MESA-FALCON FIELD AIRPORT

AIRPORT MASTER PLAN

AIRPORT MASTER PLAN

for

MESA-FALCON FIELD AIRPORT
Mesa, Arizona

Prepared for the

CITY OF MESA

by

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Approved by

The City Council of the City of Mesa

on

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MESA-FALCON
FIELD AIRPORT

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Mesa, Arizona

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INTRODUCTION

Introduction

The Mesa-Falcon Field Airport (FFZ) Master Plan Study Update has been undertaken to evaluate the airport's capabilities and role, to forecast 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 maintenance, development, 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 City of Mesa can coordinate project approvals, design, financing, and construction to avoid experiencing detrimental effects due to inadequate facilities.

Mesa-Falcon Field Airport is located on the east side of the greater Phoenix metropolitan area and serves as a vital economic asset for the City of Mesa and the region. As such, it should be carefully and thoughtfully planned and subsequently developed in a manner which matches the developmental goals of the community. An important result of this master planning effort will be a comprehensive development plan tailored to meet future facility needs. A comprehensive and proactive development plan protects development areas and ensures they will be readily available when required to meet future needs.

The preparation of this Master Plan is evidence that the City of Mesa recognizes the importance of air transportation to the community, as well as the unique challenges operating an airport presents. The investment in an air-

port yields many benefits to the community and the region. With a sound and realistic Master Plan, Mesa-Falcon Field Airport will remain an important link to the national air transportation system for the community and maintain the existing public and private investments in its facilities.

The City of Mesa initiated this Master Plan to re-evaluate and adjust as necessary the future development plan for Mesa-Falcon Field Airport. The last Master Plan for the airport was completed in October 1992. The City has owned the airport since 1948, and more recently operated the airport since 1965, and is responsible for funding all capital improvements at the airport and obtaining Federal Aviation Administration (FAA) and Arizona Department of Transportation (ADOT) – Aeronautics Division development grants. This Master Plan is intended to provide guidance through an updated capital improvement program to demonstrate the future investments required by the City of Mesa at Mesa-Falcon Field Airport. Many national, regional, and local aviation factors have changed significantly since the completion of the previous Master Plan. The City has undertaken this Master Plan to account for those changes in future planning for the airport.

On a national level, the events of September 11, 2001, and the repercussions to the national aviation system have affected general aviation. One of the most significant effects is the shift of traditional airline passengers to the corporate aircraft market. Inconveniences and time lost due to security and large airport congestion have made corporate aircraft use more affordable and attractive. For this reason, general aviation airports in large demand centers, such as the City of Mesa and the greater Phoenix metropolitan area as a whole, need to be readied to meet the growing demand.

More recently, the introduction of a new class of business jets, the very light jets (VLJs), may also have a significant impact on general aviation airports across the country. VLJs are currently being introduced to the national fleet and many orders for the aircraft are by companies wishing to provide on-demand air-taxi service. Part of the appeal of these air-taxi companies is the ability to utilize the national network of small general aviation airports and, thus, further save the consumer time.

On a regional level, the Phoenix metropolitan area is one of the fastest growing areas in the United States. This growth in population and employment needs to be considered in the Master Plan update.

On a local level, the City of Mesa supports a diverse and strong economic base. One of the nation's fastest growing cities, Mesa is the third largest city in Arizona. It provides for a very dynamic environment with abundant recreational, educational, and business opportunities. The City is home to the Chicago Cubs Major League Baseball franchise during its spring training season and two new state-of-the-art downtown facilities, the Mesa Arts Center and Mesa Indoor Aquatics Center. Large industry and commercial businesses are also located in the

City. Banner Health, one of the largest non-profit health care systems in the country, providing an array of services ranging from hospital to laboratory services.

The Boeing Company, one of the world's leading aerospace companies and manufacturer of the Apache Longbow helicopter and MD helicopters, a manufacturer of civilian helicopters, play a major role in the local economy. Given the diverse and strong economic base in the City, it is imperative that the airport match the first class facilities that the community provides. This Master Plan will consider not only the facility needs to meet demand, but also methods to ensure that the airport projects a first class image for the City.

MASTER PLAN 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 facilities 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.

A Master Plan must be developed according to the FAA and ADOT – Aeronautics Division requirements. However, the study can also be developed in a manner which makes it useful as a strategic business plan for the airport. FAA and ADOT require specific components within a Master Plan. These components, detailed below, are guidelines which allow for a systematic and technical approach to reach the final development plan.

While the Master Plan is technical in nature, it can also be used by airport administration and city leaders as a tool to actively promote the airport. In a sense, this Airport Master Plan is very similar to a business plan. A business plan is often necessary in order to obtain investor or bank funds for planned capital growth. So too is a Master Plan, which ultimately will enable the City and airport to compete for state and federal grant funds.

This Master Plan will provide a vision for the airport covering the next 20 years and, in some cases, beyond. With this vision, the City of Mesa 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 Mesa-Falcon Field Airport Master Plan Update are:

- To preserve and protect public and private investments in existing airport facilities;
- To be reflective of community and regional goals, needs, and plans;
- To establish a schedule of development priorities designed to meet forecast aviation demand;
- To develop an orderly and comprehensive plan that is responsible to

air transportation demands of the City and region as a whole;

- To enhance the safety of aircraft operations;
- To meet FAA and ADOT – Aeronautics Division airport design standards;
- To ensure that future development is environmentally compatible;
- 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 2027;
- Analyzing socioeconomic factors likely to affect air transportation demand in the City of Mesa, including regional factors;
- Identifying potential existing and future land acquisition needs;
- Evaluating future airport facility development alternatives which will optimize undeveloped airport property to promote capacity and aircraft safety;
- Developing a realistic, common-sense plan for the use and expansion of the airport;
- Presenting environmental consideration associated with any recommended development alternatives, and;
- Producing current and accurate airport base maps and Airport Layout Plan (ALP) drawings.

BASELINE ASSUMPTIONS

While the ultimate recommendations of this Master Plan have yet to be determined, a study such as this typically requires several baseline assumptions that will be used throughout this analysis. These baseline assumptions for this study are as follows:

- Mesa-Falcon Field Airport will continue to operate as a publicly owned general aviation reliever airport through the planning period.
- Phoenix Sky Harbor International Airport will continue to be a commercial service airport with minimal general aviation activity.
- Phoenix-Mesa Gateway Airport is planned as a commercial service reliever airport for Phoenix Sky Harbor International Airport.
- The other regional general aviation airports in Maricopa County will remain open for the foreseeable future.
- Mesa-Falcon Field Airport will continue to serve general aviation and corporate business aviation

based tenants and transient operations.

- The general aviation industry will continue to grow positively through the planning period. Specifics of projected growth in the national general aviation industry are contained in Chapter Two, Aviation Demand Forecasts.

- Population and employment will continue to grow positively through the planning period as forecast by the Maricopa Association of Governments (MAG) and the State of Arizona.

- Both a federal program and a state program will be in place through the planning period to assist in funding future capital development needs.

MASTER PLAN ELEMENTS AND PROCESS

The Mesa-Falcon Field Airport Master Plan Update is being prepared in a systematic fashion following FAA guidelines and industry-accepted principles and practices, as shown in **Exhibit A**. The Master Plan has six chapters and two appendices 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 – Aviation Demand 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 Mesa-Falcon Field Airport through the year 2027. 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 – Airport 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 – Airport Development 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.

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.

Chapter Six – Capital Improvement Program focuses on the capital needs program which defines the schedules, costs, and funding sources for the recommended development projects.

Appendix B – Environmental Evaluation provides a review of the potential environmental impacts associated with proposed airport projects.

Appendix C – Airport Layout Drawings includes the official Airport Layout Plan (ALP) and detailed technical drawings depicting related airspace, land use, and property data. These drawings are used by the FAA in determining grant eligibility and funding.

COORDINATION

The Mesa-Falcon Field 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, Mesa-Falcon Field 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 City has identified a group of community members and aviation interest groups with a vested interest in Mesa-Falcon Field Airport to act in an advisory role in the development of the Master Plan. Members of this Planning Advisory Committee (PAC) will review phase reports and provide comments throughout the study to help ensure that a realistic, viable plan is developed. Groups represented on the PAC include the FAA, ADOT-Aeronautics, MAG, Arizona Military Airspace Working Group, airport traffic control tower (ATCT) personnel, airport administration from Mesa-Falcon Field Airport, and Phoenix-Mesa Gateway Airport, the Boeing Company, MD Helicopters, Aircraft Owners and Pilots Association, National Business Aircraft Association, Arizona Pilots Association, Falcon Field Tenants and Users Association, Experimental Aircraft Association, City departments, airport businesses, and citizen and neighborhood groups.

To assist in the review process, draft phase reports will be prepared at various milestones in the planning process. The phase report process allows for timely input and review dur-

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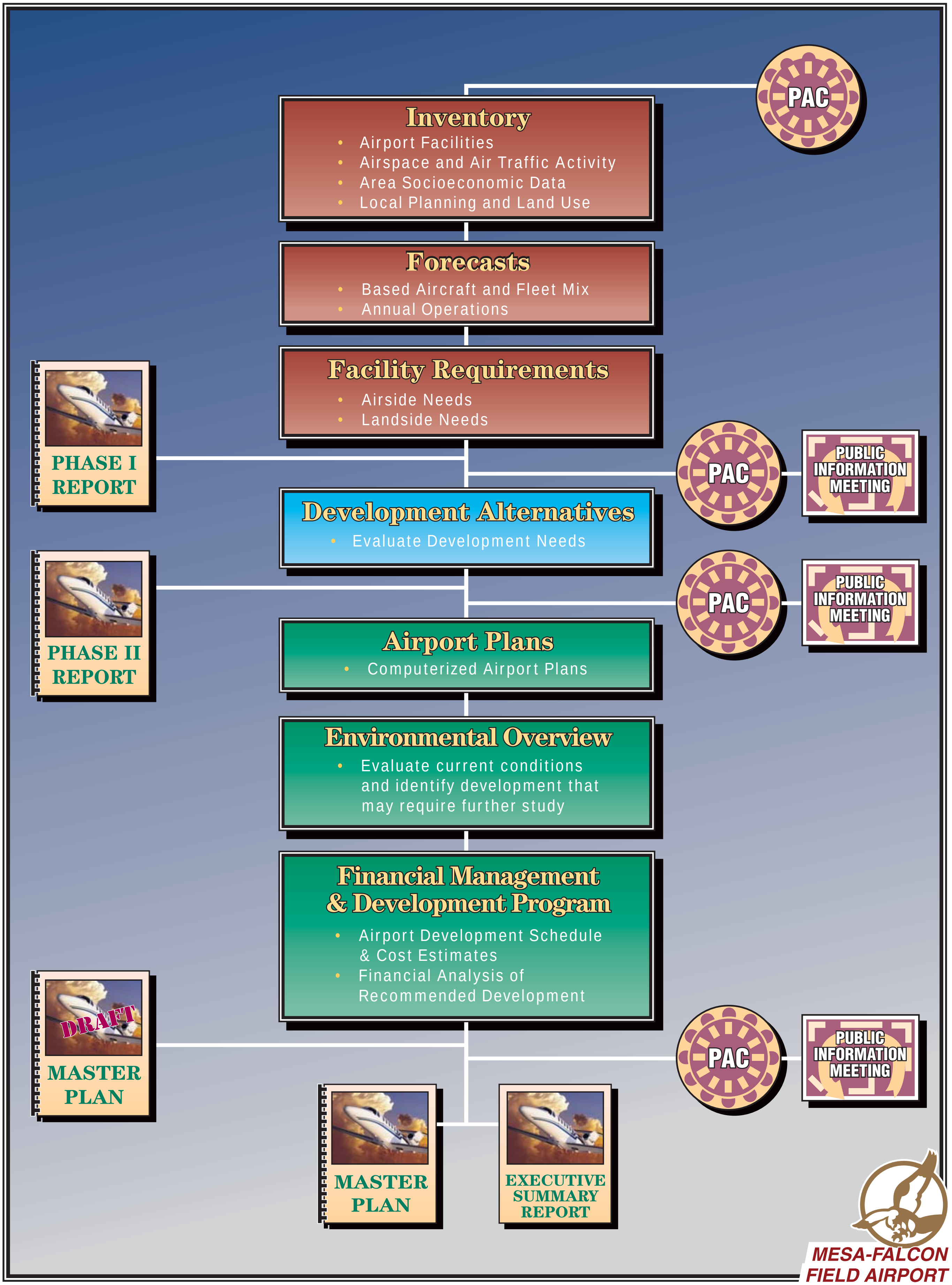

Exhibit A
PROJECT WORK FLOW

ing each step within the Master Plan to ensure that all Master Plan issues are fully addressed as the recommended program develops.

At each milestone, the information completed to date will be presented to the public via open-house workshops. The workshops give the public an opportunity to view the working materials, ask questions, and provide feedback with the consultant, airport administration, and city officials. Notices of meeting times and locations will be advertised through the media as well as local neighborhood associations. The draft phase reports were also made available to the public on the Mesa-Falcon Field Airport's website (www.mesaaz.gov/falcon_field) and Coffman Associates' website (www.coffmanassociates.com).

MESA-FALCON
FIELD AIRPORT

Chapter One

INVENTORY

INVENTORY

The inventory of existing conditions at Mesa-Falcon Field Airport (FFZ) will serve as an overview of the airport, its facilities, its role in regional and national aviation systems, and the relationship to development which has occurred around the airport in the past. The information delineated in this chapter provides a foundation, or starting point, for all subsequent evaluations.

The update of this Master Plan required a comprehensive collection and evaluation of information relating to the airport including airport history, physical inventories of facilities and services currently provided by the airport, as well as a review of regional airspace, air traffic control, and aircraft operating procedures.

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, including the City of Mesa Transportation Plan (2003), City of Mesa General Plan (2002), Mesa-Falcon Field Airport Master Plan (1992), and Falcon Field Sub-Area Plan (2007). Additional information and documents were provided by the Federal Aviation Administration (FAA), Maricopa Association of Governments (MAG), Arizona Department of Transportation – Aeronautics Division (ADOT), and the City of Mesa – Development and Sustainability Division.

BACKGROUND

Any comprehensive master planning effort must factor all influences on an airport. Many of these factors are not directly aviation-related in nature, but do play a key role in the overall growth potential of the airport. Before the airport and its facilities are discussed, these outside influences should be identified. The following sections will discuss the factors which will influence the development potential at Mesa-Falcon Field Airport.

AIRPORT LOCATION

As depicted on **Exhibit 1A**, Mesa-Falcon Field Airport sits on approximately 784 acres of property on the north side of the City of Mesa, Arizona. This includes 575 acres with airfield access and 209 acres to the south and west currently segregated from the airfield by major roadways. The airport is approximately five miles to the northeast of the City of Mesa's central business district. The City of Mesa is part of the greater Phoenix metropolitan area within Maricopa County. It is located in eastern Maricopa County, and lies adjacent to Pinal County just a few miles east. Neighboring communities include Apache Junction to the east, Queen Creek, Gilbert, and Chandler to the south, and Tempe to the west. The Salt River Pima-Maricopa Indian Community lies to the north and consists of a less-populated and less-congested land use area.

The airport is bounded on the north by East McDowell Road, to the east by North Higley Road, to the south by East McKellips Road, and to the west by North Greenfield Road. Immediate access to the airport terminal area is provided by Falcon Drive, which is accessed directly from East McKellips Road. Fighter Aces Drive also connects to Falcon Drive and provides access to other airport businesses and hangars in the southwest area of the airport. To the east, off of North Higley Road, Falcon Drive provides access to several aviation-related businesses. Eagle Drive provides access to the U.S. Post Office, and Roadrunner Drive provides access to other aviation-related businesses. Additional roadways extend off East McDowell Road and North Greenfield Road providing vehicle access to specific areas of the airport. Both east and west bound traffic on East McKellips Road have universal green airport directional signs indicating the main entrance to the airport.

The City of Mesa has excellent access to regional highway infrastructure linking it to the entire Phoenix metropolitan area and points beyond. Loop 202 (Santan Freeway) is a newer roadway system located north of the airport. It creates a bypass around the downtown Mesa area and provides direct access to Tempe and Phoenix to the west and connects to Loop 101 providing service to Scottsdale north and west. Loop 202 also connects to U.S. Highway 60, which leads to Gilbert and Chandler farther south and west. Known as Superstition Freeway, U.S. Highway 60 runs in an east/west direction on the south side of Mesa and provides access to U.S. Interstates 10 and 17 farther west. I-10 directly links the Phoenix metropolitan area to cities such as Tucson to the

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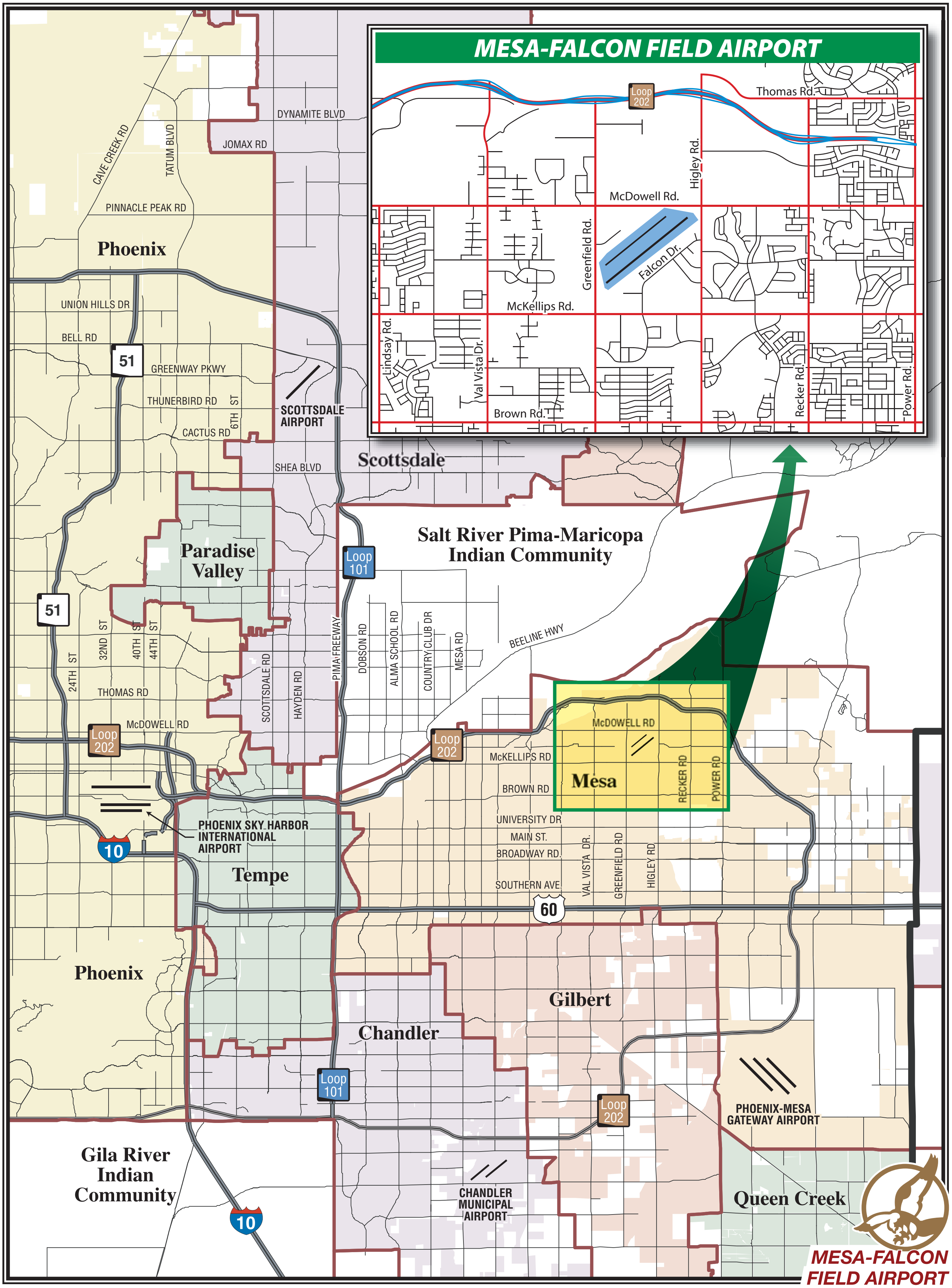

Exhibit 1A
AIRPORT VICINITY MAP

southeast and Los Angeles to the west. I-17 provides service to Flagstaff to the north and Beeline Highway provides a northern access route to Payson.

OTHER TRANSPORTATION MODES

Union Pacific rail lines extend through the City of Mesa approximately six miles to the southwest of the airport. Adjacent to the downtown Mesa area, the rail lines make up the Union Pacific Business Corridor providing a diverse employment center with a wide range of retail centers, manufacturing, and technology companies. There are no rail spurs extending in the vicinity of the airport. The City of Mesa has partnered with the cities of Phoenix and Tempe to develop a light rail system providing service to the region. The system utilizes high-capacity trains with the ability to carry 5,000 passengers each direction per hour during peak periods. The Light Rail Transit (LRT) will initially serve the downtown Mesa area. There are no plans showing the LRT extending into areas near the airport. Greyhound Bus Lines provides a depot in the City of Mesa, approximately eight miles to the southwest on South Country Club Drive.

Local transportation includes two services that serve the general public. The City-funded fixed-route bus service operates six days a week, for approximately 16 hours per day. There are nine local routes and four express routes to downtown Phoenix. The second service is the East Valley Dial-A-Ride, which is a partnership among several public agencies, including the City of Mesa, which provides customers the ability to travel between the cities of Mesa, Chandler, Tempe, Scottsdale, and Gilbert in a more efficient manner. Also, proposed to start with the completion of the light rail project in 2008, the Bus Rapid Transit (BRT) system is planned to boost ridership of light-rail while taking cars off the road.

REGIONAL CLIMATE

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

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 region averages approximately 9 inches of precipitation annually. On average, Mesa experiences sunshine 85 percent of the year. The monthly average wind speed is 6.2 mph, and the predominant wind direction is from the southwest to northeast. A summary of climatic data is presented in **Table 1A**.

TABLE 1A
Climate Summary
Mesa, Arizona

	Jan.	Feb.	Mar.	Apr.	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

AREA LAND USE AND ZONING

The area land use surrounding Mesa-Falcon Field Airport can have a significant impact on airport operations and growth. The following sections identify baseline information related to both existing and future land uses in the vicinity of Mesa-Falcon Field Airport. By understanding the land use issues surrounding the airport, more appropriate recommendations can be made for the future of the airport.

Existing Land Uses

Mesa-Falcon Field Airport is located within the corporate boundaries of the City of Mesa. Existing land uses immediately surrounding the airport include The Boeing Company and its large manufacturing operation to the north. To the east of the airport is the Apache Wells residential housing community. Land adjacent to the airport to the west of North Greenfield Road provides for agricultural-related uses that also gives a buffer to more residential developments farther to the west. Commercial and industrial businesses as well as office complexes are located south of the airport adjacent to McKellips Road. A parcel of land north of East McKellips Road adjoining current airport property is utilized for agricultural and commercial purposes. There are also large areas of vacant land located south and northwest of the airport. **Exhibit 1B** presents the existing land use of the area as identified in the *Mesa 2025 General Plan*.

Future Land Uses and Zoning

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.

Land use zoning is the most common land use control. Zoning is the exercise of the jurisdictional powers granted state and local governments to designate permitted land uses on

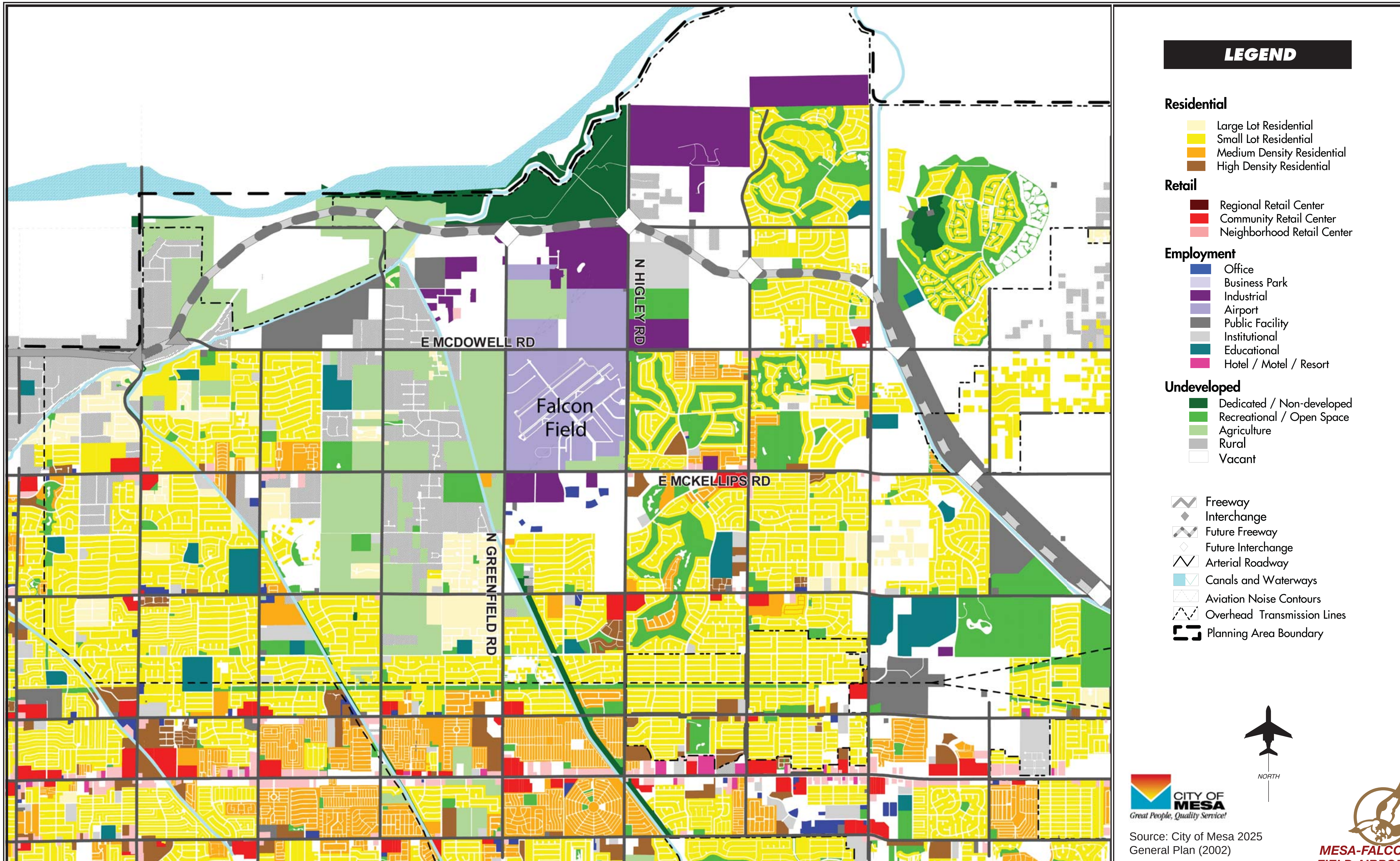

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Exhibit 1B
EXISTING LAND USE

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 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.

Title 11, Chapter 11 of the City of Mesa Zoning Ordinance establishes the Airfield Overlay District. This district is designed to protect the public health, safety, and general welfare of the area surrounding the airport by minimizing exposure to high noise levels and the hazards generated by airport operations. Also, it is to further the development of compatible land uses around the airport. In addition to the restriction of the Airfield Overlay District, existing zoning surrounding the airport calls for light industrial, general industrial, and limited commercial except for areas on the east and southeast sides. This zoning is considered compatible with airport activity.

The areas on the east and southeast sides of the airport are zoned residential. The largest area is on the east side of North Higley Road, which consists of a large area of single resident housing. An area located on the southeast side of the airport, north of East McKellips Road, is also zoned for residential housing in the form of suburban ranch. These residential zoning areas are not typically compatible with airport activity. Future airport operations will need to be sensitive to these existing residential developments.

Height restrictions are necessary to ensure 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. Current City of Mesa ordinances adhere to and support the height restriction guidelines as set forth in 14 CFR Part 77. Height restrictions can be accomplished through height and hazard zoning, avigation easements, or fee simple acquisition.

PUBLIC AIRPORT DISCLOSURE MAP

Arizona Revised Statutes (ARS) 28-8486, *Public Airport Disclosure*, provides for a public airport owner to publish a map depicting the "territory in the vicinity of the airport." The territory in the vicinity of the airport is defined as the traffic pattern airspace and the property that experiences 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 provides for the State Real Estate Office to prepare a disclosure map in conjunction with the airport owner. The disclosure map is recorded with the county. Mesa-Falcon Field Airport has a traffic pattern map and noise contour map produced in February 1994. It is evident from viewing the maps that they are in need of updating. As part of this Master Plan, an updated Public Airport Disclosure Map has been prepared.

AIRPORT HISTORY

Construction of the present day Mesa-Falcon Field Airport began during World War II. The British were looking for areas to train thousands of pilots as World War II was beginning, and Winston Churchill turned to the United States for help in this area. As a result, President Roosevelt called for the establishment of three training bases in the Phoenix area, one of which was Falcon Field, to aid in the training of these British pilots. Construction commenced in July of 1941, and by September, the airport was open for training. Initially, the airport's only runway was 2,600 feet in length and did not have a paved surface. Once the United States became involved in the war, American pilots also utilized the airfield for flight training. Approximately 1,500 pilots trained in the skies over Falcon Field until 1945, when military training activities ceased due to the end of the war.

Once the war was over, there was no longer a need for the airport as a military installation. As a result, approximately 600 acres of land containing the airport and facilities was turned over to the City of Mesa for one dollar by quitclaim deed in August of 1948. It has remained the City's since this time.

General aviation was not in huge demand in the area during the 1950s, and as a result of the airport being underutilized, the City of Mesa leased it to a private company named Rocket Power, Inc. who manufactured solid propellants for military use. In 1965, the City terminated the lease agreement and resumed operation of the airfield. It was during this time that the initial runway was lengthened to 4,300 feet and widened to 100 feet.

The airport was officially annexed into the city boundary in 1978. During the 1980s, there were several improvements and activities occurring at the airport, including construction of the present-day parallel runway and additional taxiways, the extension of the main runway to its present length of 5,100 feet, upgrades to approach lighting and navigational aids, and the first AH-64 Apache Attack Helicopter rolling out of the Hughes Helicopter factory, known today as The Boeing Company. In 1992, the previous Airport Master Plan was completed. Since this time, numerous utility and environmental improvements have been made in addition to other recommendations called for in the plan.

Today, Mesa-Falcon Field Airport is ranked among the nation's "top 10" general aviation airports in terms of based aircraft and number of flight operations. Several aviation-related businesses are located on the field that provide an array of general aviation services.

RECENT CAPITAL IMPROVEMENTS

Table 1B summarizes a list of the major improvements made to Mesa-Falcon Field Airport since 1998. Since this time, approximately $17 million has been invested in the airport. The vast majority of this total has been funded through various federal and state grants. This has included funding for engineering and construction projects, planning studies, airfield safety improvements, and security enhancements.

TABLE 1B
Projects and Improvements Since 1998
Mesa-Falcon Field Airport

Grant Number	Description	Total Grant Amount
FEDERAL GRANTS		
304-0023-06	Construct new taxiway and apron; reconstruct existing taxiways and taxilanes	$942,157
304-0023-07	Taxiway improvements	$1,027,000
304-0023-08	Drainage improvements adjacent to taxiway	$1,000,000
FAA-09	Airfield signage improvements; electrical upgrades; parallel taxiway and apron improvements	$1,035,109
FAA-10	Land acquisition	$500,830
FAA-11	Pavement preservation improvements; pavement marking upgrades; road study	$150,000
FAA-12	Construct hangar area; Falcon Drive cul-de-sac design and construction	$2,503,423
FAA-13	Pavement preservation improvements; taxiway improvements	$365,000
FAA-14	Runway safety area improvements; perimeter fencing installation	$1,139,396
FAA-15	Airport Master Plan Update	$170,000
Subtotal Federal Grants		**$8,832,915**
STATE GRANTS		
ADOT E9081	Terminal building design	$125,000
ADOT E9023	Construct new taxiway and perimeter road; security enhancements	$969,750
ADOT N607	Drainage and pavement preservation designs	$500,000
ADOT N709	Construct new taxiway and perimeter road; security enhancements	$650,000
ADOT N819	Taxiway improvements	$46,250
ADOT N867	Taxiway and taxilane improvements; taxiway design; hangar rehabilitation; runway safety area improvements	$437,500
ADOT E0128	Airport layout plan update	$9,000
ADOT E0116	Construct new terminal building	$774,000
ADOT E0105	Taxiway improvements	$225,000
ADOT E0157	Taxiway improvements	$50,414
ADOT E1133	Drainage improvements adjacent to taxiway	$49,089
ADOT E1113	Design perimeter road, fencing, and drainage; install fencing	$171,000
ADOT E0165	Apron design; electrical upgrades	$119,000
ADOT E9081	Terminal design	$125,000
ADOT E1145	Airfield signage improvements; electrical upgrades; parallel taxiway and apron	$50,812
ADOT E2F43	Land acquisition	$24,585
ADOT E2S11	Taxiway and apron improvements	$600,000
ADOT E3S02	Design and install perimeter fencing	$270,000
ADOT E3S03	Pavement marking improvements	$90,000
ADOT E3S04	Taxiway reconstruction	$180,000

TABLE 1B (Continued) Projects and Improvements Since 1998 Mesa-Falcon Field Airport		
Grant Number	**Description**	**Total Grant Amount**
STATE GRANTS (Continued)		
ADOT E3F48	Pavement preservation improvements; pavement marking upgrades; road study	$7,363
ADOT E3F49	Construct hangar area; Falcon Drive cul-de-sac design and construction	$122,889
ADOT E4F49	Pavement preservation improvements; taxiway improvements	$17,917
ADOT E6S22	Apron design and construction	$594,000
JPA 05-02	Pavement preservation	$1,175,000
ADOT E7S26	Design and construct eastside aeronautical use area	$270,000
ADOT EFS29	Security fencing installation	$225,000
ADOT E7F52	Airport Master Plan Update	$58,178
ADOT E7F59	Airport Master Plan Update	$4,250
ADOT E7F60	Runway safety area improvements; perimeter fencing installation	$29,985
Subtotal State Grants		**$7,970,982**
TOTAL ALL GRANTS		**$16,803,897**
Source: Airport records		

FUEL SALES

Falcon Executive Aviation and Tango One Aviation are the fixed base operators (FBOs) on the airfield that provide fueling services. Overall, fuel sales have increased steadily over the years with the exception of 2006. Prior to 2007, noticeable trends were evident in the amount of Avgas versus the amount of Jet A fuel disbursed. Avgas fuel totals had declined since 2002, while Jet A fuel totals had significantly increased during the same time period. The significant increase in Avgas fuel sales in 2007 is most likely attributed to the increase in flight training activity at the airport. **Table 1C** summarizes combined fuel sales by both FBO operators at the airport.

TABLE 1C
Historical Fuel Sales
Mesa-Falcon Field Airport

Year	Avgas (gallons)	Jet A (gallons)	Totals
2002	604,961	378,963	983,924
2003	599,604	402,267	1,001,871
2004	581,962	497,305	1,079,267
2005	528,877	702,929	1,231,806
2006	502,922	648,764	1,151,686
2007	716,653	628,345	1,344,998

Source: Airport records

AIRPORT ADMINISTRATION

Mesa-Falcon Field Airport is owned and operated by the City of Mesa. The City of Mesa employs a full-time Airport Director who reports to one of three Deputy City Managers within the City's administrative structure. The airport also employs a full-time Airport Projects Supervisor and Airport Administrative Supervisor who report directly to the Airport Director. In addition, there are seven full-time employees who serve in administrative, operational, and maintenance capacities. The airport staff maintains a presence on the airport seven days per week. The airport is an independent business department within the City and operates as an enterprise fund, meaning it is financially self-sufficient and does not require contributions from the City of Mesa's general fund.

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 Mesa-Falcon Field Airport. At the time, it was estimated that Mesa-Falcon Field Airport had an impact of $2.71 billion annually on the local economy.

The total economic impact of the airport includes the direct-effect employment, payroll, and sales. Indirect benefits would 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.

On-airport direct economic benefits include 5,312 jobs, with a direct payroll of $320.3 million and sales of over $1 billion. Visitor spending accounts for 456 additional jobs, $9.1 million in payroll, and $22.3 million in sales. When the multiplier effect is applied, economic activity generated at Mesa-Falcon Field Airport accounts for 17,602 local jobs, $701 million in payroll, and $2 billion in sales. These figures are very impressive as most reliever airports such as Mesa-Falcon Field typically generate less than $50 million in total impacts and fewer than 500 jobs.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

Stormwater runoff is simply rainwater or snowmelt 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 SWPPP.

The airport has a SWPPP in place which is updated annually. The SWPPP for the airport includes airport tenants, and the City of Mesa provides annual training and inspection services. The airport has a Multi-Sector General Permit.

SPILL PREVENTION CONTROL AND COUNTERMEASURES (SPCC) PLAN

Title 40 of the Code of Federal Regulations (CFR) Part 112, defines the Environmental Protection Agency's (EPA) *Oil Pollution Prevention Plan*. The purpose of the rule is to prevent the discharge of oil into the navigable waters of the United States or adjoining shorelines as opposed to response and cleanup after a spill occurs. The EPA revised these prevention rules on July 17, 2002, to establish the SPCC Plan to meet the purpose of this rule. The EPA has recently approved a final rule to extend compliance dates for SPCC Plans to July 1, 2009.

Before a facility is subject to the SPCC rule, it must meet the following three criterion:

1) it must be non-transportation related,

2) it must have an aggregate above-ground storage capacity greater than 1,320 gallons or a completely buried storage capacity greater than 42,000 gallons, and

3) there must be a reasonable expectation of a discharge into or upon navigable waters of the United States or adjoining shorelines.

By definition within the rule, an airport is considered a non-transportation-related facility. In using this wording, the EPA is trying to distinguish between oil delivery vehicles using public roadways from those facilities that store or handle oil products. The airport has 10,000 gallons of above-ground fuel storage and 66,000 gallons of below-ground fuel storage, exceeding the minimums for above and below-ground storage capacities. Finally, there are a number of existing washes and ditches on the airport that lead to navigable waters of the United States. Therefore, the airport meets all three criterion.

The airport currently does not have a SPCC Plan in place to address issues related to the discharge of oils. As stated earlier, the SPCC has extended the compliance deadline to July 1, 2009 for owners and operators of facilities to prepare or amend and implement their SPCC Plan.

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 airside and landside facilities over the course of the next 20 years.

At the regional level, Mesa-Falcon Field Airport is included in the MAG Regional Aviation System Plan (RASP). The RASP is in place to provide an overview for airport planning in the region, to set the overall plan for airports in the region, and to assess proposed project costs and the proper phasing of projects. Mesa-Falcon Field 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, Mesa-Falcon Field 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. The SASP defines the specific role of each airport in the state's aviation system and establishes funding needs. Through the state's continuous aviation system planning process, the SASP is updated approximately every five years. According to records, the most recent update to the SASP was in 2000 when the *State Aviation Needs Study* (SANS) was prepared. The SANS provides 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. Mesa-Falcon Field Airport is one of 112 airports included in the 2000 SANS, which includes all public and private airports and heliports in Arizona that are open to the public, including American Indian and recreational airports.

At the national level, the airport is included in the FAA *National Plan of Integrated Airport Systems* (NPIAS). This plan includes a total of 3,431 existing airports that are significant to national air transportation and are therefore eligible to receive grants under the FAA 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 grant-in-aid assistance from the FAA.

The 2007-2011 NPIAS identifies $41.2 billion for airport development across the country. Of that total, approximately seven percent is designated for the 274 reliever airports identified.

Reliever airports are located in major metropolitan areas and serve to provide pilots with an attractive alternative to using busy commercial service airports. Moreover, these airports provide a vital function of relieving congestion at capacity-constrained airports. Mesa-Falcon Field Airport is one of seven designated reliever airports in the Phoenix metropolitan area for Phoenix Sky Harbor International Airport. According to the NPIAS, reliever airports across the country have an average of 232 based aircraft and account for 29 percent of the nation's total active aircraft fleet.

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 1C**. **Table 1D** summarizes airside facility data for Mesa-Falcon Field Airport.

Runways

Mesa-Falcon Field Airport is served by parallel runways orientated in a northeast/southwest manner. Runway 4R-22L and Runway 4L-22R are separated by 700 feet from centerline to centerline, which is the minimum separation allowed for a parallel runway system.

Runway 4R-22L is 5,101 feet long by 100 feet wide. The asphalt runway is in "good" condition, the highest rating the FAA designates for runway condition. The pavement has been strength rated at 38,000 pounds single wheel loading (SWL), 60,000 pounds dual wheel loading (DWL), and 90,000 pounds dual tandem wheel loading (DTWL). SWL refers to the design of aircraft landing gear which has one wheel on each landing gear strut. DWL and DTWL include the design of aircraft landing gear with additional wheels on each landing gear strut which distributes more of the aircraft weight on the runway and taxiway surfaces; thus, the surface itself can support a greater total aircraft weight. The weight-bearing strengths listed above are adequate to accommodate nearly all aircraft in the general aviation fleet today.

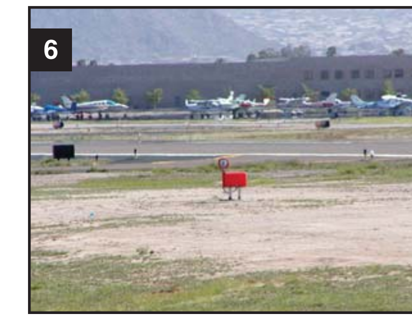
Runway 4L-22R is 3,799 feet long by 75 feet wide. The asphalt runway is in "good" condition and provides a weight-bearing capacity of 12,500 pounds SWL.

06MP17-1C-1/21/09

Airport Traffic Control Tower / Rotating Beacon

Precision Approach Path Indicator Lights

Segmented Circle / Windcone



Runway End Identification Lights

Helipads

Taxiway Lighting, Markings, and Signage

Intersection of Runway 4R-22L and Taxiway B

NORTH

0 600 1200
SCALE IN FEET

DATE OF AERIAL PHOTOGRAPHY:
FEBRUARY 2007

MESA-FALCON FIELD AIRPORT

Exhibit 1C
EXISTING AIRSIDE FACILITIES

Helipads

There are two designated helipads located on the terminal ramp apron directly northeast of the airport traffic control tower (ATCT). The helipads are dimensioned 60 feet long by 60 feet wide and are constructed of asphalt. They provide a weight-bearing capacity of 30,000 SWL and are rated in "good" condition by the FAA.

TABLE 1D
Airside Facility Data
Mesa-Falcon Field Airport

	Runway 4R-22L	Runway 4L-22R	Two Helipads
Length (feet)	5,101	3,799	60
Width (feet)	100	75	60
Surface	Asphalt	Asphalt	Asphalt
Surface Treatment	None	None	None
Condition	Good	Good	Good
Runway Load Bearing Strength (pounds):			
Single Wheel Loading (SWL)	38,000	12,500	30,000
Dual Wheel Loading (DWL)	60,000	N/A	N/A
Dual Tandem Wheel Loading (DTWL)	90,000	N/A	N/A
Runway Lighting	MIRL	MIRL	N/A
Runway Markings	Non-precision	Basic	N/A
Taxiway Lighting	MITL	MITL	N/A
Taxiway Marking	Centerline striping	Centerline striping	N/A
Visual Approach Aids:			
Approach Slope Indicators	PAPI - 2	PAPI-2	N/A
Approach Lighting	REILs	N/A	N/A
Instrument Approach Aids	GPS Runway 4R NDB/GPS-A	N/A	N/A
Weather or Navigational Aids	LAWRS; NDB on field; Anemometer; ATCT		
Visual Aids	Segmented Circle, Lighted Wind Cones, Rotating Beacon		

MIRL - Medium Intensity Runway Lighting
MITL - Medium Intensity Taxiway Lighting
PAPI - Precision Approach Path Indicator
REIL - Runway End Identifier Lights
GPS - Global Positioning System
NDB - Non Directional Beacon
LAWRS - Limited Aviation Weather Reporting Station
ATCT – Airport Traffic Control Tower

Source: Airport Facility Directory - Southwest U.S. (May 2007); FAA Form 5010-1, Airport Master Record

Taxiways

The taxiway system at Mesa-Falcon Field Airport includes a full-length parallel taxiway to both Runway 4R-22L and Runway 4L-22R. Taxiway D serves as the parallel taxiway for Runway 4R-22L and is located 250 feet south of the runway centerline. A large hold apron is located near the east end of Taxiway D which allows pilots to perform preflight checks, including engine run-up, and where ATCT personnel can instruct pilots to wait for clearance to enter the runway. Taxiway E serves as the parallel taxiway for Runway 4L-22R and is located 200 feet north of the runway centerline. Hold aprons are located on each end of this taxiway.

There are nine entrance/exit taxiways on the south side of Runway 4R-22L designated as D-2, A, D-3, D-4, B, D-5, D-6, C, and D-8 as one moves from west to east. Taxiways D-3, D-4, D-5, and D-6 provide high-speed exits from the runway. Taxiways D-3 and D-4 are located approximately 1,350 feet from the Runway 4R threshold, and Taxiways D-5 and D-6 are located approximately 1,900 feet from the Runway 22L threshold. High-speed taxiways are angled to allow aircraft to exit the runway at a greater speed than if the taxiway were at a right angle. This configuration adds to the overall capacity of the airfield and increases aircraft movement efficiency.

There are three entrance/exit taxiways located on the north side of Runway 4L-22R designated as A, B, and C moving from west to east. Taxiway B serves as the midfield taxiway connecting both runways. All active taxiways with their associated dimensions are listed in **Table 1E**. There are several taxilanes that serve more remote areas of the airfield such as individual hangars and T-hangar complexes.

Pavement Markings

Pavement markings aid in the movement of aircraft along airport surfaces and identify closed or hazardous areas on the airport. Runway 4R-22L has non-precision markings to include the runway designations, centerline, edges, touchdown point, and landing thresholds. Runway 4L-22R has basic markings which include runway designations, centerline, edges, and touchdown point.

TABLE 1E
FAA Designated Taxiways
Mesa-Falcon Field Airport

Taxiway	Length (feet)	Width (feet)
A	1,100	35-50
B	3,500	75-150
C	1,100	35-50
D	5,000	50
D-2	200	50
D-3	200	50
D-4	200	50
D-5	200	50
D-6	200	50
D-8	200	50
E	3,700	40
West Taxiway	1,025	50

Source: Airport Records

Taxiway and taxilane centerline markings are provided to assist pilots in maintaining proper clearance from pavement edges and objects near the taxiway/taxilane edges. Taxiway markings also include aircraft holding positions located on the connecting taxiways. Aircraft movement areas on the apron are also identified with centerline markings. Aircraft tie-down positions are identified on various apron surfaces, and pavement edge markings are present on certain portions of Taxiways A, B, C, and D.

Airfield Lighting

Airfield lighting systems extend an airport's usefulness into periods of darkness and/or poor visibility. A variety of lighting systems are 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 Mesa-Falcon Field Airport is located on the top of the ATCT.

Runway and Taxiway Lighting/Signage: Runway and taxiway edge 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 runways and aircraft parking areas.

Runway 4R-22L and Runway 4L-22R are equipped with medium intensity runway lights (MIRL). These lights are 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.

All runway ends are equipped with threshold lighting. Threshold lighting consists of specially designed light fixtures that are red on the departure side and green on the arrival side.

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

The airport also has a runway/taxiway signage system. The presence of runway/taxiway signage is an essential component of a surface movement guidance control system necessary for the safe and efficient operation of the airport. The signage system installed at Mesa-Falcon Field Airport, which is lighted, includes runway and taxiway designations, holding positions, routing/directional, and runway exits.

Visual Approach Lighting: On the left side of Runway 4R, 22L, 4L, and 22R is a two-box precision approach path indicator (PAPI-2L). The PAPI consists of a system of lights located approximately 800 feet from the runway thresholds at Mesa-Falcon Field Airport. When interpreted by pilots, these lights give an indication of being above, below, or on the designated descent path to the runway. A PAPI system has a range of five miles during the day and up to twenty miles at night. There are no approach lighting systems prior to the runways.

Runway End Identification Lights: Runway end identification lights (REILs) provide rapid and positive identification of the approach ends of a runway. A REIL consists of two synchronized flashing lights, located laterally on each side of the runway end, facing the approaching aircraft. A REIL system has been installed on both ends of Runway 4R-22L.

Pilot-Controlled Lighting: When the ATCT is closed, the MIRL for Runway 4R-22L and taxiway lighting is preset to low intensity. With the pilot-controlled lighting system (PCL), pilots can control airfield lights from their aircraft, through a series of clicks of their radio transmitter. In order to increase the lighting intensity, pilots utilizing Mesa-Falcon Field Airport can tune their radio to the common traffic advisory frequency (CTAF) 124.6 MHz when the ATCT is closed. It should be noted that Runway 4L-22R is unavailable for use after the ATCT closes; thus, PCL does not apply to this runway.

Weather and Communication Aids

Mesa-Falcon Field Airport has three lighted windcones, one inside the segmented circle and the other two located closer to each of the runway ends. The lighted wind cones provide information to pilots regarding wind conditions, such as direction and speed. The segmented circle provides traffic pattern information to pilots. Having three wind cones spread out equally along the runway system is advantageous because wind indications can be determined from anywhere along the runways.

Mesa-Falcon Field Airport is equipped with an automated terminal information service (ATIS), which is a recorded message updated hourly, and broadcast on 118.25 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.

Mesa-Falcon Field Airport also utilizes a CTAF, which was briefly discussed earlier. This radio frequency (124.6 MHz) is used by pilots in the vicinity of the airport to communicate with each other about approaches or take-offs from the airport when the ATCT is closed. The same frequency will reach the ATCT when the tower is open. Ground control can be reached via 121.2 MHz during tower hours. In addition, a UNICOM frequency is also available (122.95 MHz) where a pilot can obtain FBO information.

The airport does have an on-site weather observer. The limited aviation weather reporting station (LAWRS) has personnel who report cloud height, weather, obstructions to visibility, temperature, dewpoint, surface wind, altimeter settings, and any other pertinent remarks. An anemometer is also located between the two runways approximately 200 feet southwest of midfield Taxiway B. It measures wind velocity.

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 to or from Mesa-Falcon Field Airport include a non-directional beacon (NDB), a very high frequency omnidirectional range (VOR) facility, global positioning system (GPS), and Loran-C.

The NDB transmits nondirectional radio signals whereby the pilot of an aircraft equipped with direction-finding equipment can determine their bearing to or from the NDB facility in order to track to the beacon station. There is an active NDB (Falcon Field NDB) located in the northwest area of the airport. The Chandler NDB is located approximately 12 nautical miles to the southwest of the airport.

The 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 directional 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 approximately 10 nm to the southeast of the airport at Phoenix-Mesa Gateway Airport. The Phoenix VORTAC is located approximately 12 nautical miles to the west of the airfield at Phoenix Sky Harbor International Airport. The Stanfield VORTAC is located approximately 36 nautical miles to the south of Mesa-Falcon Field 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 an NDB or VOR in that pilots are not required to navigate using a specific ground-based facility. GPS uses satellites placed in orbit around the earth to 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 specific ground-based navigational facility.

The civilian GPS has been improved with the wide area augmentation system (WAAS), which was launched on July 10, 2003. The WAAS uses a system of reference stations to correct signals from the GPS satellites for improved navigation and approach capabilities. The present GPS provides for enroute navigation and instrument approaches with both course and vertical navigation. The WAAS upgrades are expected to allow for the development of approaches to most airports with cloud ceilings as low as 250 feet above the ground and visibilities as low as three-quarters mile, after 2015.

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.

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 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.

Two instrument approaches have been approved for Mesa-Falcon Field Airport. The details for the GPS Runway 4R approach and NDB or GPS-A approach are presented in **Table 1F**.

TABLE 1F
Instrument Approach Data
Mesa-Falcon Field Airport

	Weather Minimums by Aircraft Type					
	Categories A and B		Category C		Category D	
	Cloud Height (feet AGL)	Visibility (miles)	Cloud Height (feet AGL)	Visibility (miles)	Cloud Height (feet AGL)	Visibility (miles)
GPS Runway 4R						
Straight-In	419	1	419	1.25	N/A	N/A
Circling	468	1	468	1.5	N/A	N/A
Phoenix Sky Harbor Altimeter Setting Minimums						
Straight-In	479	1	479	1.25	N/A	N/A
Circling	548	1	548	1.5	N/A	N/A
NDB or GPS-A						
Circling	468	1	488	1.5	N/A	N/A
Phoenix Sky Harbor Altimeter Setting Minimums						
Circling	528	1	548	1.5	N/A	N/A

Aircraft categories are established 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
AGL - Above Ground Level

Source: U.S. Terminal Procedures, Southwest SW-4 (May 2007)

There is a GPS straight-in approach procedure to Runway 4R. This is a non-precision approach providing only course guidance to the runway end. The minimum descent altitude (MDA) is 419 feet above the ground for the GPS straight-in approach. At this altitude, the pilot must have broken through the cloud ceiling and be able to make visual reference with the runway environment in order to land. If the pilot does not have visual reference, he or she must execute a missed approach procedure. The missed approach procedure requires pilots to climb to 5,000 feet while making a right turn and hold for further instruction from the ATCT.

The GPS circling approach allows pilots to land to Runway 22L at the airport. This provides flexibility for the pilot to land on the runway most closely aligned with the prevailing wind at that time. This flexibility requires the circling approach to have higher visibility and cloud ceiling minimums than the straight-in instrument approach. This is done to provide pilots with sufficient visibility and ground clearance to navigate visually from the approach to the desired runway end for landing. An NDB or GPS-A approach also serves Mesa-Falcon Field Airport and is considered a circling approach only.

The airport has approved instrument approaches for aircraft with approach speeds up to and including 140 knots. This means that the airport has a design capacity for some larger business jets such as the Citation X and Challenger.

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) procedures. A 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, Jcobs Two, and Sunss Five.

Air Traffic Control

The airport has had an operational airport traffic control tower (ATCT) since 1980. It is located to the south of the parallel runways, approximately 850 feet from the Runway 4R-22L centerline and adjacent to the airport terminal building. The FAA assumes responsibility for the ATCT and its operations. 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 (124.6 MHz), ground control (121.3 MHz), and ATIS information (118.25 MHz). When the tower is closed, pilots operating in the vicinity of the airport can announce their intentions on the CTAF, which is the same frequency as the tower (124.6 MHz).

The ATCT located at the airport controls air traffic within the Class D airspace that surrounds Mesa-Falcon Field Airport. Aircraft operating within the Class B airspace associated with Phoenix Sky Harbor International Airport and surrounding Mesa-Falcon Field Airport's Class D airspace are controlled by the Phoenix Terminal Radar Approach Control (TRACON) facility located at Phoenix Sky Harbor International Airport. Aircraft arriving and departing the Phoenix metropolitan area are controlled by the Albuquerque Center Air Route Traffic Control Center (ARTCC). The Albuquerque ARTCC controls aircraft in a large multi-state area.

LANDSIDE FACILITIES

Landside facilities are the ground-based facilities that support the aircraft and pilot/passenger handling functions. These facilities typically include the terminal building, fixed base operators (FBOs), aircraft storage hangars, aircraft maintenance hangars, aircraft parking aprons, and support facilities such as fuel storage, automobile parking, utilities, and aircraft rescue and firefighting. Landside facilities at Mesa-Falcon Field Airport are identified on **Exhibit 1D**.

Terminal Building

There is a dedicated general aviation terminal building at Mesa-Falcon Field Airport. The building is located on the south side of the parallel runways and directly west of the ATCT. The facility is multi-functional, providing space for a public lobby, restrooms, and airport administrative offices. The terminal building provides approximately 4,500 square feet of enclosed space.

Aircraft Hangar Facilities

Hangar facilities at Mesa-Falcon Field Airport are comprised of conventional hangars, executive hangars, T-hangars, and shade hangars. Conventional hangars provide a large open space, free from roof support structures, and have the capability to store several aircraft simultaneously. Conventional hangars are typically 10,000 square feet or larger. Often, conventional hangars are owned or leased by an airport business such as a FBO. Executive hangars provide the same type of aircraft storage as conventional hangars in that the structure is free from roof supports, but are typically smaller than 10,000 square feet. These hangars are normally utilized by individual owners to store several aircraft or by smaller airport businesses. This type of hangar is becoming much more popular at general aviation airports. T-hangars provide for separate storage facilities within a larger contiguous facility. Shade hangars are tiedown spaces with a protective roof covering. **Table 1G** lists the hangar facilities at Mesa-Falcon Field Airport. These facilities are also identified on **Exhibit 1D**.

General Aviation Services

A full range of aviation services are available at Mesa-Falcon Field Airport. This includes aircraft rental, flight training, aircraft maintenance, aircraft charter, aircraft fueling, aircraft manufacturing, and many other services. As mentioned earlier, the airport is served by two full-service FBOs, Falcon Executive Aviation and Tango One Aviation. The following provides a brief description of general aviation services currently at the airport.

The City of Mesa provides airport management and operations oversight, land lease rental, aircraft hangar rental, and tiedown rental.

Falcon Executive Aviation, Inc. is a full-service FBO at the airport that provides a variety of general aviation services. It operates out of a 17,000 square-foot facility that provides hangar space, offices, and a pilot's lounge. A smaller office building and fuel office are located directly in front of the hangar on the ramp apron and provide additional services to pilots and aircraft. It employs 54 people and provides full-service Jet A and Avgas

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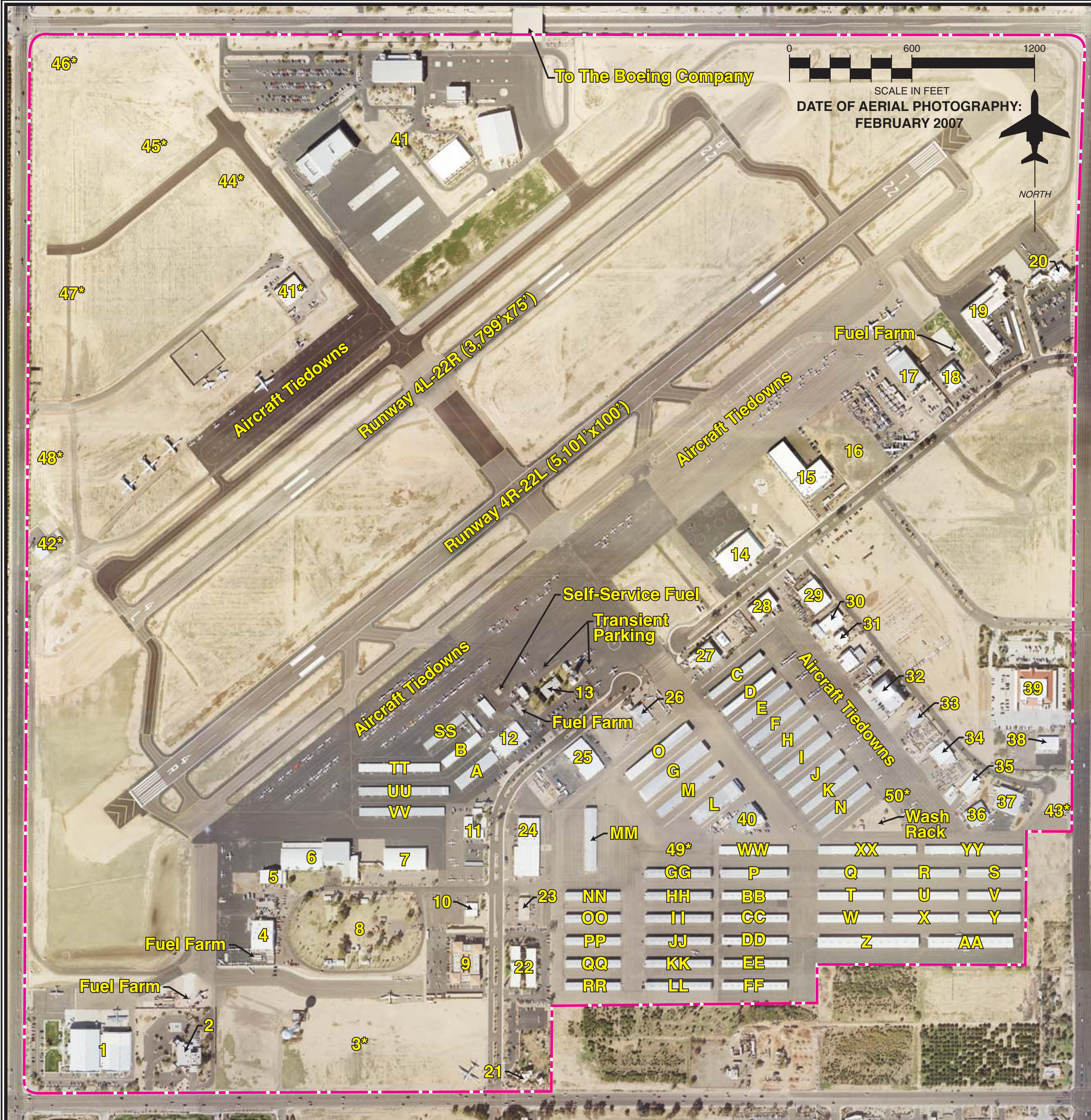


Tango One Aviation


Aircraft Tiedowns


Terminal Building


Falcon Executive Aviation


T-Hangars

LEGEND

1 -Commemorative Air Force
2 -City Fire Station #208
3* -Falcon 7, LLC - Desert Jet Center
4 -Tango One Aviation; Arizona Wing Waxers; Aero-Tech; Falcon Aircraft Accessories; Learn To Fly AZ; AirEvac Services, Inc.; Sun Country Services; National/Alamo
5 -Horizon Land Development
6 -West World War II Hangar
7 -East World War II Hangar
8 -Falcon Field Park
9 -32 Falcon Field Corporate Building
10 -Civil Air Patrol
11 -Mitchell Aircraft Sales; S/W Eye Center
12 -Falcon Executive Aviation; Hertz
13 -Terminal Building
14 -Heliponents
15 -Sabena Airline Training Center; Structures, Inc.
16 -Falcon Jet Center
17 -Marsh Aviation
18 -Mesa Police - Aviation Unit
19 -Thunderbird Airport Plaza
20 -Anzio Landing Restaurant
21 -The Monastary
22 -Falcon Corporate Center
23 -Falcon's Roost Restaurant
24 -Phoenix Heliservices
25 -Flight Trail Helicopters
26 -Arizona Aviation; Red Mountain Aircraft Service
27 -Lifenet; Starman Brothers Auction; Mace Aviation
28 -Aeromaritime America, Inc.
29 -Air Response
30 -Aeromaritime America, Inc.
31 -Private Aircraft Storage
32 -Arizona Aircraft Interiors
33 -Helicopter Systems
34 -Arizona Heliservices; Western Heliserve
35 -Falcon Executive - Avionics
36 -Air Power
37 -Air West
38 -Airport Operations Building
39 -U.S. Post Office
40 -Phoenix Composites
41 -MD Helicopters
42* -General Aviation Services, LLP
43* -Hangar One, LLC
44* -Falcon Pacific Aviation, LLC
45* -Hangar One, LLC
46* -Falcon Office Center
47* -Desert Pacific Aviation, LLC
48* -ExecJet Holdings, LLC
49* -Falcon Hangar, LLC
50* -AZ Aircraft Painting, LLC
A-SS -T-Hangars
L,O -Executive Hangars
TT-YY -Shade Hangars
* -Under Construction / To Be Developed
-Airport Property Line

MESA-FALCON FIELD AIRPORT

Exhibit 1D
EXISTING LANDSIDE FACILITIES

TABLE 1G
Hangar Facilities
Mesa-Falcon Field Airport

Hangar Type	Square Feet (Hangar and Office)	Occupant	Labeled on Map
Conventional	27,000	Commemorative Air Force	1
Executives*	228,000	Falcon 7 - Desert Jet Center	3
Conventional	14,000	Tango One Aviation; AirEvac Services; Arizona Wing Waxers; Aero-Tech; Falcon Aircraft Accessories; Learn to Fly AZ; National/Alamo	4
Executive	6,000	Horizon Land & Development	5
Conventional	47,200	West World War II Hangar	6
Conventional	20,000	East World War II Hangar	7
Conventional	17,000	Falcon Executive Aviation; Hertz	12
Conventional	25,500	Heliponents	14
Conventional	39,000	Sabena Airline Training Center; Structures, Inc.	15
Conventional	35,000	Falcon Jet Center	16
Conventional	18,000	Marsh Aviation	17
Executive	6,500	Mesa Police - Aviation Unit	18
Conventional	23,200	Thunderbird Airport Plaza	19
Conventional	18,000	Flight Trails Helicopter	25
Executive	6,000	Arizona Aviation; Red Mountain Aircraft Service	26
Conventional	12,500	Lifenet; Starman Brothers Auction; Mace Aviation	27
Conventional	15,000	Air Response	29
Executive	3,800	Aeromaritime America	30
Executive	2,500	Private	31
Conventional	16,000	Arizona Aircraft Interiors	32
Executive	3,800	Helicopter Systems	33
Executive	8,000	Arizona Heliservices; Western Heliserve	34
Executive	5,000	Falcon Executive – Avionics	35
Conventional	15,000	Air West	36
Conventional	22,000	Air Power	37
Conventional	12,000	Phoenix Composites	40
Conventional	125,000	MD Helicopters	41
Executive*	3,500	General Aviation Services	42
Conventional*	12,000	Hangar One, LLC	43
Conventionals/ Executives*	86,000	Falcon Pacific Aviation	44
Conventionals/ Executives*	73,500	Reilly Aviation	45
Conventional*	22,400	Falcon Hangars, LLC	49
Executive*	12,500	AZ Aircraft Painting, LLC	50
T-Hangars	579,100	Private	A-SS
Shade Hangars	101,000	Private	TT-YY
Executives	26,300	Private	L,O

Total Existing Hangar Space**	**1,196,700**
Total Conventional**	446,200
Total Executive**	70,400
Total T-Hangar**	579,100
Total Shade Hangar	101,000

*Under Construction / To Be Developed
**Does not include hangars currently being constructed or hangars planned for development

Source: Airport records

fuel and self-service Avgas 24 hours per day, seven days per week. Additional services include aircraft maintenance and avionics repairs, flight planning, aircraft rental, flight instruction, aircraft charter, aircraft sales, pilot supplies, and on-site ground transportation.

Tango One Aviation, Inc. is also a full-service FBO at the airport that operates out of a 14,000 square-foot facility located on the southwest portion of the airport. The facility provides approximately 8,000 square feet of hangar space, with the remainder being utilized for offices, commercial businesses, and pilot amenities. The company employs 10 people and provides full-service Jet A and Avgas fuel 24 hours per day, seven days per week. In addition to the full-service fuel, Tango One Aviation provides additional general aviation services including flight planning, a pilot's lounge, aircraft catering, on-site transportation, aircraft maintenance, and hangar space.

Air West, Inc. provides air charter services.

Arizona Heliservices, Inc. operates an air charter service in the form of sightseeing helicopter tours.

Helicopter Systems provides air charter services and helicopter maintenance and repairs.

AirEvac Services, Inc. is an air medical transport service for the City of Mesa and surrounding area.

Lifenet is also an air medical transport service utilizing helicopters that provide services to the surrounding area.

Flight Trails Helicopter provides a one-stop shop for fixed wing and rotorcraft avionics installations and completions.

T**he Boeing Company** in Mesa is one of the world's leading producers of military rotorcraft and electrical assemblies for Boeing military and commercial aircraft programs. The site builds the AH-64D Apache Longbow combat helicopter for the U.S. Army and a growing number of nations around the world. The site also produces components and electrical assemblies for The Boeing Company's military and commercial aircraft, including the C-17, F/A-18, F-15, CH-47, AV-8B, T-45, V22, and C-130. Development of high technology innovations for future rotorcraft applications is also a focus of the company through Advanced Systems, a research and development unit of Boeing with a new generation of products, including the A-160 Hummingbird and the A/MH-6X Little Bird.

MD Helicopters, Inc. is also a helicopter manufacturer on the north side of the airport that maintains a strong presence on the field. The company designs and produces the MD-500 series, MD-600 series, and MD Explorer helicopter. These high performance helicopters are in service with air medical, law enforcement, and corporate and utility operators around the world.

Arizona Aviation provides flight instruction, aircraft rental, aircraft restorations and conversions, and aircraft sales.

Marsh Aviation operates an aircraft restoration and conversion service and offers aircraft maintenance and repairs as well.

Civil Air Patrol provides aircraft search and rescue services to the surrounding area and offers programs to youth interested in aviation.

Phoenix Composites, Inc. is a complete manufacturing, service, and modification facility for all makes and models of experimental aircraft. It also provides painting and upholstery services as well as flight instruction. It employs 12 people at the airport.

Arizona Wing Waxers provides aircraft detailing, aluminum polishing, paint touch-up, and repair services.

Arizona Aircraft Interiors, Inc. operates an aircraft upholstery and interior service at the airport.

Aeromaritime America, Inc. is a comprehensive repair, overhaul, and test facility at the airport that specializes in the handling of the full line of Rolls Royce Model 250 turboshaft and turboprop engines.

Starman Brothers Auction has grown to be one of the country's leading aviation auction companies providing a qualified list of aviation buyers and helping in the advertising of aviation-related products.

Aero-Tech is an aircraft maintenance and repair company located at the airport.

Phoenix Heliparts restores and repairs products made by MD Helicopters, Inc.

Air Power, LLC provides aircraft maintenance, airframe, and engine repair services.

Air Response is a certified repair station specializing in the maintenance of agricultural aircraft.

Falcon Aircraft Accessories specializes in the sale of remanufactured starters, generators, and alternators for all general aviation aircraft.

Heliponents, Inc. operates out of a 25,500 square-foot hangar at the airport specializing in the maintenance and component overhaul of aircraft engines, in particular Bell models. It has recently installed an underground fuel storage tank for the re-sale of Jet A fuel.

Mace Aviation specializes in aircraft maintenance and repairs.

Mesa Police – Aviation Unit operates three helicopters and one fixed-wing aircraft out of a hangar on the airport. The unit provides an array of law enforcement and safety-related services to the greater Phoenix area, averaging ten flight hours per day.

Red Mountain Aircraft Service provides maintenance on general aviation aircraft.

Western Heliserve is also an aircraft maintenance and repair station on the airport.

Learn To Fly AZ provides flight instruction services.

Sabena Airline Training Center provides specialized flight instruction services to international students utilizing approximately 50 aircraft. It plans to add several aircraft in the near future and conduct thousands of operations at the airport each year.

The **Commemorative Air Force Museum** is located on the southwest corner of the airport and houses several vintage World War II aircraft and offers tours and flights to the general public. It also restores these aircraft back to their original condition.

There are rental car agencies located at Mesa-Falcon Field Airport that provide automobile transportation to pilots and passengers utilizing the airport. **Hertz Corporation** occupies an area of space in Falcon Executive Aviation's facility. **National** and **Alamo** car rental companies are located in Tango One Aviation's FBO facility.

Three restaurants are located at the airport. They include **Anzio's Landing Italian Restaurant**, **Falcon's Roost Restaurant and Lounge**, and **The Monastery Restaurant**.

Other private businesses/entities exist on the airport and are located in commercial office complexes in various locations. **Thunderbird Airport Plaza, Falcon Corporate Center,** and **32 Falcon Field Corporate Building** are among the complexes that house several of these businesses.

Proposed Hangar Development

There are currently 11 parcels of land that have recently been leased to private developers on the airport. The areas are identified on **Exhibit 1D** and in **Table 1G**. Approximately 400,000 square feet of infrastructure (hangar space and offices combined) are planned to be developed. These facilities will be constructed in phases over the next several years and provide additional hangar space in the form of conventional and executive hangars.

Automobile Parking

There are several parking lots available for vehicle parking at Mesa-Falcon Field Airport. The airport terminal building offers 55 total parking spaces, plus two handicap positions for the general public and four rental cars ready/return spaces. The ATCT, located adjacent to the terminal, includes 12 parking spaces.

The two major FBOs located on the airport, Tango One Aviation and Falcon Executive Aviation, also have designated parking spaces for the general public. Tango One Aviation has approximately 30 marked parking spaces plus additional unmarked parking to the east of its facility. Falcon Executive Aviation has 45 total parking spaces, eight of which are reserved for rental car ready/return and one for handicap.

Additional aviation-related businesses on the airport also provide parking for their employees and customers. A total of approximately 430 parking spaces plus 10 handicap positions are available on the south side of the airport. Fire Station #208, located adjacent to East McKellips Road, has approximately 80 marked automobile parking spaces. MD Helicopters, located on the north side of the airport adjacent to East McDowell Road, provides approximately 425 parking spaces.

There are also several parking lots available for other business activity located at the airport. Thunderbird Airport Plaza, Falcon Corporate Center, and 32 Falcon Field Corporate Building account for a total of 367 parking positions and 15 handicap positions. The three restaurants provide 234 parking positions, plus seven handicap positions. The U.S. Post Office adjacent to North Higley Road has 65 parking spaces and three handicap positions.

There are a total of approximately 1,780 automobile parking spaces located on Mesa-Falcon Field Airport that serve a variety of aviation and non-aviation related businesses.

Aircraft Parking Aprons

There are two main aircraft parking apron areas at Mesa-Falcon Field Airport totaling 191,500 square yards, and approximately 343 aircraft tiedown spaces. The apron areas include the terminal apron, located south of the runways adjacent to the airport terminal building and several other businesses, and the north apron, located to the north of Runway 4L-22R.

The terminal apron stretches nearly the entire length of Runway 4R-22L and has approximately 140,000 square yards of pavement for aircraft and circulation taxilanes. There are 197 aircraft tiedown spaces on the terminal apron, plus two helipads used for rotorcraft parking. Of the 199 total aircraft tiedown spaces, 142 are located in the immediate area of the terminal building, while 57 are located farther to the east. The north apron area encompasses approximately 51,500 square yards of pavement and includes 144 aircraft tiedown spaces.

There are an additional 83 tiedown spaces associated with smaller aircraft parking aprons located throughout the airport in proximity to conventional and executive hangars and T-hangars. These areas are located adjacent to the World War II hangars, Tango One Aviation, Anzio Landing Restaurant, T-hangars, and other more remote locations on the airport. Approximately 31,000 square yards of apron space account for these locations on the airport.

Aircraft Wash Rack

An aircraft wash rack is located on the southeast side of the airport near several T-hangar and shade hangar complexes. This facility allows aircraft owners to wash their aircraft and was constructed to ensure proper drainage of run-off water and cleaners.

Fuel Facilities

There are five fuel farms located on the airport that currently store aviation fuel. Falcon Executive Aviation owns and operates a fuel farm that consists of three underground fuel storage tanks. Two 10,000-gallon capacity tanks are dedicated for the storage of Avgas, and one 12,000-gallon capacity tank is dedicated for Jet A fuel. Fuel is delivered to aircraft via fuel trucks. Self-service Avgas fueling capability is also offered by Falcon Executive Aviation. This facility consists of a fuel dispenser that is connected to one of the underground Avgas fuel storage tanks and a credit card reader. Tango One Aviation also owns and operates a fuel storage area on the airport. The fuel farm consists of one 12,000-gallon capacity Avgas storage tank and one 10,000-gallon capacity Jet A storage tank. Both tanks are underground. Tango One Aviation also has fuel trucks that deliver fuel to aircraft.

The three remaining fuel farms on the airport are owned and operated by the City of Mesa's Police Aviation Division, the Commemorative Air Force Museum, and Heliponents. The Police Aviation Division has one underground fuel storage tank that holds 12,000 gallons of Jet A fuel. The Commemorative Air Force Museum has the only aboveground fuel storage facility on the airport. It has a 10,000-gallon capacity and is dedicated for Avgas. Heliponents has a 20,000-gallon capacity aboveground fuel storage facility dedicated for Jet A fuel.

In addition, the airport provides the general aviation tenants with a waste collection area. This is a depository for oil, hydraulic fluid, chemical wastes, and aircraft batteries to ensure the appropriate disposal and recycling of the waste streams. This area is located adjacent to the aircraft wash rack and is totally enclosed.

Aircraft Rescue and Firefighting (ARFF)

The City of Mesa's Fire Station #208 is located in the southwest area of the airport and fronts McKellips Road. It is designed to provide emergency and rescue services to the surrounding area, including Mesa-Falcon Field Airport. Fire Station #208 has six personnel present 24 hours per day, seven days per week. The station is ARFF certified, meaning that they are capable of handling fire and rescue operations specific to aircraft emergencies. One 500-gallon capacity fire engine and one 1,500-gallon ARFF certified foam truck are stationed at the facility, as well as a utility truck capable of carrying equipment specific to each situation that may be encountered. Personnel must go through annual ARFF training in order for the station to maintain its proper ARFF certification.

Safety Fencing

The airport is currently in the process of designing and constructing remaining portions of perimeter fencing and gates that will totally enclose airfield sensitive areas and aircraft movement areas to prevent the inadvertent access onto the airport by vehicles and/or pedestrians. The fence is eight-foot tall chain link. The airport plans to have the fencing project completed within the next 18 months.

In addition to the fencing project, the airport is also updating its vehicle gate system. Currently, there are no control-access powered gates at the airport. At the completion of the project, there will be approximately eight powered general-use access gates operated by the City. Approximately 20 additional vehicle manual access-gates will be installed in locations to provide access to commercial and individual tenants on the field.

Utilities

The availability and capacity of the utilities serving the airport are factors in determining the development potential of the airport, as well as the land immediately adjacent to the facility. Utility availability is a critical element when considering future expansion capabilities of an airport, both airside and landside components.

The airport is supplied by electricity, natural gas, water and sanitary sewer. Electric service is provided by Salt River Project (SRP). The City of Mesa provides natural gas, water, and sanitary sewer services. Telephone and communications services are provided by Qwest.

PAVEMENT MANAGEMENT PROGRAM

The Arizona Department of Transportation – Aeronautics Division (ADOT) has implemented the Arizona Pavement Preservation Program (APPP) to assist in the preservation of the Arizona airport system infrastructure. 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. To this end, ADOT has completed and is maintaining an Airport Pavement Management System (APMS) which, coupled with monthly pavement evaluations by the airport sponsor, fulfills this requirement.

The APMS uses the Army Corps of Engineers' "Micropaver" program as a basis for generating a five-year APPP. The APMS consists of visual inspections of all airport pavements. Evaluations are made of the types and severities observed and entered into a computer program database. Pavement Condition Index (PCI) values are determined through the visual assessment of pavement conditions in accordance with the most recent FAA Advisory Circular 150/5380-6 and range from 0 (failed) to 100 (excellent). Every three years, a complete database update with new visual observations is conducted. Individual airport reports from the update are shared with all participating system airports. ADOT ensures that the APMS database is kept current, in compliance with FAA requirements.

Every year ADOT, utilizing the APMS, will identify airport pavement maintenance projects eligible for funding for the upcoming five years. These projects will appear in the State's Five-Year Airport Development Program. Once a project has been identified and approved for funding by the State Transportation Board, the airport sponsor may elect to accept a state grant for the project and not participate in the APPP, or the airport sponsor may sign an Inter-Government Agreement (IGA) with ADOT to participate in the APPP.

Mesa-Falcon Field Airport participates in the State's pavement maintenance program for AIP eligible pavement rehabilitation projects. On a daily basis, airport personnel complete an operations log for the airport, a portion of which includes visual observations of the pavement conditions. The City of Mesa performs routine pavement maintenance such as crack sealing and repair on an as-needed basis.

It should be noted that recent state legislative decisions have reduced funding for aviation-related projects in Arizona. Mesa-Falcon Field Airport is budgeting for pavement rehabilitation and preservation on the airport and funding these projects when the need arises.

AREA AIRSPACE

The Federal Aviation Administration 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 Aerospace 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 1E** 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). This airspace is designed in Federal Aviation Regulation (F.A.R) Part 71.193, for positive control of aircraft. The Positive Control Area (PCA) allows flights governed only under instrument flight rules (IFR) operations. The aircraft must have special radio and navigational equipment, and the pilot must obtain clearance from an air traffic

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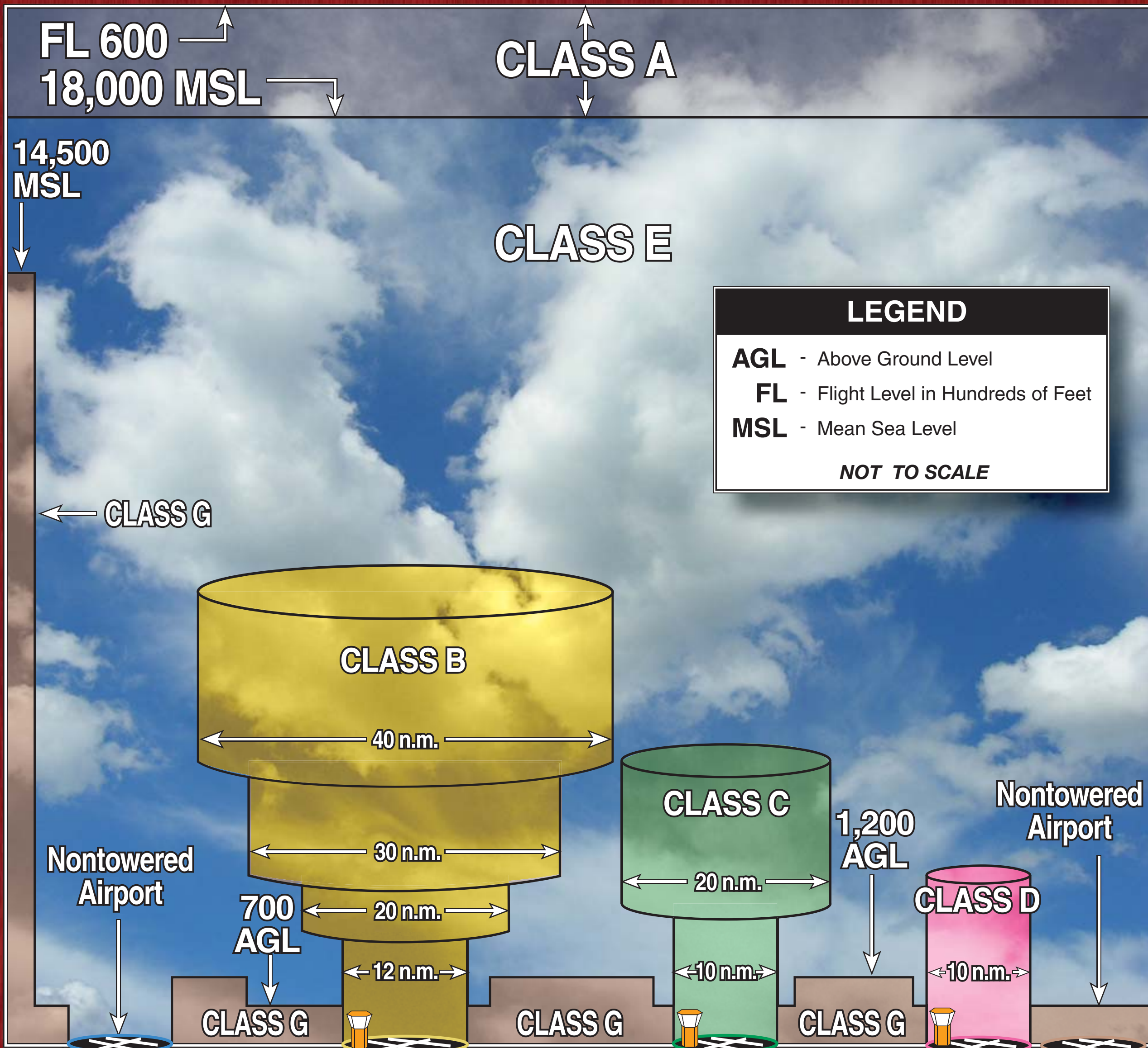

CLASSIFICATION	*DEFINITION*
CLASS A	Generally airspace above 18,000 feet MSL up to and including FL 600.
CLASS B	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports.
CLASS C	Generally airspace from the surface to 4,000 feet AGL surrounding 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.

MESA-FALCON FIELD AIRPORT

Exhibit 1E
AIRSPACE CLASSIFICATION

control (ATC) facility to enter Class A airspace. In addition, the pilot must possess an instrument rating.

- Class B airspace is controlled airspace surrounding high-activity commercial service airports (i.e. Phoenix Sky Harbor International Airport). Class B airspace is designed to regulate the flow of uncontrolled traffic, above, around, and below the arrival and departure airspace required for high performance, passenger-carrying aircraft at major airports. In order to fly within Class B airspace, an aircraft must be equipped with special radio and navigation equipment and must obtain clearance from air traffic control. A pilot is required to have at least a private pilot's certificate or be a student pilot who has met the requirements of F.A.R. Part 61.95, which requires special ground and flight training for the Class B airspace. Aircraft are also required to utilize a Mode C transponder within a 30 nautical mile range of the center of the Class B airspace. A Mode C transponder allows the ATCT to track the location and altitude of the aircraft.

- Class C airspace is controlled airspace surrounding lower-activity commercial service (i.e. Tucson International Airport) and some military airports. The FAA has established Class C airspace at 120 airports around the country, as a means of regulating air traffic in these areas. Class C airspace is designed to regulate the flow of uncontrolled traffic above, around, and below the arrival and departure airspace required for high-performance, passenger-carrying aircraft at major airports. To operate inside Class C airspace, the aircraft must be equipped with a two-way radio and an encoding transponder, and the pilot must have established communication with ATC.

- Class D airspace is controlled airspace surrounding most airports with an operating ATCT and not classified under B or C airspace designations. The Class D airspace typically constitutes a cylinder with a horizontal radius of four or five nautical mile from the airport, extending from the surface up to a designated vertical limit, typically set at approximately 2,500 feet above the airport elevation. If an airport has an instrument approach or departure, the Class D airspace sometimes extends along the approach or departure path.

All aircraft operating within Class 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 the appropriate air traffic control facility 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 minimum visibility and cloud ceilings exist.

- Class G airspace is uncontrolled airspace typically in overtop rural areas that does not require communication with an air traffic control facility.

Airspace within the vicinity of Mesa-Falcon Field Airport is depicted on **Exhibit 1F**. When the ATCT is open, 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 approximately 2,500 feet above ground level (AGL). Class D airspace surrounding the airport has recently changed, extending approximately four nm to the west of the airport before being superseded by Class B airspace for Phoenix Sky Harbor International Airport. When the tower is closed, the airport operates in Class G airspace which extends to 18,000 feet MSL, or where Class B airspace begins. In this case, Class B airspace begins at 4,000 feet MSL directly above Mesa-Falcon Field Airport.

Victor Airways

Victor Airways are designated navigational routes extending between VOR facilities. Victor Airways have a floor of 1,200 feet AGL 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. Nine Victor Airways lead to and from the Phoenix VORTAC. V190, the closest Victor Airway, is located approximately four nautical miles north of the Mesa-Falcon Field Airport.

Military Operations Areas (MOAs)

Mesa-Falcon Field Airport is located approximately 17 nautical miles west of the Outlaw MOA. An MOA is an area of airspace designated for military training use. This is not restricted airspace; however, pilots who use the airspace 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. The Outlaw MOA to the east of the airport typically will have activity from 3,000 feet AGL to 18,000 feet MSL. It is published in use from 7:00 a.m. to 6:00 p.m. Monday thru Friday, and hours can be extended to 10:00 p.m. by NOTAM.

Restricted Areas

An area of restricted airspace is located approximately 26 nautical miles to the southeast of Mesa-Falcon Field Airport. Restricted airspace surrounds areas of significant hazard to aircraft operations such as artillery firing, aerial gunnery, or guided missiles. Restricted areas R-2310 A, B, and C operate intermittently and at altitudes up to 10,000 feet MSL.

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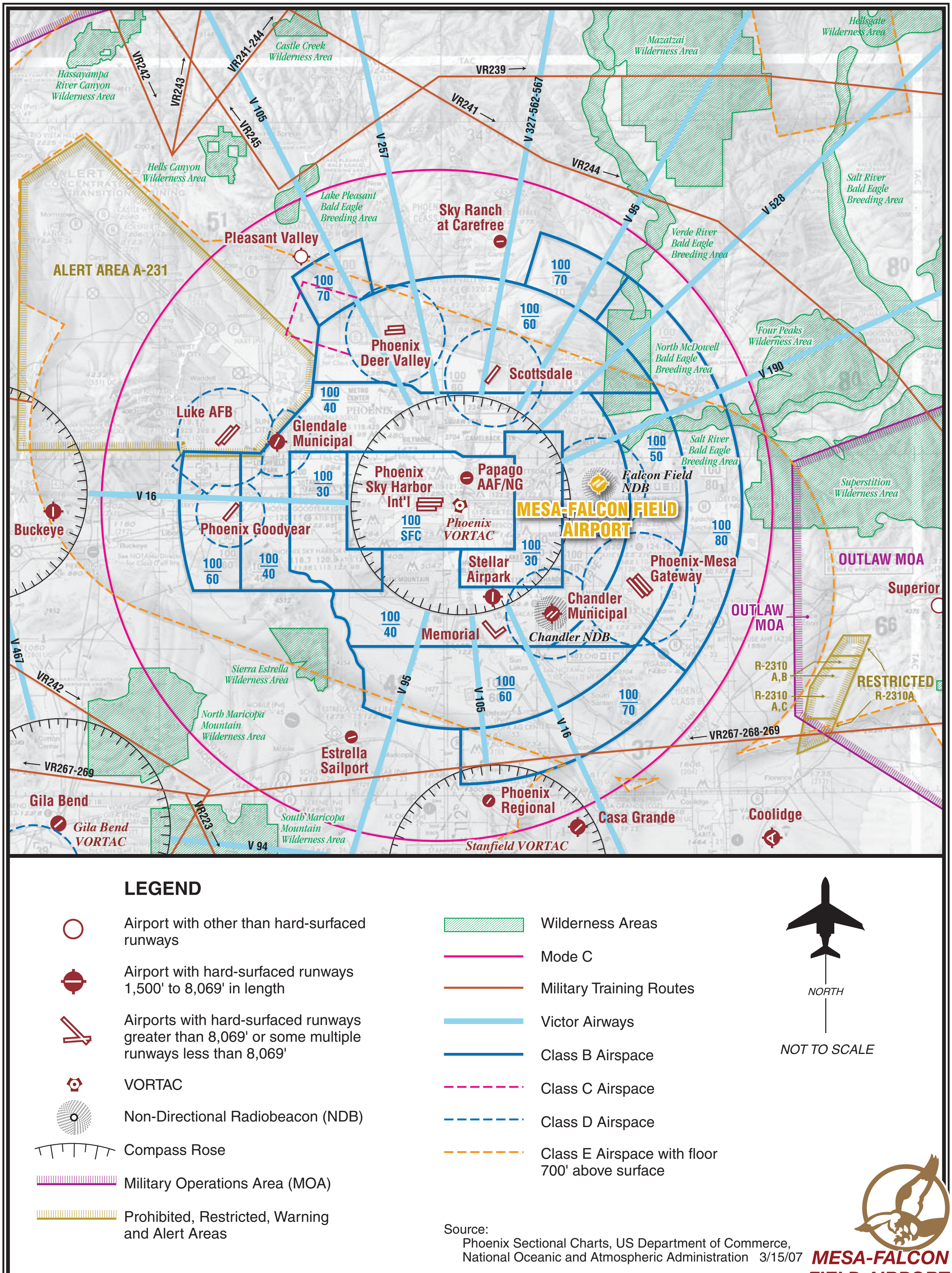

Exhibit 1F
AREA AIRSPACE

While general aviation aircraft operations are not prohibited, aircraft operations are restricted during specified times and between the defined altitudes.

Alert Areas

Alert Area A-231 is located approximately 26 nautical miles to the northwest of the airport. This alert area is associated with Luke Air Force Base and is likely to have high concentrations of military jet aircraft performing training maneuvers. The military activity in this area operates at lower altitudes 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 long, low-altitude corridor that serves as a flight path for military aircraft. The corridor is often 10 miles wide, 70 to 100 miles long, and may range from 500 feet to 1,500 feet above ground level; occasionally, they are higher. There are several MTRs located in the vicinity of the airport, with the closest being approximately 22 nautical miles to the south. General aviation pilots should be aware of the locations of the MTRs and exercise special caution if they need to cross them.

Boeing Flight Test Area

Located immediately to the north of Mesa-Falcon Field Airport is The Boeing Company, which manufactures helicopters and conducts flight tests on a regular basis. A large area northeast of the airport has been set aside for the flight testing of these aircraft. Between ground level and 14,500 feet MSL, it can be expected that these aircraft will be conducting routine flight testing operations from sunrise to sunset Monday thru Saturday.

Local Operating Procedures

Mesa-Falcon Field Airport is situated at 1,394 feet MSL. The traffic pattern at the airport is maintained to provide the safest and most efficient use of the airspace surrounding the airport. The airport utilizes a right-hand traffic pattern for Runways 4R and 22R and a standard left-hand traffic pattern for Runways 4L and 22L. These traffic patterns are intended to keep proper separation of aircraft while being able to utilize both parallel runways. There is a large amount of flight training conducted at the airport, which results in several touch-and-go aircraft operations.

There are also a large number of helicopter operations at the airport due to the manufacturing of military and civilian helicopters on and adjacent to the airport. Flight training of these helicopters occurs on the north side of Runway 4L-22R in areas adjacent to Taxiway E.

The ATCT asks that these helicopters utilize a tight traffic pattern to the north of this area when possible at an altitude of 1,900 feet MSL. The traffic pattern for high-performance aircraft, including jets, is at 2,900 feet MSL. The traffic pattern altitude for smaller turbine and piston aircraft is 2,400 feet MSL.

Pilots operating in and out of Mesa Falcon-Field Airport are encouraged to adhere to the voluntary Falcon Field Noise Abatement Program which has adopted NBAA and AOPA noise awareness recommendations.

Obstructions: Runway 4R has a road located 530 feet from the runway end. It is 305 feet left of the runway centerline. Pilots should implement a 31:1 approach slope angle to clear the obstruction. Runway 22L has a 45-foot tall tree, 1,200 feet from the runway end, which is 335 feet right of the centerline. Pilots should implement a 22:1 approach slope to safely clear the obstruction. Runway 4L has an 18-foot tall pole located 597 feet from the end of the runway that is 66 feet left of the centerline. An approach slope angle of 22:1 should be used to clear the obstruction. Finally, Runway 22R has a road 16 feet tall located 600 feet from the runway end. It is 165 feet right of the centerline and can be cleared with a 25:1 approach angle.

REGIONAL AIRPORTS

There are a number of airports of various size, capacities, and functions within the vicinity of Mesa-Falcon Field Airport, as indicated on **Exhibit 1F**. It is important to consider the capabilities and limitations of other airports when planning for future changes or improvements at Mesa-Falcon Field Airport. In an urban setting, airports within 30 nautical miles of each other will generally have some influence on the activity of the other airport. The following are those public-use airports with asphalt or concrete runways that can serve general aviation aircraft and are important to the airspace and control environment of the area. Information pertaining to each airport was obtained from FAA Form 5010-1, *Airport Master Record*. **Table 1H** identifies the major characteristics of each airport.

Phoenix-Mesa Gateway Airport (IWA) is located approximately 10 nautical miles southeast of Mesa-Falcon Field Airport. It is owned and operated by the Williams Gateway Airport Authority. The airport is served by three parallel runways, with Runway 12R-30L providing the greatest runway length at 10,401 feet. The airport reports 115 based aircraft, including 19 jets and 21 helicopters. Served by an ATCT, the airport had 280,700 operations in 2006. The airport is a converted Air Force Base, with long range planning calling for support of air carrier service, general aviation, and cargo operators. One FBO is located on the field that provides a variety of aviation services including full-service fuel, minor maintenance, and tiedown spaces. Several instrument approaches are available at the airport, including a precision instrument landing system (ILS) approach to Runway 30C.

TABLE 1H Regional Airport Data Mesa-Falcon Field Airport					
Airport Name	**FAA Classification**	**Distance (nm)**	**Longest Runway**	**Based Aircraft**	**Annual Operations (2006)**
Phoenix-Mesa Gateway	GA Reliever	10	10,400	114	280,700
Chandler Municipal	GA Reliever	12	4,870	449	269,100
Scottsdale	GA Reliever	13	8,250	471	196,300
Stellar Airpark	GA	14	3,900	152	39,000
Phoenix Sky Harbor International	Commercial	14	11,500	117	546,300
Memorial Airfield	GA - Private	15	8,650	17	2,300
Phoenix Deer Valley	GA Reliever	22	8,200	1,149	406,500
Glendale Municipal	GA Reliever	29	7,150	378	150,800
Phoenix Regional	GA	30	5,000	12	N/A
Source: FAA Form 5010-1, Airport Master Record; FAA Air Traffic Activity System (ATADS)					

Chandler Municipal Airport (CHD), located approximately 12 nautical miles to the southwest of Mesa-Falcon Field Airport, is owned and operated by the City of Chandler. The airport is equipped with two parallel runways similar to Mesa-Falcon Field Airport. Runway 4L-22R is 4,401 feet long, and Runway 4R-22L is 4,870 feet long. Approximately 449 aircraft are based at the airport, including 50 multi-engine aircraft and 24 helicopters. The airport is served by an ATCT and reported 269,100 aircraft operations in 2006. One major FBO on the field provides an array of services, including full-service fueling, maintenance, aircraft rental, flight training, and pilot supplies. The City of Chandler also provides self-serve Avgas fuel. The airport is served by three non-precision instrument approaches.

Scottsdale Airport (SDL) is located 13 nautical miles northwest of Mesa-Falcon Field Airport and is owned and operated by the City of Scottsdale. It has one runway which is 8,249 feet long. A control tower is located on the field which reported approximately 196,300 aircraft operations in 2006. The airport reports 471 based aircraft, including 96 jets, 89 multi-engine aircraft, and 10 helicopters. Three FBOs are located on the field, providing a variety of aviation services, including full-service fuel, aircraft maintenance and avionics, a pilot's lounge, aircraft rental, and courtesy transportation. Three non-precision instrument approaches serve the airport.

Stellar Airpark (P19) is a privately owned airport that is open to public use. It is located approximately 14 nautical miles southwest of Mesa-Falcon Field Airport and has one runway that is 3,913 feet long. Approximately 152 aircraft are reported to be based at the airport, including five jets and ten multi-engine aircraft. The airport reported 39,000 aircraft operations in 2005. The local FBO provides self-service Avgas fuel, aircraft maintenance, tiedowns, and pilot supplies to its customers. One circling non-precision approach serves the airport.

Phoenix Sky Harbor International Airport (PHX) is located 14 nautical miles west of Mesa-Falcon Field Airport in the heart of Phoenix. The airport is owned and operated by the City of Phoenix and is the largest air carrier airport within the State of Arizona, and one of the largest air carrier airports within the United States. Sky Harbor is served by all of the major airlines, with Southwest and USAirways utilizing the airport as a hub.

Phoenix Sky Harbor International Airport is equipped with three parallel runways, two of which are over 10,000 feet long. An array of instrument approach aids, including an ILS, serve the airport and aid pilots on approach during inclement weather conditions. The airport is served by 17 published instrument approaches, three of which provide Category I (CAT 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 area, the airport also serves general aviation activity. Approximately 117 aircraft are considered to be based at the airport, including 28 jets and 22 helicopters. In 2006, over 546,000 aircraft operations were reported, with a large majority of these being commercial aircraft. Major FBO services are also provided at the airport.

Memorial Airfield is a privately owned, private use airport located approximately 15 nautical miles southwest of Mesa-Falcon Field Airport. The most current data found pertaining to the airport shows that it is served by an 8,560-foot runway. Approximately 17 aircraft are based at the airport and limited services are present at the facility.

Phoenix Deer Valley Airport (DVT), located approximately 22 nautical miles northwest of Mesa-Falcon Field Airport, is also owned and operated by the City of Phoenix. It is served by parallel runways, with Runway 7R-25L providing the greatest length at 8,208 feet. Approximately 1,149 based aircraft are reported at the airport, making it one of the largest airports regarding based aircraft in the country. Of this number, 125 multi-engine aircraft and 19 helicopters are included, and ironically, no jets are considered to be based at the airport. The airport is equipped with a control tower, which reported 406,500 aircraft operations in 2006. One major FBO is located on the field that provides full-service fueling capability, aircraft maintenance, a pilot's lounge, aviation accessories, and aircraft cleaning. There are four non-precision instrument approaches approved for use into the airport.

Glendale Municipal Airport (GEU) is located 29 nautical miles west of Mesa-Falcon Field Airport. It is owned and operated by the City of Glendale, and provides one runway that is 7,150 feet long. The airport is home to 378 aircraft, including five jets and 21 helicopters. It is equipped with an ATCT that reported approximately 150,800 aircraft operations in 2006. FBO services are provided at the airport, including full-service fuel, a pilot's lounge, courtesy transportation, and aircraft avionics service. One non-precision instrument approach serves the airport.

Phoenix Regional Airport (A39) is located approximately 30 nautical miles to the southwest of Mesa-Falcon Field Airport. It is a privately owned airport that is open to public use. One 5,000-foot-long runway serves the airport. The airport has 12 aircraft based on the field. There are limited services available at the airport to include self-service Avgas fuel. There are no instrument approaches approved for use into the airport.

SOCIOECONOMIC CHARACTERISTICS

Socioeconomic characteristics are collected and examined to derive an understanding of the dynamics of growth within the study area. This information is essential in determining aviation demand level requirements, as most general aviation demand can be directly related to the socioeconomic condition of the area. Statistical analysis of population, employment, and income trends define the economic strength of the region and the ability of the region to sustain a strong economic base over an extended period of time.

Whenever possible, local or regional data is used for analysis. Historical and forecast data were primarily obtained from the Maricopa Association of Governments (MAG), which is the regional metropolitan planning organization (MPO), and 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.

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, and the State of Arizona is shown in **Table 1J**.

TABLE 1J
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%

MPA: Municipal Planning Area
*Estimated MPA Population

Source: MAG; U.S. Census Bureau

The table indicates that the City of Mesa, Maricopa County, and State of Arizona have all grown at a greater rate than the national average over the past 16 years. The City of Mesa Municipal Planning Area (MPA) has shown strong growth over the last 16 years, increasing at an average annual growth rate (AAGR) of 2.54 percent. This translates into the addition of approximately 163,000 new residents to the area over this time period. Maricopa County, as a whole, has shown even greater growth since 1990, with a 3.70 percent AAGR.

Since 1990, Arizona is regularly at the top of the list of states with the highest growth rates. It has shown very strong growth rates over the period, at 3.30 percent annually.

The overall U.S. population grew at a 1.17 percent AAGR as a point of comparison. These positive growth trends have been attributed to the availability of affordable quality homes, excellent educational institutions, and enjoyable recreational amenities.

EMPLOYMENT

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

TABLE 1K
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 Safety

Total employment in the region has grown at a very similar rate to that of the population over the past 15 years. The City of Mesa's employment base has grown 3.12 percent annually since 1990. This number is very similar to the State of Arizona's growth rate. Maricopa County and the Phoenix-Mesa-Scottsdale MSA have grown added jobs at a rate of approximately 3.40 percent annually since 1990. These statistics reveal a long-term, positive employment growth trend for the City, greater Phoenix MSA, and the State. These numbers are impressive given the national economic slowdown coupled with the impacts of 9/11.

The major employers in the City of Mesa are presented in **Table 1L**. Understanding the types of employment opportunities will aid in identifying demand for general aviation services. As is common in most cities, the Mesa Public School District represents the largest employer with 10,000 employees. The second largest employer is Banner Health System, a company that provides hospital and healthcare services. The Boeing Company, located adjacent to Mesa-Falcon Field Airport also maintains a large economic presence in the area. As presented in the table, the largest employers are diverse, providing opportunities for a wide array of economic sectors.

TABLE 1L
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

PER CAPITA PERSONAL INCOME

Table 1M compares the per capita personal income (PCPI) for Maricopa County, the Phoenix-Mesa-Scottsdale MSA, the State of Arizona, and the United States. As illustrated on the table, Maricopa County's PCPI has historically mirrored the country's PCPI. Over the period, Maricopa County PCPI has increased at an AAGR of 3.79 percent, compared to the national PCPI increasing at an AAGR of 3.88 percent. The greater Phoenix MSA and the State have also experienced strong annual growth rates over the 15-year period, growing at 3.76 percent and 3.86 percent, respectively.

TABLE 1M
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 the Airport has been completed to ensure proper consideration of the environment through the planning process. Available information about the existing environmental conditions at Mesa-Falcon Field Airport has been derived from a variety of internet resources, agency maps, and existing literature.

AIR QUALITY

The 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_x), Nitrogen Oxide (NO_x), Particulate Matter (PM_{10}), and Lead (Pb).

Primary air quality standards are established at levels 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 NAAQS.

Air contaminants increase the aggravation and the 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 personnel comfort and well-being. According to the Environmental Protection Agency's "Green Book," Maricopa County is in nonattainment for carbon monoxide, ozone, and particulate matter.

FISH, WILDLIFE, AND PLANTS

The Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) are charged with overseeing the requirements contained within Section 7 of the *Endangered Species Act*. This Act was put into place to protect animal or plant species whose populations are threatened by human activities. Along with the FAA, the FWS and the NMFS review projects to determine if a significant impact to these protected species will result with implementation of a proposed project. Significant impacts occur when the proposed action could jeopardize the continued existence of a protected species, or would result in the destruction or adverse modification of federal designated critical habitat in the area. On the state level, the *Sikes Act* and various amendments authorize states to prepare statewide wildlife conservation plans for resources under their jurisdiction.

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

TABLE 1N Threatened, Endangered, or Sensitive Species		
Common Name	**Scientific Name**	**Status**
Arizona cliffrose	Purshia subintegra	E
Bald eagle	Haliaeetus leucocephalus	T
California Brown pelican	Pelecanus occidentalis californicus	E
Desert pupfish	Cyprinodon macularius	E
Gila topminnow	Poeciliopsis occidentalis occidentalis	E
Lessor long-nosed bat	Leptonycteris curasoae yerbabuenae	E
Mexican spotted owl	Strix occidentalis lucida	T
Razorback sucker	Xyrauchen texanus	E
Sonoran pronghorn	Antilocapra Americana sonoriensis	E
Southwestern willow flycatcher	Empidonax traillii extimus	E
Yuma clapper rail	Rallus longirostris yumanensis	E
Gila chub	Gila intermedia	E
Yellow-billed cuckoo	Coccyzus americanus	C
E: Endangered; T: Threatened; C: Candidate		
Source: U.S. Fish and Wildlife Service, Maricopa County Species List		

Airport property consists mostly of heavily disturbed land with terrain characteristics typical of the Lower Sonoran Desert with Desert Saltbrush and Creosote Bush vegetation. Airport property west of Greenfield road consists of cultivated farmland. No threatened or endangered species are known to exist on airport property.

FARMLAND

In the State of Arizona, prime and unique farmland is characterized as any farmland which is currently being irrigated. Irrigated farmland exists on Airport property west of Greenfield Road. Much of this property is currently preserved as airport approach protection.

FLOODPLAINS

As defined in the *FAA Order 1050.1E,* floodplains consist of "lowland and relatively flat areas adjoining inland and coastal water including flood-prone areas of offshore islands, including at a minimum, that area subject to one percent or greater chance of flooding in any given year." Federal agencies are directed 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. Floodplains have natural and beneficial values, such as providing ground water recharge, water quality maintenance, fish, wildlife, plants, open space, natural beauty, outdoor recreation, agriculture and forestry. *FAA Order 1050.1E (12) (c)* indicates that "if the proposed action and reasonable alternatives are not within the limits of a base floodplain (100-year flood area)," that it may be assumed that there are no floodplain impacts. The limits of base floodplains are determined by Flood Insurance Rate Maps (FIRM) prepared by the Federal emergency Management Agency (FEMA).

According to the FIRM map panel number 04013C2205G, a 100-year floodplain associated with Roosevelt Canal is located west of the airfield.

HAZARDOUS MATERIALS AND SOLID WASTE

Four primary laws have been passed governing the handling and disposal of hazardous materials, chemicals, substances, and wastes. The two statutes of most importance to the FAA in proposing actions to construct and operate facilities and navigational aids are the *Resource Conservation Recovery Act* (RCRA) (as amended by the *Federal Facilities Compliance Act of 1992*) and the *Comprehensive Environmental Responses, Compensation, Liability Act* (CERCLA), as amended (also known as Superfund). RCRA governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA provides for cleanup of any release of a hazardous substance (excluding petroleum) into the environment.

In evaluating potential impacts within this resource category, significant impact determinations are typically only made when a resource agency, such as the Arizona Department of Environmental Quality, has indicated that it would be difficult to issue a permit for the proposed development. A significant impact may also be realized if the proposed action would affect a property listed on the National Priorities List (NPL) which is the list of hazardous waste sites in the United States that are eligible for long-term remedial action financed under the federal Superfund program. No sites listed on the NPL are located on or in the vicinity of the airport. Additionally, no active Superfund sites are present.

Solid waste disposal facilities can cause a hazard to aircraft by attracting wildlife and, most importantly, birds. A bird hazard exists if a landfill is located approximately 5,000 feet from runways used by piston aircraft and 10,000 feet from runways used by turbojet aircraft. There are no solid waste disposal facilities within 10,000 feet of the airport.

DEPARTMENT OF TRANSPORTATION SECTION 4(f) RESOURCES

Section 4(f) properties include publicly owned parks, recreational areas, wildlife and waterfowl refuges of national, state, or local significance or land of a historic site of a national, state, or local significance.

Falcon Field Park, located on airport property, is owned by the City of Mesa. Several memorial plaques, as well as the fireplace and chimney from the remains of the cadet lounge, are located within this park. Several golf courses are within the immediate vicinity of the airport: Longbow Golf Course is located northeast of the airport and several holes are located within the existing 65 DNL; Apache Wells Golf Course is east of the airport; and Alta Mesa Country Club Golf Course is located southeast of the airport. Gene Autry Park is located southwest of the airport.

HISTORICAL AND CULTURAL RESOURCES

No cultural or historical surveys have been completed at the airport. Because of its significance during World War II, structures remaining from that period may be eligible for listing on the National Register of Historic Places. A fireplace and chimney, which was once part of the cadet lounge dating back to when the airport was a WWII training facility, remains located in the Falcon Field Park. Additionally, several memorial plaques are located in this park.

Cultural surveys may need to be conducted before construction. In addition, if any undocumented buried cultural resource should be encountered, all ground disturbing activities should stop immediately and the remains should be evaluated.

WATER SUPPLY AND QUALITY

The City of Mesa provides potable water and wastewater service to the City. The City's water treatment facilities process 91 million gallons of water on an average day, with a peak production of nearly 138 million gallons per day. When additional water is needed, groundwater from City wells – each between 800 and 1,000 feet deep – is pumped and distributed to the zones.

The City of Mesa operates under a National Pollutant Discharge Elimination System (NPDES) Permit that allows the discharge of treated wastewater into the Salt River. This permitting process provides a mechanism to require the implementation of controls designed to prevent harmful pollutants from being washed by stormwater runoff into local water bodies.

WETLANDS

The U.S. Army Corps of Engineers (COE) regulates the discharge of dredge 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 includes 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.

No known wetlands are located on airport property. A wetland survey may need to be completed in order to determine if any jurisdictional wetlands or Waters of the U.S. are located on airport property.

WILD AND SCENIC RIVERS

The Verde River is the only wild and scenic river in Arizona. This river is not in the proximity to the airport.

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, 2007-20011.

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

City of Mesa Transportation Plan – A Shared Vision 2025. City of Mesa. 2003.

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

City of Mesa Zoning Map. City of Mesa – Planning Division. September 2003.

Falcon Field Land Use Guidelines. City of Mesa – Community Development Department. May 1994.

Falcon Field Sub-Area Plan. City of Mesa – Planning Division. April 2007.

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

City of Mesa:
www.cityofmesa.org

City of Mesa Chamber of Commerce:
www.mesachamber.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

MESA-FALCON FIELD AIRPORT

Chapter Two

AVIATION DEMAND FORECASTS

Aviation Demand Forecasts

A very 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. In fact, only two components of a Master Plan are actually approved by the Federal Aviation Administration (FAA), the aviation demand forecasts and the airport layout plan (ALP) drawing set. The ALP set will be developed later in this study. For a general aviation reliever airport such as Mesa-Falcon Field Airport, forecasts of based aircraft and annual aircraft operations (takeoffs and landings) serve as the basis for facility planning.

The 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*, dated December 4, 2004, forecasts should:

- Be realistic
- Be based on the latest available data
- Reflect current conditions at the airport
- Be 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 forecasts. 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.

Aviation activity can be affected by many influences on the local, regional, and national level, making it virtually impossible to predict year-to-year fluctuations of activity over 20 years with any certainty. Therefore, it is important to remember that forecasts are to serve only as guidelines, and planning must remain flexible enough to respond to a range of unforeseen developments.

The following forecast analysis for Mesa-Falcon Field Airport was produced following these basic guidelines. Previous forecasts dating back to the previous Master Plan are examined and compared against current and historical 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 Mesa-Falcon Field Airport that will permit the City of Mesa to make planning adjustments necessary to maintain a viable, efficient, and cost-effective facility.

NATIONAL AVIATION TRENDS

Each year, the FAA updates and publishes a national aviation forecast. Included in this publication are forecasts for large air carriers, regional air carriers, 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 is *FAA Aerospace Forecasts – Fiscal Years 2007-2020*. 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 2001, the U.S. civil aviation industry experienced unprecedented growth in demand and profits. The impacts to the economy and the aviation industry from the events of 9/11 were immediate and significant. The economic climate and aviation industry, however, have been recovering. U.S. airline passengers (combined domestic and international) are expected to recover to exceed pre-9/11 levels within the next two years. Although there was an estimated decrease in passenger enplanements in 2006 compared to 2005 (0.5 percent), U.S. commercial airline passenger enplanements are forecast to increase 3.4 percent annually through 2010. This number is expected to increase to 3.7 percent annually from 2010 to 2020. U.S regional airlines are also forecast to experience similar growth, averaging a 3.1 percent growth rate through 2020.

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.

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	13,497.0
2001	2,994	1,644	147	421	782	13,866.6
2002	2,687	1,601	130	280	676	11,823.1
2003	2,686	1,825	71	272	518	9,994.8
2004	2,963	1,999	52	321	591	11,903.8
2005	3,580	2,326	139	365	750	15,140.0
2006	4,042	2,508	242	407	885	18,793.0

SEP – Single Engine Piston; MEP – Multi-Engine Piston; TP – Turboprop; J – Turbofan/Turbojet

Source: GAMA

In 2004, the general aviation production showed a significant increase, returning to 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 2006, total aircraft deliveries increased 12 percent. The largest increase was in single engine piston aircraft deliveries that increased seven percent or by over 180 aircraft. Turbojet and multi-engine piston aircraft also increased significantly from the previous year. As evidence in the table, new aircraft deliveries in 2006 exceed pre-9/11 levels by approximately 1,000 aircraft.

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 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 2020, there are expected to be 13,200 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 increased by approximately 1,500 between 2000 and 2005. Corporate operators are defined as those companies that have their own flight departments and utilize general aviation aircraft to enhance productivity. **Table 2B** summarizes the number of U.S. companies operating fixed-wing turbine aircraft between 1991 and 2005.

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.

TABLE 2B U.S. Companies Operating Fixed-Wing Turbine Business 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		

Since beginning in 1986, fractional jet programs have flourished. **Table 2C** summarizes the growth in fractional shares between 1986 and 2005. The number of aircraft in fractional jet programs grew rapidly from 2001 to 2005, increasing by approximately 250. Although there is no data available, it can be projected that fractional shares and aircraft have increased even more since 2005.

Very light jets (VLJs) entered the operational fleet in 2006. Also known as microjets, the VLJ is commonly defined as a jet aircraft that weighs less than 10,000 pounds. There are several new aircraft that fall in this category including the Eclipse 500 jet. While not categorized by Cessna Aircraft as a VLJ, the Cessna Mustang is a competing aircraft to many of the VLJs expected to reach the market. These jets cost between $1 and $2 million, can takeoff on runways 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. The FAA projects 350 VLJs in service in 2007. This category of aircraft is expected to grow by 400 to 500 aircraft per year, reaching 6,300 aircraft by 2020.

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

The FAA forecast assumes that the regulatory environment affecting general aviation will not change dramatically. It is expected that the U.S. economy will continue to expand through 2007 and 2008, and then continue to grow moderately (near three percent annually) thereafter. This will positively influence the aviation industry, leading to passenger, air cargo, and general aviation growth throughout the forecast period (assuming that there will not be any new successful terrorist incidents against either the U.S. or world aviation). The FAA does recognize that a major risk to continued economic growth is upward pressure on commodity prices, including the price of oil. However, FAA economic models predict a 4.8 percent decrease in the price of oil in 2007, followed by a 7.1 percent increase in 2008. The price of oil is expected to become somewhat less volatile through the remainder of the forecast period.

The FAA projects the active general aviation aircraft fleet to increase at an average annual rate of 1.4 percent over the 14-year forecast period, increasing from 226,422 in 2006 to 274,914 in 2020. This growth is depicted on **Exhibit 2A**. FAA forecasts identify two general aviation economies that follow different market patterns. The turbine aircraft fleet is expected to increase at an average annual rate of 6.0 percent, increasing from 18,058 in 2006, to 31,558 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 growth of the VLJ/microjet market, and a continuation of the shift from commercial air travel to corporate/business air travel by business travelers and corporations. Piston-powered aircraft are projected to show minimal growth through 2020 at 0.3 percent annually. Single engine piston aircraft are projected to grow at 0.3 percent annually while multi-engine piston aircraft are projected to decrease in number by 0.2 percent annually. Piston-powered rotorcraft aircraft are forecast to increase by 5.7 percent annually through 2020.

Aircraft utilization rates are projected to increase through the 14-year forecast period. 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 over the next 14 years, being the largest increase in any one category for total aircraft hours flown.

The total pilot population is projected to increase by 51,000 in the next 14 years, from an estimated 455,000 in 2006 to 506,000 in 2020, which represents an average annual growth rate of 0.8 percent. The student pilot population is forecast to increase at an annual rate of 1.2 percent, reaching a total of 100,181 in 2020. Growth rates for other pilot categories over the forecast period are as follows: recreational pilots declining 0.1 percent; commercial pilots increasing 0.8 percent; airline transport pilots increasing 0.2 percent; rotorcraft only pilots increasing 3.1 percent; glider only pilots increasing 0.4 percent; and private pilots showing no change. The sport pi-

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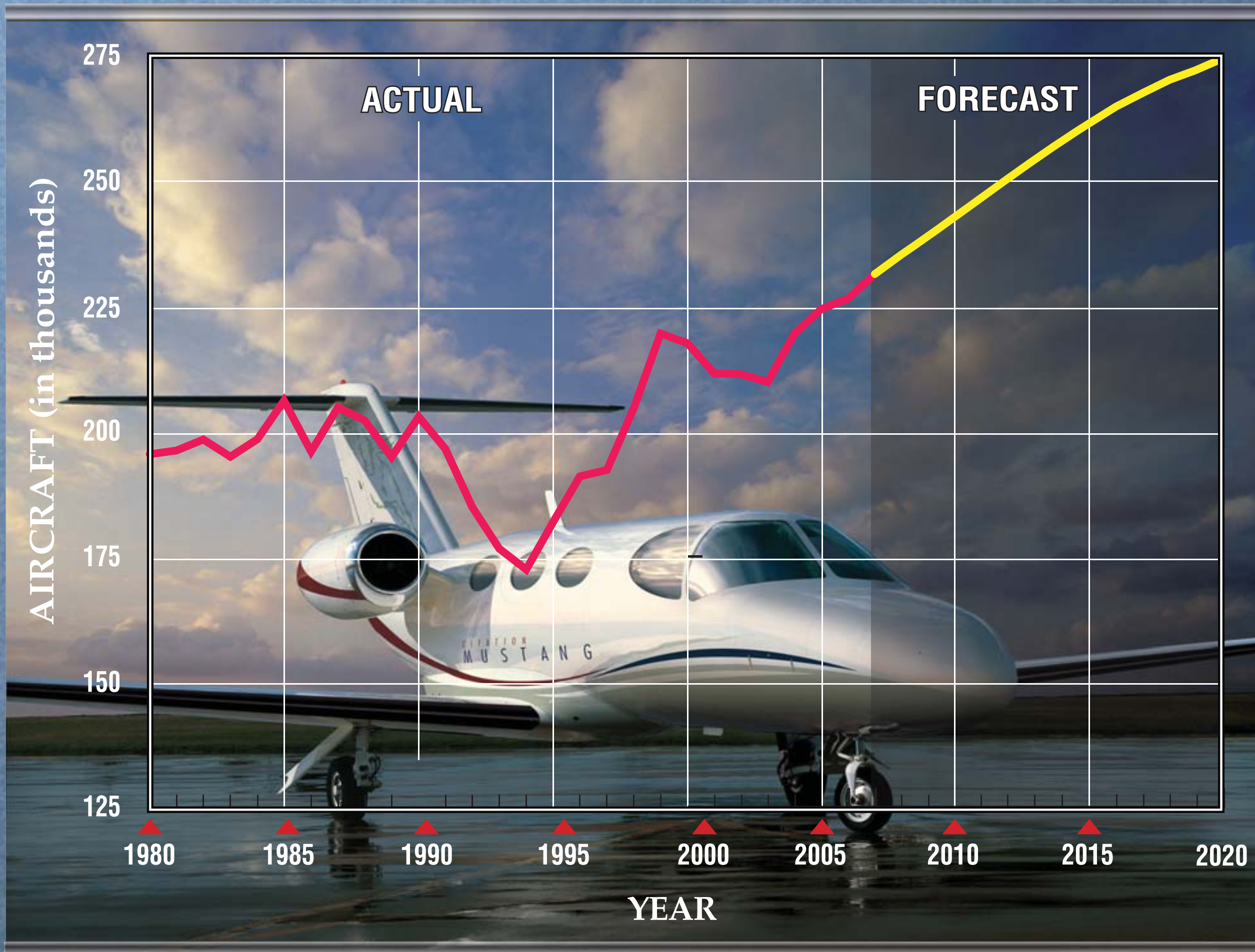
U.S. ACTIVE GENERAL AVIATION AIRCRAFT



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

Year	FIXED WING: PISTON: Single Engine	FIXED WING: PISTON: Multi-Engine	FIXED WING: TURBINE: Turboprop	FIXED WING: TURBINE: Turbojet	ROTORCRAFT: Piston	ROTORCRAFT: Turbine	Experimental	Sport Aircraft	Other	Total
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.

MESA-FALCON FIELD AIRPORT

Exhibit 2A
U.S. ACTIVE GENERAL AVIATION AIRCRAFT FORECASTS

lot is expected to grow significantly through 2020 at 22.6 percent annually. The decline in recreational pilots and no increase in 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. The "No Plane, No Gain" is an advocacy program created in 1992 by 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. The Experimental Aircraft Association (EAA) promotes the "Young Eagles" program which introduces young children to aviation by offering them a free airplane ride courtesy of aircraft owners who are part of the association. 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.

STATE AND REGIONAL TRENDS

The Arizona Department of Transportation – Aeronautics Division (ADOT) assists airports in the state in identifying infrastructure needs with a state aviation needs study and other special aviation studies. The most recent study on a statewide basis is the *State Aviation Needs Study* (SANS)-*2000*. The SANS-2000 includes forecasts of aviation activity in the state.

Table 2D depicts the based aircraft forecasts prepared from the SANS-2000 for the State of Arizona and Maricopa County. The base year for these forecasts was 1998. The SANS-2000 projects based aircraft to grow at an annual average growth rate (AAGR) of 1.3 percent through 2020. This is in line with current FAA forecasts of 1.4 percent annual growth over the next 14 years.

The percentage of Arizona-based aircraft located in Maricopa County was actually forecast to decrease over the period from 57.6 percent in 1998, to 54.8 percent in 2020. Thus, the AAGR for based aircraft in Maricopa County was projected to lag behind the state rate, at 1.07 percent annually.

The Maricopa Association of Governments (MAG) is charged with preparing and updating a *Regional Aviation System Plan* (RASP) for the Phoenix metropolitan area. The most recent aviation forecasts for the MAG-RASP were prepared in late 2001, after the events of September 11. These forecasts were adopted by MAG in 2003.

Table 2D presents the more recent forecast of Maricopa County based aircraft prepared for the MAG-RASP. The base year for this forecast was 2000. As presented in the table, the more recent MAG-RASP forecasts are somewhat higher than those in the SANS-2000. In fact, the actual based aircraft included as the MAG-RASP's base year (2000) were higher than the SANS-2000 projection for 2005.

The MAG-RASP forecast projects total based aircraft in the region to reach 7,288 by 2025. This equates to an annual average increase of 2.29 percent, a significantly stronger growth rate than the national and statewide growth rates projected by FAA and ADOT, respectively. The MAG-RASP projects fixed-wing turbine aircraft based in the county to grow from 170 in 2000, to 420 by 2025. This equates to a 3.7 percent AAGR. Turbine aircraft would also grow as a percentage of all based aircraft from 4.0 percent in 2000, to 5.8 percent in 2025.

TABLE 2D
State and Regional Based Aircraft Forecasts
Arizona and Maricopa County

	Base Year	2005	2010	2015	2020	2025	AAGR
SANS-2000							
Arizona	6,700	7,156	7,674	8,247	8,896	N/A	1.30%
Maricopa County	3,857	4,065	4,303	4,568	4,877	N/A	1.07%
MAG-RASP							
Maricopa County	4,133	4,615	5,240	5,950	6,585	7,288	2.29%

AAGR: Average Annual Growth Rate
*Base Year: SANS - 1998; MAG-RASP – 2000

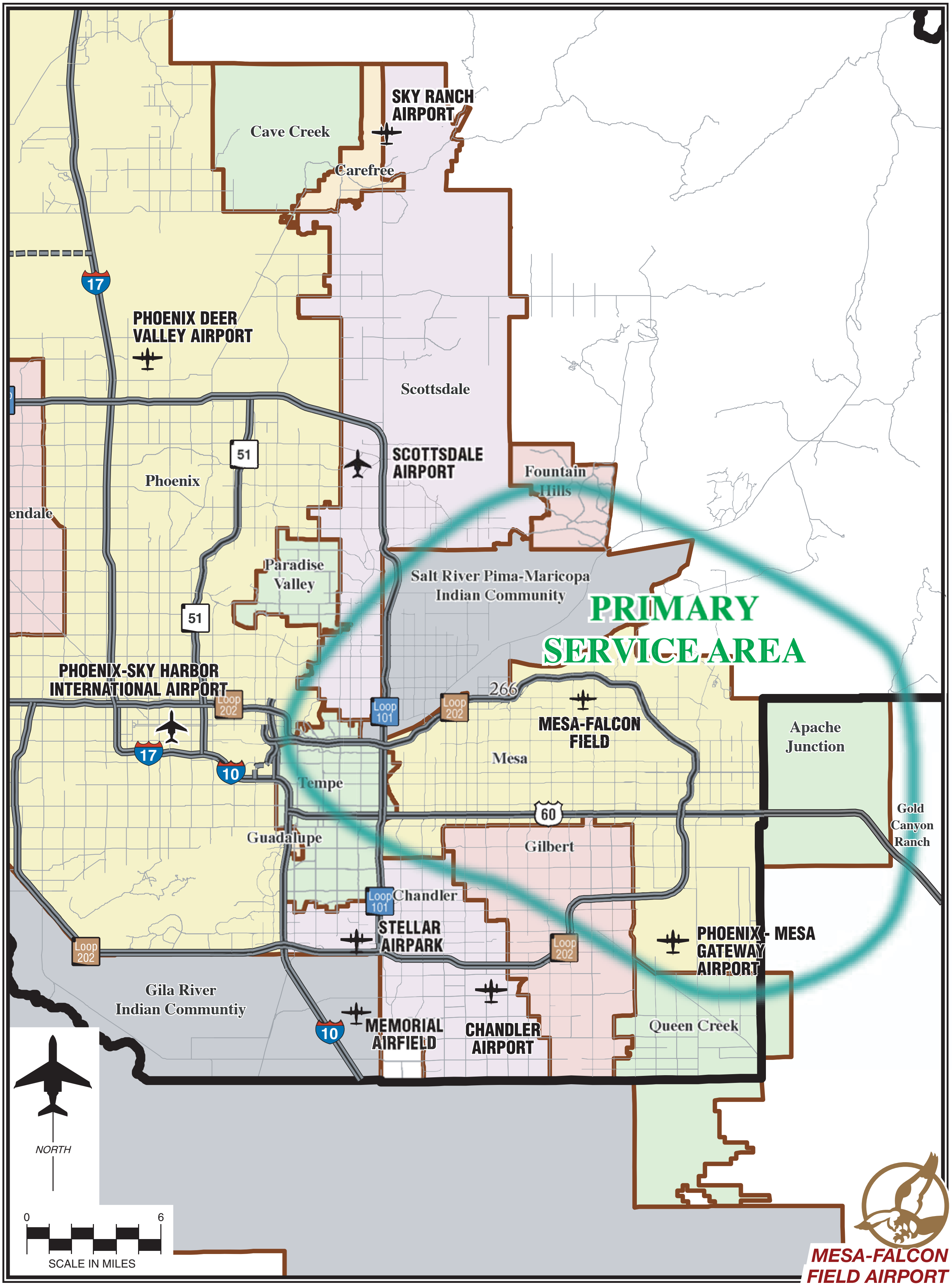
Sources: State Aviation Needs Study (SANS) - 2000, ADOT, 1999. Regional Aviation System Plan, Maricopa Association of Governments, 2001

SERVICE AREA

The generalized service area of an airport is defined by its proximity to other airports providing similar services. Mesa-Falcon Field Airport is one of several airports serving the general aviation needs in the Phoenix metropolitan area.

Exhibit 2B depicts Mesa-Falcon Field Airport in relationship to other airports that serve the east Phoenix metropolitan area. Other regional airports include Phoenix-Mesa Gateway Airport to the southeast, Chandler Municipal Airport to the southwest, Scottsdale Airport to the northwest, and Phoenix Sky Harbor International Airport to the west. Stellar Airpark, a privately owned, public-use airport, is located to the southwest.

Phoenix Sky Harbor International Airport, although mainly served by commercial airlines, does support some general aviation corporate operations; however, a trend continues to show general aviation based aircraft and annual operations declining. This



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MESA-FALCON FIELD AIRPORT

Exhibit 2B
GENERALIZED SERVICE AREA MAP

can be attributed directly to the ever-increasing presence of air carrier operations and the airport's main focus on accommodating commercial airline services.

Phoenix-Mesa Gateway Airport, considered a reliever airport for Phoenix Sky Harbor International Airport, is also looking to expand into commercial service operations should justification exist. A current study is underway to determine the needs and levels of potential commercial service in the area. Scottsdale Airport serves a wide variety of general aviation aircraft in the northeast Phoenix metropolitan area, in particular, business jets. Recent studies indicate, however, that the airport is reaching capacity in terms of developable land and number of aircraft operations it can safely accommodate.

It should be mentioned that Memorial Airfield, a privately owned, private-use airport, is located approximately fifteen miles to the southwest of Mesa-Falcon Field Airport. The airport has one runway that is in poor condition, with limited aviation services available and a low number of annual aircraft operations. A recent airport study shows the potential for significant aviation growth and development if proper steps are taken to improve the runway and terminal area environment. **Table 2E** presents the regional public-use airports.

TABLE 2E
Public-Use Airports Serving East Phoenix Metropolitan Area

Airport	FAA Classification	Approach Minimums (CH - Vis)	Location (nm)	Longest Runway (feet)	Based Aircraft	Annual Operations (2006)
Mesa-Falcon Field	GA Reliever	419-1	N/A	5,101	892	249,081
Phoenix-Mesa Gateway	GA Reliever	200-3/4	10 SE	10,401	115	280,719
Chandler Municipal	GA Reliever	440-1	12 SW	4,870	449	269,072
Scottsdale	GA Reliever	570-1	13 NW	8,249	471	196,298
Phoenix Sky Harbor Intl.	Commercial	200-1/2	14 W	11,489	117	546,300
Stellar Airpark	GA	420-1	14 SW	3,913	152	39,000

GA - General Aviation
nm - nautical miles
CH - Cloud Height (feet above ground level)
Vis - Visibility (miles)

Source: FAA Form 5010-1, Airport Master Record; FAA Air Traffic Activity System (ATADS)

These six airports currently base a total of 2,196 aircraft. Mesa-Falcon Field has the most with 892 based aircraft, which accounts for approximately 40 percent of the overall total. Phoenix Sky Harbor International Airport reported the most annual aircraft operations in 2005 with 546,300. The vast majority of these operations were conducted by commercial airlines. Approximately 130,000 general aviation aircraft operations were reported by the airport in 2006.

Phoenix-Mesa Gateway Airport experienced 280,719 operations while Mesa-Falcon Field reported 249,081 operations. Of these airports, all but

Scottsdale Airport and Stellar Airpark have a parallel runway system in place allowing them to better accommodate higher traffic levels. Phoenix Sky Harbor International Airport and Phoenix-Mesa Gateway Airport have a three-runway system available.

The MAG-RASP has considered alternatives for developing new airports in the Phoenix metropolitan area, in particular on the east side. The location for the proposed New East Valley site would be located near the Tonto National Forest and existing Indian communities northeast of Mesa-Falcon Field Airport. The study recognized an airport in this area would have only moderate potential for implementation because of the location near environmentally sensitive areas as well as the impacts it could have on airspace in the region, in particular, military training routes.

Other sites taken into consideration include a new general aviation airport on the south side of the Phoenix metropolitan area, in Pinal County and contained within the Gila River Indian Community. Another site that has been studied is the Pleasant Valley Airport, on the northwest side of Phoenix. A draft study was prepared which recommended improvements to the private airport, but the study was tabled and has never been adopted.

As in any business enterprise, the more attractive the facility is in services and capabilities, the more competitive it will be in the market. As the level of attractiveness expands, so will the service area. If an airport's attractiveness increases in relation to nearby airports, so will the size of the service area. If facilities are adequate and rates and fees are competitive at Mesa-Falcon Field Airport, some level of general aviation activity might be attracted to the airport from surrounding areas.

The previously mentioned airports' available levels of service and facilities will play a role in determining the airport's service area. However, Mesa-Falcon Field Airport has remained a very important facility that meets the needs of general aviation operators in the region. This includes recreational flying in single-engine aircraft, up to corporate business jets and charter operators. As noted in **Table 2E**, Mesa-Falcon Field Airport is home to significantly more aircraft than any other airport in the region. In addition, Mesa-Falcon Field Airport is a designated reliever airport for Phoenix Sky Harbor International Airport. In this capacity, the airport should be maintained to accommodate all general aviation aircraft.

A number of factors are considered when defining the airport service area. In addition to the considerations above, extensive study has shown that the number one factor for an aircraft owner considering a location to base his/her aircraft is convenience to home or place of business. Based upon this consideration, the airport service area is limited by comparable airports such as Chandler Municipal and Phoenix-Mesa Gateway to the south and Scottsdale to the northwest. Areas to the north and east of Mesa are not as populated and developed as areas to the south and west. Apache Junction lies directly to the east of Mesa in Pinal County and the Salt River Pima-

Maricopa Indian Community is located north. There are no airports in these areas. Directly to the west is the City of Tempe.

Due to the nature of Phoenix Sky Harbor International Airport being primarily utilized for commercial service, the service area for Mesa-Falcon Field Airport could be extended to the west to include portions of the City of Tempe and other areas near Phoenix Sky Harbor International Airport. Also, to aid in identifying the generalized service area for Mesa-Falcon Field Airport, an analysis of based aircraft owners' addresses was conducted. As a result of these considerations, the primary service area for Mesa-Falcon Field Airport is generally comprised of Mesa, the northern portions of Gilbert and Tempe, the southern portions of Scottsdale and Fountain Hills, the Salt River Pima-Maricopa Indian Community, and Apache Junction as shown on **Exhibit 2B**.

SOCIOECONOMIC PROJECTIONS

The socioeconomic conditions in the service area can provide an important baseline for preparing aviation demand forecasts. Local socioeconomic variables such as population and employment can be indicators for understanding the dynamics of the service area, in particular, trends in aviation growth. In 2007, MAG adopted a new set of population, housing, and employment forecasts for Maricopa County. This included not only the county and city totals, but also a breakdown of Regional Analysis Zones (RAZ). Each RAZ is typically smaller than a city and allows a more accurate socioeconomic analysis of the airport service area.

POPULATION

Table 2F summarizes historical and forecast population estimates for Mesa-Falcon Field Airport's service area as well as the entirety of Maricopa County. Resident population of the service area totaled 773,721 in 2000 and 862,641 in 2006. This equated to a 1.83 percent AAGR during the period and represented 21.8 percent of total population for Maricopa County (not including Apache Junction in Pinal County) in 2006.

Although the service area is projected to grow throughout the planning period, it is projected to do so at a slower growth rate than in the past. MAG projects population to grow at an AAGR of 0.84 percent through 2027. The annual average growth rate for the county is projected to be approximately 2.1 percent during the same period. This growth rate is also lower than the growth rates experienced in the county during the 1990s and early 2000s. By 2027, it is projected that the airport service area population within Maricopa County will consist of approximately 16.7 percent of the total county population, compared to approximately 21.8 percent in 2006.

TABLE 2F Population Summary for Primary Service Area Mesa-Falcon Field Airport	Historical		Forecast			
	2000	2006	2012	2017	2022	2027
Mesa MPA	441,846	492,657	527,974	551,243	569,476	579,047
North Gilbert	85,761	99,848	107,580	112,980	116,485	116,827
North Tempe	104,338	111,694	122,929	129,262	134,340	137,189
South Scottsdale	83,014	90,997	96,087	97,559	99,012	100,424
Fountain Hills	20,497	24,886	28,300	31,347	33,426	33,665
Salt River Indian Community	6,451	6,874	7,131	7,241	7,331	7,390
Apache Junction (Pinal Co.)	31,814	35,685	40,027**	44,047**	48,470**	53,337**
Total	773,721	862,641	930,028	973,679	1,008,540	1,027,879
Avg. Annual % Change	N/A	1.83%	1.26%	0.92%	0.71%	0.38%
Maricopa County*	3,072,149	3,792,670	4,402,171	4,902,913	5,399,881	5,848,280
Service Area % of Maricopa Co.*	24.15%	21.80%	20.22%	18.96%	17.78%	16.66%

MPA: Municipal Planning Area
Interpolation by Coffman Associates
*Does not include Apache Junction numbers
**Extrapolated

Source: MAG 2007 Draft Socioeconomic Forecasts; Arizona Department of Economic Security; Year 2000 information from MAG 2003 Interim Projections

EMPLOYMENT

Historical and forecast employment data for the airport's service area and Maricopa County is presented in **Table 2G**. The employment for the area was 401,590 in 2000 and 443,219 in 2006. This equated to a 1.66 percent average annual growth rate. Employment numbers are forecast to increase at a stronger growth rate than that of population during the planning period, but not as strong as employment growth rates during the past 15 years. It is projected these figures will experience a 2.94 percent AAGR during the next five years, and then slow to 1.18 percent annually for the remainder of the forecast period.

Employment in the service area accounted for 22.72 percent of Maricopa County employment in 2006. By 2027, MAG forecasts that this number will decrease to 20.26 percent. Although the growth rates aren't projected to be as high as in the past, they still exemplify strong economic opportunities in the service area surrounding Mesa-Falcon Field Airport.

BASED AIRCRAFT

The number of based aircraft is one of the most basic indicators of general aviation demand. By first developing a forecast of based aircraft, the growth of other general aviation activities and needs can be projected. **Table 2H** presents a history of based aircraft at Mesa-Falcon Field Airport dating back to 1981. The based aircraft totals at Mesa-Falcon Field Airport have fluctuated between a low of 648 in 1990 and a high of 939 in 2003. Based aircraft totals have remained relatively constant over the past few years.

TABLE 2G
Employment Forecasts for Primary Service Area
Mesa-Falcon Field Airport

	Historical		Forecast			
	2000	2006	2012	2017	2022	2027
Mesa MPA	172,000	182,799	228,476	256,674	281,136	296,447
North Gilbert	28,107	42,063	51,729	56,838	60,870	62,728
North Tempe	123,487	130,844	145,241	153,411	161,305	168,450
South Scottsdale	55,718	60,722	64,727	65,318	65,772	66,016
Fountain Hills	4,285	7,930	10,258	11,059	11,570	11,572
Salt River Indian Community	7,289	6,769	13,147	19,933	29,245	40,842
Apache Junction (Pinal Co.)	10,704	12,092	13,660**	15,121**	16,738**	18,528**
Total	401,590	443,219	527,238	578,354	626,636	664,583
Avg. Annual % Change	N/A	1.66%	2.94%	1.87%	1.62%	1.18%
Maricopa County*	1,564,900	1,897,387	2,270,963	2,581,645	2,897,338	3,189,527
Service Area % of Maricopa County*	24.98%	22.72%	22.61%	21.82%	21.05%	20.26%

MPA: Municipal Planning Area
Interpolation by Coffman Associates
*Does not include Apache Junction numbers
**Extrapolated

Source: MAG 2007 Draft Socioeconomic Forecasts; Arizona Department of Economic Security; Year 2000 information from MAG 2003 Interim Projections

TABLE 2H
Based Aircraft History
Mesa-Falcon Field Airport

Year	Total Based Aircraft
1981	665
1982	724
1983	760
1984	754
1985	736
1986	757
1987	707
1988	675
1989	671
1990	648
1991	668
1992	690
1993	704
1994	721
1995	731
1996	789
1997	830
1998	864
1999	872
2000	900
2001	899
2002	917
2003	939
2004	922
2005	926
2006	919
2007	892*

Source: Airport records
* March 2007 total

MAG-RASP 2001

As previously mentioned, in an effort to identify and maintain needs of the regional aviation system, the MAG-RASP was updated in 2001 and adopted in 2003. The MAG-RASP forecast methodology first projected the total based aircraft at public airports in Maricopa County, and then distributed them to the airports within the county. A strong correlation was found between Maricopa County based aircraft and the County's overall population. Thus, the county-wide based aircraft forecasts were derived from a linear regression, using the county population as the independent variable. The r-squared (r^2) value (coefficient determination) is 0.97, which indicates very good predictive reliability.

Table 2J compares based aircraft at each of the public-use airports in the eastern Phoenix metropolitan area over the last eight years. The total number of based aircraft at these airports has increased by ten percent since 1998, and averaged a 1.24 percent annual growth rate. During this time, Mesa-Falcon Field Airport has experienced a 0.77 percent average annual growth rate for based aircraft, while other airports such as Chandler Municipal and Stellar Airpark have averaged approximately four percent growth rates. Phoenix Sky Harbor International Airport has experienced a significant decline in the number of based aircraft during this time period, mainly due to its primary role as the air carrier airport for the region.

TABLE 2J
Based Aircraft Forecasts (MAG-RASP 2001)
Eastern Phoenix Metropolitan Area

Year	Total	Mesa-Falcon Field	Phoenix-Mesa Gateway	Chandler Municipal	Scottsdale	Phoenix Sky Harbor	Stellar Airpark
ACTUAL							
1998	2,051	864	54	337	401	270	125
2000	2,169	900	63	392	425	237	152
2006	2,264	919	115	468	471	117	174
% Change	10%	6%	113%	39%	17%	-57%	39%
Average Annual Growth Rate	1.24%	0.77%	9.91%	4.19%	2.03%	-9.93%	4.22%
FORECAST (MAG-RASP)							
2005	2,449	1,062	109	450	427	231	170
2006*	2,497	1,086	116	465	429	226	175
2015	3,025	1,324	208	629	450	183	231
2025	3,593	1,586	301	807	473	135	291
Average Annual Growth Rate	1.94%	2.03%	5.21%	2.96%	0.51%	-2.65%	2.72%

*Interpolated

Source: Airport records; MAG-RASP

Table 2J also presents MAG-RASP forecast of based aircraft, which was developed in 2001, with base year information being 2000. As can be seen from the table, the MAG-RASP 2001 based aircraft forecast for Mesa-Falcon Field Airport is somewhat higher than the actual number reported at the airport in 2006. After experiencing a strong 3.34 percent average annual growth rate in based aircraft during the 1990s, the number of based aircraft at the airport has remained relatively constant since 2000, only increasing by 16 aircraft, or 0.35 percent average growth annually. From discussions with airport staff, newly signed leases between the airport and private developers will lead to the development of more hangars at the airport, adding approximately 420,000 square feet of hangar space over the next several years. This will provide opportunity for an increase in based aircraft numbers.

The MAG-RASP forecast was very close to the actual based aircraft totals for Phoenix-Mesa Gateway, Chandler Municipal, and Stellar Airpark in 2006. Actual records for Scottsdale indicate that the airport has already exceeded its 2006 forecast and nearly exceeded its 2025 forecast. While the study shows a gradual decline in based aircraft for Phoenix Sky Harbor, actual numbers indicate the decline is occurring much quicker than anticipated.

UPDATED MAG-RASP PROJECTIONS

The based aircraft forecasts in the MAG-RASP 2001 update were determined from 1997 population forecasts conducted by MAG. Since this time, population forecasts have been updated in 2003, and again, most recently, in 2007. As presented in **Table 2J**, actual based aircraft reported for Mesa-Falcon Field in 2006 was 919 compared to 1,086 aircraft projected by the MAG-RASP.

Due to the ever-changing socioeconomic environment in the region and the disparity in actual versus forecast based aircraft projections for Mesa-Falcon Field Airport, Coffman Associates conducted an in-house update to the MAG-RASP using the new 2007 population forecast recently approved by the MAG. Since the most recent MAG-RASP found such a high correlation (r^2=0.97) between population and based aircraft within the county, the regression analysis was updated with additional based aircraft and population data that has become available. The based aircraft update was derived from a combination of recent airport master plans, the FAA Terminal Area Forecast (TAF), and airport records. The correlation coefficient of the expanded historic data is r^2=0.96. This number, although slightly lower than the past correlation, still lends itself to good predictive reliability.

A new projection for Maricopa County based aircraft utilizing the updated county population forecast and more recent based aircraft totals was then developed. This resulted in an updated projection of 7,513 based aircraft at public use airports in the county by 2027, which is within two percent of the 2001 forecast of 7,626 based aircraft; a difference of 113 aircraft. **Table 2K** presents this analysis.

BASED AIRCRAFT FORECASTS

Exhibit 2C and **Table 2K** outline previous forecasts of based aircraft prepared for Mesa-Falcon Field Airport. The oldest forecast shown is from the SANS-2000, which was prepared in 1998. The most current forecast is the FAA TAF, which was prepared in 2007 and published in January 2008.

As previously mentioned, the MAG-RASP 2001 forecast presented a higher number of based aircraft for 2006 than was actually experienced. Strong growth rates similar to those experienced at the airport during the 1990s would be required to reach the MAG-RASP projections; however, actual based aircraft numbers have leveled off somewhat since 2000. Overall, this forecast projects an average annual growth rate of 1.99 percent for based aircraft at the airport, with 1,644 being realized by 2027.

The SANS-2000 projection is closer to actual based aircraft totals for 2006. However, it projects an annual average growth rate of 0.76 percent through the planning period, which is low compared to other projections. This study's overall projection for based aircraft in Maricopa County has also been proven to be low. This forecast yields 1,132 based aircraft by 2027. With abundant land still available at the airport and projected infrastructure development set to take place in the near future to accommodate more aircraft, this forecast will likely serve as the low end of the planning envelope.

TABLE 2K
Based Aircraft Forecasts
Mesa-Falcon Field Airport

	2000	2006	2012	2017	2022	2027	AAGR 2006-2027
Maricopa County Based Aircraft Forecasts							
MAG-RASP (2001)	4,133	4,741	5,540	6,208	6,878	7,626	2.29%
MAG-RASP Updated (2007)*	4,133	4,606	5,625	6,279	6,926	7,513	2.36%
Previous Mesa-Falcon Field Aircraft Forecasts							
Actual	900	919	N/A	N/A	N/A	N/A	N/A
MAG-RASP (2001)	923	1,086	1,239	1,373	1,502	1,644	1.99%
SANS-2000 (1998)	933	965	1,011	1,050	1,090	1,132	0.76%
FAA TAF (2007)	923	988	1,098	1,201	1,310	1,432	1.78%
Market Share Projections							
Based Aircraft per 1,000 Service Area Population							
Constant	900	919	977	1,022	1,059	1,079	0.77%
Increasing	900	919	1,004	1,100	1,210	1,305	1.68%
Based Aircraft per 1,000 Service Area Employment							
Constant	900	919	1,054	1,157	1,253	1,329	1.77%
Increasing	900	919	1,091	1,226	1,366	1,495	2.34%
Updated Mesa-Falcon Field Forecast							
Master Plan Projections	900	919	1,150	1,300	1,400	1,500	2.36%
Percent of Updated County Forecast	21.78%	19.95%	20.44%	20.70%	20.21%	19.97%	

AAGR: Average Annual Growth Rate
*Prepared by Coffman Associates to account for additional based aircraft history and new county population forecasts.
All figures interpolated and extrapolated to plan years.
Source: MAG-RASP; FAA TAF; SANS-2000

The FAA TAF is more reflective of current based aircraft at the airport. It projects a 1.78 percent annual growth rate through 2027, yielding 1,432 based aircraft. This is similar to the growth rate the airport has experienced over the past ten years.

A market share analysis of based aircraft at Mesa-Falcon Field Airport was also conducted. This involved using past based aircraft numbers and comparing them to the airport service area's population and employment statistics which came directly from the

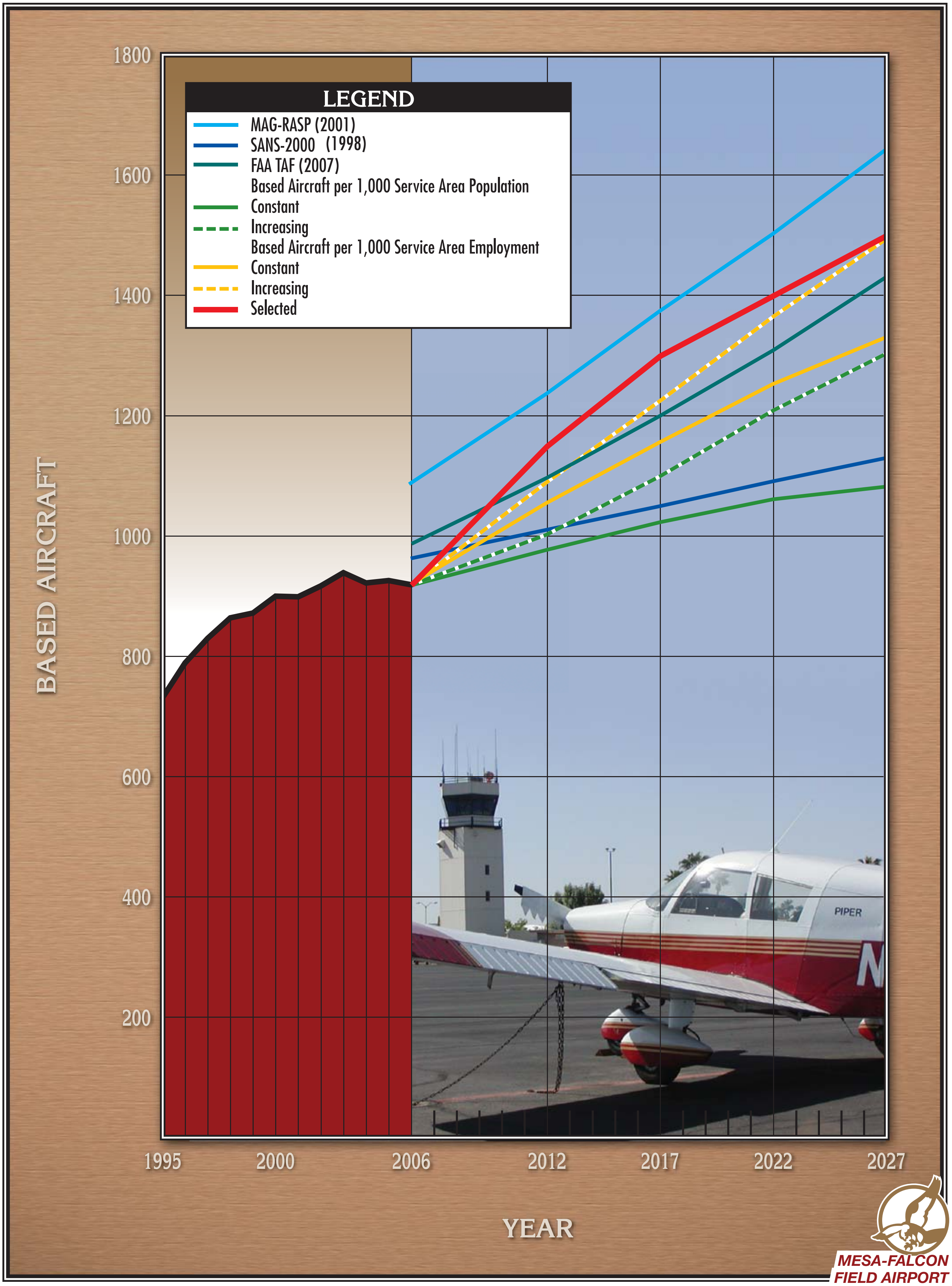

Exhibit 2C
BASED AIRCRAFT FORECASTS

recent 2007 MAG socioeconomic study. By being able to break down the service area according to Regional Analysis Zones (RAZ), generalized service area population and employment numbers were determined which, in turn, provided for realistic market share projections. As seen in **Table 2K**, the constant and increasing market shares ranged from approximately 1,100 based aircraft to 1,500 based aircraft through the long term planning period.

Regression analysis was also conducted on the data sets. It is optimal to have an "r^2" value near or above 0.90, which would represent a very strong correlation. The results of the regression analysis did not provide values near the 0.90 indicator. This can be directly attributed to the fluctuating nature of based aircraft in the early 2000s, while population, employment, and other socioeconomic factors were increasing. As a result, this type of analysis was not used.

The selected Master Plan forecast is reflected on **Exhibit 2C** and in **Table 2K**. The selected forecast results in approximately 150 fewer aircraft at the airport than the MAG-RASP projected. After taking into consideration that the actual 2006 based aircraft numbers for the county and Mesa-Falcon Field Airport are lower than those forecast in the 2001 MAG-RASP projections (135 and 167 respectively fewer aircraft), the disparity in the long-term projections is not significant. The selected forecast reflects a 2.36 percent average annual growth rate. The following based aircraft forecasts will be utilized to determine airport needs over the planning scope of this Master Plan:

- 2012: 1,150 based aircraft
- 2017: 1,300 based aircraft
- 2022: 1,400 based aircraft
- 2027: 1,500 based aircraft

BASED AIRCRAFT FLEET MIX

The based aircraft fleet mix at Mesa-Falcon Field Airport is presented in **Table 2L**. The forecast fleet mix utilizes existing local trends as well as forecast U.S. general aviation trends as presented in *FAA Aerospace Forecasts - Fiscal Years 2007-2020*. The FAA projects that business jets will be the fastest growing general aviation aircraft type in the future. The number of business jets in the U.S. fleet is expected to more than double through 2020 and triple in size in 20 years. This represents an annual growth rate of 6.0 percent. Helicopters are also projected to show a strong growth rate of 3.6 percent annually through this time period. Turboprop and single engine piston powered aircraft are projected to grow, but at a much slower pace. Multi-engine aircraft are the only category expected to decrease in number through 2020.

While single engine piston-powered aircraft are projected to continue to dominate the based aircraft fleet mix at Mesa-Falcon Field Airport, business jets and turboprop aircraft are expected to experience significant growth. Currently, there are 11 jets based at the airport, with three of them being business jets and the remainder being military jets in various states of renovation. There are 13 turboprop aircraft based at the airport. The fleet mix indicates as many as 33 turboprops and 48 jets, including the historic warbirds, could base at the airport by 2027.

TABLE 2L
Based Aircraft Fleet Mix
Mesa-Falcon Field Airport

	Current*	%	2012	%	2017	%	2022	%	2027	%
Single Engine Piston	679	76.1%	909	79.0%	1,033	79.5%	1,109	79.2%	1,187	79.1%
Multi-Engine Piston	123	13.8%	132	11.5%	135	10.4%	135	9.6%	132	8.8%
Turboprop	13	1.5%	18	1.6%	23	1.8%	28	2.0%	33	2.2%
Jet	11	1.2%	19	1.7%	30	2.3%	38	2.7%	48	3.2%
Helicopter	66	7.4%	72	6.3%	79	6.1%	90	6.4%	100	6.7%
Totals	**892***	**100.0%**	**1,150**	**100.0%**	**1,300**	**100.0%**	**1,400**	**100.0%**	**1,500**	**100.0%**
U.S Active Aircraft (FAA Aerospace Forecasts 2006 Estimated)										
Single Engine Piston	173,177	76.5%	188,737	75.3%	199,099	74.4%	206,686	73.1%	214,562	71.6%
Multi-Engine Piston	19,364	8.6%	19,101	7.6%	18,916	7.1%	18,678	6.6%	18,444	6.2%
Turboprop	8,026	3.5%	8,352	3.3%	8,605	3.2%	8,946	3.2%	9,301	3.1%
Jet	10,032	4.4%	15,304	6.1%	19,881	7.4%	25,377	9.0%	32,393	10.8%
Helicopter	9,232	4.1%	12,308	4.9%	14,272	5.3%	16,271	5.8%	18,551	6.2%
Other	6,592	2.9%	6,785	2.7%	6,698	2.5%	6,606	2.3%	6,515	2.2%
Totals	**226,423**	**100.0%**	**250,587**	**100.0%**	**267,471**	**100.0%**	**282,564**	**100.0%**	**299,766**	**100.0%**

Note: Experimental and Sport Aircraft totals are included in Single Engine Piston category; 2022 and 2027 U.S. Active Aircraft projections extrapolated; *March 2007 totals

Source: Airport records; FAA Aerospace Forecasts FY 2007-2020

The growth in based jets is forecast to out-pace the growth in turboprop aircraft for a number of reasons. Nationally, the introduction of very light jets (VLJs) will likely attract buyers who might otherwise purchase a turboprop due to the similarity in cost. Mesa-Falcon Field Airport is also perfectly positioned to attract VLJ activity because of the excellent general aviation facilities including adequate runway length and the airport traffic control tower (ATCT). In addition, the City of Mesa is continuing to grow in terms of population and employment. These factors add to the optimism for business jet growth at the airport.

ANNUAL OPERATIONS

General aviation operations are classified by the 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.

Airport operations can be further broken down into distinct groups. For airports such as Mesa-Falcon Field, operations typically include general aviation, air taxi, and military. General aviation operations are those conducted by private individuals or companies not flying commercially. Air taxi refers to those operators that are certified in accordance with Federal Aviation Regulation (F.A.R.) Part 135 and are authorized to provide, on-demand, public transportation of persons and property by aircraft. Military operations are those conducted by military personnel and aircraft.

Table 2M depicts the history of all aircraft operations, as counted by the ATCT, at Mesa-Falcon Field Airport since 1997. Itinerant operations increased from 115,936 in 1997 to 143,431 in 2007. During this time, itinerant operations were as high as 151,080. Local operations experienced even more growth during the same time period, increasing from 93,715 in 1997 to 170,698 in 2007. The fluctuations in annual local operations totals over the past ten years have mirrored the trend in based aircraft numbers reported at the airport. There was a significant increase in local operations in 2007 compared to previous years. This can be attributed to a major increase in the number of flight training operations associated with Sabena Airline Training Center and Regional Airline Academy, which both began operating at the airport in 2007. These operational statistics are the actual ATCT counts conducted when the tower is open and do not reflect operations that occur while the tower is closed. An industry standard three percent adjustment will be added to the final operations forecast to account for operations that occur when the tower is closed.

TABLE 2M
Historical Aircraft Operations
Mesa-Falcon Field Airport

	Itinerant Operations				Local Operations			
Year	Air Taxi & Air Carrier	GA	Military	Total	GA	Military	Total	Grand Total
1997	161	111,781	3,994	115,936	92,938	777	93,715	209,651
1998	995	114,698	6,179	121,872	97,640	1,457	99,097	220,969
1999	3,592	127,071	7,743	138,406	122,997	2,585	125,582	263,988
2000	7,288	133,525	4,405	145,218	128,260	1,187	129,447	274,665
2001	6,670	122,576	3,356	132,602	118,422	677	119,099	251,701
2002	9,935	137,275	3,870	151,080	137,193	444	137,637	288,717
2003	10,287	130,232	3,506	144,025	137,372	345	137,717	281,742
2004	9,517	126,211	3,843	139,571	122,102	336	122,438	262,009
2005	8,243	124,582	3,654	136,479	133,087	617	133,704	270,183
2006	6,329	115,610	3,129	125,068	123,728	285	124,013	249,081
2007	6,912	134,773	1,746	143,431	170,026	672	170,698	314,129

Source: Airport Tower records / TAF

Mesa-Falcon Field Airport has realized approximately 52 percent of the total operations as itinerant and 48 percent as local since 1997. Typically, an urban/suburban reliever airport such as Mesa-Falcon Field with significant flight training activity would have more local operations than itinerant operations. Although this was the case in 2007 with the addition of two major flight training schools at the airport, the findings point to the fact that the airport also serves as an important destination for business and recreation activities in the east Phoenix metropolitan area. Moreover, military operations are also significant at the airport.

The Maricopa Association of Governments and the Arizona Department of Transportation – Aeronautics Division have performed operational forecasts for Mesa-Falcon Field Airport as presented in **Table 2N**. The MAG-RASP forecasts strong growth for both local and itinerant operations through the planning period, with total operations increasing from 316,100 in 2005 to 472,100 in 2025. Based on previous data, the actual 2005 operations count for the airport was approximately 270,000. The FAA TAF forecasts 372,782 operations by 2025. The SANS-2000 presents the most conservative forecast with 273,902 operations by 2020, which was exceeded by 2007 actual annual operations.

TABLE 2N
Previous Total Operations Forecasts
Mesa-Falcon Field Airport

	2005	2010	2012	2015	2017	2020	2022	2025
Itinerant GA Operations								
MAG-RASP (2001)	167,217			208,479				249,700
FAA TAF (2007)	121,850	135,955	144,178	155,436	160,639	168,770	174,419	183,249
Local GA Operations								
MAG-RASP (2001)	148,883			185,621				222,400
FAA TAF (2007)	122,885	157,307	161,265	167,390	171,603	178,121	182,603	189,533
Total GA Operations								
MAG-RASP (2001)	316,100			394,100				472,100
FAA TAF (2007)	244,735	293,262	305,443	322,826	332,242	346,891	357,022	372,782
SANS-2000 (1998)	233,156	246,016		259,584		273,902		

Source: MAG-RASP; FAA TAF; SANS-2000

GENERAL AVIATION ITINERANT OPERATIONS

Table 2P outlines the history of itinerant general aviation operations in relation to the total general aviation itinerant operations at towered airports in the U.S. The Mesa-Falcon Field Airport market share, as a percentage of general aviation itinerant operations at towered airports across the country, increased from a low of 0.5151 percent in 1997, to a high of 0.7012 percent in 2007. Prior to 2007, the market share had averaged approximately 0.62 percent since 2000.

The market share steadily rose during the late 1990s and then dropped in 2001. This can be directly attributed to the events of 9/11 which significantly impacted the aviation industry as a whole. The very next year, in 2002, the market share again increased and peaked at 0.7012 percent in 2007. The table shows that overall itinerant operations in the U.S. have declined slightly since 2001 and the airport's itinerant operations had followed this trend until 2007.

TABLE 2P
General Aviation Itinerant Operations Forecast
Mesa-Falcon Field Airport

Year	GA Itinerant Ops	US GA Itinerant Ops	Market Share Itinerant Ops	Based Aircraft	Itinerant Ops Per Based Aircraft
1997	111,781	21,700,000	0.5151%	830	135
1998	114,698	22,086,500	0.5193%	864	133
1999	127,071	23,019,400	0.5520%	872	146
2000	133,525	22,844,100	0.5845%	900	148
2001	122,576	21,433,300	0.5719%	899	136
2002	137,275	21,450,500	0.6400%	917	150
2003	130,232	20,231,300	0.6437%	939	139
2004	126,211	20,007,200	0.6308%	922	137
2005	124,582	19,315,100	0.6450%	926	135
2006	115,610	18,751,900	0.6165%	919	126
2007	134,773	19,220,100	0.7012%	892	151
Constant Market Share of Total U.S. Itinerant Operations					
2012	138,686	21,840,300	0.6350%	1,150	121
2017	153,375	24,153,600	0.6350%	1,300	118
2022	168,357	26,512,869	0.6350%	1,400	120
2027	187,709	29,560,461	0.6350%	1,500	125
Constant Itinerant GA Operations Per Based Aircraft					
2012	159,850	21,840,300	0.7319%	1,150	139
2017	180,700	24,153,600	0.7481%	1,300	139
2022	194,600	26,512,869	0.7340%	1,400	139
2027	208,500	29,560,461	0.7053%	1,500	139
FAA TAF Projections					
2012	144,178	21,840,300	0.6601%	1,098	131
2017	160,639	24,153,600	0.6651%	1,201	134
2022	174,419	26,512,869	0.6579%	1,310	133
2027	191,842	29,560,461	0.6490%	1,432	134
Selected Forecast					
2012	150,000	21,840,300	0.6868%	1,150	130
2017	170,000	24,153,600	0.7038%	1,300	131
2022	185,000	26,512,869	0.6978%	1,400	132
2027	195,000	29,560,461	0.6597%	1,500	130

Source: FAA Aerospace Forecasts FY 2007-2020; Coffman Associates analysis

This table also depicts the itinerant operations per based aircraft ratio. Over the past ten years, this ratio has fluctuated from a high of 151 itinerant operations per based aircraft most recently in 2007, to a low of 126 in 2006.

Since the turn of the century, the average has been 139 operations per based aircraft.

Table 2P presents a pair of projections based upon maintaining a "constant" or average market share of the U.S. towered traffic and the average ratio of operations per based aircraft. The constant market share projection would result in a slight increase in operations per based aircraft, increasing from 121 in 2012 to 125 in 2027. Although the operations per based aircraft ratio have fluctuated at Mesa-Falcon Field Airport over the past several years, it has maintained an average of 139 operations per based aircraft since 2000. This is slightly higher than the market share operations per based aircraft.

For comparison, the FAA TAF projections are also presented in the table. This forecast falls in the mid-range of the market share and ratio of operations per based aircraft projections.

The selected forecast for itinerant operations at Mesa-Falcon Field Airport tends to fall between the FAA TAF and operations per based aircraft forecast. Thus, itinerant general aviation operations in 2012 are forecast at 150,000; in 2017, 170,000; in 2022, 185,000; and in 2027, 195,000. This equates to an average annual growth rate of 1.8 percent through the planning period. General aviation itinerant operations forecasts are also presented on **Exhibit 2D**.

GENERAL AVIATION LOCAL OPERATIONS

Table 2Q outlines the history of local general aviation operations in relation to the total general aviation local operations at towered airports in the U.S. The Mesa-Falcon Field Airport market share, as a percentage of general aviation local operations at towered airports across the country, increased from a low of 0.6114 percent in 1997, to a high of 1.1462 percent most recently in 2007. Prior to 2007, the market share of local operations had averaged approximately 0.8640 percent since 2002. Local traffic reached its peak in 2007 with 170,026 operations and a market share of 1.1462 percent. This coincides with the fact that two major flight schools began operating at the airport during this time and conducted a significant number of local flight training operations.

Also depicted in the table is the local operations per based aircraft ratio. This number has fluctuated from a low of 112 in 1997 to 190 in 2007. Between 2000 and 2006, the average had been 140 local operations per based aircraft. Due to the substantial increase in local operations in 2007, the ratio was 190.

As presented in **Table 2Q**, projections similar to what were made for itinerant operations at Mesa-Falcon Field Airport are depicted. The first forecast considers the airport maintaining

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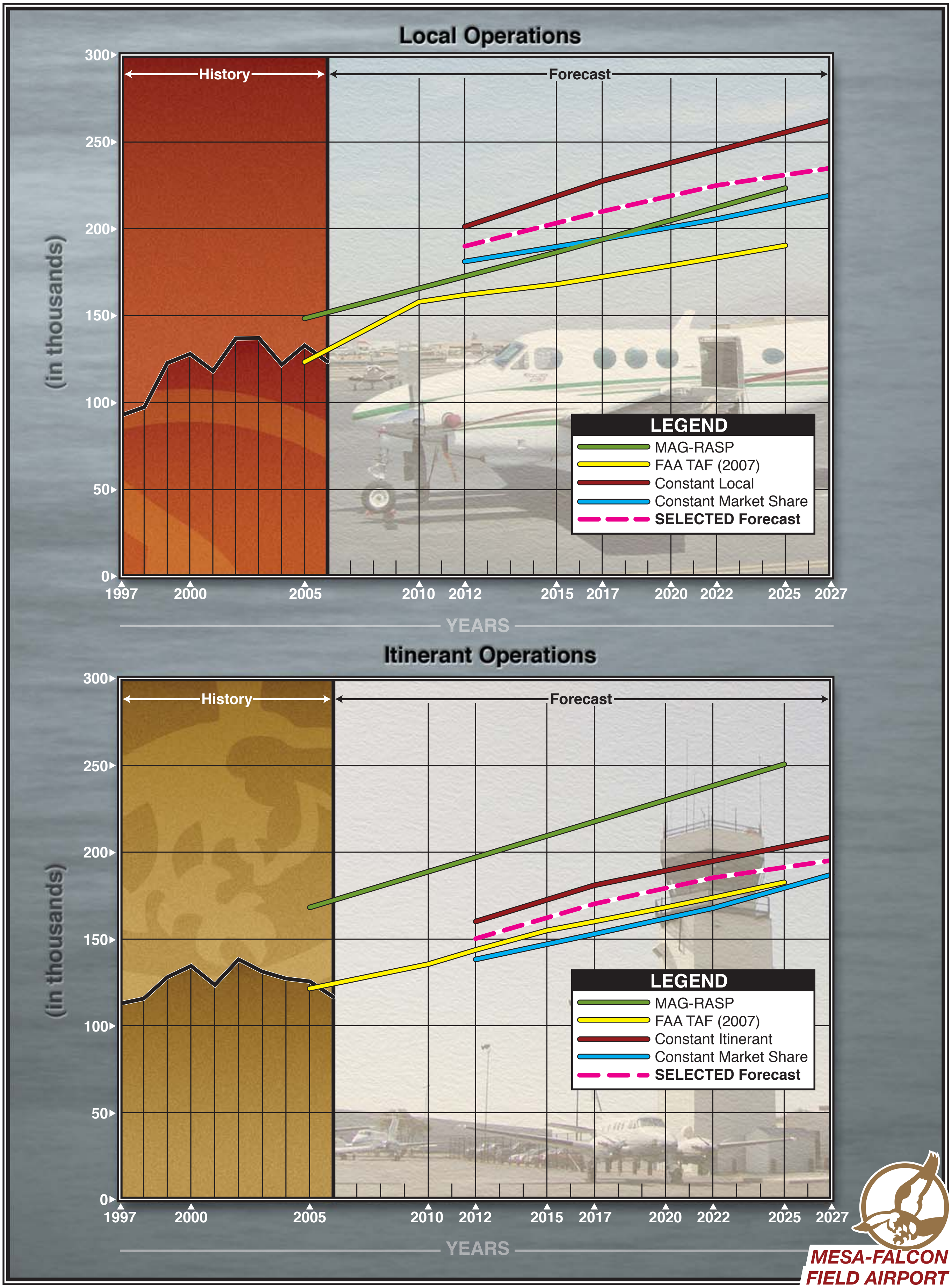


Exhibit 2D
GENERAL AVIATION
OPERATIONS FORECAST

a constant 1.1000 percent market share of national local operations. This scenario resulted in 182,082 local operations in 2012, increasing to 220,321 local operations in 2027. A second forecast was completed taking a constant number of local operations per based aircraft (175). This forecast resulted in 201,250 local operations in 2012, increasing to 262,500 local operations in 2027.

TABLE 2Q
General Aviation Local Operations Forecast
Mesa-Falcon Field Airport

Year	GA Local Ops	US GA Local Ops	Market Share Local Ops	Based Aircraft	Local Ops Per Based Aircraft
1997	92,938	15,200,000	0.6114%	830	112
1998	97,640	15,960,000	0.6118%	864	113
1999	122,997	16,980,200	0.7244%	872	141
2000	128,260	17,034,400	0.7529%	900	143
2001	118,422	16,193,700	0.7313%	899	132
2002	137,193	16,172,800	0.8483%	917	150
2003	137,372	15,292,100	0.8983%	939	146
2004	122,102	14,960,400	0.8162%	922	132
2005	133,087	14,845,900	0.8965%	926	144
2006	123,728	14,378,900	0.8605%	919	135
2007	170,026	14,833,300	1.1462%	892	190
Constant Market Share of Total U.S. Local Operations					
2012	182,082	16,552,900	1.1000%	1,150	158
2017	194,874	17,715,800	1.1000%	1,300	150
2022	206,542	18,776,533	1.1000%	1,400	148
2027	220,321	20,029,200	1.1000%	1,500	147
Constant Local GA Operations Per Based Aircraft					
2012	201,250	16,552,900	1.2158%	1,150	175
2017	227,500	17,715,800	1.2842%	1,300	175
2022	245,000	18,776,533	1.3048%	1,400	175
2027	262,500	20,029,200	1.3106%	1,500	175
FAA TAF Projections					
2012	161,265	16,552,900	0.9742%	1,098	147
2017	171,603	17,715,800	0.9686%	1,201	143
2022	182,603	18,776,533	0.9725%	1,310	139
2027	194,308	20,029,200	0.9701%	1,432	136
Selected Forecast					
2012	190,000	16,552,900	1.1478%	1,150	165
2017	210,000	17,715,800	1.1854%	1,300	162
2022	225,000	18,776,533	1.1983%	1,400	161
2027	235,000	20,029,200	1.1733%	1,500	157

Source: FAA Aerospace Forecasts FY 2007-2020; Coffman Associates analysis

For comparison, the FAA TAF projections are also presented in the table. The TAF numbers are significantly lower than the other forecasts. While it does show a gradual decline in the number of local operations per based aircraft through the planning period, similar to the market share projections, it does not take into account the substantial increase in local operations brought about by the flight schools that recently began operating at the airport.

The selected forecast for local operations at Mesa-Falcon Field Airport is depicted on **Exhibit 2D** and at the bottom of **Table 2Q**. The level of local activity will continue to be dependent upon the operations of existing flight schools, as well as aircraft basing at the airport.

It is anticipated that as the airport becomes more congested during the planning period, the operations per based aircraft will gradually decline throughout the planning period. Moreover, the forecast considers an increase in itinerant traffic as the airport continues to become more attractive to corporate aircraft users. Local general aviation operations in 2012 are forecast at 190,000; in 2017, 210,000; in 2022, 225,000; and in 2027, 235,000. This equates to a 1.6 percent average annual growth rate during the planning period.

AIR TAXI OPERATIONS

The air taxi category includes aircraft involved in on-demand passenger, small parcel transport, and air ambulance activity. The history of air taxi operations at Mesa-Falcon Field Airport was previously presented in **Table 2M**. Since 2000, air taxi operations have averaged 8,148 per year. The FAA TAF projects air taxi activity to remain level at 6,507 annual operations through the planning period.

Many general aviation airports are experiencing increases in air taxi activity. This can be primarily attributed to the increased popularity of on-demand air travel for time savings and due to scheduled airline security procedures.

As mentioned earlier, an entire new category of very light jets (VLJs) are entering the general aviation market. A number of companies are proceeding with business plans to offer on-demand air taxi service utilizing these types of aircraft. The VLJs are relatively inexpensive compared to larger cabin class business jets, and they will have access to more airports as the required runway length is much less. Mesa-Falcon Field Airport is well positioned to attract operations by VLJs with adequate runway length and forecasted growth in business opportunities in the airport service area.

The relatively steady air taxi activity at Mesa-Falcon Field Airport over the previous seven years does not produce a statistical trend line that can be relied upon to predict future activity levels. A low range forecast would be in line with the FAA TAF air taxi forecast of level activity through the planning period.

Another scenario considers air taxi operations growing at a rate similar to general aviation itinerant operations. Air taxi operations at Mesa-Falcon Field Airport have generally been equivalent to five to seven percent of the itinerant general aviation operations at the airport each year since 2000. For the seven towered reliever airports in the Phoenix metropolitan area, combined air taxi operations have grown from 4.8 percent of itinerant GA operations in 2000 to six percent in 2006. Mesa-Falcon Field Airport fits in this trend with their recent air taxi operation counts.

For planning purposes, air taxi operations were projected to grow at six percent of itinerant operations in the short term and decrease to four percent through the remainder of the planning period as the airport experiences additional increases in total aircraft operations. **Table 2R** presents this growth scenario that would result in approximately 16,000 operations by 2027. This projection was selected as the preferred forecast for air taxi operations.

TABLE 2R
Air Taxi Operations Forecast
Mesa-Falcon Field Airport

Year	FAA TAF	Master Plan Forecast
2012	6,507	8,900
2017	6,507	10,800
2022	6,507	13,200
2027	6,507	16,000

MILITARY

Military activity accounts for the smallest portion of the operational traffic at Mesa-Falcon Field Airport. **Table 2M** presents the history of military operations since 1997. Over that ten-year period, military operations have averaged 4,983 annually, with a high of 10,328 in 1999, and a low of 2,418 in 2007. Of these operations, approximately 83 percent were itinerant and 17 percent were local.

A large portion of these military operations can be attributed to test flights associated with Boeing Company's helicopter manufacturing facility adjacent to the airport. Due to the unpredictable nature of military operations, a constant of 5,000 total operations annually will be utilized in forecasting.

OPERATIONS ADJUSTMENT AND SUMMARY

Since the Mesa-Falcon Field Airport traffic control tower (ATCT) is not a 24-hour tower, its air traffic counts are not all-inclusive of aircraft operations at the airport. Some aspects of the Master Plan analysis require that all airport activity be considered. For these evaluations, it is necessary to estimate and adjust for operations that occur when the tower is closed. The Mesa-Falcon Field Airport tower currently operates from 6:00 a.m. to 9:00 p.m. daily. For planning purposes, operations after the tower has closed are estimated at three percent of total operations. This estimate is based on experience at other regional airports where after hours operational counts have been conducted.

General aviation operations for Mesa-Falcon Field Airport have been forecast through 2027. A number of existing resources have been consulted including the MAG-RASP, SANS-2000, and the FAA TAF. The selected operations forecasts fall between the MAG-RASP and FAA TAF forecasts. **Table 2S** presents a summary of forecast annual operations at Mesa-Falcon Field Airport.

TABLE 2S Operations Activity Forecast Summary Mesa-Falcon Field Airport					
	Actual	Forecast			
Annual Operations	**2007**	**2012**	**2017**	**2022**	**2027**
General Aviation					
Itinerant	134,773	150,000	170,000	185,000	195,000
Local	170,026	190,000	210,000	225,000	235,000
Air Taxi	6,912	8,900	10,800	13,200	16,000
Military					
Itinerant	1,746	4,000	4,000	4,000	4,000
Local	672	1,000	1,000	1,000	1,000
Totals					
Total Itinerant	143,431	162,900	184,800	202,200	215,000
Total Local	170,698	191,000	211,000	226,000	236,000
Evening 3% Adjustment	9,424	10,600	11,900	12,800	13,500
Total Operations	323,553	364,500	407,700	441,000	464,500
Note: Forecast operations totals are rounded to nearest 1,000					

PEAKING CHARACTERISTICS

Many airport facility needs are related to the levels of activity during peak periods (busy times). 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 derived by dividing the peak month operations by the number of days in the month.
- **Busy Day** – The busy day of a typical week in the peak month.
- **Design Day** – The peak hour within the design day.

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. The peak periods forecast has been determined utilizing operations reported by the ATCT to the FAA.

The peak month at Mesa-Falcon Field Airport has historically been during the late winter and early spring months. In 2007, the peak month was November, with 30,738 operations. This peak month average accounted for 9.5 percent of the annual operations. The design day operations were calculated by dividing the peak month (November) by the number of days in the month (30).

Daily operational counts from the ATCT were utilized to determine a busy day peaking factor for general aviation activity. During the peak month in 2007, the peak day of each week averaged 19 percent of weekly operations. Thus, to determine the typical busy day, the design day is multiplied by 1.33, which represents 19 percent of the days in a week (7 x 0.19). Design hour operations were determined to be approximately 13 percent of the design day operations, but this percentage can be expected to decline slightly as activity increases over the long term. The peaking operations characteristics are summarized in **Table 2T** for each planning horizon.

TABLE 2T
Peak Operations Forecast
Mesa-Falcon Field Airport

	2007	2012	2017	2022	2027
Annual Operations	323,553	364,500	407,700	441,000	464,500
Peak Month	30,738	34,628	38,730	41,895	44,128
Busy Day	1,361	1,534	1,717	1,857	1,955
Design Day	1,024	1,154	1,291	1,396	1,470
Design Hour	133	150	155	160	166

ANNUAL INSTRUMENT APPROACHES

An instrument approach, as defined by the FAA, is "an approach to an airport with the 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." To qualify as an instrument approach at Mesa-Falcon Field Airport, aircraft must land at the airport after following one of the published instrument approach procedures and then properly close their flight plan on the ground. The approach must be conducted in weather conditions which necessitate the use of the instrument approach. If the flight plan is closed prior to landing, then the instrument approach is not counted in the records. Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities. It should be noted that practice or training approaches do not count as annual AIAs.

Typically, AIAs for airports with available instrument approaches utilized by advanced aircraft will average between one and two percent of itinerant operations. In the Phoenix area, weather conditions rarely necessitate an instrument approach. There is no FAA record of instrument approach operations at Mesa-Falcon Field Airport. In environments similar to the Phoenix area, four-tenths of one percent of itinerant operations has been utilized to estimate potential future instrument approaches. A forecast utilizing this percentage is shown on **Exhibit 2E**.

The increased availability of low-cost navigational equipment could allow smaller and less sophisticated aircraft to utilize instrument approaches. National trends indicate an increasing percentage of approaches given the greater availability of approaches at airports with GPS and the availability of more cost-effective equipment.

SUMMARY

Exhibit 2E provides a summary of the aviation activity forecasts for Mesa-Falcon Field Airport. These forecasts will be utilized in establishing planning horizon milestones that will then be used to determine future facility needs and potential solutions.

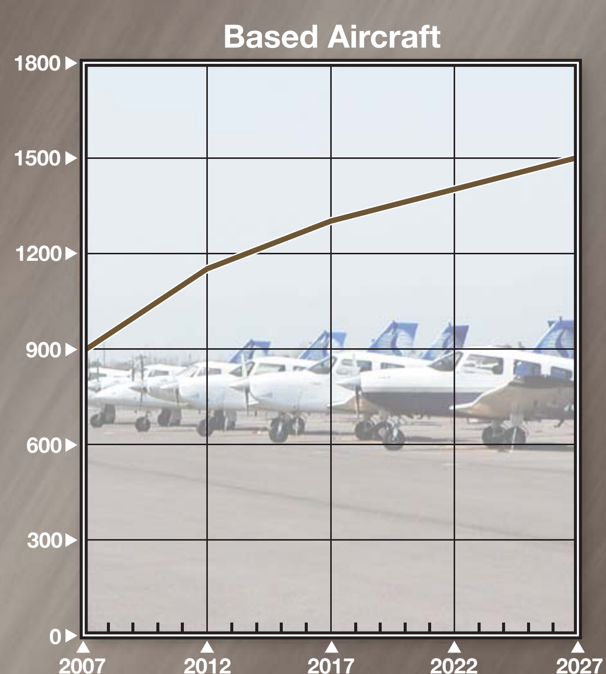
Based aircraft at Mesa-Falcon Field Airport are projected to grow from 892 currently, to 1,500 in 2027. Business jets are anticipated to show the strongest rate of growth in the future, reflective of what is happening in the industry. Based jets are expected to increase from 11 in 2007 to 48 in 2027, or growing from 1.2 percent to 3.2 percent of the Mesa-Falcon Field Airport based aircraft fleet. Single engine piston aircraft will continue to dominate the based aircraft fleet, making up approximately 79 percent of the fleet over the planning period.

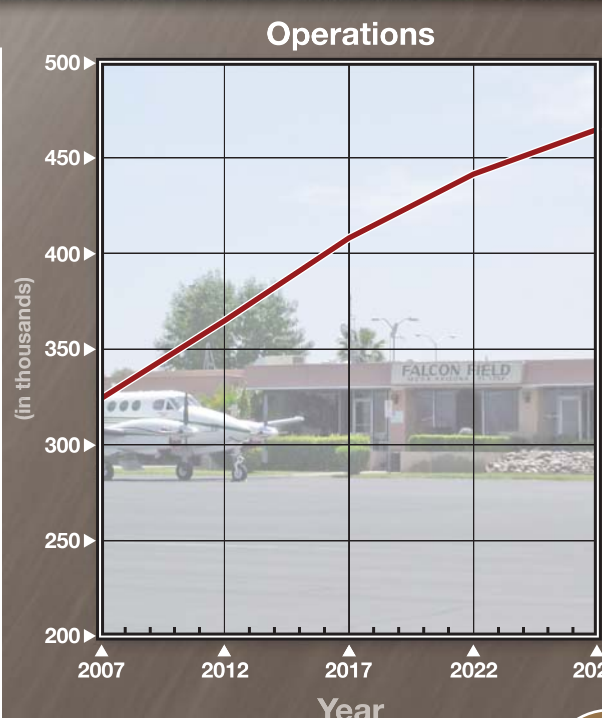
Annual operations are forecast to grow from 323,553 in 2007, to 464,500 by 2027. Air taxi operations are expected to grow significantly; particularly with growth in on-demand charters and the introduction of very light jets to the national general aviation fleet. Although itinerant aircraft will continue to play a major role in operations at the airport, local operations are forecast to account for approximately 52 percent of total operations through the planning period. This is consistent with projections that existing flight training activities will maintain a presence at the airport. The next chapter will examine the operational capabilities of the airfield in relation to both existing and projected aviation activity.

06MP17-2E-1/21/09

	Current	2012	2017	2022	2027
Based Aircraft Forecast					
Single Engine	679	909	1,033	1,109	1,187
Multi-Engine	123	132	135	135	132
Turboprop	13	18	23	28	33
Jet	11	19	30	38	48
Helicopter	66	72	79	90	100
TOTAL Based Aircraft	**892***	**1,150**	**1,300**	**1,400**	**1,500**
Operations Forecast					
Itinerant					
GA	134,773	150,000	170,000	185,000	195,000
Air Taxi	6,912	8,900	10,800	13,200	16,000
Military	1,746	4,000	4,000	4,000	4,000
TOTAL Itinerant	**143,431**	**162,900**	**184,800**	**202,200**	**215,000**
Local					
GA	170,026	190,000	210,000	225,000	235,000
Military	672	1,000	1,000	1,000	1,000
TOTAL Local	**170,698**	**191,000**	**211,000**	**226,000**	**236,000**
3% Nightime Ops	9,424	10,600	11,900	12,800	13,500
TOTAL Operations	**323,553**	**364,500**	**407,700**	**441,000**	**464,500**
Peak Operations					
Peak Month	30,738	34,628	38,730	41,895	44,128
Busy Day	1,361	1,534	1,717	1,857	1,955
Design Day	1,024	1,154	1,291	1,396	1,470
Design Hour	133	150	155	160	166
AIA's	N/A	650	739	808	860

* March 2007 based aircraft total





MESA-FALCON FIELD AIRPORT

Exhibit 2E
FORECAST SUMMARY

MESA-FALCON FIELD AIRPORT

Chapter Three

AIRPORT FACILITY REQUIREMENTS

Airport Facility Requirements

To properly plan for the future of Mesa-Falcon Field Airport, it is necessary to translate forecast aviation demand into the specific types and quantities of facilities that can adequately serve this identified demand. 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 forecast activity levels 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.

As indicated earlier, airport facilities include both airfield and landside components. Airfield facilities include those facilities that are related to the arrival, departure, and ground movement of aircraft. The components include:

- Runways
- Taxiways
- Navigational Approach Aids
- Airfield Lighting, Marking, and Signage

Landside facilities are needed for the interface between air and ground transportation modes. This includes components for general aviation needs such as:

- General Aviation Terminal
- Aircraft Hangars
- Aircraft Parking Aprons
- Auto Parking and Access
- Airport Support Facilities

The objective of this effort is to identify, in general terms, the adequacy of the existing airport facilities and 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 these facilities will be evaluated in Chapter Four to determine the most practical, cost-effective, and efficient direction for future development.

PLANNING HORIZONS

Cost-effective, safe, efficient, and orderly development of an airport should rely more on actual demand at an airport 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 resulting plan can accommodate unexpected shifts or changes in the 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 and potentially extend this plan's useful life should aviation trends slow over time.

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 resulting plan provides airport officials with a financially responsible and needs-based program. **Table 3A** presents the planning horizon milestones for each activity demand category. The planning milestones of short, intermediate, and long term generally correlate to the five, ten, and twenty-year periods used in the previous chapter.

The Mesa-Falcon Field Airport airport traffic control tower (ATCT) is not manned 24 hours per day, so the existing operational count is not all-inclusive of operations at the airport. Certain elements of the planning analyses, however, require that all the airport activity be considered. For these evaluations, it is necessary to estimate and adjust for operations that occur when the tower is closed. The Mesa-Falcon Field ATCT hours are from 6:00 a.m. to 9:00 p.m. The operations were increased by three percent for nighttime adjustment and included in the table.

TABLE 3A
Planning Horizon Activity Summary
Mesa-Falcon Field Airport

	2007	Short Term (0-5 years)	Intermediate Term (6-10 years)	Long Term (11-20 years)
Itinerant Operations				
General Aviation	134,773	150,000	170,000	195,000
Air Taxi	6,912	8,900	10,800	16,000
Military	1,746	4,000	4,000	4,000
Total Itinerant	143,431	162,900	184,800	215,000
Local Operations				
General Aviation	170,026	190,000	210,000	235,000
Military	672	1,000	1,000	1,000
Total Local	170,698	191,000	211,000	236,000
Nighttime 3% Adjustment	9,424	10,600	11,900	13,500
TOTAL OPERATIONS	**323,553**	**364,500**	**407,700**	**464,500**
TOTAL BASED AIRCRAFT	**892**	**1,150**	**1,300**	**1,500**

AIRFIELD PLANNING CRITERIA

The selection of appropriate Federal Aviation Administration (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 used to define the design parameters for 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 many airside and landside components. 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 (physical characteristic). Generally, aircraft approach speed applies to runways and runway-related facilities, while aircraft wingspan primarily relates to separation criteria involving taxiways, taxilanes, and landside facilities.

According to FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, Change 11, 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 II for wingspan at 70 feet, but ADG III for tail height at 33 feet. This aircraft would be classified under ADG III. The six ADGs used in airport planning are as follows:

ADG	Tail Height (feet)	Wingspan (feet)
I	<20	<49
II	20 - <30	49 - <79
III	30 - <45	79 - <118
IV	45 - <60	118 - <171
V	60 - <66	171 - <214
VI	66 - <80	214 - <262
Source: AC 150/5300-13, Change 11 (March 2007)		

Exhibit 3A summarizes representative aircraft by ARC. As shown on the exhibit, the airport does not currently, nor is it expected to, regularly serve aircraft in ARCs C-III, D-III, C-IV, D-IV, or D-V. These are large transport aircraft commonly used by commercial air carriers and air cargo carriers, which do not currently use, nor are they expected to use, Mesa-Falcon Field Airport through the planning period. Operations by aircraft in ARCs C-I through D-II are also somewhat limited by available runway length at the airport.

The FAA recommends designing airport functional elements to meet the requirements for the most demanding ARC for that airport. The majority of aircraft currently operating at the airport are small single engine aircraft weighing less than 12,500 pounds. The airport also has a significant volume of corporate aircraft ranging from the smaller Cessna Citation family to the Challenger 600, which can weigh more than 50,000 pounds.

In order to determine airfield design requirements, the critical aircraft and critical ARC should first be determined, and then appropriate airport design criteria can be applied. This process begins with a review of aircraft currently using the airport and those expected to use the airport through the long term planning period.

CURRENT CRITICAL AIRCRAFT

The critical design aircraft is defined as the most demanding category of aircraft which conduct 500 or more operations at the airport each year. In some cases, more than one specific make and model of aircraft comprises the airport's critical design aircraft. For example, one category of aircraft may be the most critical in terms of approach speed, while another is most critical in terms of wingspan. Smaller general aviation piston-powered air-

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A-I

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

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

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

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

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

A-III, B-III

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

C-I, D-I

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

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

C-III, D-III

- ERJ-170, 190
- Boeing Business Jet
- B 727-200
- **B 737-300 Series**
- MD-80, DC-9
- Fokker 70, 100
- A319, A320
- Gulfstream V
- Global Express

C-IV, D-IV

- **B-757**
- B-767
- C-130
- DC-8-70
- DC-10
- MD-11
- L1011

D-V

- **B-747** Series
- B-777

Note: Aircraft pictured is identified in bold type.

MESA-FALCON FIELD AIRPORT

Exhibit 3A
AIRPORT REFERENCE CODES

craft within approach categories A and B and ADG I conduct the majority of operations at Mesa-Falcon Field Airport. Business turboprops and jets with longer wingspans and higher approach speeds also utilize the airport less frequently.

General aviation aircraft using the airport include a variety of small single and multi-engine piston-powered aircraft, turboprops, and jet aircraft. While the airport is used by a number of helicopters, helicopters are not included in this determination as they are not assigned an ARC.

As of March 2007, there were 892 based aircraft at Mesa-Falcon Field Airport. The majority of these are single and multi-engine piston-powered aircraft which fall within approach categories A and B and ADG I. There are 13 turboprop aircraft and 11 jets based at the airport. The most demanding of the turboprops is the King Air B300, with a published approach speed and wingspan that categorizes it as an ARC B-II aircraft. Of the 11 jets, three of these are in the Cessna Citation family of aircraft, with the most demanding being a Cessna 550, which also falls in ARC B-II. The remaining jets are warbirds that are in various states of restoration. The warbirds that do fly do so irregularly and are not considered in the critical aircraft determination. Before making a final determination of the critical aircraft family, an examination of the transient turboprop and jet aircraft using the airport should also be considered.

Turboprop and Jet Operations

A wide range of transient turboprop and jet aircraft operate at the airport. In order to discern the number and type of turboprop and jet operations at Mesa-Falcon Field Airport, an analysis of instrument flight plan data was conducted. Flight plan data was acquired for this study from the subscription service, *Airport IQ*. The data available includes documentation of flight plans that are opened and closed on the ground at the airport. Flight plans that are opened or closed from the air are not credited to the airport. Therefore, it is likely that there are more turboprop and jet operations at the airport that are not captured by the methodology. Additionally, some turboprops and jets conduct operations within the traffic pattern at the airport. These local operations are also not captured on instrument flight plans.

Table 3B presents private jet and turboprop operations at Mesa-Falcon Field Airport from June 1, 2006, to June 2, 2007 (12-month operational count). The privately owned and operated aircraft are not flown under Federal Aviation Regulation (F.A.R.) Part 135 (considered air taxi). These operations would be considered itinerant general aviation operations.

TABLE 3B
Private Jet and Turboprop Operations (Minimum)
June 1, 2006 - June 2, 2007
Mesa-Falcon Field Airport

ARC	Aircraft Type	Annual Operations	%	Number of Jets	%
JETS					
B-I	Cessna 500	62	3.6%	4	1.4%
	Cessna 501	30	1.8%	12	4.2%
	Premier 390	29	1.7%	5	1.7%
	Mitsubishi MU-300	3	0.3%	1	0.9%
	Falcon 10	7	0.4%	3	1.0%
Total B-I		**131**	**7.7%**	**25**	**8.7%**
B-II	Cessna 525	121	7.1%	24	8.4%
	Cessna 550	142	8.4%	17	5.9%
	Cessna 551	4	0.2%	2	0.7%
	Cessna 560	90	5.3%	22	7.7%
	Hawker 800	14	0.8%	5	1.7%
	Hawker 850XP	2	0.1%	1	0.3%
	Falcon 20	12	0.7%	2	0.7%
	Falcon 50	8	0.5%	3	1.0%
	Falcon 200	2	0.1%	1	0.3%
	Falcon 900	4	0.2%	2	0.7%
Total B-II		**399**	**23.5%**	**79**	**27.5%**
C-I	Lear 23	2	0.1%	1	0.3%
	Lear 24	4	0.2%	2	0.7%
	Lear 31	5	0.3%	3	1.0%
	Lear 35	10	0.6%	5	1.7%
	Lear 45	27	1.6%	6	2.1%
	IAI Westwind	19	1.1%	3	1.0%
	Beechjet 400	22	1.3%	5	1.7%
Total C-I		**89**	**5.2%**	**25**	**8.7%**
C-II	Cessna 650	4	0.2%	2	0.7%
	Gulfstream G-200	2	0.1%	1	0.3%
	Challenger 600	31	1.8%	6	2.1%
	Challenger BD-100	4	0.2%	2	0.7%
	IAI Astra 1125	6	0.4%	1	0.3%
	IAI Galaxy	2	0.1%	1	0.3%
	Embraer 135BJ	2	0.1%	1	0.3%
Total C-II		**51**	**3.0%**	**14**	**4.9%**
C-III	Global Express	2	0.1%	1	0.3%
Total C-III		**2**	**0.1%**	**1**	**0.3%**
D-I	Lear 60	2	0.1%	1	0.3%
Total D-I		**2**	**0.1%**	**1**	**0.3%**
D-II	Gulfstream II	20	1.2%	10	3.5%
	Gulfstream IV	14	0.8%	7	2.4%
Total D-II		**34**	**2.0%**	**17**	**5.9%**
D-III	Gulfstream V	9	0.5%	2	0.7%
Total D-III		**9**	**0.5%**	**2**	**0.7%**
Total Jet Activity		**717**	**42.2%**	**164**	**57.1%**

TABLE 3B (Continued) Private Jet and Turboprop Operations (Minimum) June 1, 2006 - June 2, 2007 Mesa-Falcon Field Airport					
ARC	**Aircraft Type**	**Annual Operations**	**%**	**Number of Turboprops**	**%**
TURBOPROPS					
B-I	Piaggio P-180	10	0.6%	4	1.4%
	Socata TBM-700	47	2.8%	11	3.8%
	Turbo Commander 690	70	4.1%	9	3.1%
	Mitsubishi MU-2	6	0.4%	2	0.7%
	Beech King Air 100	14	0.8%	4	1.4%
Total B-I		**147**	**8.7%**	**30**	**10.5%**
B-II	Cessna Conquest II	36	2.1%	4	1.4%
	Beech King Air C90	259	15.2%	40	13.9%
	Beech King Air 200	147	8.7%	30	10.5%
	Beech King Air B300	376	22.1%	15	5.2%
	Swearingen Metro	17	1.0%	4	1.4%
Total B-II		**835**	**49.1%**	**93**	**32.4%**
Total Turboprop Activity		**982**	**57.8%**	**123**	**42.9%**
Total Activity (Jet+Turboprop)		**1,699**	**100.0%**	**287**	**100.0%**
Source: *Airport IQ* utilizing FAA data					

There were a total of 1,699 operations by privately owned jet and turboprop aircraft. The greatest number of operations in any single ARC family was 1,234 in ARC B-II. This number overwhelmingly accounted for the majority of private jet and turboprop operations, at more than 72 percent.

The table also presents the number of operations by specific aircraft type. The Cessna 550 model, which includes one of the based jet aircraft at the airport, performed the most jet operations (142) at the airport. There were 17 different Cessna 550 aircraft which accounted for this total. As for the turboprop aircraft, the King Air B300 conducted 376 operations, and the King Air C90 recorded 259 operations. These aircraft types represent six of the 13 based turboprop aircraft at the airport.

The most demanding privately operated aircraft, in terms of ARC design standard, has been the Gulfstream V. The Gulfstream V is classified by the FAA as ARC D-III. Several ARC C-II operations by the Challenger 600 were also conducted at the airport over the last year.

Another segment of corporate aircraft users operate under F.A.R. Part 135 (air taxi) rules for hire and through fractional ownership programs. Air taxi operators are governed by the FAA rules which are more stringent than those required for private aircraft owners. For example, aircraft operating under Part 135 rules must increase their calculated landing length requirements by 20 percent for safety factors. Fractional ownership operators are actual aircraft owners who acquire a portion of an aircraft with the ability to use any aircraft in the program's fleet. These programs have become quite popular over the last several years, especially since 9/11. Some of the most notable fractional ownership programs include NetJets, Bombardier Flexjet, Citation Shares, and Flight Options.

From June 1, 2006, to June 2, 2007, air taxi and fractional ownership operators accounted for an additional 298 jet and turboprop operations. **Table 3C** provides additional information regarding the ARC of many of the aircraft utilized by the fractional and charter companies which operate at Mesa-Falcon Field Airport.

TABLE 3C
Air Taxi Jet and Turboprop Operations
Mesa-Falcon Field Airport

ARC	Aircraft Type	Annual Operations	%
JETS			
B-I	Cessna 500	8	2.7%
Total B-I		**8**	**2.7%**
B-II	Cessna 525	2	0.7%
	Cessna 550	4	1.3%
	Cessna 560	56	18.8%
	Cessna 680	10	3.4%
	Hawker 800	30	10.1%
	Falcon 2000	10	3.4%
Total B-II		**112**	**37.6%**
C-I	Lear 24	2	0.7%
	Lear 25	2	0.7%
	Lear 35	24	8.1%
	Lear 45	4	1.3%
	Beechjet 400	12	4.0%
Total C-I		**44**	**14.8%**
C-II	Cessna 650	2	0.7%
	Cessna 750 (X)	28	9.4%
	Challenger 300	10	3.4%
	Challenger 600	4	1.3%
	IAI Galaxy	20	6.7%
Total C-II		**64**	**21.5%**
D-I	Lear 60	2	0.7%
Total D-I		**2**	**0.7%**
D-II	Gulfstream III	6	2.0%
Total D-II		**6**	**2.0%**
Total Jet Activity		**236**	**79.2%**
TURBOPROPS			
B-I	Socata TBM-700	2	0.7%
Total B-I		**2**	**0.7%**
B-II	King Air C90	34	11.4%
	King Air 200	20	6.7%
	King Air 350	4	1.3%
	Swearingen Metro	2	0.7%
Total B-II		**60**	**20.1%**
Total Turboprop Activity		**62**	**20.8%**
Total Activity (Jet + Turboprop)		**298**	**100.0%**

Source: *Airport IQ* utilizing FAA data

The combination of private and air taxi jet and turboprop operations accounted for a minimum of 1,997 itinerant operations at Mesa-Falcon Field Airport over a one-year time period, as presented in **Table 3D**. Based upon operational estimates, operations by jet and turboprop aircraft within ARC B-II exceed the substantial use threshold of 500 operations per year to be considered the current critical design aircraft. In fact, ARC B-II aircraft totaled approximately 70 percent of all operations used in this analysis. Therefore, the current critical design aircraft for Mesa-Falcon Field Airport is defined by cabin-class aircraft in ARC B-II.

TABLE 3D
Total Jet and Turboprop Operations by ARC
Mesa-Falcon Field Airport

Aircraft Reference Code (ARC)	Total Turbojet Ops	Total Turboprop Ops	Total Combined
B-I	139	149	288
B-II	511	895	1,406
C-I	133	N/A	133
C-II	115	N/A	115
C-III	2	N/A	2
D-I	4	N/A	4
D-II	40	N/A	40
D-III	9	N/A	9
Totals	**953**	**1,044**	**1,997**

Source: *Airport IQ*

FUTURE CRITICAL AIRCRAFT

The aviation demand forecasts indicate the potential for continued growth in business jet and turboprop aircraft activity at the airport. This includes the addition of 37 based jets and 17 based turboprops through the long term planning period. Transient business jet and turboprop activity is also expected to continue to be strong. Therefore, it is expected that business jet and turboprop aircraft will continue to define the critical aircraft parameters for Mesa-Falcon Field Airport through the planning period.

Mesa-Falcon Field Airport is fully capable of serving the full breadth of piston-powered and turboprop general aviation aircraft. The airport is also capable of serving the majority of business jet aircraft. The majority of business jets in the fleet today are in ARC B-I through B-II. With a 5,101-foot main runway, larger business jet operations may be limited due to the fact that some of these jets prefer or are required to operate at an airport with a longer runway.

Analysis of the operations of larger business jets in approach category C indicates that 250 operations were conducted from June 1, 2006, to June 2, 2007. This includes aircraft such as the Lear 35, Citation 750 (X), and Challenger 600. These larger business jets will likely never frequent the airport on a regular basis due to the amount of runway length available. The hot weather conditions that prevail during a significant portion of the year will further limit their capability of utilizing the airport. Projecting their activity in the long term to exceed the FAA threshold of 500 annual operations is not justified. Thus, the future critical aircraft is projected to remain as ARC B-II.

AIRFIELD CAPACITY

Airfield capacity is measured in a variety of different ways. The **hourly capacity** of a runway 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 in **Exhibit 3B**. The following describes the input factors as they relate to Mesa-Falcon Field Airport:

- **Runway Configuration** – The existing runway configuration consists of a parallel runway system with full-length parallel taxiways. The runways have a centerline-to-centerline separation of 700 feet. The primary runway is 5,101 feet long and the secondary runway is 3,799 feet long.

- **Runway Use** – Runway use in capacity conditions will be controlled by wind and/or airspace conditions. For Mesa-Falcon Field Airport, the direction of take-offs and landings are generally determined by the speed and direction of the wind. It is generally safest for aircraft to takeoff and land into the wind, avoiding a crosswind (wind that is blowing perpendicular to the travel of the aircraft) or tailwind components during these operations. Based upon information received from the ATCT, Runway 22L and 22R are utilized approximately 60 percent of the time, with Runway 4L and 4R being utilized approximately 40 percent of the time. The availability of instrument approaches is also considered. Runway 4R is the only runway served by a straight-in instrument approach procedure. The airport is also served by a circling approach.

- **Exit Taxiways** – Exit taxiways have a significant impact on airfield capacity since the number and location of exits directly determines the occupancy time of an aircraft on the runway. The airfield capacity analysis gives credit to exits located within the prescribed range from a runway's threshold. This range is based upon the mix index of the aircraft that use the runways. For Mesa-Falcon Field Airport, those exit taxiways located between 2,000 and 4,000 feet of the landing threshold count in the capacity determination. The exits must be at least 750 feet apart to count as separate exits. Under this criteria, there are two exits available within

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Exhibit 3B
AIRFIELD CAPACITY FACTORS

this range for Runways 4R and 22L. Runways 4L and 22R each have just one exit within this range. For this analysis, the more constraining circumstance was considered which lead to the use of one exit taxiway.

- **Weather Conditions** – The airport operates under visual meteorological conditions (VMC) over 99.5 percent of the time. Instrument meteorological conditions (IMC) occur when cloud ceilings are between 500 and 1,000 feet. Poor visibility conditions (PVC) apply for minimums below 500 feet and one mile. Because IMC and PVC occur less than one percent combined, they are considered negligible for this analysis. Therefore, airfield capacity for Mesa-Falcon Field Airport has been determined assuming that VMC conditions occur 100 percent of the time.

- **Aircraft Mix** – Aircraft mix for the capacity analysis is defined in terms of four aircraft classes. Classes A and B consist of small and medium-sized propeller and some jet aircraft, all weighing 12,500 pounds or less. These aircraft are associated primarily with general aviation activity, but do include some air taxi, air cargo, and commuter aircraft. Class C consists of aircraft weighing between 12,500 pounds and 300,000 pounds. These aircraft include most business jets and some turboprop aircraft. Class D aircraft consists of large aircraft weighing more than 300,000 pounds. These aircraft are associated with airline and air cargo activities, and include the DC-10, Boeing 767, and Boeing 747. The airport does not experience operations by Class D aircraft. A description of the classifications and the percentage mix for each planning horizon is presented in **Table 3E**.

TABLE 3E
Aircraft Operational Mix - Capacity Analysis
Mesa-Falcon Field Airport

Aircraft Classification	Current	Short Term (0-5 years)	Intermediate Term (6-10 years)	Long Term (11-20 years)
VFR				
Classes A & B	97.5%	96.6%	95.8%	95.1%
Class C	2.5%	3.4%	4.2%	4.9%
Class D	0%	0%	0%	0%
Percent Local Operations (Touch-and-Go's)	52%	52%	52%	51%

Definitions: Class A: Small single engine aircraft with gross weights of 12,500 pounds or less
Class B: Small twin-engine aircraft with gross weights 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

- **Percent Arrivals** – Generally follows the typical 50/50 percent split.

- **Touch-and-Go Activity** – Percentages of touch-and-go activity are presented in **Table 3E**. This activity typically includes local flight training operations.

- **Peak Period Operations** – For the airfield capacity analysis, average daily operations and average peak hour operations during the peak month, as calculated in the previous section, 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 Mesa-Falcon Field 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.

Based upon the input factors, current and future hourly capacities at Mesa-Falcon Field Airport were determined. As the mix of aircraft operating at an airport changes to include a higher percentage of large aircraft weighing over 12,500 pounds, the hourly capacity of the system declines slightly. As indicated in **Table 3E**, the percentages of Class C aircraft will increase with the planning horizon activity milestones. This results in a slight decline in the hourly capacity. This progression would be representative as corporate aircraft operations will likely increase at a greater rate than other general aviation operations.

The current and future hourly capacities are depicted in **Table 3F**. At Mesa-Falcon Field Airport, the current hourly capacity is 194 operations. This is expected to decline to 184 operations in the long term. The deadline can be attributed to the projected increase in jet and turboprop activity which typically requires additional space and time in the aircraft traffic pattern and on the runway system. This is still above the design hour of 166 operations expected in the long term.

Annual Service Volume

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

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

The ratio of annual demand to average daily demand (D) was determined to be 316 for Mesa-Falcon Field Airport. This is expected to decrease slightly over the long range planning period. The ratio of average daily demand to average peak hour demand (H) was determined to be 7.7. This ratio was projected to increase to 8.9 by the long term planning horizon.

The current ASV was determined to be 472,000 operations. As peaks spread, becoming less concentrated with increased operations, the ASV will tend to increase, resulting in an annual service volume of 516,000 by the long term planning horizon. With operations in 2007 totaling 323,553, the airport is currently at 68.5 percent of its annual service volume. Long range annual operations are forecast to reach nearly 464,500 operations, which would be 90 percent of the airport's ASV. **Table 3F** summarizes the airport's ASV over the long range planning horizon.

Aircraft Delay

As the number of annual aircraft operations approaches the airfield's capacity, increasing operational delays begin to occur. Delays occur to arriving and departing aircraft in all weather conditions. Arriving aircraft delays result in aircraft holding outside the airport traffic area. Departing aircraft delays result in aircraft holding until released by air traffic control.

Table 3F summarizes the aircraft delay analysis conducted for Mesa-Falcon Field Airport. Current annual delay is estimated at 0.4 minutes per aircraft operation or 2,157 annual hours. As an airport's operations near the annual service volume, delays increase exponentially. Analysis of delay factors for the long range planning horizon indicates that annual delays can be expected to reach 6,968 hours, or 0.9 minutes per aircraft operation.

TABLE 3F
Airfield Demand/Capacity Summary
Mesa-Falcon Field Airport

	Current	Short Term (0-5 years)	Intermediate Term (6-10 years)	Long Term (11-20 years)
Operational Demand				
Annual	323,553	364,500	407,700	464,500
Design Hour	133	150	155	166
Capacity				
Annual Service Volume	472,000	460,000	493,000	516,000
Percent Capacity	68.5	79.2	82.7	90.0
Weighted Hourly Capacity	194	189	187	184
Delay				
Per Operation (Minutes)	0.4	0.5	0.7	0.9
Total Annual (Hours)	2,157	3,038	4,757	6,968

CAPACITY ANALYSIS CONCLUSIONS

Exhibit 3C compares annual service volume to existing and forecast operational levels at Mesa-Falcon Field Airport. The current operations level represents 68.5 percent of the airfield's annual service volume. By the end of the planning period, total annual operations are expected to represent 90 percent of annual service volume.

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. This range has been reached and could be exceeded by the short term planning horizon. An example of a capacity improvement would include additional taxiway exits. Options to increase capacity will be considered and evaluated in the alternatives analyses of the next chapter.

AIRFIELD REQUIREMENTS

Airfield requirements include the need for those facilities related to the arrival and departure of aircraft. The adequacy of existing airfield facilities at Mesa-Falcon Field Airport has been analyzed from a number of perspectives, including:

- Runways
- Safety Area Design Standards
- Taxiways
- Airfield Lighting, Marking, and Signage
- Navigational Aids and Instrument Approach Procedures

RUNWAYS

Runway conditions such as orientation, length, pavement strength, width, and safety standards at Mesa-Falcon Field Airport were analyzed. From this information, requirements for runway improvements were determined for the airport.

Primary Runway 4R-22L at Mesa-Falcon Field Airport is currently designed to ARC B-II standards. Planning and development considerations will keep this runway as ARC B-II.

Parallel Runway 4L-22R currently possesses design standards that conform to ARC B-I in some categories and ARC B-II in others. According to Mesa-Falcon Field ATCT personnel, the majority of aircraft that operate on this runway are in ARC A-I and B-I; however, some larger aircraft, in particular King Air turboprops, do utilize the runway on an infrequent basis. In an effort to protect the safety areas related to this runway, future consideration should be given to upgrading this runway to full ARC B-II standards.

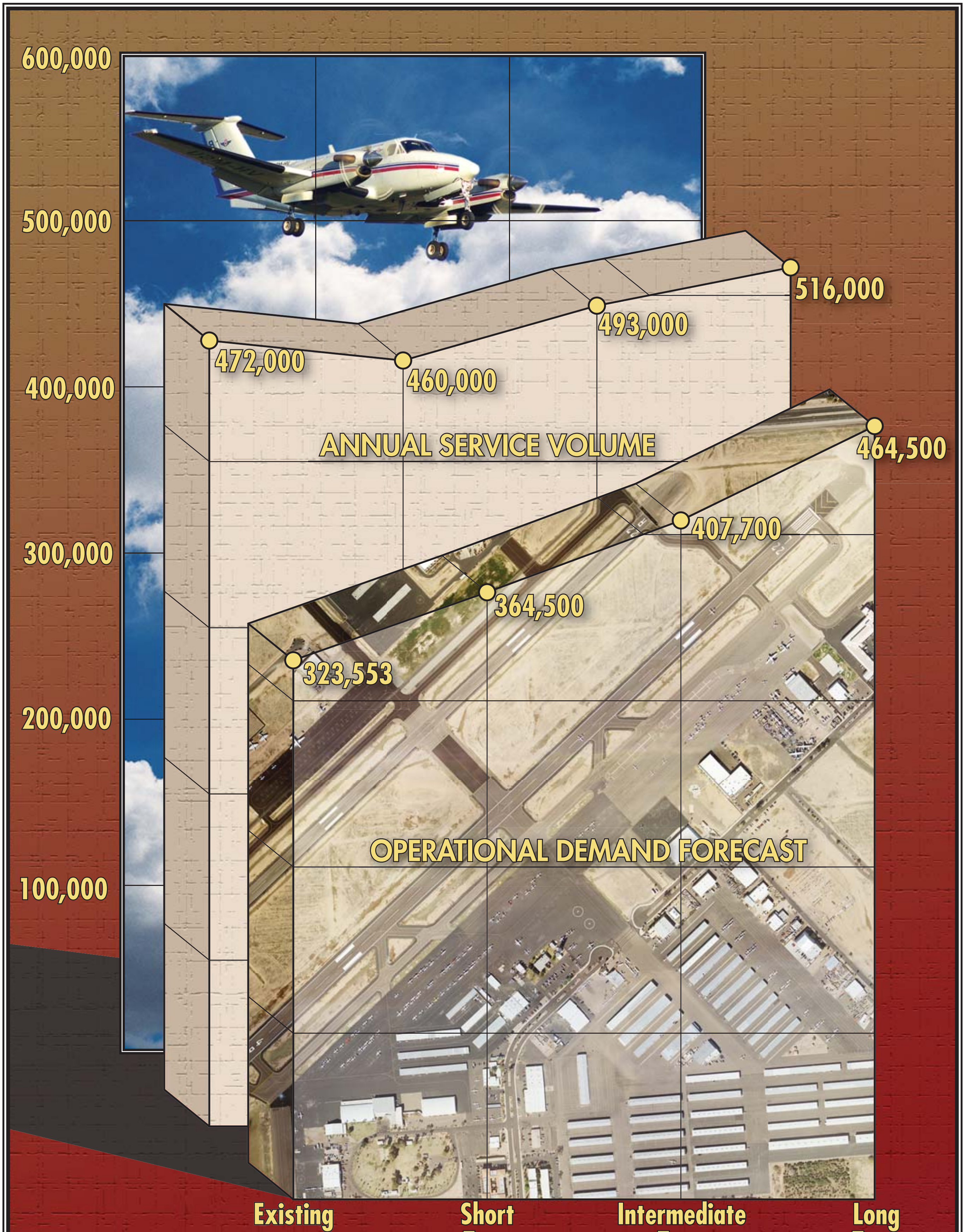

Exhibit 3C
AIRFIELD DEMAND VS. CAPACITY

Runway Orientation

The airport is served by a parallel runway system orientated in a northeast-southwest manner. For the operational safety and efficiency of an airport, it is desirable for the primary runway to be orientated as close 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 Advisory Circular 150/5300-13, Change 11, *Airport Design*, recommends that a crosswind runway should be made available when the primary runway orientation provides less than 95 percent wind coverage for specific crosswind components. The 95 percent wind coverage is computed on the basis of the crosswind component not exceeding 10.5 knots (12 mph) for ARC A-1 and B-I; 13 knots (15 mph) for ARC A-II and B-II; 16 knots (18 mph) for ARC C-I through D-II; and 20 knots for ARC A-IV through D-VI.

Wind data specific to the airport is available and is depicted on **Exhibit 3D**. The runway orientation provides 94.51 percent wind coverage for 10.5 knot crosswinds, 97.73 percent wind coverage at 13 knots, and 99.65 percent coverage at 16 knots. Aircraft in ARC A-I and B-I could experience crosswinds exceeding 10.5 knots or greater 5.49 percent of the year.

According to FAA planning standards, a crosswind runway should be planned, if feasible. Topographical features and surrounding development limit the feasibility of a crosswind runway at Mesa-Falcon Field Airport. Further, the existing runway orientation fails to meet the 95 percent wind coverage standard by only 0.49 percent. This equates to only two days worth of additional crosswind components exceeding the 10.5 knot standard for ARC A-I and B-I aircraft. In addition, the main runway is 100 feet wide, which provides a greater safety margin for aircraft operating in crosswind conditions. Even if feasible, the costs of constructing a crosswind runway would far exceed the benefit of meeting the standard. As a result, no additional runway orientations will be planned.

Runway Length

The determination of runway length requirements for the airport is based on five primary factors:

- Mean maximum daily temperature of the hottest month
- Airport elevation
- Runway gradient
- Critical aircraft type expected to use the airport
- Stage length of the longest nonstop trip destination (specific to larger aircraft)

The mean maximum daily temperature of the hottest month for Mesa-Falcon Field Airport is 106 degrees Fahrenheit (F). The airport elevation is 1,394 feet above mean sea level (MSL). The maximum runway end elevation difference for Runway 4R-22L is 29 feet, while the elevation difference for Runway 4L-22R is 20 feet. Runway 4R-22L has a longitudinal gradient of 0.6 percent, while Runway 4L-22R has 0.5 percent longitudinal gradient, both of which conform to FAA design standards. For aircraft in approach categories A and B, the runway longitudinal gradient cannot exceed two percent. For aircraft in approach categories C and D, the maximum allowable longitudinal runway gradient is 1.5 percent.

Table 3G outlines the runway length requirements for various classifications of general aviation aircraft at Mesa-Falcon Field Airport. These were derived utilizing the FAA Airport Design Computer Program for *Runway Lengths Recommended for Airport Design*. These runway lengths are based upon groupings or "families" of aircraft. As discussed earlier, the runway design required should be based upon the most critical family with at least 500 annual operations.

TABLE 3G
Runway Length Requirements
Mesa-Falcon Field Airport

Airport and Runway Data	
Airport Elevation	1,394 feet MSL
Mean daily maximum temperature of the hottest month	106 degrees F
Maximum difference in runway centerline elevation	29 feet
Length of haul for airplanes of more than 60,000	1,000 miles
Dry runways	
Runway Length 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	**4,500 feet**
Small airplanes with 10 or more passenger seats	4,800 feet
Large airplanes of 60,000 pounds or less	
75 percent of business jets at 60 percent useful load	5,500 feet

Source: FAA Airport Design Computer Program utilizing Chapter Two of AC 150/5325-4A, *Runway Length Requirements for Airport Design*

The current critical aircraft using the airport falls in ARC B-II. The category of "100 percent of small airplanes with less than 10 passenger seats" generally corresponds to ARC B-II aircraft. As the table shows, conditions call for a runway length of at least 4,500 feet to accommodate this aircraft category. At 5,101 feet, Runway 4R-22L exceeds this recommended length. The critical aircraft will remain within ARC B-II. For ARC C-II aircraft, 5,500 feet of runway length would be recommended. Some aircraft in approach categories C and D will continue to utilize the airport, but they are not expected to reach 500 annual operations within the long term planning horizon of this plan. As such, the current length of Runway 4R-22L will be adequate through the planning period.

The shorter parallel Runway 4L-22R is currently 3,799 feet long. This length exceeds the category of "75 per-

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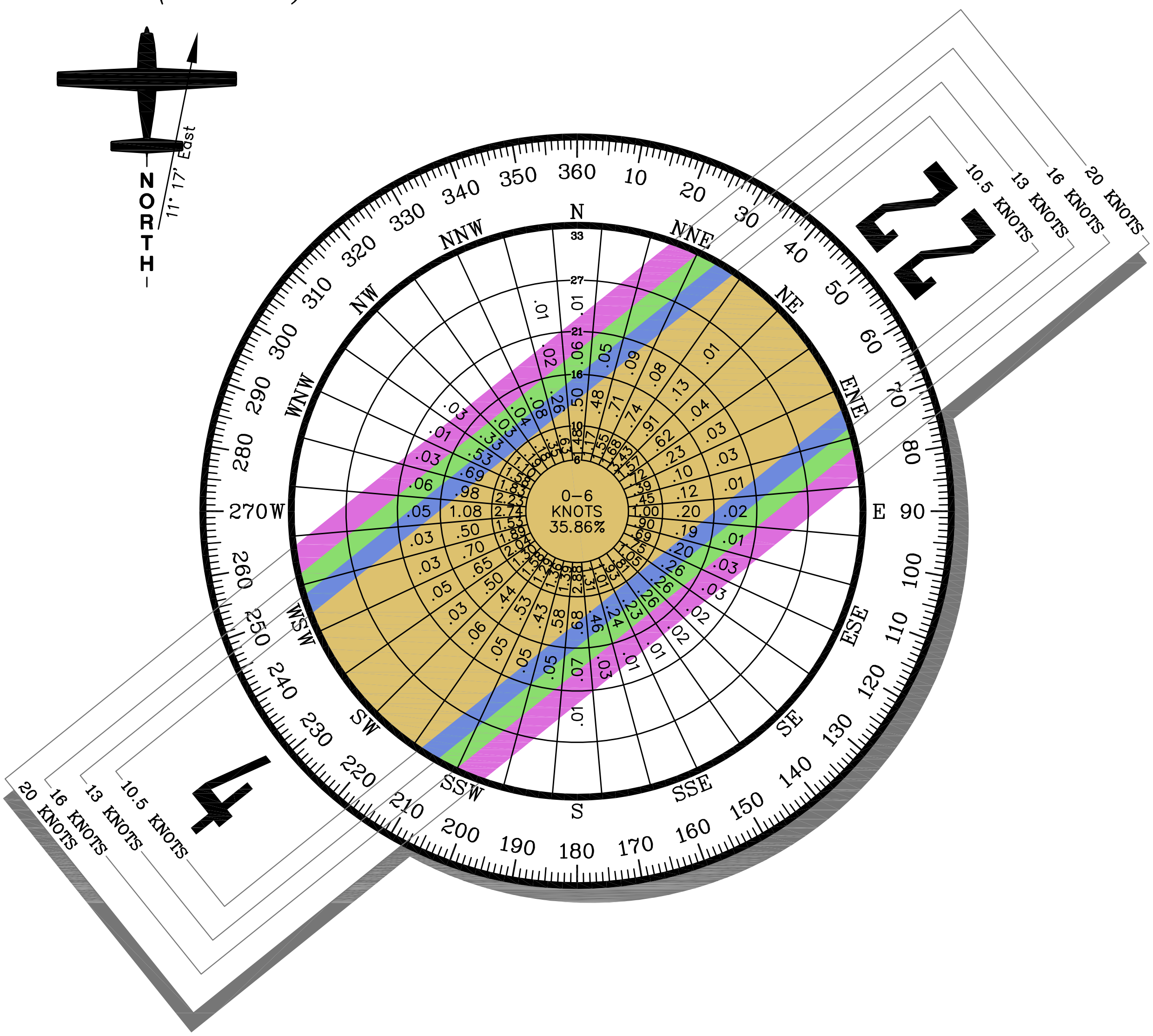
ALL WEATHER WIND COVERAGE

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 4-22	94.51%	97.73%	99.65%	99.94%

Magnetic Variance
11° 17' East (June 2007)
Annual Rate of Change
00° 06' West (June 2007)



SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Falcon Field (FFZ)
Mesa, Arizona

OBSERVATIONS:
23,996 All Weather Observations
1997-2006

MESA-FALCON FIELD AIRPORT

Exhibit 3D
WINDROSE

cent of small airplanes with less than 10 passenger seats," which generally corresponds to ARC B-I aircraft. As previously mentioned, in order to satisfy ARC B-II aircraft demands, this runway would need to be at least 4,500 feet long. After review of safety areas (in particular, the runway safety area and object free area) associated with this runway, it may not be feasible to extend the runway given the obstructions associated with the approach ends of each runway, which include East McDowell Road and North Greenfield Road. More information will be provided on the safety area design standards in the following section.

The runway lengths available at Mesa-Falcon Field Airport are capable of accommodating the airport's current and future critical aircraft. As such, the existing runway lengths should be maintained in the future.

Runway Width

Runway 4R-22L is currently 100 feet wide, and Runway 4L-22R is currently 75 feet wide. FAA design standards call for a runway width of at least 75 feet to serve aircraft up to ARC B-II, as long as the instrument approach minimums are not lower than three-quarters of a mile. Both runways currently meet FAA criteria for runway width and should be maintained as such.

The runway shoulder width for Group I and II aircraft is 10 feet on both sides. The shoulder areas provide resistance to blast erosion and must be capable of accommodating emergency and maintenance vehicles as well as the occasional passage of an aircraft veering from the primary runway surfaces. Typically, runway shoulders are paved surfaces, as is the case at Mesa-Falcon Field Airport. The runway shoulders should be maintained on both runways.

Runway Strength

The officially published pavement strength rating for Runway 4R-22L is 38,000 pounds single wheel loading (SWL). As previously mentioned, SWL refers to the aircraft weight based upon the landing gear configuration with a single wheel on each landing strut. The strength rating for dual wheel configurations (DWL) is 60,000 pounds, and 90,000 pounds for dual tandem wheel loading (DTWL). DWL and DTWL include the design of aircraft landing gear with additional wheels on each landing gear strut which distributes more of the aircraft weight on the runway and taxiway surfaces; thus, the surface itself can support a greater total aircraft weight. Runway 4L-22R provides a strength rating of 12,500 pounds SWL.

The strength rating of a runway does not preclude aircraft weighing more than the published strength rating from using the runway. All federally obligated airports must remain open to the public, and it is typically up to the pilot of the aircraft to determine if a runway can support their aircraft safely. An airport sponsor cannot restrict an aircraft from using the runway simply because its weight exceeds the published strength rating. On the other hand, the airport sponsor has an obligation to properly maintain the runway and protect the useful life of the runway, typically for 20 years.

According to the FAA published *Airport/Facility Directory*, "Runway strength-rating is not intended as a maximum allowable weight or as an operating limitation. Many airport pavements are capable of supporting limited operations with gross weights in excess of the published figures." The directory goes on to say that those aircraft exceeding the pavement strength should contact the airport sponsor for permission to operate at the airport.

The strength rating of a runway can change over time. Regular usage by heavier aircraft can decrease the strength rating, while periodic runway resurfacing can increase the strength rating. The current strength ratings of Runway 4R-22L are adequate to serve the critical aircraft in ARC B-II as well as occasional operations by heavier aircraft. The strength rating of Runway 4L-22R is adequate to serve small general aviation aircraft weighing less than 12,500 pounds. Consideration should be given to strengthening this runway to 30,000 pounds SWL during the planning period.

Runway/Taxiway Separation

FAA AC 150/5300-13, *Airport Design*, Change 11, also discusses separation distances between aircraft and various areas on the airport. The separation distances are a function of the approaches approved for the airport and the runway's designated ARC. Under current conditions (ARC B-II, approaches not lower than three-quarters of a mile), parallel taxiways need to be at least 240 feet from the Runway 4R-22L centerline. Aircraft parking areas are required to be at least 250 feet from the runway centerline.

Currently, parallel Taxiway D located on the south side of Runway 4R-22L is located 250 feet from the runway centerline. The aircraft parking apron is located approximately 350 feet from the runway centerline. These distances exceed FAA standards.

Parallel Taxiway E is situated 200 feet (centerline to centerline) to the north of Runway 4L-22R. This exceeds the FAA standard for ARC B-I (small aircraft exclusively), but falls short of ARC B-II standards for a visual runway, which call for 240 feet. The north aircraft parking apron is approximately 270 feet from the runway centerline, which exceeds the 250-foot requirement for ARC B-II.

Runway Blast Pad

The blast pad is a surface adjacent to the ends of the runways provided to reduce the erosive effect of jet blast and propeller wash. Runway 4R-22L is equipped with 130-foot wide by 150-foot long blast pads off each end. This meets the blast pad length for ARC B-II runways with not lower than three-quarters of a mile visibility and exceeds the blast pad width for the same runway ARC. Runway 4L-22R does not currently have blast pads, but a 60-foot by 80-foot pad would meet B-I standards, and a 150-foot by 95-foot pad would meet B-II standards.

Parallel Runway Separation

The parallel runways at Mesa-Falcon Field Airport currently have a centerline separation of 700 feet. This meets the minimum standard for the existing and future critical aircraft under visual flight rules (VFR).

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 the safe operation of aircraft. These include the runway safety area (RSA), object free area (OFA), obstacle free zone (OFZ), and runway protection zone (RPZ). The dimensions of these safety areas are dependent upon the critical aircraft and, thus, the ARC of the runway.

Runway Safety Area (RSA)

The RSA is defined in FAA Advisory Circular 150/5300-13, Change 11, *Airport Design*, 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, 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 due to recent aircraft accidents. Under Order 5200.8, effective October 1, 1999, the FAA established a *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 ARC B-II runways with not lower than three-quarters of a mile approach minimums, the FAA calls for the RSA to be 150 feet wide and extend 300 feet beyond the runway ends. As depicted on **Exhibit 3E**, the airport meets the RSA design requirements for Runway 4R-22L.

Parallel Runway 4L-22R also currently meets the RSA standard for B-I and B-II aircraft. ARC B-I standards call for a runway's RSA to be 120 feet wide and extend 240 feet beyond each runway end. ARC B-II standards require RSAs to be 150 feet wide, extending 300 feet beyond the runway end. In an effort to protect safety areas to the fullest extent possible, the more constraining safety design standards (ARC B-II) should be maintained on this 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 is centered on the runway, extending out in accordance to the critical aircraft design category utilizing the runway.

For ARC B-II aircraft and approaches not lower than three-quarters of a mile, the FAA calls for the OFA to be 500 feet wide (centered on the runway), extending 300 feet beyond each runway end.

For ARC B-I (small aircraft exclusively), the OFA should be 250 feet wide, and for ARC B-II, the OFA standard is 400 feet in width. Both categories extend the OFA 240 beyond each runway end.

As depicted on **Exhibit 3E**, the airport currently meets OFA standards up to ARC B-II aircraft. Since the critical aircraft for the airport is not expected to change during the planning period, this OFA standard should remain the same.

Obstacle Free Zone (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.

The FAA's criterion for runways utilized by small airplanes (those weighing less than 12,500 pounds) with approach speeds greater than 50 knots requires a clear OFZ to extend 200 feet beyond the runway ends, by 250 feet wide (125 feet on either side of the runway centerline). For runways serving aircraft over 12,500 pounds, the OFZ width increases to 400 feet (200 feet on either side of the runway centerline).

Currently, Runway 4R-22L meets ARC B-II standards for OFZ. Runway 4L-22R meets ARC B-I standards but falls short of ARC B-II standards, as parallel Taxiway E to the north traverses the OFZ.

Runway Protection Zone (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 dimensions of the RPZ vary according to

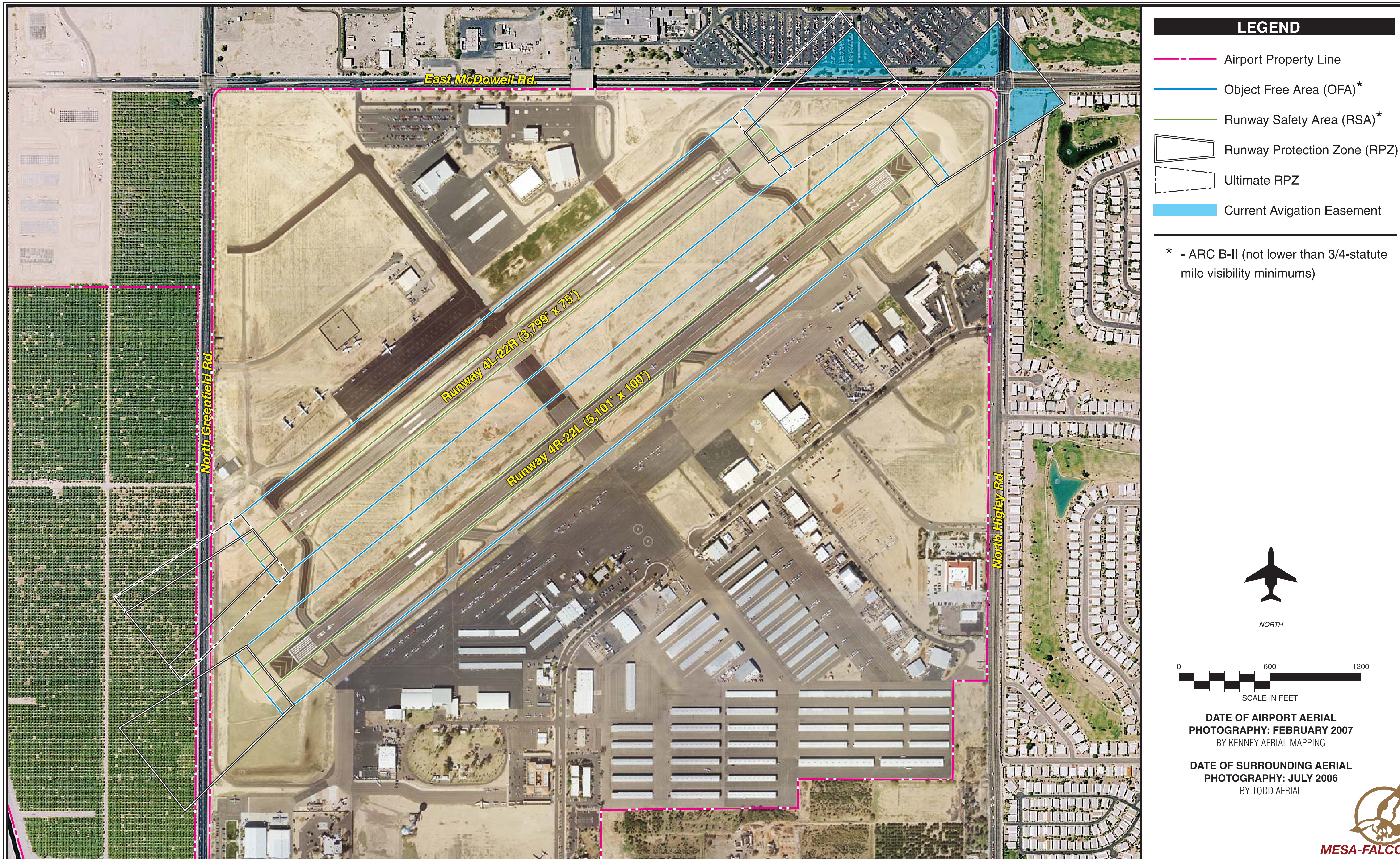


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Exhibit 3E
SAFETY AREAS

the visibility requirements serving the runway and the type of aircraft operating on the runway.

The lowest existing visibility minimum for approaches to the runways at Mesa-Falcon Field Airport is one mile. RPZ dimensions for ARC B-I (small aircraft exclusively) call for a 250-foot inner width, extending outward 1,000 feet, to a 450-foot outer width. For ARC B-II, the RPZ has an inner width 500 feet, extending outward 1,000 feet, to an outer width of 700 feet.

The RPZs located on the northeast side of the airport extend across East McDowell Road and North Higley Road into a large parking lot owned by The Boeing Company, as well as a golf course and residential area. To the southwest, the RPZs extend across North Greenfield Road and into an agricultural area currently owned by the airport.

Where possible, the airport should have positive control over the RPZ, through fee simple acquisition; however, avigation easements (acquiring control of designated airspace within the RPZ) can be pursued if fee simple acquisition is not feasible. Currently, avigation easements totaling 9.15 acres are in place for the areas within the RPZs located outside of airport property. The dimensions for RPZs, considering existing and ultimate ARCs, are detailed on **Exhibit 3E** and in **Table 3H**.

TABLE 3H
Airfield Design Standards
Mesa-Falcon Field Airport

	Runway 4R-22L		Runway 4L-22R		
Airport Reference Code (ARC)	Existing (feet)	B-II (feet)	Existing (feet)	B-I [small aircraft] (feet)	B-II (feet)
Approach Visibility Minimums	1-mile		Visual		
Runway Width	100	75	75	60	75
Runway Safety Area					
Width	150	150	150	120	150
Length Beyond Runway End	300	300	300	240	300
Object Free Area					
Width	500	500	500	250	500
Length Beyond Runway End	300	300	300	240	300
Obstacle Free Zone					
Width	400	400	350	250	400
Length Beyond Runway End	200	200	200	200	200
Runway Protection Zone					
Inner Width	500	500	250	250	500
Outer Width	700	700	450	450	700
Length	1,000	1,000	1,000	1,000	1,000
Runway Centerline to:					
Holding Position	200	200	125	125	200
Parallel Taxiway Centerline	250	240	200	150	240
Parallel Runway Centerline	700	700	700	700	700
Taxiway Width	50	35	40	25	35
Taxiway Object Free Area Width	131	131	131	89	131
Taxiway Centerline to: Fixed or Moveable Object	65.5	65.5	65.5	44.5	65.5

TAXIWAYS

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access between the aprons and runways, whereas other taxiways become necessary as activity increases at an airport to provide safe and efficient use of the airfield.

As detailed in Chapter One, Runway 4R-22L and Runway 4L-22R are each served by a full-length parallel taxiway. **Table 3H** outlines the runway to taxiway centerline separation standards. Parallel Taxiway D is 250 feet from primary Runway 4R-22L. This is adequate for the existing and future ARC B-II standards. Parallel Taxiway E is located 200 feet from Runway 4L-22R. While this satisfies ARC B-I standards for small aircraft exclusively, it falls short of the ARC B-II standard that calls for a minimum 240-foot separation.

Exit taxiways provide a means to enter and exit the runways at various points on the airfield. The type and number of exit taxiways can have a direct impact on the capacity and efficiency of the airport as a whole. Runway 4R-22L has a total of nine exit taxiways on the south side of the runway and three on the north side of the runway. Runway 4L-22R has a total of three exit taxiways on each side of the runway.

Exit taxiways are most effective when planned at least 750 feet apart. Some of the closely spaced exits are directional, angled exits, and another acts as a bypass taxiway at the end of the runway, so they serve other purposes. Potential locations for new exit taxiways that may improve capacity or efficiency will be examined in Chapter Four – Airport Alternatives.

Right-angled exits may require an aircraft to be nearly stopped before it can safely exit the runway. Angled exits allow aircraft to use a higher safe exit speed while exiting the runway. There are presently four angled exits serving Runway 4R-22L and none on Runway 4L-22R.

Dimensional standards for the taxiways are depicted on **Table 3H**. The airfield taxiways are at least 35 feet wide, with several exceeding 50 feet in width. All taxiways meet or exceed Design Group II standards and should be maintained through the planning period.

Holding aprons and bypass taxiways can also improve the efficiency of the taxiway system. Currently, holding aprons or bypass taxiways are located at all runway ends except for Runway 22L, in which the holding apron is located approximately 700 feet from the runway end. Runway 4R does have a bypass taxiway but no holding apron. Locations for additional holding aprons will be discussed further in the next chapter.

AIRFIELD LIGHTING, MARKING, AND SIGNAGE

There are a number of lighting and pavement marking aids serving pilots using the airport. These aids assist pilots in locating the airport and runway at night or in poor visibility conditions. They also assist in the ground movement of aircraft.

Runway and Taxiway Lighting

Runway identification lighting provides the pilot with a rapid and positive identification of the runway and its alignment. Runway 4R-22L and Runway 4L-22R are equipped with medium intensity runway lights (MIRL). Medium intensity taxiway lighting (MITL) is provided on all taxiways at the airport. The runway and taxiway lighting systems are vital to the airport's operations and should be maintained throughout the planning period.

Airport Identification Lighting

The location of the airport at night is universally indicated by a rotating beacon. For civil airports, a rotating beacon projects two beams of light, one white and one green, 180 degrees apart. At Mesa-Falcon Field Airport, the beacon is located on top of the airport traffic control tower (ATCT). The beacon is sufficient and should be maintained through the planning period.

Visual Approach Lighting

In most instances, the landing phase of any flight must be conducted in visual conditions. To provide pilots with visual guidance information during landings to the runway, electronic visual approach aids are commonly provided at airports. Currently, all four runway ends at Mesa-Falcon Field Airport are equipped with a two-box precision approach path indicator (PAPI-2). These units should be maintained throughout the ultimate planning period. Consideration should be given to upgrading the two-box systems on Runway 4R-22L to four-box systems. The four-box systems are better to serve the corporate aircraft currently using the airport because they are more visible for faster aircraft.

Runway End Identification Lighting

Runway end identification lights (REILs) are flashing lights located at each runway end that facilitate identification of the runway end at night or during poor visibility conditions. REILs provide pilots with the ability to identify the runway ends and distinguish the runway end lighting from other lighting on the airport and in the approach areas. The FAA indicates that REILs should be considered for all lighted runway ends not planned for a more sophisticated approach lighting system (ALS).

Currently, REILs are located on each end of Runway 4R-22L and should be maintained through the planning period. Runway 4L-22R, which has MIRL, does not have REILs. Consideration should be given to the installation of REILs on each end of this runway.

Pilot-Controlled Lighting

Mesa-Falcon Field Airport is equipped with pilot-controlled lighting (PCL) for Runway 4R-22L after the ATCT is closed. With PCL, a pilot can control airfield lights from their aircraft through a series of clicks of their radio transmitter. PCL also provides for more efficient use of energy. This system should be maintained through the planning period. PCL does not apply for Runway 4L-22R due to the fact that this runway is unavailable for use after the ATCT closes each night.

Airfield Signs

Airfield identification signs assist pilots in identifying their location on the airfield and directing them to their desired location. Lighted signs are installed on all runway and taxiway intersections serving Runway 4R-22L and Runway 4L-22R. All of these signs should be maintained throughout the planning period.

Pavement Markings

Runway markings are designed according to the type of instrument approach available on the runway. FAA AC 150/5340-1F, *Marking of Paved Areas on Airports*, provides guidance necessary to design airport markings. Runway 4R-22L has non-precision markings, and Runway 4L-22R has basic markings. These markings should be properly maintained through the planning period.

The current hold positions associated with primary Runway 4R-22L are marked 200 feet from the runway centerline. This meets the standard for ARC B-II aircraft and should be maintained throughout the planning period. The hold positions associated with parallel Runway 4L-22R are marked 125 feet from the runway centerline. This meets ARC B-I standard for small airplanes, but would need to be relocated to 200 feet from the runway centerline for the runway to meet ARC B-II standards.

Helipads

Mesa-Falcon Field Airport does have two designated helipads on the main apron area east of the ATCT. These areas should be maintained throughout the course of the planning period as they allow for segregated parking of helicopters from fixed-wing aircraft, which is desirable.

NAVIGATIONAL AIDS AND INSTRUMENT APPROACH PROCEDURES

Airport and runway navigational aids are based on FAA recommendations, as defined in DOT/FAA Handbook 7031.2B, *Airway Planning Standard Number One*, and FAA AC 150/5300-2D, *Airport Design Standards, Site Requirements for Terminal Navigation Facilities*.

Navigational Aids

Navigational aids are electronic devices that transmit radio frequencies which properly equipped aircraft and pilots translate into point-to-point guidance and position information. The very high frequency omnidirectional range (VOR), global positioning system (GPS), nondirectional beacon (NDB), and LORAN-C are available for pilots to navigate to and from Mesa-Falcon Field Airport. These systems are sufficient for navigation to and from the airport; therefore, no other navigational aids are needed at the airport.

Instrument Approach Procedures

Instrument approach procedures (IAPs) are a series of predetermined maneuvers established by the FAA using electronic navigational aids that assist pilots in locating and landing at an airport during low visibility and cloud ceiling conditions. At Mesa-Falcon Field Airport, there is a straight-in GPS approach to Runway 4R and a circling NDB or GPS-A approach to the airport. This approach allows aircraft to land at the airport when visibility is as low as one mile and cloud ceilings are as low as 419 feet above ground level (AGL) for aircraft with approach speeds less than 120 knots. For higher approach speeds, the visibility minimums increase to as much as 1.5 miles.

A GPS modernization effort is underway by the FAA and focuses on augmenting the GPS signal to satisfy requirements for accuracy, coverage, availability, and integrity. For civil aviation use, this includes the continued development of the Wide Area Augmentation System (WAAS), which was initially launched in 2003. The WAAS uses a system of reference stations to correct signals from the GPS satellites for improved navigation and approach capabilities. Where the non-WAAS GPS signal provides for enroute navigation and limited instrument approach (lateral navigation) capabilities, WAAS provides for approaches with both course and vertical navigation. This capability was historically only provided by an instrument landing system (ILS), which requires extensive on-airport facilities. After 2015, the WAAS upgrades are expected to allow for the development of approaches to most airports with cloud ceilings as low as 200 feet above the ground and visibilities restricted to one-half mile.

Weather conditions at Mesa-Falcon Field Airport are very rarely below approach minimums to prevent an aircraft from landing. The GPS-WAAS would allow for lower approach minimums at the airport, and could be an option in the future for improved approach procedures. It should be noted, however, that any approach providing less than one mile visibility minimums will require the installation of an approach lighting system.

Weather Reporting Aids

Mesa-Falcon Field Airport has a lighted wind cone and segmented circle as well as two supplemental lighted wind cones. The lighted wind cones provide information to pilots regarding wind conditions, such as direction and speed. The segmented circle consists of a system of visual indicators designed to provide traffic pattern information to pilots. A wind cone and segmented circle are required since the ATCT is not open 24 hours per day. These should be maintained throughout the planning period.

The airport also has an on-site weather observer. The limited aviation weather reporting station (LAWRS) has personnel who report cloud height, weather, obstructions to visibility, temperature, dew point, surface wind, and altimeter settings.

Two types of automated weather observing systems are currently deployed at airports around the country. Automated Surface Observing System (ASOS) and Automated Weather Observing System (AWOS) both measure and process surface weather observations 24 hours per day, with reporting varying from one minute to hourly. These systems provide near real-time measurements of atmospheric conditions.

ASOS systems are typically commissioned by the National Weather Service. AWOS systems are often commissioned by the Federal Aviation Administration for airports that meet criteria of either 8,250 annual itinerant operations or 75,500 local operations. Mesa-Falcon Field Airport meets both these criteria. Future consideration should be given to the installation of an AWOS at Mesa-Falcon Field Airport in order to provide current weather conditions at the airport during times when the ATCT is closed.

Air Traffic Control

As previously mentioned, Mesa-Falcon Field Airport has an operational airport traffic control tower that is attended from 6:00 a.m. through 9:00 p.m. local time daily. The control tower is owned and operated by the FAA and provides several control services, including approach and departure clearances, automated terminal information services (ATIS), and ground control.

It is estimated that approximately three percent of the airport's total ATCT counted operations occur during the hours when the tower is closed. As traffic continues to grow, the ATCT hours of operation may need to be extended.

LANDSIDE REQUIREMENTS

Landside facilities are those necessary for the handling of aircraft and passengers while on the ground. These facilities provide the essential interface between the air and ground transportation modes. The capacity of the various components of each area was examined in relation to projected demand to identify future landside facility needs. This includes components for general aviation needs such as:

- Aircraft Hangars
- Aircraft Parking Aprons
- General Aviation Terminal
- Auto Parking and Access
- Airport Support Facilities

HANGARS

The demand for aircraft storage hangars typically depends upon the number and type of aircraft expected to be based at the airport. For planning purposes, it is necessary to estimate hangar requirements based upon forecast operational activity. However, hangar development should be based on actual demand trends and financial investment opportunities.

Before an analysis of aircraft storage hangar requirements is given, it should be noted that a certain number of aircraft were taken out of the total current and forecast based aircraft numbers to account for MD Helicopters and The Boeing Company. This is due to the fact that these two companies use their private hangar storage space for aircraft directly related to their overall operation on the airport. From based aircraft numbers provided by airport management, a determination was made that approximately 40 aircraft (helicopters) are specific to MD Helicopters and The Boeing Company and, therefore, were not included in the current and forecast based aircraft numbers used to determine hangar storage needs.

Hangar facilities at Mesa-Falcon Field Airport consist of conventional hangars, executive hangars, T-hangars, and shade hangars. These different types of hangars offer varying levels of privacy, security, and protection from the elements. Demand for hangars also varies with the number of aircraft based at the airport. Another important factor is the type of based aircraft. Smaller single engine aircraft usually prefer shade or T-hangars, while larger multi-engine aircraft and business jets will prefer conventional or executive hangars. Rental costs will also be a factor in the choice.

While a majority of aircraft owners prefer enclosed aircraft storage, a number of based aircraft will still tie-down outside (due to the lack of hangar availability, hangar rental rates, and/or operational needs). Therefore, enclosed hangar facilities do not necessarily need to be planned for each based aircraft. At Mesa-Falcon Field Airport, the majority of based aircraft are currently stored in hangars (73 percent). According to staff interviews, there are approximately 230 aircraft which utilize the tie-down spaces available on the airport.

Airport staff maintains a waiting list of aircraft owners desiring to store their aircraft in a City-owned shade hangar and T-hangar storage space. This list is comprised of approximately 400 aircraft owners, with 292 waiting for a T-hangar and 104 waiting for a shade hangar. Aircraft owners desiring to be placed on the waiting list must pay a deposit equal to one month's rent on the particular hangar type they desire. It is assumed that several aircraft that are currently located in tiedown positions on the airport would move into a hangar facility as they become available. Conversion of the waiting list to signed hangar leases was taken into consideration when developing hangar storage requirements.

Presently, all of the T-hangar and shade hangar positions on the airfield are occupied and there is a waiting list for units. The airport has 49 T-hangar and shade hangar storage facilities, providing a total of 518 storage units. T-hangar and shade hangar space available at the airport totals approximately 681,000 square feet for aircraft storage. Analysis of future T-hangar and shade hangar requirements, as depicted on **Table 3J**, indicates additional T-hangar and/or shade hangar positions which will be needed through the long range planning horizon.

TABLE 3J
Aircraft Storage Hangar Requirements
Mesa-Falcon Field Airport

		Future Requirements		
	Currently Available	Short Term (0-5 years)	Intermediate Term (6-10 years)	Long Term (11-20 years)
Total Based	852	1,110	1,260	1,460
Aircraft To Be Hangared	625	833	964	1,190
T-Hangar/Shade Hangar Positions	518	600	660	823
Executive Hangar Positions	20	85	120	160
Conventional Hangar Positions	87	148	184	207
Hangar Area Requirements				
T-Hangar/Shade Hangar Area	681,000	720,000	792,000	987,600
Executive Hangar Area	63,000	170,000	240,000	320,000
Conventional Hangar Area	250,000	370,000	460,000	517,500
Maintenance/Office Area	78,000	145,700	168,700	208,250
Total Hangar Area (s.f.)	**1,072,000**	**1,406,000**	**1,661,000**	**2,033,000**

Source: Coffman Associates analysis

Executive hangar space makes up a much smaller portion of hangar space at the airport. These hangars are typically utilized by owners of larger aircraft or multiple aircraft. Often a corporate flight department will operate out of an executive hangar as well. Executive hangar space at Mesa-Falcon Field Airport currently totals approximately 63,000 square feet. Future requirements show a large demand for executive hangar space.

Conventional hangars are typically 10,000 square feet or larger and utilized for bulk aircraft storage and by airport businesses such as fixed base operators (FBOs), maintenance providers, and flight schools. At Mesa-Falcon Field Airport, conventional hangars provide approximately 250,000 square feet of aircraft storage space.

Table 3J compares existing hangar space to the future hangar requirements. It is evident from the table there is a need for additional hangar space throughout the planning period. As previously mentioned in Chapter

One, Mesa-Falcon Field Airport has approximately 400,000 square feet of hangar space, mainly in the form of executive and conventional hangars, proposed to be developed over the next several years by the private sector. The analysis also indicates a potential need for additional maintenance and office area space through the planning period. It is expected that the aircraft storage hangar requirements will continue to be met through a combination of hangar types through the 20-year planning horizon.

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 Mesa-Falcon Field Airport, the number of itinerant spaces required was determined to be approximately 15 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 (which can be much larger), a planning criterion of 1,600 square yards per aircraft position was used. Locally based tiedowns typically will be utilized by smaller single engine aircraft; thus, a planning standard of 650 square yards per position is utilized.

A parking apron should provide space for the number of locally based aircraft that are not stored in hangars, transient aircraft, and for maintenance activity. For local tie-down needs, an additional 40 spaces are identified for maintenance activity. Maintenance activity would include the movement of aircraft into and out of hangar facilities and temporary storage of aircraft on the ramp.

Total apron parking requirements are presented in **Table 3K**. Currently, there are 68 transient positions available for single and multi-engine aircraft on the airport. This includes City tiedowns and tiedowns associated with FBO leases. A total of approximately ten business jet positions are available. Finally, there are 358 positions available for locally based aircraft.

As shown in the table, there may be a need for additional transient parking for single and multi-engine aircraft, as well as business jet aircraft, in the future. It appears that there is adequate locally based aircraft parking through the planning period. By the long term planning period, there may be a decreased need for locally based aircraft apron positions due to the projected hangar storage opportunities on the airport.

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 FBOs for these functions and services.

TABLE 3K
Aircraft Parking Apron Requirements
Mesa-Falcon Field Airport

	Currently Available	Short Term (0-5 years)	Intermediate Term (6-10 years)	Long Term (11-20 years)
Single, Multi-Engine Transient Aircraft Positions	68	92	101	123
Apron Area (s.y.)	31,000	73,400	80,500	98,700
Transient Business Jet Positions	10	13	16	20
Apron Area (s.y.)	15,000	20,800	25,600	32,000
Locally Based Aircraft Positions	358	318	330	303
Apron Area (s.y.)	176,500	206,400	214,400	196,800
Total Positions	**436**	**424**	**451**	**442**
Total Apron Area (s.y.)	**222,500**	**302,300**	**324,100**	**324,500**

The methodology used in estimating general aviation terminal building space needs is based on the number of itinerant 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 per aircraft (from 1.8 to 2.0) is used to account for the likely increase in the number of passengers utilizing general aviation services. **Table 3L** outlines the general aviation terminal facility space requirements for Mesa-Falcon Field Airport.

As presented in the table, the existing public space will need to be addressed in the short term of the plan. By the long term, approximately 19,200 square feet of space could be needed. As mentioned earlier, the desired space can be made up of a combination of facilities at the airport. The 6,000 square feet of current available building space listed in **Table 3L** accounts for the approximate amount of space dedicated to general aviation use within the terminal building, Tango One Aviation, and Falcon Executive Aviation.

An additional consideration for terminal space is the emergence of a new class of aircraft. As mentioned in a previous chapter, a number of aircraft manufacturers are beginning to produce low cost microjets, commonly referred to as 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 by taking advantage of the nationwide network of general aviation airports such as Mesa-Falcon Field Airport. General aviation airports with appropriate terminal building services are better positioned to meet the needs of this new class of business traveler.

TABLE 3L General Aviation Terminal Area Facilities Mesa-Falcon Field Airport	Currently Available	Short Term (0-5 years)	Intermediate Term (6-10 years)	Long Term (11-20 years)
Design Hour Operations	133	150	155	166
Design Hour Itinerant Operations	51	72	75	80
Multiplier	1.8	1.9	1.9	2.0
Total Design Hour Itinerant Passengers	92	137	143	160
General Aviation Building Spaces (s.f.)*	6,000	16,400	17,100	19,200

*Includes space provided by the terminal building, Tango One Aviation, and Falcon Executive Aviation.

AUTOMOBILE PARKING

General aviation vehicular parking demands have been determined for Mesa-Falcon Field Airport. Space determinations were based on an evaluation of the existing airport use, as well as industry standards. Terminal automobile parking spaces required to meet general aviation itinerant demands were calculated by taking the design hour itinerant passengers and using a multiplier of 1.9, 1.9, and 2.0 for each planning period. This multiplier represents the anticipated gradual increase in the number of passengers per aircraft utilizing general aviation services. Currently, the terminal building has approximately 61 parking spaces. Tango One Aviation and Falcon Executive Aviation could also be considered as a high volume of pilots and passengers utilize their FBO facilities. When taking these facilities into account, approximately 80 additional vehicle parking spaces with 35,000 square feet of parking area are available. In total, approximately 60,000 square feet of parking area providing 141 vehicle spaces is provided.

The parking requirements of based aircraft owners should also be 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 one-half of based aircraft at the airport, were applied to general aviation automobile parking space requirements. Most of the general aviation parking is located in areas adjacent to Falcon Drive and Fighter Aces Drive in the south area of the airport. Additional parking is located at MD Helicopters on the north side of the airport.

Non-aviation related parking spaces at the airport total approximately 500 and includes the post office, commercial office complexes, and restaurants. This figure, as well as future requirements for non-aviation related parking, was not considered in this analysis. Current and future total parking spaces and total parking area take into account aviation-related needs only. Parking requirements for the airport are summarized in **Table 3M**.

TABLE 3M
Vehicle Parking Requirements
Mesa-Falcon Field Airport

		Future Requirements		
	Currently Available	Short Term (0-5 years)	Intermediate Term (6-10 years)	Long Term (11-20 years)
Design Hour Itinerant Passengers	92	137	143	160
Terminal Vehicle Spaces*	141	247	257	288
Parking Area (s.f.)*	60,000	98,600	103,000	115,200
General Aviation Vehicle Spaces	1,056	555	630	730
Parking Area (s.f.)	260,000	222,000	252,000	292,000
Total Parking Spaces	**1,197**	**802**	**887**	**1,018**
Total Parking Area (s.f.)	**320,000**	**320,600**	**355,000**	**407,200**

* Indicates space provided by the terminal building, Tango One Aviation, and Falcon Executive Aviation.

Throughout the planning period, dedicated parking spaces for general aviation uses will not be needed as the airport provides more than forecast need; however, there does appear to be a need for additional parking area. This may be due to the fact that some facilities do not have enough parking spaces, while others are oversized for their particular needs. Additional terminal vehicle spaces and parking area will also be needed during the planning period.

SUPPORT REQUIREMENTS

Various facilities that do not logically fall within the classifications of airside or landside facilities have also been identified. These other areas provide certain functions related to the overall operation of the airport.

FUEL STORAGE

There are four fuel farms located on the airport that currently store fuel for aviation use. Tango One Aviation and Falcon Executive Aviation, the two major FBOs at the airport, each own and operate their own fuel storage facility.

Tango One Aviation has one 12,000-gallon capacity Avgas storage tank and one 10,000-gallon capacity Jet A storage tank. Both tanks are underground. They use four fuel trucks to deliver fuel to aircraft that include two 1,500-gallon capacity Avgas trucks, one 2,000-gallon capacity Jet A truck, and one 3,000-gallon capacity Jet A truck.

Falcon Executive Aviation has three underground fuel storage tanks consisting of two 10,000-gallon capacity

Avgas tanks and one 12,000-gallon capacity Jet A tank. They use six fuel trucks for delivery of fuel that include three Avgas fuel trucks that store 750, 1,000, and 2,000 gallons of fuel, and three Jet A fuel trucks that store 450, 2,200, and 3,000 gallons of fuel. Falcon Executive Aviation also provides self-service Avgas fuel capability. By using a credit card, one can access Avgas fuel at their convenience.

The City of Mesa's Police Aviation Division has a 12,000-gallon capacity Jet A fuel storage tank that is located underground and dedicated specifically to refueling the Police Division's helicopters. The Commemorative Air Force Museum has a 10,000-gallon capacity Avgas fuel storage tank that is located aboveground. This fuel is used specifically for aircraft associated with the Commemorative Air Force. Heliponents has installed a 20,000-gallon capacity underground fuel storage tank that will be used exclusively for Jet A fuel.

Fuel storage requirements are typically based upon maintaining a two-week supply of fuel during an average month. However, more frequent deliveries can reduce the fuel storage capacity requirement. Generally, fuel tanks should be of adequate capacity to accept a full refueling tanker, which is approximately 8,000 gallons, while maintaining a reasonable level of fuel in the storage tank. Maintaining storage to meet a two-week supply for each is currently available.

Future Avgas and Jet A fuel storage requirements for the airport, based upon a two-week supply during the peak month, will likely exceed the existing total storage capacities. One option to address this potential storage issue is to increase the frequency of fuel deliveries. By the long term planning period, it is suggested that additional fuel storage facilities be constructed.

AIRCRAFT RESCUE AND FIREFIGHTING (ARFF)

Mesa-Falcon Field Airport is currently served by an aircraft rescue and firefighting facility (ARFF). The City of Mesa's Fire Station #208, located in the southwest area of the airport adjacent to East McKellips Road, is designed to provide emergency and rescue services to the airport and the surrounding area. There are six personnel present at Fire Station #208 24 hours per day, seven days per week. One 500-gallon capacity fire engine, one 1,500-gallon ARFF certified foam truck, and one utility truck capable of carrying equipment specific to aircraft emergencies are stationed at the facility. Personnel go through annual training in order for the station to maintain its ARFF certification.

It is not necessary that ARFF services be located at the airport, although it serves as an added safety enhancement with personnel and equipment located on the airport. Only certified airports providing scheduled passenger service with greater than nine passenger seats are required to provide ARFF services. Many corporate flight departments, however, are requesting ARFF services at the airports they utilize. It is recommended that

Mesa-Falcon Field Airport be able to continue providing ARFF services in the future as forecasts indicate an increasing amount of business jets utilizing the airport.

WASH RACK

The airport has an aircraft wash rack, and it should be maintained through the planning period.

PERIMETER FENCING/GATES

A large portion of the airport is currently surrounded by eight-foot tall chain link security fencing. The airport is currently engaged in the process of designing and constructing remaining portions of perimeter fencing that will totally enclose airfield sensitive areas and aircraft movement areas. The project is expected to be complete within the next six months.

The airport is also updating its vehicle gate system to include approximately eight to ten electric powered-use access gates operated by the City and approximately 20 additional manual access gates to be located in various locations on the airport to provide enhanced security of the airfield.

AIRPORT MAINTENANCE BUILDING

The airport maintenance building is located in the southeast area of the airport adjacent to North Higley Road. This facility provides approximately 7,500 square feet for the storage of airport maintenance equipment. This facility should be maintained through the long term planning period.

SURFACE TRANSPORTATION ACCESS

Primary access to the majority of businesses located on the airport is provided via Falcon Drive. Falcon Drive connects to East McKellips Road south of the airport and North Higley Road east of the airport. Recent safety improvements at the airport included dividing Falcon Drive in the area adjacent to the terminal building and airport traffic control tower in an effort to minimize the amount of vehicle traffic crossing the active taxiway leading to hangar development farther south. In doing so, a cul-de-sac was built on each side to allow for smoother transition of vehicle movements. To the north of the airport, MD Helicopters can be accessed by East McDowell Road. Any future development should include appropriate road construction to provide appropriate access.

SUMMARY

The intent of this chapter has been to outline the facilities required to meet potential aviation demands projected for Mesa-Falcon Field Airport for the planning horizon. A summary of the airside and landside requirements is presented on **Exhibits 3F** and **3G**.

Following the facility requirements determination, the next step is to determine a direction of development which best meets these projected

06MP17-3F-7/20/07

RUNWAYS

AVAILABLE	SHORT TERM	LONG TERM
Runway 4R-22L 5,101' x 100' 38,000 SWL/60,000 DWL 90,000 DTWL 1-mile visibility (4R) ARC B-II **Runway 4L-22R** 3,799' x 75' 12,500 SWL Visual Approach ARC B-I (small aircraft exclusively)	**Runway 4R-22L** 5,101' x 100' 38,000 SWL/60,000 DWL 90,000 DTWL 1-mile visibility (4R) ARC B-II **Runway 4L-22R** 3,799' x 75' 12,500 SWL Visual Approach ARC B-I (small aircraft exclusively)	**Runway 4R-22L** 5,101' x 100' 38,000 SWL/60,000 DWL 90,000 DTWL 1-mile visibility (4R) ARC B-II **Runway 4L-22R** 3,799' x 75' ***30,000 SWL*** Visual Approach ***ARC B-II***

TAXIWAYS

AVAILABLE	SHORT TERM	LONG TERM
Runway 4R-22L Full parallel Taxiway D 250' separation 9 exits south/ 3 exits north All taxiways 35'-150' wide Hold apron Runway 22L **Runway 4L-22R** Full parallel Taxiway E 200' separation 3 exits south/3 exits north All taxiways 35'-150' wide Hold aprons at each end	**Runway 4R-22L** Full parallel Taxiway D 250' separation 9 exits south/ 3 exits north All taxiways 35'-150' wide ***Additional hold aprons*** **Runway 4L-22R** Full parallel Taxiway E 200' separation ***2 additional exits north*** ***Additional taxiways 35' wide*** Hold aprons at each end	**Runway 4R-22L** Full parallel Taxiway D 250' separation 9 exits south/ 3 exits north All taxiways 35'-150' wide ***Additional hold aprons*** **Runway 4L-22R** Full parallel Taxiway E ***Taxiway E to 240' separation*** ***2 additional exits north*** ***Additional taxiways 35' wide*** Hold aprons at each end

NAVIGATIONAL AIDS

AVAILABLE	SHORT TERM	LONG TERM
ATCT (6:00 am - 9:00 pm) LAWRS GPS, NDB, VOR **Runway 4R-22L** GPS Approach **Runway 4L-22R** Visual Approach	ATCT (6:00 am - 9:00 pm) ***ASOS or AWOS*** GPS, NDB, VOR **Runway 4R-22L** GPS Approach **Runway 4L-22R** Visual Approach	***ATCT (5:00 am - 11:00 pm)*** ***ASOS or AWOS*** GPS, NDB, VOR **Runway 4R-22L** GPS Approach **Runway 4L-22R** Visual Approach

LIGHTING AND MARKING

AVAILABLE	SHORT TERM	LONG TERM
Airport Beacon Segmented Circle/Windcones (3) MITL Helipads (2) **Runway 4R-22L** MIRL/PAPI-2/REILs/PCL Hold Positions - 200' Non-precision Marking **Runway 4L-22R** MIRL/PAPI-2 Hold Positions - 125' Basic Markings	Airport Beacon Segmented Circle/Windcones (3) MITL Helipads (2) **Runway 4R-22L** MIRL/***PAPI-4***/REILs/PCL Hold Positions - 200' Non-precision Marking **Runway 4L-22R** MIRL/PAPI-2/***add REILs*** Hold Positions - 125' Basic Markings	Airport Beacon Segmented Circle/Windcones (3) MITL Helipads (2) **Runway 4R-22L** MIRL/***PAPI-4***/REILs/PCL Hold Positions - 200' Non-precision Marking **Runway 4L-22R** MIRL/PAPI-2/***add REILs*** ***Hold Positions - 200'*** Basic Markings

KEY

ATCT - Airport Traffic Control Tower
ASOS - Automated Surface Observing System
AWOS - Automated Weather Observing System
DTWL - Dual Tandem Wheel Loading
DWL - Dual Wheel Loading
LAWRS - Limited Aviation Weather Reporting Station
MIRL - Medium Intensity Runway Lighting
MITL - Medium Intensity Taxiway Lighting
PAPI - Precision Approach Path Indicator
PCL - Pilot Controlled Lighting
REILs - Runway End Identifier Lights
SWL - Single Wheel Loading

Bold Red print indicates recommended / required changes

Exhibit 3F
AIRFIELD FACILITY REQUIREMENTS

06MP17-3G-1/21/09

AIRCRAFT STORAGE HANGARS

	Currently Available	Future Requirements: Short Term	Future Requirements: Intermediate Term	Future Requirements: Long Term
Aircraft to be Hangared	625	833	964	1,190
T-Hangar/Shade Hangar Positions	518	600	660	823
Executive Hangar Positions	20	85	120	160
Conventional Hangar Positions	87	148	184	207
T-Hangar/Shade Hangar Area (s.f.)	681,000	720,000	792,000	987,600
Executive Hangar Area (s.f.)	63,000	170,000	240,000	320,000
Conventional Hangar Area (s.f.)	250,000	370,000	460,000	517,500
Maintenance/Office Area (s.f.)	78,000	145,700	168,700	208,250
Total Hangar Area (s.f.)	**1,072,000**	**1,406,000**	**1,661,000**	**2,033,000**

AIRCRAFT PARKING APRON AREA

	Available	Short Term	Intermediate	Long Term
Single, Multi-Engine Transient Aircraft Positions	68	92	101	123
Apron Area (s.y.)	31,000	73,400	80,500	98,700
Transient Business Jet Positions	10	13	16	20
Apron Area (s.y.)	15,000	20,800	25,600	32,000
Locally-Based Aircraft Positions	358	318	330	303
Apron Area (s.y.)	176,500	206,400	214,400	196,800
Total Positions	**436**	**424**	**451**	**442**
Total Apron Area (s.y.)	**222,500**	**302,300**	**324,100**	**324,500**

GENERAL AVIATION TERMINAL AREA AND VEHICLE PARKING

	Available	Short Term	Intermediate	Long Term
General Aviation Building Spaces (s.f.)*	6,000	16,400	17,100	19,200
Terminal Vehicle Spaces*	141	247	257	288
General Aviation Vehicle Spaces	1,056	555	630	730
Total Parking Spaces	1,197	802	887	1,018
Total Parking Area (s.f.)	320,000	320,600	355,000	407,200

* Indicates space provided by the terminal building, Tango One Aviation, and Falcon Executive Aviation.

Red indicates demand needed

MESA-FALCON FIELD AIRPORT

Exhibit 3G

LANDSIDE FACILITY REQUIREMENTS

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.

MESA-FALCON FIELD AIRPORT

Chapter Four

AIRPORT DEVELOPMENT ALTERNATIVES

Airport Development Alternatives

Prior to defining the recommended development program for Mesa-Falcon Field Airport, it is important to first consider development potential as well as constraints to future development at the airport. The purpose of this chapter is to evaluate the ability to provide facilities which are needed to accommodate projected demand and meet the program requirements as defined in Chapter Three - Airport Facility Requirements. In some cases, development needs are straight-forward, while for other items, alternatives to meeting demand should be considered.

In this chapter, airport development alternatives are considered for the airport, where applicable. The ultimate goal is to develop the underlying rationale which supports the final recommended Master Plan development concept. Through this process, an evaluation of the most realistic and best uses of airport property is made while considering local development goals, physical and environmental constraints, and appropriate federal airport design standards.

Any development proposed by a Master Plan evolves from an analysis of projected needs. Though the needs were determined by the best methodology available, it cannot be assumed that future events will not change these needs.

The development alternatives for Mesa-Falcon Field Airport can be categorized into two functional areas: airside (runways, taxiways, navigational aids, etc.) and landside (general aviation hangars, aprons, terminal area, etc.)

Within each of these areas, specific facilities are required or desired. In addition, the utilization of the remaining airport property to provide revenue support for the airport and to benefit the economic development and well-being of the regional area must be considered.

Each functional area interrelates and affects the development potential of the others. Therefore, all areas must be examined individually, and then coordinated as a whole to ensure the final plan is functional, efficient, and cost-effective. The total impact of all these factors on the existing airport must be evaluated to determine if the investment in Mesa-Falcon Field Airport will meet the needs of the community, both during and beyond the planning period.

The alternatives presented in this chapter have been developed to meet the overall program objectives for the airport in a balanced manner. Through coordination with the Planning Advisory Committee (PAC), the City of Mesa, and the general public, the alternatives (or combination thereof) will be refined and modified as necessary to develop the recommended development concept. Therefore, the alternatives presented in this chapter can be considered a beginning point in the development of the recommended concept for the future development of Mesa-Falcon Field Airport.

NO-BUILD ALTERNATIVE

In analyzing and comparing the advantages and disadvantages of various development alternatives, it is important to consider the consequences of no future development at Mesa-Falcon Field Airport. The "no-build" or "do nothing" alternative essentially considers keeping the airport in its present condition and not providing for any type of expansion or improvement to the existing facilities (other than general airfield and City-owned hangar and terminal building maintenance projects). The primary result of this alternative, as with any growing air transportation market, would be the eventual inability of the airport to satisfy the increasing demands of the airport service area.

The growth of activity at Mesa-Falcon Field Airport can largely be attributed to the growing economy and population of the City of Mesa and Phoenix metropolitan area and growth within the general aviation industry as a whole. The general aviation industry has experienced extended periods of decline and growth over the last 20 years. However, general aviation is now seen as a growth industry once more. While overall, general aviation growth will be steady but slow nationally, the demand for higher performance aircraft is experiencing the strongest rate of growth. With heightened interest in commercial aviation security, corporate general aviation could expect demand for private aircraft to grow even more. This is expected to be spurred by the introduction of the new very light jet (VLJ), also known as the microjet, and expectations for true air taxi service at general aviation airports. As mentioned in previous chapters, Mesa-Falcon Field Airport is well positioned to attract operations by VLJs with adequate runway length and forecasted growth in business opportunities in the airport service area.

The analysis of facility needs indicated a future need for improved facilities at Mesa-Falcon Field Airport. Improvements recommended in the previous chapter include increasing pavement weight bearing strength to Runway 4L-22R, improvements to the taxiway system to include additional taxiways, construction of additional hangar facilities, improved navigational aids, improved lighting and marking aids, and additional aircraft parking apron area. Without these improvements, regular users of the airport will be constrained from taking maximum advantage of the airport's air transportation capabilities.

Continual air traffic growth and changes in the mix of aircraft operating at the airport are placing increased demands on the airfield and changes in aircraft storage, apron, and taxiway needs. The increased use of Mesa-Falcon Field Airport is projected to cause the airport to begin to reach its annual service volume (ASV), which could result in increasing levels of delay to aircraft operators.

The unavoidable consequence of the no-build alternative would involve the airport's inability to attract potential airport users. An airport's facilities are often the first impression many officials will have of the community. If the airport does not have the capability to meet the hangar, apron, or airfield needs of potential users, the City's capability to attract the major sector businesses that rely on air transportation could be diminished. Following the no-build alternative would also not support the private businesses that have made investments at Mesa-Falcon Field Airport. As these businesses grow, the airport will need to be able to accommodate the infrastructure needs associated with their growth. Each of the businesses on the airport provides jobs for local residents, create positive economic benefits for the community, and pay taxes for local government operations.

By owning and operating Mesa-Falcon Field Airport, the City of Mesa is charged with the responsibility of developing aviation facilities necessary to accommodate aviation demand and minimize operational constraints. Flexibility must be programmed into airport development to assure adequate capacity should market conditions change unexpectedly. Mesa-Falcon Field Airport is part of a system of public airports that serve the aviation needs of the region. The airport is a reliever to Phoenix Sky Harbor International Airport. As such, the airport has a responsibility to provide adequate facilities to support the full range of general aviation activity so as to reduce congestion and relieve capacity constraints at Phoenix Sky Harbor International Airport.

To propose no further development at Mesa-Falcon Field Airport could adversely affect the long term viability of the airport, resulting in negative economic effects on the City of Mesa and the region as a whole. The no-build alternative is also inconsistent with the long term goals of the Arizona Department of Transportation (ADOT) – Aeronautics Division and the Federal Aviation Administration (FAA), which are to enhance local and interstate commerce. Therefore, this alternative is not considered to be prudent or feasible and will no longer be considered in this study.

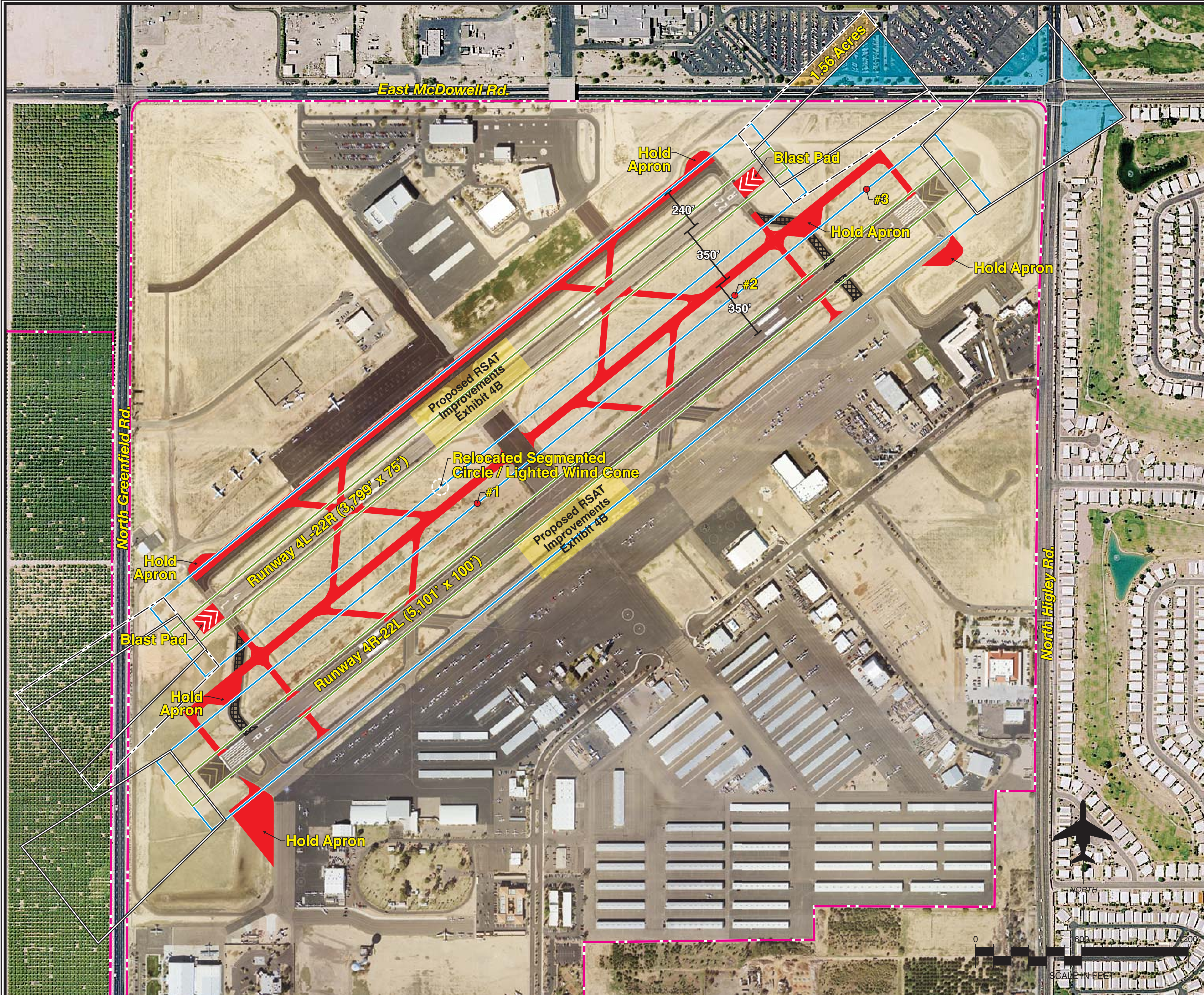
AIRSIDE DEVELOPMENT CONSIDERATIONS

The purpose of this section is to identify and evaluate the various viable airside development considerations at Mesa-Falcon Field Airport to meet the program requirements set forth in Chapter Three. Airfield facilities are, by nature, the focal point of an 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 airport development alternatives. In particular, the runway and taxiway system requires the greatest commitment of land area to meet the physical layout of the system as well as the required FAA safety standards. Moreover, the design of the airfield system defines minimum building set-back distances from the runway and object clearance standards. These criteria should be defined first in order to ensure that the fundamental needs of the airport are met. Therefore, airside requirements will be considered prior to detailing land use development alternatives.

The issues to be considered in this analysis are summarized on **Exhibit 4A**. These issues are the result of the findings of the aviation demand forecasts and airport facility requirements evaluations, and they include input from the PAC, Airport staff, and general public.

AIRFIELD CAPACITY

The need to increase airfield capacity was a primary finding of the airport facility requirements analysis. FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems* (NPIAS), indicates that improvements for airfield capacity should be considered once annual operations reach 60 to 75 percent of the ASV. For Mesa-Falcon Field Airport, the ASV of the parallel runway system is estimated at 472,000 annual operations. The ASV is expected to increase to 516,000 annual operations over the 20-year planning period, as peak operational activity becomes more spread out with increased operations. Previous analysis determined that Mesa-Falcon Field Airport is currently operating at approximately 68 percent of its ASV, and is expected to reach 79 percent of annual service volume during the short term planning horizon. Forecasted long term operations would approach 90 percent of the airport's ASV.



LEGEND

- Airport Property Line
- Object Free Area (OFA)*
- Runway Safety Area (RSA)*
- Runway Protection Zone (RPZ)
- Ultimate RPZ
- Current Avigation Easement
- Future Avigation Easement
- Future Airfield Pavement
- Pavement to be Removed
- Potential AWOS Site

* - ARC B-II (not lower than 3/4-statute mile visibility minimums)

AIRSIDE CONSIDERATIONS

- Improve airfield capacity by constructing additional taxiway exits to the parallel runway system.
- The upgrade of Runway 4L-22R to Airport Reference Code (ARC) B-II design standards.
- Increase the pavement strength on Runway 4L-22R to 30,000 pounds single wheel loading (SWL).
- Construct blast pads on each end of Runway 4L-22R.
- The installation of runway end identification lights (REILs) on Runway 4L-22R.
- The upgrade to a four-box precision approach path indicator (PAPI-4) on Runway 4R-22L.
- Additional hold aprons on Runway 4R-22L to reduce departure delays and provide for smoother transition for taxiing aircraft.
- Relocate aircraft hold position markings on Runway 4L-22R.
- Construct a midfield parallel taxiway serving Runways 4R-22L and 4L-22R.
- Relocate parallel Taxiway E further north to conform to future ARC B-II safety design standards associated with Runway 4R-22L.
- Acquire land north of the airport through avigation easement to protect the ultimate runway protection zone (RPZ) on Runway 22R.
- The installation of an Automated Weather Observation System (AWOS) or Automated Surface Observation System (ASOS).
- The reconfiguration of Taxiway B north of Runway 4L-22R and south of Runway 4R-22L per Runway Safety Area Team (RSAT) recommendations.

DATE OF AIRPORT AERIAL PHOTOGRAPHY: FEBRUARY 2007
BY KENNEY AERIAL MAPPING

DATE OF SURROUNDING AERIAL PHOTOGRAPHY: JULY 2006
BY TODD AERIAL

Exhibit 4A
AIRSIDE CONSIDERATIONS

Topographical features and surrounding development limit the feasibility of any runway extension or construction of a third runway at Mesa-Falcon Field Airport. As a result, the capacity analysis concluded that additional taxiway exits are the best method available for improving capacity and reducing delays. The proposed taxiways are depicted in the airfield alternative to follow. They include additional high-speed (angled) taxiway exits on Runway 4R-22L and on Runway 4L-22R. Adding these taxiways would improve airfield capacity, especially during peak hour periods.

AIRPORT REFERENCE CODE (ARC) DESIGNATION

The design of airfield facilities is based, in part, on the physical and operational characteristics of aircraft using the airport. The FAA utilizes the Airport Reference Code (ARC) system to relate airport design requirements to the physical (wingspan and tail height) and operational (approach speed) characteristics of the largest and fastest aircraft conducting 500 or more operations annually at the airport. While this can at times be represented by one specific make and model of aircraft, most often the airport's ARC is represented by several different aircraft which collectively conduct more than 500 annual operations at the airport.

The FAA uses the 500 annual operations threshold when evaluating the need to develop and/or upgrade airport facilities to ensure that an airport is cost-effectively constructed to meet the needs of those aircraft that are using, or have the potential to use, the airport on a regular basis. It should be noted that it is not uncommon for aircraft to operate at airports that are not designed to meet that aircraft's ARC.

At Mesa-Falcon Field Airport, the majority of based aircraft fall within approach categories A and B and Airplane Design Group (ADG) I and II (refer to Chapter Three for a full discussion of the ARC). The mix of transient aircraft is more diverse and includes aircraft in ARCs B-I, B-II, C-I, C-II, C-III, D-I, D-II, and D-III. Aircraft in ARCs C/D-I, C/D-II, and C/D-III are the most demanding aircraft to operate at the airport (due to their higher approach speeds); however, these aircraft conduct less than 500 annual operations at the airport. Therefore, at this time, the most demanding approach category for the airport is approach category B. The wingspans of the most demanding aircraft fall within ADG II.

The current critical aircraft at Mesa-Falcon Field Airport fall within ARC B-II design standards. The potential exists in the future for increased use of the airport by business turboprop and turbojet aircraft. This follows with the national trend of increased business and corporate use of turboprop and turbojet aircraft, strong sales and deliveries of turboprop and turbojet aircraft, and expanded fractional ownership programs for these aircraft. With a 5,101-foot main runway, larger business jet operations will be limited due to the fact that some of these jets prefer, or are required, to operate on longer runways. The hot weather conditions that prevail in the area during a significant portion of the year will further limit their capability of utilizing the airport. As a result, the future critical aircraft is projected to remain as ARC B-II.

Primary Runway 4R-22L at Mesa-Falcon Field Airport is currently designed to ARC B-II standards and future planning will keep this runway as ARC B-II. Parallel Runway 4L-22R currently is utilized by smaller aircraft and possesses design standards that conform to ARC B-I in some categories and ARC B-II in others. According to airport traffic control tower (ATCT) personnel, the majority of aircraft that operate on this runway are in ARC A-I and B-I; however, some larger aircraft such as King Air turboprops do utilize the runway. As operations at Mesa-Falcon Field Airport continue to increase, it can be expected that larger turboprop aircraft will utilize Runway 4L-22R on a more frequent basis. In order to better protect the safety areas associated with this runway, airfield alternative planning will consider upgrading this runway to full ARC B-II standards.

Table 4A compares the existing ARC B-I (small aircraft exclusively) and future ARC B-II design requirements for Runway 4L-22R. ARC B-II design standards currently apply to Runway 4R-22L, and it is expected to remain in this design standard through the long term planning period.

Exhibit 4A depicts the upgrade of Runway 4L-22R to ARC B-II design standards. The primary change between ARC B-I (small aircraft exclusively) and ARC B-II is the increase in width and length of the runway safety area (RSA), object free area (OFA), obstacle free zone (OFZ), and runway protection zone (RPZ). As shown in **Table 4A**, the RSA increases from 120 feet in width and 240 feet beyond the runway end to 150 feet and 300 feet, respectively. The OFA doubles in width from 250 feet to 500 feet while its length beyond the runway end increases from 240 feet to 300 feet. The width of the OFZ increases from 250 feet to 400 feet. Presently, Mesa-Falcon Field Airport has adequate land available beyond each end of Runway 4L-22R to accommodate the larger RSA and OFA on airport property. The parallel taxiway north of Runway 4L-22R currently meets OFZ design standards for ARC B-I (small aircraft exclusively); however, should the runway transition to ARC B-II, the parallel taxiway will penetrate the OFZ. The RPZ on each end of Runway 4L-22R also increases in size as detailed on **Exhibit 4A** and in **Table 4A**. Runway 4R-22L currently meets all safety design standards associated with ARC B-II.

TABLE 4A
Airfield Safety and Facility Dimensions (in feet)
Mesa-Falcon Field Airport

	Runway 4R-22L		Runway 4L-22R		
Airport Reference Code (ARC)	Existing	B-II	Existing	B-I (small aircraft)	B-II
Approach Visibility Minimums	One mile		Visual		
Runway Length	5,101		3,799		
Runway Width	100	75	75	60	75
Runway Safety Area (RSA)					
Width	150	150	150	120	150
Length Beyond Runway End	300	300	300	240	300
Object Free Area (OFA)					
Width	500	500	500	250	500
Length Beyond Runway End	300	300	300	240	300
Obstacle Free Zone (OFZ)					
Width	400	400	350	250	400
Length Beyond Runway End	200	200	200	200	200
Runway Protection Zone (RPZ)					
Inner Width	500	500	250	250	500
Outer Width	700	700	450	450	700
Length	1,000	1,000	1,000	1,000	1,000
Runway Centerline to:					
Holding Position	200	200	125	125	200
Parallel Taxiway Centerline	250	240	200	150	240
Parallel Runway Centerline	700	700	700	700	700
Edge of Aircraft Apron Parking	330	250	270	125	250
Taxiway Width	50	35	40	25	35
Taxiway Object Free Area Width	131	131	131	89	131
Taxiway Centerline to:					
Fixed or Moveable Object	65.5	65.5	65.5	44.5	65.5
Taxilane Object Free Area Width	115	115	115	79	115
Taxilane Centerline to:					
Fixed or Moveable Object	57.5	57.5	57.5	39.5	57.5

Source: FAA Advisory Circular (AC) 150/5300-13, Change 11, *Airport Design*; 14 CFR Part 77, *Objects Affecting Navigable Airspace*

RUNWAY PAVEMENT STRENGTH

The current pavement strength for Runway 4R-22L is 38,000 pounds for single wheel loading (SWL), 60,000 pounds for dual wheel loading (DWL), and 90,000 pounds for dual tandem wheel loading (DTWL). Runway 4L-22R provides a pavement strength rating of 12,500 pounds SWL. While aircraft weighing more than the certified strength can operate on the runway on a limited basis, the life span of airport pavements can be shortened due to the utilization of heavier loads over time.

Due to the forecast increase in utilization of Runway 4L-22R by larger aircraft (in particular turboprops), an increased pavement strength rating of up to 30,000 pounds SWL should be planned for this runway. The pavement strength rating for Runway 4R-22L should be maintained through the planning period.

RUNWAY BLAST PADS

In order to reduce the erosive effect of jet blast and propeller wash, blast pads are planned on each end of Runway 4L-22R. A 150-foot long by 95-foot wide blast pad is depicted on **Exhibit 4A** that would meet ARC B-II standards. Runway 4R-22L is currently equipped with 150-foot long by 130-foot wide blast pads on each end, which exceed ARC B-II standards.

RUNWAY END IDENTIFICATION LIGHTS

Runway end identification lights (REILs) should be installed on each end of Runway 4L-22R. This will provide pilots with the improved ability to distinguish the runway ends at night or during poor visibility conditions. Further, the FAA indicates the REILs should be considered on all lighted runway ends not planned for a more sophisticated approach lighting system. REILs are currently located on each end of Runway 4R-22L.

VISUAL APPROACH LIGHTING

Currently, all four runway ends at Mesa-Falcon Field Airport are equipped with a two-box precision approach path indicator (PAPI-2). A four-box PAPI should be planned for primary Runway 4R-22L, as this system better serves the corporate aircraft currently using the airport.

HOLDING APRONS

Holding aprons provide an area at the runway end for aircraft to prepare for departure and/or bypass other aircraft which are not ready for departure. Currently, there is one holding apron located on the south side of Runway 4R-22L near the intersection of parallel Taxiway D and Taxiway C. Holding aprons should be planned for each end of Runway 4R-22L. In addition, two hold aprons are recommended on the proposed midfield parallel taxiway. The airport is currently working to design and construct a hold apron at the end of Runway 4R similar to that depicted on **Exhibit 4A**.

HOLD POSITION MARKINGS

The current hold positions associated with Runway 4L-22R are marked 125 feet from the runway centerline. In order to accommodate ARC B-II design standards, the hold lines would need to be relocated to 200 feet from the runway centerline. The current hold positions associated with primary Runway 4R-22L are marked 200 feet from the runway centerline and will be adequate through the planning period.

TAXIWAYS

The current location and number of taxiways at Mesa-Falcon Field Airport is adequate to provide access to existing landside facilities and the runway system. However, in order to provide increased capacity at the airport, additional taxiway exits should be planned.

A midfield parallel taxiway is proposed as depicted on **Exhibit 4A**. Located 350 feet (runway centerline to taxiway centerline) north of Runway 4R-22L and 350 feet south of Runway 4L-22R, this taxiway would extend the full length of Runway 4R-22L. The construction of a midfield parallel taxiway would require relocating the segmented circle and wind cone. Shifting these pilot aids approximately 100 feet north of their current location, as depicted, should satisfy safety areas associated with the runway and proposed taxiway. With the construction of this parallel taxiway, midfield Taxiways A and C, which currently connect both runways, should be straightened as this will allow greater visibility of both the approach and departure paths of the parallel runway system.

Exhibit 4A depicts four high-speed (angled) taxiway exits on the north side of Runway 4R-22L. High-speed exits allow aircraft to use a higher safe exit speed while exiting the runway, which will expedite the flow of aircraft off the runway system, thus increasing overall capacity. Two high-speed exits are proposed approximately 1,300 feet from the Runway 4R threshold as well as two high-speed exits approximately 1,900 feet from the Runway 22L threshold. Eight high-speed taxiway exits are also planned for Runway 4L-22R (four on the north side and four on the south side). These taxiway exits are located approximately 950 feet from each runway threshold.

In order to meet ARC B-II safety design standards on Runway 4L-22R, parallel Taxiway E will need to be relocated further north. Currently, Taxiway E is located 200 feet north of the runway centerline, which exceeds ARC B-I (small aircraft exclusively) design standards which call for 150 feet separation. A runway to parallel taxiway centerline separation of 240 feet is required to meet ARC B-II design standards.

Dimensional standards for the taxiways are depicted in **Table 4A**. All future taxiways should be constructed to at least 35 feet in width to meet ADG II standards.

RUNWAY INCURSION IMPROVEMENTS

Over the past several years, the FAA has placed high importance on runway incursions. The Runway Incursion Prevention Program was established to improve safety of ground movements to prevent aircraft incidents. This program is charged with collecting data and making suggestions to improve airport movement areas deemed as problematic. Many airports have confusing ground routes which can lead pilots and other vehicles onto active runways or taxiways causing incursions or accidents. These areas are commonly referred to as hotspots. The Runway Safety Action Team (RSAT) has met with airport staff to determine ways to minimize these hotspots.

The primary hotspot at Mesa-Falcon Field Airport is associated with Taxiway B. Recent runway incursions have involved aircraft entering onto Taxiway B directly from the ramp apron and taxiing north across primary Runway 4R-22L without permission from the ATCT.

Due to the width of Taxiway B at this location (150 feet), pilots could mistake it for a runway. Looking into the future, a second potential hotspot could involve the area north of secondary Runway 4L-22R at the intersection of Taxiway B. With an increase in activity associated with current and future aviation development on the north side of the airport, this area will be utilized more often and could present similar problems.

Exhibit 4B presents options for improving the hotspot area on the south side of Runway 4R-22L. The two options consider eliminating certain portions of Taxiway B and replacing it with smaller connecting taxiways. In doing so, Taxiway B will provide a more indirect route to the runway system and could minimize incursion potential. Option 1 depicts the elimination of Taxiway B that connects the runway to parallel Taxiway D. Two angled taxiways are then proposed on each side of its current location providing access to the parallel taxiway. Option 2 considers eliminating a portion of Taxiway B between Taxiway D and the ramp apron and constructing two right-angled taxiways to replace it. Similar alternatives are also presented for Taxiway B adjacent to the north side of Runway 4L-22R on **Exhibit 4B**.

RUNWAY APPROACH PROTECTION

FAA requirements state that airports maintain positive control over the RPZ located beyond each runway. The RPZ is a two-dimensional trapezoidal area beyond the runway end that should be cleared of any objects that can cause the congregation of people or property on the ground. Currently, all RPZs that correspond to each of the four runway ends at Mesa-Falcon Field Airport are located inside the property line or within an area protected by an avigation easement. As discussed earlier, the transition to an ARC B-II designation on Runway 4L-22R will require a larger RPZ that would encompass additional property beyond the airport property line north of East McDowell Road.

The FAA recommends an airport to have positive control over its RPZs through fee simple property acquisition; however, avigation easements (acquiring control of designated airspace within the RPZ) can be pursued if fee simple acquisition is not feasible. Due to the nature of the current land use north of East McDowell Road, it is recommended that an additional 1.56 acres of avigation easement be purchased to protect the ultimate RPZ associated with Runway 4L-22R, as depicted on **Exhibit 4A**.

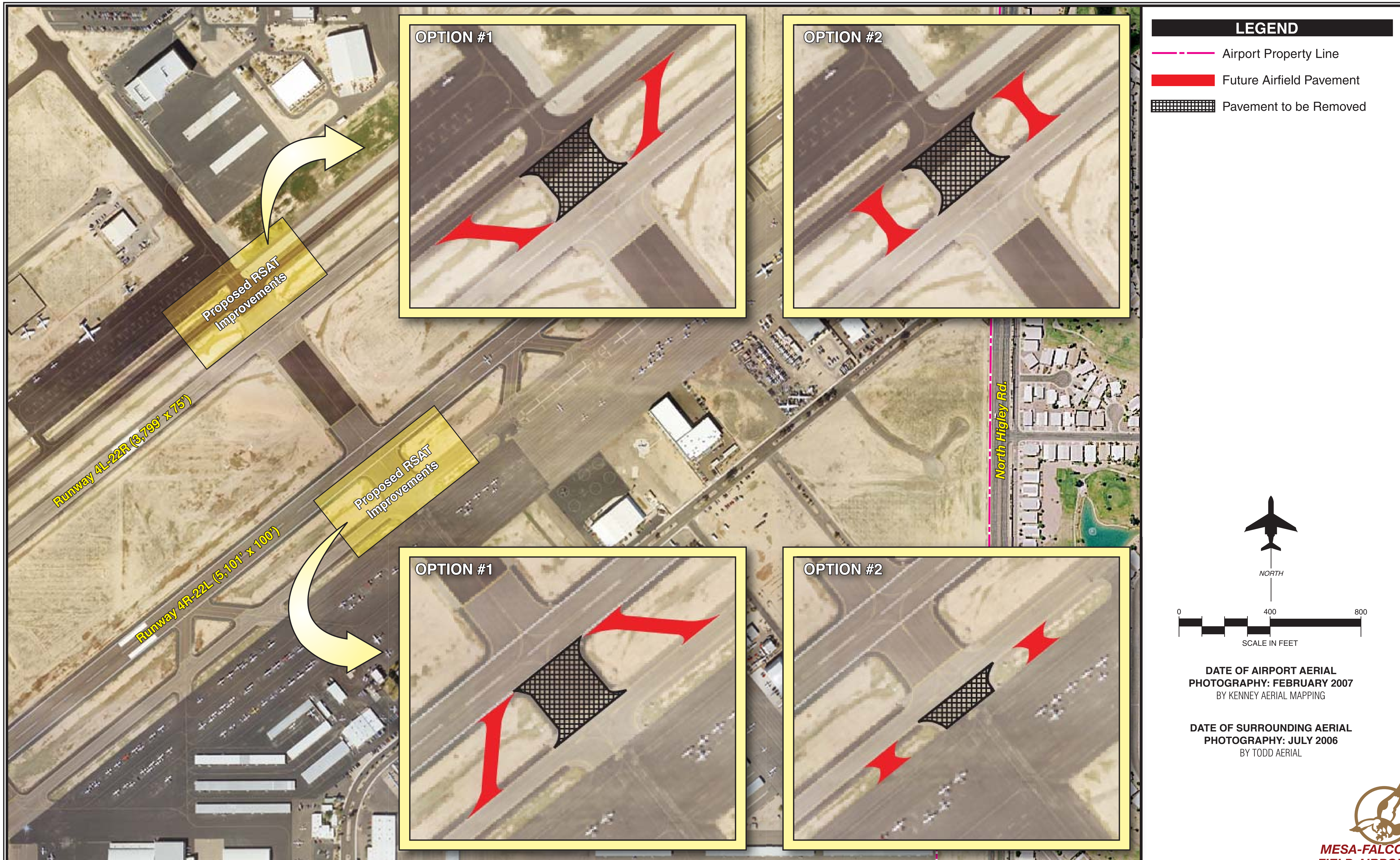


Exhibit 4B
RUNWAY SAFETY ACTION TEAM (RSAT) RECOMMENDATIONS FOR TAXIWAY B

WEATHER REPORTING AIDS

Presently, Mesa-Falcon Field Airport has a limited aviation weather reporting station (LAWRS) which requires personnel to measure and report information related to cloud height, weather, obstructions to visibility, temperature, dew point, surface winds, and altimeter settings. Wind speed and direction can also be estimated by pilots using three lighted wind cones located on airfield.

The airport facility requirements analysis determined that an Automated Weather Observation System (AWOS) or Automated Surface Observation System (ASOS) should be considered for Mesa-Falcon Field Airport to provide up-to-date weather details to pilots, especially during times when the ATCT is closed. AWOS systems are typically commissioned by the FAA and are eligible for federal grant funding. ASOS systems are commissioned by the National Weather Service.

FAA Order 6560.20B, *Siting Criteria for Automated Weather Observing Systems (AWOS)*, was utilized for general siting requirements. While each AWOS sensor has specific siting requirements, all AWOS sensors should be located together and outside the runway and taxiway object free areas. Generally, AWOS sensors are best placed between 1,000 and 3,000 feet from the primary runway threshold and between 500 and 1,000 feet from the runway centerline.

Based upon information received from ATCT personnel, prevailing winds are from the southwest approximately 60 percent of the time leading to a greater use of Runways 22L and 22R, with Runway 22L being the primary. Therefore, following AWOS siting criteria, it is recommended that the AWOS/ASOS be situated along the Runway 22L end as it serves as the primary runway threshold. Due to the parallel runway system in place and proposed midfield parallel taxiway, the recommended separation distances for an AWOS/ASOS site are difficult to meet.

Exhibit 4A depicts three potential AWOS/ASOS siting locations on the airfield. None of the three proposed locations meet the recommended 500- to 1,000-foot separation from the runway centerline. Site #1 is near the existing segmented circle and wind cone. It is approximately 3,000 feet from the Runway 22L threshold. This area is already served with electricity which could decrease the cost of installation. Site #2 is located further east approximately 1,200 feet from the Runway 22L threshold. While this location satisfies the recommended distance from the primary runway threshold, it is not currently provided with electric utility service. Site #3 is located approximately 250 feet from the Runway 22L threshold. This site does not meet the recommended separation criteria from the runway threshold and is not provided with electric utility service. In review, all three sites meet runway and taxiway safety area criteria, and Sites #1 and #2 meet the recommended siting distance from the primary runway threshold.

The final siting of the AWOS/ASOS could be dependent on the factors previously mentioned. Most important to the final siting of the AWOS/ASOS, however, is that it is located in an area not planned for future development and located outside any safety areas associated with the runways and taxiways.

LANDSIDE DEVELOPMENT CONSIDERATIONS

The orderly development of the airport terminal area, those areas along the flight line parallel to the runway, can be the most critical, and often times the most difficult to control on the airport. A development approach of taking the path of least resistance can have a significant effect on the long-term viability of an airport. Allowing development without regard to a functional plan could result in a haphazard array of buildings and small ramp areas, which will eventually preclude the most efficient use of valuable space along the flight line.

Activity in the terminal area should be divided into high, medium, and low intensity levels at the airport. The high-activity area should be planned and developed to provide aviation services on the airport. An example of the high-activity area is the airport terminal building and adjoining aircraft parking apron, which provides tiedown locations and circulation for aircraft. In addition, large conventional hangars used for fixed base operators (FBOs), corporate aviation departments, or storing a large number of aircraft would be considered a high-activity use area. The best location for high-activity areas is along the flight line near midfield, for ease of access to all areas of the airfield.

The medium-activity use category defines the next level of airport use and primarily includes smaller corporate aircraft that may desire their own executive hangar storage on the airport. The best location for medium-activity use is off the immediate flight line, but still readily accessible to aircraft including corporate jets. Due to an airport's layout and other existing conditions, if this area is to be located along the flight line, it is best to keep it out of the midfield area of the airport, so as to not cause congestion with transient aircraft utilizing the airport. Parking and utilities such as water and sewer should also be provided in this area.

The low-activity use category defines the area for storage of smaller single and twin-engine aircraft. Low-activity users are personal or small business aircraft owners who prefer individual space in T-hangars or shade hangars. Low-activity areas should be located in less conspicuous areas. This use category will require electricity, but generally does not require water or sewer utilities.

Ideally, terminal area facilities at general aviation airports should follow a linear configuration parallel to the primary runway. The linear configuration allows for maximizing available space, while providing ease of access to terminal facilities from the airfield. Landside alternatives will address development in specific areas on the airport. Separation of activity levels and efficiency of layout will be discussed as well.

In addition to the functional compatibility of the terminal area, the proposed development concept should provide a first-class appearance for Mesa-Falcon Field Airport. As previously mentioned, the City of Mesa serves as a very important link to the entire region whether it is for business or pleasure. Consideration to aesthetics should be given high priority in all public areas, as the airport can serve as the first impression a visitor may have of the community.

Mesa-Falcon Field Airport is located on approximately 784 acres. In order to allow for maximum development of the airport while keeping with FAA mandated safety design standards, it is very important to devise a plan that allows for the orderly development of airport facilities. Typically, general aviation airports will reserve the first 1,000 feet parallel to the runway for aviation-related activity exclusively. This distance will allow for the location of taxiways, apron, and hangars.

Aviation-related growth is forecasted to be very strong at Mesa-Falcon Field Airport throughout the planning period, thus, all of the property on the airport will be dedicated for aviation use in the future.

The issues to be considered in the landside analysis are summarized on **Exhibit 4C**. Similar to airside analysis issues, these were determined from aviation demand forecasts and airport facility requirements evaluations. Input was also provided from the PAC, airport staff, and general public.

Properties to the south of the parallel runway system are currently the most developed areas at Mesa-Falcon Field Airport and include aircraft parking aprons, the terminal building, ATCT, FBOs, and an array of other aviation-related commercial activities occupying conventional and executive hangars. There are also several aircraft storage hangars in the form of T-hangars and shade hangars south of the runways. To the north of the parallel runway system are large conventional hangars associated with an aviation-related commercial business as well as an aircraft parking apron and non-directional beacon (NDB) used for navigation purposes.

The airport is currently in the process of leasing parcels of land to private entities for aviation-use development. The largest areas are located in the northwestern and southwestern portions of the airport. One other smaller parcel is currently leased adjacent to the aircraft parking apron on the south side of Runway 4R-22L. **Exhibit 4C** shows a generalized layout of these privately leased aviation-use parcels. The airport is currently working with private developers to determine the hangar and utility infrastructure layouts on these parcels that best fit the needs of aviation activity that will be represented in those areas. As these areas are currently under lease to private entities, no specific alternatives will be evaluated. These areas will be developed to serve aviation demand.

A more specific landside consideration depicted on **Exhibit 4C** shows the addition of aircraft parking aprons in various locations on the airfield. North of the parallel runways, approximately 45,300 square yards of ramp apron are considered for aircraft parking and tiedowns. Automobile access to the proposed ramp apron adjacent to the Runway 22R threshold could be provided by a road connecting to East McDowell Road. To the south of the parallel runway system, an additional 12,200 square yards of ramp apron is proposed.

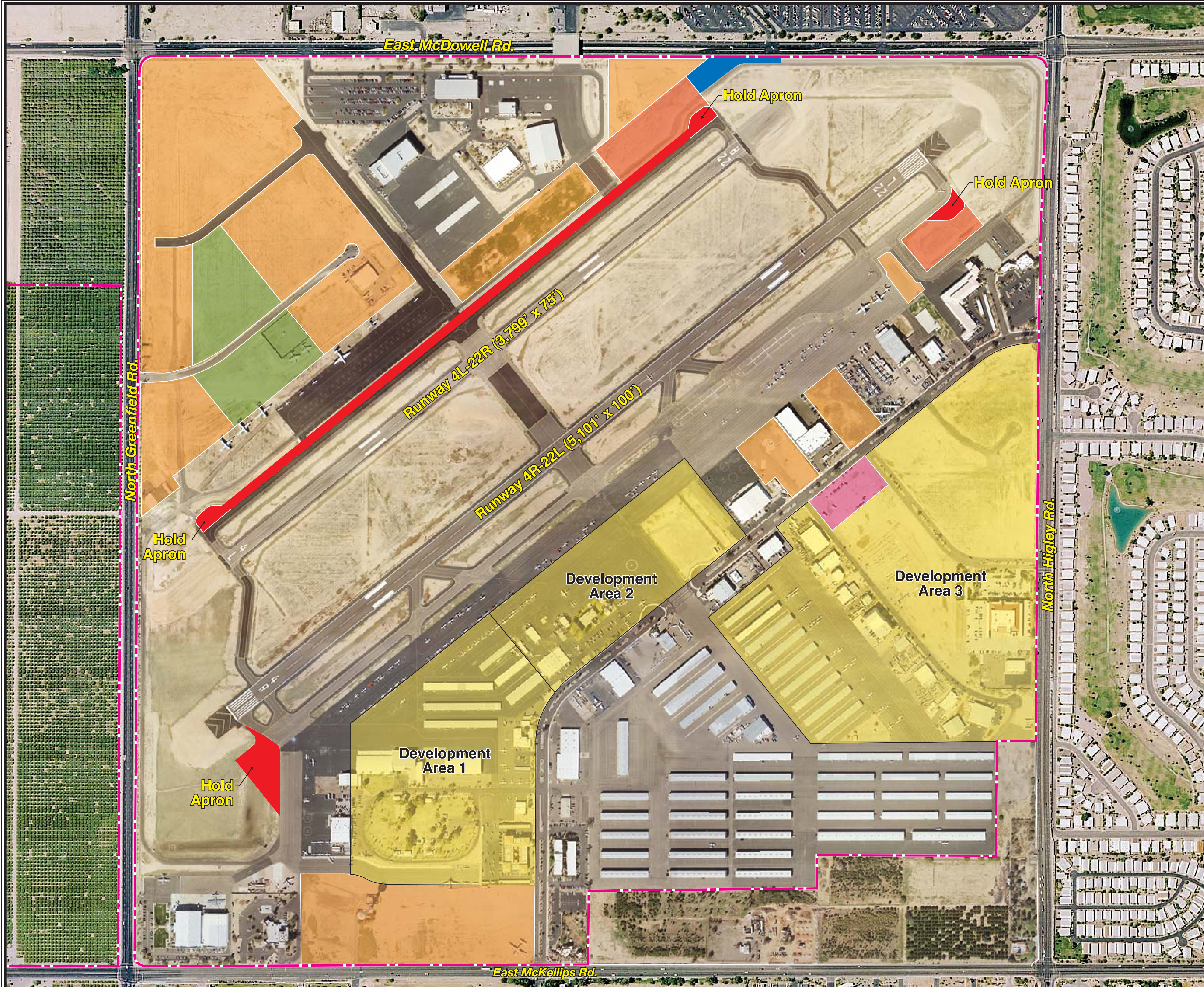
There is a parcel of land totaling approximately 3.25 acres located north of Runway 4L-22R that is currently vacant and not leased to a private developer. The Falcon Field NDB is located in this parcel. This area should also be considered for future aviation-use development. Due to advances in navigational aids including the global positioning system (GPS), the FAA is decommissioning navigational aids such as the NDB. Although the NDB is considered an important navigational aid for aviation activity related to flight training, which occurs at a high frequency at Mesa-Falcon Field Airport, long term planning should consider the removal of the NDB due to anticipated advances in navigational aid technology over the next several years.

Exhibit 4C also depicts three separate development areas. A series of landside alternatives have been examined for each development area. These alternatives consider general aviation facility development providing for separation of activity levels. The goal of this analysis is to indicate development potential which would provide the City of Mesa with a specific goal for future development. The resultant plan will aid the City in strategic marketing of available airport properties.

Development Area 1 currently encompasses Falcon Field Park, an aircraft tiedown apron, and aviation and non-aviation related buildings. Development alternatives for this area will focus on maximizing space available for aviation-related activity and potential terminal building locations. Development Area 2 is located further north and east, and includes the existing airport terminal building, ATCT, aircraft parking and tiedown areas, as well as several types of aircraft hangars. Alternatives for this area will include planning for high-intensity aviation activity levels due to the location adjacent to the runway and taxiway system. Other considerations will be given to potential relocation of the airport terminal building and ATCT. Development Area 3 is located on the east side of the airport. Several aircraft storage hangars and commercial aviation businesses are located in this area. Farther east is a large area of vacant land that will be considered for future aviation-use development.

TERMINAL BUILDING LOCATION

FAA Advisory Circular 150/5360-13, *Planning and Design Guidelines for Airport Terminal Facilities*, identifies a number of basic considerations that affect the location of a terminal build-



LEGEND

- Airport Property Line
- Privately Leased Aviation-Use Parcels
- Leased Automobile Parking
- Future Privately Leased Aviation-Use Parcels
- Development Areas
- Aircraft Hold Apron/Taxiway
- Automobile Parking
- Aircraft Parking Apron

LANDSIDE CONSIDERATIONS

- Identify parcels on the airport privately leased for aviation-use activities.
- Construct additional aircraft ramp apron areas for aircraft parking and tiedowns.
- Develop alternatives for a new airport terminal building location in Development Area 2.
- Develop alternatives for a new airport traffic control tower (ATCT) location in Development Area 2.
- Study potential aviation development in the current location of Falcon Field Park (Development Area 1)
- Relocate / Reconfigure existing hangar development to provide for maximum use of airport property.
- Provide airfield access to the east of Roadrunner Drive (Develoopment Area 3) and designate land for aviation-use activities.

NORTH

0 600 1200

SCALE IN FEET

DATE OF SURROUNDING AERIAL PHOTOGRAPHY: JULY 2006
BY TODD AERIAL

DATE OF AIRPORT AERIAL PHOTOGRAPHY: FEBRUARY 2007
BY KENNEY AERIAL MAPPING

06MP17-4C-1/21/09

MESA-FALCON FIELD AIRPORT

Exhibit 4C
GENERALIZED LANDSIDE CONSIDERATIONS

ing. The primary considerations include the following:

1. **Runway configuration**: The terminal should be located to minimize aircraft taxiing distances and times and number of runway crossings.

2. **Access to transportation network**: The terminal should be located to provide the most direct/shortest route to the regional roadway network.

3. **Expansion potential**: The long term viability of the terminal is dependent upon the ability of the site to accommodate expansion of the terminal beyond forecast requirements.

4. **FAA Geometric Design Standards**: The terminal location needs to assure adequate distance from present and future aircraft operational areas.

A review of each of these factors is listed below.

Runway configuration: The existing terminal is situated near the midpoint of the main apron along primary Runway 4R-22L. Taxiway D serves the main apron and is located south of Runway 4R-22L. In this location, aircraft do not need to cross Runway 4R-22L to access either end of the primary runway.

Access to transportation network: The existing terminal building is located directly north of Falcon Drive. Falcon Drive connects directly with East McKellips Road south of the airport. East McKellips Road provides access to several roadway networks.

Expansion potential: Space is available adjacent to the facility for building and parking expansion.

FAA Geometric Design Standards: The existing terminal is located more than 800 feet south of the Runway 4R-22L centerline. This is well outside any area obstruction clearance areas and does not impact any design standards.

As shown, the existing terminal site meets the general recommendations of the FAA utilizing this criterion. Therefore, retention of the terminal in its existing location will be considered in one of the landside alternatives to follow. However, for planning purposes, other new terminal locations will also be explored.

AIRPORT TRAFFIC CONTROL TOWER SITING ALTERNATIVES

The ATCT is the focal point for controlling flight operations within the airport's designated airspace and all aircraft and vehicle movements on the airport's runways and taxiways. Site selection involves certain mandatory requirements concerning the ultimate planned development of the airport.

The following operational and spatial requirements are identified in FAA Order 6480.4, *Airport Traffic Control Tower Siting Criteria*.

Mandatory Siting Requirements

- There must be maximum visibility of airport traffic patterns.
- There must be a clear, unobstructed, and direct view of the approaches to all runways or landing areas and to all runway and taxiway surfaces.
- The proposed site must be large enough to accommodate current and future building needs including employee parking spaces.
- The proposed tower must not violate F.A.R. Part 77 surfaces unless it is absolutely necessary.
- The proposed tower must not derogate the signal generated by any existing or planned electronic navigational aid.

Nonmandatory Siting Requirements

- To assure adequate depth perception, the line-of-sight to aircraft movement areas should be perpendicular to the direction of aircraft travel.
- The tower cab should be oriented to face north or alternatively to the east, south, or west. Every effort should be made to prevent an aircraft approach from being aligned with the rising or setting sun.
- The controller's visibility should not be impaired by direct or indirect external lighting sources.
- All aircraft movement areas including parking aprons, tiedown spaces, run-up pads, etc., should be visible from the ATCT.
- Consideration must be given to local weather phenomena to preclude restriction to visibility due to fog or ground haze.
- Exterior noise should be at a minimum and sites should be evaluated for expected noise levels.
- Access to the site should not require controllers to cross a runway or taxiway.
- Consideration should be given to planned airport expansion, especially for the construction of buildings, hangars, runway/taxiway extensions, etc., to preclude the relocation of the ATCT at a later date.

Requirements for a new ATCT site include several important considerations. The area required for a tower site will range from one or more acres depending on the types of facilities to be combined at the site. For Mesa-Falcon Field Airport, an area of up to two acres should be provided for the future site of the ATCT.

Line-of-Sight

In order to determine actual tower elevations for each site, analysis of cab eye elevation must be conducted. Cab eye elevation is the projected height at which a controller will view aircraft activity from the ATCT.

The analysis of cab eye elevation must factor two considerations: determine the minimum eye level elevation utilizing the criteria provided in FAA Order 6480.4 and evaluate any structures located between the ATCT site and surface movement areas to determine if they may obstruct the line-of-sight. An obstructed view is commonly referred to as a shadow. A tall structure which casts a shadow or loss of view of a particular surface area would require the cab eye elevation to be increased in order to view the surface area in question.

Minimum Cab Eye Elevation Analysis

FAA Order 6480.4 provides a method for determining the minimum cab eye elevations for proposed ATCT sites. This calculation was established to meet the minimum requirements for visual depth perception. According to the Order, the line-of-sight from the tower cab eye level must intersect the grade of the airport traffic surface in question (parking apron, taxiway, runway, etc.) at an angle of 35 minutes or greater. The formula provided in the Order and utilized in this analysis is as follows:

$E_e = E_{as} + [\ D \times \text{Tangent}\ (35 \text{ minutes} + G_s)\ ]$

whereas:

E_e = Eye level elevation (MSL)

E_{as} = Average elevation for section of airport traffic surface in question

D = Distance from proposed tower site to section of airport traffic surface in question

G_s = Angular slope of airport traffic surface measured horizontally and in direction of proposed tower site

It should be noted that the cab eye elevation provides the mean sea level (MSL) or above ground level (AGL) height at which a controller will be viewing from. Actual tower heights will be higher to accommodate the cab roof and necessary antenna equipment. It can be expected that the actual tower height will be at least seven feet higher than the cab eye elevation calculation indicates.

Siting Analysis

Three ATCT sites have been analyzed and are presented within Development Area 2 alternatives. Initial consideration was given to locating the tower on the north side of the airfield as ample space is available. Locating on the north side of the airport, however, would require a new access road and parking lot to be constructed, as well as the extension of all utilities including electricity, water, sewer, and communications lines. It is likely that the cost of all these elements would be substantially more than a south-side site.

LANDSIDE ALTERNATIVES

The following section considers landside development alternatives associated with Development Areas 1, 2, and 3. The alternatives to be presented are not the only options for development. In some cases, a portion of one alternative could be intermixed with another. Also, some development concepts could be replaced with others. The final recommended plan only serves as a guide for the City. Many times, airport operators change their plan to meet the needs of specific users. The goal in analyzing landside development alternatives is to focus future development so that the airport property can be maximized.

As previously mentioned, several portions of the airport are currently leased to private entities. The airport is currently working with these developers to maximize the use of land for aviation use. As a result, no specific alternatives are developed for these areas.

DEVELOPMENT AREA 1
ALTERNATIVE A

Alternative A associated with Development Area 1, depicted on **Exhibit 4D**, considers future aviation-related development in the area currently occupied by Falcon Field Park. In an effort to maximize aviation land use to satisfy the demand forecasts presented in a previous chapter, a large area for potential aviation-use development is depicted with ample aircraft apron space allowing access to the existing aircraft parking apron to the north side of this property. This area could accommodate FBO-type operations, corporate flight departments, and/or bulk aircraft storage. A non-aviation related commercial building is currently located directly east of this proposed development. Due to the long-term nature of the lease associated with this building and associated automobile parking lot, there is no alternative for redeveloping this property for aviation use.

In addition, a new airport terminal building is proposed in the existing location of an aircraft storage hangar. Access to the terminal area would be provided via Fighter Aces Drive to the south.

DEVELOPMENT AREA 1
ALTERNATIVE B

Exhibit 4D also depicts Alternative B, which considers aviation-use development in the area currently being occupied by Falcon Field Park. Access to and from the area could be obtained by constructing aircraft parking and taxilanes to the north.

As with the previous alternative, a new terminal building is depicted in this area. Access to the terminal area is provided by extending a roadway south connecting it to East McKellips Road. Potential hangar development is proposed farther north and east.

DEVELOPMENT AREA 2
ALTERNATIVE A

Alternative A for Development Area 2 is depicted on **Exhibit 4E.** This alternative proposes the expansion or construction of a new terminal building in its present location in order to accommodate the forecast increase in aircraft traffic through the planning period, which will lead to a greater use of the facility. The existing terminal building would need to be razed and

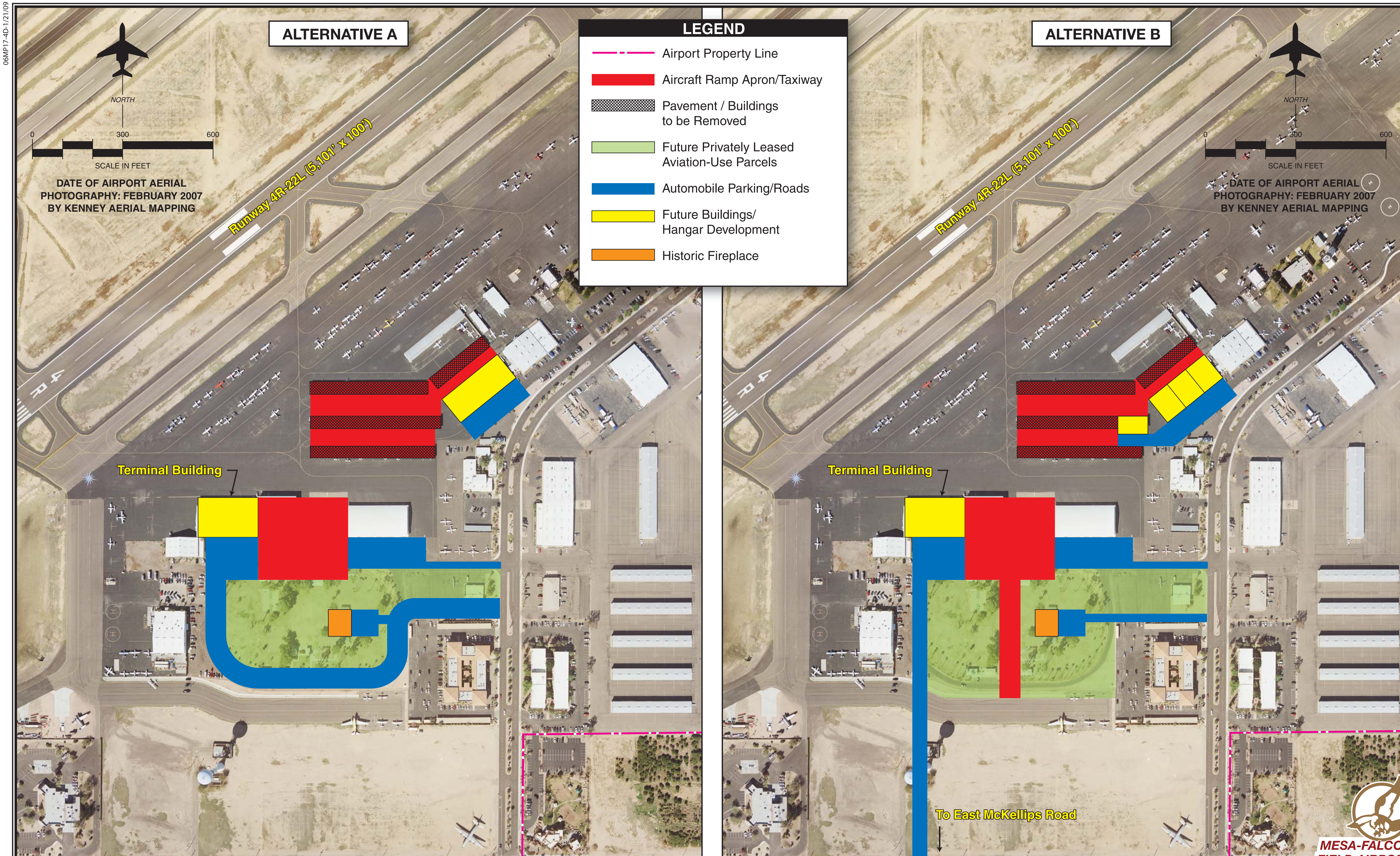


Exhibit 4D
DEVELOPMENT AREA 1

06MP17-4E-1/21/09

MESA-FALCON FIELD AIRPORT

Exhibit 4E
DEVELOPMENT AREA 2
ALTERNATIVES

replaced with a new facility, requiring airport administration to temporarily relocate their offices until the completion of the new terminal building. Pilots and passengers would need to utilize existing FBO facilities to accommodate their needs during this time as well.

To the east of Taxiway B is a vacant parcel encompassing approximately 3.4 acres. Alternative A proposes the construction of a large conventional hangar that could house commercial aviation-related activities. This type of activity would be desired in this area as it is adjacent to the aircraft parking apron and allows good circulation for aircraft to and from the runway system. Additional ramp apron space is proposed to the north of the hangar with automobile parking directly to the south.

This alternative also proposes that the ATCT be relocated approximately 100 feet to the east of its current location. Further analysis of this site location will be discussed in the next section. Additional parking to accommodate the relocation of the ATCT is proposed immediately south of the facility in areas currently occupied by aircraft parking and tiedowns. According to spot elevation information for the airport, the proposed ATCT for Alternative A is at approximately 1,380 feet MSL and is approximately 900 feet from the Runway 4R-22L centerline. The calculated minimum cab eye elevation for the most demanding pavement surface for this site is 1,446.4 feet MSL or approximately 66.4 feet AGL.

Visibility is clear and unobstructed to both runway ends under all alternatives. The site is nearly at midfield, which aids visibility. As the site is currently utilized for aircraft parking and, thus, can be re-developed for an ATCT, there will be enough room for employee parking as well as future expansion.

This site will not derogate the signal generated by any of the existing or planned navigational aids. The ATCT would likely penetrate the transition surface of PART 77, but not significantly so.

Depth perception of all surface areas to be controlled should be adequate. The controller's line-of-sight will be perpendicular or oblique, not parallel, to the line established by aircraft and/or ground vehicle movement. The cab eye elevation will intersect all airport surfaces.

The tower cab will be oriented to face north which is ideal as opposed to east/west facing towers. Visibility is not expected to be impaired by direct or indirect external lighting sources. Visibility to all areas requiring control is good.

There are no known local weather phenomena that would restrict visibility for any tower location. Noise levels at this site may be an issue during high operational levels, but no more so than the existing tower. Access to the site will not cross areas of aircraft operations. No future construction is planned that would derogate visibility from this site.

DEVELOPMENT AREA 2 ALTERNATIVE B

Alternative B considers a new terminal building location. As depicted on **Exhibit 4E**, the terminal building would be located to the east of Taxiway B in the 3.4-acre parcel that is currently vacant. Directly to the east of the terminal building, a proposed ATCT would be constructed. Ramp apron space would be provided in front of the terminal building, and automobile parking is provided to the south. This terminal building and ATCT location would require access from the east of the airport off North Higley Road.

A conventional hangar is proposed in the existing terminal building and ATCT location should both of these facilities be relocated. Adequate parking currently in place would accommodate the users of the facility.

As illustrated on **Exhibit 4E**, the proposed ATCT for Alternative B is located in a currently vacant area approximately 750 feet east of the current ATCT. According to spot elevation information for the airport, the ground elevation of the proposed site is at approximately 1,385 feet MSL and is situated approximately 900 feet from the primary runway centerline. The calculated minimum cab eye elevation for this site is 1,447.7 feet MSL or 62.7 feet AGL.

Similar to the previous alternative, the location of Alternative B is more than adequate to provide unobstructed views to all runway and taxiway ends. The minimum height required on this site will again obstruct the Part 77 transitional surface. This does not preclude construction at this site; it means additional review and analysis will need to be conducted. The site is large enough to accommodate future building needs and employee parking.

All nonmandatory requirements are essentially the same as with Alternative A.

DEVELOPMENT AREA 2 ALTERNATIVE C

The final alternative associated with future airport development within Development Area 2 is depicted on **Exhibit 4E**. Alternative C assumes the construction of a new terminal building in the southwest portion of the terminal area. A new ATCT is proposed in the location of the current terminal building area and, farther to the east, a conventional hangar with ramp apron space and automobile parking is depicted, making for optimal utilization of otherwise vacant property.

Exhibit 4E depicts the ATCT for Alternative C, which is on the current location of the airport's general aviation terminal building. Spot elevation information for the airport indicates that the site is at approximately 1,380 feet MSL. The calculated minimum cab eye elevation for existing conditions is 1,449.97 feet MSL or 70 feet AGL.

Visibility of airborne traffic patterns is more than adequate as with the previous alternatives. This site plot provides sufficient area to accommodate the initial building and the addition of a base building in the future if required. Obviously, this site would require the removal of the terminal building. Also, this area would readily supply parking areas with the existing terminal building lot already sufficiently serving the existing ATCT.

Minimum cab eye elevations for this site indicate that the tower will likely penetrate the Part 77 transitional surface, however, should not be an obstruction to flight. The tower should not derogate the performance of any existing or planned electronic facilities.

Depth perception of all surface areas to be controlled will be adequate. The controller's line-of-sight will be perpendicular or oblique, not parallel, to the line established by aircraft and/or ground vehicle movement.

The tower cab will be oriented to face north. Visibility to all areas requiring control is excellent and would not be impaired or shadowed. Access to the site, once constructed, would not require crossing aircraft operation areas.

DEVELOPMENT AREA 3 ALTERNATIVE A

Depicted on **Exhibit 4F**, Alternative A associated with Development Area 3 focuses on currently vacant property on the east side of the airport adjacent to Falcon Drive and North Higley Road. A generalized layout of parcels for future privately leased aviation-use development is depicted.

Prior to any development in this area, aircraft access will need to be provided. A private lease recently expired on an area of property that will allow for the removal of existing facilities so that a taxilane can be extended, allowing for development farther to the east. This alternative also calls for the removal of a T-hangar complex in order to provide for smoother transition of aircraft from this area to the runway and taxiway system. A dual-use taxilane is proposed which would allow two-way access for smaller aircraft to transition to and from the east area of the airport, thereby reducing congestion.

Seven separate aviation-use parcels are depicted on this alternative with access provided by the dual-use taxilane. These parcels range in size from approximately one acre to six acres, with the larger parcels set back farther to the east. Eight executive hangar additions are depicted adjacent to the east side of existing City-owned T-hangar complexes located on the west side of Development Area 3. This area is currently occupied by marked aircraft tiedown spaces and would satisfy a need for future hangar growth at the airport, making for maximum utilization of space.

In order to provide for efficient access to current and proposed building locations, Roadrunner Drive is proposed to be extended to the east connecting to North Higley Road. The proposed taxilane would, in essence, divide the east area into north and south sections. Cul-de-sacs would be constructed on Roadrunner Drive and Eagle Drive to accommodate the taxilane. It should be mentioned that one parcel located in the northwest corner of Development Area 3 is currently leased for automobile parking associated with aviation businesses on the airport and will remain so throughout the planning period.

DEVELOPMENT AREA 3 ALTERNATIVE B

Exhibit 4G illustrates a second alternative associated with Development Area 3. Alternative B depicts a dual-use taxilane extending to the east and providing for aviation-use development within ten generalized parcels. Eight of these parcels are approximately one to two acres in size and could accommodate commercial aviation-related activities. Two large parcels are located farther east and south. These sites would be ideal for executive hangar development that could accommodate aircraft storage or small commercial aviation businesses. As depicted on **Exhibit 4F**, executive hangar additions are proposed adjacent to City-owned T-hangar complexes that would provide for additional aircraft storage.

The extension of Roadrunner Drive to the east connecting to North Higley Road would provide adequate access to current and future aviation development. Falcon Drive would provide desired access to development north of the proposed dual-use taxilane.

SUMMARY

The process utilized in assessing the airside and landside development alternatives involved a detailed analysis of short and long term requirements, as well as future growth potential. Current airport design standards were considered at every stage in the analysis. Safety, both in the air and on the ground, was given a high priority in the analysis of alternatives.

After review and input from the PAC, City officials, and the general public, a recommended concept will be developed by the consultant. The resultant plan will represent an airside facility that fulfills safety design standards, and a landside complex that can be developed as demand dictates. The development plan for Mesa-Falcon Field Airport must represent a means by which the airport can evolve in a balanced manner, both on the airside and landside, to accommodate the forecast demand. In addition, the plan must provide flexibility to meet activity growth beyond the long range planning horizon.

The following chapters will be dedicated to refining the basic concept into a final plan, with recommendations to ensure proper implementation and timing for a demand-based program.

Exhibit 4F
DEVELOPMENT AREA 3
ALTERNATIVE A

Exhibit 4G
DEVELOPMENT AREA 3
ALTERNATIVE B

MESA-FALCON
FIELD AIRPORT

Chapter Five

RECOMMENDED MASTER PLAN CONCEPT

Chapter Five

Recommended Master Plan Concept

The planning process for Mesa-Falcon Field Airport has evolved through the development of forecasts for future demand, an assessment of future facility needs, and the evaluation of airport development alternatives to meet those future facility needs. The process also included the presentation of draft phase materials to the Planning Advisory Committee (PAC) and at public information workshops. The City of Mesa and airport administration have participated in each of these meetings and have been actively involved in the master planning process.

The PAC is comprised of several constituents with a stake in Mesa-Falcon Field Airport. Groups represented on the PAC include the Federal Aviation Administration (FAA), the Arizona Department of Transportation (ADOT) - Aeronautics Division, Maricopa Association of Governments, Arizona Military Airspace Working Group, airport traffic control tower (ATCT) personnel, Mesa-Falcon Field airport administration, Phoenix-Mesa Gateway airport administration, The Boeing Company, MD Helicopters, Aircraft Owners and Pilots Association, National Business Aircraft Association, Arizona Pilots Association, Falcon Field Tenants and Users Association, Experimental Aircraft Association, various city departments, airport businesses, and citizen and neighborhood groups. This diverse group has provided valuable input into this recommended plan.

In the previous chapter, several development alternatives were analyzed to explore different options for the future growth and development of Mesa-Falcon Field Airport. The development alternatives have been refined into a single recommended concept for the Master Plan. This chapter describes, in narrative and graphic form, the recommended direction for the future use and development of Mesa-Falcon Field Airport.

RECOMMENDED MASTER PLAN CONCEPT

The recommended Master Plan concept presents an ultimate configuration for the airport that meets FAA design standards, increases overall airport capacity, and provides a variety of landside development options. It is important to note that the finalized concept provides for anticipated facility needs over the next twenty years, as well as establishing a vision and direction for meeting facility needs beyond the planning period. The City of Mesa and Phoenix metropolitan area have experienced significant growth over the past several years, and it can be expected that the area will continue to experience strong growth in the coming years. The following sections summarize the airside and landside development recommendations as depicted on **Exhibit 5A**.

AIRFIELD DESIGN STANDARDS

The FAA has established design criteria to define the physical dimensions of runways and taxiways and the imaginary surfaces surrounding them which provide for 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 will conduct 500 or more operations (takeoffs and landings) per year at the airport. Factors included in the airport design are an aircraft's wingspan, tail height, approach speed, and in some cases, the runway approach visibility minimums. The FAA has established the Airport Reference Code (ARC) to relate these factors to airfield design standards.

Analysis in Chapter Three – Airport Facility Requirements indicated that Mesa-Falcon Field Airport is presently used by a wide range of general aviation aircraft. The majority of these aircraft include single and multi-engine aircraft which fall into ARC A-I and B-I categories. In addition, larger business aircraft that fall within approach categories B, C, and D and airplane design groups (ADG) II and III use the airport on an infrequent basis.

The largest and/or fastest based aircraft in terms of ARC category will often account for the critical design aircraft to be applied to the airport. The most demanding aircraft currently based at Mesa-Falcon Field Airport are the King Air B300 and Cessna 550. Both of these aircraft have a published approach speed and

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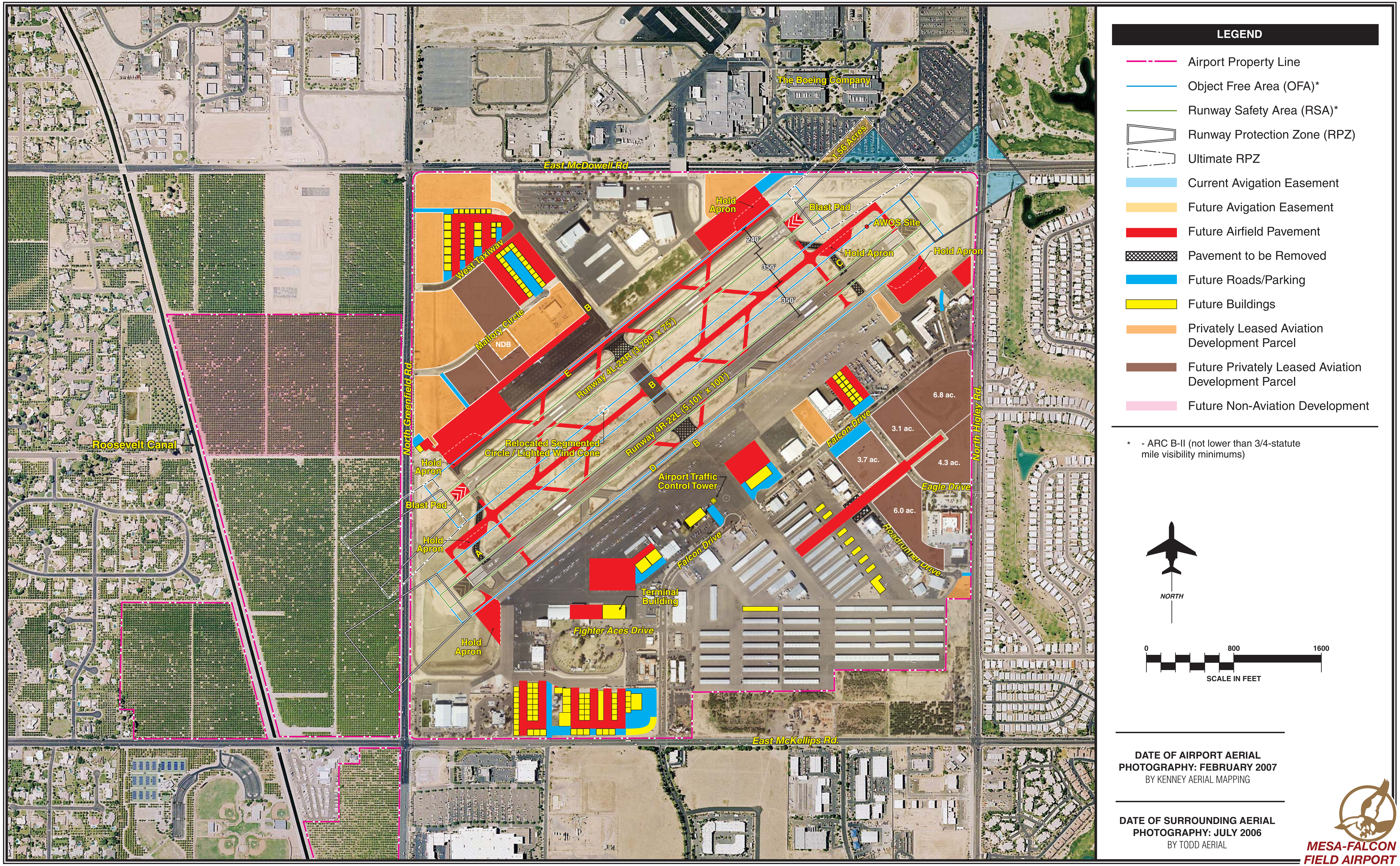


Exhibit 5A
MASTER PLAN CONCEPT

wingspan that categorize them as ARC B-II aircraft.

Due to the large amount of transient jet and turboprop operations at the airport, consideration was also given to these aircraft. The analysis indicated that the airport had a minimum of 1,997 operations by aircraft ranging from ARC B-I to D-III. Of these operations, the largest aircraft included the Gulfstream V (D-III), which conducted only nine operations at the airport during the one-year timeframe. Aircraft in approach category B (1,694 operations) and ADG II (1,561 operations) currently exceed the threshold of 500 or more operations per year for the most demanding family of aircraft. As a result, the existing critical aircraft for the airport is ARC B-II.

The Master Plan anticipates that jet and turboprop activity will continue to be strong and define the critical aircraft parameters for Mesa-Falcon Field Airport through the planning period, consistent with national trends and FAA forecasts. Due to the length of primary Runway 4R-22L (5,101 feet), however, larger business jet operations will be limited in the future and will likely never become a significant portion of the airport's annual operations. As a result, the future critical aircraft is projected to remain as ARC B-II.

It should be noted that previous analysis determined Runway 4L-22R should ultimately conform to design standards for ARC B-II aircraft. In an effort to protect the safety areas related to this runway and accommodate larger turboprop aircraft that will likely utilize this runway on a more frequent basis in the future, planning will consider the full upgrade of Runway 4L-22R to ARC B-II standards, similar to what currently exists on the primary runway. **Table 5A** summarizes the existing conditions and future planning to conform to ARC B-II design standards on both runways at Mesa-Falcon Field Airport.

AIRSIDE RECOMMENDATIONS

The recommended airfield layout is presented on **Exhibit 5A**. The airside recommendations primarily focus on providing for increased capacity at the airport. Additional recommendations include the upgrade of Runway 4L-22R to ARC B-II design standards, improved approach lighting aids and weather reporting aids, and additional hold aprons.

- **Improve airport capacity by constructing additional taxiways on the airfield**

Given the mix of aircraft operating at the airport and the forecast increase in operations, the annual service volume (ASV) of the parallel runway system at the airport is expected to be approached during the planning period. As this occurs, delay to aircraft departures and arrivals increases. Increasing levels of annual delay create undesirable conditions, such as increased air emissions, increased operating costs, and extended aircraft traffic patterns. Increased air emissions are the result of aircraft engines running for longer periods of time, which increases fuel and maintenance costs for owners. In-flight delays cause extended downwind legs for arriving aircraft, which can lead to aircraft flying larger-than-typical traffic patterns and increased overflights of adjoining land uses.

TABLE 5A
Airfield Safety and Facility Dimensions (in feet)
Mesa-Falcon Field Airport

	Runway 4R-22L Existing Conditions	Runway 4L-22R Existing Conditions	Future Planning (Both Runways)
Airport Reference Code (ARC)	ARC B-II	ARC B-I (small aircraft)	ARC B-II
Approach Visibility Minimums	One mile	Visual	Same
Runways			
Length	5,101	3,799	Same
Width	100	75	Same
Runway Safety Area (RSA)			
Width	150	150	150
Length Beyond Runway End	300	300	300
Object Free Area (OFA)			
Width	500	500	500
Length Beyond Runway End	300	300	300
Obstacle Free Zone (OFZ)			
Width	400	350*	400
Length Beyond Runway End	200	200	200
Runway Centerline to:			
Hold Position	200	125*	200
Parallel Taxiway Centerline	250	200*	240
Parallel Runway Centerline	700	700	700
Edge of Aircraft Parking Apron	330	270	250
Runway Protection Zone (RPZ)			
Inner Width	500	250	500
Outer Width	700	450	700
Length	1,000	1,000	1,000
Taxiways			
Width	50	40	35
Safety Area Width	79	79	79
Object Free Area Width	131	131	131
Taxiway Centerline to:			
Fixed or Moveable Object	65.5	65.5	65.5
Taxilanes			
Object Free Area Width	115	115	115
Taxilane Centerline to:			
Fixed or Moveable Object	57.5	57.5	57.5

*Notes deficiency in meeting future ARC B-II design standards

Source: FAA Advisory Circular 150/5300-13, Change 12, *Airport Design*

As presented in Chapter Three, current operational levels have reached approximately 69 percent of the airfield's ASV. By the long term planning period, operations could reach 90 percent of the airfield's ASV. Topographical features and surrounding development limit the feasibility of any runway extension or construction of a third runway at Mesa-Falcon Field Airport that would improve airport capacity and reduce delays. As a result, analysis has indicated that additional taxiway exits are the best method for addressing airport capacity needs through the planning period.

The Master Plan Concept depicts 16 additional high-speed (angled) taxiway exits to be implemented on the airfield. Four high-speed exits are shown connecting to the north side of Runway 4R-22L. Two of these high-speed exits are proposed approximately 1,300 feet from the Runway 4R threshold, while two exits are proposed approximately 1,900 feet from the Runway 22L threshold. On the south side of Runway 4R-22L, two additional high-speed exits are proposed that would connect to parallel Taxiway D near the existing Taxiway B intersection. Farther north, ten high-speed exits are shown connecting to Runway 4L-22R (six on the north side and four on the south side). Two of these exits are located approximately 1,600 feet from each runway threshold, while the other eight are approximately 950 feet from the runway ends.

A midfield parallel taxiway extending the full length of Runway 4R-22L is also proposed. The high-speed exit taxiways extending north of Runway 4R-22L and south of Runway 4L-22R would adjoin this parallel taxiway, which is located 350 feet from each runway centerline. The construction of this parallel taxiway would allow midfield Taxiways A and C to be straightened as this will improve visibility of both the approach and departure paths of the parallel runway system, enhancing airfield safety. All future taxiways at the airport should be equipped with medium intensity taxiway lighting (MITL).

- **Upgrade Runway 4L-22R to ARC B-II design standards**

Currently, Runway 4L-22R is primarily utilized by smaller aircraft and possesses design standards that conform to ARC B-I in some categories and ARC B-II in others. The majority of aircraft that operate on the runway are in ARC A-1 and B-I; however, some larger aircraft such as King Air turboprops do utilize the runway. According to airport traffic control tower (ATCT) personnel, it can be expected that larger turboprop aircraft will utilize Runway 4L-22R in the future as the airport experiences an increase in overall operations. Should the runway be utilized by aircraft in ARC B-II more than 500 operations annually, it will be required to conform to ARC B-II design standards. The runway currently meets most of ARC B-II design standards; however, **Table 5A** outlines three deficiencies that will need to be addressed in order for Runway 4L-22R to fully comply with ARC B-II standards.

- **Relocate Taxiway E farther north to conform to future ARC B-II design standards associated with Runway 4L-22R**

Taxiway E is currently located 200 feet north of Runway 4L-22R. In order to meet ARC B-II safety design standards, parallel Taxiway E will need to be relocated 40 feet farther north to satisfy the 240-foot runway centerline to parallel taxiway centerline separation criteria. Providing for 240 feet of separation will also satisfy future obstacle free zone (OFZ) requirements. The Master Plan Concept depicts the relocation of Taxiway E, which should have a minimal effect on existing and future airfield development north of Runway 4L-22R.

- **Relocate aircraft hold position markings on Runway 4L-22R**

Currently, the hold position markings associated with Runway 4L-22R are located 125 feet from the runway centerline. In order to accommodate ARC B-II design standards, the hold lines would need to be relocated to 200 feet from the runway centerline.

- **Acquire land north of the airport through avigation easement to protect the ultimate runway protection zone (RPZ) on Runway 22R**

The Master Plan Concept depicts additional land acquisition related to securing the ultimate RPZ associated with an ARC B-II runway. As previously discussed, FAA requirements state that an airport should maintain positive control over the RPZ beyond each runway end. Typically, positive control of the RPZ would entail the fee simple property acquisition of land within the designated area. Due to the nature of the current land use north of East McDowell Road encompassed by the expanded RPZ (parking lot for The Boeing Company), an avigation easement on approximately 1.56 acres of land is proposed for the ultimate RPZ. The airport currently has avigation easements in place in areas where the RPZs associated with Runways 22R and 22L extend beyond airport property to the north and east of the airport. The RPZs for Runways 4L and 4R fall within airport property with the exception of North Greenfield Road which traverses both RPZs.

- **Strengthen Runway 4L-22R to 30,000 pounds single wheel loading (SWL)**

The current pavement strength rating on Runway 4L-22R is 12,500 pounds SWL. This strength rating should be adequate to meet the mix of aircraft currently utilizing the runway on a regular basis. The Master Plan Concept includes reconstructing Runway 4L-22R to obtain an ultimate SWL of 30,000 pounds. This will meet the future critical design aircraft within ARC B-II on a regular basis.

- **Construct blast pads on each end of Runway 4L-22R**

In order to mitigate dust particulate and the erosive effect of jet blast and propeller wash, blast pads are proposed on each end of Runway 4L-22R. A 150-foot long by 95-foot wide blast pad is depicted for both ends of the runway on the Master Plan Concept, which would meet ARC B-II design standards.

- **Reconfigure Taxiway B north of Runway 4L-22R and south of Runway 4R-22L per Runway Safety Action Team (RSAT) recommendations**

As discussed in Chapter Four – Airport Development Alternatives, the FAA has placed high importance on runway incursions in recent years. The Runway Safety Action Team (RSAT) has met with airport staff to determine ways to enhance safety related to specific hotspot areas on the airport, where confusing ground routes can lead pilots and other vehicles onto active runways or taxiways causing incursions or accidents.

At Mesa-Falcon Field Airport, the primary hotspot area is associated with Taxiway B where it intersects the south side of Runway 4R-22L. Due to the 150-foot width of Taxiway B, it has been determined that pilots often fail to stop before crossing Runway 4R-22L. Recent runway incursions have involved aircraft entering onto Taxiway B directly from the aircraft parking apron and taxiing north across Runway 4R-22L without ATCT permission. In order to decrease the likelihood of future runway incursions in this area, the airfield plan recommends removing Taxiway B between Runway 4R-22L and parallel Taxiway D and replacing it with two high-speed exits connecting the runway and parallel taxiway. This would create a less direct route for aircraft to enter the runway environment from the aircraft parking apron, thus reducing the chance for incursions.

As aviation development continues to occur on the north side of the airport, the intersection of Taxiway B and Runway 4L-22R could create a potential hotspot similar to the area previously mentioned as additional aircraft traverse this area. As a result, the Master Plan Concept depicts the removal of Taxiway B between Runway 4L-22R and parallel Taxiway E and replaces it with two high-speed exit taxiways. In addition to enhancing the safety of the airfield, the airport's capacity will be further increased with the addition of these high-speed exits.

- **Construct additional holding aprons at the runway ends and in other various infield locations to provide smoother transition of taxiing aircraft**

There are currently three holding aprons located on the airfield. One is located on the south side of Runway 4R-22L near the intersection of parallel Taxiway D and Taxiway C, while the other two are located adjacent to parallel Taxiway E at each end of Runway 4L-22R. A fourth holding apron is currently being designed near the end of Runway 4R.

Additional holding aprons are recommended to be constructed on the Runway 22L end as well as in two locations adjacent to the proposed midfield taxiway. These are designed to provide an area for aircraft to prepare for departure and/or bypass other aircraft which are ready for departure. With the number of aircraft operations at the airport forecast to increase significantly during the planning period, it will be important that the airfield be able to support the smooth transition of taxiing aircraft. Holding aprons will also provide a designated area for aircraft to perform engine run-ups prior to departure. The large holding aprons that are depicted should accommodate the number of aircraft operations projected to occur at the airport during the planning period. Further, the proposed holding aprons on the north side of Runway 4L-22R should be constructed when Taxiway E is relocated farther to the north to satisfy ARC B-II design standards associated with the runway's future critical aircraft.

- **Install runway end identification lights (REILs) on Runway 4L-22R**

The Master Plan Concept includes the installation of REILs on Runway 4L-22R. This will provide pilots with the improved ability to distinguish the runway ends during nighttime or poor visibility conditions. Further, the FAA indicates that REILs should be considered on all lighted runway ends not planned for a more sophisticated approach lighting system.

- **Upgrade to a four-box precision approach path indicator (PAPI-4) on Runway 4R-22L**

Currently, Runway 4R-22L is equipped with a two-box PAPI that provides visual approach lighting for pilots. The airfield plan considers implementing a four-box PAPI on each end of Runway 4R-22L in order to better serve larger and quicker aircraft that currently use and are projected to frequent the airport more regularly.

As previously mentioned, several high-speed exit taxiways are proposed in certain locations on the airfield. In order to accommodate some of these taxiways, future planning should consider the relocation of certain PAPI units in order to satisfy the object free area (OFA) associated with these taxiways. Further analysis will determine if any of the units will need to be relocated.

- **Install an Automated Weather Observation System (AWOS)**

An AWOS is planned to be implemented approximately 250 feet north of Runway 4R-22L and approximately 200 feet from the existing Runway 22L end. Although this location does not meet the recommended separation criteria from the runway threshold as set forth in FAA Order 6560.20B, *Siting Criteria for Automated Weather Observing Systems*, it does provide a location that is easily accessible for personnel to conduct testing and maintenance on the facility when necessary. Electric utility service can be extended to this location from the adjacent runway or proposed midfield taxiway. The AWOS will provide important weather information to pilots such as visibility, cloud ceilings, and altimeter settings.

Currently, Mesa-Falcon Field Airport is equipped with a limited aviation weather reporting station (LAWRS) that requires personnel to measure and report information related to cloud height, weather, obstructions to visibility, temperature, dew point, surface winds, and altimeter settings. Enhancing the LAWRS with an AWOS will provide up-to-date weather details to pilots, especially during times when the ATCT is closed and during times when Instrument Flight Rules (IFR) conditions prevail at the airport.

The unavailability of current weather observation and reporting primarily affects itinerant aircraft operations to the airport as pilots cannot readily determine weather conditions at the airport from a distant location. Aircraft operating under Title 14 Code of Federal Regulations (CFR) Part 135, *Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons On Board Such Aircraft*, conducting aircraft charter and commercial activities, are especially affected as these aircraft cannot operate at the airport unless current weather reporting is available. Section 135.213, *Weather Reports and Forecasts*, states that weather observations made and furnished to pilots to conduct IFR operations at an airport must be taken at the airport where those IFR operations are conducted. Fractional aircraft operators are also limited when there is limited weather reporting at the airport.

LANDSIDE RECOMMENDATIONS

Examples of landside facilities include aircraft storage hangars, commercial aviation business hangars, terminal buildings, aircraft parking aprons, hangar and apron access taxilanes, fuel storage facilities, and vehicle parking lots. The landside plan for Mesa-Falcon Field Airport has been devised to efficiently accommodate potential aviation demand and provide revenue enhancement possibilities by designating the use of certain portions of airport property for aviation-related commercial uses. Future construction of landside facilities is anticipated to be done through a combination of private and public investments.

The landside plan is based on projected needs that can change over time. The landside plan is developed with flexibility in mind to ensure the orderly development of the airport. **Exhibit 5A** depicts the recommended landside development plan for the airport.

North Landside Plan

The north landside plan comprises all the available land north of Runway 4L-22R. Currently, MD Helicopters leases a large portion of land on the north side of the airport that includes approximately 125,000 square feet of hangar and office space as well as aircraft parking apron and automobile parking areas.

Analysis in Chapter Three indicated the need for additional aircraft parking apron space to meet the needs of projected growth in based aircraft and transient aircraft use at the airport. The Master Plan Concept depicts approximately 45,300 square yards of additional aircraft parking apron to be utilized for aircraft parking and tiedowns north of Runway 4L-22R. One area is an expansion to the existing apron on the west side of Taxiway B. The second proposed area is east of the taxiway providing access to MD Helicopters and The Boeing Company.

The airport is also in the process of leasing several parcels of land to private entities for aviation-related development. In fact, the majority of vacant land in the north landside area is now being privately leased. The landside plan shows parcels ranging in size from approximately one acre to 11 acres that are dedicated for aviation use. Automobile access will be obtained by the current access road (Mallory Circle) that extends east of North Greenfield Road as well as a second proposed access road farther north extending from North Greenfield Road. It should be noted that three separate parcels are shown with actual infrastructure layouts in the form of aircraft storage hangars, apron space, and automobile parking. One parcel is approximately one acre in size and is located adjacent to the expansion of the existing aircraft parking apron. The other two parcels encompasses approximately six acres each and are located farther north near the intersection of Taxiway B and West Taxiway. The site plans for these parcels have been approved and hangar development within these areas is depicted as shown on the respective site plans, mainly in the form of executive hangars.

The Falcon Field non-directional beacon (NDB) is also located on approximately one acre of property in the north landside plan. Due to advances in navigational aids including the global positioning system (GPS), the FAA is in the process of decommissioning navigational aids such as the NDB. Long term planning considers the removal of the NDB due to anticipated advances in navigational aid technology over the next several years. As a result, the area currently encompassing the NDB is considered for aviation-use development.

Terminal Area Plan

The current terminal area at Mesa-Falcon Field Airport is comprised of the general aviation terminal building, fixed base operators (FBOs), other aviation-related commercial businesses, and aircraft storage hangars. These facilities are located between Runway 4R-22L and Falcon Drive.

The current terminal building provides for approximately 4,500 square feet of enclosed space. The majority of this area is dedicated for airport administration offices. Analysis in Chapter Three indicated the need for additional terminal building space to accommodate the future demands of airport users.

Analysis also outlined a need to expand public parking to meet the needs of projected growth at the airport. In an effort to better accommodate future airport users, the recommended plan proposes the construction of a new terminal building in the southwest terminal area. Different terminal building locations were analyzed in the previous chapter. The proposed location is well-served for a high volume of aircraft and passenger use as it is adjacent to the main terminal apron. Vehicle access to the relocated terminal building will be obtained via Fighter Aces Drive extending west from Falcon Drive. A large hangar capable of accommodating FBO-type activities is proposed in the location of the existing terminal building.

The terminal area plan also depicts a new location for the ATCT. The current ATCT has been in operation since 1980 and is located directly east of the terminal building. The new ATCT location is approximately 200 feet northeast of its current location. Added benefits of the new ATCT location are the amount of additional space for the construction of a proposed hangar as well as additional automobile parking that could support ATCT personnel and the general public. Analysis in the previous chapter indicated that this location would provide a clear and unobstructed view to all runway ends.

Other areas in the terminal area were closely studied for future development. Approximately 500 feet west of the existing terminal building are six aircraft storage hangars in the form of three enclosed T-hangars and three shade hangars. These storage hangars are considered low-activity facilities and would better serve the airport in a location that is removed from the terminal area flight line. The Master Plan Concept proposes that five of the six hangars be replaced with two conventional hangars that could satisfy the needs of high-activity level aviation activities as well as additional aircraft parking space in the relocated terminal area. Additional aircraft parking area in front of the proposed conventional hangars will help to accommodate the forecast increase in aircraft traffic on the airport.

Keeping in the terminal area, on the east side of Taxiway B is a large conventional hangar that could support FBO-type activities or bulk aircraft storage. The facility is adjacent to apron frontage which is ideal for the high-level activities of an FBO. Approximately 1,000 feet to the east of this location is a linear executive hangar complex that allows separation of multiple aircraft storage.

Approximately 400 feet south of the Runway 22L threshold, an aircraft parking apron is proposed that would provide additional parking and tie-downs to help accommodate the projected increase in aircraft utilization at the airport. It should be noted that a section of this proposed parking apron is dedicated as a holding apron or by-pass taxi area.

East Landside Plan

The east landside plan focuses on currently vacant property on the east side of the airport adjacent to Falcon Drive and North Higley Road. Before any aviation development can take place in this area, aircraft access will need to be provided. A private lease recently expired on an area of property that will allow for the removal of existing facilities so that a large taxilane can be extended to the east, opening up this area for aircraft access and aviation development. The Master Plan Concept also calls for the removal of one T-hangar complex in order to provide for a more convenient transition of aircraft from this area to the runway system. A dual-use taxilane is proposed which would allow two-way access for smaller aircraft to transition to and from the east side of the airport, thus reducing congestion. The proposed taxilane would divide the east area into north and south sections. Cul-de-sacs would be constructed on Roadrunner Drive and Eagle Drive to accommodate the taxilane.

Between Roadrunner Drive and Eagle Drive are two parcels designated for future aviation use. An area to the north of these parcels adjacent to Falcon Drive is currently dedicated for leased automobile parking associated with aviation businesses on the airport and will remain so throughout the planning period.

To the east of Eagle Drive, the Master Plan Concept depicts three parcels ranging in size from 3.1 to 6.8 acres. These parcels are dedicated for future privately leased aviation development. There is adequate space in this area to accommodate several different types of aviation activities.

Keeping in the east landside area, seven executive hangar additions are proposed adjacent to existing T-hangar facilities. To the south of these, an area adjacent to the wash rack facility at the airport is under construction to accommodate an aircraft hangar that will support an aviation-related business.

Southwest Landside Plan

Land that encompasses the southwest side of the airport currently is used for both aviation and non-aviation related activities. Falcon Field Park, located immediately south of the proposed terminal building, encompasses approximately five acres on airport property. The landside plan calls for the retention of the park in its current condition.

Farther south, adjacent to East McKellips Road, a large parcel totaling approximately 14 acres in size is being transformed to accommodate aviation development in the form of conventional and executive hangars. This area will provide activity levels on the airport for aviation businesses, corporate flight departments, and aircraft storage.

Non-Aviation Landside Plan

Mesa-Falcon Field Airport owns portions of land to the west of North Greenfield Road, as depicted on **Exhibit 5A**. These areas of the airport do not have airfield access potential due to the major roadway arteries that separate them from the airfield; therefore, these areas cannot be readily used for aeronautical purposes. Land uses could include retail, office, and a business park. These uses would provide the airport with an opportunity to improve revenue streams, increasing the airport's financial resources. These uses should be promoted as a means to bolster the airport's financial position and ability to become and remain financially self-sufficient. It should be noted that the City has obtained specific approval from the FAA to use certain portions of this airport property for non-aeronautical purposes at this time.

The landside plan identifies one parcel for future non-aviation development. This parcel is located adjacent to the west side of North Greenfield Road and encompasses approximately 59 acres. Immediately south of this area is land owned by the airport that is proposed as open space in order to protect and maintain the approaches serving Runways 4L and 4R. To the west of Roosevelt Canal, an additional 27 acres is included on airport property. A third parcel located on the southwest side of the intersection of East McKellips Road and North Greenfield Road is also located on the airport and encompasses approximately 31 acres, some of which extend farther south of the parameters of **Exhibit 5A**.

SUMMARY

The recommended Master Plan Concept has been developed in conjunction with the PAC, Mesa-Falcon Field Airport management, city officials, airport businesses/users, and interested citizens, and is designed to assist in making decisions on the future development and growth of Mesa-Falcon Field Airport. Flexibility will be very important to future development at the airport, as activity may not occur as predicted. 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.

MESA-FALCON
FIELD AIRPORT

Chapter Six

CAPITAL IMPROVEMENT PROGRAM

Capital Improvement Program

The analyses conducted in previous chapters outlined development needs at the airport over the next 20 years and beyond, based on forecast activity and operational efficiency. Alternatives were evaluated which considered long term layouts to meet the projected facility needs. It is important to note that these needs were tied to planning milestones which could occur as projected; however, it is likely that the demand will fluctuate. Based upon the expanding nature of the Phoenix metropolitan area and the City of Mesa, aviation demand will likely follow similar expansion. One of the most important elements of the master planning process is the application of basic economic, financial, and management rationale to each development item so that the feasibility of implementation can be assured. The purpose of this chapter is to identify capital needs at Mesa-Falcon Field Airport and identify when these should be implemented according to need, function, and demand.

The presentation of the capital improvement program (CIP) has been organized into two sections. First, the airport's capital needs, based on the projected CIP, are presented in narrative and graphic form. Second, capital improvement funding sources on the federal, state, and local levels are identified and discussed.

DEMAND-BASED PLAN

The Master Plan for Mesa-Falcon Field Airport has been developed according to a demand-based schedule. Demand-based planning establishes planning guidelines for the airport

based upon airport activity levels instead of guidelines using subjective factors such as 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 a new level of demand should only be implemented when the levels of demand experienced at the airport justify their implementation.

As discussed, most development items included in the recommended concept will need to follow demand indicators. For example, the plan includes the construction of new aircraft parking aprons, taxilanes, and storage hangars. Based aircraft will be an indicator for additional hangar needs and tiedown spaces. If based aircraft growth occurs as projected, additional hangars and tiedowns will need to be provided to meet the demand. If growth slows or does not occur as projected, hangars and pavement projects can be delayed. As a result, capital expenditures will be undertaken as needed, which leads to a responsible use of capital assets. Some development items do not correspond specifically to actual demand levels, such as maintenance. Maintenance projects are typically associated with day-to-day operations or aging factors and should be monitored and identified by airport management.

A demand-based Master Plan does not specifically require the implementation of any of the demand-based improvements. Instead, it is envisioned that implementation of any Master Plan improvement would be examined against the demand levels prior to implementation. In many ways, this Master Plan is similar to a City's general plan. The Master Plan establishes a plan for the use of airport facilities consistent with the potential aviation needs and 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 for funding.

AIRPORT DEVELOPMENT SCHEDULE AND COST SUMMARIES

Once the specific needs for the airport have been established, the next step is to determine a realistic capital improvement schedule and associated costs for implementing the plan. This section will identify these projects and the overall cost of each item in the development plan. The program outlined in the following pages has been evaluated from a variety of perspectives and represents the culmination of a comparative analysis of basic budget factors, demand, and priority assignments.

The recommended improvements are grouped by planning horizon: short term, intermediate term, and long term. **Table 6A** summarizes the key milestones for each of the three planning horizons. Each year, Mesa-Falcon Field Airport will need to re-examine the priorities for funding, adding or removing projects on the capital programming lists.

TABLE 6A Planning Horizon Milestone Summary Mesa-Falcon Field Airport	Current	Short Term	Intermediate Term	Long Term
ANNUAL OPERATIONS				
Total Itinerant	143,431	162,900	184,800	215,000
Total Local	170,698	191,000	211,000	236,000
Nighttime 3% Adjustment	9,424	10,600	11,900	13,500
Total Operations	**323,553**	**364,500**	**407,700**	**464,500**
BASED AIRCRAFT				
Single Engine	679	909	1,033	1,187
Multi-Engine	123	132	135	132
Turboprop	13	18	23	33
Jet	11	19	30	48
Helicopter	66	72	79	100
Total Based Aircraft	**892**	**1,150**	**1,300**	**1,500**

While some projects will be demand-based, others will be dictated by design standards, safety, or rehabilitation needs. In putting together a listing of projects, an attempt has been made to include anticipated rehabilitation needs through the planning period and capital replacement needs.

Exhibit 6A summarizes the CIP for Mesa-Falcon Field 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. **Exhibits 6B** and **6C** graphically depict development staging. As a Master Plan is a conceptual document, implementation of these capital projects should only be undertaken after further refinement of their design and costs through architectural and engineering analyses. Moreover, projects could require wastewater and drainage improvements. The financial plan addresses this concern, but any future development should include analysis of the capacity of the infrastructure to support the growth.

The cost estimates presented in this chapter have been increased to allow for contingencies that may arise on the project. Capital costs presented here should be viewed only as estimates subject to further refinement during design. Nevertheless, these estimates are considered sufficiently accurate for planning purposes. Cost estimates for each of the development projects listed in the CIP are listed in current (2008) dollars. Adjustments will need to be applied over time as construction costs or capital equipment costs change.

In an effort to further identify capital needs at the airport, the proposed projects can be categorized as follows:

1) **Safety/Security (SS)** – these are capital needs considered necessary for operational safety and protection of aircraft and/or people and

property on the ground near the airport.

2) **Environmental (EN)** – these are capital needs which are identified to enable the airport to operate in an environmentally acceptable manner or meet needs identified in the Environmental Evaluation (Appendix B).

3) **Maintenance (MN)** – these are capital needs required to maintain the existing infrastructure at the airport.

4) **Efficiency (EF)** – these are capital needs intended to optimize aircraft ground operations or passenger use of the general aviation terminal building.

5) **Demand (DM)** – these are capital needs required to accommodate levels of aviation demand. The implementation of these projects should only occur when demand for these needs is verified.

6) **Opportunities (OP)** – these are capital needs intended to take advantage of opportunities afforded by the airport setting. Typically, this will involve improvements to property intended for lease to aviation-related commercial and industrial development. In most cases, projects under this category will be listed as intermediate or long term to be implemented as marketing opportunities present themselves.

Each capital need is categorized according to this schedule. The applicable category (or categories) included are presented in **Table 6B**.

A major focus in the short term period is placed on demand, safety and security, and efficiency. Items include the construction of additional aircraft parking aprons, continued construction of perimeter fencing and control-access gates, and development of a partial midfield parallel taxiway. Also included are additional automobile access roads, upgrades to navigational aids, and aesthetic improvements to airport facilities and roadways.

Intermediate term improvements continue to focus on projects related to growth and development such as the relocation and construction of a new general aviation terminal building, additional aircraft parking aprons, and the continued development of the midfield parallel taxiway. There are also safety-related projects associated with Runway 4L-22R ultimately transitioning to Airport Reference Code (ARC) B-II status that includes the purchase of an avigation easement to provide additional approach protection. Finally, allowance is provided for pavement rehabilitation and maintenance projects.

Long term improvements relate to continued capacity enhancements on the airfield in the form of high-speed exit taxiways on Runway 4L-22R. It is during this time that several airfield upgrades are considered to include the relocation of Taxiway E, taxiway lighting, and safety area improvements. The following subsections discuss the capital needs program in more detail, breaking down the projects by short, intermediate, and long term planning horizons.

06MP17-6A-2/16/09

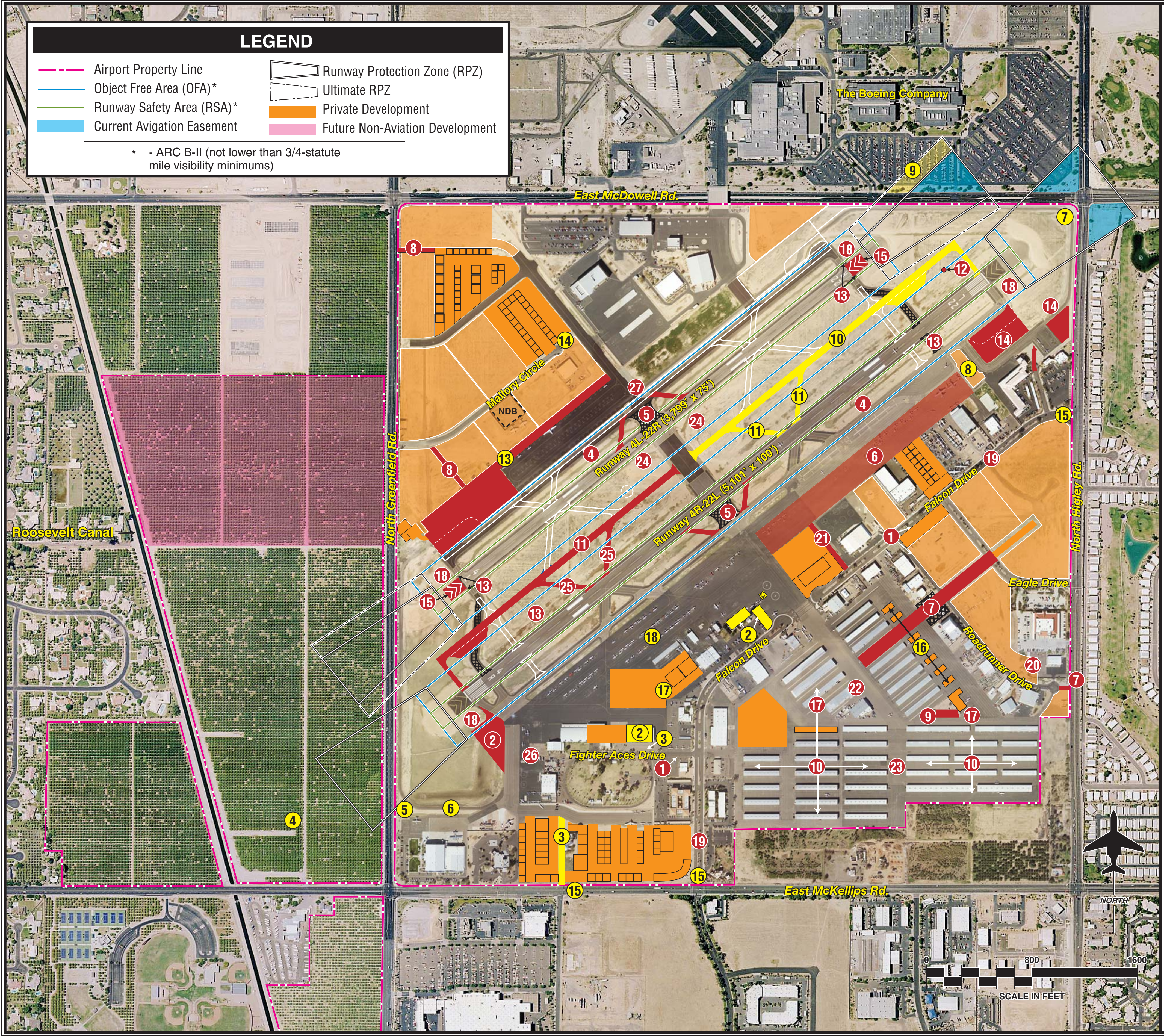
	PROJECT DESCRIPTION	PROJECT COST	FAA ELIGIBLE	ADOT ELIGIBLE	LOCAL SHARE
	SHORT TERM PROGRAM (0-5 YEARS)				
1	Construct Perimeter Fencing along Falcon Drive, Roadrunner Drive, and Fighter Aces Drive - Phases III and IV (RSAT)	$1,500,000	$1,425,000	$37,500	$37,500
2	Construct Runway 4R Hold Apron/Run-Up Area (RSAT)	1,500,000	1,425,000	37,500	37,500
3	Install Vehicle Access Control System onto Airfield (not pictured)	300,000	0	0	300,000
4	Upgrade Stormwater Drainage System to Improve Runway Safety Areas (RSAT)	600,000	570,000	15,000	15,000
5	Design and Construct Taxiway B Reconfiguration and Install Runway Guard Lights (RSAT)	3,150,000	2,992,500	78,750	78,750
6	Design and Reconfigure Higley Ramp and Install Apron Security Lighting	180,000	0	0	180,000
7	Design and Construct Taxilane Extending to Eastside Development Area	2,550,000	0	2,295,000	255,000
8	Design and Construct Vehicle Access Roads in Northwest Development Area	400,000	0	0	400,000
9	Design and Construct Washrack Cover	175,000	0	0	175,000
10	Reconstruct Pavement in South Storage Hangar and Apron Areas	600,000	570,000	15,000	15,000
11	Design Midfield Parallel Taxiway; Construct Phase I (RSAT)	5,350,000	5,082,500	133,750	133,750
12	Design and Construct AWOS Installation	250,000	0	225,000	25,000
13	Design and Construct REILs for Runway 4L-22R; Relocate/Upgrade PAPI System for Runway 4R-22L	325,000	0	292,500	32,500
14	Design and Construct Anzio Ramp Expansion and Access Road	1,650,000	0	1,485,000	165,000
15	Design and Construct Blast Pads for Runway 4L-22R	525,000	0	472,500	52,500
16	Design and Implement Airport Street Signage Program (not pictured)	5,000	0	0	5,000
17	Design and Construct Trash Dumpster Enclosures	50,000	0	0	50,000
18	Design and Install Lighted Noise Abatement Signs	15,000	0	0	15,000
19	Design and Install Landscaping Improvements along Falcon Drive	15,000	0	0	15,000
20	Relocate Airport Operations Yard Wall in Eastside Development Area	50,000	0	0	50,000
21	Relocate and Pave Falcon Drive-Higley Ramp Access Road	400,000	0	0	400,000
22	Upgrade City-Owned Hangar Area Restrooms	10,000	0	0	10,000
23	Design and Construct Vehicle Parking Spaces in South T-Hangar Area	5,000	0	0	5,000
24	Design and Construct Runway 4L-22R Safety Area Upgrades	50,000	47,500	1,250	1,250
25	Design and Construct High-Speed Exit Taxiways on North Side of Runway 4R-22L - Phase I	750,000	712,500	18,750	18,750
26	Design and Construct Former Fuel Farm for Aircraft Parking	300,000	285,000	7,500	7,500
27	Design and Construct Taxiway E Entrance Lights	25,000	23,750	625	625
28	General Pavement Replacement - Runways, Taxiways, Taxilanes, and Parking Aprons (not pictured)	1,325,000	1,258,750	33,125	33,125
	Total Short Term Program	**$22,055,000**	**$14,392,500**	**$5,148,750**	**$2,513,750**
	INTERMEDIATE TERM PROGRAM (6-10 YEARS)				
1	Conduct Part 150 Airport Noise Study	$400,000	$380,000	$10,000	$10,000
2	Design New Terminal Building/Remove Existing Terminal Building/Construct New Terminal Building or Remodel Hangar Building for New Terminal Building	2,750,000	2,612,500	68,750	68,750
3	Design and Construct New Roadway Improvements for New Terminal Building Area; Remove Water Tower	2,500,000	2,375,000	62,500	62,500
4	Purchase and Install Noise Monitors	100,000	0	0	100,000
5	Design and Construct Stormwater Retention Outlet/CAF Intersection Upgrades on West Side	5,000	0	0	5,000
6	Design and Install Fence and Landscaping Between CAF and Airport Service Road	5,000	0	0	5,000
7	Design and Construct Landscaping Improvements at East McDowell Road/ North Higley Intersection	15,000	0	0	15,000
8	Upgrade Higley Ramp Lighting Improvements at East End	30,000	28,500	750	750
9	Acquire 1.56 Acres of Avigation Easement for Runway 22R Approach Protection	500,000	475,000	12,500	12,500
10	Construct Midfield Parallel Taxiway - Phase II (RSAT)	5,000,000	4,750,000	125,000	125,000
11	Construct High-Speed Exit Taxiways on North Side of Runway 4R-22L - Phase II	750,000	712,500	18,750	18,750
12	Update Stormwater Drainage Master Plan (not pictured)	150,000	142,500	3,750	3,750
	INTERMEDIATE TERM PROGRAM (6-10 YEARS) - continued				
13	Design and Construct Restrooms at Greenfield Ramp	100,000	0	0	100,000
14	Design and Construct Mallory Circle Cul-de-sac Improvements	15,000	0	0	15,000
15	Design and Construct New Airport Entrance Signs	50,000	0	0	50,000
16	Design and Construct Lighting Improvements for Aircraft Tiedown Areas Adjacent to City T-Hangars	100,000	95,000	2,500	2,500
17	Prepare Falcon Field Apron for Future Development/Remove T-Hangars and Shade Hangars on Falcon Apron	300,000	285,000	7,500	7,500
18	Design and Install Falcon Ramp Lighting	100,000	95,000	2,500	2,500
19	General Pavement Replacement - Runways, Taxiways, Taxilanes, and Parking Aprons (not pictured)	2,731,000	2,594,450	68,275	68,275
	Sub-Total Intermediate Term Program	**$15,601,000**	**$14,545,450**	**$382,775**	**$672,775**
	Total Intermediate Term Program (Includes 15% Inflation Factor)	**$17,941,150**	**$16,727,268**	**$440,191**	**$773,691**
	LONG TERM PROGRAM (11-20 YEARS)				
1	Design and Relocate Taxiway E to 240' Separation from Runway 4L-22R	$3,000,000	$2,850,000	$75,000	$75,000
2	Reconstruct Runway 4L-22R to 30,000 Pounds Single Wheel Loading	3,954,000	3,756,300	98,850	98,850
3	Design and Relocate Taxiway A	1,000,000	950,000	25,000	25,000
4	Design and Relocate Taxiway C	1,000,000	950,000	25,000	25,000
5	Relocate PAPI System on Runway 4L-22R	100,000	95,000	2,500	2,500
6	Design and Construct High-Speed Exit Taxiways on North Side of Runway 4L-22R	1,000,000	950,000	25,000	25,000
7	Design and Construct High-Speed Exit Taxiways on South Side of Runway 4L-22R	1,500,000	1,425,000	37,500	37,500
8	Design and Install MITL on West Taxiway	100,000	95,000	2,500	2,500
9	Design and Install MITL on Taxiway B - South Side	100,000	95,000	2,500	2,500
10	Design and Install MITL on Taxiway B - North Side	100,000	95,000	2,500	2,500
11	Design and Install Airport Traffic Control Tower Ramp Lighting	100,000	95,000	2,500	2,500
12	Upgrade Falcon Drive, Roadrunner Drive, and Fighter Aces Drive Street Lighting	750,000	0	0	750,000
13	Design and Install Landscaping Improvements along North Higley Road	150,000	0	0	150,000
14	Design and Construct Lighting Improvements along South Side Fence Area	50,000	0	0	50,000
15	Design and Install Landscaping Improvements along East McDowell Road	200,000	0	0	200,000
16	Design and Construct Runway 4R-22L Safety Area Improvements	50,000	47,500	1,250	1,250
17	Design and Construct Additional Runway 4L-22R Safety Area Improvements	50,000	47,500	1,250	1,250
18	Design and Construct Runway 4R-22L Side Safety Area Improvements	200,000	190,000	5,000	5,000
19	Design and Construct Runway 4L-22R Side Safety Area Improvements	200,000	190,000	5,000	5,000
20	Design and Construct Taxiway D Safety Area Improvements	200,000	190,000	5,000	5,000
21	Design and Construct Taxiway E Safety Area Improvements	200,000	190,000	5,000	5,000
22	Design and Construct Midfield Parallel Taxiway Safety Area Improvements	200,000	190,000	5,000	5,000
23	Design and Construct Perimeter Road/Access Road Improvements	100,000	95,000	2,500	2,500
24	Design and Construct Stormwater Retention Basin Improvements	200,000	190,000	5,000	5,000
25	Design and Construct Northeast Aircraft Parking Apron	1,500,000	1,425,000	37,500	37,500
26	Design and Construct Blast Fences	600,000	570,000	15,000	15,000
27	Design and Construct Improvements to Existing City-Owned T-Hangars	750,000	0	0	750,000
28	Design and Construct Lighting Improvements to Existing Shade Hangars	25,000	0	0	25,000
29	Design and Construct Aircraft Tiedowns along North Side Taxiway B	200,000	190,000	5,000	5,000
30	Design and Construct Dust Mitigation Improvements along South Side Fence Area	40,000	0	0	40,000
31	General Pavement Replacement - Runways, Taxiways, Taxilanes, and Parking Aprons (not pictured)	10,000,000	9,500,000	250,000	250,000
	Sub-Total Long Term Program	**$27,619,000**	**$24,371,300**	**$641,350**	**$2,606,350**
	Total Long Term Program (Includes 30% Inflation Factor)	**$35,904,700**	**$31,682,690**	**$833,755**	**$3,388,255**
	TOTAL PROGRAM COSTS (INCLUDING INFLATION FACTORS)	**$75,900,850**	**$62,802,458**	**$6,422,696**	**$6,675,696**

MESA-FALCON FIELD AIRPORT

Exhibit 6A

CAPITAL IMPROVEMENT PROGRAM

06MP17-6B-1/22/09



Short Term Program (0-5 Years)

1. Construct Perimeter Fencing along Falcon Drive, Roadrunner Drive, and Fighter Aces Drive - Phases III and IV (RSAT)
2. Construct Runway 4R Hold Apron/Run-Up Area (RSAT)
3. Install Vehicle Access Control System onto Airfield (not pictured)
4. Upgrade Stormwater Drainage System to Improve Runway Safety Areas (RSAT)
5. Design and Construct Taxiway B Reconfiguration and Install Runway Guard Lights (RSAT)
6. Design and Reconfigure Higley Ramp and Install Apron Security Lighting
7. Design and Construct Taxilane Extending to Eastside Development Area
8. Design and Construct Vehicle Access Roads in Northwest Development Area
9. Design and Construct Washrack Cover
10. Reconstruct Pavement in South Storage Hangar and Apron Areas
11. Design Midfield Parallel Taxiway; Construct Phase I (RSAT)
12. Design and Construct AWOS Installation
13. Design and Construct REILs for Runway 4L-22R; Relocate/Upgrade PAPI System for Runway 4R-22L
14. Design and Construct Anzio Ramp Expansion and Access Road
15. Design and Construct Blast Pads for Runway 4L-22R
16. Design and Implement Airport Street Signage Program (not pictured)
17. Design and Construct Trash Dumpster Enclosures
18. Design and Install Lighted Noise Abatement Signs
19. Design and Install Landscaping Improvements along Falcon Drive
20. Relocate Airport Operations Yard Wall in Eastside Development Area
21. Relocate and Pave Falcon Drive-Higley Ramp Access Road
22. Upgrade City-Owned Hangar Area Restrooms
23. Design and Construct Vehicle Parking Spaces in South T-Hangar Area
24. Design and Construct Runway 4L-22R Safety Area Upgrades
25. Design and Construct High-Speed Exit Taxiways on North Side of Runway 4R-22L - Phase I
26. Design and Construct Former Fuel Farm for Aircraft Parking
27. Design and Construct Taxiway E Entrance Lights
28. General Pavement Replacement - Runways, Taxiways, Taxilanes, and Parking Aprons (not pictured)

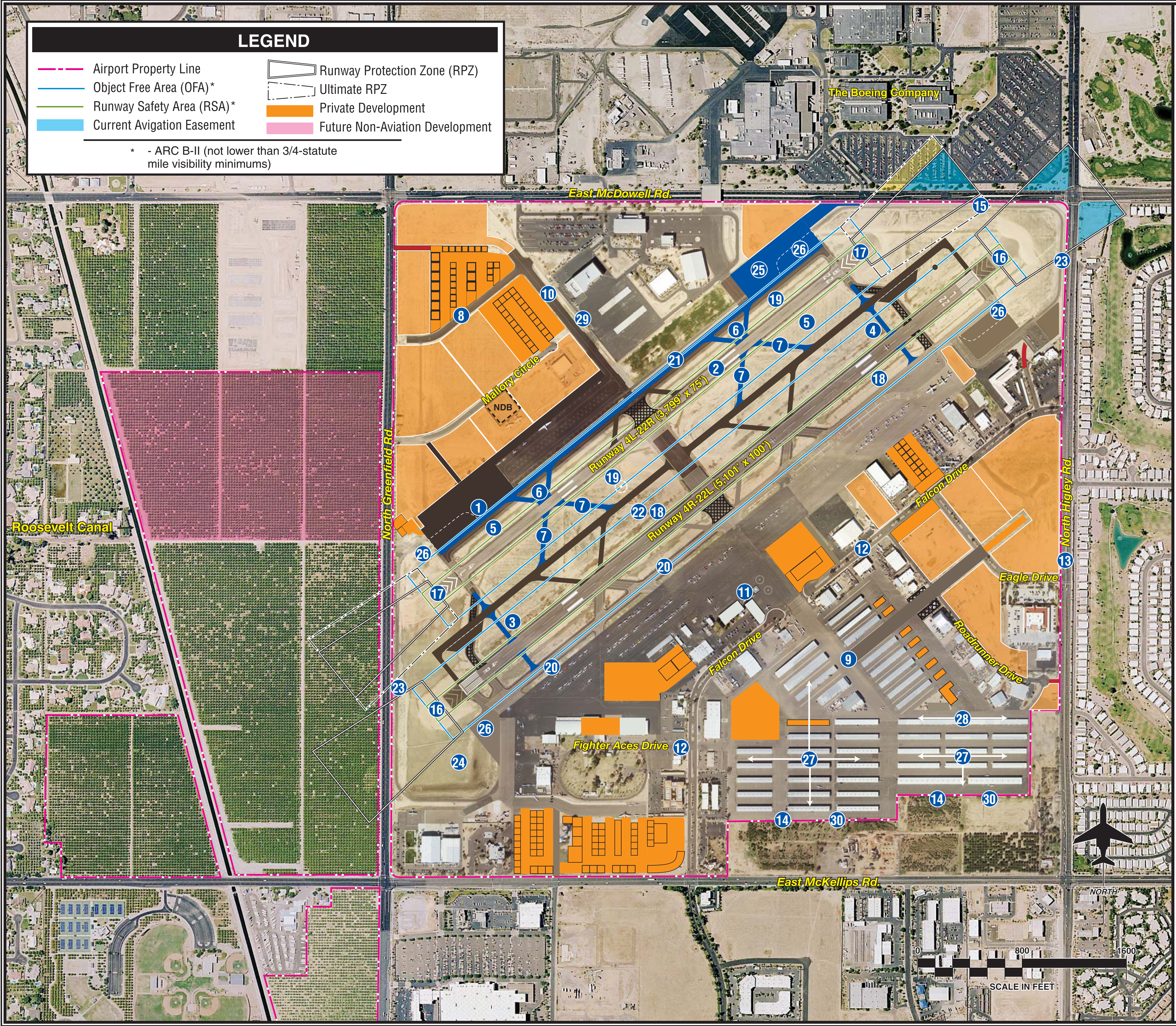
Intermediate Term Program (6-10 Years)

1. Conduct Part 150 Airpot Noise Study (not pictured)
2. Design New Terminal Building/Remove Existing Terminal Building/Construct New Terminal Building or Remodel Hangar Building for New Terminal Building
3. Design and Construct New Roadway Improvements for New Terminal Building Area; Remove Water Tower
4. Purchase and Install Noise Monitors
5. Design and Construct Stormwater Retention Outlet/CAF Intersection Upgrades on West Side
6. Design and Install Fence and Landscaping Between CAF and Airport Service Road
7. Design and Construct Landscaping Improvements at East McDowell Road/ North Higley Intersection
8. Upgrade Higley Ramp Lighting Improvements at East End
9. Acquire 1.56 Acres of Avigation Easement for Runway 22R Approach Protection
10. Construct Midfield Parallel Taxiway - Phase II (RSAT)
11. Construct High-Speed Exit Taxiways on North Side of Runway 4R-22L - Phase II
12. Update Stormwater Drainage Master Plan (not pictured)
13. Design and Construct Restrooms at Greenfield Ramp
14. Design and Construct Mallory Circle Cul-de-sac Improvements
15. Design and Construct New Airport Entrance Signs
16. Design and Construct Lighting Improvements for Aircraft Tiedown Areas Adjacent to City T-Hangars
17. Prepare Falcon Field Apron for Future Development/Remove T-Hangars and Shade Hangars on Falcon Apron
18. Design and Install Falcon Ramp Lighting
19. General Pavement Replacement - Runways, Taxiways, Taxilanes, and Parking Aprons (not pictured)

MESA-FALCON FIELD AIRPORT

Exhibit 6B
DEVELOPMENT STAGING
SHORT & INTERMEDIATE TERMS

06MP17-6C-1/22/09



Long Term Program (11-20 Years)

1. Design and Relocate Taxiway E to 240' Separation from Runway 4L-22R
2. Reconstruct Runway 4L-22R to 30,000 Pounds Single Wheel Loading
3. Design and Relocate Taxiway A
4. Design and Relocate Taxiway C
5. Relocate PAPI System on Runway 4L-22R
6. Design and Construct High-Speed Exit Taxiways on North Side of Runway 4L-22R
7. Design and Construct High-Speed Exit Taxiways on South Side of Runway 4L-22R
8. Design and Install MITL on West Taxiway
9. Design and Install MITL on Taxiway B - South Side
10. Design and Install MITL on Taxiway B - North Side
11. Design and Install Airport Traffic Control Tower Ramp Lighting
12. Upgrade Falcon Drive, Roadrunner Drive, and Fighter Aces Drive Street Lighting
13. Design and Install Landscaping Improvements along North Higley Road
14. Design and Construct Lighting Improvements along South Side Fence Area
15. Design and Install Landscaping Improvements along East McDowell Road
16. Design and Construct Runway 4R-22L Safety Area Improvements
17. Design and Construct Additional Runway 4L-22R Safety Area Improvements
18. Design and Construct Runway 4R-22L Side Safety Area Improvements
19. Design and Construct Runway 4L-22R Side Safety Area Improvements
20. Design and Construct Taxiway D Safety Area Improvements
21. Design and Construct Taxiway E Safety Area Improvements
22. Design and Construct Midfield Parallel Taxiway Safety Area Improvements
23. Design and Construct Perimeter Road/Access Road Improvements
24. Design and Construct Stormwater Retention Basin Improvements
25. Design and Construct Northeast Aircraft Parking Apron
26. Design and Construct Blast Fences
27. Design and Construct Improvements to Existing City-Owned T-Hangars
28. Design and Construct Lighting Improvements to Existing Shade Hangars
29. Design and Construct Aircraft Tiedowns along North Side Taxiway B
30. Design and Construct Dust Mitigation Improvements along South Side Fence Area
31. General Pavement Replacement - Runways, Taxiways, Taxilanes, and Parking Aprons (not pictured)

NORTH

0 800 1600

SCALE IN FEET

DATE OF AIRPORT AERIAL PHOTOGRAPHY: FEBRUARY 2007

BY KENNEY AERIAL MAPPING

DATE OF SURROUNDING AERIAL PHOTOGRAPHY: JULY 2006

BY TODD AERIAL

MESA-FALCON FIELD AIRPORT

Exhibit 6C
DEVELOPMENT STAGING
LONG TERM

TABLE 6B Development Needs by Category Mesa-Falcon Field Airport		
PROJECT DESCRIPTION		**CATEGORY**
SHORT TERM PROGRAM (0-5 YEARS)		
1	Construct Perimeter Fencing along Falcon Drive, Roadrunner Drive, and Fighter Aces Drive - Phases III and IV (RSAT)	SS
2	Construct Runway 4R Hold Apron/Run-Up Area (RSAT)	SS / EF
3	Install Vehicle Access-Control System onto Airfield	SS
4	Upgrade Storm Water Drainage System to Improve Runway Safety Areas (RSAT)	SS
5	Design and Construct Taxiway B Reconfiguration and Install Runway Guard Lights (RSAT)	SS / EF
6	Design and Reconfigure Higley Ramp and Install Apron Security Lighting	DM / SS
7	Design and Construct Taxilane Extending to Eastside Development Area	DM
8	Design and Construct Vehicle Access Roads in Northwest Development Area	DM
9	Design and Construct Washrack Cover	EF / DM
10	Reconstruct Pavement in South Storage Hangar and Apron Areas	MN
11	Design Midfield Parallel Taxiway; Construct Phase I (RSAT)	EN / DM / EF
12	Design and Construct AWOS Installation	SS / EF
13	Design and Construct REILs for Runway 4L-22R; Relocate/Upgrade PAPI System for Runway 4R-22L	SS / EF
14	Design and Construct Anzio Ramp Expansion and Access Road	DM / EF
15	Design and Construct Blast Pads for Runway 4L-22R	SS
16	Design and Implement Airport Street Signage Program	SS / EF
17	Design and Construct Trash Dumpster Enclosures	EF
18	Design and Install Lighted Noise Abatement Signs	SS / EN
19	Design and Install Landscaping Improvements along Falcon Drive	EF
20	Relocate Airport Operations Yard Wall in Eastside Development Area	OP
21	Relocate and Pave Falcon Drive-Higley Ramp Access Road	DM / EF
22	Upgrade City-Owned Hangar Area Restrooms	MN
23	Design and Construct Vehicle Parking Spaces in South T-Hangar Area	SS / DM
24	Design and Construct Runway 4L-22R Safety Area Upgrades	SS
25	Design and Construct High-Speed Exit Taxiways on North Side of Runway 4R-22L - Phase I	DM / EF
26	Design and Construct Former Fuel Farm for Aircraft Parking	DM
27	Design and Construct Taxiway E Entrance Lights	SS / EF
28	General Pavement Replacement - Runways, Taxiways, Taxilanes, and Parking Aprons	MN
INTERMEDIATE TERM PROGRAM (6-10 YEARS)		
1	Conduct Part 150 Airport Noise Study	EN
2	Design New Terminal Building/Remove Existing Terminal Building/Construct New Terminal Building or Remodel Hangar Building for New Terminal Building	DM / EF
3	Design and Construct New Roadway Improvements for New Terminal Building Area; Remove Water Tower	EF / DM
4	Purchase and Install Noise Monitors	EN
5	Design and Construct Stormwater Retention Outlet/CAF Intersection Upgrades on West Side	EN
6	Design and Install Fence and Landscaping Between CAF and Aiprort Service Road	SS
7	Design and Construct Landscaping Improvements at East McDowell Road/North Higley Intersection	MN
8	Upgrade Higley Ramp Lighting Improvements at East End	SS
9	Acquire 1.56 Acres of Avigation Easement for Runway 22R Approach Protection	SS
10	Construct Midfield Parallel Taxiway - Phase II (RSAT)	DM / EF

TABLE 6B (Continued) Development Needs by Category Mesa-Falcon Field Airport		
PROJECT DESCRIPTION		**CATEGORY**
INTERMEDIATE TERM PROGRAM (6-10 YEARS) (Continued)		
11	Construct High-Speed Exit Taxiways on North Side of Runway 4R-22L - Phase II	DM / EF
12	Update Stormwater Drainage Master Plan	EN
13	Design and Construct Restrooms at Greenfield Ramp	OP
14	Design and Construct Mallory Circle Cul-de-sac Improvements	EF
15	Design and Construct New Airport Entrance Signs	EF
16	Design and Construct Lighting Improvements for Aircraft Tiedown Areas Adjacent to City T-Hangars	SS
17	Prepare Falcon Field Apron for Future Development/Remove T-Hangars and Shade Hangars on Falcon Apron	DM / OP
18	Design and Install Falcon Ramp Lighting	SS / EF
19	General Pavement Replacement - Runways, Taxiways, Taxilanes, and Parking Aprons	MN
LONG TERM PROGRAM (11-20 YEARS)		
1	Design and Relocate Taxiway E to 240' Separation from Runway 4L-22R	SS
2	Reconstruct Runway 4L-22R to 30,000 Pounds Single Wheel Loading	SS / MN
3	Design and Relocate Taxiway A	SS / EF
4	Design and Relocate Taxiway C	SS / EF
5	Relocate PAPI System on Runway 4L-22R	SS / EF
6	Design and Construct High-Speed Exit Taxiways on North Side of Runway 4L-22R	EF / DM
7	Design and Construct High-Speed Exit Taxiways on South Side of Runway 4L-22R	EF / DM
8	Design and Install MITL on West Taxiway	SS / EF
9	Design and Install MITL on Taxiway B - South Side	SS / EF
10	Design and Install MITL on Taxiway B - North Side	SS / EF
11	Design and Install Airport Traffic Control Tower Ramp Lighting	SS / EF
12	Upgrade Falcon Drive, Roadrunner Drive, and Fighter Aces Drive Street Lighting	SS / EF
13	Design and Install Landscaping Improvements along North Higley Road	MN
14	Design and Construct Lighting Improvements along South Side Fence Area	SS
15	Design and Install Landscaping Improvements along East McDowell Road	MN
16	Design and Construct Runway 4R-22L Safety Area Improvements	SS
17	Design and Construct Additional Runway 4L-22R Safety Area Improvements	SS
18	Design and Construct Runway 4R-22L Side Safety Area Improvements	SS
19	Design and Construct Runway 4L-22R Side Safety Area Improvements	SS
20	Design and Construct Taxiway D Safety Area Improvements	SS
21	Design and Construct Taxiway E Safety Area Improvements	SS
22	Design and Construct Midfield Parallel Taxiway Safety Area Improvements	SS
23	Design and Construct Perimeter Road/Access Road Improvements	SS / EF
24	Design and Construct Stormwater Retention Basin Improvements	SS / EN
25	Design and Construct Northeast Aircraft Parking Apron	DM
26	Design and Construct Blast Fences	SS / EN
27	Design and Construct Improvements to Existing City-Owned T-Hangars	SS / MN
28	Design and Construct Lighting Improvements to Existing Shade Hangars	SS
29	Design and Construct Aircraft Tiedowns along North Side Taxiway B	DM
30	Design and Construct Dust Mitigation Improvements along South Side Fence Area	EN
31	General Pavement Replacement - Runways, Taxiways, Taxilanes, and Parking Aprons	MN

Categories:
SS - Safety/Security
EN - Environmental
MN - Maintenance
EF - Efficiency
DM - Demand
OP - Opportunity

SHORT TERM IMPROVEMENTS

The short term planning horizon CIP considers 28 projects for the five-year period and is presented on **Exhibit 6A** and illustrated on **Exhibit 6B**. A large majority of these projects deal with expanding the airport and include additional and improved aircraft parking aprons, taxiways, and taxilanes. Safety and security are also a priority among projects in the short term planning horizon. Per recommendations by the Runway Safety Action Team (RSAT), installation of perimeter fencing and control-access gates and improvements to runway safety areas are also identified.

The first project listed in the plan calls for the Phases III and IV construction of perimeter fencing in certain locations on the airport. In the post-9/11 era, security has become a top priority for airports in particular. Mesa-Falcon Field Airport is currently in the process of constructing perimeter chain-link fencing in several areas where continued aviation-related landside development is occurring. In addition to safety factors, constructing this perimeter fencing will allow the airport to better comply with potential security mandates that may be required of general aviation airports in the future. This project was a recommendation made by the RSAT due to the high number of vehicle runway incursions at the airport. To follow this project, the City plans to install access-control gates in several locations on the airport to provide an improved system of allowing vehicles access to aircraft storage areas and aviation-related businesses.

The construction of an aircraft hold apron/run-up area on the south side of Runway 4R is also included in the short term CIP. As previously discussed, the airport is projected to experience a significant increase in aircraft operations through the planning period which means more aircraft will be present on the airfield at any particular time. This aircraft hold apron/run-up area will allow a designated area for aircraft to prepare for departure. It will also provide more efficient taxiing operations as aircraft can bypass those waiting for departure without delay. It should be mentioned that this project was recommended by the RSAT to increase safety on the airfield.

The next project in the short term is associated with storm water drainage improvements to be made on the airport. Certain portions of the airfield included in the runway safety area (RSA) on the south side of Runway 4R-22L are expected to be improved as part of this project.

The reconfiguration of Taxiway B is also programmed in the short term CIP. As previously discussed, the FAA has placed high importance on runway incursions in recent years. The RSAT has met with airport staff at Mesa-Falcon Field Airport to determine ways to enhance safety related to specific hotspot areas on the airfield. It has been determined that an area of concern is currently located on the south side of Runway 4R-22L at the intersection of Taxiway B. Recent runway incursions have involved aircraft entering onto Taxiway B directly from the aircraft parking apron and taxiing north across Runway 4R-22L without airport traffic control tower (ATCT) permission. This may be due to the 150-foot width of Taxiway B. In order to decrease the likelihood of future runway incursions in this area, it is recommended that the portion of Taxiway B be removed between Runway 4R-22L and Taxiway D. Two high-speed exit taxiways will serve as a replacement; thus, creating a less direct route for aircraft to enter the runway environment from the aircraft parking apron. This project also entails doing the same thing to the north side of Runway 4L-22R at the intersection of Taxiway B, as a similar problem could arise in this area in the future as aviation development continues to occur on the north side of the airport. Replacing portions of Taxiway B with high-speed exit taxiways will also further increase the airport's capacity which is desired as operations are projected to grow. Runway guard lights are also included as part of this project to help direct aircraft to proper airfield pavements.

In order to provide additional aircraft parking space on existing airport pavement, another project calls for reconfiguring the Higley Ramp. Areas of the terminal apron on the east side of Taxiway B are currently being analyzed to provide a more efficient layout of aircraft tiedown spaces in order to maximize the amount of apron space available for aircraft activities. In addition to providing more parking space, apron lighting will also be installed to make the area more secure during nighttime conditions.

The next project involves additional landside development on the east side of the airport. A taxilane will be extended that provides aircraft access to the area. This project includes the removal of one T-hangar complex and two box hangars in order for the taxilane to be extended to the east. Constructing this taxilane will allow approximately 25 acres of property to be utilized for aviation development over the next several years. In addition, cul-de-sacs will be constructed on Roadrunner Drive and Eagle Drive, and the south portion of Roadrunner Drive will be extended to North Higley Road in order to provide vehicle access to the southeast side of the airport.

Vehicle access roads are planned in the northwest area of the airport that will provide access to private hangar development. This is desired as they will limit the amount of vehicular traffic transitioning active taxiways and other aircraft movement areas.

The short term planning horizon includes improvements to existing pavement in the south area of the airport adjacent to hangar storage and apron areas. The airport currently has a washrack that is located on the southeast side of the airport adjacent to several aircraft storage hangars. A cover is proposed to be constructed over the washrack to provide more efficient use of the facility.

The next three projects in the short term are associated with areas located adjacent to the parallel runway system. To improve airfield capacity and create a more efficient system for taxiing aircraft, a parallel taxiway is proposed that will be located between Runways 4R-22L and 4L-22R and extend the full-length of Runway 4R-

22L. An environmental assessment will need to be completed before the design and construction of this parallel taxiway. The Phase I construction of this taxiway will extend from Runway 4R to Taxiway B. A hold apron/run-up area will also be included in this project to allow a designated area for aircraft to prepare for departure or bypass those aircraft waiting for departure. The segmented circle and windcone will need to be relocated prior to the implementation of the taxiway. An automated weather observation system (AWOS) is also planned between the parallel runways adjacent to the Runway 22L threshold. The AWOS will provide accurate weather reporting for the airport and replace the limited aviation weather reporting station (LAWRS) that is currently located on the airfield.

In an effort to better serve larger and faster aircraft that currently use and are projected to frequent the airport more regularly, a four-box precision approach path indicator (PAPI-4) is considered for Runway 4R-22L. In addition, the PAPI system serving Runway 22L should be relocated to accommodate future taxiway construction in this area. Runway end identifier lights (REILs) are also recommended on Runway 4L-22R to provide pilots with the improved ability to distinguish the runway ends.

As previously discussed, forecasts predict that additional aircraft parking space will be needed to accommodate the future demands of aircraft utilizing the airport. The CIP calls for the design and construction of additional aircraft parking apron space immediately north of Anzio's Restaurant and in the former fuel farm area located north of Tango One Aviation. These aprons will allow for additional itinerant aircraft parking while also providing a designated hold apron/run-up area for aircraft departing Runway 22L. Blast pads on each end of Runway 4L-22R are also programmed in the short term CIP.

A number of additional projects are listed within the short term CIP that deal with improving both airside and landside facilities. These include runway safety area upgrades, landscaping adjacent to automobile access roads, and redeveloping certain portions of the airport for future aviation activities.

Ongoing replacement and maintenance of airport pavements is considered throughout the plan. A total of $1.3 million is included for these projects that could entail crack sealing, rejuvenating seal coats, slab replacements, and overlays. It should be noted that the airport has recently expanded the aircraft parking apron on the northwest side of the airport.

Short term projects presented on Exhibit 6A and graphically depicted on Exhibit 6B have been estimated to cost approximately $22.1 million. Of that total, the local share is projected to be $2.5 million.

INTERMEDIATE TERM IMPROVEMENTS

The intermediate term CIP considers 19 projects for the five-year timeframe that include the continued extension of a midfield parallel taxiway and the relocation of the terminal area. Intermediate improvements are listed on **Exhibit 6A** and depicted on **Exhibit 6B**.

The initial project during this timeframe calls for the airport to conduct a Part 150 noise study. This will seek to reduce the impacts of aircraft operations on areas adjacent to the airport.

The next project in the intermediate term deals with the general aviation terminal building. Previous analysis determined that additional terminal building space will be needed to accommodate future demands of airport users. The current general aviation terminal building is placed in a central location on the airfield that serves a high volume of aircraft and general aviation passenger use. The plan calls for the existing terminal building to be removed and for the construction of a new general aviation terminal facility farther southwest in the area currently occupied by existing World War II hangars. It should be mentioned that it is anticipated during this timeframe that Mesa-Falcon Field Airport is expected to have a new ATCT constructed. The location of the new control tower is expected to be approximately 200 feet northeast of its current location. This will provide additional space for the construction of a large commercial aviation hangar where the existing terminal building is located. The construction of the ATCT is not listed in the CIP, as this is a Federal Aviation Administration (FAA) project.

A project is also identified that prepares Runway 4L-22R for the transition to ARC B-II design standards. The plan considers the airport acquire an avigation easement over land north of East McDowell Road to satisfy an expanded runway protection zone (RPZ) serving the runway.

The intermediate term CIP includes the Phase II construction of the parallel taxiway that extends from Taxiway B to Runway 22L. Similar to the Phase I construction in the short term CIP, Phase II includes an aircraft hold apron/run-up area that will provide a more efficient taxiing system for aircraft. Upon completion of this parallel taxiway, it is recommended that high-speed exit taxiways be constructed on the north side of Runway 4R-22L connecting to the new parallel taxiway. Previous studies indicated that high-speed taxiways are the best remedy for increasing capacity on the airport since factors adjacent to the airport limit the feasibility of a runway extension or construction of a third runway.

Remaining projects within the intermediate term CIP deal with removing five aircraft storage hangar complexes in order to provide an area for high-activity aviation use on the Falcon apron. In doing so, space for additional aircraft parking and conventional hangar development will be provided that could support fixed base operator (FBO) or other aviation business activities and transient aircraft parking for the new terminal building. Finally, projects calling for additional airfield lighting and improvements to access roads are identified as well as continued landscaping improvements.

A total of $2.7 million is included in this planning period for on-going pavement replacement and maintenance needs such as crack sealing, rejuvenating seal coats, slab replacements, and overlays as necessary.

Projects included in the intermediate term have been estimated to cost $17.9 million when applying a 15% inflation factor, as presented on Exhibit 6A and graphically depicted on Exhibit 6B. The total local share is approximately $773,700.

LONG TERM IMPROVEMENTS

The long term CIP considers 31 projects for the ten-year period focused on improving airfield capacity and efficiency and improving existing runway, taxiway, and apron pavements and safety areas. These projects are listed on **Exhibit 6A** and illustrated on **Exhibit 6C**.

The first projects in the long term include the upgrade of Runway 4L-22R to ARC B-II standards. Parallel Taxiway E will need to be relocated 240 feet north of Runway 4L-22R in order to meet FAA safety standards. Finally, strengthening Runway 4L-22R in order to better accommodate larger aircraft projected to utilize the runway on a more frequent basis should be considered. Currently, the runway has a weight-bearing capacity of 12,500 pounds single wheel loading (SWL). Increasing the pavement strength to 30,000 pounds SWL will withstand the runway's future critical aircraft in ARC B-II on a regular basis. Due to the proposed taxiways associated with Runway 4R-22L, midfield Taxiways A and C should be relocated to provide a safer airfield environment.

Another project in the long term includes the relocation of both PAPI-2 units on Runway 4L-22R. In doing so, proper clearances will be provided for the construction of additional taxiways to the runway. Four high-speed exit taxiways to be constructed on each side of Runway 4L-22R that would connect to parallel Taxiway E and the midfield parallel taxiway comprise the next items on the long term CIP. These would provide continued capacity enhancements that will be needed as the airport experiences increases in aircraft operations. The construction of these taxiways should provide the maximum potential for taxiway development on the airfield.

The next four projects focus on implementing additional lighting on the airfield. Medium intensity taxiway lights (MITL) are called for on taxiways located in the northwest area of the airport as well as on Taxiway B extending south into the hangar storage areas. Additional ramp lighting is also identified for aircraft parking near the ATCT.

Other projects in the long term include enhancing lighting and landscaping on the airport's three main automobile access road: Falcon Drive, Roadrunner Drive, and Fighter Aces Drive. Several projects related to improving various airfield safety areas are also identified. A new aircraft parking apron on the northeast side of the airport is called for at this time. A roadway from East McDowell Road will provide automobile access to this area.

As with the short term and intermediate term CIP, a large amount of money is dedicated for improving airport pavements as well.

Total long term projects listed on Exhibit 6A and graphically depicted on Exhibit 6C have been estimated to cost approximately $35.9 million when applying a 30% inflation factor. The local share is estimated at $3.4 million. The total CIP program costs are estimated at $77.1 million, with $6.7 million being the projected local share.

CAPITAL IMPROVEMENT FUNDING SOURCES

Financing capital improvements at Mesa-Falcon Field 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 federal and state levels. The following discussion outlines key sources of funding potentially available for capital improvements at Mesa-Falcon Field Airport.

FEDERAL GRANTS

The United States Congress has long recognized the need to develop and maintain a system of aviation facilities across the nation for purposes of national defense and promotion of interstate commerce. Various grant-in-aid programs to public airports have been established over the years for this purpose. The most recent legislation is the Airport Improvement Program (AIP) of 1982. The AIP has been reauthorized several times, with the most recent legislation enacted in late 2003 and entitled, *Vision 100 – Century of Aviation Reauthorization Act*. *Vision 100's* enacted four-year program covered FAA fiscal years 2004, 2005, 2006, and 2007.

The source for *Vision 100* funds was 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, taxes on airline tickets, aviation fuel, and various aircraft parts.

Vision 100 expired on September 30, 2007. Since this time (March 2009), the United States Congress has not passed a reauthorization or long term AIP program. The federal government has been operating on a series of continuing resolutions which allows the continued collection of aviation taxes at 2007 levels. Both the Senate and House of Representatives have considered legislation reauthorizing the AIP program and reestablishing the Aviation Trust Fund; however, Senate and House versions vary and neither bill has been passed. While different in make-up, both bills retained the fundamentals of the current program for eligibility and matching levels. Therefore, the CIP assumes a similar funding system will be in place through the planning period of this Master Plan.

Non-Primary Entitlement Funds

Funds are distributed each year by the FAA from appropriations by Congress. A portion of the annual distribution is to primary commercial service airports based upon enplanement (passenger) levels. Eligible general aviation airports could receive up to $150,000 funding each year in Non-Primary Entitlement (NPE) funds. Eligible general aviation airports include those that are included in the *National Plan of Integrated Airport Systems* (NPIAS). Mesa-Falcon Field Airport is eligible for full NPE funding according to the 2007-2011 NPIAS.

Discretionary Funds

In a number of cases, airports face major projects that will require funds in excess of the airport's annual non-primary entitlements. Thus, additional funds from discretionary apportionments under AIP are desirable. The primary feature about discretionary funds is that they are distributed on a priority basis. A National Priority Ranking System is used to evaluate and rank each airport project. Under this system, projects are ranked by their purpose. Projects ensuring airport safety and security are ranked as the most important priorities, followed by maintaining current infrastructure development, mitigating noise and other environmental impacts, meeting standards, and increasing system capacity.

Whereas NPE monies are guaranteed on an annual basis, discretionary funds are not assured. If the combination of entitlement and discretionary funds does not provide enough capital for planned development, projects would either be delayed or require funding from the airport's revenue or other authorized sources.

STATE FUNDING PROGRAM

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, aircraft registration tax, and registration fees (as well as interest on these funds) are deposited in the Arizona Aviation Fund. The State Transportation Board establishes the policies for distribution of these state funds.

Under the State of Arizona's grant program, an airport can receive funding for one-half (currently 2.5 percent) of the local share of projects receiving federal AIP funding. The state also provides 90 percent funding for projects which are typically not eligible for federal AIP funding or have not received federal funding.

It should be noted that due to recent budget shortfalls, limitations have been placed on state funding programs. This has directly impacted the

State's Aviation Fund, as the amount of money dedicated to airport improvements has been significantly reduced. It is projected that the Aviation Fund will return to normal levels within the next few years as the State's budget improves.

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. Eligible projects include runway, taxiway, and apron improvements; land acquisition, planning studies, and the preparation of plans and specifications for airport construction projects; as well as revenue-generating improvements such as hangars and fuel storage facilities. Projects which are not currently eligible for the State Airport Loan Program are considered if the project would 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. As previously discussed, current limitations on the state funding program could affect this program.

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 that 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. Mesa-Falcon Field Airport participates in this program.

Public Law 103-305 requires that airports requesting federal AIP funding for pavement rehabilitation or reconstruction have an effective pavement maintenance program system. To this end, ADOT-Aeronautics maintains an Airport Pavement Management System (APMS). This system requires monthly airport inspections which are conducted by airport management and supplied to ADOT.

The Arizona Airport Pavement Management System uses the Army Corps of Engineers "Micropaver" program as a basis for generating a Five-Year

APPP. The APMS consists of visual inspections of all airport pavements. Evaluations are made of the types and severities observed and entered into a computer program database. Pavement Condition Index (PCI) values are determined through the visual assessment of pavement conditions in accordance with the most recent FAA Advisory Circular 150/5380-7, *Pavement Management System*, and range from 0 (failed) to 100 (excellent). Every three years, a complete database update with new visual observations is conducted. Individual airport reports from the update are shared with all participating system airports. ADOT-Aeronautics ensures that the APMS database is kept current, in compliance with FAA requirements.

Every year, ADOT-Aeronautics, utilizing the APMS, will identify airport pavement maintenance projects eligible for funding for the upcoming five years. These projects will appear in the State's Five-Year Airport Development Program. Once a project has been identified and approved for funding by the State Transportation Board, the airport sponsor may elect to accept a state grant for the project and not participate in the APPP, or the airport sponsor may sign an Inter-Government Agreement (IGA) with ADOT-Aeronautics to participate in the APPP. Existing limitations on the state funding program could temporarily affect the usefulness of this program.

LOCAL FUNDING

The balance of project costs, after consideration has been given to grants, must be funded through local resources. Mesa-Falcon Field Airport is operated by the City of Mesa. The airport is currently financially self-sustaining and does not rely upon general funds from the city. The goal for the operation of the airport is to continue to generate ample revenues to cover all operating and maintenance costs as well as the local matching share of capital expenditures.

There are several alternatives for local financing options for future development at the airport, including airport revenues, direct funding from the City, issuing bonds, and leasehold financing. These strategies could be used to fund the local matching share, or complete the project if grant funding cannot be arranged or airport revenues are insufficient to cover the costs.

Local funding options may also include the solicitation of private developers to construct and manage hangar facilities at the airport. This practice is currently in place at Mesa-Falcon Field Airport. The capital improvement program has assumed that much of the landside facility development would be undertaken in this manner. Outsourcing hangar development can benefit the airport sponsor by generating land lease revenue and relieving the sponsor of operations and maintenance costs.

PLAN IMPLEMENTATION

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, while continuing to be economically self-sufficient.

The actual need for facilities is most appropriately established by airport activity levels rather than a specified date. For example, projections have been made as to 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 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 policy-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 airport management, thereby improving the plan's effectiveness.

In summary, the planning process requires that airport management 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.

MESA-FALCON FIELD AIRPORT

Appendix A

GLOSSARY OF TERMS

Glossary of Terms

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 non-regulatory 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: An alphabetic classification of aircraft based upon 1.3 times the stall speed in a landing configuration at their maximum certified landing weight.

AIRCRAFT OPERATION: The landing, takeoff, or touch-and-go procedure by an aircraft on a runway at an airport.

AIRCRAFT OPERATIONS AREA: 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 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 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 LAYOUT DRAWING (ALD): The drawing of the airport showing the layout of existing and proposed airport facilities.

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 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 enroute 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 enroute phase of flight.

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, dewpoint, 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).

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.

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.

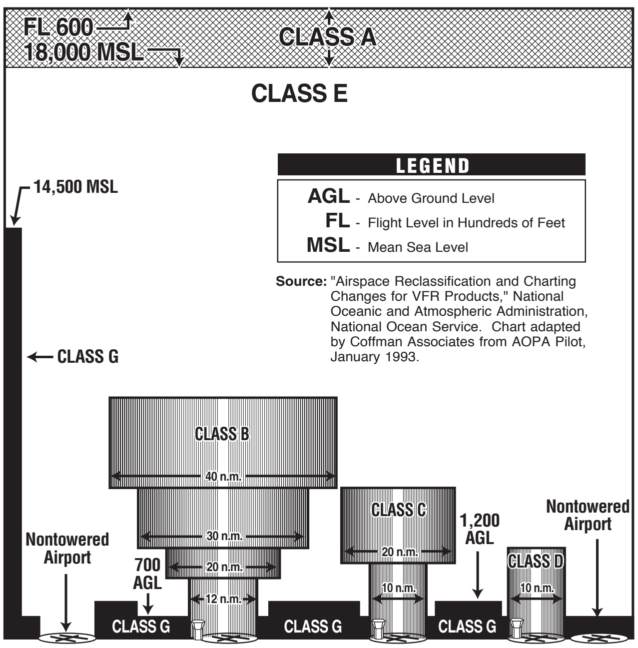
CONTROLLED AIRPORT: An airport that has an operating airport traffic control tower.

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 proce dures. 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."

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.

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; and

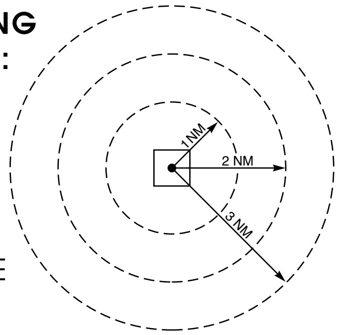
- *LANDING DISTANCE AVAILABLE (LDA):* The runway length declared available and suitable for landing.

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 A-weighted 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."

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 non-scheduled 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 ar 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.

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.

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."

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.

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.

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.

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.

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.

KNOTS: A unit of speed length used in navigation that is equivalent to the number of nautical miles traveled in one hour.

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 enroute 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.

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.

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.)

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.

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.

OPERATION: A take-off or a landing.

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.

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 Sevice Volume. PVC conditions exist when the cloud ceiling is less than 500 feet and visibility is less than one mile.

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 enroute 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 enroute 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.

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 TERMINAL ARRIVAL (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.

TACTICAL AIR NAVIGATION (TACAN): An ultra-high 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.

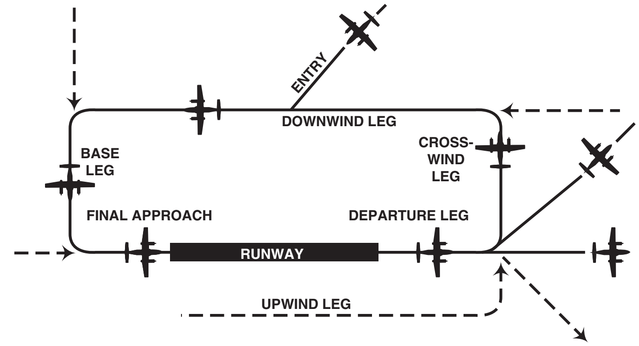
TOUCHDOWN: The point at which a landing aircraft makes contact with the runway surface.

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.

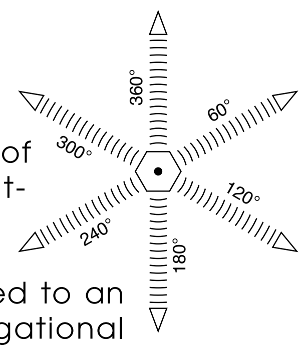


UNCONTROLLED AIRPORT: An airport without an air traffic control tower at which the control of Visual Flight Rules traffic is not exercised.

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."



VECTOR: A heading issued to an aircraft to provide navigational guidance by radar.

VERY HIGH FREQUENCY/ OMNIDIRECTIONAL RANGE STATION (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 STATION/ 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."

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.

Abbreviations

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)

APV: instrument approach procedure with vertical guidance

ARC: airport reference code

ARFF: aircraft rescue and firefighting

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 (100LL)

AWOS: automated weather observation station

BRL: building restriction line

CFR: Code of Federal Regulations

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

DWL: runway weight bearing capacity for aircraft with dual-wheel type landing gear

DTWL: runway weight bearing capacity fo 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 middle marker

LOC: ILS localizer

LOM: compass locator at ILS outer marker

LORAN: long range navigation

MALS: medium intensity approach lighting system

MALSR: medium intensity approach lighting system with runway alignment 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

MSL: 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 rulemaking

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 sequenced flashers

SSALR: 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 type landing gear

STWL: 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

MESA-FALCON
FIELD AIRPORT

Appendix B

ENVIRONMENTAL EVALUATION

Appendix B
ENVIRONMENTAL EVALUATION

A review of the potential environmental impacts associated with proposed airport projects is an essential consideration in the Airport Master Plan process. The primary purpose of this section is to review the proposed improvement program at Mesa-Falcon Field Airport to determine whether the proposed actions could, individually or collectively, have the potential to significantly affect the quality of the environment. The information contained in this section was obtained from previous studies, various internet websites, and analysis by the consultant.

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 FAA *Order 1050.1E, Environmental Impacts: Policies and Procedures*, compliance with NEPA is generally satisfied through the preparation of an Environmental Assessment (EA). 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 *Order1050.1E and Order 5050.4B, National Environmental Policy Act* (NEPA) *Implementation Instructions for Airport Actions.*

ENVIRONMENTAL ANALYSIS

FAA Orders 1050.1E and 5050.4B contain a list of the environmental categories to be evaluated for airport projects. Of the 20 plus environmental categories, the following resources are not found within the airport environs:

- Coastal Resources
- Environmental Justice Areas and Children's Environmental Health Risks
- Wild and Scenic Rivers
- Section 4(f) Properties

The following sections describe potential impacts to resources present within the airport environs. These resources were described in detail within Chapter One of this study.

AIR QUALITY

At the time Chapter One of this Master Plan was prepared, portions of Maricopa County were classified as being in non-attainment for particulate matter, ozone (both one and eight hour), and carbon monoxide. Recently, the area was reclassified as being a maintenance area for carbon monoxide; therefore, the area is currently in non-attainment for only particulate matter and ozone.

As airport development projects are undertaken the amount of emissions at the airport will increase. To determine the significance of this potential increase an emissions inventory will need to be performed as part of the NEPA analysis for the projects. This emissions inventory will be used to determine if the project meets General Conformity outlined within the State Implementation Plan (SIP).

Proposed airport improvements which will result in a disturbance greater than 0.1 acre of surface area are subject to Maricopa County Air Quality Department Rule 310: *Control of Air Contaminants – Fugitive Dust Sources*. This rule establishes limits for the emissions of particulate matter into the ambient air from any property, operations, or activity that may serve as a fugitive dust source.

COMPATIBLE LAND USE AND NOISE

Aircraft sound emissions are often the most noticeable environmental impact an airport will produce on a surrounding community. If the sound is sufficiently loud or frequent in occurrence, it may interfere with various activities or otherwise be considered objectionable. To determine noise-related impacts that the proposed action could have on the environment surrounding the airport, noise exposure patterns based on projected future aviation activity were analyzed.

The standard methodology for analyzing noise conditions at airports involves the use of a computer simulation model. The Federal Aviation Administration (FAA) has approved the Integrated Noise Model (INM) for use in modeling noise for airports.

The INM describes aircraft noise in the *Yearly Day-Night Average Sound Level* (DNL). DNL accounts for the increased sensitivity to noise at night (10:00 p.m. to 7:00 a.m.) and is the metric preferred by the FAA, Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD), among others, as an appropriate measure of cumulative noise exposure.

The INM works by defining a network of grid points at ground level around the airport. It then selects the shortest distance from each grid point to each flight track and computes the noise exposure for each aircraft operation by aircraft type and engine thrust level, along each flight track. Corrections are applied for air-to-ground acoustical attenuation, acoustical shielding of the aircraft engines by the aircraft itself, and aircraft speed variations. The noise exposure levels for each aircraft are summed at each grid location. The DNL at all grid points is used to develop noise exposure contours for selected values (e.g., 65, 70, and 75 DNL). Noise contours are then plotted on a base map of the airport environs using the DNL metrics.

In addition to the mathematical procedures defined in the model, the INM has another very important element. This is a database containing tables correlating noise, thrust settings, and flight profiles for most of the civilian aircraft and many common military aircraft operating in the United States. This database, often referred to as the noise curve data, has been developed under FAA guidance based on rigorous noise monitoring in controlled settings. In fact, the INM database was developed through more than a decade of research, including extensive field measurements of more than 10,000 aircraft operations. The database also includes performance data for each aircraft to allow for the computation of airport-specific flight profiles (rates of climb and descent). The most recent version of the INM, Version 7.0, was used for modeling the noise condition for this master plan.

INM Input

A variety of user-supplied input data is required to use the INM. This includes the airport elevation, average annual temperature, airport area terrain, a mathematical definition of the airport runways, the mathematical description of ground tracks above which aircraft fly, and the assignment of specific take-off weights to individual flight tracks. In addition, aircraft not included in the model's database may be defined for modeling, subject to FAA approval.

- **Activity Data**

Airport activity is defined as the take-offs and landings by aircraft operating at the facility; this is also referred to as aircraft operations. Activity is further described as either *local*, indicating aircraft practicing take-offs and landings (i.e., performing touch-and-go's), or *itinerant*, referring to the initial departure from or final arrival at the airport.

Existing airport activity (i.e., take-offs and landings, or operations by aircraft) was estimated using data prepared during the development of this master plan. **Table B1** provides a breakdown of operations for the existing condition as well as the capacity forecast.

TABLE B1
Activity Data for Noise Modeling Purposes

	Existing	Capacity
Large Business Jet	500	1,000
Medium Business Jet	600	1,200
Small Business Jet	1,771	3,000
Turboprop	16,050	27,500
Multi-Engine Piston	35,989	50,000
Single-Engine Piston	248,980	409,310
Total Operations	323,555	516,000

- **Time-of-Day**

The time-of-day at which operations occur is important as input to the INM due to the 10 decibel weighting of nighttime (10:00 p.m. to 7:00 a.m.) flights. In calculating airport noise exposure, one operation at night has the same noise emission value as 10 operations during the day by the same aircraft. For the noise modeling purposes, it was assumed that 97 percent of the operations occurred during the daytime and evening hours and three percent occurred during the nighttime hours.

- **Runway Use**

Runway usage data is another essential input to the INM. For modeling purposes, wind data analysis usually determines runway use percentages. Aircraft will normally land and take-off into the wind. However, wind analysis provides only the directional availability of a runway and does not consider pilot selection, primary runway operations, or local operating conventions.

The runway usage at the airport was established through discussions with airport staff. **Table B2** summarizes the runway use percentages for existing and capacity conditions.

TABLE B2
Existing and Future Runway Use

Runway	Percentage of Use
4L	20%
22R	25%
4R	20%
22L	35%

INM Output

Output data selected for calculation by the INM are annual average noise contours in DNL. The DNL is a measure of the 24-hour noise level of a community to allow for comparison between the no action and proposed action alternatives. DNL is the metric currently accepted by the Federal Aviation Administration (FAA), Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD), as an appropriate measure of cumulative noise exposure.

Impact Assessment

To standardize the assessment of airport land use compatibility and noise, the Federal Aviation Administration (FAA) has established guidelines, codified within 14 CFR Part 150, that identify suitable land uses for development near airport facilities. These guidelines, outlined in **Exhibit B1**, state that residential development, including standard construction (residential construction without acoustic treatment), mobile homes, and transient lodging are all incompatible with noise above 65 DNL. Homes of standard construction and transient lodging may be considered compatible where local communities have determined these uses are permissible; however, sound insulation methods are recommended. Schools and other public use facilities are also generally considered to be incompatible with noise exposure above 65 CNEL.

The results of the noise analysis are depicted on **Exhibits B2** and **B3**. The existing noise condition is depicted on **Exhibit B2**. As depicted on the exhibit, the 65 DNL noise contour extends off airport property to the northeast and encompasses eight homes which are located along North Higley Road. No other noise-sensitive development is contained within the existing 65 DNL noise contour.

The capacity noise contour is depicted on **Exhibit B3**. As indicated on the exhibit, the 65 DNL noise contour extends off airport property to the northeast and the southwest. To the northeast the number of impacted homes grows from eight in the existing condition to 24 homes.

For informational purposes the 55 and 60 DNL noise contours were included on the exhibits. Generally residential and other noise-sensitive land uses are considered a compatible land use within these noise contours.

WETLANDS AND WATERS OF THE U.S.

As discussed within Chapter One, no known wetlands are located on airport property. Roosevelt Canal, located adjacent to the airport's westernmost property line, would likely be considered a Water of the U.S. No airport improvements are planned that would impact this canal. Field surveys and further coordination with the U.S. Army Corps of Engineers will likely be needed in order to determine if any jurisdictional wetlands or Waters of the U.S. are located within the areas proposed for development.

FARMLAND

In the State of Arizona, prime and unique farmland is characterized as any farmland which is currently being irrigated. Irrigated farmland exists on airport property west of Greenfield Road. This property is currently preserved for airport approach protection.

Within the Master Plan, approximately 59 acres of land west of North Greenfield Road is planned for non-aviation use in the form of industrial/commercial development. The location of the proposed development is depicted on **Exhibit B4**.

FLOODPLAINS

According to the Federal Insurance Rate Map (FIRM), panel number 04013C2205G, a 100-year floodplain associated with Roosevelt Canal is located west of the airfield. Portions of this floodplain are located within airport boundaries as depicted on **Exhibit B4**. There is non-aviation development proposed in some of the area identified as a 100-year floodplain. Consultation with appropriate state and local agencies is required prior to project implementation to determine if the projects would result in impacts to the floodplain.

06MP17-B1-1/21/09

LAND USE	Yearly Day-Night Average Sound Level (DNL) in Decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
RESIDENTIAL						
Residential, other than mobile homes and transient lodgings	Y	N[1]	N[1]	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N[1]	N[1]	N[1]	N	N
PUBLIC USE						
Schools	Y	N[1]	N[1]	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums, and concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y[2]	Y[3]	Y[4]	Y[4]
Parking	Y	Y	Y[2]	Y[3]	Y[4]	N
COMMERCIAL USE						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail-building materials, hardware and farm equipment	Y	Y	Y[2]	Y[3]	Y[4]	N
Retail trade-general	Y	Y	25	30	N	N
Utilities	Y	Y	Y[2]	Y[3]	Y[4]	N
Communication	Y	Y	25	30	N	N
MANUFACTURING AND PRODUCTION						
Manufacturing, general	Y	Y	Y[2]	Y[3]	Y[4]	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y[6]	Y[7]	Y[8]	Y[8]	Y[8]
Livestock farming and breeding	Y	Y[6]	Y[7]	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
RECREATIONAL						
Outdoor sports arenas and spectator sports	Y	Y[5]	Y[5]	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

The designations contained in this table do not constitute a federal determination that any use of land covered by the program is acceptable under federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally-determined land uses for those determined to be appropriate by local authorities in response to locally-determined needs and values in achieving noise compatible land uses.

See other side for notes and key to table.

MESA-FALCON FIELD AIRPORT

Exhibit B1

LAND USE COMPATIBILITY GUIDELINES

KEY

Y (Yes) Land Use and related structures compatible without restrictions.

N (No) Land Use and related structures are not compatible and should be prohibited.

NLR Noise Level Reduction (outdoor-to-indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

25, 30, 35 Land Use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structure.

NOTES

1 Where the community determines that residential or school uses must be allowed, measures to achieve outdoor-to-indoor Noise Level Reduction (NLR) of at least 25 dB and 30 dB, respectively, should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB; thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

2 Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

3 Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

4 Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

5 Land use compatible provided special sound reinforcement systems are installed.

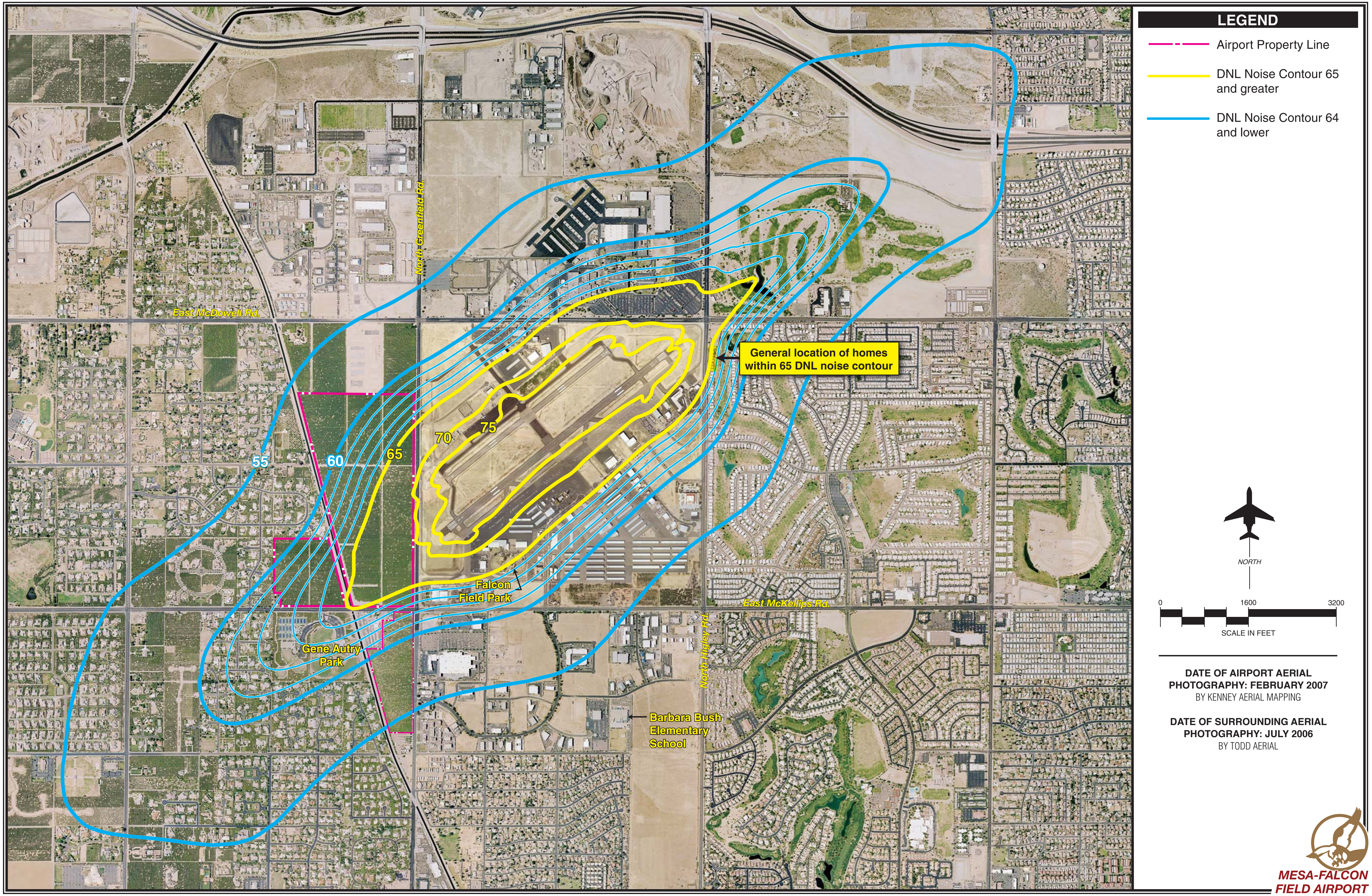
6 Residential buildings require a NLR of 25.

7 Residential buildings require a NLR of 30.

8 Residential buildings not permitted.

Source: ***14 CFR Part 150***, Appendix A, Table 1.

06MP17-B2-1/22/09



MESA-FALCON FIELD AIRPORT

Exhibit B2

EXISTING AIRCRAFT NOISE EXPOSURE

06MP17-B3-1/22/09

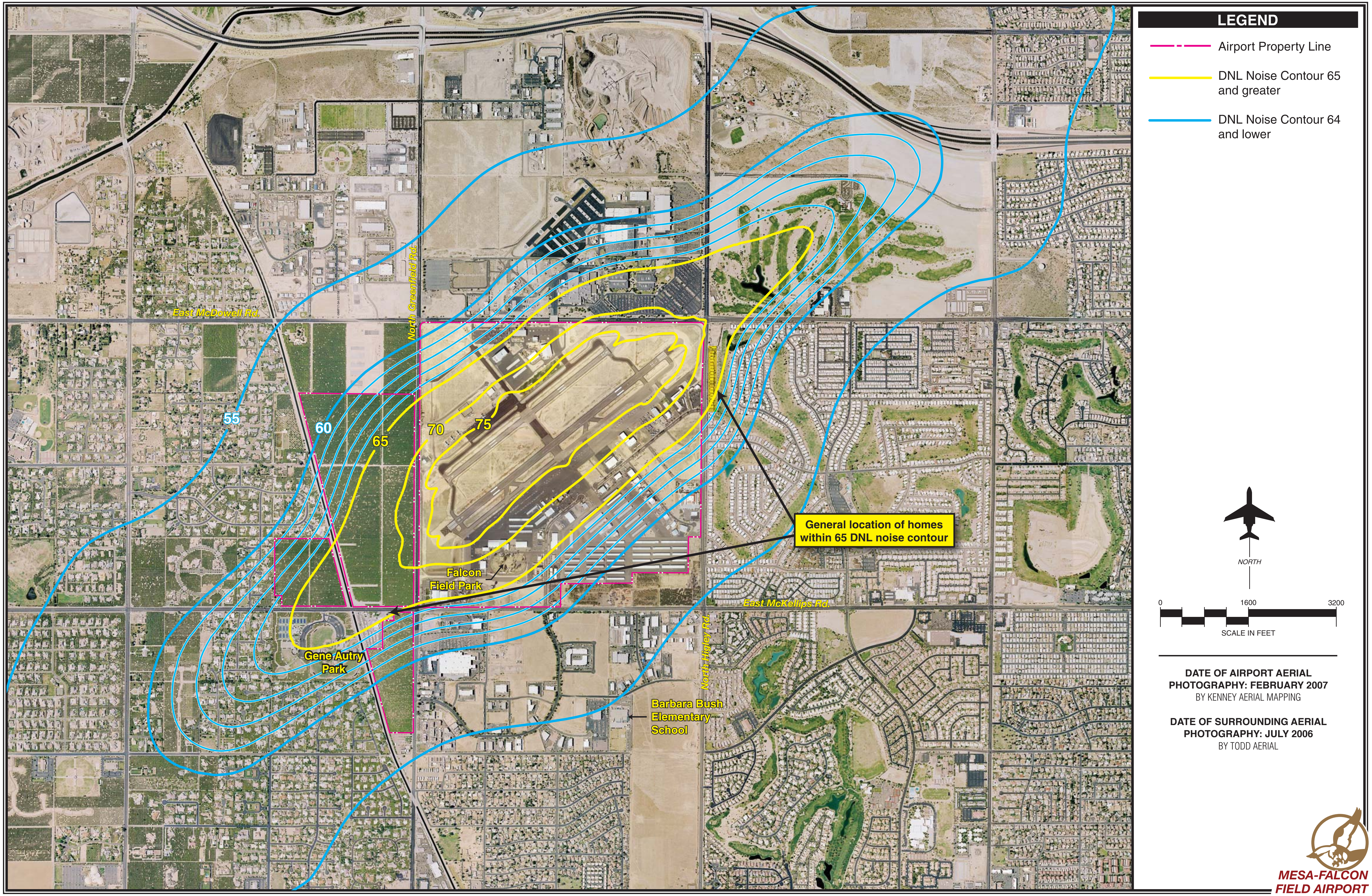
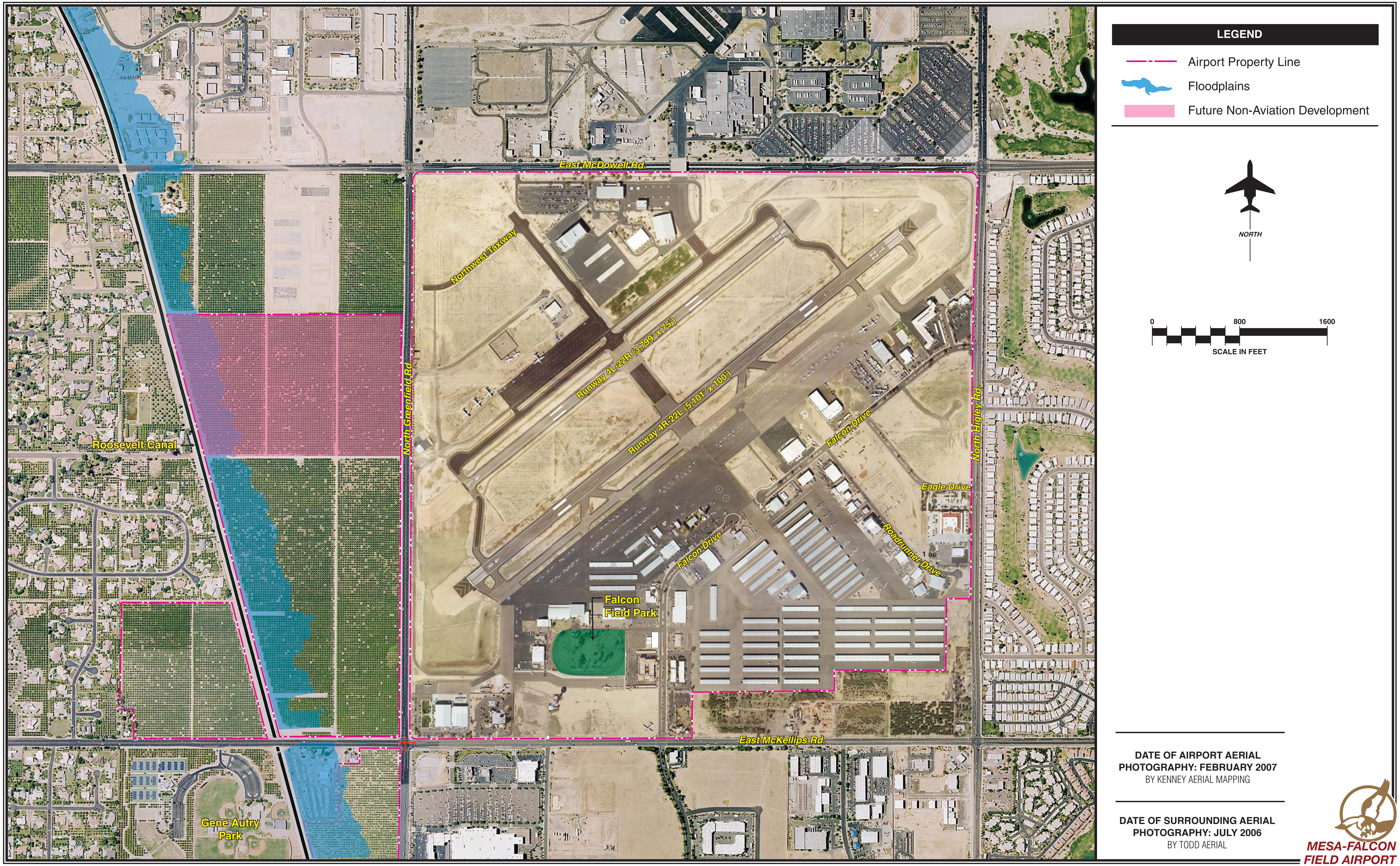


Exhibit B3
CAPACITY AIRCRAFT NOISE EXPOSURE



MESA-FALCON FIELD AIRPORT

Exhibit B4

NATURAL RESOURCES

WATER QUALITY

The airport will need to continue to comply with an Arizona Pollution Discharge Elimination System (AZPDES) operations permit. With regard to construction activities, the airport and all applicable contractors will need to obtain and comply with the requirements and procedures of the construction-related AZPDES General Permit number AZG2003-001, including the preparation of a *Notice of Intent* and a *Stormwater Pollution Prevention Plan,* prior to the initiation of product construction activities.

As development occurs at the airport, the AZPDES permit will need to be modified to reflect the additional impervious surfaces and any stormwater retention facilities. The addition and removal of impervious surfaces may require modifications to this permit should drainage patterns be modified.

BIOTIC RESOURCES

Biotic resources were discussed in detail in Chapter One. **Table B1** lists the threatened, endangered, and candidate species with the potential to occur in Maricopa County.

TABLE B1
Threatened, Endangered, and Candidate Species

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 chub	Gila intermedia	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
Yellow-billed cuckoo	Coccyzus americanus	Candidate

Source: U.S. Fish and Wildlife Service, Maricopa County Species List.

It is unlikely that any of these species are present in the areas proposed for development as the habitat which supports most of them consists of treed areas or locations near rivers, streams, or marshes; however, field surveys would be needed to verify this determination.

According to the Arizona Game and Fish Department's On-Line Environmental Review Tool, the Sonoran Desert Tortoise has been documented to occur within three miles of Mesa Falcon Field. The Department recommends biological surveys to be conducted prior to construction. Further coordination with the U.S. Fish and Wildlife Service and the Arizona Fish and Game Department is needed prior to the development of projects in areas which are previously undisturbed.

HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Field surveys will likely be needed prior to the development of airport property that is previously undisturbed.

CONSTRUCTION IMPACTS

Construction impacts typically relate to the effects on specific impact categories, such as air quality or noise, during construction. The use of Best Management Practices (BMPs) during construction is typically a requirement of construction-related permits such as an AZPDES permit. Use of these measures typically alleviates potential resource impacts.

Construction-related noise impacts are anticipated as residential development, parks, and golf courses border the airport. These impacts will be short term in nature.

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 the air emission inventory, if one is requested.

SECONDARY (INDUCED) IMPACTS

These impacts address those secondary impacts to surrounding communities resulting from the proposed development, including shifts in patterns of population growth, public service demands, and changes in business and economic activity to the extent influenced by airport development.

Significant shifts in patterns of population movement or growth or public service demands are not anticipated as a result of the proposed development. It could be expected, however, that the proposed development would potentially induce positive socioeconomic impacts for the community over a period of years. The airport, with expanded facilities and services, would be expected to attract additional users. It is also expected to encourage tourism, industry, and trade, and to enhance the future growth and expansion of the community's economic base. Future socioeconomic impacts resulting from the proposed development are anticipated to be primarily positive in nature.

LIGHT EMISSIONS AND VISUAL IMPACTS

Landside development at the airport will create several new hangar complexes as well as privately leased aviation development parcels. These new facilities are not anticipated to create an annoyance among people or interfere with normal activities as the areas planned for development are surrounded by agricultural uses, open space, and light industrial land uses.

PUBLIC AIRPORT DISCLOSURE MAP

As previously discussed in Chapter One, Arizona Revised Statues (ARS) 28-8486, *Public Airport Disclosure*, provides for a public airport owner to publish a map depicting the "territory in the vicinity of the airport." The territory in the vicinity of the airport is defined as the traffic pattern airspace and the property that experiences 60 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. ARS 28-8486 provides for the State Real Estate Office to prepare a disclosure map in conjunction with the airport owner. The Disclosure Map is recorded with the County Recorder.

Exhibit B5 depicts the Disclosure Map for Mesa-Falcon Field Airport. Traffic pattern airspace is defined in FAA Order 7400.2D, *Procedures for Handling Airspace Matters*. Traffic pattern airspace is a function of the approach category for the runway. Approach category B is planned for both runways at the airport. According to FAA Order 7400.2D, the traffic pattern airspace for approach category B extends 1.5 miles beyond each runway end and 1.5 miles laterally from the runway centerline to encompass the traffic pattern.

The Disclosure Map for Mesa-Falcon Field Airport extends 2.5 nautical miles beyond each end of the primary runway. The area within 1.5 nautical miles of the runway centerline for each runway is also included in the limits of public disclosure. The 60 DNL contour is shown as required by the statute.

NOTES:

1. This map has been prepared in accordance with the Arizona Revised Statutes, Section 28-8486, relating to Public Airport Disclosure.
2. Traffic Pattern Airspace Boundaries have been established in accordance with the guidelines provided in the FAA Order 7400.2G.
3. The Airport Noise Contours have been developed with the Integrated Noise Model (Version 7.0) and are based on Total Annual Operations (Take-offs and Landings) of 516,000.
4. 1 Nautical mile = 6,080 feet or 1.1516 statute miles.
5. Base map derived from electronic USGS mapping and the Maricopa Assocation of Governments (MAG) street Map.

LEGEND:

TRAFFIC PATTERN AIRSPACE

65

NOISE CONTOURS DAY NIGHT LEVEL (DNL)

EXISTING AIRPORT PROPERTY LINE

EXTENDED RUNWAY CENTERLINE

MESA FALCON FIELD

PUBLIC AIRPORT DISCLOSURE MAP

MESA, ARIZONA

PLANNED BY: Matt Quick
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris, P.E.
October 14, 2009 SHEET 1 OF 1

Coffman Associates Airport Consultants

Exhibit B5
Public Airport Disclosure Map

MESA-FALCON FIELD AIRPORT

Appendix C

AIRPORT LAYOUT DRAWINGS

Appendix C
AIRPORT LAYOUT PLAN DRAWINGS

Per Federal Aviation Administration (FAA) requirements, an official Airport Layout Plan (ALP) has been developed for Mesa-Falcon Field Airport. The ALP is used in part by the FAA to determine funding eligibility for future development projects.

The ALP was prepared on a computer-aided drafting system for future ease of use. The computerized plan set provides detailed information of existing and future facility layout on multiple layers that permits the user to focus in on any section of the airport at a desirable 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.

A number of related drawings, which depict the ultimate airspace and landside development, are included with the ALP. The following provides a brief discussion of the additional drawings included with the ALP.

Airport Layout Drawing (Sheet 2 of 9) – The Airport Layout Drawing graphically presents the existing and ultimate airport layout.

Airport Airspace Drawing (Sheet 3 of 9) – The Airport Airspace Drawing is a graphic depiction of the Title 14 Code of Federal Regulations (CFR) Part 77, *Objects Affecting Navigable Airspace*, regulatory criterion. The Airport Airspace Drawing is intended to aid local authorities in determining if proposed development could present a hazard to the airport and obstruct the approach path to a runway end. These plans should be coordinated with local land use planners.

Approach Surface Profile Drawing (Sheet 4 of 9) – The Approach Surface Profile Drawing provides both plan and profile views of 14 CFR Part 77 approach surfaces for each runway end. A composite profile of the extended ground line is depicted. Obstructions and clearances over roads are shown as appropriate.

Inner Portion of the Approach Surface Drawings (Sheets 5 and 6 of 9) – The Inner Portion of the Approach Surface Drawings are scaled drawings of the runway protection zone (RPZ), runway safety area (RSA), obstacle free zone (OFZ), and 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 (as appropriate).

Terminal Area Drawing (Sheet 7 of 9) – The Terminal Area Drawing provides greater detail concerning landside improvements on the north and south sides of the airport and at a larger scale than on the Airport Layout Drawing.

On-Airport Land Use Drawing (Sheet 8 of 9) – The On-Airport Land Use Drawing is a graphic depiction of the land use recommendations. When development is proposed, it should be directed to the appropriate land use area depicted on this plan.

Airport Property Map (Sheet 9 of 9) – The Airport Property Map provides information on the acquisition and identification of all land tracts under the control of the airport. Both existing and future property holdings are identified on the Airport Property Map.

DRAFT ALP DISCLAIMER

The ALP set has been developed in accordance with accepted FAA and Arizona Department of Transportation (ADOT) – Aeronautics Division 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.

AIRPORT LAYOUT PLANS
FOR
MESA-FALCON FIELD AIRPORT

Prepared for the

City of Mesa, Arizona

INDEX OF DRAWINGS

1. DATA SHEET
2. AIRPORT LAYOUT PLAN
3. PART 77 AIRSPACE DRAWING
4. RUNWAY APPROACH ZONE PROFILES/RUNWAY PROFILES
5. INNER PORTION OF RUNWAY 4R-22L APPROACH SURFACE DRAWING
6. INNER PORTION OF RUNWAY 4L-22R APPROACH SURFACE DRAWING
7. TERMINAL AREA PLAN
8. ON-AIRPORT LAND USE PLAN
9. AIRPORT PROPERTY MAP

DRAFT

Coffman Associates
Airport Consultants

AIRPORT DATA

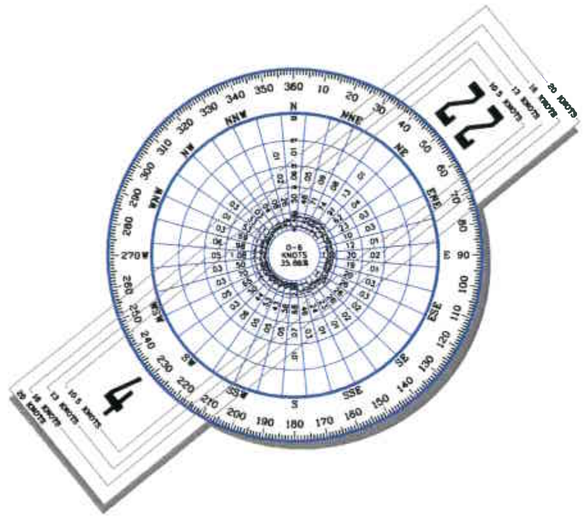
MESA-FALCON FIELD AIRPORT (FFZ)

CITY: MESA, ARIZONA | COUNTY: MARICOPA, ARIZONA | RANGE: 6 EAST | TOWNSHIP: 1 NORTH

		EXISTING	ULTIMATE
AIRPORT SERVICE LEVEL		RELIEVER	RELIEVER
AIRPORT REFERENCE CODE		B-II	B-II
AIRPORT ELEVATION		1394.0	1394.0
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		106° F (July)	106° F (July)
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	Latitude	33° 27' 39.000" N	33° 27' 39.000" N
	Longitude	111° 43' 42.000" W	111° 43' 42.000" W
AIRPORT and TERMINAL NAVIGATIONAL AIDS		ATCT SEGMENTED CIRCLE ROTATING BEACON NDB	ATCT SEGMENTED CIRCLE ROTATING BEACON NDB
GPS Approach		4R/22L	4R/22L

ALL WEATHER WIND COVERAGE

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 4-22	94.51%	97.73%	99.65%	99.94%



SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Falcon Field (FFZ)
Mesa, Arizona

OBSERVATIONS:
23,986 All Weather Observations
1997-2006

Magnetic Variance
11° 11' East (June 2008)
Annual Rate of Change
00° 06' West (June 2008)

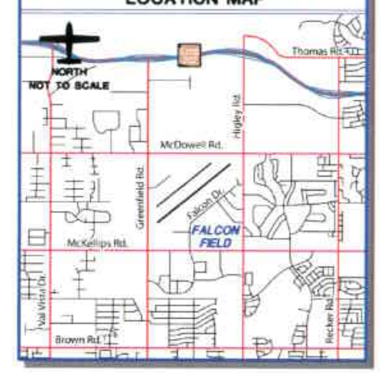
RUNWAY DATA

RUNWAY DATA	RUNWAY 4R-22L				RUNWAY 4L-22R			
	EXISTING		ULTIMATE		EXISTING		ULTIMATE	
	4R	22L	4R	22L	4L	22R	4L	22R
AIRCRAFT APPROACH CATEGORY-DESIGN GROUP	B-II		B-II		B-I		B-II	
CRITICAL AIRCRAFT	CITATION II		CITATION II		KING AIR 100		CITATION II	
CRITICAL AIRCRAFT WINGSPAN (FEET)	51.7		51.7		45.8		51.7	
CRITICAL AIRCRAFT UNDERCARRIAGE WIDTH (FEET)	17.6		17.6		7.7		17.6	
CRITICAL AIRCRAFT APPROACH SPEED (KNOTS)	108		108		111		108	
CRITICAL AIRCRAFT MAXIMUM CETIFIED TAKEOFF WEIGHT (1,000 LBS.)	13.3		13.3		16.7		13.3	
APPROACH VISIBILITY MINIMUMS (LOWEST)	1 Mile	Visual	1 Mile	1 Mile	VISUAL	VISUAL	VISUAL	VISUAL
F.A.R. PART 77 CATEGORY	ANP	ANP	ANP	ANP	ANP	ANP	ANP	ANP
PERCENTAGE OF WIND COVERAGE (ALL WEATHER IN MPH)	94.51% 12/97.73% 15/99.65 18%/99.94 23%		94.51% 12/97.73% 15/99.65 18%/99.94 23%		94.51% 12/97.73% 15/99.65 18%/99.94 23%		94.51% 12/97.73% 15/99.65 18%/99.94 23%	
LINE OF SIGHT REQUIREMENT MET	YES		YES		YES		YES	
MAXIMUM ELEVATION (ABOVE MSL)	1394.0		1394.0		1386.0		1386.0	
LOWEST ELEVATION (ABOVE MSL)	1365.4		1365.4		1365.7		1365.7	
RUNWAY DIMENSIONS	5,101' x 100'		5,101' x 100'		3,799' x 75'		3,799' x 75'	
RUNWAY BEARING (TRUE BEARING - DECIMAL DEGREES)	51.17	231.18	51.17	231.18	51.15	231.16	51.15	231.16
RUNWAY APPROACH SURFACES (F.A.R. PART 77)	34:1	20:1	34:1	34:1	20:1	20:1	20:1	20:1
RUNWAY END ELEVATION (NAVD 88)	1365.4	1394.0	1365.4	1394.0	1365.7	1386.0	1365.7	1386.0
RUNWAY THRESHOLD DISPLACEMENT	0'	0'	0'	0'	0'	0'	0'	0'
RUNWAY THRESHOLD SITING REQUIREMENTS (APPENDIX 2, CATEGORY)	2	2	2	2	1	1	2	2
RUNWAY STOPWAY	0'	0'	0'	0'	0'	0'	0'	0'
RUNWAY SAFETY AREA WIDTH (RSA)	150'		150'		120'		150'	
RUNWAY SAFETY AREA (RSA) BEYOND RUNWAY STOP END	300'	300'	300'	300'	240'	240'	300'	300'
RUNWAY OBSTACLE FREE ZONE WIDTH (OFZ)	400'		400'		250'		400'	
RUNWAY OBSTACLE FREE ZONE (OFZ) BEYOND RUNWAY STOP END	200'	200'	200'	200'	200'	200'	200'	200'
RUNWAY OBJECT FREE AREA WIDTH (OFA)	500'		500'		250'		500'	
RUNWAY OBJECT FREE AREA (OFA) BEYOND RUNWAY STOP END	300'	300'	300'	300'	240'	240'	300'	300'
RUNWAY PAVEMENT SURFACE MATERIAL	ASPHALT		ASPHALT		ASPHALT		ASPHALT	
RUNWAY PAVEMENT STRENGTH (IN THOUSAND LBS.)*	38(S)/60(D)/90(DT)		38(S)/60(D)/90(DT)		12.5(S)		30(S)	
RUNWAY EFFECTIVE GRADIENT	0.56%		0.56%		0.53%		0.53%	
RUNWAY MAXIMUM GRADIENT	0.56%		0.56%		0.53%		0.53%	
RUNWAY TOUCHDOWN ZONE ELEVATION (ABOVE MSL)	1383.4	1394.0	1383.4	1394.0	1382.7	1386.0	1382.7	1386.0
RUNWAY MARKING	NONPRECISION	NONPRECISION	NONPRECISION	NONPRECISION	BASIC	BASIC	BASIC	BASIC
RUNWAY LIGHTING	MIRL		MIRL		MIRL		MIRL	
RUNWAY APPROACH LIGHTING	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
RUNWAY TO TAXIWAY SEPARATION (FROM CENTERLINE TO CENTERLINE)	250'		250'		200'		240'	
RUNWAY HOLD LINE POSITION (FROM RUNWAY CENTERLINE)	200'		200'		125'		200'	
TAXIWAY TO TAXILANE SEPARATION (FROM CENTERLINE TO CENTERLINE)	105'		105'		105'		105'	
TAXIWAY CENTERLINE TO FIX OR MOVEABLE OBJECT	65.5'		65.5'		65.5'		65.5'	
TAXIWAY LIGHTING	MITL		MITL		MITL		MITL	
TAXIWAY MARKING	CENTERLINE/SIGNAGE		CENTERLINE/SIGNAGE		CENTERLINE/SIGNAGE		CENTERLINE/SIGNAGE	
TAXIWAY SURFACE MATERIAL	ASPHALT		ASPHALT		ASPHALT		ASPHALT	
TAXIWAY WINGTIP CLEARANCE	26'		26'		20'		26'	
TAXIWAY WIDTH	50'		50'		40'		40'	
TAXIWAY SAFETY AREA WIDTH	79'		79'		79'		79'	
TAXIWAY OBJECT FREE AREA WIDTH	131'		131'		131'		131'	
RUNWAY VISUAL NAVIGATIONAL AIDS	PAPI-2L REIL	PAPI-2L REIL	PAPI-4L REIL	PAPI-4L REIL	PAPI-2L	PAPI-2L	PAPI-2L REIL	PAPI-2L REIL
RUNWAY ELECTRONIC NAVIGATIONAL AIDS	GPS/NDB	GPS/NDB	GPS	GPS				

*Pavement strengths are expressed in Single(S), Dual(D) and Dual Tandem(DT) wheel loading capacities.

VICINITY MAP

LOCATION MAP



DECLARED DISTANCES DATA

DECLARED DISTANCES DATA	EXISTING RUNWAY 4R-22L		ULTIMATE RUNWAY 4R-22L		EXISTING RUNWAY 4L-22R		ULTIMATE RUNWAY 4L-22R	
	4R	22L	4R	22L	4L	22R	4L	22R
TORA - TAKEOFF RUN AVAILABLE	5,101'	5,101'	5,101'	5,101'	3,799'	3,799'	3,799'	3,799'
TODA - TAKEOFF DISTANCE AVAILABLE	5,101'	5,101'	5,101'	5,101'	3,799'	3,799'	3,799'	3,799'
ASDA - ACCELERATE-STOP DISTANCE AVAILABLE	5,101'	5,101'	5,101'	5,101'	3,799'	3,799'	3,799'	3,799'
LDA - LANDING DISTANCE AVAILABLE	5,101'	5,101'	5,101'	5,101'	3,799'	3,799'	3,799'	3,799'

RUNWAY END COORDINATES (NAD 83)

RUNWAY		EXISTING	ULTIMATE
Runway 4R	Latitude	33° 27' 21.234" N	33° 27' 21.234" N
	Longitude	111° 44' 02.721" W	111° 44' 02.721" W
Runway 22L	Latitude	33° 27' 52.868" N	33° 27' 52.868" N
	Longitude	111° 43' 15.819" W	111° 43' 15.819" W
Runway 4L	Latitude	33° 27' 29.884" N	33° 27' 29.884" N
	Longitude	111° 44' 03.058" W	111° 44' 03.058" W
Runway 22R	Latitude	33° 27' 53.453" N	33° 27' 53.453" N
	Longitude	111° 43' 28.142" W	111° 43' 28.142" W

DEVIATIONS FROM FAA AIRPORT DESIGN STANDARDS

DEVIATION DESCRIPTION	AFFECTED DESIGN STANDARD	STANDARD	EXISTING	PROPOSED DISPOSITION
NONE				

DRAFT

NO.	REVISIONS	BY	DATE APP'D.
2	UPDATE AIRPORT LAYOUT PLAN	Z&H	November 2007
1	UPDATE AIRPORT LAYOUT PLAN	CA	December 2000

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MESA-FALCON FIELD AIRPORT (FFZ)

DATA SHEET

MESA, ARIZONA

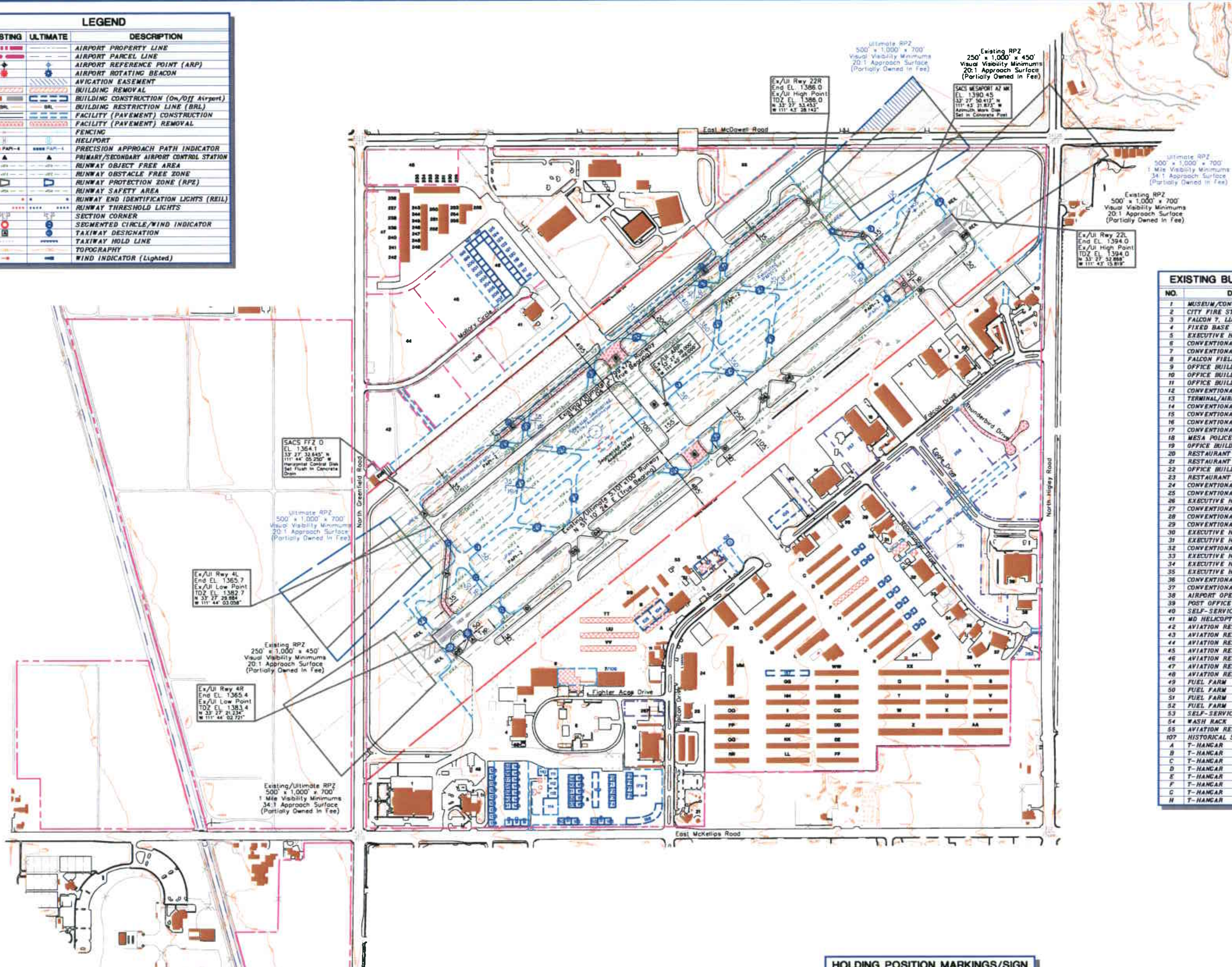
PLANNED BY: Matt R. Quick
DETAILED BY: Richard A. Lolly
APPROVED BY: James M. Harris

January 22, 2010

Coffman Associates Airport Consultants

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT PARCEL LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVICATION EASEMENT
		BUILDING REMOVAL
		BUILDING CONSTRUCTION (On/Off Airport)
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
		FACILITY (PAVEMENT) CONSTRUCTION
		FACILITY (PAVEMENT) REMOVAL
		FENCING
		HELIPORT
PAPI-4	PAPI-4	PRECISION APPROACH PATH INDICATOR
		PRIMARY/SECONDARY AIRPORT CONTROL STATION
		RUNWAY OBJECT FREE AREA
		RUNWAY OBSTACLE FREE ZONE
		RUNWAY PROTECTION ZONE (RPZ)
		RUNWAY SAFETY AREA
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		SECTION CORNER
		SEGMENTED CIRCLE/WIND INDICATOR
		TAXIWAY DESIGNATION
		TAXIWAY HOLD LINE
		TOPOGRAPHY
		WIND INDICATOR (Lighted)



EXISTING BUILDINGS/FACILITIES

NO.	DESCRIPTION	ELEV.
1	MUSEUM/CONVENTIONAL HANGAR	
2	CITY FIRE STATION NO. 208	
3	FALCON 7, LLC - DESERT JET CENTER	
4	FIXED BASE OPERATION	
5	EXECUTIVE HANGAR	
6	CONVENTIONAL HANGAR	
7	CONVENTIONAL HANGAR	
8	FALCON FIELD PARK	
9	OFFICE BUILDING	
10	OFFICE BUILDING	
11	OFFICE BUILDING	
12	CONVENTIONAL HANGAR	
13	TERMINAL/AIRPORT ADMINISTRATION/ATCT	
14	CONVENTIONAL HANGAR	
15	CONVENTIONAL HANGAR	
16	CONVENTIONAL HANGAR	
17	CONVENTIONAL HANGAR	
18	MESA POLICE - AVIATION UNIT	
19	OFFICE BUILDING/EXECUTIVE HANGARS	
20	RESTAURANT	
21	RESTAURANT	
22	OFFICE BUILDING	
23	RESTAURANT	
24	CONVENTIONAL HANGAR	
25	CONVENTIONAL HANGAR	
26	EXECUTIVE HANGAR	
27	CONVENTIONAL HANGAR	
28	CONVENTIONAL HANGAR	
29	CONVENTIONAL HANGAR	
30	EXECUTIVE HANGAR	
31	EXECUTIVE HANGAR	
32	CONVENTIONAL HANGAR	
33	EXECUTIVE HANGAR	
34	EXECUTIVE HANGAR	
35	EXECUTIVE HANGAR	
36	CONVENTIONAL HANGAR	
37	CONVENTIONAL HANGAR	
38	AIRPORT OPERATIONS BUILDING	
39	POST OFFICE	
40	SELF-SERVICE FUEL	N/A
41	MD HELICOPTERS COMPLEX	
42	AVIATION RELARED PARCEL	N/A
43	AVIATION RELARED PARCEL	N/A
44	AVIATION RELARED PARCEL	N/A
45	AVIATION RELARED PARCEL	N/A
46	AVIATION RELARED PARCEL	N/A
47	AVIATION RELARED PARCEL	N/A
48	AVIATION RELARED PARCEL	N/A
49	FUEL FARM	N/A
50	FUEL FARM	N/A
51	FUEL FARM	N/A
52	FUEL FARM	N/A
53	SELF-SERVICE FUEL	N/A
54	WASH RACK	
55	AVIATION RELARED PARCEL	N/A
107	HISTORICAL SITE	
A	T-HANGAR	
B	T-HANGAR	
C	T-HANGAR	
D	T-HANGAR	
E	T-HANGAR	
F	T-HANGAR	
G	T-HANGAR	
H	T-HANGAR	

EXISTING BUILDINGS/FACILITIES

NO.	DESCRIPTION	ELEV.
I	T-HANGAR	
J	T-HANGAR	
K	T-HANGAR	
L	EXECUTIVE HANGAR	
M	T-HANGAR	
N	T-HANGAR	
O	EXECUTIVE HANGAR	
P	T-HANGAR	
Q	T-HANGAR	
R	T-HANGAR	
S	T-HANGAR	
T	T-HANGAR	
U	T-HANGAR	
V	T-HANGAR	
W	T-HANGAR	
X	T-HANGAR	
Y	T-HANGAR	
Z	T-HANGAR	
AA	T-HANGAR	
BB	T-HANGAR	
CC	T-HANGAR	
DD	T-HANGAR	
EE	T-HANGAR	
FF	T-HANGAR	
GG	T-HANGAR	
HH	T-HANGAR	
II	T-HANGAR	
JJ	T-HANGAR	
KK	T-HANGAR	
LL	T-HANGAR	
MM	T-HANGAR	
NN	T-HANGAR	
OO	T-HANGAR	
PP	T-HANGAR	
QQ	T-HANGAR	
RR	T-HANGAR	
SS	T-HANGAR	
TT	SHADE HANGAR	
UU	SHADE HANGAR	
VV	SHADE HANGAR	
WW	SHADE HANGAR	
XX	SHADE HANGAR	
YY	SHADE HANGAR	
195	AIRCRAFT PAINT FACILITY	
228	CONVENTIONAL HANGAR	
229	EXECUTIVE HANGAR	
230	EXECUTIVE HANGAR	
231	EXECUTIVE HANGAR	
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254	EXECUTIVE HANGAR	
255	EXECUTIVE HANGAR	
256	EXECUTIVE HANGAR	
257	CIVIL AIR PATROL	

ULTIMATE BUILDINGS/FACILITIES

NO.	DESCRIPTION
101	CONVENTIONAL HANGAR
102	AIR TRAFFIC CONTROL TOWER (ATCT)
103	CONVENTIONAL HANGAR
104	CONVENTIONAL HANGAR
105	CONVENTIONAL HANGAR
106	TERMINAL/AIRPORT ADMINISTRATION BUILDING
110	EXECUTIVE HANGAR
111	EXECUTIVE HANGAR
112	EXECUTIVE HANGAR
113	EXECUTIVE HANGAR
114	CONVENTIONAL HANGAR
115	PARCEL - AVIATION RELATED
116	EXECUTIVE HANGAR
117	EXECUTIVE HANGAR
118	EXECUTIVE HANGAR
119	EXECUTIVE HANGAR
120	EXECUTIVE HANGAR

ULTIMATE BUILDINGS/FACILITIES

NO.	DESCRIPTION
121	EXECUTIVE HANGAR
122	EXECUTIVE HANGAR
123	EXECUTIVE HANGAR
124	EXECUTIVE HANGAR
125	EXECUTIVE HANGAR
126	EXECUTIVE HANGAR
127	EXECUTIVE HANGAR
128	EXECUTIVE HANGAR
129	EXECUTIVE HANGAR
130	EXECUTIVE HANGAR
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155	EXECUTIVE HANGAR
156	EXECUTIVE HANGAR
157	CONVENTIONAL HANGAR
158	CONVENTIONAL HANGAR
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178	EXECUTIVE HANGAR
179	CONVENTIONAL HANGAR
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185	EXECUTIVE HANGAR
186	OFFICE BUILDING
187	T-HANGAR
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203	EXECUTIVE HANGAR
204	EXECUTIVE HANGAR
205	EXECUTIVE HANGAR
206	EXECUTIVE HANGAR
207	EXECUTIVE HANGAR
257	PARCEL - AVIATION RELATED
258	PARCEL - AVIATION RELATED
259	PARCEL - AVIATION RELATED
260	PARCEL - AVIATION RELATED
261	PARCEL - AVIATION RELATED
262	PARCEL - AVIATION RELATED

FAA APPROVAL STAMP

FOR APPROVAL BY:

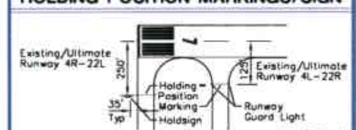
City of Mesa, Arizona

APPROVED BY: ON THE DATE OF:

Jack Friedline
Deputy City Manager

DRAFT

HOLDING POSITION MARKINGS/SIGN



GENERAL NOTES:

1. Features and objects, including related elevations and clearances, within the runway protection zonesare depicted on the INNER PORTION APPROACH SURFACE DRAWINGS
2. Details concerning terminal improvements are depicted on the TERMINAL AREA DRAWING.
3. Recommended land uses are depicted on the AIRPORT LAND USE DRAWING.
4. The Building Restriction Line (BRL) is placed in accordance with FAA AC 150/5300-13, Change 11, Airport Design, and encompasses the runway protection zones, the runway object free area, the runway visibility zone, NAVAID critical areas, areas required for terminal instrument procedures, and lower line of sight
5. All Elevations are in NAVD 88, all Horizontal Coordinates are in NAD 83.
6. No Obstacle Free Zone (OFZ) Object Penetrations
7. No Threshold Surface Siting (TSS) Object Penetrations

RUNWAY END COORDINATES (NAD 83)

RUNWAY		EXISTING	ULTIMATE
Runway 4R	Latitude	33° 27' 21.234" N	33° 27' 21.234" N
	Longitude	111° 44' 02.721" W	111° 44' 02.721" W
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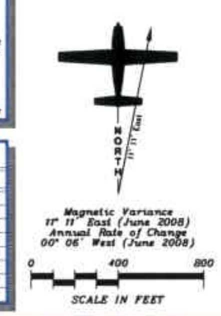

NO.	REVISIONS	BY	DATE APP'D.
2	UPDATE AIRPORT LAYOUT PLAN	Z&H	November 2007
1	UPDATE AIRPORT LAYOUT PLAN	CA	December 2000

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MESA-FALCON FIELD AIRPORT (FFZ)

AIRPORT LAYOUT PLAN

MESA, ARIZONA

PLANNED BY: Matt R. Quick
DETAILED BY: Richard A. Lolly
APPROVED BY: James M. Harris

January 22, 2010 SHEET 2 OF 9

Coffman Associates
Airport Consultants

OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1. TREE	1454	7:1 TRANSITIONAL SURFACE	1437	17'	REQUEST AERONAUTICAL STUDY
2. ROAD	1411	34:1 APPROACH SURFACE	1407	4'	REQUEST AERONAUTICAL STUDY
3. ROAD	1407	34:1 APPROACH SURFACE	1404	3'	REQUEST AERONAUTICAL STUDY
4. SERVICE ROAD	1373	34:1 APPROACH SURFACE	1372	1'	REQUEST AERONAUTICAL STUDY
5. ANTENNA ON WATER TOWER	1535	7:1 TRANSITIONAL SURFACE	1531	UP TO 5'	TO REMAIN LIGHTED
6. GROUND	1549	HORIZONTAL SURFACE	1543.5	UP TO 6'	REQUEST AERONAUTICAL STUDY
7. LIGHT STANDARD	1550	HORIZONTAL SURFACE	1543.5	UP TO 7'	TO BE LIGHTED
8. POLE	1563	HORIZONTAL SURFACE	1543.5	UP TO 20'	TO BE LIGHTED
9. POLE	1614	20:1 CONICAL SURFACE	1587	27'	TO BE LIGHTED
10. POLE	1623	20:1 CONICAL SURFACE	1587	36'	TO BE LIGHTED
11. POLE	1608	20:1 CONICAL SURFACE	1587	21'	TO BE LIGHTED
12. POLE	1637	20:1 CONICAL SURFACE	1620	17'	TO BE LIGHTED
13. BUSH/TERRAIN	1973	SUPPLEMENTAL SURFACE	SEE NOTE 8	UP TO 380'	REQUEST AERONAUTICAL STUDY
14. MICROWAVE TOWER	2728	SUPPLEMENTAL SURFACE	SEE NOTE 8	UP TO 934'	REQUEST AERONAUTICAL STUDY
15. TERRAIN	2974	SUPPLEMENTAL SURFACE	SEE NOTE 8	UP TO 1181'	REQUEST AERONAUTICAL STUDY
16. TERRAIN	2950	SUPPLEMENTAL SURFACE	SEE NOTE 8	UP TO 1157'	REQUEST AERONAUTICAL STUDY
17. BUSH/TERRAIN	2553	SUPPLEMENTAL SURFACE	SEE NOTE 8	UP TO 760'	REQUEST AERONAUTICAL STUDY

GENERAL NOTES:

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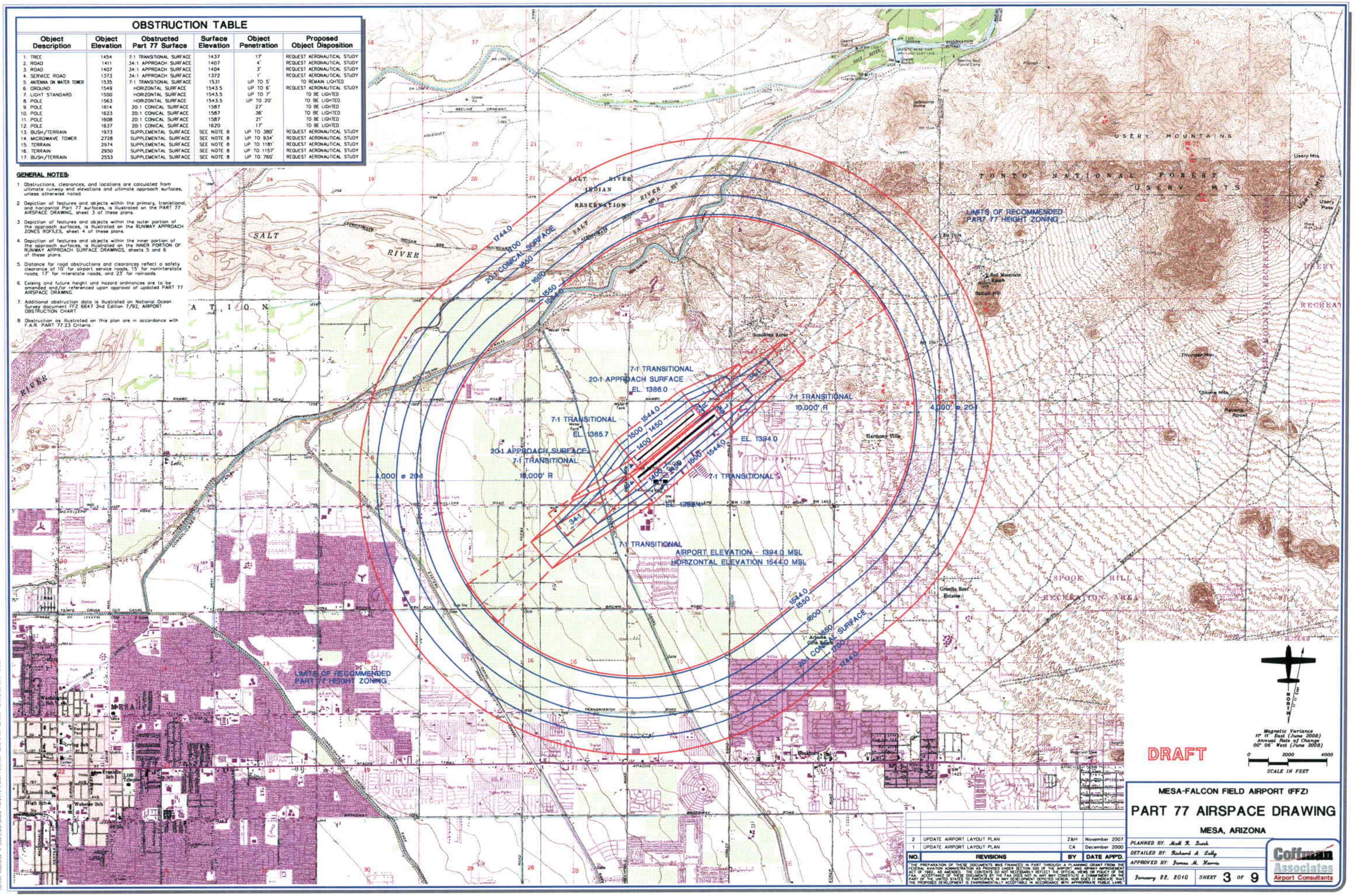
2. Depiction of features and objects within the primary, tranistional, and horizontal Part 77 surfaces, is illustrated on the PART 77 AIRSPACE DRAWING, sheet 3 of these plans.
3. Depiction of features and objects within the outer portion of the approach surfaces, is illustrated on the RUNWAY APPROACH ZONES ROFILES, sheet 4 of these plans.
4. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWINGS, sheets 5 and 6 of these plans.
5. Distance for road obstructions and clearances reflect a safety clearance of 10' for airport service roads, 15' for noninterstate roads, 17' for interstate roads, and 23' for railroads.
6. Exising and future height and hazard ordinances are to be amended and/or referenced upon approval of updated PART 77 AIRSPACE DRAWING.
7. Additional obstruction data is illustrated on National Ocean Survey document FFZ 6647 2nd Edition 7/92, AIRPORT OBSTRUCTION CHART.
8. Obstruction as illustrated on this plan are in accordance with F.A.R. PART 77.23 Criteria.



NO.	REVISIONS	BY	DATE APP'D.
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MESA-FALCON FIELD AIRPORT (FFZ)

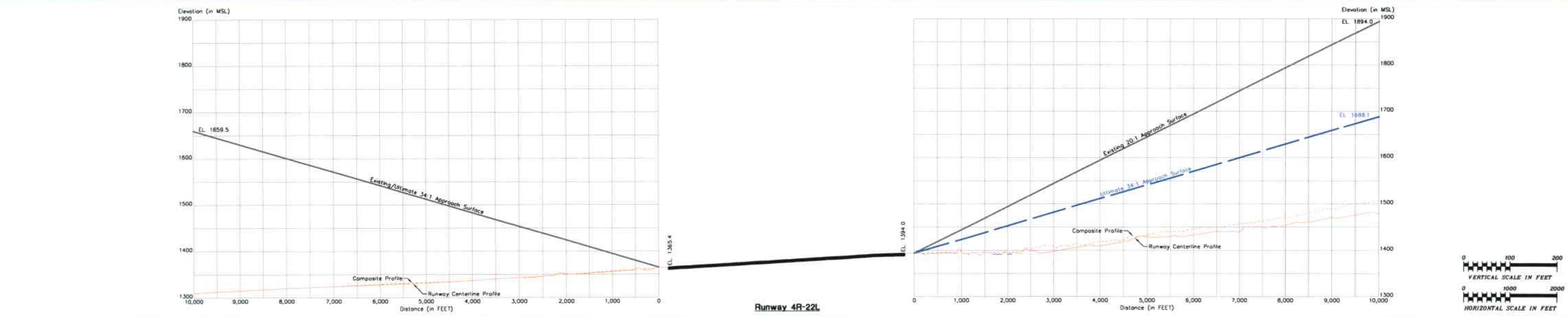
PART 77 AIRSPACE DRAWING

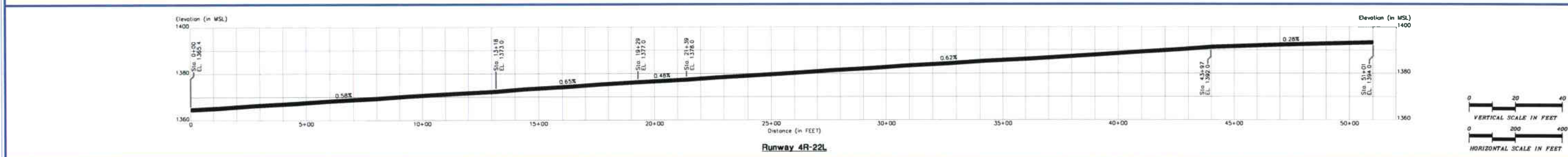
MESA, ARIZONA

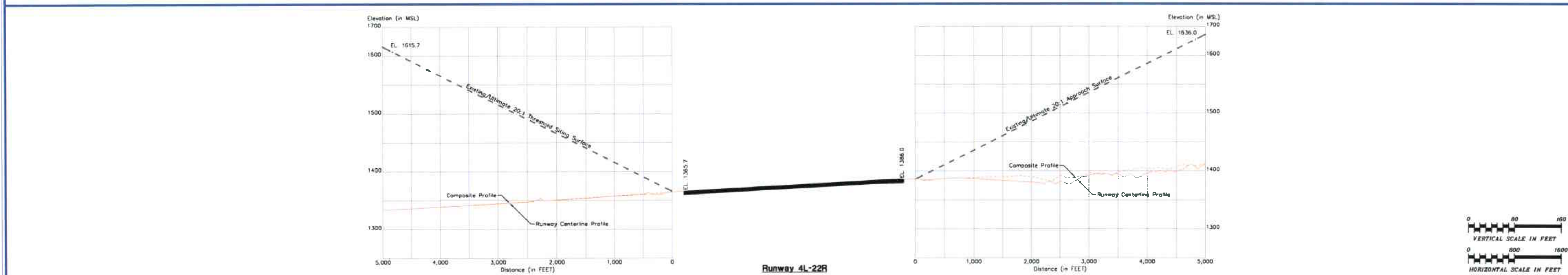
PLANNED BY: Matt R. Quick
DETAILED BY: Richard A. Lolly
APPROVED BY: James M. Harris

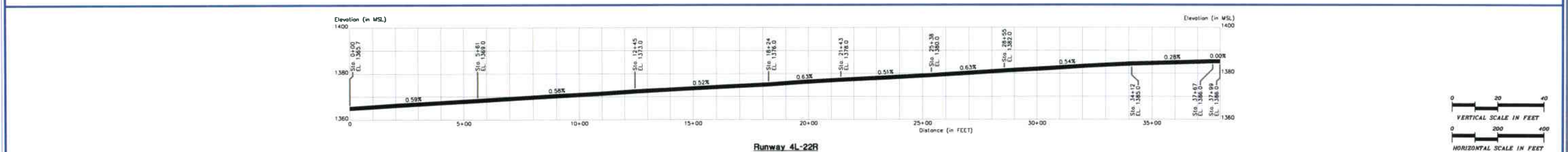
January 22, 2010 | SHEET 3 OF 9

Coffman Associates
Airport Consultants









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OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE					

DRAFT

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MESA-FALCON FIELD AIRPORT (FFZ)

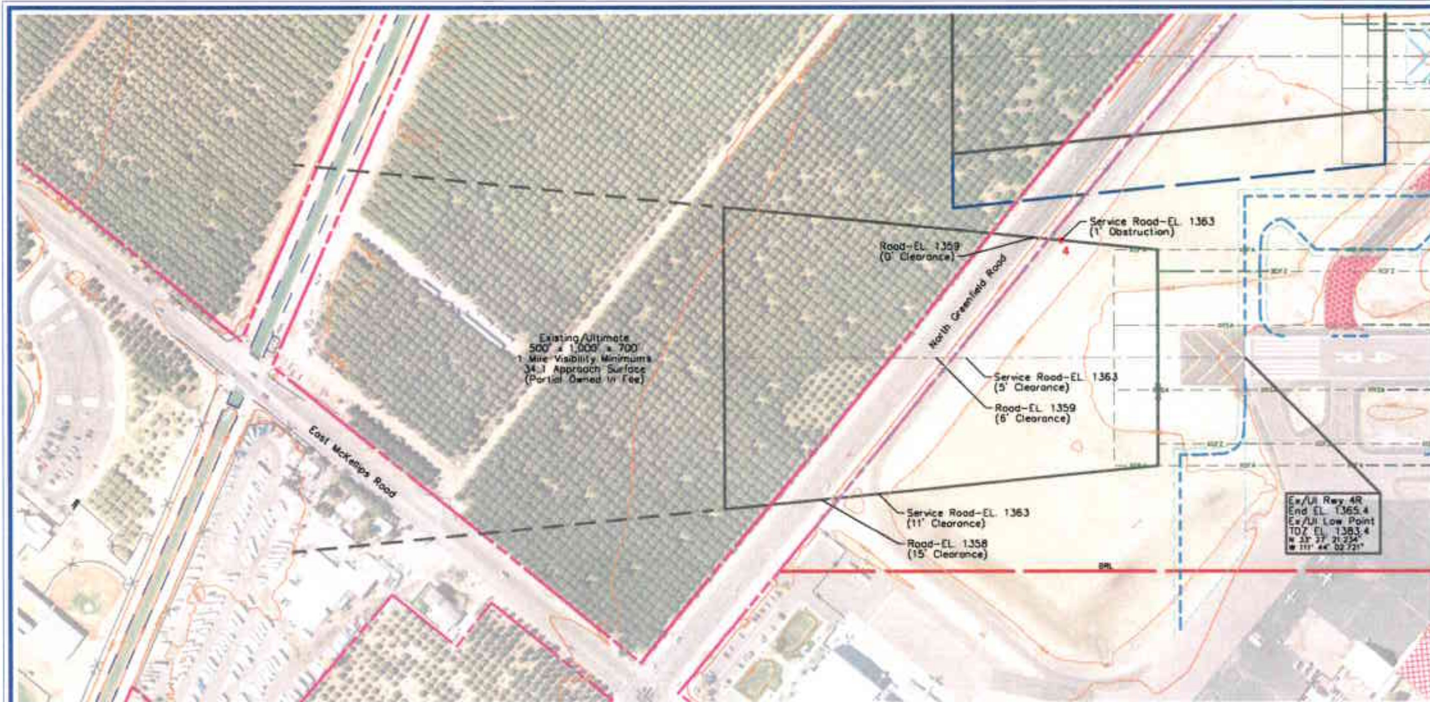
RUNWAY APPROACH ZONES PROFILES/RUNWAY PROFILES

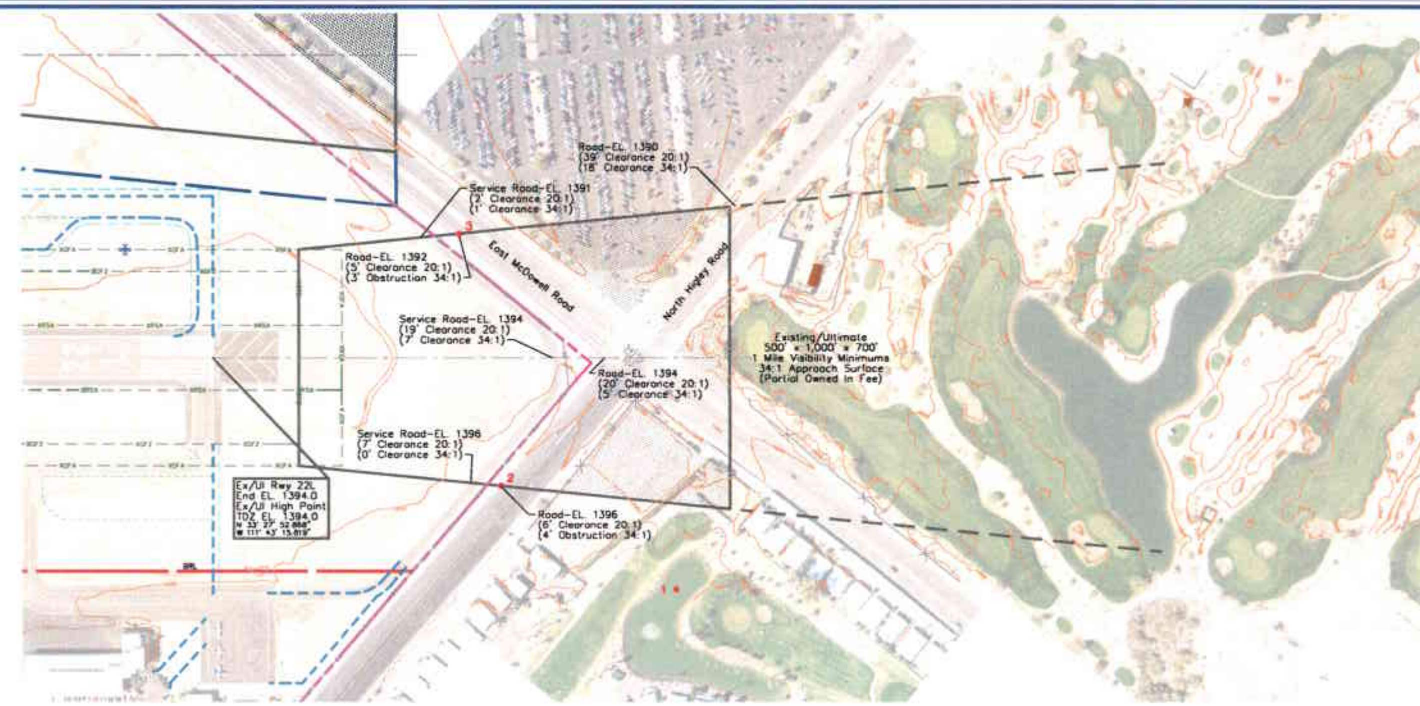
MESA, ARIZONA

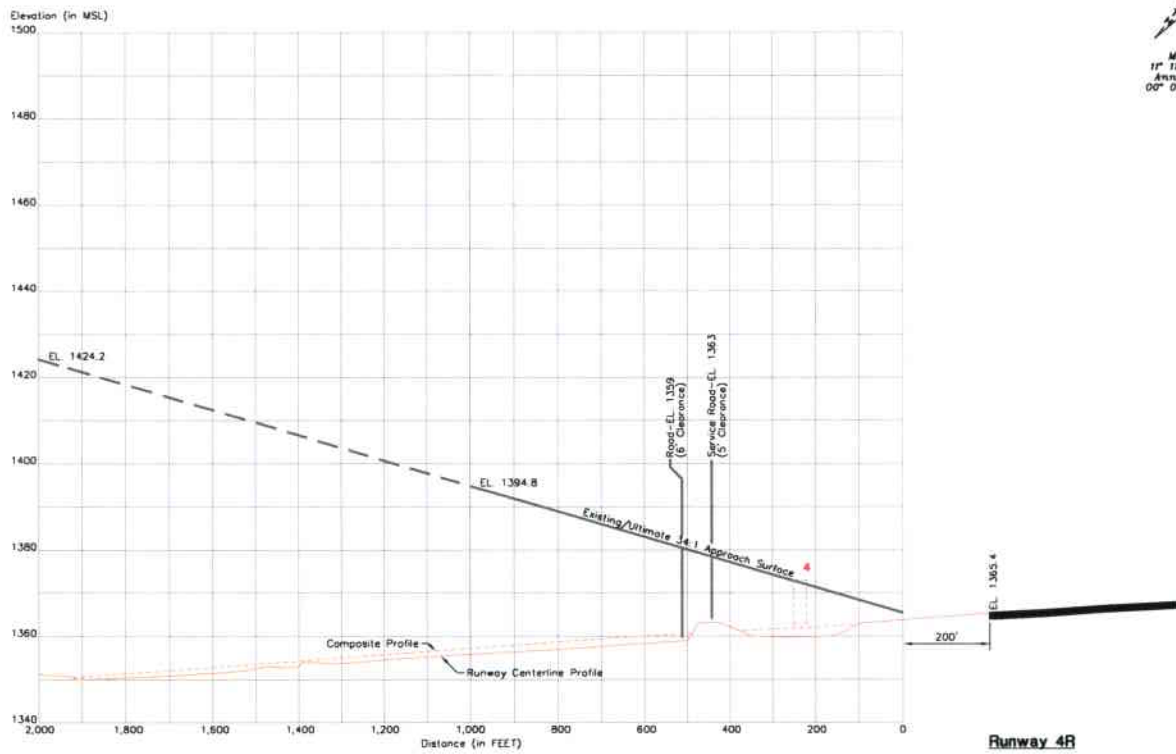
PLANNED BY: Matt R. Quick
DETAILED BY: Richard A. Lolly
APPROVED BY: James M. Harris

January 22, 2010 | SHEET 4 OF 9

Coffman Associates Airport Consultants

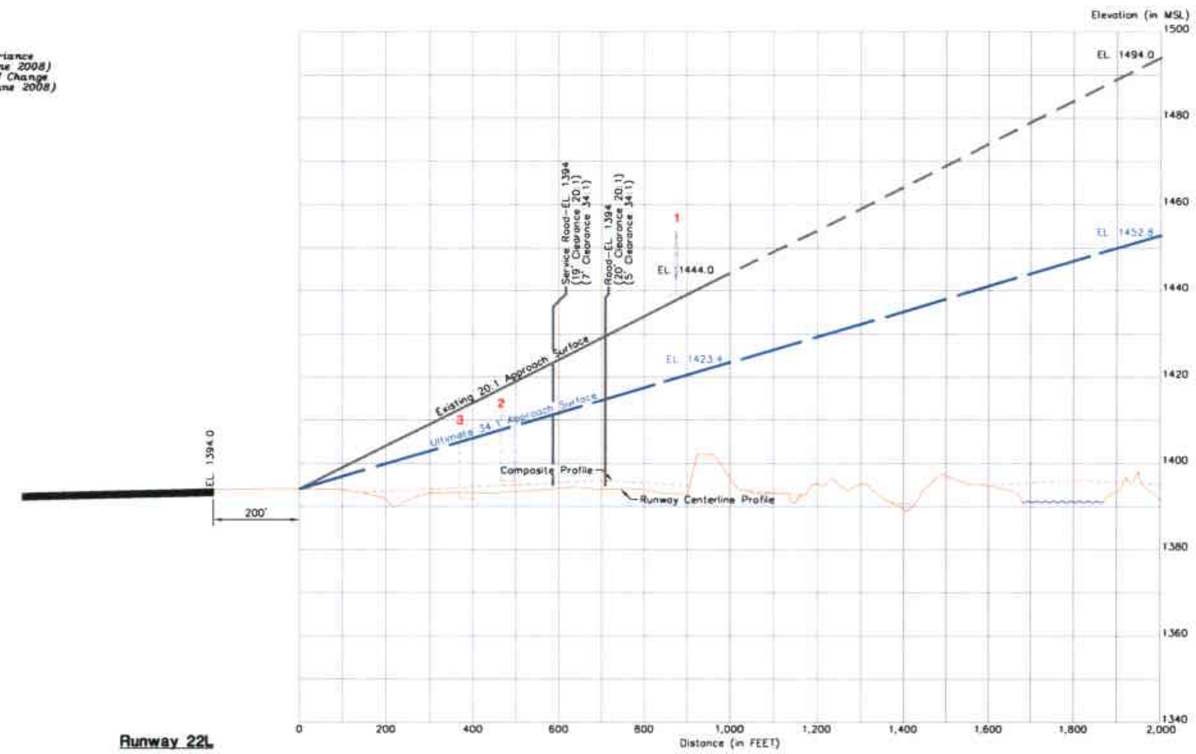






Runway 4R

Runway 22L



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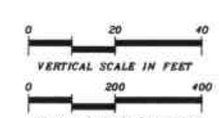
OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1. TREE	1454	7:1 TRANSITIONAL SURFACE	1437	17'	REQUEST AERONAUTICAL STUDY
2. ROAD	1411	34:1 APPROACH SURFACE	1407	4'	REQUEST AERONAUTICAL STUDY
3. ROAD	1407	34:1 APPROACH SURFACE	1404	3'	REQUEST AERONAUTICAL STUDY
4. SERVICE ROAD	1373	34:1 APPROACH SURFACE	1372	1'	REQUEST AERONAUTICAL STUDY



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MESA-FALCON FIELD AIRPORT (FFZ)

INNER PORTION OF RUNWAY 4R-22L APPROACH SURFACE DRAWING

MESA, ARIZONA

PLANNED BY: Matt R. Quick
DETAILED BY: Richard A. Lolly
APPROVED BY: James M. Harris

January 22, 2010 | SHEET 5 OF 9

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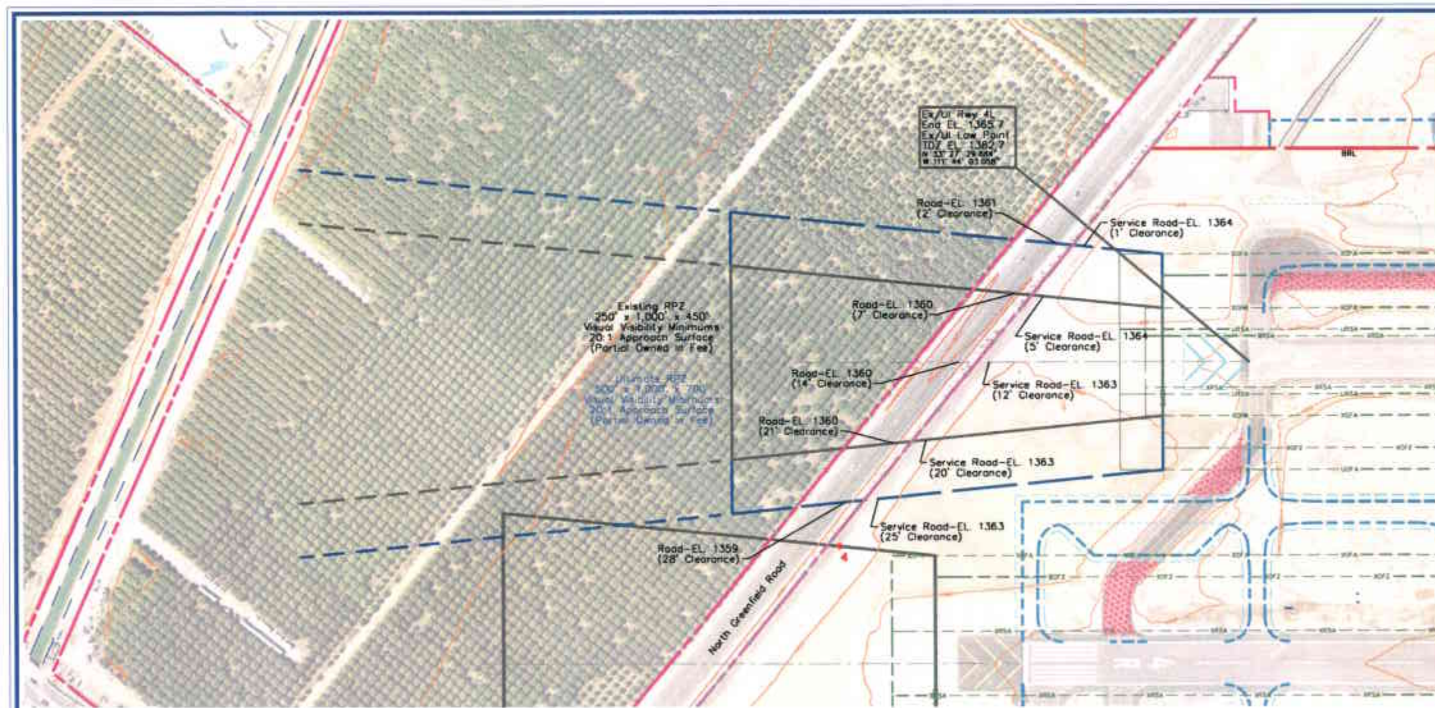
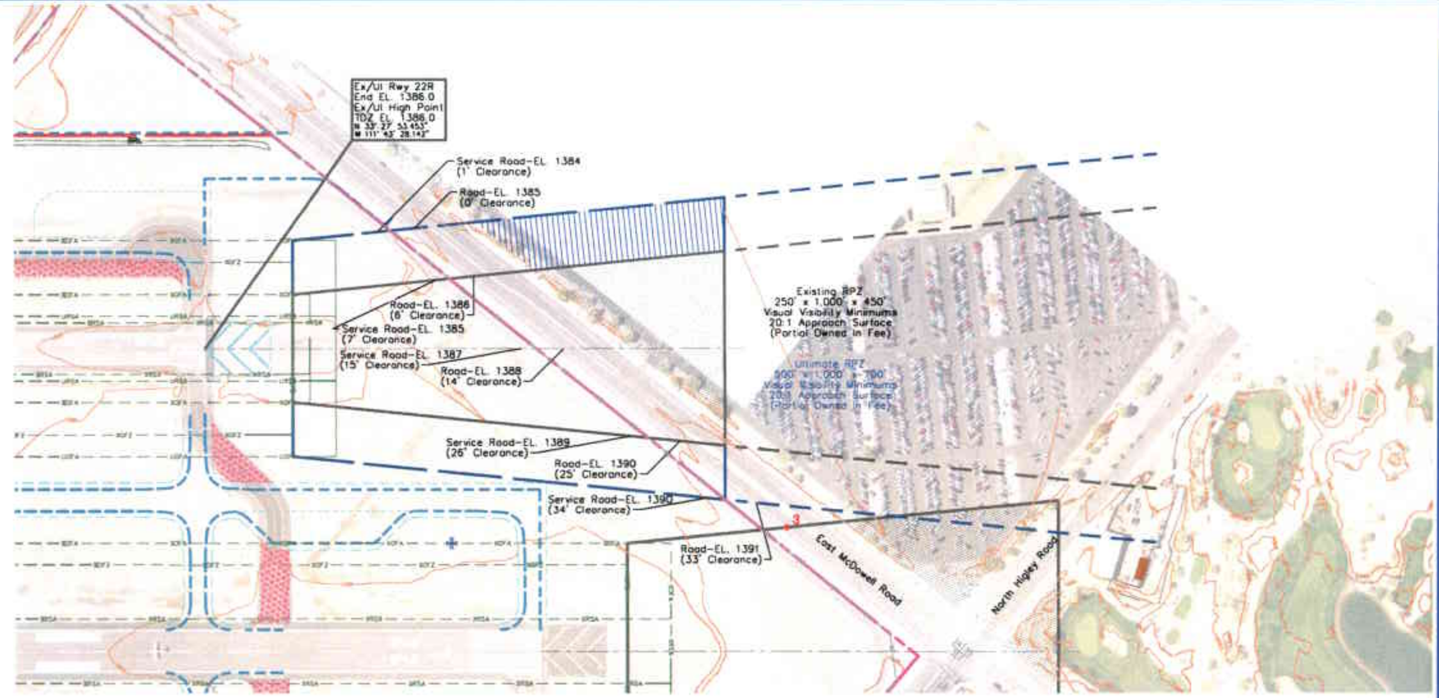
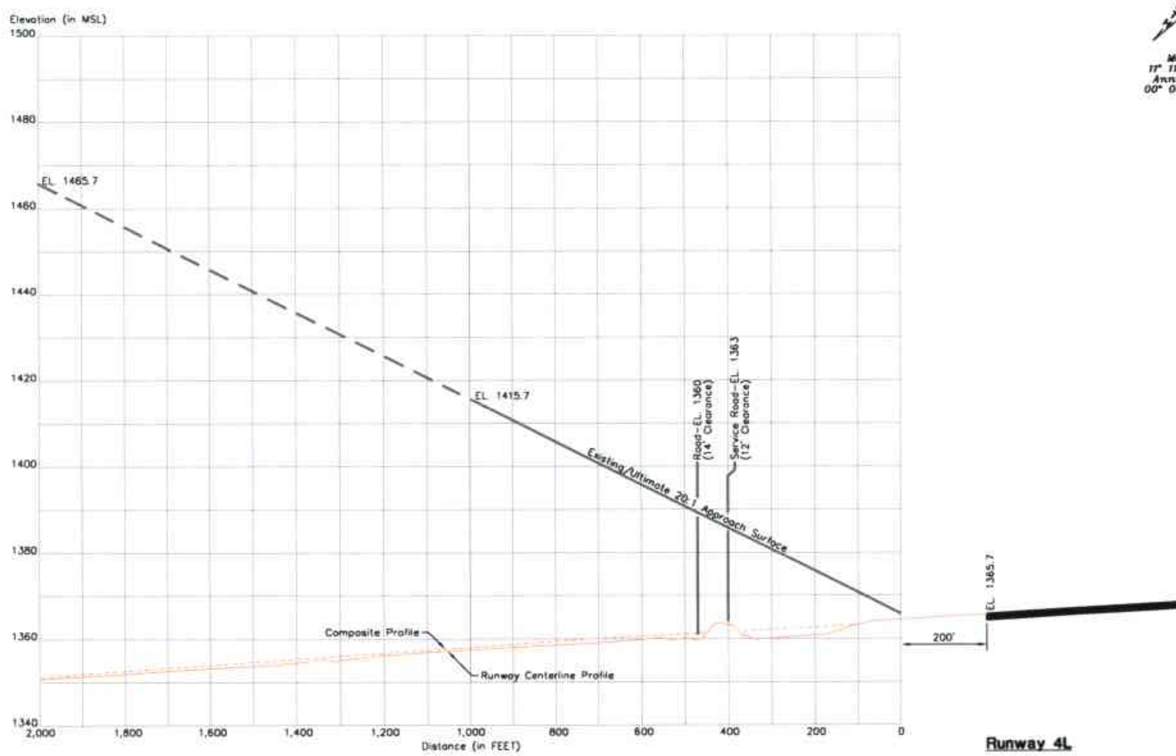
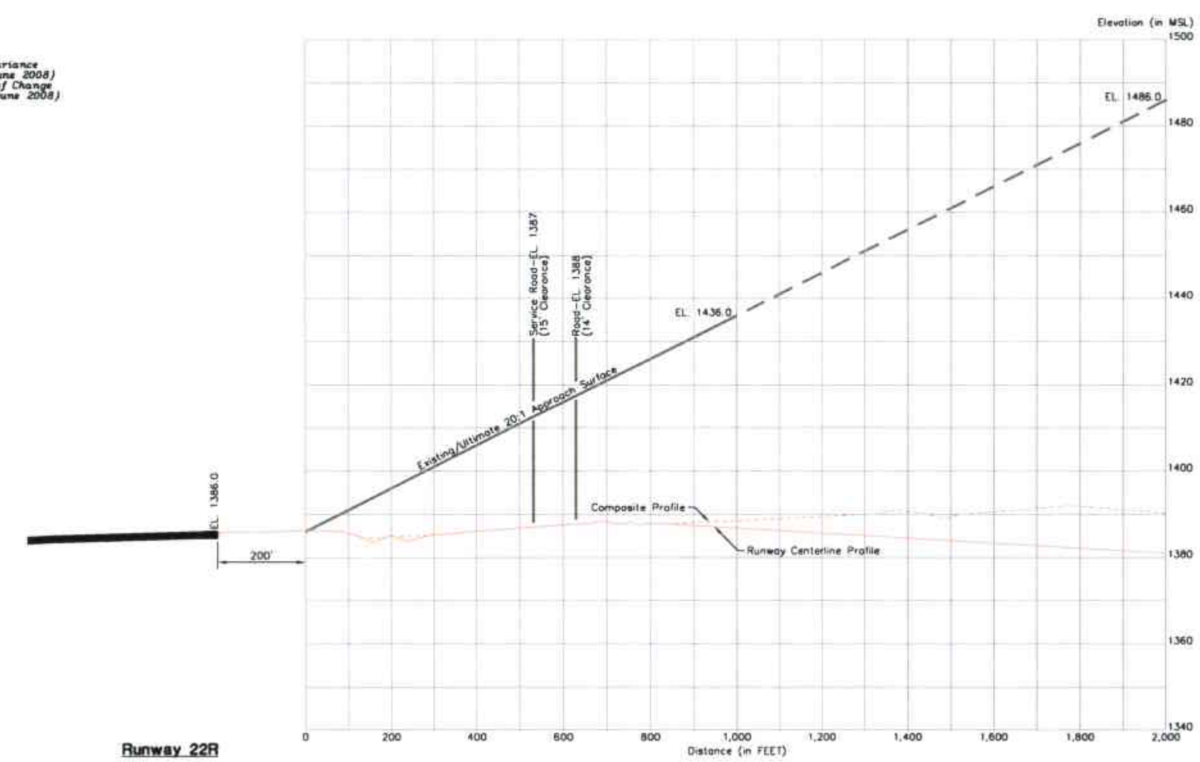






Runway 4L

Runway 22R



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OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE					

0 20 40
VERTICAL SCALE IN FEET

0 200 400
HORIZONTAL SCALE IN FEET

DRAFT

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MESA-FALCON FIELD AIRPORT (FFZ)

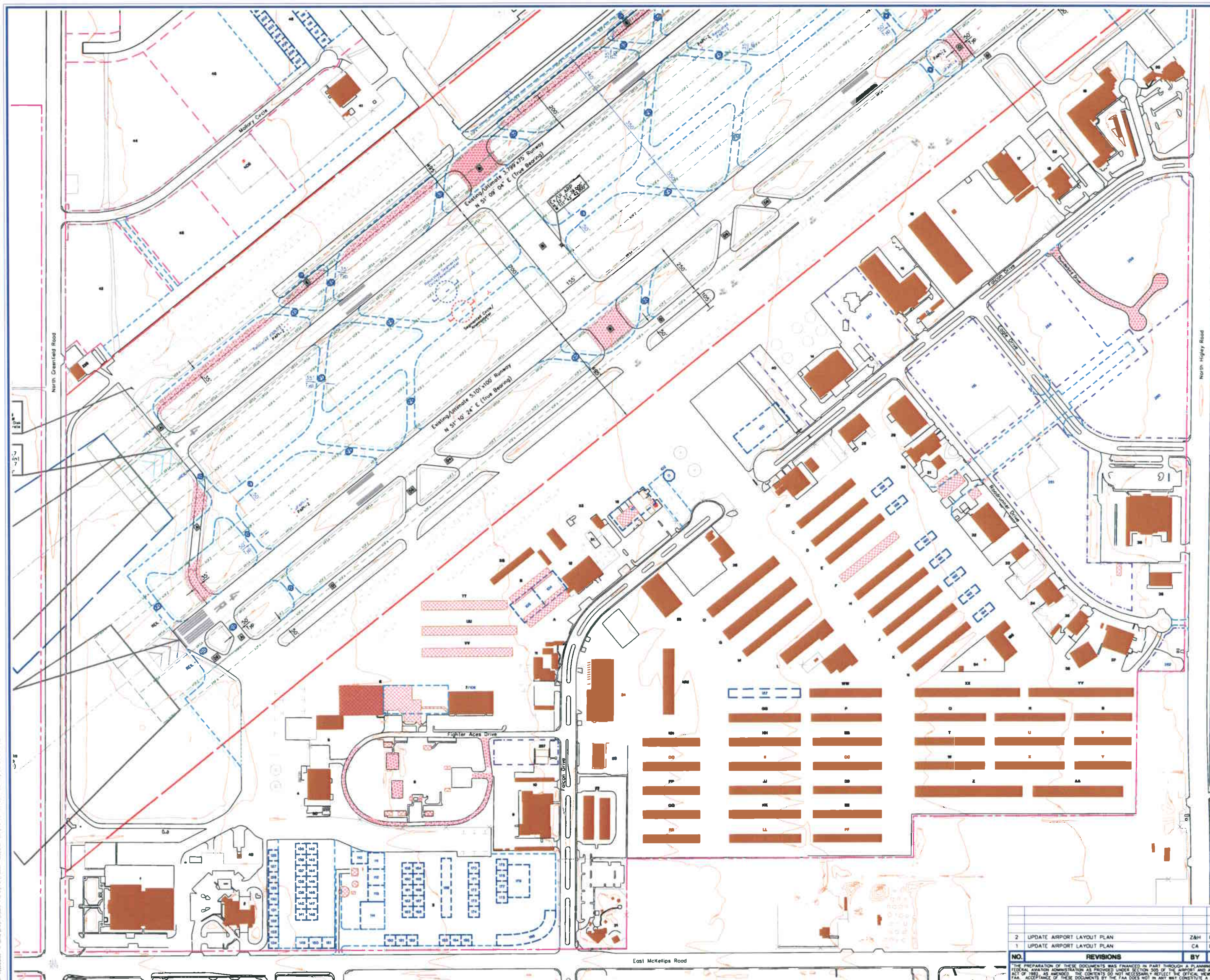
INNER PORTION OF RUNWAY 4L-22R APPROACH SURFACE DRAWING

MESA, ARIZONA

PLANNED BY: Matt R. Quick
DETAILED BY: Richard A. Lolly
APPROVED BY: James M. Harris

January 22, 2010 | SHEET 6 OF 9

Coffman Associates
Airport Consultants



LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT PARCEL LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVICATION EASEMENT
		BUILDING REMOVAL
		BUILDING CONSTRUCTION (On/Off Airport)
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
		FACILITY (PAVEMENT) CONSTRUCTION
		FACILITY (PAVEMENT) REMOVAL
		FENCING
		HELIPORT
PAPI-4	PAPI-4	PRECISION APPROACH PATH INDICATOR
		PRIMARY/SECONDARY AIRPORT CONTROL STATION
		RUNWAY OBJECT FREE AREA
		RUNWAY OBSTACLE FREE ZONE
		RUNWAY PROTECTION ZONE (RPZ)
		RUNWAY SAFETY AREA
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		SECTION CORNER
		SEGMENTED CIRCLE/WIND INDICATOR
		TAXIWAY DESIGNATION
		TAXIWAY HOLD LINE
		TOPOGRAPHY
		WIND INDICATOR (Lighted)

NOTE: See Drawing No. 2 AIRPORT LAYOUT DRAWING for a complete detail listing of the Existing and Ultimate Building/Facilities Tables.

Magnetic Variance
11° 11' East (June 2008)
Annual Rate of Change
00° 06' West (June 2008)

DRAFT

0 200 400
SCALE IN FEET

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MESA-FALCON FIELD AIRPORT (FFZ)

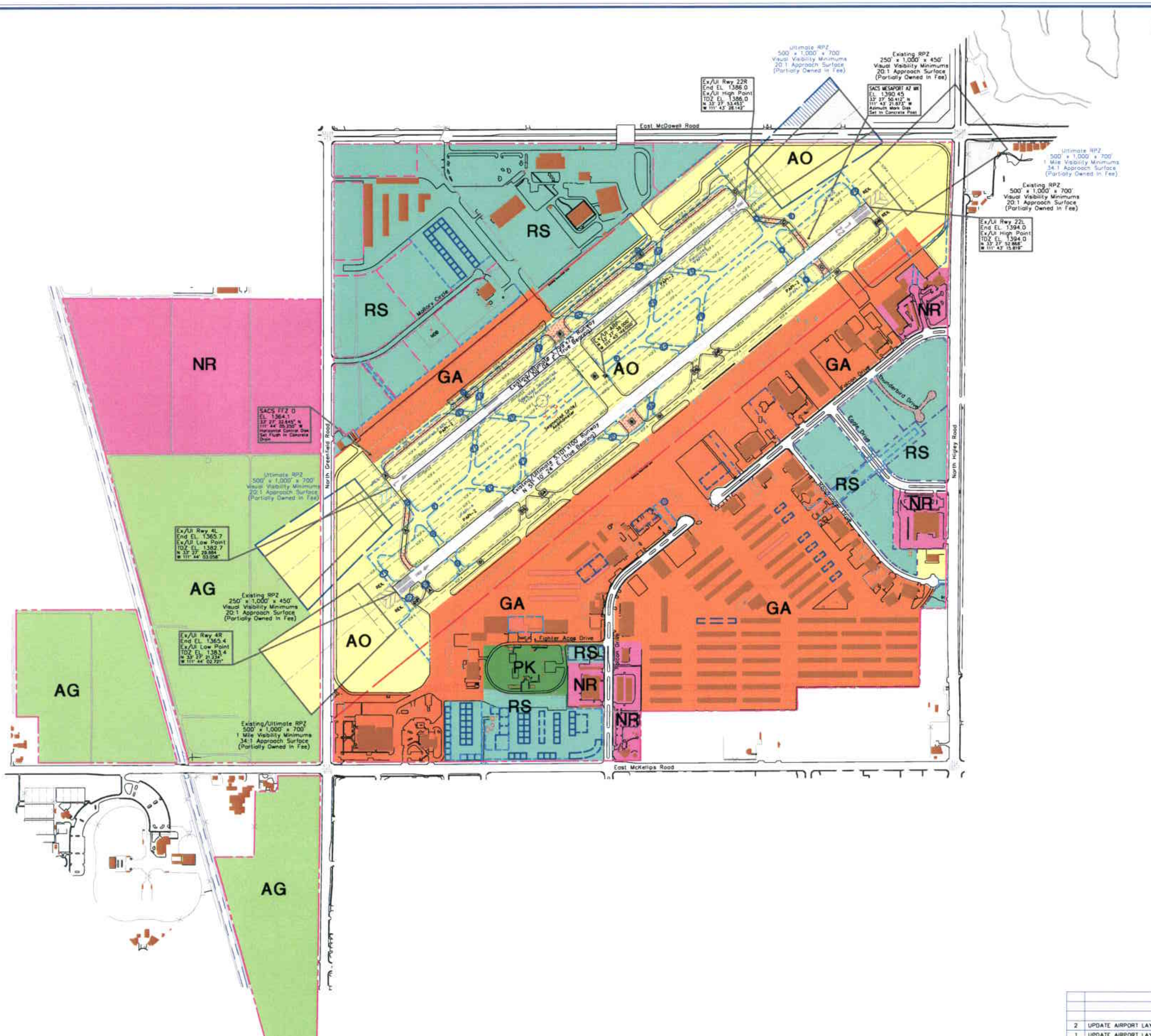
TERMINAL AREA PLAN

MESA, ARIZONA

PLANNED BY: Matt R. Quick
DETAILED BY: Richard A. Lolly
APPROVED BY: James M. Harris

January 22, 2010 | SHEET 7 OF 9

Coffman Associates
Airport Consultants



LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT PARCEL LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVICATION EASEMENT
		BUILDING REMOVAL
		BUILDING CONSTRUCTION (On/Off Airport)
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
		FACILITY (PAVEMENT) CONSTRUCTION
		FACILITY (PAVEMENT) REMOVAL
		FENCING
		HELIPORT
PAPI-4	PAPI-4	PRECISION APPROACH PATH INDICATOR
		PRIMARY/SECONDARY AIRPORT CONTROL STATION
		RUNWAY OBJECT FREE AREA
		RUNWAY OBSTACLE FREE ZONE
		RUNWAY PROTECTION ZONE (RPZ)
		RUNWAY SAFETY AREA
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		SECTION CORNER
		SEGMENTED CIRCLE/WIND INDICATOR
		TAXIWAY DESIGNATION
		TAXIWAY HOLD LINE
		TOPOGRAPHY
		WIND INDICATOR (Lighted)

AIRPORT LAND USE LEGEND

AO	Airfield Operations
GA	General Aviation
RS	Aviation Related Revenue Support
NR	Non-Aviation Related Revenue Support
	Historical Site
	Park
AG	Agriculture/Open Space

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00° 06' West (June 2008)

DRAFT

0 400 800
SCALE IN FEET

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MESA-FALCON FIELD AIRPORT (FFZ)

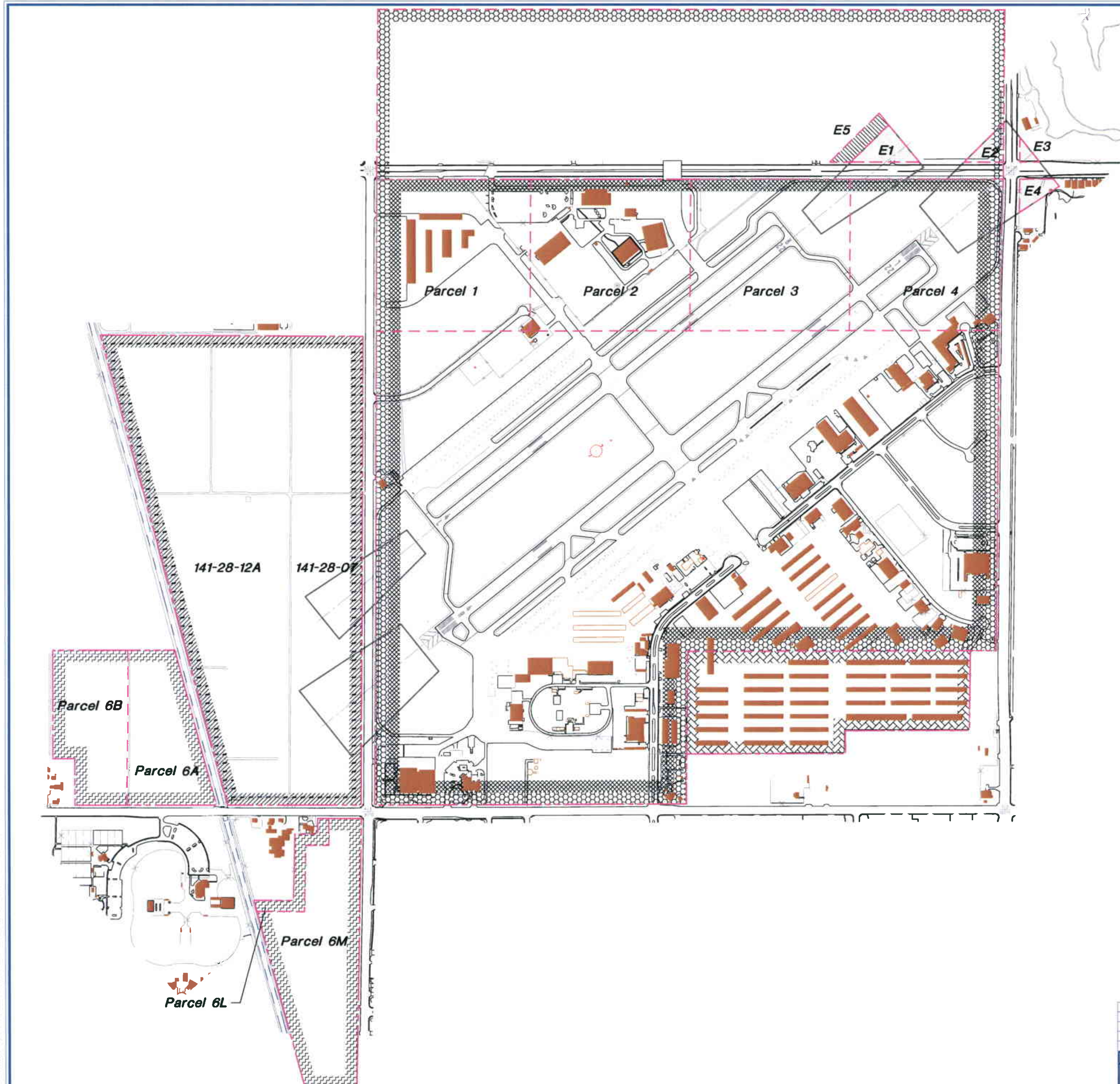
ON-AIRPORT LAND USE PLAN

MESA, ARIZONA

PLANNED BY: Matt R. Quick
DETAILED BY: Richard A. Lolly
APPROVED BY: James M. Harris

January 22, 2010 SHEET 8 OF 9

Coffman Associates
Airport Consultants



LEGEND

EXISTING	ULTIMATE	DESCRIPTION
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		AIRPORT ROTATING BEACON
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		FACILITY (PAVEMENT) CONSTRUCTION
		FACILITY (PAVEMENT) REMOVAL
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PAPI-4	PAPI-4	PRECISION APPROACH PATH INDICATOR
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		SECTION CORNER
		SEGMENTED CIRCLE/WIND INDICATOR
		TAXIWAY DESIGNATION
		TAXIWAY HOLD LINE
		TOPOGRAPHY
		WIND INDICATOR (Lighted)

PARCELS

TYPE: Warranty Deed
PARCEL: (See legal description)
DATE: 6-28-41
ACRES: 680
RECORDED AT: Maricopa Cty
DOCKET #: 19673
PAGE #: Unknown
NOTE: Deed recorded in Book 357, Page 588 (See Note 1)

TYPE: Instrument of Transfer
PARCEL: (See legal description)
DATE: 8-17-48
ACRES: 600
RECORDED AT: Maricopa Cty
DOCKET #: 270
PAGE #: 90-101
(See Note 2)

TYPE: Instrument of Release
PARCEL: (See legal description)
DATE: 7-29-59
NOTE: Permits the use of property and Buildings for commercial/industrial purposes

TYPE: Instrument of Release
PARCEL: (See legal description)
DATE: 3-15-66
NOTE: Deleted provision in Instrument of Transfer to allow U.S. Government to take possession of airport property without compensation.

TYPE: Warranty Deed
PARCEL: 141-36-003B
DATE: 12-28-76
ACRES: 39.9
RECORDED AT: Maricopa Cty
DOCKET #: 12008
PAGE #: 326

TYPE: Fee Simple
PARCEL: 141-28-12A
DATE: Unknown
ACRES: 56.341
RECORDED AT: Maricopa Cty
DOCKET #: 09015
PAGE #: 754

TYPE: Fee Simple
PARCEL: 141-28-07
DATE: 2-2-78
ACRES: 37.006
RECORDED AT: Maricopa Cty
DOCKET #: 12693
PAGE #: 39

TYPE: Special Warranty
PARCEL: 141-28-006A
DATE: 5-19-95
ACRES: 14.948
RECORDED AT: Maricopa Cty
DOCKET #: 95-284558
PAGE #: --

TYPE: Special Warranty
PARCEL: 141-28-006B
DATE: 5-19-95
ACRES: 18.182
RECORDED AT: Maricopa Cty
DOCKET #: 95-284558
PAGE #: --

EASEMENTS

TYPE: Avigation
PARCEL: E1
OWNER: The Boeing Company
BY: City of Mesa
DATE: January 1988
RECORDED: No
DATE: Unknown
DOCKET #: Unknown
PAGE #: Unknown

TYPE: Avigation
PARCEL: E2
OWNER: The Boeing Company
BY: City of Mesa
DATE: January 1988
RECORDED: No
DATE: Unknown
DOCKET #: Unknown
PAGE #: Unknown

TYPE: Avigation
PARCEL: E3
OWNER: The Boeing Company
BY: City of Mesa
DATE: January 1988
RECORDED: No
DATE: Unknown
DOCKET #: Unknown
PAGE #: Unknown

TYPE: Avigation
PARCEL: E4
OWNER: Apache Wells Country Club
BY: City of Mesa
DATE: Unknown
RECORDED: No
DATE: Unknown
DOCKET #: Unknown
PAGE #: Unknown

TYPE: Avigation
PARCEL: E5
OWNER: The Boeing Company
BY: City of Mesa
DATE: January 1988
RECORDED: No
DATE: Unknown
DOCKET #: Unknown
PAGE #: Unknown

GENERAL NOTES

1. This property includes Parcels 1, 2, 3 and 4 located in the north half of the north half of Section 3, Township 1 North, Range 6 East, Gila and Salt River Base Meridian.
2. This property was transferred from the U.S. Government to the City of Mesa under the Surplus Property Act of 1947 and was to be used only for an airport. The transfer documents required that all the property (including buildings/facilities) be used for aviation purposes only. The property originally taken by the U.S. Government included 160 acres north of McDowell Road. This property was not included in the Transfer agreement and was returned to the City of Mesa.
3. A search of all the property records in the City of Mesa, McDonnell Douglas Helicopters, the Maricopa County Recorder and the Title companies, failed to produce any recorded avigation easements. Recommend the Sponsor secure recorded Avigation Easements for these properties.

Magnetic Variance
11° 11' East (June 2008)
Annual Rate of Change
00° 06' West (June 2008)

DRAFT

0 400 800
SCALE IN FEET

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2	UPDATE AIRPORT LAYOUT PLAN	Z&H	November 2007
1	UPDATE AIRPORT LAYOUT PLAN	CA	December 2000

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MESA-FALCON FIELD AIRPORT (FFZ)

AIRPORT PROPERTY MAP

MESA, ARIZONA

PLANNED BY: Matt R. Quick
DETAILED BY: Richard A. Lolly
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