument approaches to runways under instrument meteorological conditions.

TERMINAL RADAR APPROACH CONTROL: An element of the air traffic control system responsible for monitoring the en-route and terminal segment of air traffic in the airspace surrounding airports with moderate to high levels of air traffic.

TETRAHEDRON: A device used as a landing direction indicator. The small end of the tetrahedron points in the direction of landing.

THRESHOLD: The beginning of that portion of the runway available for landing. In some instances the landing threshold may be displaced.

TOUCH-AND-GO: An operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and go is recorded as two operations: one operation for the landing and one operation for the takeoff.

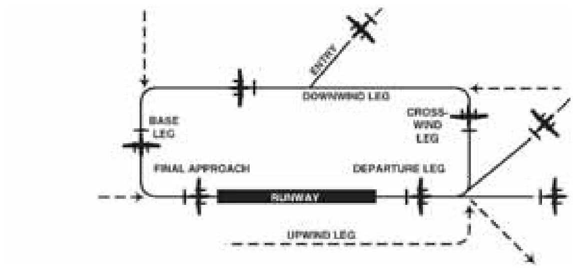
TOUCHDOWN: The point at which a landing aircraft makes contact with the runway surface.

TOUCHDOWN ZONE (TDZ): The first 3,000 feet of the runway beginning at the threshold.

TOUCHDOWN ZONE ELEVATION (TDZE): The highest elevation in the touchdown zone.

TOUCHDOWN ZONE (TDZ) LIGHTING: Two rows of transverse light bars located symmetrically about the runway centerline normally at 100- foot intervals. The basic system extends 3,000 feet along the runway.

TRAFFIC PATTERN: The traffic flow that is prescribed for aircraft landing at or taking off from an airport. The components of a typical traffic pattern are the upwind leg, crosswind leg, downwind leg, base leg, and final approach.



U

UNCONTROLLED AIRPORT: An airport without an air traffic control tower at which the control of Visual Flight Rules traffic is not exercised.

UNCONTROLLED AIRSPACE: Airspace within which aircraft are not subject to air traffic control.

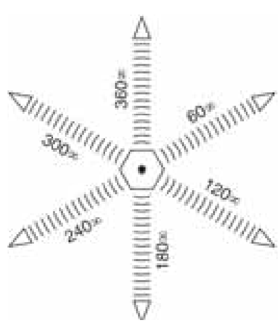
UNIVERSAL COMMUNICATION (UNICOM): A nongovernment communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOM's are shown on aeronautical charts and publications.

UPWIND LEG: A flight path parallel to the landing runway in the direction of landing. See "traffic pattern."

V

VECTOR: A heading issued to an aircraft to provide navigational guidance by radar.

VERY HIGH FREQUENCY/ OMNIDIRECTIONAL RANGE (VOR): A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the national airspace system. The VOR periodically identifies itself by Morse Code and may have an additional voice identification feature.



VERY HIGH FREQUENCY OMNI-DIRECTIONAL RANGE/ TACTICAL AIR NAVIGATION (VORTAC): A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.

VICTOR AIRWAY: A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.

VISUAL APPROACH: An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

VISUAL APPROACH SLOPE INDICATOR (VASI): An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that he is on path if he sees red/white, above path if white/white, and below path if red/red. Some airports serving large aircraft have three-bar VASI's which provide two visual guide paths to the same runway.

VISUAL FLIGHT RULES (VFR): Rules that govern the procedures for conducting flight under visual conditions. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

VISUAL METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.

VOR: See "Very High Frequency Omnidirectional Range Station."

VORTAC: See "Very High Frequency Omnidirectional Range Station/Tactical Air Navigation."

W

WARNING AREA: See special-use airspace.

WIDE AREA AUGMENTATION SYSTEM: An enhancement of the Global Positioning System that includes integrity broadcasts, differential corrections, and additional ranging signals for the purpose of providing the accuracy, integrity, availability, and continuity required to support all phases of flight.

AC: advisory circular

ADF: automatic direction finder

ADG: airplane design group

AFSS: automated flight service station

AGL: above ground level

AIA: annual instrument approach

AIP: Airport Improvement Program

AIR-21: Wendell H. Ford Aviation Investment and Reform Act for the 21st Century

ALS: approach lighting system

ALSF-1: standard 2,400-foot high intensity approach lighting system with sequenced flashers (CAT I configuration)

ALSF-2: standard 2,400-foot high intensity approach lighting system with sequenced flashers (CAT II configuration)

AOA: Aircraft Operation Area

APV: instrument approach procedure with vertical guidance

ARC: airport reference code

ARFF: aircraft rescue and fire fighting

ARP: airport reference point

ARTCC: air route traffic control center

ASDA: accelerate-stop distance available

ASR: airport surveillance radar

ASOS: automated surface observation station

ATCT: airport traffic control tower

ATIS: automated terminal information service

AVGAS: aviation gasoline - typically 100 low lead (100L)

AWOS: automated weather observation station

BRL: building restriction line

CFR: Code of Federal Regulation

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

DWL: runway weight bearing capacity of aircraft with dual-wheel type landing gear

DTWL: runway weight bearing capacity of aircraft with dual-tandem type landing gear

FAA: Federal Aviation Administration

FAR: Federal Aviation Regulation

FBO: fixed base operator

FY: fiscal year

GPS: global positioning system

GS: glide slope

HIRL: high intensity runway edge lighting

IFR: instrument flight rules (FAR Part 91)

ILS: instrument landing system

IM: inner marker

LDA: localizer type directional aid

LDA: landing distance available

LIRL: low intensity runway edge lighting

LMM: compass locator at ILS outer marker

LORAN: long range navigation

MALS: midium intensity approach lighting system with indicator lights

MIRL: medium intensity runway edge lighting

MITL: medium intensity taxiway edge lighting

MLS: microwave landing system

MM: middle marker

MOA: military operations area

MLS: mean sea level

NAVAID: navigational aid

NDB: nondirectional radio beacon

NM: nautical mile (6,076.1 feet)

NPES: National Pollutant Discharge Elimination System

NPIAS: National Plan of Integrated Airport Systems

NPRM: notice of proposed rule making

ODALS: omnidirectional approach lighting system

OFA: object free area

OFZ: obstacle free zone

OM: outer marker

PAC: planning advisory committee

PAPI: precision approach path indicator

PFC: porous friction course

PFC: passenger facility charge

PCL: pilot-controlled lighting

PIW public information workshop

PLASI: pulsating visual approach slope indicator

POFA: precision object free area

PVASI: pulsating/steady visual approach slope indicator

PVC: poor visibility and ceiling

RCO: remote communications outlet

REIL: runway end identifier lighting

RNAV: area navigation

RPZ: runway protection zone

RSA: runway safety area

RTR: remote transmitter/receiver

RVR: runway visibility range

RVZ: runway visibility zone

SALS: short approach lighting system

SASP: state aviation system plan

SEL: sound exposure level

SID: standard instrument departure

SM: statute mile (5,280 feet)

SRE: snow removal equipment

SSALF: simplified short approach lighting system with runway alignment indicator lights

STAR: standard terminal arrival route

SWL: runway weight bearing capacity for aircraft with single-wheel tandem type landing gear

TACAN: tactical air navigational aid

TDZ: touchdown zone

TDZE: touchdown zone elevation

TAF: Federal Aviation Administration (FAA) Terminal Area Forecast

TODA: takeoff distance available

TORA: takeoff runway available

TRACON: terminal radar approach control

VASI: visual approach slope indicator

VFR: visual flight rules (FAR Part 91)

VHF: very high frequency

VOR: very high frequency omni-directional range

VORTAC: VOR and TACAN collocated

PhxMesa Gateway Airport

Appendix B

AIRPORT PLANS

As part of this master plan, the FAA requires the development of several computer drawings detailing specific parts of the airport and its environs. These drawings were created on a computer-aided drafting system (CAD) and serve as the official depiction of the current and planned condition of the airport. These drawings will be delivered to the FAA for their review and inspection. The FAA will critique the drawings from a technical perspective to be sure all applicable federal regulations are met. The FAA will use the CAD drawings as the basis and justification for funding decisions.

It should be noted that the FAA requires that any changes to the airfield (i.e., runway and taxiway system, etc.) be represented on the drawings. The landside configuration, developed during this master planning process, is also depicted on the drawings but the FAA recognized that landside development is much more fluid and dependent upon developer needs. Thus, an updated drawing set is not necessary for future landside alterations.

The following is a description of the CAD drawings included with this master plan.

AIRPORT LAYOUT PLAN

An official Airport Layout Plan (ALP) drawing has been developed for Phoenix-Mesa Gateway Airport, a draft of which is included in this appendix. The ALP drawing graphically presents the existing and ultimate airport layout plan. The ALP drawing will include such elements as the physical airport features, wind data tabulation, location of airfield facilities (i.e., runways, taxiways, navigational aids), and existing general aviation development (and commercial development for air carrier airports). Also presented on the ALP are the runway safety areas, airport property boundary, and revenue support areas. The ALP is used by FAA to determine funding eligibility for future capital projects.

The computerized plan provides detailed information on existing and future facility layouts on multiple layers that permit the user to focus on any section of the airport at a desired scale. The plan can be used as base information for design and can be easily updated in the future to reflect new development and more detail concerning existing conditions as made available through design surveys.

AIRSPACE DRAWING

Federal Aviation Regulation (F.A.R.) Part 77, *Objects Affecting Navigable Airspace*, was established for use by local authorities to control the height of objects near airports. The Part 77 Airspace Drawing included in this master plan is a graphic depiction of this regulatory criterion. The Part 77 Airspace Drawing is a tool to aid local authorities in determining if proposed development could present a hazard to aircraft using the airport. The Airspace Drawing can be a critical tool for the airport sponsor's use in planning against future development limitations.

The Williams Gateway Airport Authority should do all in its power to ensure development stays below the Part 77 surfaces to protect the future role of the airport. The following discussion will describe those approach surfaces that make up the recommended F.A.R. Part 77 operations at Phoenix-Mesa Gateway Airport.

The Part 77 Airspace Drawing assigns three-dimensional imaginary areas to each runway. These imaginary surfaces emanate from the runway centerline and are dimensioned according to the visibility minimums associated with the approach to the runway end and size of aircraft to operate on the runway. The Part 77 imaginary surfaces include the primary surface, approach surface, transitional surface, horizontal surface, and conical surface. Part 77 imaginary surfaces are described as follows.

Primary Surface

The primary surface is an imaginary surface longitudinally centered on the runway. The primary surface extends 200 feet beyond each runway end. The elevation of any point on the primary surface is the same as the elevation along the nearest associated point on the runway centerline. Under Part 77 regulations, the primary surface for all runways is 1,000 feet wide.

Approach Surface

An approach surface is also established for each runway. The approach surface begins at the same width as the primary surface and extends upward and outward from the primary surface end and is centered along an extended runway centerline. The approach surface leading to each runway is based upon the type of approach available (instrument or visual) or planned. The inner edge of the approach surface is the same width as the primary surface and it expands uniformly.

The approach surface to Runway 30C, as defined by the presence of the Instrument Landing System (ILS), is 10,000 feet long rising at a 50:1 slope with an additional 40,000 feet at a 40:1 slope. The width of this approach surface is 16,000 feet.

The approach surface to runway ends 12C, 12R, and 30L is 10,000 feet long, rising at a 34:1 slope to an ultimate width of 3,500 feet. This approach surface is dictated by the presence of instrument approach procedures to these runway ends with not lower than ¾-mile visibility minimums.

As a visual approach runway, Runway 12L-30R has an approach surface that extends to a width of 1,500 feet at a 20:1 ratio to a distance of 5,000 feet.

Transitional Surface

Each runway has a transitional surface that begins at the outside edge of the primary surface at the same elevation as the runway. The transitional surface also connects with the approach surfaces of each runway. The surface rises at a slope of 7 to 1, up to a height 150 feet above the highest runway elevation. At that point, the transitional surface is replaced by the horizontal surface.

Horizontal Surface

The horizontal surface is established at 150 feet above the highest elevation of the runway surface. Having no slope, the horizontal surface connects the transitional and approach surfaces to the conical surface at a distance of 10,000 feet from the end of the primary surfaces of each runway.

Conical Surface

The conical surface begins at the outer edge of the horizontal surface. The conical surface then continues for an additional 4,000 feet horizontally at a slope of 20 to 1. Therefore, at 4,000 feet from the horizontal surface, the elevation of the conical surface is 350 feet above the highest airport elevation.

DEPARTURE SURFACE

For commercial service runways, such as those at Phoenix-Mesa Gateway Airport, the departure surface drawing is a required element of the ALP set. The departure service, also called the one engine inoperable (OEI) obstacle identification surface (OIS) is a surface emanating from the departure end of the runway to a distance of 10,200 feet. The inner width is 1,000 feet and the outer width is 6,466 feet. The OEI surface emanates from the runway end at a 62.5:1 ratio. On January 1, 2010, the FAA requires that the airport have this drawing completed. The departure surface information should be made available to any commercial operator at the airport.

RUNWAY PROFILE DRAWING

The runway profile drawing presents the entirety of the F.A.R. Part 77 approach surface to each runway end. It also depicts the runway centerline profile with elevations. This drawing provides profile detail that the Airspace Drawing does not. There is a separate drawing for each runway.

INNER APPROACH SURFACE DRAWINGS

The Inner Portion of the Approach Surface Plan is a scaled drawing of the runway protection zone (RPZ), the runway safety area (RSA), the obstacle free zone (OFZ), and the object free area (OFA) for each runway end. A plan and profile view of each RPZ is provided to facilitate identification of obstructions that lie within these safety areas. Detailed obstruction and facility data is provided to identify planned improvements and the disposition of obstructions. A drawing of each runway end is provided.

TERMINAL AREA DRAWING

The terminal area drawing is a larger scale plan view drawing of existing and planned aprons, buildings, hangars, parking lots, and other landside facilities. It is prepared in accordance with FAA AC 150/5300-13, *Airport Design*.

GENERAL AVIATION AREA PLANS

The general aviation drawing is a larger scale plan view drawing of those areas typically considered for general aviation use. It includes existing and ultimate aprons, buildings, hangars, parking lots, and other landside facilities. The drawing is prepared in accordance with FAA AC 150/5300-13, *Airport Design*.

AIRPORT LAND USE DRAWING

The objective of the Airport Land Use Drawing is to coordinate uses of the airport property in a manner compatible with the functional design of the airport facility. Airport land use planning is important for orderly development and efficient use of available space. There are two primary considerations for airport land use planning. These are to secure those areas essential to the safe and efficient operation of the airport and to determine compatible land uses for the balance of the property which would be most advantageous to the airport and community.

In the development of an airport land use plan for Phoenix-Mesa Gateway Airport, the airport property was broken into several large general tracts. Each tract was analyzed for specific site characteristics such as: tract size and shape, land characteristics, and existing land uses. The availability of utilities and the accessibility to various transportation modes were also considered. Limitations and constraints to development such as height and noise restrictions, runway visibility zones, and contiguous land uses were analyzed next. Finally, the compatibility of various land uses in each tract was analyzed.

AIRPORT PROPERTY MAP

The Property Map provides information on the acquisition and identification of all land tracts under control of the airport. Easement interests in areas outside the fee property line are also included. The primary purpose of the drawing is to provide information for analyzing the current and future aeronautical use of land acquired with federal funds.

DRAFT ALP DISCLAIMER

The Airport Layout Plan (ALP) set has been developed in accordance with accepted Federal Aviation Administration (FAA) and Arizona Department of Transportation – Aeronautics Division (ADOT) standards. The ALP set has not been approved by the FAA and is subject to FAA airspace review. Land use and other changes may result. A sampling of the major drawings is provided in this draft document.

AIRPORT LAYOUT PLANS
FOR
PHOENIX-MESA GATEWAY AIRPORT
MESA, ARIZONA

Prepared for

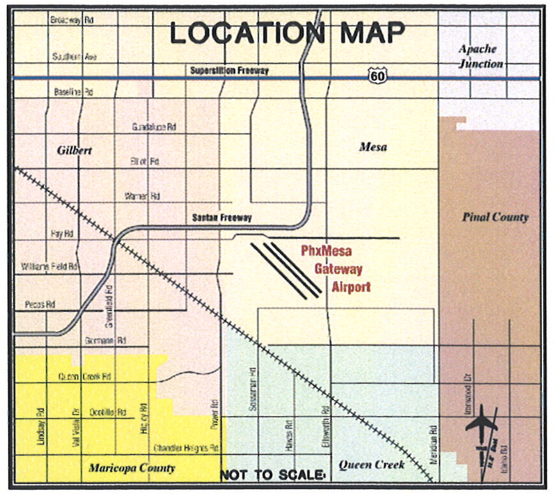
WILLIAMS GATEWAY AIRPORT AUTHORITY

PhxMesa **Gateway** Airport

INDEX OF DRAWINGS

Coffman Associates
Airport Consultants
www.coffmanassociates.com
February 2009

Coffman Associates-LDJ IWA_mp & alp-sh10_cover.dwg Friday February 13 2009 9:40am



AIRPORT DATA

OWNER: Williams Gateway Airport Authority	AIRPORT NPIAS CODE: RL/CS (Ultimate)
CITY: Mesa, Arizona	COUNTY: Maricopa, Arizona
RANGE: 6 East TOWNSHIP: 10/11 North	CIVIL TOWNSHIP: N/A

PHOENIX-MESA GATEWAY AIRPORT (IWA)		EXISTING	ULTIMATE
AIRPORT SERVICE LEVEL		Commercial Service	Commercial Service
AIRPORT REFERENCE CODE		D-V	D-V
DESIGN AIRCRAFT		Boeing 747-400	Boeing 747-400
AIRPORT ELEVATION		1383.5' MSL	1383.5' MSL
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		108.4° F (July)	108.4° F (July)
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	Latitude	33° 18' 28.200" N	33° 18' 28.650" N
	Longitude	111° 39' 19.700" W	111° 39' 20.970" W
AIRPORT INSTRUMENT APPROACHES		HI-ILS (30C) Cat I-ILS (30C) HI-VOR/DME (30C) VOR or TACAN (30C)	HI-ILS (30C) Cat I-ILS (30C) HI-VOR/DME (30C) VOR or TACAN (30C) Cat I-ILS (12C)
AIRPORT and TERMINAL NAVIGATIONAL AIDS		ATCT, ASR-8 Rotating Beacon Localizer/GS	ATCT Rotating Beacon Localizer/GS
GPS Approach		12C-30C 12R-30L	12L-30R 12C-30C 12R-30L

RUNWAY END COORDINATES (NAD 83)

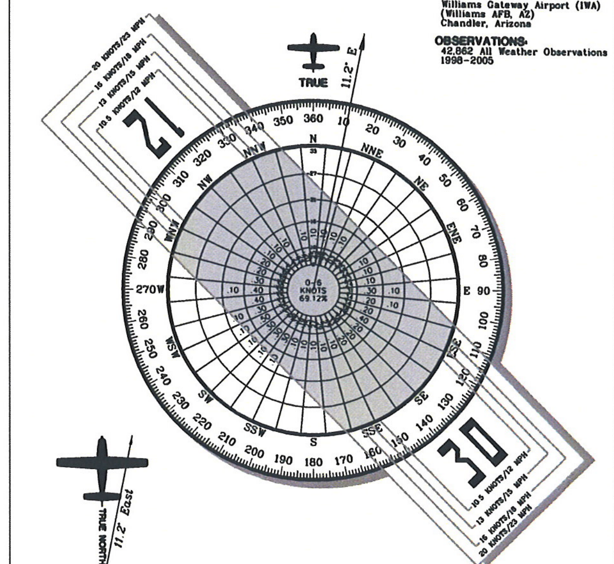
MAPPING 07	AIRPORT 5010 / ASIS / AIRNAV			EXISTING	ULTIMATE
LP EL 1356.0 TDZE-1365.1	Runway 12L EL. 1354.5	TDZE 1363.7	Latitude Longitude	33° 19' 03.320" N 111° 39' 40.730" W	33° 19' 10.388" N 111° 39' 48.978" W
TDZE-RW 30/ HP EL 1383.5	Runway 30R EL. 1382.2	TDZE 1382.2	Latitude Longitude	33° 17' 57.610" N 111° 38' 24.020" W	33° 17' 57.610" N 111° 38' 24.020" W
LP EL 1347.8 TDZE-1358.3	Runway 12C EL. 1347.6	TDZE 1358.1	Latitude Longitude	33° 19' 03.400" N 111° 39' 57.320" W	33° 19' 03.400" N 111° 39' 57.320" W
TDZE-RW 30/ HP EL 1380.4	Runway 30C EL. 1379.9	TDZE 1379.9	Latitude Longitude	33° 17' 51.330" N 111° 38' 33.190" W	33° 17' 51.330" N 111° 38' 33.190" W
LP EL 1340.2 TDZE-1348.6	Runway 12R EL. 1340.2	TDZE 1348.6	Latitude Longitude	33° 19' 03.610" N 111° 40' 22.320" W	33° 19' 09.442" N 111° 40' 29.130" W
TDZE-RW 30/ HP EL 1373.6	Runway 30L EL. 1373.4	TDZE 1376.4	Latitude Longitude	33° 17' 50.140" N 111° 38' 56.540" W	33° 17' 41.127" N 111° 38' 46.014" W

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots 12 MPH	13 Knots 15 MPH	16 Knots 18 MPH	20 Knots 23 MPH
Runway 12-30	*96.22%*	*97.88%*	*99.61%*	*99.82%*

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Williams Gateway Airport (IWA)
(Williams AFB, AZ)
Chandler, Arizona

OBSERVATIONS:
42,862 All Weather Observations
1998-2005



Magnetic Declination 11° 12' East (2007)
Annual Rate of Change 6' West (2007)

RUNWAY DATA

RUNWAY DATA	Runway 12L-30R EXISTING	Runway 12L-30R ULTIMATE	Runway 12C-30C EXISTING	Runway 12C-30C ULTIMATE	Runway 12R-30L EXISTING	Runway 12R-30L ULTIMATE
RUNWAY CATEGORY	Commercial Service	Commercial Service	Commercial Service	Commercial Service	Commercial Service	Commercial Service
AIRCRAFT APPROACH CATEGORY-DESIGN GROUP	D-V	D-V	D-V	D-V	D-V	D-V
DESIGN CRITICAL AIRCRAFT	B 747-400	B 747-400	B 747-400	B 747-400	B 747-400	B 747-400
WINGSPAN OF DESIGN AIRCRAFT	213'	213'	213'	213'	213'	213'
MAX. CERTIFIED TAKEOFF WEIGHT OF DESIGN A/C	870,000#	870,000#	870,000#	870,000#	870,000#	870,000#
UNDERCARRIAGE WIDTH OF DESIGN AIRCRAFT	84'	84'	84'	84'	84'	84'
DESIGN AIRCRAFT APPROACH SPEED IN KNOTS	154 Knots	154 Knots	154 Knots	154 Knots	154 Knots	154 Knots
RUNWAY CENTERLINE TO PARALLEL RUNWAY CENTERLINE	1000' (12C) and 2500' (12R)	1000' (12C) and 2500' (12R)	1000' (12L) and 1500' (12R)	1000' (12L) and 1500' (12R)	1000' (12C) and 2500' (12L)	1000' (12C) and 2500' (12L)
TAXIWAY CENTERLINE TO FIXED OR MOVABLE OBJECT	160'	160'	160'	160'	160'	160'
TAXIWAY WINGTIP CLEARANCE	53'	53'	53'	53'	53'	53'
RUNWAY CENTERLINE TO PARALLEL TAXIWAY CENTERLINE	450'	450'	N/A	N/A	450' and 787.5'	450' and 787.5'
RUNWAY DIMENSIONS (L X W)	9301' x 150'	10,301' x 150'	10,201' x 150'	10,201' x 150'	10,401' x 150'	12,501' x 150'
RUNWAY TRUE BEARING (NGS SURVEY)	S 44° 25' 48" E	S 44° 25' 48" E	S 44° 25' 48" E	S 44° 25' 48" E	S 44° 26' 24" E	S 44° 26' 24" E
RUNWAY AZIMUTH	135.57° / 315.58°	135.57° / 315.58°	135.57° / 315.58°	135.57° / 315.58°	135.56° / 315.57°	135.56° / 315.57°
RUNWAY WIND COVERAGE (16 KNOTS/18 MPH)	99.61%	99.61%	99.61%	99.61%	99.61%	99.61%
RUNWAY SHOULDERS	35'	35'	35'	35'	35'	35'
RUNWAY MAXIMUM ELEVATION/HIGH POINT OF RUNWAY	1383.5 MSL	1383.5 MSL	1380.4 MSL	1380.4 MSL	1373.6 MSL	1378.0 MSL
RUNWAY LOW POINT ELEVATION	1356.0 MSL	1356.0 MSL	1347.8 MSL	1347.8 MSL	1340.2 MSL	1338.0 MSL
RUNWAY LIGHTING	HIRL	HIRL	HIRL	HIRL	MIRL	MIRL
RUNWAY EFFECTIVE GRADIENT/MAXIMUM GRADIENT	.3 %	.3 %	.32 %	.32 %	.32 %	.32 %
RUNWAY PAVEMENT MATERIAL / SURFACE TREATMENT	Concrete	Concrete	Asphalt/Concrete	Asphalt/Concrete	Concrete	Concrete
RUNWAY PAVEMENT STRENGTH (IN THOUSAND LBS.) [1]	75(S), 210(D), 590(DT), 850(DDT)	75(S), 210(D), 590(DT), 850(DDT)	55(S), 95(D), 185(DT), 550(DDT)	55(S), 95(D), 185(DT), 550(DDT)	55(S), 95(D), 185(DT), 550(DDT)	55(S), 95(D), 185(DT), 550(DDT)
LINE OF SIGHT REQUIREMENT MET	YES	YES	YES	YES	YES	YES
FAR PART 77 APPROACH SURFACES	500' x 5000' x 1500' (12L) 500' x 5000' x 1500' (30R)	500' x 10,000' x 3500' (12L) 500' x 10,000' x 3500' (30R)	1000' x 10,000' x 3500' (12C) 1000' x 50,000' x 16000' (30C)	1000' x 50,000' x 16000' (12C) 1000' x 50,000' x 16000' (30C)	500' x 10,000' x 3500' (12R) 500' x 10,000' x 3500' (30L)	500' x 10,000' x 3500' (12R) 500' x 10,000' x 3500' (30L)
RUNWAY PROTECTION ZONES	500' x 1700' x 1010' (12L) 500' x 1700' x 1010' (30R)	500' x 1700' x 1010' (12L) 500' x 1700' x 1010' (30R)	500' x 1700' x 1010' (12C) 1000' x 1700' x 1510' (30C)	1000' x 2500' x 1750' (12C) 1000' x 2500' x 1750' (30C)	500' x 1700' x 1010' (12R) 500' x 1700' x 1010' (30L)	500' x 1700' x 1010' (12R) 500' x 1700' x 1010' (30L)
TAXIWAY WIDTH	75' (Varies)	75' (Varies)	75' (Varies)	75' (Varies)	75' (Varies)	75' (Varies)
TAXIWAY LIGHTING	MITL	MITL	MITL	MITL	MITL	MITL
TAXIWAY MARKING	Centerline/Signage	Centerline/Signage	Centerline/Signage	Centerline/Signage	Centerline/Signage	Centerline/Signage
TAXIWAY SURFACE MATERIAL	Asphalt/Concrete	Asphalt/Concrete	Asphalt/Concrete	Asphalt/Concrete	Asphalt/Concrete	Asphalt/Concrete
TAXIWAY SAFETY AREA WIDTH	214'	214'	214'	214'	214'	214'
TAXIWAY OBJECT FREE AREA WIDTH	320'	320'	320'	320'	320'	320'
TAXIWAY HOLDING POSITION MARKING/HOLDSIGN	264'	264'	294'	294'	264'	264'

RUNWAY ENDS DATA	RUNWAY 12L	RUNWAY 30R	RUNWAY 12L	RUNWAY 30R	RUNWAY 12C	RUNWAY 30C	RUNWAY 12C	RUNWAY 30C	RUNWAY 12R	RUNWAY 30L	RUNWAY 12R	RUNWAY 30L
FAR PART 77 CATEGORY	Visual	Visual	Nonprecision (c)	Nonprecision (c)	Nonprecision (c)	Precision	Precision	Precision	Nonprecision (c)	Nonprecision (c)	Nonprecision (c)	Nonprecision (c)
FAR PART 77 APPROACH SLOPE	20:1	20:1	34:1	34:1	34:1	50:1/40:1	50:1/40:1	50:1/40:1	34:1	34:1	34:1	34:1
RUNWAY INSTRUMENTATION	Visual	Visual	Nonprecision	Nonprecision	Nonprecision	Precision	Precision	Precision	Nonprecision	Nonprecision	Nonprecision	Nonprecision
RUNWAY MARKING	Precision	Precision	Precision	Precision	Precision	Precision	Precision	Precision	Precision	Precision	Precision	Precision
RUNWAY BLAST PAD	400'	400'	400'	400'	1000'	1000'	1000'	1000'	1000'	1000'	1000'	1000'
RUNWAY STOPWAY	None	None	None	None	None	None	None	None	None	None	None	None
RUNWAY APPROACH VISIBILITY MINIMUMS (LOWEST)	1 mile	1 mile	1 mile	1 mile	1 mile	3/4 mile	1/2 mile	1/2 mile	1 mile	1 mile	1 mile	1 mile
RUNWAY APPROACH LIGHTING	None	None	None	None	None	MALSR	MALSR	MALSR	None	None	None	None
PRECISION OBJECT FREE ZONE (800' X 200')	N/A	N/A	N/A	N/A	N/A	POFZ	POFZ	POFZ	N/A	N/A	N/A	N/A
THRESHOLD SITING REQUIREMENTS (APPENDIX 2)	20:1	20:1	20:1	20:1	20:1	34:1	34:1	34:1	20:1	20:1	20:1	20:1
THRESHOLD SITING SURFACE OBJECT PENETRATIONS	None	None	None	None	None	None	None	None	None	None	None	None
RUNWAY THRESHOLD DISPLACEMENT	None	None	None	None	None	None	None	None	None	None	None	None
RUNWAY DISPLACED THRESHOLD ELEVATION	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
RUNWAY END ELEVATION	1356.0 MSL	1383.5 MSL	1352.0 MSL	1383.5 MSL	1347.8 MSL	1380.4 MSL	1347.8 MSL	1380.4 MSL	1340.2 MSL	1373.6 MSL	1338.0 MSL	1378.0 MSL
RUNWAY TOUCHDOWN ZONE ELEVATION (TDZE)	1365.1 MSL	1383.5 MSL	1365.1 MSL	1383.5 MSL	1358.3 MSL	1380.4 MSL	1358.3 MSL	1380.4 MSL	1348.6 MSL	1373.6 MSL	1348.6 MSL	1378.0 MSL
RUNWAY SAFETY AREA (RSA BEYOND STOP END)	1000'	1000'	1000'	1000'	1000'	1000'	1000'	1000'	1000'	1000'	1000'	1000'
RUNWAY SAFETY AREA WIDTH	500'	500'	500'	500'	500'	500'	500'	500'	500'	500'	500'	500'
RUNWAY OBJECT FREE AREA (OFA BEYOND STOP END)	1000'	1000'	1000'	1000'	1000'	1000'	1000'	1000'	1000'	1000'	1000'	1000'
RUNWAY OBJECT FREE AREA WIDTH	800'	800'	800'	800'	800'	800'	800'	800'	800'	800'	800'	800'
RUNWAY OBSTACLE FREE ZONE (BEYOND STOP END)	200'	200'	200'	200'	200'	200'	200'	200'	200'	200'	200'	200'
RUNWAY OBSTACLE FREE ZONE WIDTH	400'	400'	400'	400'	400'	400'	400'	400'	400'	400'	400'	400'
TAKEOFF RUN AVAILABLE (TORA)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TAKEOFF DISTANCE AVAILABLE (TODA)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LANDING DISTANCE AVAILABLE (LDA)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ELECTRONIC NAVIGATIONAL AIDS	*None*	*None*	*None*	*None*	*RNAV (GPS)*	*HI-ILS ILS Cat-I GPS HI-VOR/DME VORTAC*	*RNAV (GPS)*	*HI-ILS ILS Cat-I GPS HI-VOR/DME VORTAC*	*RNAV (GPS)*	*RNAV (GPS)*	*RNAV (GPS)*	*RNAV (GPS)*
RUNWAY VISUAL NAVIGATIONAL AIDS	PAPI-4L REIL	PAPI-4L REIL	PAPI-4L REIL	PAPI-4L REIL	PAPI-4L –	PAPI-4L –	PAPI-4L –	PAPI-4L –	None –	None –	PAPI-4L REIL	PAPI-4L REIL

[1] PAVEMENT STRENGTHS ARE EXPRESSED IN SINGLE (S), DUAL (D), DUAL TANDEM (DT), AND/OR DOUBLE DUAL TANDEM (DDT) WHEEL LOAD CAPACITIES.

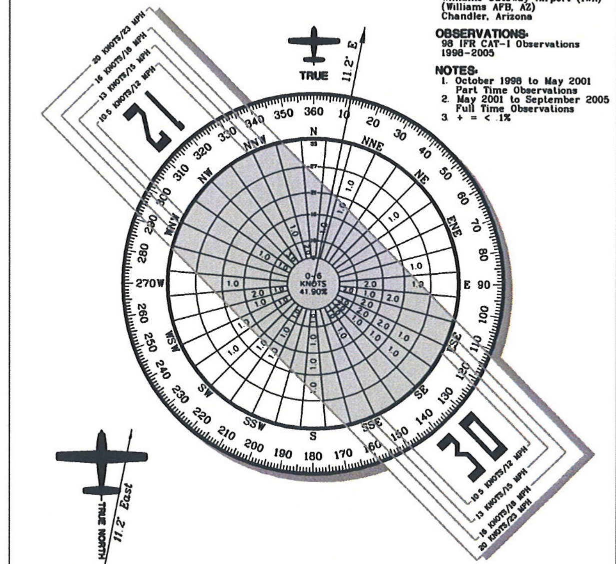
IFR CAT-I WIND COVERAGE

Runways	10.5 Knots 12 MPH	13 Knots 15 MPH	16 Knots 18 MPH	20 Knots 23 MPH
Runway 12-30	*80.50%*	*85.97%*	*92.69%*	*95.70%*

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Williams Gateway Airport (IWA)
(Williams AFB, AZ)
Chandler, Arizona

OBSERVATIONS:
98 IFR CAT-I Observations
1998-2005

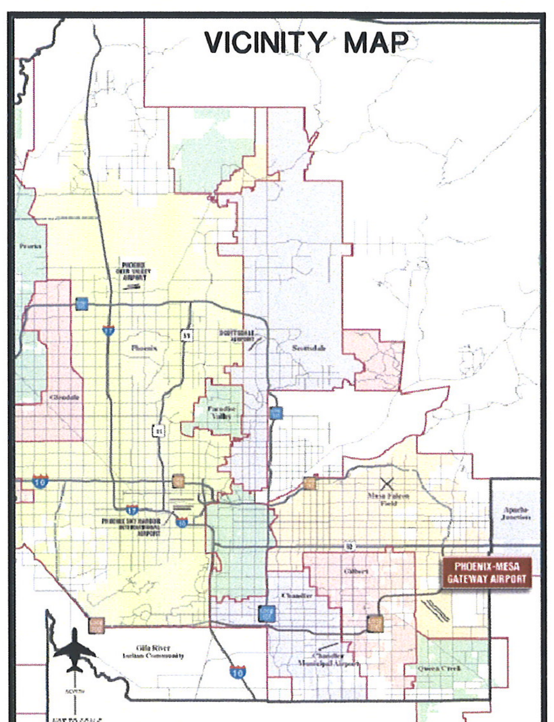
NOTES:
1. October 1998 to May 2001 Part Time Observations
2. May 2001 to September 2005 Full Time Observations
3. + = < .1%



Magnetic Declination 11° 12' East (2007)
Annual Rate of Change 6' West (2007)

GENERAL NOTES:

1. Depiction of features and objects, including related elevations and clearances, within the runway protection zones are depicted on the INNER APPROACH SURFACE DRAWINGS.
2. Details concerning terminal improvements depicted on the EASTSIDE FACILITIES DRAWING and WESTSIDE FACILITIES DRAWING
3. Recommended land uses within the airport environs are depicted on the AIRPORT LAND USE DRAWING.
4. PHOENIX-MESA GATEWAY AIRPORT Runway 12L, 30R, 12R and 30L Supplemental 34:1 Approach Surface (O.C. Chart 74, December 1995).



OBSTACLE FREE ZONE (OFZ) OBJECT PENETRATIONS

OBJECT	PENETRATION	DISPOSITION
None	–	–
–	–	–
–	–	–

THRESHOLD SITING SURFACE OBJECT PENETRATIONS

OBJECT	PENETRATION	DISPOSITION
None		

MODIFICATIONS FROM FAA AIRPORT DESIGN STANDARDS

STANDARD MODIFIED	DESCRIPTION	AIRSPACE CASE NUMBER	APPROVAL DATE
None	–	–	–
–	–	–	–

DEVIATIONS FROM FAA AIRPORT DESIGN STANDARDS

DEVIATION DESCRIPTION	EFFECTED DESIGN STANDARD	STANDARD	EXISTING	PROPOSED DISPOSITION
None	–	–	–	–
–	–	–	–	–
–	–	–	–	–

No.	REVISIONS	DATE	BY	APP'D.
4	UPDATE TO 1999 MASTER PLAN (ALP APPROVED 2/2/2005)	2/05	LDJ	JMH
3	UPDATE TO 1999 MASTER PLAN (ALP APPROVED 7/12/2000)	6/00	LDJ	JMH
2	1999 MASTER PLAN (ALP APPROVED 6/23/1998)	5/98	WEH	JMH
1	1993 MASTER PLAN	9/93	BH	JMH

PHOENIX-MESA GATEWAY AIRPORT
AIRPORT DATA SHEET
Mesa, Arizona

PLANNED BY: Steven G. Benson/Patrick Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: James M. Harris, P.E.

October 8, 2008 SHEET 1 OF 7

Coffman Associates
Airport Consultants
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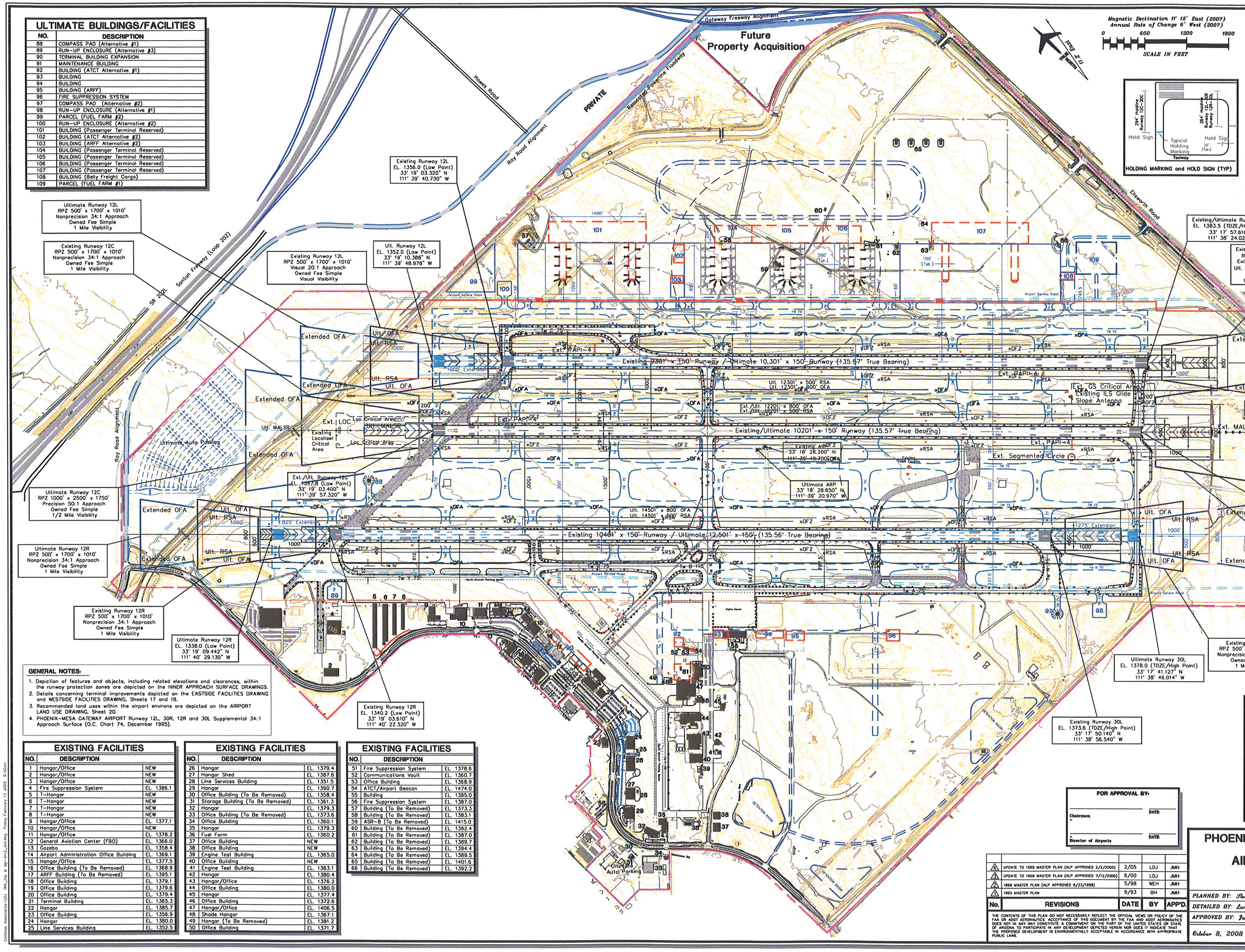
ULTIMATE BUILDINGS/FACILITIES

NO.	DESCRIPTION
88	COMPASS PAD (Alternative #1)
89	RUN-UP ENCLOSURE (Alternative #3)
90	TERMINAL BUILDING EXPANSION
91	MAINTENANCE BUILDING
92	BUILDING (ATCT Alternative #1)
93	BUILDING
94	BUILDING
95	BUILDING (ARFF)
96	FIRE SUPPRESSION SYSTEM
97	COMPASS PAD (Alternative #2)
98	RUN-UP ENCLOSURE (Alternative #1)
99	PARCEL (FUEL FARM #2)
100	RUN-UP ENCLOSURE (Alternative #2)
101	BUILDING (Passenger Terminal Reserved)
102	BUILDING (ATCT Alternative #2)
103	BUILDING (ARFF Alternative #2)
104	BUILDING (Passenger Terminal Reserved)
105	BUILDING (Passenger Terminal Reserved)
106	BUILDING (Passenger Terminal Reserved)
107	BUILDING (Passenger Terminal Reserved)
108	BUILDING (Belly Freight Cargo)
109	PARCEL (FUEL FARM #1)



GENERAL NOTES:

1. Depiction of features and objects, including related elevations and clearances, within the runway protection zones are depicted on the INNER APPROACH SURFACE DRAWINGS.
2. Details concerning terminal improvements depicted on the EASTSIDE FACILITIES DRAWING and WESTSIDE FACILITIES DRAWING, Sheets 17 and 18.
3. Recommended land uses within the airport environs are depicted on the AIRPORT LAND USE DRAWING, Sheet 20.
4. PHOENIX-MESA GATEWAY AIRPORT Runway 12L, 30R, 12R and 30L Supplemental 34:1 Approach Surface (O.C. Chart 74, December 1995).

EXISTING FACILITIES

NO.	DESCRIPTION	
1	Hangar/Office	NEW
2	Hangar/Office	NEW
3	Hangar/Office	NEW
4	Fire Suppression System	EL. 1386.1
5	T-Hangar	NEW
6	T-Hangar	NEW
7	T-Hangar	NEW
8	T-Hangar	NEW
9	Hangar/Office	EL. 1377.1
10	Hangar/Office	NEW
11	Hangar/Office	EL. 1378.2
12	General Aviation Center (FBO)	EL. 1366.0
13	Gazebo	EL. 1358.4
14	Airport Administration Office Building	EL. 1369.1
15	Hangar/Office	EL. 1377.5
16	Office Building (To Be Removed)	EL. 1368.9
17	ARFF Building (To Be Removed)	EL. 1395.1
18	Office Building	EL. 1379.1
19	Office Building	EL. 1379.6
20	Office Building	EL. 1379.4
21	Terminal Building	EL. 1365.3
22	Hangar	EL. 1385.7
23	Office Building	EL. 1356.9
24	Hangar	EL. 1380.0
25	Line Services Building	EL. 1352.5

EXISTING FACILITIES

NO.	DESCRIPTION	
26	Hangar	EL. 1379.4
27	Hangar Shed	EL. 1387.6
28	Line Services Building	EL. 1351.5
29	Hangar	EL. 1390.7
30	Office Building (To Be Removed)	EL. 1358.4
31	Storage Building (To Be Removed)	EL. 1361.3
32	Hangar	EL. 1379.3
33	Office Building (To Be Removed)	EL. 1373.6
34	Office Building	EL. 1360.1
35	Hangar	EL. 1379.3
36	Fuel Farm	EL. 1360.2
37	Office Building	NEW
38	Office Building	NEW
39	Engine Test Building	EL. 1365.0
40	Office Building	NEW
41	Engine Test Building	EL. 1363.1
42	Hangar	EL. 1380.4
43	Hangar/Office	EL. 1376.2
44	Office Building	EL. 1380.0
45	Hangar	EL. 1377.4
46	Office Building	EL. 1372.6
47	Hangar/Office	EL. 1406.5
48	Shade Hangar	EL. 1367.1
49	Hangar (To Be Removed)	EL. 1381.2
50	Office Building	EL. 1371.7

EXISTING FACILITIES

NO.	DESCRIPTION	
51	Fire Suppression System	EL. 1378.6
52	Communications Vault	EL. 1360.7
53	Office Building	EL. 1368.9
54	ATCT/Airport Beacon	EL. 1474.0
55	Building	EL. 1385.0
56	Fire Suppression System	EL. 1387.0
57	Building (To Be Removed)	EL. 1373.3
58	Building (To Be Removed)	EL. 1383.1
59	ASR-8 (To Be Removed)	EL. 1415.0
60	Building (To Be Removed)	EL. 1382.4
61	Building (To Be Removed)	EL. 1387.0
62	Building (To Be Removed)	EL. 1389.7
63	Building (To Be Removed)	EL. 1394.4
64	Building (To Be Removed)	EL. 1389.5
65	Building (To Be Removed)	EL. 1401.6
66	Building (To Be Removed)	EL. 1392.2

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
	SAME	ABANDONED PAVEMENT (To Be Removed)
		AIRPORT PROPERTY LINE/FENCE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT
	SAME	BUILDING ABANDONMENT (To Be Removed)
		BUILDING CONSTRUCTION (Off / on Airport)
		DRAINAGE
		FACILITY CONSTRUCTION
		FENCING
VASI-4	PAPI-4	NAVIGATIONAL AID INSTALLATION (GVGI)
		RUNWAY THRESHOLD LIGHTS and REIL
	SAME	SECTION CORNER
		SEGMENTED CIRCLE/WIND INDICATOR
	SAME	TOPOGRAPHY (2005)
		WIND INDICATOR (Lighted)
		HOLDING POSITION MARKING
BRL		BUILDING RESTRICTION LINE (BRL)
		DIRT ROAD
		PARCELS
		TREES
		CRITICAL AREA
OFZ		RUNWAY OBSTACLE FREE ZONE
RSA		RUNWAY SAFETY AREA
OFA		RUNWAY OBJECT FREE AREA
	SAME	SURVEY MONUMENT (PACS/SACS)
		LOCALIZER ANTENNA
		GLIDE SLOPE ANTENNA
		MALSR APPROACH LIGHT SYSTEM (inoperable)
		RUNWAY PROTECTION ZONE (RPZ)
		RUNWAY SHADE

FAA APPROVAL STAMP

FOR APPROVAL BY:

Chairman: ____ DATE: ____

Director of Airports ____ DATE: ____

No.	REVISIONS	DATE	BY	APP'D.
4	UPDATE TO 1999 MASTER PLAN (ALP APPROVED 2/2/2005)	2/05	LDJ	JMH
3	UPDATE TO 1999 MASTER PLAN (ALP APPROVED 7/12/2000)	6/00	LDJ	JMH
2	1999 MASTER PLAN (ALP APPROVED 6/23/1998)	5/98	WEH	JMH
1	1993 MASTER PLAN	9/93	BH	JMH

THE CONTENTS OF THIS PLAN DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA OR ADOT AERONAUTICS. ACCEPTANCE OF THIS DOCUMENT BY THE FAA AND ADOT AERONAUTICS DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES OR STATE OF ARIZONA TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

PHOENIX-MESA GATEWAY AIRPORT

AIRPORT LAYOUT PLAN

Mesa, Arizona

PLANNED BY: Steven G. Benson/Patrick Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: James M. Harris, P.E.

October 8, 2008 — SHEET 2 OF 7

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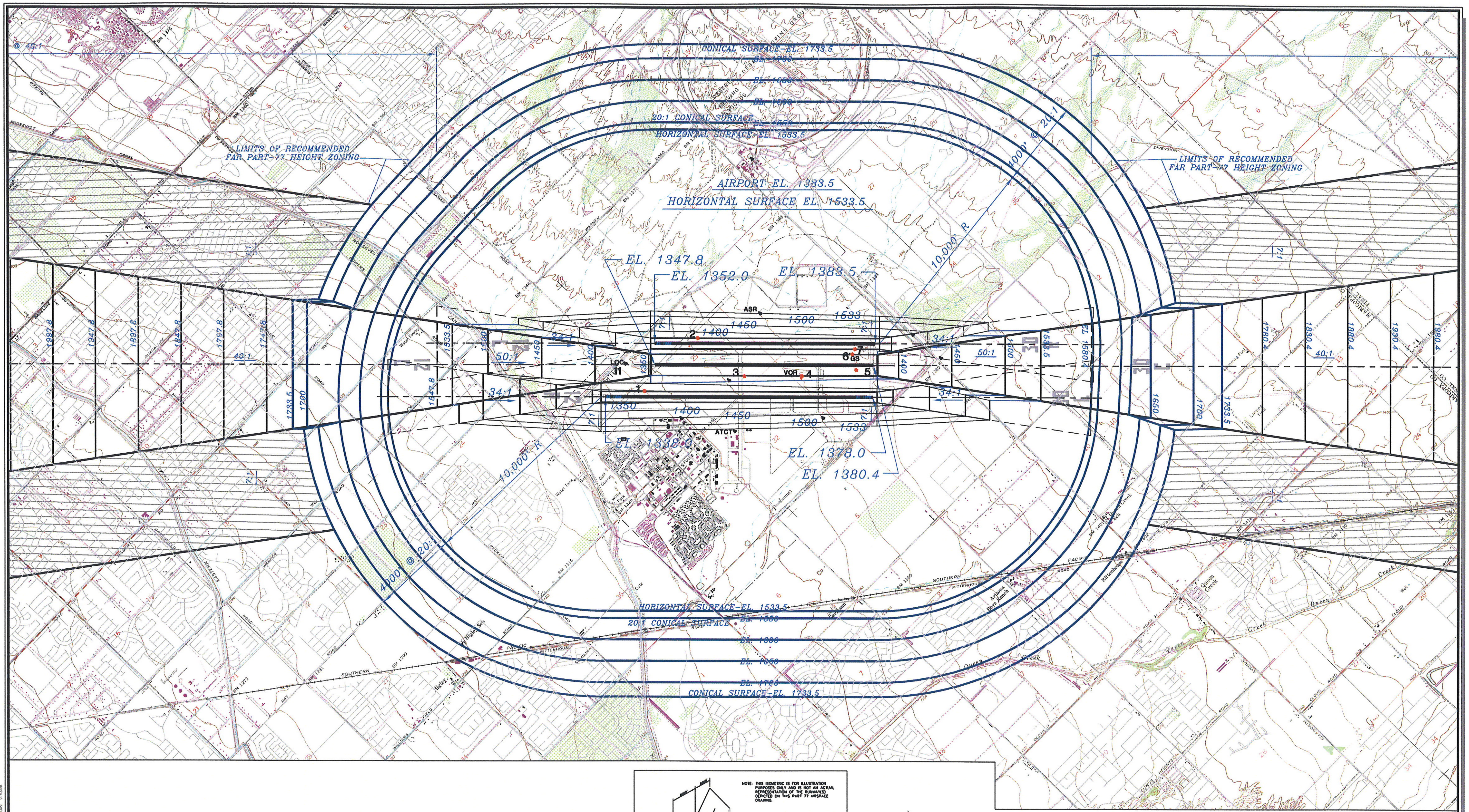


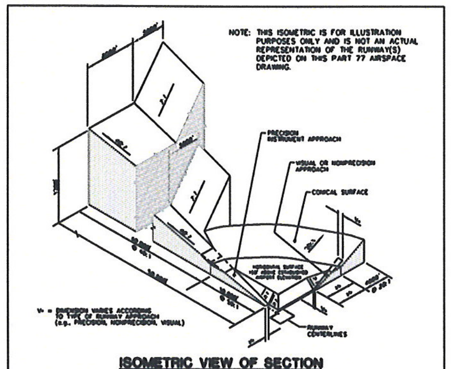
OBSTRUCTION TABLE							
Object Description/ Elevation (MSL)	Primary Surface	Approach Surface	Transitional Surface	Horizontal Surface	Conical Surface	Penetrate Surface	Proposed Disposition
1. WIND SOCK – EL. 1367			EL 1347			20'	NO ACTION (Navaid)
2. WIND SOCK – EL. 1379			EL 1357			22'	NO ACTION (Navaid)
3. OL ON EQUIP – EL 1383			EL 1372			11'	NO ACTION (Navaid)
4. VORTAC – EL 1408			EL 1408			0'	NO ACTION (Navaid)
5. ROD ON OL POLE – EL 1393	EL 1377					16'	NO ACTION (Navaid)
6. GLIDE SLOPE – EL 1424			EL 1377			47'	NO ACTION (Navaid)
7. WIND SOCK – EL 1402	EL 1381					21'	NO ACTION (Navaid)

OBSTRUCTION LEGEND

- OBSTRUCTION
- GROUP or MULTIPLE OBSTRUCTIONS
- TOPOGRAPHIC OBSTRUCTION

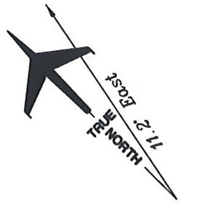
GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Additional obstruction data is illustrated on National Ocean Survey document OC 74, AIRPORT OBSTRUCTION CHART.



ISOMETRIC VIEW OF SECTION THRU CENTERLINE OF RUNWAYS

N.T.S.



Magnetic Declination
11° 12' East (2007)
Annual Rate of Change
6' West (2007)

0 2000 4000 6000
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
4	UPDATE TO 1999 MASTER PLAN (ALP APPROVED 2/2/2005)	2/05	LDJ	JMH
3	UPDATE TO 1999 MASTER PLAN (ALP APPROVED 7/12/2000)	6/00	LDJ	JMH
2	1999 MASTER PLAN (ALP APPROVED 6/23/1998)	5/98	WEH	JMH
1	1993 MASTER PLAN	9/93	BH	JMH

PHOENIX-MESA GATEWAY AIRPORT
AIRPORT AIRSPACE DRAWING
CONICAL SURFACE

Mesa, Arizona

PLANNED BY: Steven G. Benson/Patrick Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: James M. Harris, P.E.

October 8, 2008 | SHEET 3 OF 7

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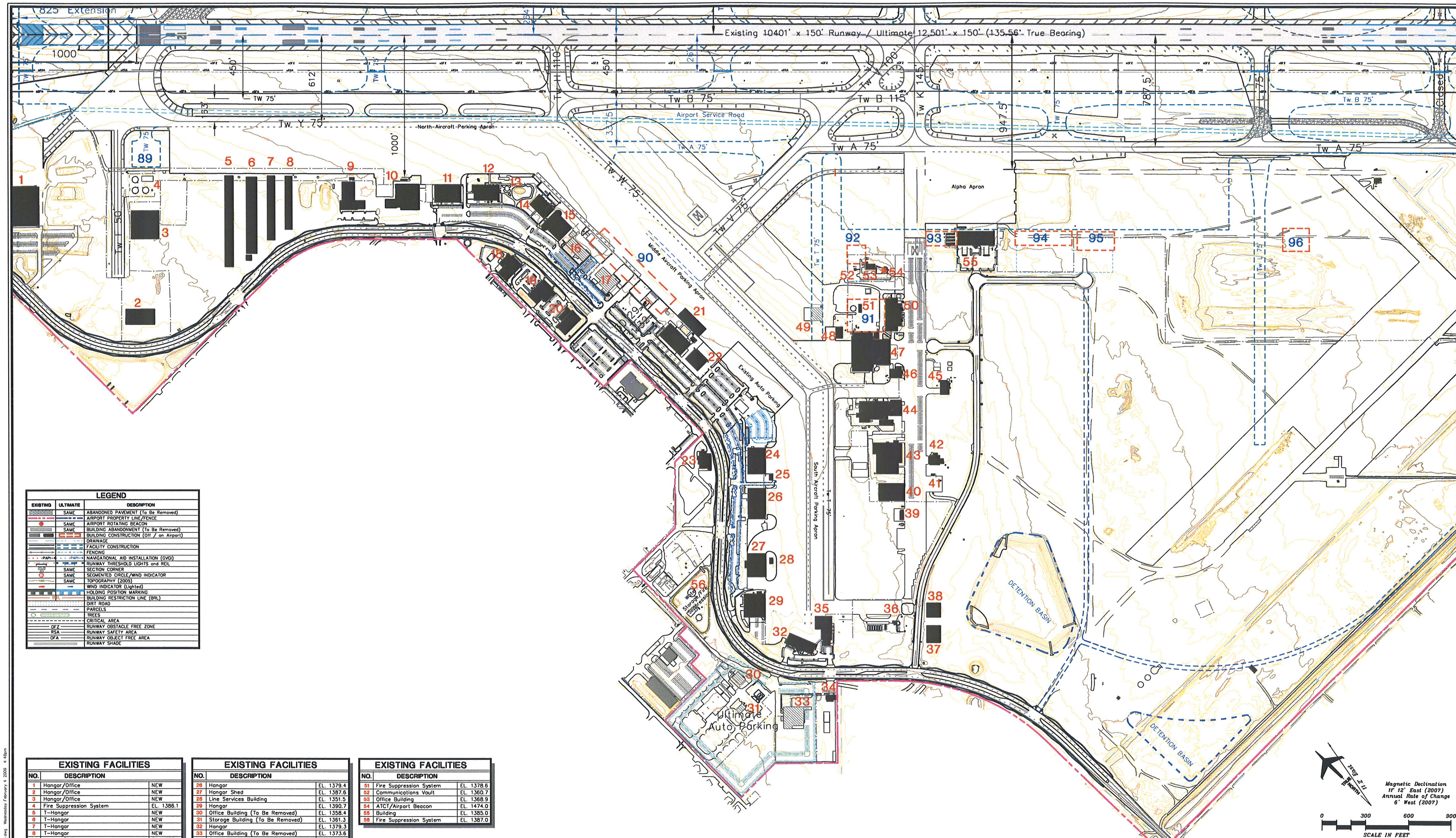


EXISTING FACILITIES

NO.	DESCRIPTION	
1	Hangar/Office	NEW
2	Hangar/Office	NEW
3	Hangar/Office	NEW
4	Fire Suppression System	EL. 1386.1
5	T-Hangar	NEW
6	T-Hangar	NEW
7	T-Hangar	NEW
8	T-Hangar	NEW
9	Hangar/Office	EL. 1377.1
10	Hangar/Office	NEW
11	Hangar/Office	EL. 1378.2
12	General Aviation Center (FBO)	EL. 1366.0
13	Gazebo	EL. 1358.4
14	Airport Administration Office Building	EL. 1369.1
15	Hangar/Office	EL. 1377.5
16	Office Building (To Be Removed)	EL. 1368.9
17	ARFF Building (To Be Removed)	EL. 1395.1
18	Office Building	EL. 1379.1
19	Office Building	EL. 1379.6
20	Office Building	EL. 1379.4
21	Terminal Building	EL. 1365.3
22	Hangar	EL. 1385.7
23	Office Building	EL. 1356.9
24	Hangar	EL. 1380.0
25	Line Services Building	EL. 1352.5

EXISTING FACILITIES

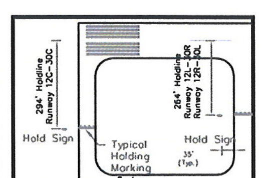
NO.	DESCRIPTION	
26	Hangar	EL. 1379.4
27	Hangar Shed	EL. 1387.6
28	Line Services Building	EL. 1351.5
29	Hangar	EL. 1390.7
30	Office Building (To Be Removed)	EL. 1358.4
31	Storage Building (To Be Removed)	EL. 1361.3
32	Hangar	EL. 1379.3
33	Office Building (To Be Removed)	EL. 1373.6
34	Office Building	EL. 1360.1
35	Hangar	EL. 1379.3
36	Fuel Farm	EL. 1360.2
37	Office Building	NEW
38	Office Building	NEW
39	Engine Test Building	EL. 1365.0
40	Office Building	NEW
41	Engine Test Building	EL. 1363.1
42	Hangar	EL. 1380.4
43	Hangar/Office	EL. 1376.2
44	Office Building	EL. 1380.0
45	Hangar	EL. 1377.4
46	Office Building	EL. 1372.6
47	Hangar/Office	EL. 1406.5
48	Shade Hangar	EL. 1367.1
49	Hangar (To Be Removed)	EL. 1381.2
50	Office Building	EL. 1371.7

EXISTING FACILITIES

NO.	DESCRIPTION	
51	Fire Suppression System	EL. 1378.6
52	Communications Vault	EL. 1360.7
53	Office Building	EL. 1368.9
54	ATCT/Airport Beacon	EL. 1474.0
55	Building	EL. 1385.0
56	Fire Suppression System	EL. 1387.0

ULTIMATE BUILDINGS/FACILITIES

NO.	DESCRIPTION
89	RUN-UP ENCLOSURE (Alternative #3)
90	TERMINAL BUILDING EXPANSION
91	MAINTENANCE BUILDING
92	BUILDING (ATCT Alternative #1)
93	BUILDING
94	BUILDING
95	BUILDING (ARFF)
96	FIRE SUPPRESSION SYSTEM



HOLDING MARKING and HOLD SIGN (TYP)

No.	REVISIONS	DATE	BY	APP'D.
4	UPDATE TO 1999 MASTER PLAN (ALP APPROVED 2/2/2005)	2/05	LDJ	JMH
3	UPDATE TO 1999 MASTER PLAN (ALP APPROVED 7/12/2000)	6/00	LDJ	JMH
2	1999 MASTER PLAN (ALP APPROVED 6/23/1998)	5/98	WEH	JMH
1	1993 MASTER PLAN	9/93	BH	JMH

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PHOENIX-MESA GATEWAY AIRPORT

WESTSIDE FACILITIES DRAWING

Mesa, Arizona

PLANNED BY: Steven G. Benson/Patrick Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: James M. Harris, P.E.

October 8, 2008 SHEET 4 OF 7

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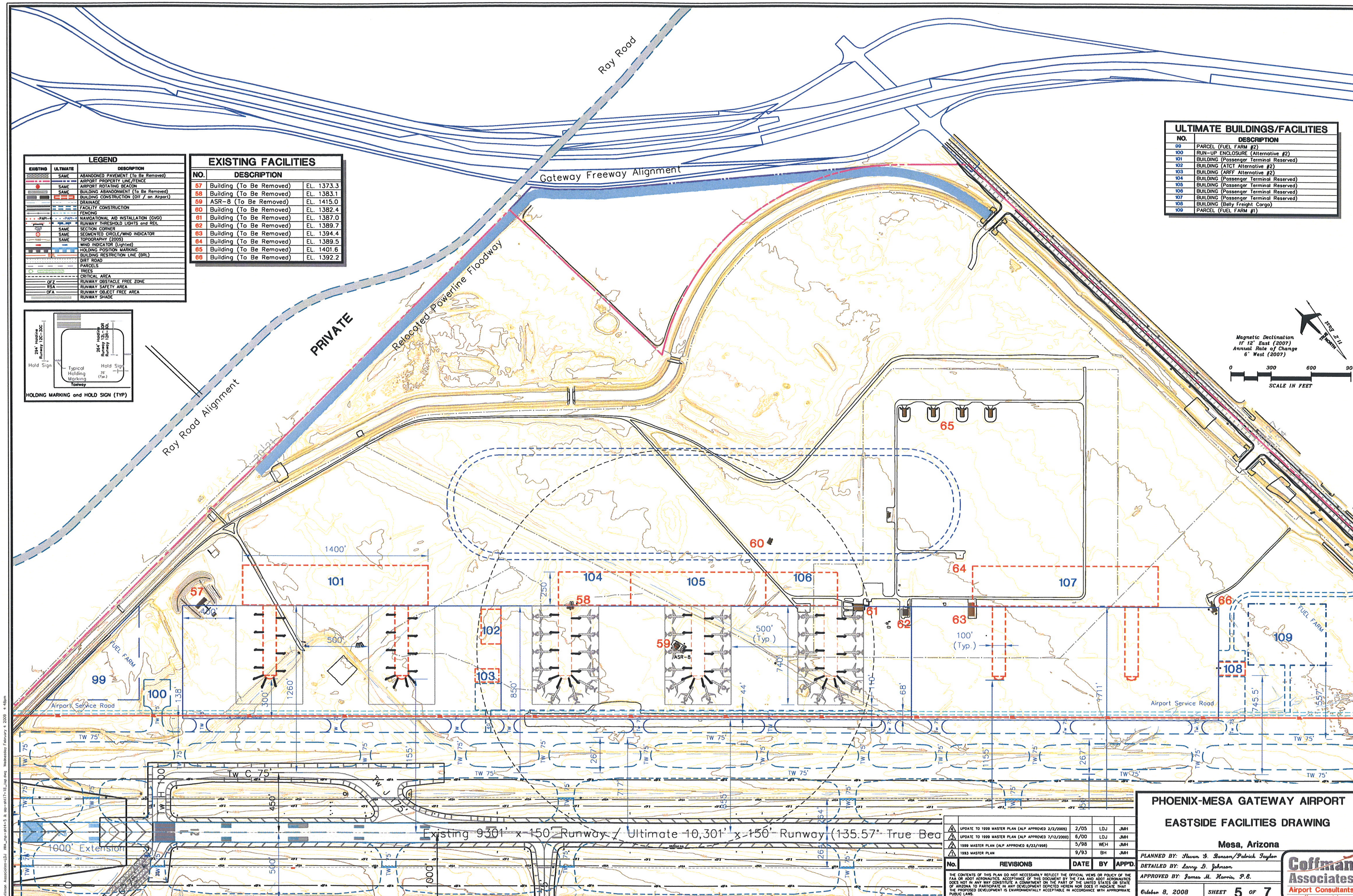

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
	SAME	ABANDONED PAVEMENT (To Be Removed)
		AIRPORT PROPERTY LINE/FENCE
	SAME	AIRPORT ROTATING BEACON
	SAME	BUILDING ABANDONMENT (To Be Removed)
		BUILDING CONSTRUCTION (Off / on Airport)
		DRAINAGE
		FACILITY CONSTRUCTION
		FENCING
PAPI-4	PAPI-4	NAVIGATIONAL AID INSTALLATION (GVGI)
		RUNWAY THRESHOLD LIGHTS and REIL
	SAME	SECTION CORNER
	SAME	SEGMENTED CIRCLE/WIND INDICATOR
	SAME	TOPOGRAPHY (2005)
		WIND INDICATOR (Lighted)
		HOLDING POSITION MARKING
BRL		BUILDING RESTRICTION LINE (BRL)
		DIRT ROAD
		PARCELS
		TREES
		CRITICAL AREA
OFZ		RUNWAY OBSTACLE FREE ZONE
RSA		RUNWAY SAFETY AREA
OFA		RUNWAY OBJECT FREE AREA
		RUNWAY SHADE

EXISTING FACILITIES

NO.	DESCRIPTION	
57	Building (To Be Removed)	EL. 1373.3
58	Building (To Be Removed)	EL. 1383.1
59	ASR-8 (To Be Removed)	EL. 1415.0
60	Building (To Be Removed)	EL. 1382.4
61	Building (To Be Removed)	EL. 1387.0
62	Building (To Be Removed)	EL. 1389.7
63	Building (To Be Removed)	EL. 1394.4
64	Building (To Be Removed)	EL. 1389.5
65	Building (To Be Removed)	EL. 1401.6
66	Building (To Be Removed)	EL. 1392.2

ULTIMATE BUILDINGS/FACILITIES

NO.	DESCRIPTION
99	PARCEL (FUEL FARM #2)
100	RUN-UP ENCLOSURE (Alternative #2)
101	BUILDING (Passenger Terminal Reserved)
102	BUILDING (ATCT Alternative #2)
103	BUILDING (ARFF Alternative #2)
104	BUILDING (Passenger Terminal Reserved)
105	BUILDING (Passenger Terminal Reserved)
106	BUILDING (Passenger Terminal Reserved)
107	BUILDING (Passenger Terminal Reserved)
108	BUILDING (Belly Freight Cargo)
109	PARCEL (FUEL FARM #1)

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PHOENIX-MESA GATEWAY AIRPORT

EASTSIDE FACILITIES DRAWING

Mesa, Arizona

PLANNED BY: Steven G. Benson/Patrick Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: James M. Harris, P.E.

October 8, 2008 | SHEET 5 OF 7

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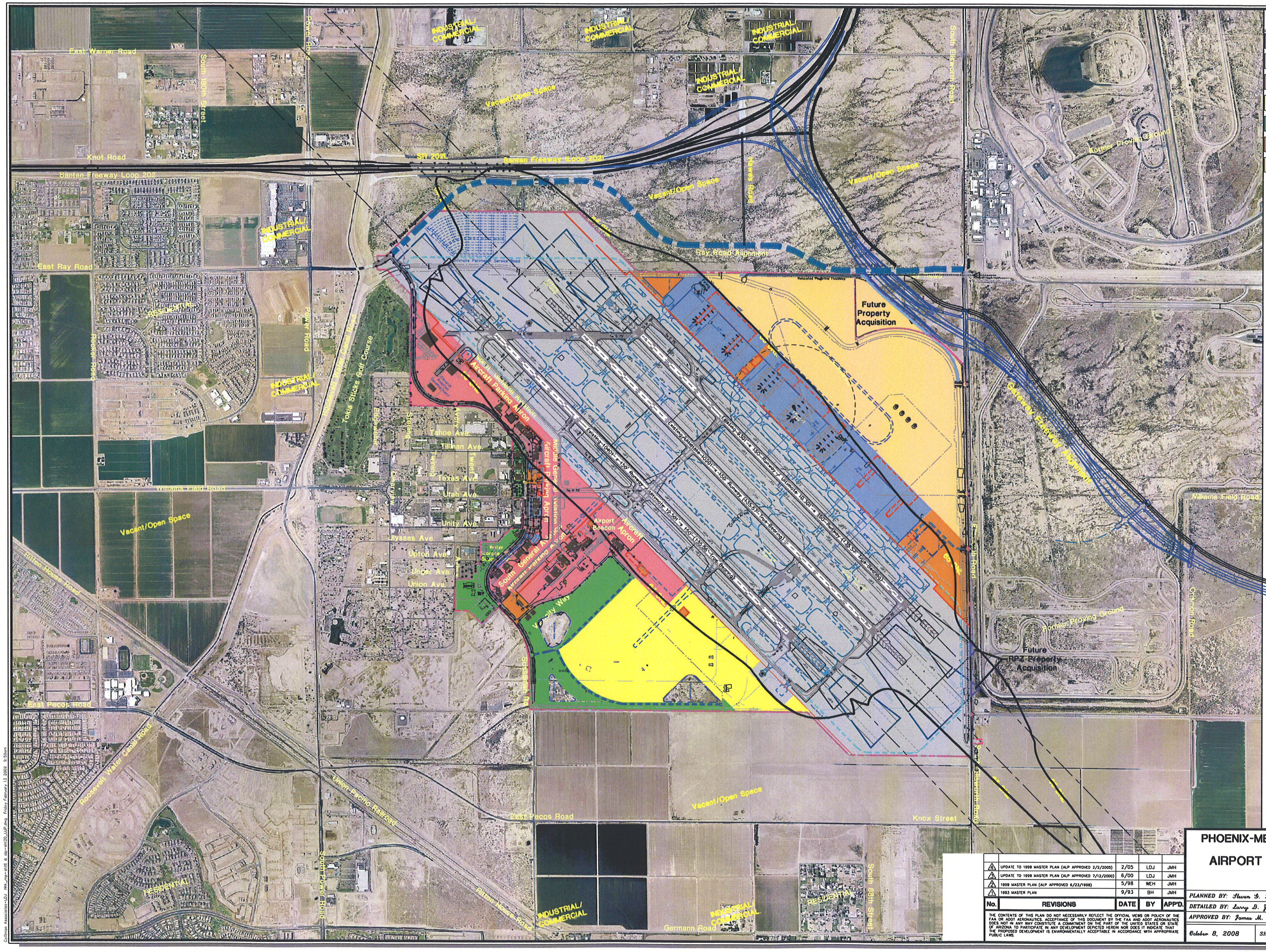

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PHOENIX-MESA GATEWAY AIRPORT

AIRPORT LAND USE DRAWING

Mesa, Arizona

PLANNED BY: Steven G. Benson/Patrick Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: James M. Harris, P.E.

October 8, 2008 | SHEET 6 OF 7

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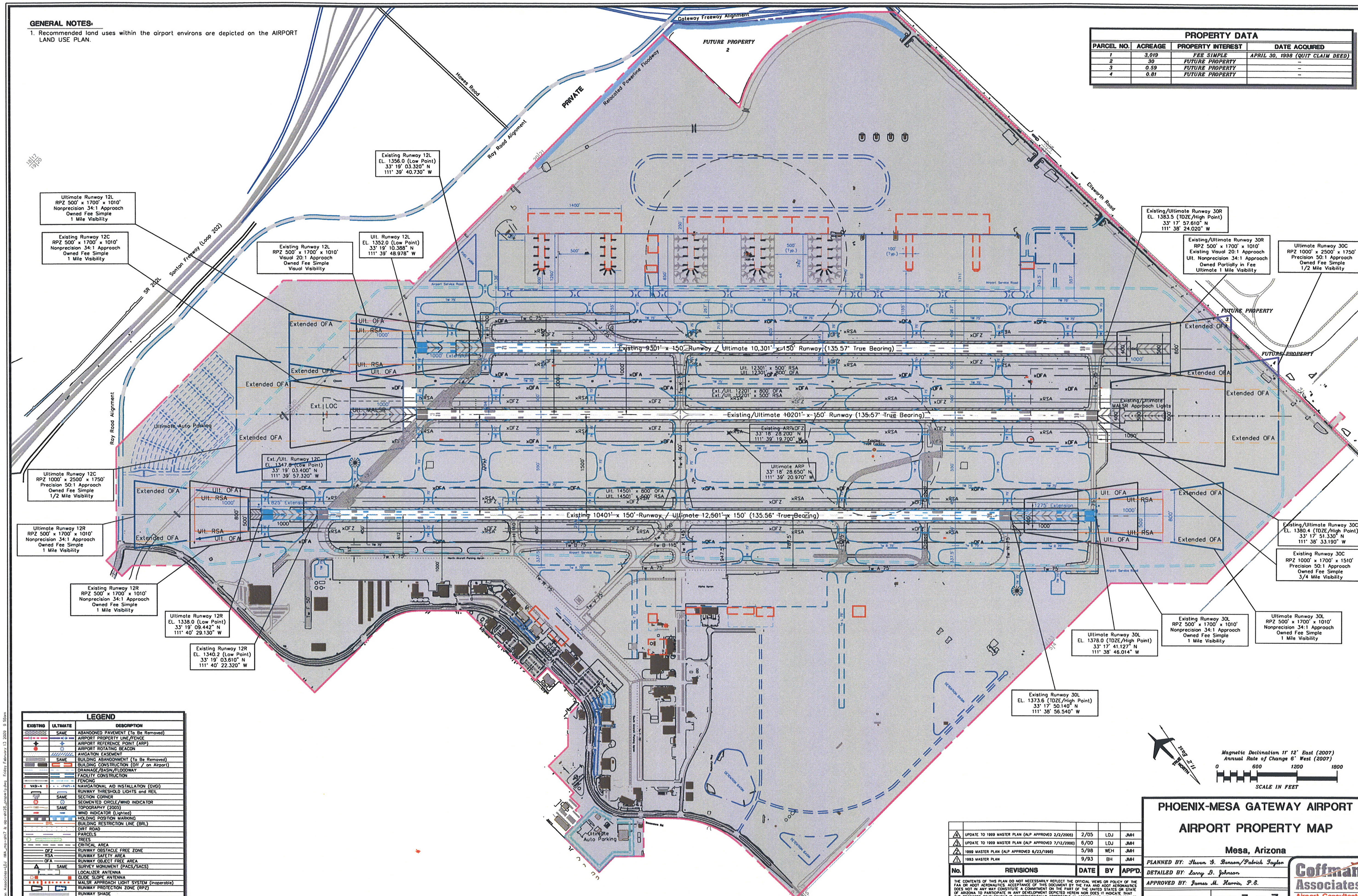
GENERAL NOTES:

1. Recommended land uses within the airport environs are depicted on the AIRPORT LAND USE PLAN.



PROPERTY DATA			
PARCEL NO.	ACREAGE	PROPERTY INTEREST	DATE ACQUIRED
1	3,019	FEE SIMPLE	APRIL 30, 1998 (QUIT CLAIM DEED)
2	30	FUTURE PROPERTY	–
3	0.59	FUTURE PROPERTY	–
4	0.81	FUTURE PROPERTY	–

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
	SAME	ABANDONED PAVEMENT (To Be Removed)
		AIRPORT PROPERTY LINE/FENCE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT
	SAME	BUILDING ABANDONMENT (To Be Removed)
		BUILDING CONSTRUCTION (Off / on Airport)
		DRAINAGE/BASIN/FLOODWAY
		FACILITY CONSTRUCTION
		FENCING
VASI-4	PAPI-4	NAVIGATIONAL AID INSTALLATION (GVGI)
		RUNWAY THRESHOLD LIGHTS and REIL
	SAME	SECTION CORNER
		SEGMENTED CIRCLE/WIND INDICATOR
1080	SAME	TOPOGRAPHY (2005)
		WIND INDICATOR (Lighted)
		HOLDING POSITION MARKING
BRL		BUILDING RESTRICTION LINE (BRL)
		DIRT ROAD
		PARCELS
		TREES
		CRITICAL AREA
OFZ		RUNWAY OBSTACLE FREE ZONE
RSA		RUNWAY SAFETY AREA
OFA		RUNWAY OBJECT FREE AREA
	SAME	SURVEY MONUMENT (PACS/SACS)
		LOCALIZER ANTENNA
		GLIDE SLOPE ANTENNA
		MALSR APPROACH LIGHT SYSTEM (inoperable)
		RUNWAY PROTECTION ZONE (RPZ)
		RUNWAY SHADE

No.	REVISIONS	DATE	BY	APP'D.
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PHOENIX-MESA GATEWAY AIRPORT

AIRPORT PROPERTY MAP

Mesa, Arizona

PLANNED BY: Steven G. Benson/Patrick Taylor
DETAILED BY: Larry D. Johnson
APPROVED BY: James M. Harris, P.E.

October 8, 2008 — SHEET 7 OF 7

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PhxMesa Gateway Airport

Appendix C

ECONOMIC BENEFIT ANALYSIS

HIGHLIGHTS

This report presents an analysis of the economic benefits of Phoenix-Mesa Gateway Airport for 2007/2008. The economic benefits impact the airport service area, which includes Maricopa and Pinal Counties as well as the rapidly-developing East Valley portion of the Greater Phoenix Metropolitan Area.

The highlights of the economic benefit analysis are set out below. The total economic benefits created by the presence of the airport sum to $534.6 million, including all multiplier effects. The primary benefits (without multiplier effects) are $201.3 million from on-airport activity and $36.6 million from visitor spending. Total economic benefits have more than doubled in the past decade.

HIGHLIGHTS

Economic Benefit Analysis
Phoenix-Mesa Gateway Airport

- **The total economic benefits (including all multiplier effects) of Phoenix-Mesa Gateway Airport summed to $534.6 million in 2007/2008, supporting 4,075 jobs in the service area.**
- **The primary economic benefits (not including multiplier effects) of combined on-airport activity and off-airport visitor spending summed to $237.9 million in 2007/2008.**
- **On-airport economic activity (not including construction) produced $121.9 million of output, creating employment for 612 workers, and labor and proprietor earnings of $35.5 million.**
- **Airline visitors spent $32.3 million in the airport service area, supporting 457 jobs in the region.**
- **General aviation travelers accounted for 42,724 visitor days in the airport service area, and visitor expenditures exceeded $4 million.**
- **Capital improvement and construction projects underway or authorized on the airport were valued at $79 million, creating employment for 639 workers.**
- **Secondary economic benefits (from multiplier effects due to economic activity of suppliers and consumer spending induced by the presence of the airport) summed to $296.7 million.**
- **The total economic benefits of the airport, measured by revenues, increased 2.7 times between 1998 and 2008 (in constant 2008 dollars), and worker earnings tripled.**

METHODOLOGY & SUMMARY

The presence of an airport creates multiple benefits for a community. Measurement of these benefits is often complex, as impacts on the pace of economic development and quality of life may be difficult to quantify.

A well functioning airport serves as a portal that welcomes commerce and visitors into the region. Commercial airline travelers arriving at Phoenix-Mesa Gateway Airport can visit friends and relatives, conduct business, or continue on to other points in Arizona.

General aviation flyers can stop for fuel or stay over in the region for business meetings or sporting events. Cargo flights can avoid more congested airports and readily serve the technology-oriented firms of the area.

Outward bound residents have options to several points in the nation from Phoenix-Mesa Gateway Airport via commercial air service. These options are expected to increase significantly in future years.

General aviation (by private aircraft or chartered service) allows business travelers to reach destinations without the delays and uncertainty of today's airline flights and provides access to more than 5,300 airports in the nation, compared to approximately 564 served by scheduled airlines.

Airports bring essential services, including enhanced medical care (such as air ambulance service), support for law enforcement and fire control, and courier delivery of mail and high value parcels. These services raise the quality of life for residents and maintain a competitive environment for economic development.

Increasingly, metropolitan airports are also prime locations for businesses not directly related to aviation. Industrial parks, logistics facilities, and office buildings are often found at airports, which have become major employment centers in many areas.

Measuring Economic Benefits

Although qualitative advantages created by the presence of an airport are important, they are also difficult to measure. In studying airport benefits, regional analysts have emphasized indicators of economic activity for airports that can be quantified, such as dollar value of output, number of jobs created, and earnings of workers and proprietors of businesses.

Economic benefit studies differ from cost-benefit analyses, which are often called for to support decision-making, typically for public sector capital projects. Study of economic benefit is synonymous with measurement of economic performance. The methodology was standardized in the publication by the Federal Aviation Administration, *Estimating the Regional Economic Significance of Airports*, Washington DC, 1992.

Following the FAA methodology, this study views Phoenix-Mesa Gateway Airport as a source of measurable economic output (the production of aviation services) that creates revenues for firms, and employment and earnings for workers on and off the airport.

Business spending on the airport injects revenues into the community when firms buy products from suppliers and again when employees of the airport spend for household goods and services. In addition, spending by air visitors produces revenues for firms in the hospitality sector as well as employment and earnings for workers.

Benefit Measures

The quantitative measures of economic benefits of the Phoenix-Mesa Gateway Airport are each described below.

Revenue is the value in dollars of the output of goods and services produced by businesses. For government units, the budget is used as the value of output.

Revenue is equivalent to purchases, spending or sales. From the perspective of the business that is the supplier of goods and services, the dollar value of output is equal to the revenues received by that producer. From the viewpoint of the consumer, the dollar value of the output is equal to the amount that the consumer spent to purchase those goods and services from the business.

Earnings are a second benefit measure, made up of employee compensation (the dollar value of payments received by workers as wages and benefits) and proprietor's income of business owners.

Employment is the third benefit measure, the number of jobs supported by the revenues created by the airport.

To measure the economic benefits of the airport, information on revenues, employment and earnings was obtained directly from suppliers and users of aviation services including private sector firms on the airport, government agencies, airport staff, commercial and general aviation air travelers, and based aircraft owners. Surveys were mailed to owners of aircraft based at the airport. Mail surveys were sent to on-airport businesses, with telephone and interview follow-up. Surveys were distributed to general aviation and commercial airline visitors to determine length of stay and spending patterns.

Administrative staff at Phoenix-Mesa Gateway were very helpful in providing current and historical information on airport operations and activity.

Summary of Economic Benefits

A summary of economic benefits created by Phoenix-Mesa Gateway airport is shown in Table C1.

The components of economic benefits include both **on-airport and off-airport** economic activity. These benefits encompass the revenues of firms, budgets of government agencies, their employment, and the earnings paid out to workers.

The on-airport and off-airport activity creates **primary benefits** (sometimes referred to as "direct" benefits) which measure the initial revenues, employment, and earnings associated with the presence of the airport.

In addition to the initial impact of primary benefits, **secondary benefits** (multiplier effects) are created when the initial spending by airport employers or visitors circulates and recycles through the economy. The secondary benefits measure the magnitude of successive rounds of re-spending in the service area.

For example, when an aircraft mechanic's wages are spent to purchase food, housing, clothing, and medical services, these dollars create more jobs and income in the general economy of the region through multiplier effects of re-spending.

Total benefits are the combined sum of primary and secondary benefits created both on and off the airport.

On-Airport Primary Benefits

Phoenix-Mesa Gateway Airport supported a total of 39 private and public employers including commercial and general aviation, government agencies, and other tenants.

In addition, on-going airport capital improvement projects created benefits on the airport. A major portion of construction spending involved improvement of airport infrastructure. However, private firms were also involved in construction of hangars and industrial buildings for sale or lease.

Including the revenues and employment created by outlays for airport capital projects and private construction, all on-airport economic units were responsible for on-airport primary benefits of:

- **$201.3 Million Revenues**
- **$73.4 Million Earnings**
- **1,251 On-Airport Jobs**

Air Visitor Primary Benefits

During the 2007/2008 period, there were more than 90,000 air visitors that arrived at the airport by commercial, private, or chartered aircraft. When air travelers make off-airport expenditures these outlays create revenues (sales) for firms that supply goods and services to visitors. Visitor spending created annual airport service area output, employment and earnings of:

- **$36.6 Million Revenues**
- **$13.3 Million Earnings**
- **527 Off-Airport Jobs**

Combined Primary Benefits

The combined primary benefits represent the sum of on-airport and off-airport (visitor) revenues, earnings and employment due to the presence of the airport. Primary benefits are the "first round" impacts and do not include any multiplier effects of secondary spending. The primary benefits were:

- **$237.9 Million Revenues**
- **$86.7 Million Earnings**
- **1,778 jobs**

Secondary Benefits (Multiplier Effects)

The initial primary revenue stream in the service area of $237.9 million created by the presence of Phoenix-Mesa Gateway Airport was estimated to stimulate secondary benefits from multiplier effects within the airport service area of:

- **$296.7 Million Revenues**
- **$112.5 Million Earnings**
- **2,297 Jobs**

Total Economic Benefits

The total economic benefits created by the presence of Phoenix-Mesa Gateway Airport are the sum of primary benefits and secondary (multiplier) benefits, and in 2007/2008 were:

- **$534.6 Million Revenues**
- **$209.2 Million Earnings**
- **4,075 Jobs**

TABLE C1
Summary of Economic Benefits: 2007/2008
Phoenix-Mesa Gateway Airport

	BENEFIT MEASURES		
Source	**Revenues**	**Earnings**	**Employment**
On-Airport Aviation Tenants & Employers	**$121,864,000**	**$35,490,000**	**612**
Capital Projects	**$79,400,000**	**$37,907,000**	**639**
All On-Airport Economic Benefits	**$201,264,000**	**$73,397,000**	**1,251**
Air Visitor Benefits	**$36,596,000**	**$13,281,000**	**527**
Primary Benefits: Sum of On-Airport & Air Visitor Benefits	**$237,860,000**	**$86,678,000**	**1,778**
Secondary Benefits (Multiplier Effects)	***$296,753,000***	***$112,504,000***	***2,297***
TOTAL BENEFITS	**$534,613,000**	**$209,182,000**	**4,075**

ON-AIRPORT BENEFITS

This section provides more detail on the economic benefits associated with activity on site at Phoenix-Mesa Gateway Airport.

Table C2 illustrates the annualized employment, earnings and value of output (revenues) produced by airport tenants in 2007/2008. Values shown for revenues, employment and earnings are the primary benefits and do not include multiplier effects of secondary benefits.

On-Airport Output

On-airport economic activity created annual output of $201.3 million (including $79.4 million budgeted for capital projects). Budgets for governmental units were $19.6 million.

Businesses at Phoenix-Mesa Gateway Airport offer passenger services including airline ticketing, auto rental and other ground transport. Based on figures from the U. S. Department of Transportation, the dollar value of outbound airline travel from Phoenix-Mesa Gateway Airport was greater than $15 million in 2007/2008.

Full FBO services available for the aviation community include aircraft rental, maintenance, avionics, storage, and fueling for various categories of aircraft including piston, turboprop, jet and rotary.

Aviation activities on the airport include corporate hangars for private aircraft. Firms and educational institutions provide flight training for those interested in learning to fly.

The airport has two firms that specialize in medical transport services, and firms involved in advanced aviation training and research. Boeing and Lockheed Martin are important tenants as well. There are several government agencies supporting aviation, including the Phoenix-Mesa Gateway Airport staff, police and fire, the Transportation Security Administration (TSA) and the airport tower. In addition, the airport houses U.S. Customs and U.S Marshall's facilities.

Capital Projects

Capital projects are vital for airports to maintain safety and provide for growth. Capital spending for airport improvements also creates jobs and injects dollars into the local economy. Phoenix-Mesa Gateway Airport has a number of private development projects underway as well, including facilities for Embraer and Cessna Aircraft Company. Private and public spending for construction projects on-going or authorized in 2007/2008 was budgeted at $79.4 million.

Employment and Earnings

There were 33 private employers on the airport in 2007 (aviation and non-aviation), and 6 administrative or government units.

Surveys and interviews with on-airport employers provided a tally of 1,251 jobs on the airport (including 639 workers for capital projects). The ratio of government sector jobs to overall jobs was 153/1,251 or 12 percent of the total.

On airport employees brought home annual earnings of $73.4 million to spend in their own local communities. The average overall wage for workers on the airport was $58,670.

TABLE C2
On-Airport Benefits: Revenues, Earnings and Employment
Phoenix-Mesa Gateway Airport

	BENEFIT MEASURES		
Sources of On-Airport Benefits	**Revenues**	**Earnings**	**Employment**
On-Airport Employers Commercial Airlines Auto Rental, Food Service, Retail FBO Services, Fueling, Supplies Avionics, Maintenance, Repairs Aviation Education & Training Air Medical Transport Aircraft Storage & Corporate Aviation Aviation Simulation & Research Industrial & Commercial Facilities Government & Administration	$102,293,000	$27,357,000	459
Capital Projects Private & Public, Underway or Authorized	$79,400,000	$37,907,000	639
Government Agencies/Services Airport Administration Customs/Border Control US Marshall Office Transportation Security Administration Air Traffic Control Tower	$19,571,000	$8,133,000	153
ON-AIRPORT BENEFITS	$201,264,000	$73,397,0000	1,251

Source: Survey of Employers, Phoenix-Mesa Gateway Airport, 2008

AIR VISITOR BENEFITS

Phoenix-Mesa Gateway Airport attracts commercial airline and general aviation visitors from throughout the region and the nation who come to the area for business, recreational and personal travel.

This section provides detail on economic benefits from commercial and general aviation air travelers who use the airport. Values shown for spending (revenues), employment and earnings are primary benefits of initial visitor outlays and do not include multiplier effects of secondary benefits.

Commercial Airline Visitors

During 2007/2008 there were 119,012 airline enplanements at Phoenix-Mesa Gateway Airport. According to an analysis of the air traveler origin and destination data bank of the U. S. Department of Transportation, 60 percent or 71,407 enplaning passengers were visitors to the area (Table C3).

Information on air visitor spending and travel patterns was based on figures compiled especially for this study over a week-long survey period at the airport. Surveys were stratified by time of day and destination to achieve balanced representative results.

Just over two thirds (67%) of visitors stated that the main purpose of their travel was "personal," including visiting friends and relatives. Approximately one fourth of visitors (23%) described the purpose of their trip to Arizona as "tourism." The remaining respondents (10%) were traveling for business related reasons.

The surveys of airline passengers revealed that the average length of stay for travel parties was 6.3 days. Airline travelers accounted for 449,864 visitor days in the service area during the 2007/2008 year.

TABLE C3
Airline Visitor Travel Patterns
Phoenix-Mesa Gateway Airport

Category	Value
Enplanements	119,012
Percent Visitors	60%
Number of Visitors	71,407
Personal Travel	67%
Tourism/Sightseeing	23%
Business	10%
Average Stay (Nights)	6.3
Visitor Days	449,864
Spending Per Visitor	$496
Visitor Spending*	$35,418,000

***Includes on-airport auto rental spending**
Source: Visitor Survey 2008

Respondents were asked to provide information on travel-related spending for lodging, food, retail goods and services and ground transportation during their stay in the service area. The average spending per visitor per trip was $496 (figures are rounded to the nearest dollar to simplify tables). Multiplication of $496 by 71,407 annual airline passenger visitors yields total airline visitor spending of $35.4 million for the year.

On a typical day, there were 1,232 airline travelers in the airport service area spending an average of $78 per person per day, creating revenues exceeding $96,000 each day.

The figures for spending per person per trip can be used to derive the economic value of visitor expenditures from a typical passenger aircraft arriving at Phoenix-Mesa Gateway Airport (Table C4).

TABLE C4
Economic Value of Arriving Airliner
Phoenix-Mesa Gateway Airport

Item	Value
Average Passengers Per Aircraft	**127**
Percent Visitors	**60%**
Number of Visitors Per Aircraft	**76**
Trip Expenditures/Person	**$496**
Value of Arriving Airliner	**$37,700**

Source: US Dept. Transportation and Airline Visitor Survey 2008

Based on current characteristics of arriving passenger aircraft, the average number of visitors per aircraft is 76. These 76 visitors per aircraft will spend on average $496 per person per trip to the area.

Total airline visitor spending of $37,700 is injected into the local economy for each arriving airliner, on average.

Spending by category and resulting economic benefits from all airline visitors are shown in Table C5. (Note: The ground transportation category has been adjusted to net out rental car spending outlays directly on the airport.)

Before adjustment, ground transportation spending by airline visitors from survey results was calculated as $4.6 million. However, some two-thirds of this amount was paid out for on-airport rental cars and therefore this portion of visitor spending has already been accounted for in the on-airport spending totals set out in Table C2.

After the adjustment for on-airport car rental, total off-airport spending by airline passengers was $32.3 million.

The largest spending category was lodging ($171 per person per trip), which is also the source of the greatest annual revenues (at $12.2 million) and earnings ($4.5 million).

Lodging outlays for the typical travel party of 2.3 persons, based on survey figures, were $393 for the average trip. Note that these average figures include responses by the 57 percent of travelers who reported that they stayed with friends and relatives and therefore had no lodging outlays.

The 43 percent of visitors that reported paid accommodations incurred an average lodging cost of $853 during their stay in the service area.

Airline visitor spending in eating and drinking places created the second largest revenues ($8.3 million), earnings ($2.9 million) and greatest number of jobs (155). The $32.3 million of visitor spending by airline travelers off-airport created a total of 463 primary jobs in the service area, with earnings to workers and proprietors of $11.7 million.

TABLE C5
Economic Benefits from Airline Visitors: Revenues, Earnings and Employment
Phoenix-Mesa Gateway Airport

Category	Spending Per Trip	Revenues	Earnings	Jobs
Lodging	**$171**	**$12,211,000**	**$4,485,000**	**130**
Food/Drink	**116**	**8,283,000**	**2,905,000**	**155**
Retail Sales	**77**	**5,498,000**	**2,366,000**	**95**
Entertainment	**67**	**4,784,000**	**1,584,000**	**68**
Ground Transport	**65**	**1,532,000**	**353,000**	**15**
TOTAL	**$496**	**$32,308,000**	**$11,693,000**	**463**

Note: Earnings and employment figures were derived from the IMPLAN input-output model based on data from the Arizona Department of Commerce and the United States Bureau of Economic Analysis. Employment is not necessarily full time equivalents; includes full and some part time workers, figures rounded to head counts. Ground Transportation figures do not include on-airport auto rental spending. On-site portion of auto rental is included in airport operations (Table C2).

General Aviation Visitors

In order to analyze general aviation traffic patterns at the airport, a database of 3,800 general aviation flight plans involving Phoenix-Mesa Gateway Airport as either destination or origin for travel was obtained from the FAA.

In this sample, the most frequent source of itinerant flights arriving at Phoenix-Mesa Gateway Airport was Ryan Field in Tucson. Second in importance was Tucson International, followed by Love Field, Sierra Vista and Montgomery Field rounding out the top five (Table C6). Overall, general aviation aircraft arriving at Phoenix-Mesa Gateway Airport originated at more than 150 airports around the nation.

Recent years have often seen more than 150,000 itinerant general aviation operations annually at Phoenix-Mesa Gateway Airport.

An operation may be either an arrival or departure. An itinerant operation can include an arrival or departure by either based or transient aircraft. An itinerant operation typically involves an origination or destination airport other than Phoenix-Mesa Gateway Airport. Therefore, both based and non-based aircraft contribute to itinerant activity in any given day.

Local operations typically involve based aircraft performing take-offs and landings for training or other local flying activity.

TABLE C6
GA Aircraft Origination
Phoenix-Mesa Gateway Airport

Rank and Origin	State
1. Ryan Field	AZ
2. Tucson International	AZ
3. Earnest A. Love Field	AZ
4. Sierra Vista	AZ
5. Montgomery Field	CA
6. Scottsdale	AZ
7. John Wayne Airport	CA
8. El Paso International	TX
9. McCarran International	NV
10. Nogales	AZ
11. Boise Air Terminal	ID
12. Wichita Mid Continental	KS
13. Yuma MCAS	AZ
14. North Las Vega	NV
15. Centennial	CO

Source: FAA Flight Plan Data Base and Airport IQ Data Base/Flight records

When a based aircraft returns to Phoenix-Mesa Gateway Airport from Orange County, California, for example, that is an itinerant operation.

When an aircraft based at an airport other than Gateway arrives at Phoenix-Mesa Gateway Airport that aircraft is classified as a transient itinerant. Transient aircraft represent outside spending brought in to the airport service area, and are therefore an important source of economic benefits.

According to analysis of flight records, there were 20,240 transient aircraft arrivals at Phoenix-Mesa Gateway Airport in 2007/2008. Of these, 7,291 brought overnight visitors and 3,643 were one-day visitors greater than four hours (Table C7). Separate analyses were conducted for those GA visitors with an overnight stay and those whose visit was one day or less in duration.

To compute a conservative estimate of economic benefits of GA visitors, one day aircraft were further partitioned into those staying less than 4 hours and 4 hours or more. Visitor spending estimates were computed only for those aircraft staying 4 hours or longer at Phoenix-Mesa Gateway Airport, reflecting the fact that many aircraft stop only for fuel and travelers do not spend for food, retail shopping, or ground transportation off the airport. There were 3,643 general aviation aircraft that stayed on the ground 4 hours or more during the year (see below, Table C10).

TABLE C7
General Aviation Transient Aircraft
Phoenix-Mesa Gateway Airport

Item	Annual Value
Itinerant AC Arrivals	**44,273**
Transient AC Arrivals	**20,240**
Overnight Transient AC	**3,441**
One Day Transient AC	**16,799**

Source: Derived from FAA Flight Plan Data Base and Phoenix-Mesa Gateway Airport Records

Overnight GA Visitors

Information on visiting general aviation aircraft was derived from a survey of visiting aircraft owners and pilots. Visitors were asked about the purpose of their trip, the size of the travel party, length of stay, type of lodging, and outlays by spending category.

The travel patterns underlying the calculation of overnight GA visitor economic benefits are shown in Table C8, for the 3,441 transient overnight aircraft arrivals during the year.

The average party size was 2.8 persons and the average overnight travel party stayed in the area for 3.3 days. There were 9,635 overnight visitors for the year with a combined total of 31,795 visitor days. Spending per travel party per aircraft averaged $1,194. Total spending by all GA overnight visitors summed to $4.1 million for the year.

TABLE C8
General Aviation Overnight Visitors
Phoenix-Mesa Gateway Airport

Item	Annual Value
Transient AC Arrivals	20,240
Overnight Transient AC	3,441
Avg. Party Size	2.8
Number of Visitors	9,635
Average Stay (nights)	3.3
Visitor Days	31,795
Spending per Aircraft	$1,194
Total Expenditures	$4,108,000

Source: Derived from FAA Flight Plan Data Base, Phoenix-Mesa Gateway Airport Records and GA Visitor Surveys.

Table C9 shows the percentage distribution of outlays by overnight travel parties at Phoenix-Mesa Gateway Airport. Lodging accounts for 30 percent of visitor spending, averaging $360 per aircraft travel party.

Food and Beverage, at $324 per overnight aircraft, made up 27 percent. Retail, at $229 and 19 percent was next in importance, followed by entertainment spending per aircraft at $144, and 12 percent for the average travel party.

Ground Transportation was the smallest expenditure category, at $137 for each visiting overnight general aviation travel party.

TABLE C9
Spending Per Overnight GA Aircraft
Phoenix-Mesa Gateway Airport

Category	Spending	Percent
Lodging	$360	30
Food/Drink	324	27
Retail	229	19
Entertainment	144	12
Transportation	137	12
TOTAL	$1,194	100

Source: GA Visitor Survey 2008

Day GA Visitors

According to flight operations records, seventeen percent of itinerant general aviation, or thirty eight percent of transient general aviation aircraft arriving at Phoenix-Mesa Gateway Airport were transients that stayed on the airport for one day or less.

During the year, there were 16,799 aircraft that stopped at the airport for one day. Some were only on the ground for a few minutes while others were parked several hours when the travel party had their aircraft serviced, pursued a personal activity or conducted business.

The economic benefits from arriving aircraft travel parties are of two types. Those pilots or aircraft owners that buy fuel or have their aircraft serviced on the airport are making purchases which contribute to the revenue stream received by aviation businesses on the airport. That type of spending creates output, employment, and earning on the airport. Those economic benefits are shown in Table C2 as on-airport benefits.

TABLE C10
General Aviation Day Visitors
Phoenix-Mesa Gateway Airport

Item	Annual Value
One Day Transient AC	16,799
Stay >/= 4 Hours	3,643
Average Stay (Hours)	6.4
Avg. Party Size	3
Number of GA Visitors	10,929
Spending per Aircraft	$162
Total Expenditures	$591,000

Source: Source: Derived from FAA Flight Plan Data Base and GA Visitor Survey 2008

However, if the aircraft travel party leaves the airport to visit a corporate site, conduct a business meeting, or attend a sporting or cultural event, these off-airport activities will generate off-airport spending that create jobs and earnings in the local community.

For the purposes of this study, those travel parties that arrived and departed within four hours were assumed to have not left the airport and not contributed any significant spending off the airport, although they may have purchased goods or service on-site.

Of the 20,240 transient aircraft that stopped at Phoenix-Mesa Gateway Airport during the past year, there were 3,643 that were parked for more than four hours but not overnight (Table C10). The average stay in the area for those travel parties was 6.4 hours, according to arrival and departure records, with a range of 4 to 12 hours.

TABLE C11
Spending Per Day Visitor Aircraft
Phoenix-Mesa Gateway Airport

Category	Spending	Percent
Lodging	$0	0
Food/Drink	102	63
Retail	0	0
Entertainment	20	12
Transportation	40	25
TOTAL	$162	100

Source: GA Visitor Survey 2008

Day trip aircraft brought 10,929 visitors to the airport service area during the year. The average spending per one-day aircraft was $162. The total economic benefits created by off-airport spending by one-day general aviation visitors tallied to $591,000 of output (revenues or sales off the airport).

The largest expenditure category for one-day visiting travel parties was food and drink, which averaged $102 per aircraft travel party for the day and accounted for 63 percent of outlays (Table C11). Spending for ground transportation was the second largest category, at $40 per aircraft.

Combined GA Visitor Spending

Table C12 shows the economic benefits resulting from spending in the region by combined overnight and day general aviation visitors arriving at Phoenix-Mesa Gateway Airport.

To recap, there were 20,240 transient general aviation aircraft that brought visitors to the airport during the year. Of these, 3,441 were arriving overnight general aviation aircraft and 3,643 were one day visiting aircraft that were parked more than 4 hours, long enough to make off-airport expenditures.

Each overnight travel party spent an average of $1,194 during their trip to the airport service area and travelers on each day visitor aircraft spent an estimated $162 per trip.

Multiplying the expenditures for each category of spending by the number of aircraft yields the total outlays for lodging, food and drink, entertainment, retail spending and ground transportation due to GA visitors during the year. This spending summed to $4.7 million in revenues.

However, since a major portion of auto rental was accounted for by on-airport rental firms, total spending by GA visitors was adjusted to reflect off-airport ground transport spending only. Therefore, GA visitor spending, net of on-airport auto rental, was $4.3 million (on-airport auto rental is included in Table C2).

There were 42,274 visitor days attributable to general aviation travelers during the year. Seventy four percent of visitor days (31,795) were due to overnight GA travelers and twenty six percent (10,929) were from one-day visitors.

On an average day, there were 116 visitors in the service area that had arrived by general aviation aircraft. Average daily spending by all GA air travelers was $11,748 within the airport service area. The average economic impact of any arriving GA transient aircraft (combined overnight and day visitors staying more than 4 hours) was $605.

Spending for food and beverages accounted for 35 percent of GA visitor spending, with outlays of $1.2 million for the year. Spending by general aviation visitors for lodging was $1.5 million or 29 percent of the total.

Taken together, these two categories accounted for 64 percent of the economic benefits from GA visitors to Phoenix-Mesa Gateway Airport.

Of total off-airport spending of $4.3 million created by GA visitors, an average of 37 cents of each dollar was used within the service area by employers as earnings paid out to workers.

Wages taken home by tourism/visitor sector workers for spending in their own community summed to $1.6 million during the year. Earnings in the food and drink services industry accounted for one third of total earnings from GA visitor spending.

Expenditures by GA visitors created 65 primary jobs in the tourist sector in the service area. Food and drink spending created the greatest number of jobs, 28, followed by retail with 14 workers and lodging with 13.

TABLE C12
Economic Benefits from GA Visitors - Revenues, Earnings and Employment
Phoenix-Mesa Gateway Airport

Category	Spending per AC		Revenues	Earnings	Employment
	Overnight	Day			
Lodging	**$360**	**$0**	**$1,239,000**	**$455,000**	**13**
Food/Drink	**324**	**102**	**1,487,000**	**522,000**	**28**
Retail Sales	**229**	**0**	**788,000**	**339,000**	**14**
Entertainment	**144**	**20**	**568,000**	**188,000**	**8**
Ground Trans.	**137**	**40**	**206,000**	**84,000**	**2**
TOTAL	**$1,194**	**$162**	**$4,288,000**	**$1,588,000**	**65**

Note: Earnings and employment figures were derived from the IMPLAN input-output model based on data from the Arizona Department of Commerce and the United States Bureau of Economic Analysis. Employment is not necessarily full time equivalents; includes full and some part time workers, figures rounded to head counts. Ground Transportation figures do not include on-airport auto rental spending. On-site portion of auto rental is included in airport operations (Table C2).

<u>**Combined Airline and GA Visitors**</u>

Airline and general aviation visitors combined to spend $36.6 million in the service area during the year, creating 527 jobs off the airport with earnings to workers of $13.3 million (see Table C13).

There were 492,588 visitor days attributable to commercial and general aviation travelers during the year. Ninety one percent of visitor days (449,864) were due to commercial air travelers and nine percent of days (42,724) were from general aviation visitors.

On an average day, there were 1,350 air visitors in the service area. Average daily spending by all air travelers was $100,000 within the airport service area.

Table C13 shows that the largest spending category by aviation visitors was expenditures for lodging, with outlays of $13.4 million, or 37 percent of the total. Spending for food and drink accounted for 26 percent of visitor spending and was the second largest category, with outlays of $9.8 million.

TABLE C13
Economic Benefits from Airline and GA Visitors: Revenues, Earnings and Employment
Phoenix-Mesa Gateway Airport

Category	Revenues	Earnings	Employment
Lodging	$13,450,000	$4,940,000	143
Food/Drink	$9,770,000	$3,427,000	183
Retail Sales	$6,286,000	$2,705,000	109
Entertainment	$5,352,000	$1,772,000	76
Ground Transport	$1,738,000	$437,000	16
TOTAL	$36,596,000	$13,281,000	527

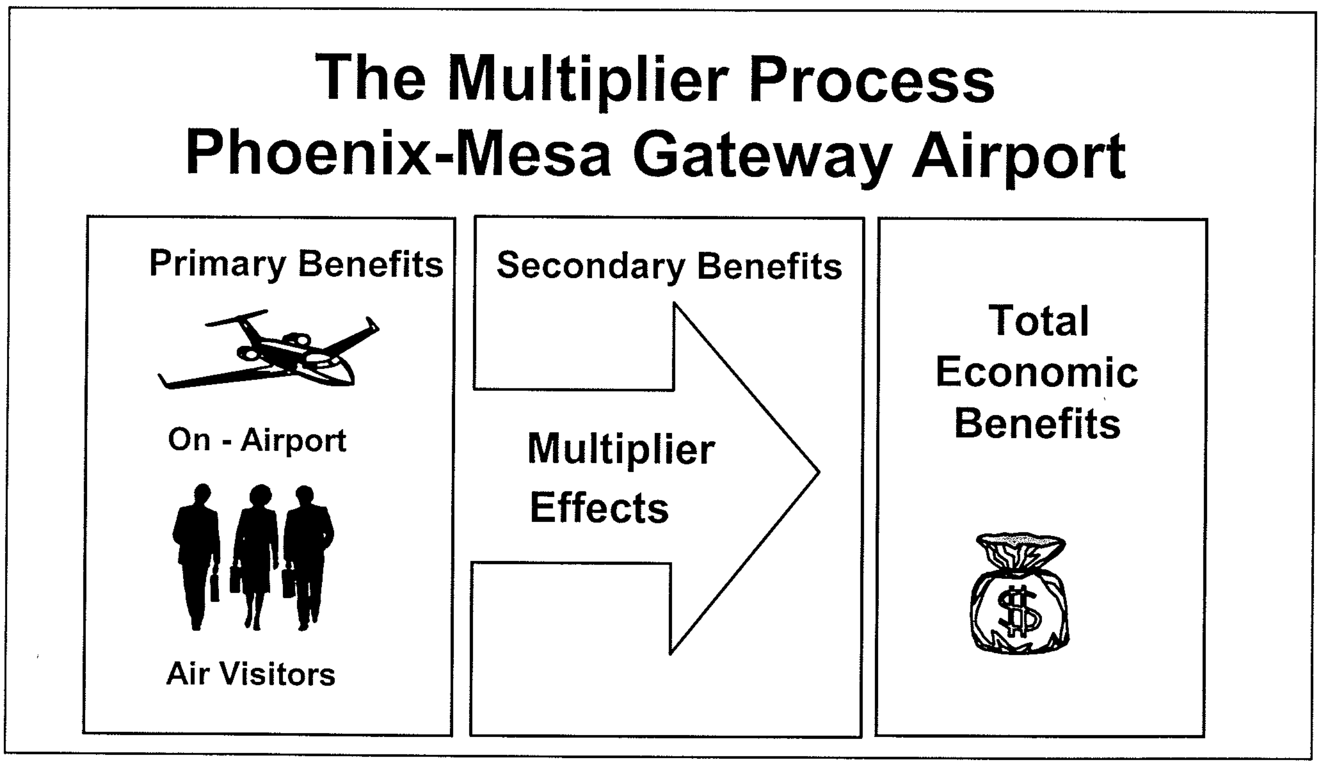
Note: Earnings and employment figures were derived from the IMPLAN input-output model based on data from the Arizona Department of Commerce and the United States Bureau of Economic Analysis. Employment is not necessarily full time equivalents; includes full and some part time workers, figures rounded to head counts. Ground Transportation figures do not include on-airport auto rental spending. On-site portion of auto rental is included in airport operations (Table C2).

SECONDARY BENEFITS: MULTIPLIER EFFECTS

The output, employment, and earnings from on-airport activity and off-airport visitor spending represent the initial or primary benefits from the presence of Phoenix-Mesa Gateway Airport. For the service area, these primary benefits summed to $213.3 million of output (measured as revenues to firms and budgets of administrative units), 2,081 jobs, and earnings to workers and proprietors of $84.1 million. These figures for initial economic activity created by the presence of the airport do not include the "multiplier effects" that result from additional spending induced in the economy.

Production of aviation output requires inputs in the form of supplies and labor. Purchase of inputs by aviation firms has the effect of creating secondary revenues and employment that should be included in total benefits of the airport. Airport benefit studies rely on multiplier factors from input-output models to estimate the impact of secondary spending on output, earnings and employment to determine secondary and total benefits, as illustrated in the figure below.

The multipliers used for this study were from the IMPLAN input-output model based on data from the Arizona Department of Commerce and the U. S. Bureau of Economic Analysis. To demonstrate the methodology, average aggregated multipliers are shown in Table C14. The full analysis used separate multipliers for each industry.



The multipliers represent weighted averages for combined industries in each category. For example, the visitor benefits multipliers shown combine lodging, food services, retailing, auto rental and entertainment multipliers used in the analysis.

The multipliers in this table illustrate the process for calculating the secondary and total impacts on all industries of the regional economy resulting from the primary impact of each aviation related industry. The multipliers for output show the average dollar change in revenues for all firms in the service area due to a one-dollar increase in revenues either on the airport or through visitor spending.

For example, each dollar of new output (revenue) created by on-airport employers circulates through the economy until it has stimulated total output in all industries in the service area of $449.2 million or, put differently, the revenue multiplier of 2.2317 for on-airport activity shows that for each dollar spent on the airport there is additional spending created of 1.2317 or $1.23 of secondary or multiplier spending.

Primary revenues from all sources associated with the presence of Phoenix-Mesa Gateway Airport were $237.9 million for the year. After accounting for the multiplier effect, total revenues created within the service area were $534.6 million. Secondary or multiplier revenues were $296.7 million, the difference between total and primary revenues.

The multiplier for earnings shows the dollar change in earnings for the service area economy due to a one-dollar increase in earnings either on the airport or in the visitor sector. The earnings multipliers determine how wages paid to workers on or off the airport stay within the economy and create additional spending and earnings for workers in non-aviation industries. For example, each dollar of wages paid for workers on the airport stimulates an overall total of $2.42 of earnings in the total economy.

The initial primary wages of $73.4 million for aviation workers and proprietors on the airport were spent for consumer goods and services that in turn created additional earnings of $104.5 million for workers and proprietors in the general economy.

The total earnings benefit of the airport was $209.2 million, consisting of $86.7 million of primary benefits and $122.5 million of secondary benefits. The economic interpretation is that the presence of the airport provided employment and earnings for workers, who then re-spent these dollars in the service area.

The multipliers for employment show the total change in jobs for the service area economy due to an increase of one job on or off the airport. Each job on the airport is associated with 2.49 total jobs in the overall airport service area economy. Each job on the airport supports 1.49 additional jobs in the rest of the economy.

The overall result is that the 1,778 primary jobs created by the airport supported an additional 2,297 jobs in the service area as secondary employment. The sum of the primary aviation related jobs and secondary jobs created in the general economy is the total employment of 4,075 workers that can be attributed to the presence of the airport.

The information above is intended for illustration only. In the full analysis 21 separate multipliers were used for on-airport aviation employers and visitor spending categories.

TABLE C14
Average Multipliers and Secondary Benefits Within the Airport Service Area
Phoenix-Mesa Gateway Airport

Revenue Source	Primary Revenues	Average Output Multipliers	Secondary Revenues	Total Revenues
On-Airport Benefits	$201,264,000	2.2317	$247,916,000	$449,180,000
Visitor Benefits	36,596,000	2.3344	48,837,000	85,433,000
Revenues	*$237,860,000*	2.2476	*$296,753,000*	*$534,613,000*
Earnings Source	**Primary Earnings**	**Average Earnings Multipliers**	**Secondary Earnings**	**Total Earnings**
On-Airport Benefits	$73,397,000	2.4241	$104,525,000	$177,922,000
Visitor Benefits	13,281,000	2.3537	17,979,000	31,260,000
Earnings	*$86,678,000*	2.4133	*$122,505,000*	*$209,182,000*
Employment Source	**Primary Employment**	**Average Employment Multipliers**	**Secondary Employment**	**Total Employment**
On-Airport Benefits	1,251	2.4963	1,872	3,123
Visitor Benefits	527	1.8066	425	952
Employment	1,778	2.2919	2,297	4,075

Notes: Multipliers above are weighted averages intended to illustrate how secondary and total benefits were calculated for Phoenix-Mesa Gateway Airport. In the full analysis, separate multipliers were used for on-airport employers (airlines, FBO, other aviation businesses), and visitor spending (lodging, eating places, retailing, entertainment, and ground transportation). Multipliers were for Phoenix-Mesa Gateway Airport service area (Maricopa County) as produced by the IMPLAN input-output model based on data from the Arizona Department of Commerce and U. S. Bureau of Economic Analysis.

CURRENT & FUTURE BENEFITS

Airports are available to serve the flying public and support the regional economy every day of the year. On a typical day at Phoenix-Mesa Gateway Airport, there are more than 700 operations by aircraft involved in local or itinerant activity including flight training, cargo service, private pilot or corporate travel, or commercial aircraft bringing passengers visiting the area for personal travel or on business.

During each day of the year, Phoenix-Mesa Gateway Airport generates $1,465,000 of revenues within its service area (see box). Revenues and production support jobs, not only for the suppliers and users of aviation services, but throughout the economy.

Each day Phoenix-Mesa Gateway Airport provides 1,251 jobs directly on the airport and in total supports 4,075 area workers who bring home daily earnings of $573,000 for spending in their home communities.

On an average day during the year, there are 1,350 visitors in the area who arrived at Phoenix-Mesa Gateway Airport. Some will stay in the Greater Phoenix area for only a few hours while they conduct their business, and others will stay overnight. The average spending by these visitors on a typical day injects $100,000 into the local economy.

Table C21 compares current economic benefits associated with the airport with benefits from 1998. Capital spending outlays have been removed to offset the influence of fluctuations in capital spending from year to year.

Phoenix-Mesa Gateway Airport Daily Economic Benefits

- **$1.465 Million Daily Revenues**
- **4,075 Area Jobs Supported**
- **$100,000 Visitor Spending**
- **1,350 Air Visitors**

TABLE C21
Ratio of Economic Benefits: FY 2008 vs. FY 1998
(Capital Improvement Projects and Construction Not Included)
Phoenix-Mesa Gateway Airport

2007/2008	Revenues	Earnings	Employment
On-Airport Activity	**$121,864,000**	**$35,490,000**	**612**
Air Visitors	**68,419,000**	**24,797,000**	**968**
Primary Benefits	**190,283,000**	**60,287,000**	**1,580**
Secondary Benefits	**162,377,000**	**58,577,000**	**1,002**
Total Benefits	**$352,660,000**	**$118,864,000**	**2,582**
1997/1998 (2008 Dollars)	**Revenues**	**Earnings**	**Employment**
Total Benefits	**$131,178,000**	**$39,253,000**	**1,019**
Growth Ratio	**Revenues**	**Earnings**	**Employment**
Ratio 2008/1998	**2.7**	**3.0**	**2.5**

Note: All figures expressed in 2008 dollars; capital improvement and construction outlays not included.

Removing the influence of construction, but including secondary or multiplier effects, total benefits to the service area for 2007/2008 are $352.7 million in revenues, 2,582 jobs and earnings of $118.9 million.

The 1997/1998 total benefits figures were taken from the economic benefit study completed in 1998, utilizing the same methodology as the current report. Dollar figures were adjusted from 1998 to 2008 values so the changes in dollar value of benefits represent real growth.

Total benefits of Phoenix-Mesa Gateway Airport have more than doubled during the past decade. Revenues are 2.7 times greater in 2008 and earnings to workers are now 3.0 times greater. Employment associated with the presence of the airport is 2.5 times greater.

As aviation activity increases in the airport service area, the economic benefits of the airport to the regional economy can be expected to increase (forecasts below do not include capital projects, a significant source of employment and earnings).

2012 Forecast

The planning horizon to 2012 is associated with an increase in enplanements to an annual level of 350,000 (Table C22). In the forecasts in these tables, enplanement growth is the driver of increases in revenues, employment and earnings. Visitor spending is projected to grow at the rate of enplanement growth. On-airport employment increases at a somewhat slower pace than enplanements, since it is also related to such factors as general aviation demand and available sites for facilities.

Not including outlays for capital projects, by 2012 on-airport operations will bring revenues of $197.1 million and employment on the airport will be 990 workers. By 2012, Embraer and Cessna Aircraft facilities will combine to provide employment for 150 workers or more. The forecasts assume another employer replaces the jobs lost by the departure of Silver State Helicopters.

Visitor spending will exceed $100 million (measured in 2008 dollars) and jobs related to air visitors will increase to 1,550.

The revenue benefits due to the presence of the airport will rise to $683.5 million, including all multiplier effects, but not including construction.

2017 Forecast

The planning horizon to 2017 is based on enplanements of 850,000 passengers (Table C23). Employment on the airport will exceed 1,700 jobs and a significant proportion of the increased employment will be related to passenger services including rental cars, food and retail, and airline operations. Air carrier activity will have to rise to serve an eight-fold increase in passengers.

TABLE C22
Summary of Economic Benefits: Short Term (2012)
Phoenix-Mesa Gateway Airport

	Revenues	Earnings	Employment
On-Airport Activity	**$197,113,000**	**$57,405,000**	**990**
Air Visitors	**107,624,000**	**39,796,000**	**1,550**
Primary Benefits	**304,737,000**	**97,201,000**	**2,540**
Secondary Benefits	**378,745,000**	**138,419,000**	**2,897**
Total Benefits	**$683,482,000**	**$235,620,000**	**5,437**

Note: Revenues, earnings and employment for period to 2012 reflect activity associated with passenger enplanements of 350,000; does not include capital improvement and construction projects. All figures in 2008 dollars.

TABLE C23
Summary of Economic Benefits: Intermediate Term (2017)
Phoenix-Mesa Gateway Airport

	Revenues	Earnings	Employment
On-Airport Activity	**$355,454,000**	**$103,518,000**	**1,785**
Air Visitors	**261,373,000**	**96,647,000**	**3,763**
Primary Benefits	**616,827,000**	**200,165,000**	**5,548**
Secondary Benefits	**772,796,000**	**283,452,000**	**6,006**
Total Benefits	**$1,389,623,000**	**$483,617,000**	**11,554**

Note: Revenues, earnings and employment for period to 2017 reflect activity associated with passenger enplanements of 850,000; does not include capital improvement and construction projects. All figures in 2008 dollars

TABLE C24
Summary of Economic Benefits: Long Term (2027)
Phoenix-Mesa Gateway Airport

	Revenues	Earnings	Employment
On-Airport Activity	**$665,943,000**	**$193,941,000**	**3,344**
Air Visitors	**676,495,000**	**250,145,176**	**9,740**
Primary Benefits	**1,342,438,000**	**444,086,176**	**13,085**
Secondary Benefits	**1,697,132,000**	**624,998,824**	**13,422**
Total Benefits	**$3,039,570,000**	**$1,069,085,000**	**26,507**

Note: Revenues, earnings and employment for period to 2012 reflect activity associated with passenger enplanements of 2,200,000; does not include capital improvement and construction projects. All figures in 2008 dollars.

The forecast does not make explicit allowance for development of airport acreage for industrial sites. However, it is expected that by 2017 the continued growth of the Greater Phoenix Metropolitan Area economy will lead to at least partial development of nearly 200 acres available on airport property.

Applying typical ratios from the Greater Phoenix area, 190 acres of land devoted to industrial development would create up to 3,000 jobs at full build out.

Even without the potential influence of industrial and commercial development on and near the airport, the total employment impact on and off the airport after all multiplier effects by 2017 is 11,545 jobs, with earnings rising to $483.6 million. Revenues will increase to $1.4 billion (2008 dollars) in the intermediate term.

2027 Forecast

The 2027 forecast is associated with passenger enplanements of 2,200,000. At this level of activity, the percentage of visitors is likely to decrease slightly from 60 percent, but it is still most likely that Phoenix-Mesa Gateway Airport will be bringing in well over one million visitors to Arizona per year. (At Phoenix Sky Harbor Airport, 56 percent of non-connecting enplanements are visitors.)

Air visitors could be expected to spend $676.5 million in the airport service area, creating over 9,700 jobs in the hospitality industry (Table C24).

By 2027, the airport is projected to have more than 50 based jets and accommodate more than 245,000 itinerant operations per year.

On-airport employment to serve this level of general aviation and airline passenger activity would exceed 3,300 jobs. The combined primary revenues due to on-airport and visitor activity will reach $1.3 billion dollars (in constant 2008 dollars).

Allowing for secondary benefits of multiplier effects as primary spending recirculates in the regional economy, the total benefits associated with the presence of the airport would be three billion dollars, supporting 26,507 jobs in the airport service area.

PhxMesa Gateway Airport

Appendix D

ENVIRONMENTAL EVALUATION & NCP REVIEW

Appendix D
ENVIRONMENTAL EVALUATION AND NOISE COMPATIBILITY PROGRAM (NCP) REVIEW

A review of the potential environmental impacts associated with proposed airport projects is an essential consideration in the airport master planning process. The primary purpose of this evaluation is to review the planned improvement program for Phoenix-Mesa Gateway Airport to determine whether the planned actions could, individually or collectively, have the potential to significantly affect the quality of the environment.

Construction of the improvements depicted on the Airport Layout Plan will require compliance with the *National Environmental Policy Act* (NEPA) *of 1969*, as amended, to receive federal financial assistance. For projects not categorically excluded under Federal Aviation Administration (FAA) Order 1050.1E, *Environmental Impacts: Policies and Procedures*, compliance with NEPA is generally satisfied through the preparation of an Environmental Assessment (EA). In instances in which significant environmental impacts are expected, an Environmental Impact Statement (EIS) may be required. While this portion of the master plan is not designed to satisfy the NEPA requirements for a categorical exclusion, EA, or EIS, it is intended to supply a preliminary review of environmental issues that would need to be analyzed in more detail within the NEPA process. This evaluation considers all environmental categories required for the NEPA process as outlined 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.* Of the 19 plus environmental categories, the following resources are not found within the airport environs.

- Coastal Resources
- Wild and Scenic Rivers

The following sections describe potential impacts to the remaining resources (as outlined within Appendix A of FAA Order 1050.1E) as development at the airport is undertaken. Exhibit 5A in Chapter Five depicts the proposed future development of the airport.

AIR QUALITY

The U.S. Environmental Protection Agency (EPA) has adopted air quality standards that specify the maximum permissible near-term and long-term concentrations of various air contaminants. Primary air quality standards are established at levels to protect the public health from harm with an adequate margin of safety. Secondary standards are set at levels necessary to protect the public health and welfare from any known or anticipated adverse effects of a pollutant. All areas of the country are required to demonstrate attainment with the National Ambient Air Quality Standards (NAAQS). The federal air quality standards focus on limiting the quantity of six criteria pollutants:

- Ozone (O_3)
- Carbon Monoxide (CO)
- Sulfur Dioxide (SO_x)
- Nitrogen Dioxide (NO_x)
- Particulate Matter (PM_{10} and $PM_{2.5}$)
- Lead (Pb)

The Maricopa County Air Quality Department has adopted the federal ambient air quality standards, the primary and secondary standards for each pollutant as presented in **Table D1**.

TABLE D1
Ambient Air Quality Standards

Pollutant	Averaging Time	Primary Standard	Secondary Standard
Carbon Monoxide (CO) in parts per million (ppm)	8-hour 1-hour	9 35	– –
Nitrogen Dioxide (NO_x) in ppm	Annual	0.053	0.053
Ozone (O_3) in ppm	1-hour 8-hour	0.12 0.08	0.12 0.08
Lead (Pb) in micrograms per cubic meter	Quarterly Average	1.5	1.5
Particulate Matter (PM_{10}) in micrograms per cubic meter	Annual 24-hour	50 150	50 150
Particulate Matter ($PM_{2.5}$) in micrograms per cubic meter	Annual 24-Hour	65 15	65 15
Sulfur Dioxide (SO_x) in ppm	Annual 24-hour 3-hour	0.03 0.14 –	– – 0.50

Source: U.S. Environmental Protection Agency

Air contaminants increase the aggravation and production of respiratory and cardiopulmonary diseases. The standards also establish the level of air quality which is necessary to protect the public health and welfare including, among other things, effects on crops, vegetation, wildlife, visibility, and climate, as well as effects on materials, economic values, and on personal comfort and well-being.

Potentially significant air quality impacts associated with an FAA project or action would occur if the project or action exceeds one or more of the NAAQS for any of the time periods analyzed.

Phoenix-Mesa Gateway Airport is located in Maricopa County, which is in nonattainment for Ozone (both 8-hour and 1-hour) and Particulate Matter (PM10). Additional air quality analysis is needed to determine potential impacts to air quality that may result from implementation of the various planned development projects at the airport. Planned projects at the airport including the construction of the taxiway and taxilane system, runway extensions, pavement strengthening, terminal expansion, cargo facilities, parking lots, and access roads could have temporary air quality impacts during construction. Emissions from the operation of construction vehicles and fugitive dust from pavement removal are common air pollutants during construction. However, with the use of best management practices (BMPs) during construction, these air quality impacts can be significantly lessened.

COMPATIBLE LAND USE AND NOISE

An airport's compatibility with surrounding land uses is usually associated with the extent of the airport's noise impacts. Airport projects such as those needed to accommodate fleet mix changes, an increase in operations at the airport, or air traffic changes are examples of activities which can alter noise impacts and affect surrounding land uses. Typically, if the noise analysis concludes that there is no significant impact, a similar conclusion usually can be made with respect to compatible land use. FAA Orders 1050.1E and 5050.4B define a significant noise impact as one which would occur if proposed airport development would cause noise-sensitive areas to experience an increase in noise of 1.5 DNL or more, at or above the 65 DNL noise exposure level when compared to the no action alternative for the same timeframe. The Integrated Noise Model (INM) describes aircraft noise in the *Yearly Day-Night Average Sound Level* (DNL). DNL is defined as the average A-weighted sound level as measured in decibels (dB) during a 24-hour period. A 10-dB penalty applies to noise events occurring at night (10:00 p.m. to 7:00 a.m.). DNL is a summation metric which allows objective analysis and can describe noise exposure comprehensively over a large area. DNL is the noise metric preferred by the FAA, EPA, and Department of Housing and Urban Development (HUD), among others, as an appropriate measure of cumulative noise exposure.

Since noise decreases at a constant rate in all directions from a source, points of equal DNL noise levels are routinely indicated by means of a contour line. The various contour lines are then superimposed on a map of the airport and its environs. It is important to recognize that a line drawn on a map does not imply that a particular noise condition exists on one side of the line and not on the other. DNL calculations do not precisely define noise impacts. Nevertheless, DNL contours can be used to: (1) highlight existing or potential incompatibilities between an airport and any surrounding development; (2) assess relative exposure levels; (3) assist in the preparation of airport environs land use plans; and (4) provide guidance in the development of land use control devices, such as zoning ordinances, subdivision regulations, and building codes.

The noise contours for Phoenix-Mesa Gateway Airport have been developed with INM Version 7.0. The INM was developed by the Transportation Systems Center of the U.S. Department of Transportation at Cambridge, Massachusetts, and has been specified by the FAA as one of the two models acceptable for federally funded noise analysis.

The INM is a computer model which accounts for each aircraft along flight tracks during an average 24-hour period. These flight tracks are coupled with separate tables contained in the database of the INM, which relate to noise, distances, and engine thrust for each make and model of aircraft type selected.

Computer input files for the noise analysis contain operational data, runway utilization, aircraft flight tracks, and fleet mix as projected in the plan. The operational data and aircraft fleet mix are summarized in **Table D2**. These estimates were derived from a review of instrument flight plans maintained by the FAA and existing airport records.

TABLE D2
Noise Model Input: Aircraft Operations
Phoenix-Mesa Gateway Airport

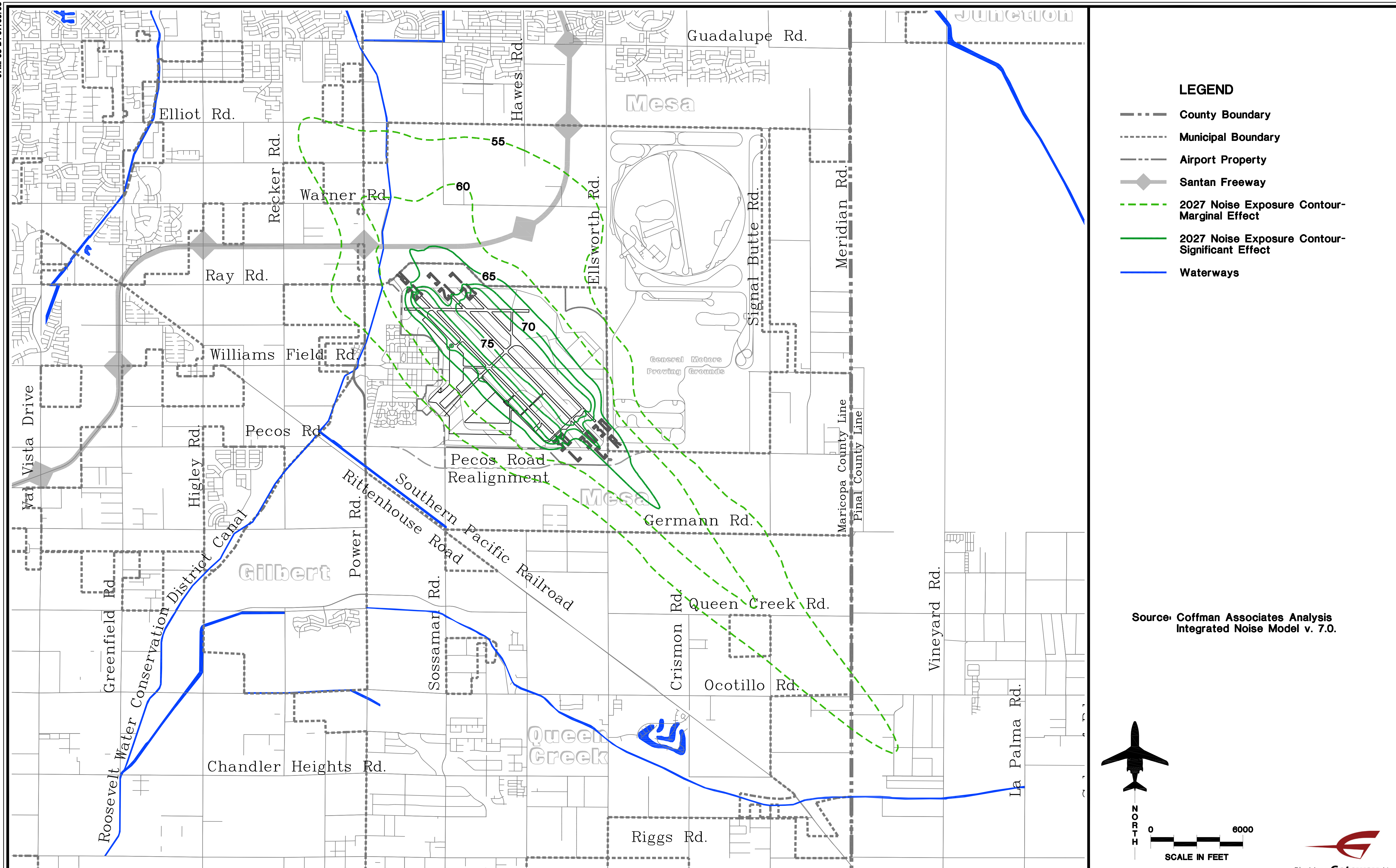
Aircraft	INM Designator	2027
Itinerant		
Air Carrier and Air Cargo		
Stage 3 Jet, Large	767300	4,468
Stage 3 Jet, Large	757300	4,467
Stage 3 Jet, Medium	737300	19,965
Stage 3 Jet, Medium	MD81	9,633
Stage 3 Jet, Small	GV	9,633
Subtotal		48,166
Air Taxi		
Stage 3 Jet	767JT9	3,500
Subtotal		3,500
Air Taxi		
Stage 3 Jet, Medium	LEAR35	6,860
Turboprop	CNA441	4,573
Very Light Jet	CNA55B(VLJ)	4,573
SEP Variable	GASEPF	1,143
SEP Fixed	GASEPV	1,143
Light Twin	BEC58P	4,573
Subtotal		22,866
General Aviation		
Single-engine, fixed	GASEPV	40,556
Single-engine, variable	GASEPF	40,555
Multi-engine	BEC58P	47,985
Turboprop – Small	CNA441	5,000
Stage 3 Jet, Small	CL600	12,532
Stage 3 Jet, Medium	LEAR35	12,531
Stage 3 Jet, Medium	GIV	9,398
Stage 3 Jet, Large	737300	1,880
Very Light Jet	CNA55B(VLJ)	12,531
Helicopter	R22	5,000
Subtotal		187,968
Military		
Trainer	T-38A	5,000
Subtotal		5,000
Itinerant Subtotal		267,500
Local		
General Aviation		
Single-engine fixed	GASEPV	105,833
Single-engine variable	GASEPF	105,832

TABLE D2 (Continued) Noise Model Input: Aircraft Operations Phoenix-Mesa Gateway Airport		
Aircraft	**INM Designator**	**2027**
Local (Continued)		
General Aviation		
Multi-engine	BEC58P	15,890
Turboprop	CNA441	5,297
Stage 3 Jet – Small	CNA500	5,297
Helicopter, Small	R22	29,134
Helicopter, Large	B206L	7,284
Subtotal		**260,000**
Military		
Refueling Tanker	767300	**1,875**
C-130	C-130E	**1,875**
Single Engine Attack	F16E	**1,875**
Turboprop	C12	**1,875**
Subtotal		**7,500**
Local Subtotal		**267,500**
Total		**535,000**
Source: Coffman Associates analysis; 2008 Master Plan forecast		

In addition to operational fleet mix, runway use influences the shape of the noise exposure contours. **Table D3** presents the runway use assumptions for the noise exposure contours. These assumptions are based on a review of previous noise documentation for the airport, discussions with airport staff, and an evaluation of future operating conditions at the airport.

The forecast noise exposure contours for Phoenix-Mesa Gateway Airport are shown on **Exhibit D1**. The forecast 65 DNL noise contour covers approximately 3.3 square miles and extends off airport property to the southeast and to the northwest.

Title 14 of the Code of Federal Regulations (14 CFR), Part 150 recommends guidelines for planning land use compatibility within various levels of aircraft noise. As the name indicates, these are guidelines only; Part 150 explicitly states that determinations of noise compatibility and regulation of land use are purely local responsibilities. Part 150 also outlines the methodology for undertaking an airport Noise Compatibility Study. A Part 150 Noise Compatibility Study was prepared for Phoenix-Mesa Gateway Airport in 2001. A summary of the study's recommendations and their status is included at the end of this appendix.



PhxMesa Gateway Airport

Exhibit D1
2027 NOISE EXPOSURE CONTOURS

07MP03-D1-07/09/08

TABLE D3 Noise Model Input: Runway Use Percentages Phoenix-Mesa Gateway Airport				
RUNWAY	**General Aviation**	**Commercial**	**Air Cargo**	**Military**
Arrivals				
Runway 12L	0%	5%	0%	5%
Runway 30R	0%	5%	0%	10%
Runway 12C	25%	25%	25%	20%
Runway 30C	65%	65%	65%	55%
Runway 12R	5%	0%	5%	5%
Runway 30L	5%	0%	5%	5%
Departures				
Runway 12L	0%	25%	0%	20%
Runway 30R	0%	60%	0%	50%
Runway 12C	10%	5%	5%	5%
Runway 30C	25%	10%	10%	15%
Runway 12R	20%	0%	25%	5%
Runway 30L	45%	0%	60%	5%
Touch And Go's				
Runway 12L	15%	0%	0%	25%
Runway 30R	35%	0%	0%	65%
Runway 12C	0%	0%	0%	5%
Runway 30C	0%	0%	0%	5%
Runway 12R	15%	0%	0%	0%
Runway 30L	35%	0%	0%	0%
Source: Coffman Associates analysis.				

No noise-sensitive land uses are contained within these contours. Additionally, the current *City of Mesa General Plan* indicates that there are no noise-sensitive land uses planned for these areas. As projects such as the planned runway extensions are undertaken, this noise and land use analysis will need to be revisited to confirm the fleet mix and anticipated numbers of operations.

CONSTRUCTION IMPACTS

Construction impacts typically relate to the effects on specific impact categories, such as air quality or noise, during construction. The use of BMPs during construction is typically a requirement of construction-related permits such as a National Pollutant Discharge Elimination System (NPDES) permit. Use of these measures typically alleviates potential resource impacts.

Short-term construction-related noise impacts could occur with implementation of the planned airport improvements including the taxiway and taxilane system, runway extensions, pavement strengthening, terminal expansion, cargo facilities, parking lots, and access roads as there are scattered residences in the vicinity. However, these impacts typically do not arise unless construction is being undertaken during early morning, evening, or nighttime hours. Furthermore, the proposed projects will be undertaken on a demand basis and will not be constructed simultaneously.

Construction-related air quality impacts can be expected. Air emissions related to construction activities will be short-term in nature and will be included in air emission inventories, as requested during the NEPA documentation processes for the various improvements.

FARMLAND

Under the *Farmland Protection Policy Act* (FPPA), federal agencies are directed to identify and take into account the adverse effects of federal programs on the preservation of farmland, to consider appropriate alternative actions which could lessen adverse effects, and to assure that such federal programs are, to the extent practicable, compatible with state or local government programs and policies to protect farmland. The FPPA guidelines apply to farmland classified as prime or unique, or of state or local importance as determined by the appropriate government agency, with concurrence by the Secretary of Agriculture.

The 30 acres identified for property acquisition are not classified as prime or unique farmland by the Natural Resources Conservation Service. The remaining areas planned for development are on airport property and are dedicated to airport uses; therefore, FPPA does not apply.

FISH, WILDLIFE, AND PLANTS

A number of acts and executive orders have been put into place to protect threatened or endangered species and their habitat. Following is a brief description of these various levels of protection:

- Section 7 of the *Endangered Species Act* (ESA), as amended, applies to federal agency actions and sets forth requirements for consultation to determine if the proposed action "may affect" a federally endangered or threatened species. If an agency determines that an action "may affect" a federally protected species, then Section 7(a)(2) requires each agency to consult with the U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS), as appropriate, to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of any federally listed endangered or threatened species, or result in the destruction or adverse modification of critical habitat. If a species has been listed as a candidate species, Sec. 7 (a)(4) states that each agency must confer with the FWS and/or NMFS.

- The *Sikes Act* and various amendments authorize states to prepare statewide wildlife conservation plans, and the Department of Defense (DOD) to prepare similar plans, for resources under their jurisdiction. Airport improvement projects should be checked for consistency with the State or DOD Wildlife Conservation Plans where such plans exist.

- The *Fish and Wildlife Coordination Act* requires that agencies consult with the state wildlife agencies and the Department of the Interior concerning the conservation of wildlife resources where the water of any stream or other water body is proposed to be controlled or modified by a federal agency or any public or private agency operating under a federal permit.

- The *Migratory Bird Treaty Act* (MBTA) prohibits private parties and federal agencies in certain judicial circuits from intentionally taking a migratory bird, their eggs, or nests. The MBTA prohibits activities which would harm migratory birds, their eggs, or nests unless the Secretary of the Interior authorizes such activities under a special permit.

- Executive Order 13112, *Invasive Species*, directs federal agencies to use relevant programs and authorities to the extent practicable and subject to available resources to prevent the introduction of invasive species and provide for restoration of native species and habitat conditions in ecosystems that have been invaded. The FAA is to identify proposed actions that may involve risks of introducing invasive species on native habitat and populations. "Introduction" is the intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity. "Invasive Species" are alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health.

According to FAA Order 1050.1E, a significant impact to listed threatened or endangered species would occur when the FWS or NMFS determines that the proposed action would likely jeopardize the continued existence of the species in question or would result in the destruction or adverse modification of critical habitat for the species. However, an action need not involve a threat to extinction to federally listed species to result in a significant impact; lesser impacts, including impacts on non-listed species, could also constitute a significant impact.

Previous coordination with the Arizona Game and Fish Department (AGFD) from the Airport's 2006 Environmental Inventory indicated that no special status species are located within a five-mile radius of the airport. Additionally, the proposed projects are not located within the vicinity of any designated or proposed critical habitats. A search conducted using the AGFD's State of Arizona On-Line Environmental Review Tool indicated that no special status species have been documented within the airport vicinity.

Table D4 indicates the threatened, endangered, and candidate species for Maricopa County. Of the 13 species in the table, the four fish are unlikely to occur within the planned project areas as there is no suitable habitat to sustain them.

TABLE D4
Federally Listed Threatened (T), Endangered (E), and Candidate (C) Species in Maricopa County, Arizona

Species	Scientific Name	Federal Status
Birds		
brown pelican	*Pelecanus occidentalis*	E
Mexican spotted owl	*Strix occidentalis lucida*	T
southwestern willow flycatcher	*Empidonax traillii extimus*	E
yellow-billed Cuckoo	*Coccyzus americanus*	C
Yuma clapper rail	*Rallus longirostris yumanensis*	E
Fishes		
desert pupfish	*Cyprinodon macularius*	E
Gila chub	*Gila intermedia*	E
Gila topminnow (incl. Yaqui)	*Poeciliopsis occidentalis*	E
razorback sucker	*Xyrauchen texanus*	E
Flowering Plants		
Arizona Cliff-rose	*Purshia (=Cowania) subintegra*	E
Mammals		
lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	E
Sonoran pronghorn	*Antilocapra americana sonoriensis*	E

Source: U.S. Fish and Wildlife Service, Southwest Region, Threatened and Endangered Species List

Five of the listed species for the county are birds including the brown pelican, Mexican spotted owl, southern willow flycatcher, yellow billed Cuckoo, and Yuma clapper rail. The brown pelican's habitat is coastal areas including those along inland bodies of water. This species will not be affected by the proposed projects as this habitat is not present within the vicinity of the airport. The Mexican spotted owl will also not be affected by the proposed development. The Mexican spotted owl's habitat is canyon and forested mountain areas, which are not present at the airport. The southern willow flycatcher and yellow-billed Cuckoo's habitat includes the riparian areas along streams, rivers, and other wetlands, conditions which do not exist at the airport. The Yuma clapper rail is a marsh bird found in dense cattail or cattail-bulrush marshes along the lower Colorado River. This habitat is not present at the airport and, therefore, this species will not be affected by the proposed projects at the airport.

Of the 13 species on the list, four are fish. The habitat for these species is shallow desert pools. This habitat is not located within the project area; therefore, these species will not be affected by the proposed development.

The Arizona cliff rose habitat is restricted to a single layer of chalky white lake deposit limestone, which form the top layer of finger-like mesas identified in four areas of Arizona. This habitat is not present at the airport.

The lesser long-nosed bat and Sonoran pronghorn are unlikely to occur within the project area; however, field surveys may be required to determine the presence of these or other listed species. The habitat for these species is desert scrub and alluvial valley areas, respectively. These habitats are not present within the planned project areas.

Further coordination with the FWS and AGFD will likely be needed prior to the development of various airport improvements, especially those that are planned in areas which have not been previously disturbed such as the terminal improvements and runway projects. It is likely that field surveys will be required to determine the presence of listed species. Additionally, no proposed or designated critical habitat exists within the airport environs.

HAZARDOUS MATERIALS, POLLUTION PREVENTION, AND SOLID WASTE

The airport must comply with applicable pollution control statutes and requirements. Impacts may occur when changes to the quantity or type of solid waste generated, or type of disposal, differ greatly from existing conditions.

Solid waste disposal facilities can cause a hazard to aircraft by attracting wildlife and, most importantly, birds. A bird hazard exists if the landfill is located approximately 5,000 feet from runways used by piston aircraft and 10,000 feet from runways used by turbojet aircraft.

The airport will need to continue to comply with an Arizona Pollution Discharge Elimination System (APDES) permit, which will ensure that pollution control measures are in place at the airport. As development occurs at the airport, the permit will need to be modified to reflect the additional impervious surfaces and stormwater retention facilities. The addition and removal of impervious surfaces may require modifications to this permit should drainage patterns be modified. Net increases in impervious surfaces are minimized by the removal of old pavement.

As documented in the 2006 Environmental Inventory for Phoenix-Mesa Gateway Airport, the Agency for Toxic Substances and Disease Registry (ATSDR) (an agency of the Department of Health and Human Resources), the United States Air Force identified 32 areas of potential concern at or near the airport resulting from its former use as a U.S. Air Force Base. These sites include landfills, fire protection training areas, pesticide burial areas, former skeet ranges and firing ranges, and hazardous materials storage areas. During a site visit conducted in 1997 by ATSDR, all 32 areas were examined for potential exposure pathways. The only area identified as a potential exposure pathway of concern was exposure to contaminated soil at the former skeet range. This site, located on airport property north of the approach end of Runway 12L, is planned to be used for aviation-related parcels under this plan. An environmental due diligence audit (EDDA) will be required prior to disturbing this area to determine the presence of any recognized environmental conditions. It was determined that the remaining 31 sites pose no public health hazard.

As noted within the environmental inventory for the 1999 Master Plan, the Air Force had operated a landfill on its former property; this landfill is not located on airport property. The inactive landfill has been capped with soil and rock, and is not considered to pose a bird hazard.

The 2008 airport master plan also includes a plan to acquire property at the southwest corner of the intersection of Ray Road and Ellsworth Road. An EDDA will be required prior to acquisition of the parcel located northeast of the planned terminal area to determine the presence of any recognized environmental conditions.

As a result of increased operations at the airport, solid waste output may slightly increase; however, these increases are not anticipated to be significant.

HISTORICAL, ARCHITECTURAL, AND CULTURAL RESOURCES

Determination of a project's environmental impact to historic and cultural resources is made under guidance in the *National Historic Preservation Act* (NHPA) *of 1966*, as amended, the *Archaeological and Historic Preservation Act* (AHPA) *of 1974*, the *Archaeological Resources Protection Act* (ARPA), and the *Native American Graves Protection and Repatriation Act* (NAGPRA) *of 1990*. In addition, the *Antiquities Act of 1906*, the *Historic Sites Act of 1935*, and the *American Indian Religious Freedom Act of 1978* also protect historical, architectural, archaeological, and cultural resources.

Section 106 of the NHPA of 1966, as amended, requires federal agencies to take into account the effects of their undertakings on historic properties and determine if any properties in, or eligible for inclusion in, the National Register of Historic Places (NRHP) are present in the area. In addition, it affords the Advisory Council on Historic Preservation a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in regulations issued by the council.

The ARPA is triggered by the presence of archaeological resources on federal or Indian lands. The AHPA describes the process when consultation with resource agencies indicates that there may be an impact on significant scientific, prehistoric, historic, archaeological, or paleontological resources. The process provides for the preparation of a professional resource survey of the area. Should the survey identify significant resources, the National Register process described above will be followed. Should the survey be inconclusive, a determination is made whether it is appropriate to provide a commitment to halt construction if resources are recovered, in order for a qualified professional to evaluate their importance and provide for data recovery as necessary.

The NAGPRA is triggered by the possession of human remains or cultural items by a federally funded repository or by the discovery of human remains or cultural items on federal or tribal lands and provides for the inventory, protection, and return of cultural items to affiliated Native American Groups. The Act includes provisions that, upon inadvertent discovery of remains, the action will cease in the area where the remains were discovered and the appropriate agency will be notified.

The *Antiquities Act of 1906* was the first general law providing protection for archaeological resources. It protects all historic and prehistoric sites on federal lands and prohibits excavation or destruction of such antiquities without the permission of the Secretary of the department having jurisdiction.

The *Historic Sites Act of 1935* declares as national policy the preservation for public use of historic sites, buildings, objects, and properties of national significance. It gives the Secretary of the Interior authority to make historic surveys, to secure and preserve data on historic sites, and to acquire and preserve archaeological and historic sites. This Act also establishes the National Historic Landmarks program for designating properties having exceptional value in commemorating or illustrating the history of the United States.

The *American Indian Religious Freedom Act of 1978* requires consultation with Native American groups concerning proposed actions on sacred sites, on federal land, or affecting access to sacred sites. It establishes federal policy to protect and preserve for American Indians, Eskimos, Aleuts, and Native Hawaiians their right to free exercise of their religion. It allows these peoples to access sites, use and possess sacred objects, and freedom to worship through ceremonial and traditional rites. The Act requires federal agencies to consider the impacts of their actions on religious sites and objects that are important to Native Americans regardless of the eligibility for the NRHP. Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments*, and the Presidential Memorandum of April 29, 1994, *Government to Government Relations with Native American Tribal Governments,* outline the government-to-government consultation process between the federal agency and the potentially affected tribe.

Development of projects would affect a property that is on or eligible for inclusion in the NRHP if it has the potential to alter the characteristics of the property which make it eligible for listing. Federal agencies can make one of three types of "effects findings" for an action: "no properties affected," "no adverse effect," and "adverse effect." The level of finding depends upon how severely a project would alter the characteristics of a property that make it eligible for the NRHP. Although the FAA works closely with the State Historic Preservation Officer (SHPO) and/or the Tribal

Historic Preservation Officer (THPO), the FAA is ultimately responsible for the effect decision, not the SHPO or THPO.

The Section 106 consultation process includes consideration of alternatives to avoid adverse effects on National Register listed or eligible properties; of mitigation measures; and of accepting adverse effects. The FAA makes the final determination on the level of effect, and advice from the SHPO/THPO may assist the FAA in making that determination.

As discussed within Chapter One, previous studies and coordination with the SHPO indicate that several cultural resource surveys have been completed for the area north of the airport for various highway projects. This area includes an existing archaeological site, known as the Berm Site, which includes prehistoric and historic materials. Additionally, a large prehistoric site, located southeast of the airport has been identified.

Prior to commencing construction on the proposed acquisition parcel, it is anticipated that a cultural resource survey will be required. Cultural resource surveys may also be required prior to commencing construction in previously undisturbed areas such as portions of the planned taxiway system, runway projects terminal expansion, parking lot construction, and access road projects.

LIGHT EMISSIONS AND VISUAL EFFECTS

Airport lighting is characterized as either airfield lighting (i.e., runway, taxiway, approach and landing lights) or landside lighting (i.e., security lights, building interior lighting, parking lights, and signage). Generally, airport lighting does not result in significant impacts unless a high intensity strobe light, such as a Runway End Identifier Light (REIL), would produce glare on any adjoining site, particularly residential uses.

Visual impacts relate to the extent that the proposed development contrasts with the existing environment and whether a jurisdictional agency considers this contrast objectionable. The visual sight of aircraft, aircraft contrails, or aircraft lights at night, particularly at a distance that is not normally intrusive, should not be assumed to constitute an adverse impact.

It is not anticipated that the planned airport development will result in significant lighting or visual impacts. If the potential for lighting or visual impacts is determined to be associated with the planned development, consultation with local residents and the owners of light-sensitive sites may be needed to determine possible alternatives to minimize these effects without risking aviation safety or efficiency. Additional coordination with state, regional, local art or architecture councils, tribes, or other organizations having an interest in airport-associated visual effects may be necessary.

NATURAL RESOURCES AND ENERGY SUPPLY

In instances of major proposed actions, power companies or other suppliers of energy will need to be contacted to determine if the proposed project demands can be met by existing or planned facilities.

There are no existing powerlines near the airport that would need to be relocated as a result of the planned development at the airport.

Increased use of energy and natural resources are anticipated as the operations at the airport grow. None of the planned development projects are anticipated to result in significant increases in energy consumption.

SOCIOECONOMIC, ENVIRONMENTAL JUSTICE, AND CHILDREN'S HEALTH AND SAFETY RISKS

Socioeconomic impacts known to result from airport improvements are often associated with relocation activities or other community disruptions, including alterations to surface transportation patterns, division or disruption of existing communities, interference with orderly planned development, or an appreciable change in employment related to the project. Social impacts are generally evaluated based on areas of acquisition and/or areas of significant project impact, such as areas encompassed by noise levels in excess of 65 DNL.

Executive Order 12898, *Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations*, and 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, as well as analysis that identifies and addresses potential impacts on these populations that may be disproportionately high and adverse.

Pursuant to Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, federal agencies are directed to identify and assess environmental health and safety risks that may disproportionately affect children. These risks include those that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products they may be exposed to.

The thresholds of significance for this impact category are reached if the project negatively affects a disproportionately high number of minority or low-income populations or if children would be exposed to a disproportionate number of health and safety risks. Significant socioeconomic impacts would result if an extensive number of residents need to be relocated and sufficient replacement housing is unavailable; if extensive relocation of businesses is required and this relocation would create a severe economic hardship for the affected communities; if disruptions of local traffic patterns would substantially reduce the level of service of the roads serving the airport and the surrounding community; or if there would be a substantial loss in the community tax base.

It is not anticipated that the proposed airport development projects would result in significant impacts within this impact category. The airport is not located within an area which would be considered an "environmental justice" area.

Approximately 30 acres would need to be acquired to accommodate the planned development. According to the Maricopa County Assessor's office, the four parcels identified for partial or complete acquisition are owned by a corporation. There are no existing structures on the parcels to be acquired. Relocation of residences, businesses, or farmland will not be required as part of the proposed property acquisition.

Potential risks to children from the development of the airport will be minimized through the use of standard security measures such as fencing and locks on cabinets or structures which contain hazardous materials.

WATER QUALITY

The *Clean Water Act* provides the authority to establish water quality standards, control discharges, develop waste treatment management plans and practices, prevent or minimize the loss of wetlands, and regulate other issues concerning water quality. Water quality concerns related to airport development most often relate to the potential for surface runoff and soil erosion, as well as the storage and handling of fuel, petroleum products, solvents, etc.

Water quality regulations and issuance of permits will normally identify any deficiencies in the proposed development with regard to water quality or any additional information necessary to make judgments on the significance of impacts. Difficulties in obtaining needed permits for the project, such as National Pollutant Discharge Elimination System (NPDES) or Section 404 permits, typically indicate a potential for significant water quality impacts.

With regard to construction activities, the Airport and all applicable contractors will need to obtain and comply with the requirements of the construction-related NPDES General Permit, including the preparation of a Notice of Intent and a Stormwater Pollution Prevention Plan, prior to the initiation of project construction activities.

The east side development at the airport, including the expanded terminal facilities, parking lot, and access road, will require the relocation of the Powerline Floodway. The Powerline Floodway was constructed by the Flood Control District of Maricopa County to manage floodwaters in 1968. Coordination with the Flood Control District of Maricopa County will be necessary. Additionally, coordination with the U.S. Army Corps of Engineers (USACE) will be necessary to determine whether the floodway is considered a jurisdictional water.

WETLANDS

The USACE regulates the discharge of dredged and/or fill material into waters of the United States, including adjacent wetlands, under Section 404 of the *Clean Water Act*.

Wetlands are defined by Executive Order 11990, *Protection of Wetlands*, as those areas that are inundated by surface or groundwater 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. Categories of wetlands include swamps, marshes, bogs, sloughs, potholes, wet meadows, river overflows, mud flats, natural ponds, estuarine areas, tidal overflows, and shallow lakes and ponds with emergent vegetation. Wetlands exhibit three characteristics: hydrology, hydrophytes (plants able to tolerate various degrees of flooding or frequent saturation), and poorly drained soils.

As outlined within FAA Orders 1050.1E and 5050.4B, a significant impact to wetlands would occur when the proposed action causes any of the following.

- The action would adversely affect the function of a wetland to protect the quality or quantity of municipal water supplies, including sole source, potable water aquifers.

- The action would substantially alter the hydrology needed to sustain the functions and values of the affected wetland or any wetlands to which it is connected.

- The action would substantially reduce the affected wetland's ability to retain floodwaters or storm-associated runoff, thereby threatening public health, safety, or welfare.

- The action would adversely affect the maintenance of natural systems that support wildlife and fish habitat or economically important timber, food, or fiber resources in the area or surrounding wetlands.

- The action would be inconsistent with applicable state wetland strategies.

As described within Chapter One, there are no wetlands present in the airport vicinity. The airport is located on a high, dry, desert plain.

FLOODPLAINS

Executive Order 11988 directs federal agencies, including the FAA, to take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health, and welfare, and restore and preserve the natural and beneficial values served by floodplains. A floodplain is defined as the "lowland and relatively flat areas adjoining inland and coastal waters…including at a minimum, that area subject to a one percent or greater chance of flooding in a given year" (i.e., an area that would be inundated by a 100-year flood).

A proposed project would be considered significant if it results in notable adverse impacts on natural and beneficial floodplain values. Typical mitigation measures for floodplain encroachments may include 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.

According to the Federal Emergency Management Agency (FEMA) Federal Insurance Rate Maps (FIRM) that include the airport, there are no facilities located within a 100-year floodplain or floodway.

EVALUATION OF CURRENT NOISE COMPATIBILITY PROGRAM

The current Noise Compatibility Plan (NCP) for Phoenix-Mesa Gateway Airport was accepted by the Federal Aviation Administration (FAA) in August 2001. The purpose of the previous Part 150 study was to evaluate noise impacts within the communities surrounding Phoenix-Mesa Gateway Airport. The outcome of the study included a set of Noise Exposure Maps dated 1999 and 2004, as well as a Noise Compatibility Plan that outlined strategies to improve compatibility between the airport and the surrounding areas. This appendix includes a comparison of the 1999 and 2004 operations levels to the current aircraft operations and noise exposure contours. Additionally, it summarizes the measures included in the existing Noise Compatibility Program and the current status of those recommendations.

AIRCRAFT OPERATIONS AND NOISE EXPOSURE CONTOUR COMPARISON

The number of annual operations at Phoenix Mesa Gateway Airport has fluctuated since the preparation of the 1999 noise exposure contours, as shown in **Table D5**.

The operations assumption for the 1999 noise exposure contours was 239,372. Since the completion of the Part 150 study, the number of operations at the airport dropped as low as 158,489 in 2000. Operations have since grown to 289,000 operations in 2006.

TABLE D5
Annual Operations Comparison
Phoenix Mesa Gateway Airport

Year	Total Operations
Operations Since 1999	
1999	239,373[1]
2000	158,489[2]
2001	161,222[2]
2002	178,489[2]
2003	182,009[2]
2004	240,483[2]
2005	276,489[2]
2006	289,000[3]
Forecast Operations	
2020	253,757[4]
2027	535,000[5]

[1] Operations from July 1998 through June 1999 used as a projection of 1999 operations for noise modeling.
[2] Airport traffic control tower records.
[3] Airport traffic control tower records for calendar year 2006. General aviation and air taxi activity were increased by approximately three percent to account for operations that occur at the airport when the tower is closed.
[4] *1999 Williams Gateway Airport Master Plan Update.*
[5] *2008 Phoenix Mesa Gateway Airport Master Plan Update.*

Forecast operations from the *1999 Williams Gateway Airport Master Plan Update* for 2020 are significantly lower than the 2027 forecasts prepared in the *2008 Phoenix Mesa Airport Master Plan Update.* The primary difference between the 1999 and 2008 forecasts is the drop in military operations, increase in general aviation itinerant operations, and increase in helicopter operations.

A comparison of the 2020 Noise Exposure Map (NEM) and the 2027 noise exposure contours prepared as part of this Master Plan are presented in **Exhibit D2**. As shown on the exhibit, the 2020 noise contours are longer than the 2027 contours. The difference in the contour shape can be attributed to a number of factors. As previously discussed, the type of aircraft operating at the airport has changed. With the 2027 noise exposure contours, the numbers of military operations have changed significantly. The military operation forecast has dropped from 33,000 in 2020 to 12,500 in 2027 based upon the most recent Master Plan forecasts. Runway 12R-30L is planned to be longer and projected to have more operations mix than previously projected. Additionally, the previous noise exposure contours were prepared with Integrated Noise Model (INM) Version 5.2a. The 2027 noise exposure

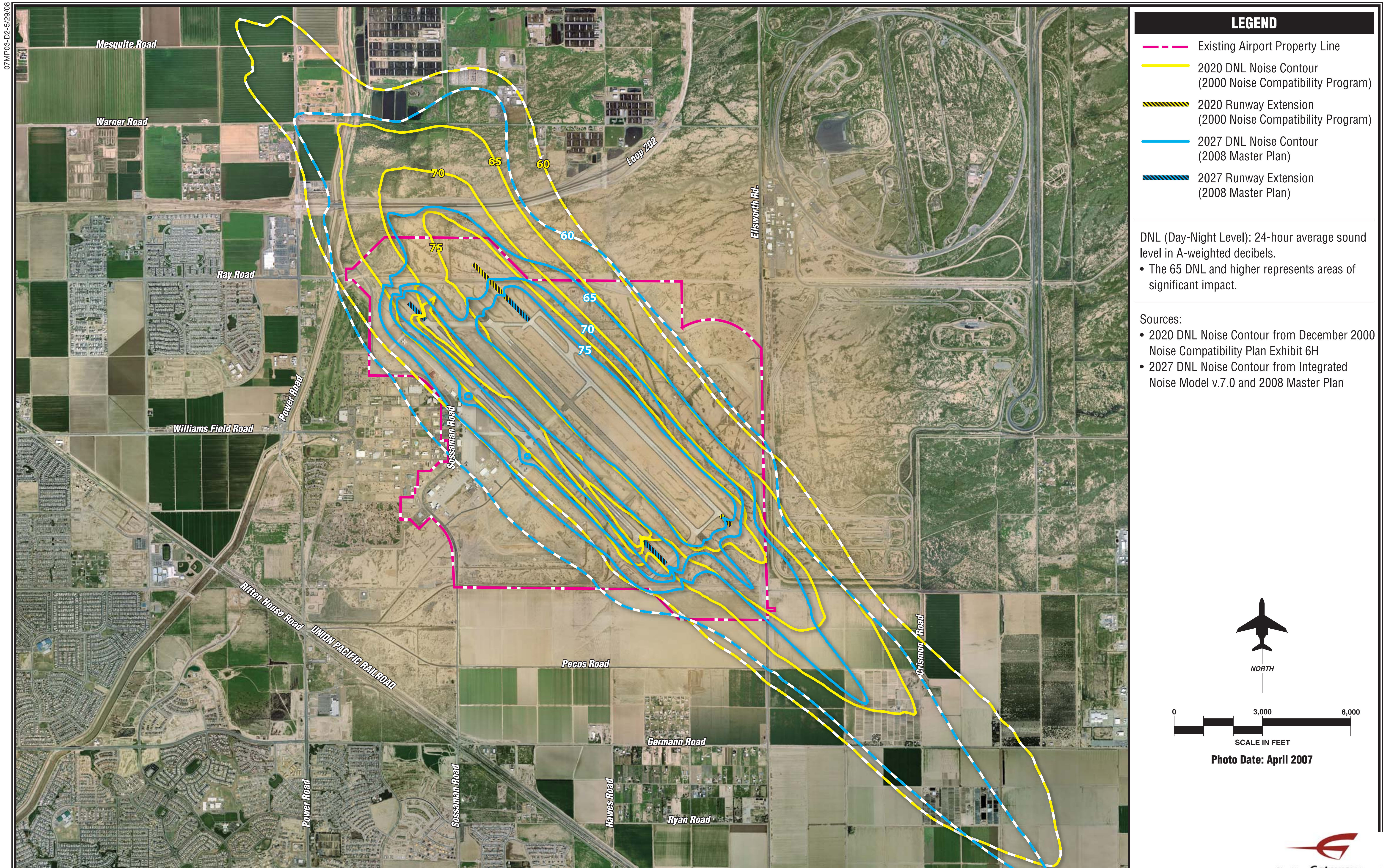


Exhibit D2
2020 & 2027 AIRCRAFT
NOISE EXPOSURE

contours were developed with INM Version 7.0. In the past nine years, advancements in the INM software, such as a more accurate representation of sideline noise, has resulted in a shorter, but wider set of contours for the baseline 2027 condition.

PROGRAM RECOMMENDATION STATUS

The 2000 Noise Compatibility Program contains 23 measures to reduce the impact of aircraft noise on the surrounding airport environment. The program was submitted to the FAA for review. The FAA's Record of Approval, detailing their response to each measure, can be found at the conclusion of this appendix. Following is a summary of each measure, the FAA's response, and the status of the measure.

NOISE ABATEMENT ELEMENT

1. Continue Calm Wind Runway 30 L/C/R Use Program.

Description: This measure recommends that the Airport Authority continue the informal preferential runway use program that designates Runways 30 L/C/R as the calm wind runways. This program is to continue to be reflected in the Authority's "Fly Friendly" program and in future published pilot guides. The NCP notes a net reduction to approximately 1,000 residents within the DNL 60 dB noise contour.

FAA Response: FAA approved this measure as a voluntary measure only.

Status: The Williams Gateway Airport Authority has published this information in the FAA's Airport Facility Directory and the Airport Traffic Control Tower (ATCT) actively uses Runway 30L/C/R as the calm wind runway.

2. Continue using Runway 12R-30L for Light Piston Aircraft and Runways 12C/L-30C/R for Large Turbojet Aircraft Operations.

Description: This measure recommends that the Airport Authority continue to encourage heavy and turbojet aircraft to use the eastern two runways (Runways 12C/L-30C/R) whenever possible. This program is to continue to be reflected in the Authority's "Fly Friendly" program and in future published pilot guides. The NCP notes a net reduction to approximately 50 residents within the DNL 60 dB noise contour.

FAA Response: Approved as a voluntary measure only.

Status: This runway use program continues to be reflected in the Authority's "Fly Friendly" program posted on their web site and posters. Williams Gateway Airport Authority staff also provides regular reminders to ATCT and tenants when repeated deviations from this runway use program are recorded.

3. Continue to Encourage use of NBAA Noise Abatement Procedures.

Description: This measure recommends that the Airport Authority continue to actively encourage business jet operators to use the National Business Aviation Association's (NBAA) Approach and Landing Procedure and Standard Noise Abatement Departure Procedures, or equivalent quiet-flying procedures developed by the aircraft manufacturer. The use of these procedures is to continue to be reflected in the Authority's "Fly Friendly" program, in future published pilot guides, signs, pilot mailings, and on the Airport's internet web site.

FAA Response: Approved this measure as voluntary only.

Status: NBAA noise abatement procedures continue to be reflected in the Authority's "Fly Friendly" program posted on their web site, pilot guides, and posters.

4. Continue to promote use of AOPA Noise Awareness Steps by light single and twin-engine aircraft.

Description: This measure recommends that the Airport Authority continue to promote the use of AOPA Noise Awareness steps. The Aircraft Owners and Pilots Association (AOPA) encourages quiet and neighborly flying by distributing generalized noise abatement procedures for use by propeller aircraft. The use of these procedures is to continue to be reflected in the Authority's "Fly Friendly" program, in future published pilot guides, signs, pilot mailings, and on the Airport's internet web site.

FAA Response: Approved as a voluntary measure only.

Status: AOPA noise awareness steps continue to be reflected in the Authority's "Fly Friendly" program posted on their web site, pilot guides, and posters.

5. Continue to Promote the Departure Procedure for the AANG 161st Air Refueling Wing KC-135 Aircraft and Aircraft less than 12,500 pounds.

Description: This measure recommends that Williams Gateway Airport Authority continue to promote the use of a right turn prior to the power lines located one-half mile north of Elliot Road for Arizona Air National Guard (AANG) KC-135 aircraft and aircraft weighing less than 12,500 pounds departing on Runways 30 C/R. This program is to continue to be reflected in the Authority's "Fly Friendly" program and in future published pilot guides. This measure also recommends that Williams Gateway Airport Authority request this procedure be referenced in a Letter of Agreement between the ATCT and the AANG. This measure would assist in over-flights remaining south of the higher density residential areas north and northwest of the airport.

FAA Response: Approved this measure as voluntary only.

Status: Regular contact with the AANG and ATCT promotes use of the immediate right departure turn procedure from Runways 30L/C/R. Right turn procedures from Runways 30C/R for KC-135 and aircraft weighing less than 12,500 pounds is not reflected in the Authority's "Fly Friendly" program posted on their web site. A Letter of Agreement between the ATCT and the AANG referencing this procedure has not been implemented.

6. Relocate Instrument Landing System to Runway 30R.

Description: This measure recommends that the Airport Authority relocate the existing Runway 30C Instrument Landing System (ILS) to Runway 30R. This results in a slight eastward shift of the noise contours.

FAA Response: This measure was disapproved for the purposes of Part 150. FAA viewed the net noise benefit to approximately 350 people as a "secondary noise benefit" associated with an airport development proposal. The FAA felt the main purpose of relocating the ILS is for aircraft operational efficiency because this recommendation was included in the airport's master plan.

Status: The Williams Gateway Airport Authority acquired a used ILS system for Runway 30C at no cost. A feasibility study was undertaken to assess the condition of the ILS equipment, the cost of installation, and environmental factors. The study determined that the ILS system was beyond repair and installation of this equipment was not feasible. The FAA upgraded the existing ILS equipment with refurbished components in 2007.

7. Install PAPI-4 Lighting on Runway 12R-30L.

Description: This measure recommended that the Williams Gateway Airport Authority install a Precision Approach Path Indicator (PAPI-4) lighting system on Runway 12R-30L. The purpose of this measure was to reduce the potential for low aircraft overflights on approach to Runway 12R-30L by providing adequate guidance to pilots.

FAA Response: Disapproved for the purposes of Part 150. A measurable noise reduction is needed for approval.

Status: Installation of PAPI lighting has not been completed.

8. Develop Helicopter Reporting Points and Arrival and Departure Routes.

Description: This measure recommends that the Airport Authority pursue the establishment of visual arrival and departure routes over certain noise abatement corridors to avoid overflights of the Williams Campus and residential properties. These routes are to be incorporated into the Authority's "Fly Friendly" program and in future published pilot guides.

FAA Response: This was approved only as a voluntary measure.

Status: Letters of Agreement between the ATCT and helicopter operators (Mesa Police Department, Silverstate, Native Air, Quantum, X-Air, and Air Evac Services, Inc.) that identify the helicopter reporting points and arrival and departure routes were signed and put into place on January 9, 2007.

9. Request Aircraft Using Runway 12R-30L Traffic Pattern To Remain East of the Southern Pacific Railroad.

Description: This measure recommends that the Airport Authority request aircraft using the Runway 12R-30L traffic pattern to remain east of the Southern Pacific Railroad to avoid residential overflights. This policy is to be incorporated into the Authority's "Fly Friendly" program and in future published pilot guides. This measure also recommends that the Airport Authority request this policy be noted in an Air Traffic Control Tower order or internal operating policy.

FAA Response: This was approved only as a voluntary measure.

Status: No specific action has been taken on this measure. Current traffic pattern typically remains east of the Southern Pacific Railroad.

10. Encourage Use of AC 91.53A Noise Abatement Departure Procedures by Air Carrier Jets.

Description: This measure recommends that the Airport Authority promote the use of the noise abatement departure procedures for training operations described in Advisory Circular (AC) 91.53A by jet aircraft over 75,000 pounds certificated gross takeoff weight.

FAA Response: Disapproved for the purposes of Part 150. A measurable noise reduction is needed for approval.

Status: Williams Gateway Airport Authority provides air carriers with "Fly Friendly" procedures and encourages the use of standard noise abatement procedures.

11. Support 161st Air Refueling Wing of the Arizona Air National Guard's efforts to re-engine KC-135 Aircraft.

Description: This measure recommends that the Airport Authority monitor and support the re-engining of Air National Guard 161st Air Refueling Wing KC-135 Aircraft. The proposed new CFM-56 engines are quieter than the existing TF-33 engines used on these aircraft.

FAA Response: This measure was approved.

Status: Williams Gateway Airport Authority sent letters of support to the AANG. Williams Gateway Airport Authority received notification that KC-135 fleet will be receiving engine upgrades. Engine upgrades were completed in 2006.

LAND USE MANAGEMENT ELEMENT

1. Update General Plans to Reflect the "Land Use Planning Scenario" noise contours and Airport Planning Area as a basis for noise compatibility planning.

Description: This measure recommends that the cities of Mesa, Gilbert, and Queen Creek, and the counties of Maricopa and Pinal, amend their general plans to show the "Land Use Planning Scenario" noise contours for the Phoenix-Mesa Gateway Airport.

FAA Response: This measure was approved.

Status: The general plan for Mesa depicts the 2015 noise exposure contour prepared as part of the 1993 Airport Master Plan. The *Queen Creek General Plan* appears to depict the Land Use Planning Scenario noise contour. The *Town of Gilbert General Plan* land use map also depicts the Land Use Planning Scenario noise contour, but depicts only the 65 DNL noise exposure contour. The Town of Gilbert does depict the Airport Planning Area and 60 DNL Planning Scenario Boundary on its general plan map.

2. Retain compatible land use designations for undeveloped land within the Airport Planning Area.

Description: This measure recommends that the existing compatible land use designations within the Airport Planning Area (APA) for the cities of Mesa, Gilbert, and Queen Creek and the County of Maricopa general plans remain unchanged.

FAA Response: This measure was approved.

Status: The APA is not depicted within the Mesa, Gilbert, and Queen Creek general plans. Mesa, Gilbert, and Queen Creek have adopted overlay zoning to maintain the compatibility of land uses within the APA. All three jurisdictions meet the general intent of this measure by retaining noise compatible land use designations within the APA.

3. Develop a new mixed-use category that does not allow residential within the planned mixed-use areas inside the planning scenario's 60 DNL boundary and immediately north of the airport.

Description: This measure recommends that the cities of Mesa and Gilbert develop a new general plan mixed-use category that does not allow residential land uses within the planned mixed-use areas within the 60 DNL contour.

FAA Response: This measure was approved.

Status: The City of Mesa has adopted a new mixed-use category that does not allow residential land uses. The Town of Gilbert has not adopted a mixed-use category that restricts residential land uses. The Town of Gilbert allows residential development within 60 DNL noise exposure contour. The Town of Gilbert does require a disclosure statement and additional sound attenuation during construction within the 60 DNL Planning Area Boundary.

4. Establish noise compatibility guidelines for the review of development projects within the "planning scenario" 60 DNL noise contour.

Description: This measure recommends that the cities of Mesa, Gilbert, and Queen Creek, and the counties of Maricopa and Pinal, include, through general plan amendments, project review criteria for development projects within the "planning scenario" 60 DNL noise contour.

FAA Response: This measure was approved.

Status: The cities of Mesa, Gilbert, and Queen Creek route development project requests to Williams Gateway Airport Authority for comment and include Williams Gateway Airport Authority's recommendations on development proposals in staff reports.

5. Encourage rezoning areas within the "Planning Scenario" noise contours and Airport Planning Area (APA) to match the compatible land use designations in the general plans.

Description: This measure recommends that the cities of Mesa, Gilbert, and Queen Creek, and the County of Maricopa, should rezone areas not currently zoned for compatible use to conform to their respective general plans.

FAA Response: This measure was approved.

Status: The City of Mesa has actively rezoned residential parcels within the Planning Scenario noise contours and APA to conform to the general plan. The cities of Gilbert and Queen Creek have not initiated rezoning within the Planning Scenario noise contours for consistency with their respective general plans. It should be noted that areas in Gilbert and Queen Creek within the Planning Scenario noise contours are zoned for compatible land uses.

6. Amend Airport Overflight Zoning Ordinance: Reflect Planning Scenario noise contours and Airport Planning Area (APA); Require fair disclosure covenants and amend sound insulation standards.

Description: This measure recommends that the cities of Mesa, Gilbert, and Queen Creek, and the counties of Maricopa and Pinal, make specific amendments to the *Williams Regional Planning Study* overflight zoning ordinance for the Phoenix Mesa Gateway Airport area.

FAA Response: This measure was approved.

Status: The cities of Mesa, Gilbert, and Queen Creek have airport overlay ordinances that meet the intent of this measure.

7. Amend subdivision regulations to require recording of fair disclosure covenants and granting of avigation easements in the Airport Planning Area.

Description: This measure recommends that the cities of Mesa, Gilbert, and Queen Creek, and the counties of Maricopa and Pinal, amend their respective subdivision regulations to support the proposed amendments to Airport Overflight Zoning Ordinance requiring the recording of fair disclosure agreements and covenants, and the dedication of avigation easements in certain areas.

FAA Response: This measure was approved.

Status: Mesa, Gilbert, and Queen Creek, and the counties of Maricopa and Pinal, have not specifically amended their respective subdivision regulations to require recording of fair disclosure and avigation easement within the APA. Queen Creek does require preliminary plats be sent for Williams Gateway Airport Authority review. The cities of Mesa, Gilbert, and Queen Creek do require disclosure per Williams Gateway Airport Authority recommendation during the rezoning and subdivision plat approval process.

8. Amend building codes to add sound insulation standards supporting the Airport Planning Area overflight zoning requirements.

Description: This measure recommends that the cities of Mesa, Gilbert, and Queen Creek, and the counties of Maricopa and Pinal, amend their local building codes to establish specific construction standards for sound insulation.

FAA Response: This measure was approved.

Status: Mesa and Gilbert and the counties of Maricopa and Pinal have not specifically amended their respective building codes to require additional sound insulation standards with the APA. The Town of Queen Creek has amended their building code to require sound insulation. The cities of Mesa, Gilbert, and Queen Creek also require sound insulation within their respective overlay zoning ordinances and per Williams Gateway Airport Authority recommendation during the rezoning and subdivision plat approval process.

PROGRAM MANAGEMENT ELEMENTS

1. Maintain and update the system for receiving, analyzing, and responding to noise complaints and community outreach.

Description: This measure recommends that the Airport Authority maintain and enhance the system of receiving, analyzing, and responding to noise complaints and community outreach.

FAA Response: This measure was approved.

Status: Williams Gateway Airport Authority hired a community relations coordinator and computerized the noise complaint database. Williams Gateway Airport Authority staff also reviews noise complaint reports and calls every person filing a noise complaint requesting a return call.

2. Acquire noise monitors.

Description: This measure recommends that the Airport Authority acquire up to four noise monitors.

FAA Response: This measure was approved.

Status: Noise monitors budget item has been included in the Williams Gateway Airport Authority capital improvement program in the past. Acquisition of this equipment has not been a high priority due to the limited number of noise complaints received.

3. Review Noise Compatibility Plan implementation.

Description: This measure recommends that the Airport Authority monitor compliance with the noise abatement element and maintain communications with the airport users and planning officials of the cities of Mesa, Gilbert, and Queen Creek, and the counties of Maricopa and Pinal, to follow their progress in implementing the land use management elements of this Noise Compatibility Program.

FAA Response: This measure was approved.

Status: WGAA review of the Noise Compatibility Program is ongoing. A complete review was completed in September 2004.

4. Update Noise Exposure Maps and Noise Compatibility Program.

Description: This measure recommends that the Airport Authority review the Noise Exposure Maps and the Noise Compatibility Program and consider revisions and refinements as necessary.

FAA Response: This measure was approved.

Status: An update of the Noise Compatibility Program is scheduled for 2012.

Coffman Associates

Airport Consultants

www.coffmanassociates.com

KANSAS CITY
(816) 524-3500

237 N.W. Blue Parkway
Suite 100
Lee's Summit, MO 64063

PHOENIX
(602) 993-6999

4835 E. Cactus Road
Suite 235
Scottsdale, AZ 85254