GILA BEND MUNICIPAL AIRPORT

AIRPORT MASTER PLAN

AIRPORT MASTER PLAN

for

GILA BEND MUNICIPAL AIRPORT
Gila Bend, Arizona

FINAL REPORT

Prepared for

The Town of Gila Bend

by

Coffman Associates, Inc.

Accepted by the Town Council
on June 11, 2013

Final Printing
March 2014

"The preparation of this document was financially supported, in part, through the Airport Improvement Program as administered by the Federal Aviation Administration as provided under Title 49 United States Code, Section 47104. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable or would have justification in accordance with appropriate public laws."

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INTRODUCTION

Introduction

The Gila Bend Airport Master Plan 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 Update is intended to be a proactive document which identifies and then plans for future facility needs well in advance of the actual need. This is done to ensure that the Town of Gila Bend can coordinate project approvals, design, financing, and construction in a timely manner, prior to experiencing the detrimental effects of inadequate facilities.

An important result of the Master Plan Update is reserving sufficient areas for future facility needs. This protects development areas and ensures they will be readily available when required to meet future needs. The intended result is a detailed land use concept which outlines specific uses for all areas of airport property, including strategies for revenue enhancement.

The preparation of this Master Plan Update is evidence that the Town of Gila Bend recognizes the importance of the airport to the community and the associated challenges inherent in providing for its unique operating and improvement needs. The cost of maintaining an airport is an investment which yields impressive benefits to the community. With a sound and realistic Master Plan Update, Gila Bend Municipal Airport can maintain its role as an important link to the national air transportation system for the community and maintain the existing public and private investments in its facilities.

MASTER PLAN GOALS AND OBJECTIVES

The primary objective of the Gila Bend Airport Master Plan Update is to develop and maintain a financially feasible, long term development program which will satisfy aviation demand; be compatible with community development, other transportation modes, and the environment; and be a source of employment and revenue for the Town and surrounding areas. The most recent planning efforts for the airport were undertaken in February 2004 for the last Airport Master Plan and the more recent Airport Layout Plan revisions in January 2011.

This Master Plan Update is intended to provide guidance through an updated capital improvement and financial program to demonstrate the future investments required by the Town. The new planning study also provides justification for new priorities. The plan will be closely coordinated with other planning studies in the area, and with aviation plans developed by the FAA and the State of Arizona. Specific objectives of the study include, but are not limited to the following:

- Research factors likely to affect air transportation demand in the Gila Bend area over the next 20 years and develop new operational and basing forecasts. The new forecasts will be reviewed and approved by the FAA.

- Determine projected needs of airport users, taking into consideration recent changes to FAA design standards and transitions in the type of aircraft flown by corporate and general aviation users.

- To evaluate the impacts and opportunities resulting from the relocation/realignment of State Highway 85.

- Recommend improvements which enhance Gila Bend Airport's ability to satisfy future aviation needs and meet FAA safety and design standards.

- Establish a schedule of development priorities and analyze potential funding sources consistent with FAA planning.

- Prepare new airport layout plan drawings using new aerial photography and mapping prepared for this study. Supplemental drawings include: landside facilities, airspace, inner approach surfaces to runways, departure surfaces, property ownership, and on-airport land use (aviation vs. non-aviation related land uses).

MASTER PLAN TASKS

The Master Plan will accomplish the above objectives by carrying out the following:

- Determining projected needs of airport users through the year 2032.

- Analyzing socioeconomic factors likely to affect air transportation demand in the Town of Gila Bend, 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, commonsense plan for the use and expansion of the airport.
- Presenting environmental considera-tion associated with any recommended development alternatives.
- Establishing a schedule of development priorities and a program for improvements.
- Producing current and accurate base maps and Airport Layout Plan (ALP) drawings.
- Coordinating this Master Plan with local, regional, state, and federal agencies.
- Preparing this Master Plan under guidelines established by the FAA and ADOT.

BASELINE ASSUMPTIONS

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

- Gila Bend Municipal Airport will continue to operate as a general aviation airport through the planning period.
- Gila Bend Municipal Airport will continue to seek general aviation 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.
- The socioeconomic characteristics of the region will remain as forecast (see Chapter One).
- 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 Gila Bend Municipal Airport Master Plan Update is being prepared in a systematic fashion following FAA guidelines and industry-accepted principles and practices, as shown on **Exhibit IA**. The Master Plan has six chapters that are intended to assist in the discovery of future facility needs and provide the supporting rationale for their implementation.

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

Chapter Two – 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 Gila Bend Municipal Airport through the year 2032. 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. An environmental overview is also provided.

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

Appendix – Airport Plans includes the official ALP and detailed technical drawings depicting related airspace, land use, and property data. These drawings are used by the FAA and ADOT in determining grant eligibility and funding.

COORDINATION

The Gila Bend Airport Master Plan Update is of interest to many within the local community. This includes local citizens, community organizations, airport users, airport tenants, and aviation organizations. As a component of the regional, state, and national aviation systems, Gila Bend Municipal Airport is of importance to both state and federal agencies responsible for overseeing air transportation.

To assist in the development of the Master Plan Update, the Town of Gila Bend identified a group of community members and aviation interest groups to act in an advisory role in the development of the Master Plan Update. Members of the Planning Advisory Committee (PAC) met four times, reviewed phase reports, and provided comments to help ensure that a realistic, viable plan was developed.

To assist in the review process, draft phase reports were prepared at various milestones in the planning process. The phase report process allowed for timely input and review during each step within the Master Plan to ensure that all issues were fully addressed as the recommended program developed.

A public information workshop was also held as part of the plan coordination.

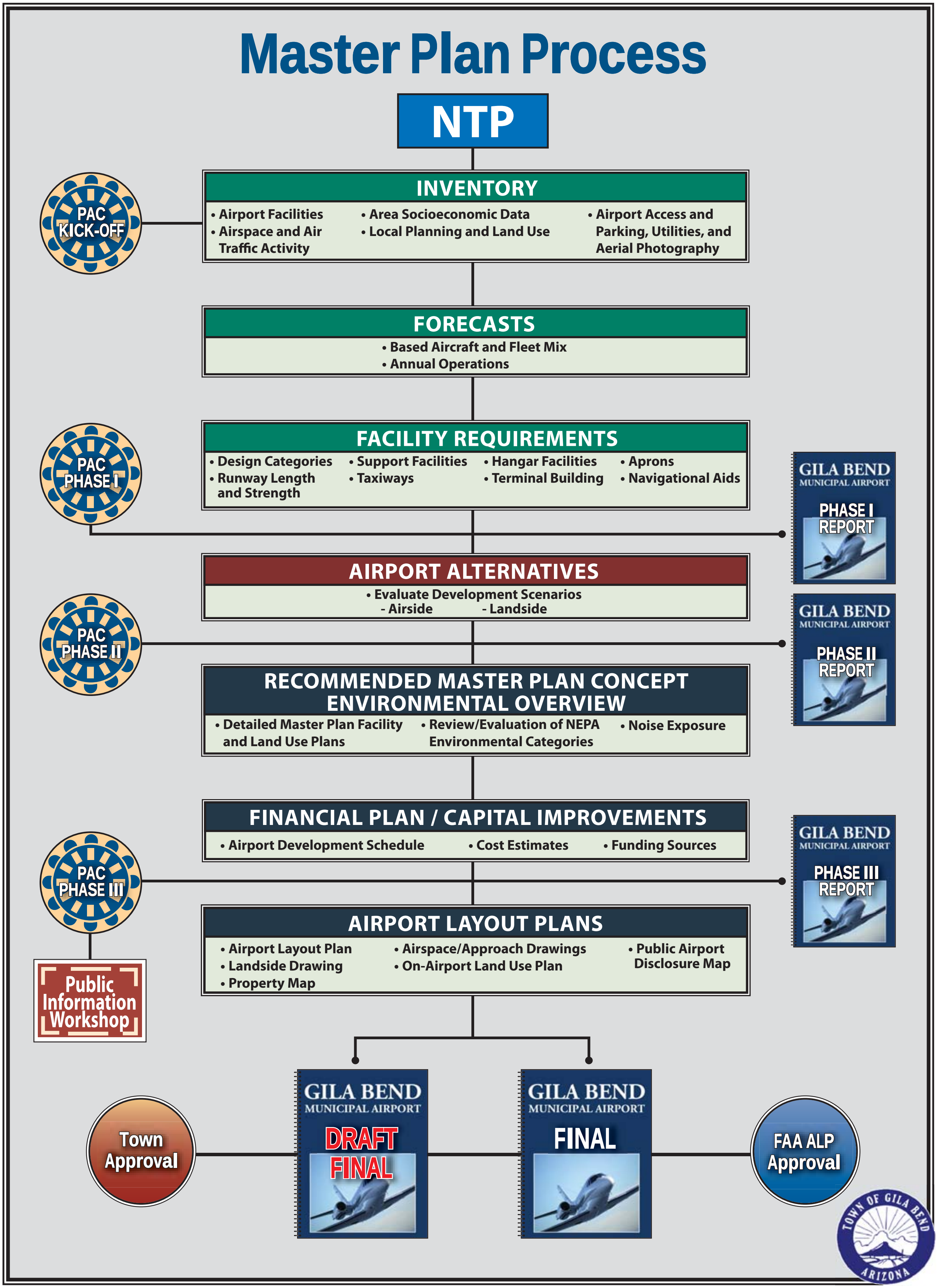


Exhibit IA
MASTER PLAN PROCESS

CHAPTER ONE

INVENTORY

GILA BEND MUNICIPAL AIRPORT

Inventory

The purpose of the Airport Master Plan Update is to provide the Town of Gila Bend, the Arizona Department of Transportation - Multimodal Planning Division - Aeronautics Group (ADOT), and the Federal Aviation Administration (FAA) with a clear vision of necessary airport improvements over the next 20 years. This document will focus on the facility changes and development direction of the airport that has occurred since the most recent master plan was completed in February 2004. The Airport Layout Plan (ALP) was updated in January 2011, but at the time of this report, had not yet been approved by the FAA.

AIRPORT CHARACTERISTICS

The purpose of this section is to summarize various studies and data collected to provide an understanding of the characteristics of the airport and the regional area. Within this section is a description of the airport's setting, history, climate, system planning role, and funding.

AIRPORT SETTING

The Town of Gila Bend is located in southwestern Maricopa County in south central Arizona, approximately 65 miles from the Phoenix metropolitan area. The Town is positioned along State Route 85, which connects Interstate 8 in Gila Bend to Interstate 10 in Buckeye. This 37-mile corridor is classified as a principal arterial highway on the National Highway System.

The Town is also situated along the Gila River in relatively flat terrain. The Gila River flows from the north and makes a sharp turn to the west at Gila Bend, which is how the Town got its name. The Gila Bend Mountains and the South Maricopa Mountains surround the Town, providing a scenic backdrop to the community. Its position along State Route 85 makes Gila Bend a popular stop for travelers to and from California and Mexico.

In February of 2009, the Town of Gila Bend adopted three themes: Sustainability, Professional & Progressive Management, and Raising the Quality of Life. At that time, the Town also committed to becoming the solar capital of the world. Gila Bend is already one of the best places in the world for solar, but with the landmark Solar Field Overlay Zone conceptualized and adopted by the Town, it also boasts being the best regulatory environment in the nation.

Permitting times have been cut from years to only a matter of weeks. As a result, in less than three years, the Town is well on its way to achieving its vision of becoming the solar capital of the world. Representing approximately $1.6 billion in investment in the community, two utility scale solar plants in the Gila Bend area are now complete and a third is under construction. Collectively, these plants will generate 315 megawatts (MW) of clean, renewable, solar energy to the grid. Approximately 15 more viable utility scale solar plants are in various planning stages.

Ongoing efforts include identifying and targeting the supply chain of the solar industry, an increased focus on distributive generation to reduce energy costs to the Town, and promoting the construction of transmission lines to California and Mexico. Dubbed the Gila Bend Transmission Initiative (GBTI), the Town has taken a regional leadership role and has made major inroads in corridor development for transmission to California. The successful completion of transmission to California would facilitate the construction of potentially several dozen utility scale plants in Gila Bend. In conjunction with opening the market for a natural gas plant, potential annual tax revenues could be increased by $5 million to $10 million per year. The Town envisions Gila Bend becoming a major energy hub for the Southwest.

Maricopa County, named after the Maricopa Tribe, was created from portions of Pima and Yavapai counties in 1871. Today, Maricopa County measures over 9,000 square miles. Twenty-nine percent of this area is owned individually or by a corporation, and 28 percent is owned by the U.S. Bureau of Land Management. The U.S. Forest Service and the State of Arizona each control 11 percent of the county, while an additional 16 percent is owned publicly, and nearly five percent is Indian reservation land.

Gila Bend Municipal Airport is located at the eastern edge of the town limits, east of and adjacent to State Highway 85. Access to the airport is off State Highway 85, via a gravel road at the north end of the property. The location of the airport in its regional setting is depicted on **Exhibit 1A**.

AIRPORT HISTORY

General aviation in Central Arizona grew at a rather fast rate during the 1950's and 1960's, especially in rural agricultural areas. More specifically, crop dusting became a large scale activity and was a major factor in the growth of general aviation in Central Arizona. This increase brought about the need for an airport to serve Gila Bend and the surrounding areas.

Property for construction of the Gila Bend Municipal Airport was acquired under Section 16 of the Federal Airport Aid Pro-

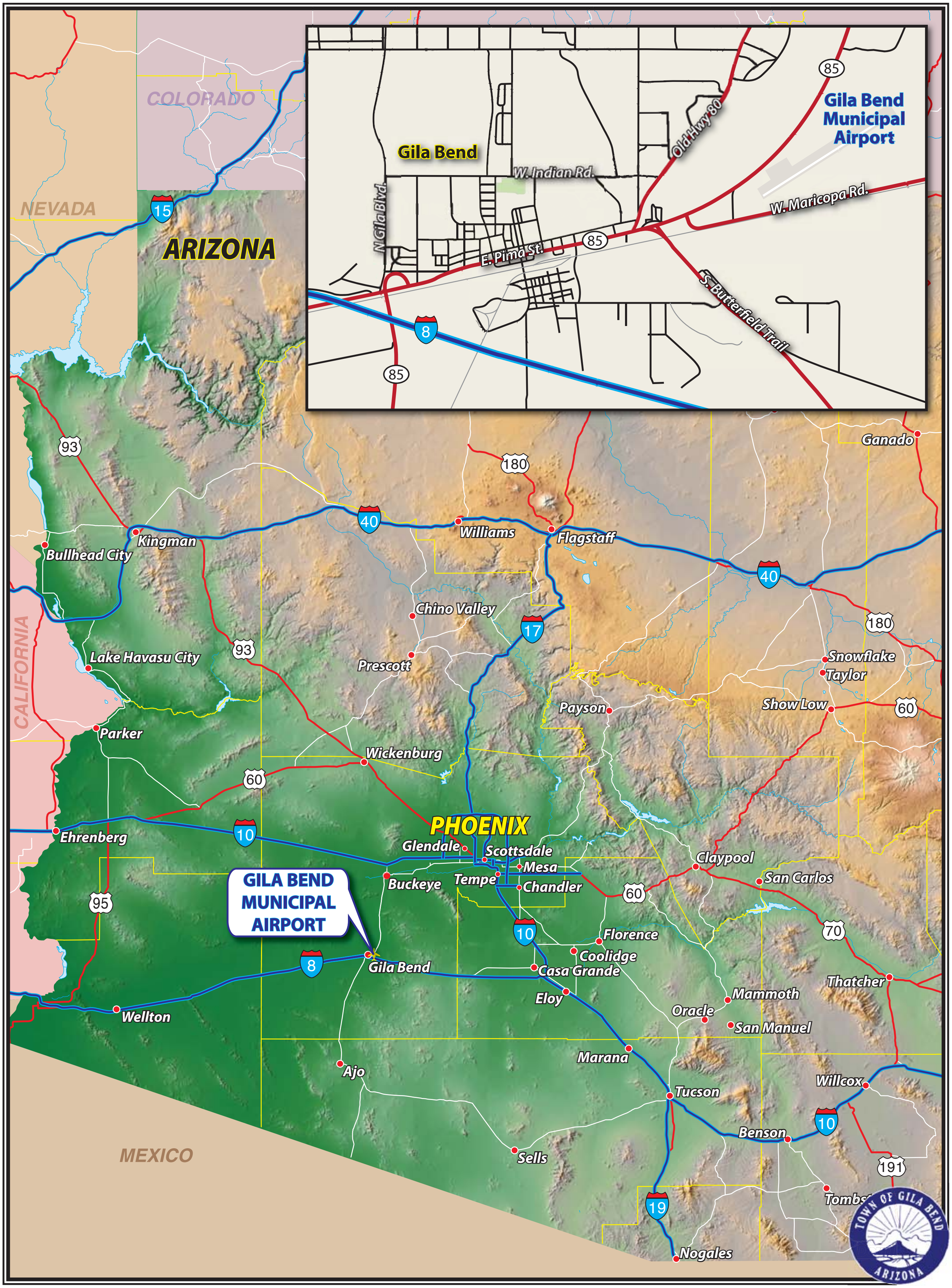


Exhibit 1A
AIRPORT LOCATION

gram in 1965. However, prior to acquisition of airport land, it was necessary to negotiate a land exchange between the State of Arizona and the federal government in order to obtain fee title at no cost to the Town of Gila Bend. Today, the airport is owned and operated by the Town of Gila Bend.

Construction of the airport began in November 1965 with a $368,420 grant from the FAA. A 2,600-foot runway, a connector taxiway, a small parking apron, and fencing were constructed with the original grant. Total project costs were $461,448, with ADOT and the Town of Gila Bend providing the supplemental funding. A number of significant improvements have been made to the airport since then, including an extension of the runway to 3,800 feet in 1975 and another extension to its current length of 5,200 feet in 1992.

CLIMATE

Weather conditions are important to the planning and development of an airport. Temperature is an important factor in determining runway length requirements, while wind direction and speed are used to determine optimum runway orientation. The need for navigational aids and lighting is determined by the percentage of time that visibility is impaired due to cloud coverage or other conditions.

Table 1A summarizes monthly climatic data for the Town of Gila Bend. This information was gathered from the Western Regional Climate Center between 1892 and 2011.

TABLE 1A
Climate Conditions
Gila Bend, Arizona

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Avg. High Temp (°F)	69.0	73.6	79.9	88.0	96.7	106.1	109.1	107.3	103.2	92.1	78.6	69.2
Avg. Low Temp (°F)	38.8	41.8	46.3	51.9	59.8	68.4	78.3	77.0	70.2	57.3	45.4	38.8
Average Precipitation (in.)	0.62	0.63	0.61	0.21	0.13	0.05	0.72	0.99	0.51	0.38	0.50	0.68

Source: Western Regional Climate Center (12/1/1892 – 10/31/2011).

Gila Bend has an arid desert climate, characterized by extremely hot summers and warm winters. July is the hottest month, with an average daily maximum temperature of 109.1 degrees Fahrenheit (° F), and January and December are the coldest months, with an average daily minimum temperature of 38.8°F. Average precipitation in Gila Bend is approximately six inches per year.

AIRPORT SYSTEM PLANNING ROLE

Airport planning exists on many levels: national, state, and local. Each level has a different emphasis and purpose. On the national level, Gila Bend Municipal Airport is included in the *National Plan of Integrated Airport Systems* (NPIAS). This federal plan identifies 3,356 existing airports which are considered significant to the national air transportation system. The NPIAS is published and used by the FAA in administering the Airport Improvement Program (AIP) which is the source of federal funds for airport improvement projects across the country. The AIP program is funded exclusively by user fees and user taxes, such as those on fuel and airline tickets. The 2011-2015 NPIAS estimates that over this time period, there will be $52.2 billion of AIP eligible infrastructure development for all segments of civil aviation. An airport must be included in the NPIAS to be eligible for federal funding assistance through the AIP. Gila Bend Municipal Airport is classified as a general aviation airport within the NPIAS.

The NPIAS supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility by identifying specific airport improvements. The current issue of the NPIAS identifies nearly $1.6 million in development needs over the next four years for Gila Bend Municipal Airport. This figure is not a guarantee of federal funding; instead, this figure represents development needs as presented to the FAA in the annual airport capital improvement program (ACIP). The most recent ACIP (2013-2017) identifies $5.6 million in development needs over the next five years at Gila Bend Municipal Airport.

Airports that apply for and accept AIP grants must provide grant assurances. These assurances include maintaining the airport facility safely and efficiently in accordance with specific conditions. The duration of the assurances depends on the type of airport, the useful life of the facility being developed, and other factors. Typically, the useful life for an airport development project is a minimum of 20 years. Therefore, when an airport accepts AIP grants, they are obligated to maintain that facility in accordance with FAA standards for at least that long.

At the state level, the airport is included in the *Arizona State Airports System Plan* (SASP). The purpose of the SASP is to ensure that the state has an adequate and efficient system of airports to serve its aviation needs well into the 21st century. The SASP defines the role of each airport in the state's aviation system and establishes funding needs.

The airport master plan is the primary local planning document. The master plan is intended to provide a 20-year vision for airport development based on aviation demand forecasts. Forecasts beyond five years become less reliable. The most recent forecasts were completed in the 2003 Airport Master Plan. As a result, this is an appropriate time to update these forecasts and revisit the development assumptions from that plan.

HISTORICAL GRANTS

To assist in funding capital improvements, the FAA has provided funding assistance at Gila Bend Municipal Airport through the Airport Improvement Program (AIP). The AIP is funded through the Aviation Trust Fund, which was established in 1970 to provide funding for aviation capital investment programs to include aviation development, facilities and equipment, and research and development. The Aviation Trust Fund also finances a portion of the operation of the FAA. A summary of capital improvement projects completed at Gila Bend Municipal Airport since 2002 is presented in **Table 1B**. ADOT has also provided assistance to Gila Bend Municipal Airport. **Table 1C** presents a summary of these projects and grant totals since 2002.

TABLE 1B
Historical AIP Grant History
Gila Bend Municipal Airport

Fiscal Year	FAA Grant Number	FAA Grant Total	Description of Project
2002	#7	$169,208	Rehabilitate Apron, Install Perimeter Fencing, Acquire Land for Approaches, and Remove Obstructions.
2003	#8	$53,384	Install Perimeter Fencing.
2004	#9	$217,240	Install Perimeter Fencing.
2005	#10	$189,264	Install Perimeter Fencing.
2006	#11	$242,471	Install Apron Lighting, Install Runway Visual Guidance System.
2007	#12	$150,000	Construct Shade Hangar.
2010	#13	$95,000	Construct Shade Hangar.

Source: FAA

TABLE 1C
Historical ADOT Grant History
Gila Bend Municipal Airport

Fiscal Year	ADOT Grant Number	ADOT Grant Total	Description of Project
2002	#1108	$297,360	Runway and Apron Pavement Preservation, Land Acquisition for RPZ (11.5 acres).
2003	#3F31	$13,254	Rehabilitate Parking Apron (Phase I), Conduct Airport Master Plan Update.
2003	#3F32	$8,306	Rehabilitate Parking Apron (Phase 2), Acquire Land for Approaches, Remove Obstructions, and Install Perimeter Fencing.
2005	#5F77	$5,717	Install Perimeter Fencing.
2005	#5F79	$2,621	Install Perimeter Fencing.
2006	#6F90	$4,981	Install Perimeter Fencing.
2007	#7F48	$6,381	Install Terminal Area Security Lighting, Install PAPI.
2008	#8S1F	$81,000	Update Airport Master Plan and ALP.
2011	#2S63	$460,527	Thin Asphalt Overlay/PFC .
2011	#2S76	$151,200	Update Airport Master Plan and ALP.

Source: ADOT MPD – Aeronautics Group.

AIRPORT SERVICE AREA

Defining a service area for an airport can be useful in the forecasting process. Once a general service area is identified, various statistical comparisons can be made for projecting aviation demand. For example, in rural areas, where there may be one airport in each county, the service area could reasonably be defined as the entire county. This would facilitate comparisons to county population and employment for forecasting purposes.

In regions where there are many airports, the definition of the service area is not as simple. Aircraft owners in areas with more airports have more choices when it comes to basing their aircraft. The most common reason aircraft owners cite for choosing an airport at which to base their aircraft is convenience to home or work. Other reasons may include the capability of the runway system, availability of hangar space, and the services available. Therefore, the primary limiting factor to defining an airport service area is the proximity of other airports that provide a similar or greater level of service.

The service area generally represents where most, but not all, based aircraft will come from. It is not unusual for some based aircraft to be registered outside the county or even outside the state. In regions with several airports in relatively close proximity, service areas will likely overlap to some extent.

A review of airports within 40 nautical miles of Gila Municipal Airport has been made to identify and distinguish the type of air service provided in the region. Information pertaining to each airport was obtained from FAA 5010 Master Records. **Table 1D** identifies the major characteristics of each airport.

TABLE 1D
Vicinity Airports

Airport Name	Distance (nm)	NPIAS* Role	Longest Runway	Based Aircraft	Annual Operations[1]	Instrument Approaches
Buckeye Municipal	28 N	GA	5,500’	44	53,000	No
Phoenix Goodyear	32 NNE	Reliever	8,500’	218	138,606	Yes
Eric Marcus Municipal	32 SSW	GA	3,800’	3	300	No
Phoenix Regional	38 E	Non-NPIAS	5,000’	12	N/A	No
Glendale Municipal	39 NNE	Reliever	7,150’	220	87,124	Yes
Sky Harbor International	44 NE	Primary	11,489’	68	461,989	Yes

Source: FAA 5010 Form
*National Plan of Integrated Airport Systems.
[1]FAA Tower Reports (2011), except Buckeye and Eric Marcus which are estimated.

Buckeye Municipal Airport (owned by the Town of Buckeye) is located approximately 28 nautical miles north of Gila Bend Municipal Airport. The airport is served by a single 5,500-foot runway. There is no control tower at the airport and there are no published instrument approaches available. There are 44 aircraft based at Buckeye Municipal Airport and annual operations are estimated at 53,000. Services available include aircraft tiedowns, fuel sales (Jet A and 100LL), and minor aircraft maintenance.

Phoenix Goodyear Airport (owned by the City of Phoenix) is located approximately 32 nautical miles north-northeast of Gila Bend Municipal Airport. The airport is served by a single 8,500-foot runway. A total of 218 aircraft are based at Phoenix Goodyear Airport and one published instrument approach is available. The airport is served by a control tower, which reported 138,606 annual operations in 2011. Services available include aircraft tiedowns, fuel sales (Jet A and 100LL), and aircraft maintenance.

Eric Marcus Municipal Airport (owned by Pima County) is located approximately 32 nautical miles south-southwest of Gila Bend Municipal Airport. The airport is served by a single 3,800-foot runway. Three aircraft are based at Eric Marcus Municipal Airport and annual operations are estimated at 300. There is no control tower at the airport and there are no published instrument approaches available. Aircraft tiedowns are available at the airport.

Phoenix Regional Airport (privately-owned by the Ak Chin Indian Community) is located approximately 38 nautical miles east of Gila Bend Municipal Airport. The airport is served by a single 5,000-foot runway. There is no control tower at Phoenix Regional Airport, and there are no published instrument approaches available. There are 12 aircraft based at the airport. Annual operations were not available. No services are provided at the airport.

Glendale Municipal Airport (owned by the City of Glendale) is located approximately 39 nautical miles north-northeast of Gila Bend Municipal Airport. The airport is served by a single 7,150-foot runway. A total of 220 aircraft are based at Glendale Municipal Airport and two published instrument approaches are available. The airport is served by a control tower, which reported 87,124 annual operations in 2011. Services available include aircraft tiedowns, fuel sales (Jet A and 100LL), and aircraft maintenance.

Located approximately 44 miles northeast**, Phoenix Sky Harbor International Airport** is the nearest commercial service airport. The airport is served by three runways, the longest of which is 11,489 feet. Approximately 68 aircraft are based at Phoenix Sky Harbor International Airport. The airport is served by a control tower, which reported 461,989 annual operations in 2011. Several published instrument approaches are approved for use into the airport. Two major fixed base operators (FBOs) are located on the airfield that provides a full array of general aviation services.

AREA LAND USE

EXISTING LAND USE

Land use surrounding an airport is a critical consideration. It is important for the operator of an airport, particularly a governmental body, to protect the airport environment for the safe operations of aircraft and for the safety of people and property on the ground. Several land use planning agencies have some jurisdiction over the airport environment.

The entire airport property is used for aviation purposes. All land surrounding the airport to the north, east, and south is undeveloped State Trust Land. The land to the west is privately owned, undeveloped, and zoned for Light Industrial use. The land upon which the airport caretaker's residence is located is zoned for Residential use. This Residential use zone extends northwest across Highway 85 and beyond. **Exhibit 1B** depicts land ownership of individual parcels surrounding the airport.

ARIZONA'S STATE TRUST LAND

Arizona is significant in the fact that a considerable portion of the state's land (approximately 9.2 million acres) is held in trust. State Trust Land, which is not considered public land, is managed by the State Land Department. In order to generate revenue, State Trust Land is leased or sold to the highest bidder at a public auction. The largest beneficiary of these sales/leases is the Common Schools (K-12), which receive approximately 87 percent of Trust Land revenue. Other beneficiaries include the Legislative, Executive, & Judicial Buildings, the University of Arizona, and the School for the Deaf & Blind.

AIRPORT HEIGHT AND HAZARD ZONING

Height and hazard zoning establishes height limitations for new construction near the airport and within the runway approaches. It is based upon an approach plan which describes artificial surfaces defining the edges of airspace, which are to remain free of obstructions for the purpose of safe air navigation. It requires that anyone who is proposing to construct or alter an object that affects airspace must notify the FAA prior to its construction.

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 zones, 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. Height restrictions can be accomplished through height and hazard zoning, avigation easements, or fee simple acquisition. The Town of Gila Bend should adhere to and support the height restriction guidelines set forth in 14 CFR Part 77.

AIRPORT FACILITIES

Airport facilities can be functionally classified into two broad categories: airside and landside. The airside category includes those facilities directly associated with aircraft operations. 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.

AIRSIDE FACILITIES

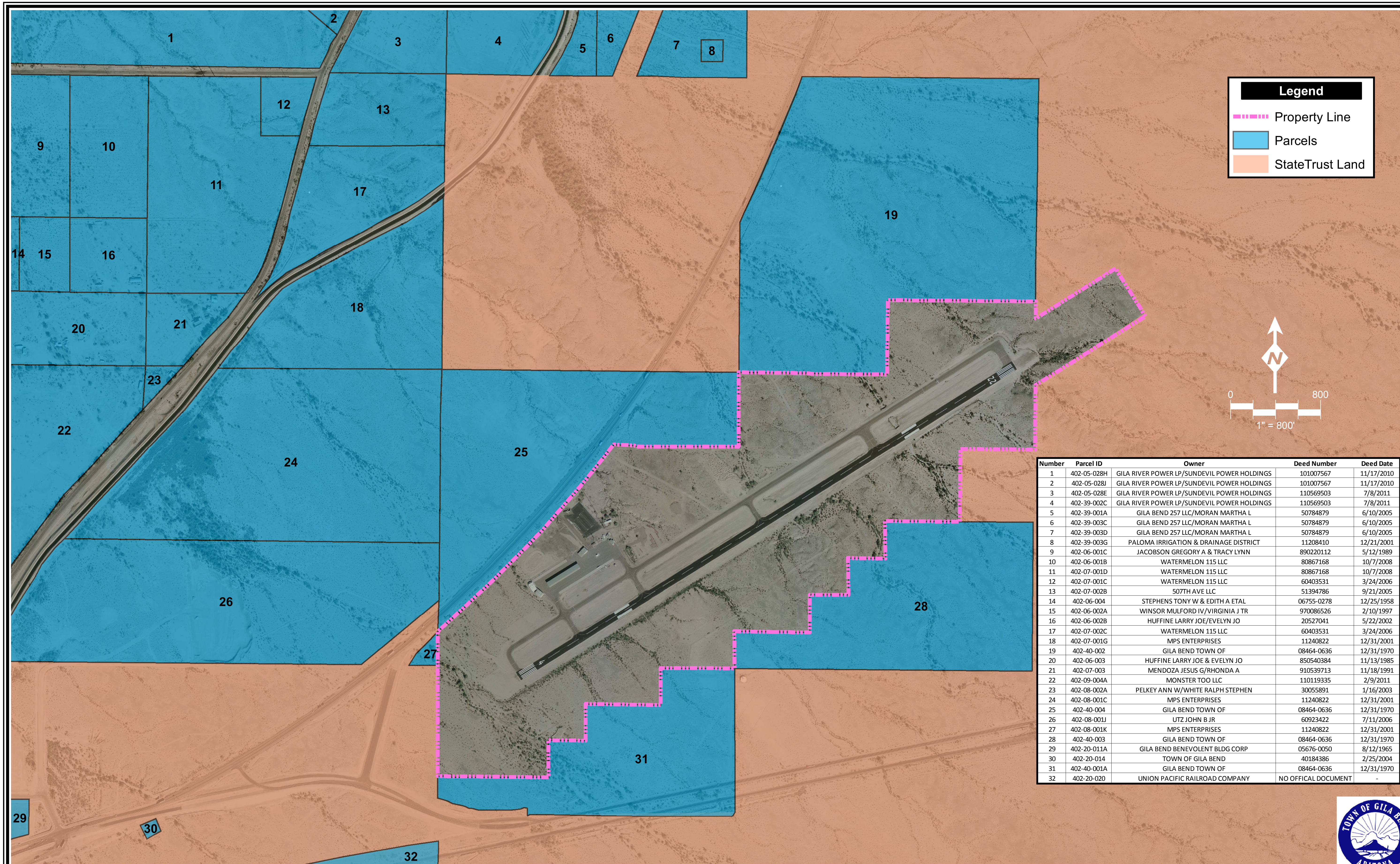
Airside facilities include runways, taxiways, airfield lighting, and navigational aids. Airside facilities are identified on **Exhibit 1C**. **Table 1E** summarizes airside facility data at Gila Bend Municipal Airport.

TABLE 1E
Airside Facilities Data
Gila Bend Municipal Airport

	Runway 4-22
Runway Length Runway Width	5,200' 75'
Runway Surface Material Condition	Asphalt Good
Pavement Markings	Non-Precision
Runway Load-Bearing Strength (lbs.) Single Wheel Loading (S)	 12,500
Runway Lighting	MIRL
Taxiway Lighting	MITL
Approach Aids	PAPI-2L
Instrument Approach Procedures	None
Weather or Visual Aids	Segmented Circle & Lighted Wind Cone Rotating Beacon

MIRL – Medium Intensity Runway Lighting
MITL – Medium Intensity Taxiway Lighting
PAPI – Precision Approach Path Indicator

Source: Airport Facility Directory; Southwest U.S. (February 9, 2012); FAA 5010 Report.



Number	Parcel ID	Owner	Deed Number	Deed Date
1	402-05-028H	GILA RIVER POWER LP/SUNDEVIL POWER HOLDINGS	101007567	11/17/2010
2	402-05-028J	GILA RIVER POWER LP/SUNDEVIL POWER HOLDINGS	101007567	11/17/2010
3	402-05-028E	GILA RIVER POWER LP/SUNDEVIL POWER HOLDINGS	110569503	7/8/2011
4	402-39-002C	GILA RIVER POWER LP/SUNDEVIL POWER HOLDINGS	110569503	7/8/2011
5	402-39-001A	GILA BEND 257 LLC/MORAN MARTHA L	50784879	6/10/2005
6	402-39-003C	GILA BEND 257 LLC/MORAN MARTHA L	50784879	6/10/2005
7	402-39-003D	GILA BEND 257 LLC/MORAN MARTHA L	50784879	6/10/2005
8	402-39-003G	PALOMA IRRIGATION & DRAINAGE DISTRICT	11208410	12/21/2001
9	402-06-001C	JACOBSON GREGORY A & TRACY LYNN	890220112	5/12/1989
10	402-06-001B	WATERMELON 115 LLC	80867168	10/7/2008
11	402-07-001D	WATERMELON 115 LLC	80867168	10/7/2008
12	402-07-001C	WATERMELON 115 LLC	60403531	3/24/2006
13	402-07-002B	507TH AVE LLC	51394786	9/21/2005
14	402-06-004	STEPHENS TONY W & EDITH A ETAL	06755-0278	12/25/1958
15	402-06-002A	WINSOR MULFORD IV/VIRGINIA J TR	970086526	2/10/1997
16	402-06-002B	HUFFINE LARRY JOE/EVELYN JO	20527041	5/22/2002
17	402-07-002C	WATERMELON 115 LLC	60403531	3/24/2006
18	402-07-001G	MPS ENTERPRISES	11240822	12/31/2001
19	402-40-002	GILA BEND TOWN OF	08464-0636	12/31/1970
20	402-06-003	HUFFINE LARRY JOE & EVELYN JO	850540384	11/13/1985
21	402-07-003	MENDOZA JESUS G/RHONDA A	910539713	11/18/1991
22	402-09-004A	MONSTER TOO LLC	110119335	2/9/2011
23	402-08-002A	PELKEY ANN W/WHITE RALPH STEPHEN	30055891	1/16/2003
24	402-08-001C	MPS ENTERPRISES	11240822	12/31/2001
25	402-40-004	GILA BEND TOWN OF	08464-0636	12/31/1970
26	402-08-001J	UTZ JOHN B JR	60923422	7/11/2006
27	402-08-001K	MPS ENTERPRISES	11240822	12/31/2001
28	402-40-003	GILA BEND TOWN OF	08464-0636	12/31/1970
29	402-20-011A	GILA BEND BENEVOLENT BLDG CORP	05676-0050	8/12/1965
30	402-20-014	TOWN OF GILA BEND	40184386	2/25/2004
31	402-40-001A	GILA BEND TOWN OF	08464-0636	12/31/1970
32	402-20-020	UNION PACIFIC RAILROAD COMPANY	NO OFFICAL DOCUMENT	-

Parcel information is from the Maricopa County Assessors Office (2012).
State Trust Land information is from the Arizona State Land Department (2012)

TOWN OF GILA BEND ARIZONA

Exhibit 1B
Property Map

11-MP-07-1C-03/20/12

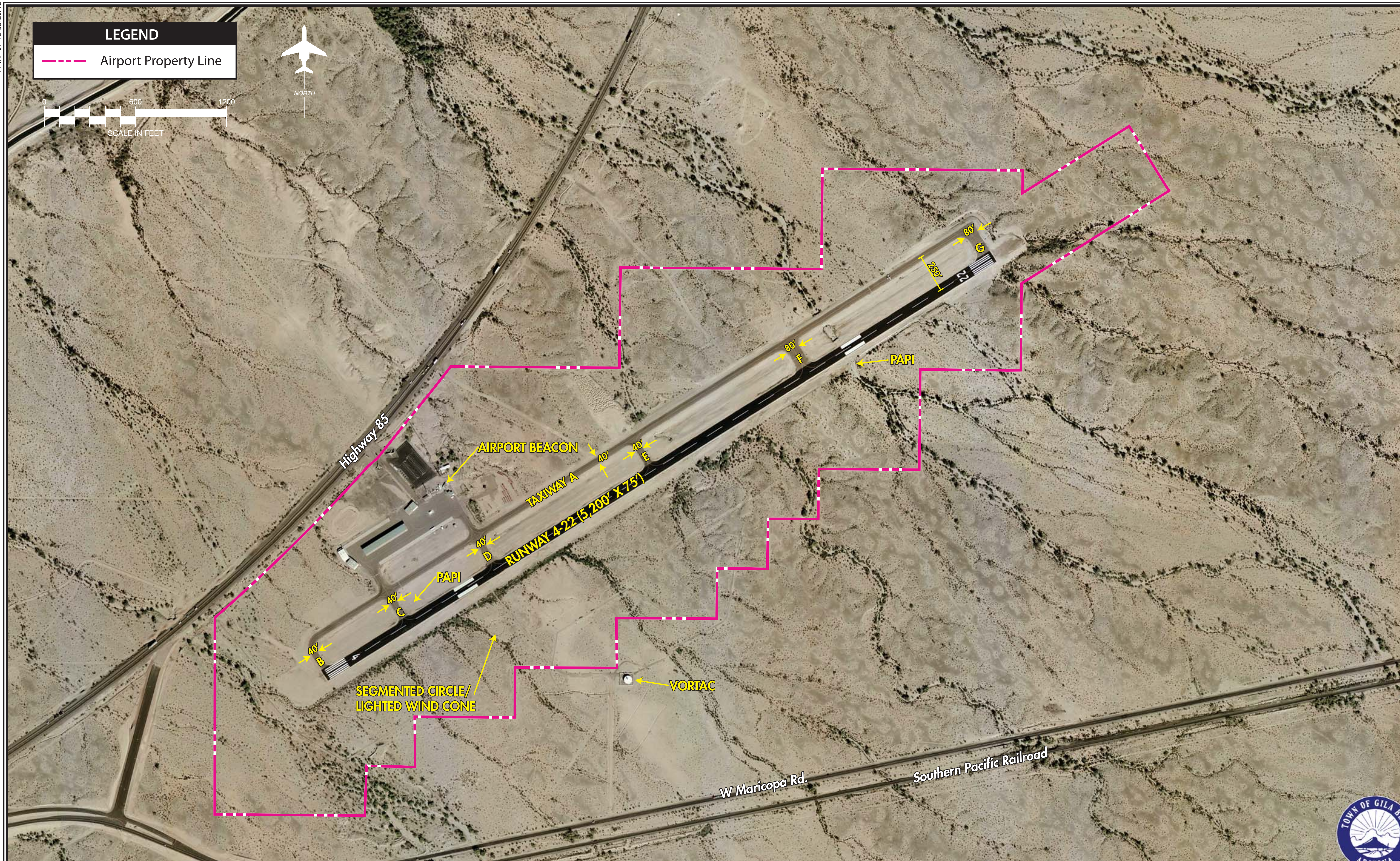


Exhibit 1C
EXISTING AIRSIDE FACILITIES

Runway/Taxiway System

Gila Bend Municipal Airport is served by a single asphalt runway. Runway 4-22 is 5,200 feet long, 75 feet wide, and oriented in a northeast-southwest manner. This runway has pavement strength of 12,500 pounds single wheel loading (S), which refers to the design of certain aircraft landing gear which has a single wheel on each main landing gear strut. The difference in runway end elevations for the runway is 14.5 feet, which results in a 0.3 percent runway gradient (elevation difference between runway high and low points divided by the length of the runway).

Runway 4-22 is served by full length parallel Taxiway A, which is located 250 feet from the runway centerline. Taxiway A is served by six connecting taxiways. Taxiways A, B, C, D, and E are each 40 feet wide. Taxiways F and G are each 80 feet wide.

Pavement Markings

Pavement markings aid in the movement of aircraft along airport surfaces and identify closed or hazardous areas on the airport. The non-precision markings on Runway 4-22 identify the runway designation, threshold, centerline, side stripes, and aiming point.

Taxiway and apron centerline markings are provided to assist pilots in maintaining proper clearance from pavement edges and objects near the taxiway/taxilane edges. Pavement markings also identify aircraft tiedown positions and aircraft holding positions.

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 Gila Bend Municipal Airport is located on a 40-foot high steel frame tower adjacent to the terminal building. The Unicom antenna is also mounted on this tower.

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

Runway 4-22 is equipped with medium intensity runway lighting (MIRL). These are lights set atop a fixture that is approximately one foot above the ground. The light fixtures are frangible, meaning that if one is struck by an object, such as an aircraft wheel, they can easily break away, thus limiting the potential damage to an aircraft. Medium intensity taxiway lighting (MITL) has been installed on all the taxiways. These lights are mounted on the same type of structure as runway lights.

Visual Approach Lighting: Approaches to both ends of Runway 4-22 are aided by the presence of precision approach path indicator lights (PAPI-2L), which provide visual approach slope guidance. PAPIs consist of a system of lights located at various distances from the runway threshold, which when interpreted by the pilot, give them an indication of being above, below, or on the correct descent path to the runway.

Lighted Airfield Signs: Airfield identification signs assist pilots in identifying their location on the airfield and direct them to their desired location. Lighted airfield signs are located throughout the airfield system.

Pilot-Controlled Lighting: All airfield lighting systems at Gila Bend Municipal Airport are controlled through a pilot-controlled lighting system (PCL). This allows the pilot to turn on, or increase the intensity of various airfield systems from the aircraft with the use of the aircraft's transmitter.

Weather Facilities

The airport is equipped with a lighted wind cone, which provides pilots with information about wind conditions, and a segmented circle, which provides traffic pattern information to pilots. The lighted wind cone and segmented circle are located south of Taxiway D.

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, aircraft storage/maintenance hangars, aircraft parking aprons, and support facilities such as fuel storage, automobile parking, roadway access, and aircraft rescue and firefighting. Landside facilities are identified on **Exhibit 1D**.

Airport Access Road And Automobile Parking

Access to the airport is off of State Highway 85, via a road at the north end of the property. A small unimproved automobile parking area is located directly north of the terminal building. Limited parking is available in this area. A Park n Ride lot is located further north. This paved lot totals approximately 42,500 square feet and provides parking for approximately 105 vehicles. While the Park n Ride lot is mainly used by commuters, it is also available to airport employees, as well as those visiting the airport.

Airport Property Line Fencing

The airport's existing property line is enclosed with a 4-strand barbed wire fence with steel posts. Access to the property is through a vehicular gate at the north end of the parking apron.

General Aviation Terminal Building

The general aviation terminal building for Gila Bend Municipal Airport is located on the northeast end of the aircraft parking apron. It is a concrete masonry structure with a wood frame shingled roof and totals approximately 600 square feet. It includes a pilot's lounge, the airport's electrical equipment vault, a storage room, and two restrooms.

Exhibit 1D
EXISTING LANDSIDE FACILITIES

Caretaker's Residence

The Caretaker's Residence is a 720 square-foot mobile home located at the northeast corner of the aircraft parking apron. This building is owned by the caretaker.

Aircraft Storage Facilities

Aircraft storage facilities at Gila Bend Municipal Airport total approximately 8,800 square feet in three individual box hangars. There is also one Town-owned T-Hangar totaling approximately 1,000 square feet.

Aircraft Parking Apron

Existing apron area at the airport is located north of Taxiway A, near the Runway 4 end. This apron totals approximately 18,600 square yards with tiedowns to accommodate 35 aircraft. A shaded canopy provides coverage to 14 of the tiedown positions. A small gazebo is located south of the aircraft parking apron and north of Parallel Taxiway A.

Fuel Storage Facilities

Fuel storage and dispensing facilities at the airport consists of a single 5,000 gallon above ground tank of 100LL AvGas. This fuel tank, which is located on the aircraft parking apron, is not currently operational. A diesel fuel tank is also located on the aircraft parking apron, but is not operational at this time either.

Aircraft Rescue and Firefighting

There is no dedicated airport rescue and firefighting (ARFF) facility at Gila Bend Municipal Airport. As a general aviation facility, the airport is not required to have on-airport firefighting capability.

AIRSPACE CHARACTERISTICS

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 two basic categories of airspace, controlled and uncontrolled, and identifies them as Classes A, B, C, D, E, and G. All aircraft operating within Classes A, B, C, and D airspace must be in contact with the air traffic control facility responsible for that particular airspace. Class E airspace is controlled airspace that encompasses all instrument approach procedures and low-altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with air traffic control when operating in Class E airspace. Aircraft conducting visual flights in Class E airspace are not required to be in radio communications with air traffic control facilities. Visual flight can only be conducted if minimum visibility and cloud ceilings exist. Class G airspace is uncontrolled airspace that does not require contact with an air traffic control facility. Airspace in the vicinity of Gila Bend Municipal Airport is depicted on **Exhibit 1E**. Gila Bend Municipal Airport is located within Class G uncontrolled airspace.

SPECIAL USE AIRSPACE

Exhibit 1E depicts one Military Operations Area (MOA) northwest of Gila Bend Municipal Airport; the Gladden MOA. MOAs define airspace where a high level of military activity is conducted and are intended to segregate military and civilian aircraft.

The exhibit also depicts several Military Training Routes (MTRs) within the vicinity of the airport. These routes are used by military aircraft for training activity and commonly operate at speeds in excess of 250 knots, at altitudes above 10,000 feet MSL. While civilian aircraft are not restricted in MOAs or in the vicinity of MTRs, civilian aircraft are cautioned to remain alert for high speed military jet activity at the specified altitudes.

In addition to Military Training Routes, three Restricted Areas located south of Gila Bend Municipal Airport (R-2301 E, R-2304, and R-2305) are identified on **Exhibit 1E**. Restricted areas denote the existence of unusual, often invisible, hazards to aircraft such as artillery firing, aerial gunnery, or guided missiles. Penetration of restricted areas without authorization from the using or controlling agency may be extremely hazardous to the aircraft and its occupants.

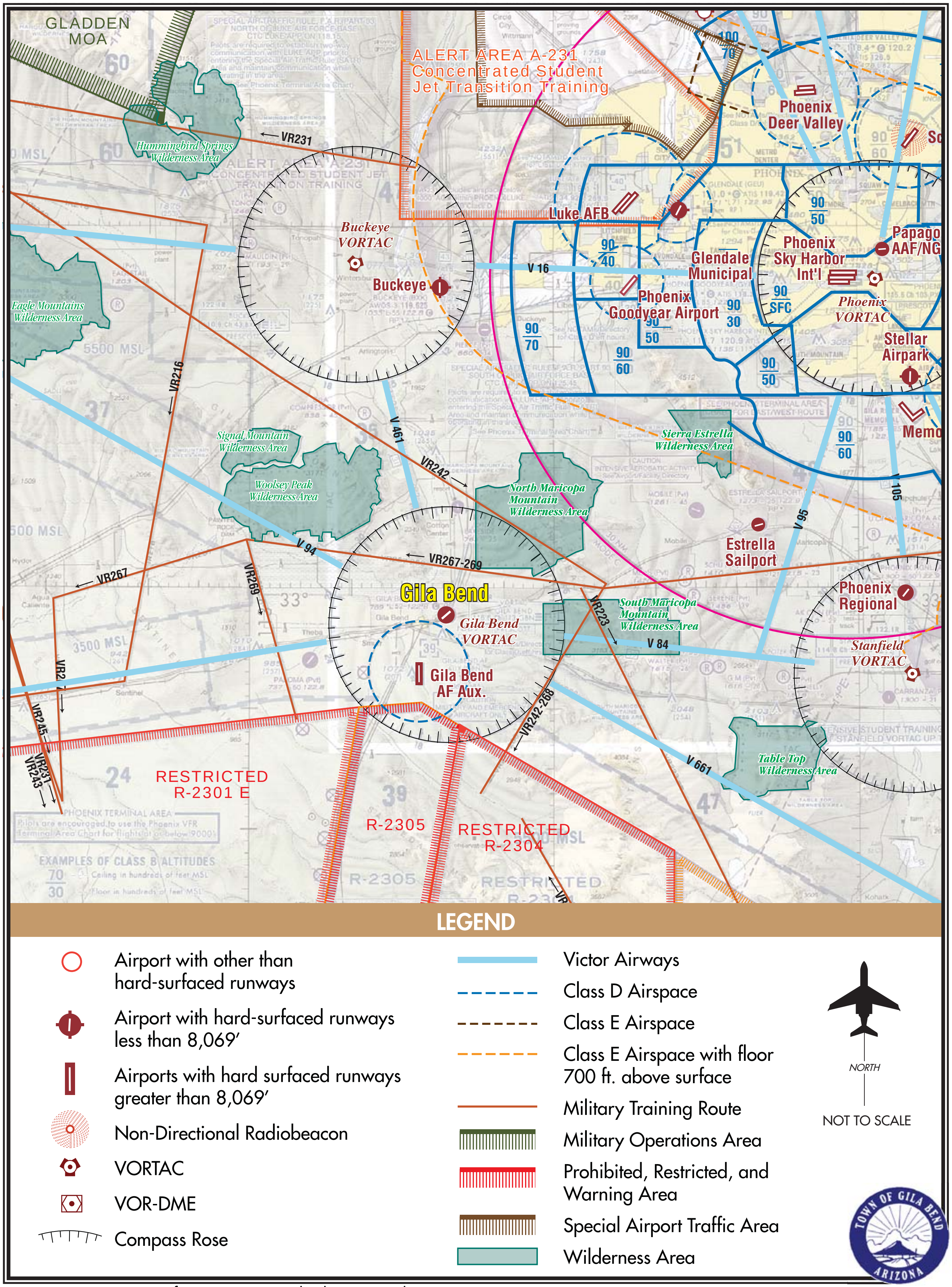
Alert Area A-231 is located approximately 35 miles north of Gila Bend Municipal Airport. This area is used primarily by students and instructors from Luke Air Force Base (AFB) conducting training missions in fighter-type aircraft. Military operations within this area are authorized from 500 feet AGL to 6,500 feet MSL continuously. Pilots transitioning in the area, either as participants or nonparticipants in training activity, are responsible for collision avoidance.

Prior to May 6, 2010, Alert Area 231 was the only charted advisory alerting general aviation operators of concentrated student jet fighter training near the vicinity of Luke AFB. As the result of an average of five Near Mid-Air Collisions (NMAC) per quarter, and in an effort to improve flight safety, the FAA mandated two-way radio communications near common fighter training areas and critical flight paths near Luke AFB in the form of a Special Air Traffic Rule (SATR). This amended Title 14 Part 93 Code of Federal Regulations (CFRs). The SATR was implemented on May 6, 2010 and mandates two-way radio communications within the vertical and lateral boundaries of the charted area (identified as Special Airport Traffic Area on **Exhibit 1E**) during periods of the base's fighter training as described in the CFRs. The SATR mandate has proven a huge success with 40,000 plus general aviation transitions and zero NMACs reported since its inception. As a result, this has significantly improved flight safety in the vicinity of Luke AFB, the largest F-16 training base in the world.

Arizona is also home to numerous national parks, forests, and wilderness areas. Because the government regards these areas as noise-sensitive, many of their boundaries are marked on aeronautical charts. Pilots are requested to maintain a minimum altitude of 2,000 feet AGL when over these areas.

AIR TRAFFIC CONTROL

There is no ATCT at Gila Bend Municipal Airport; therefore, no formal terminal air traffic control services are available for aircraft landing or departing the airport. Aircraft operating in the vicinity of the airport are not required to file any type of



Source: U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Navigation Services - Effective May 13, 2011- May 12, 2012

Exhibit 1E
VICINITY AIRSPACE

flight plan or to contact any air traffic control facility unless they are entering airspace where contact is mandatory.

Air traffic advisories and certain weather information can be obtained using the common traffic advisory frequency (CTAF) channel 122.8 MHz, also known as UNICOM. Enroute air traffic control services are provided by the Albuquerque Air Route Traffic Control Center (ARTCC), which controls aircraft in a large multi-state area. The Prescott Flight Service Station (FSS) provides additional weather data and other pertinent information to pilots on the ground and enroute.

Local Operating Procedures

Gila Bend Municipal Airport is situated at 789 feet mean sea level (MSL). The traffic pattern altitude for all aircraft operating at the airport is 800 feet above airfield elevation (1,589 feet MSL). Runway 4-22 utilizes a left-hand traffic pattern. In this manner, aircraft approaching either runway end follow a series of left-hand turns.

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 operating in the vicinity of Gila Bend Municipal Airport include the very high frequency omnidirectional range (VOR) facility and global positioning system (GPS).

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

The VORTAC provides distance and direction information to both civil and military pilots. Pilots can utilize the Gila Bend VORTAC, which is located just south of the runway, off airport property. Pilots can also utilize several other VORTACs in the area, including Buckeye, Phoenix, and Stanfield. **Exhibit 1E** depicts the location of these VORTACs.

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 VOR in that pilots are not required to navigate using a specific ground-based facility. GPS uses satellites placed in orbit around the earth that transmit electronic radio signals, which pilots of properly equipped aircraft use to determine altitude, speed, and other navigational information. With GPS, pilots can navigate directly to any airport in the country and are not required to navigate using a ground-based navigational facility.

Instrument Approach Procedures

Instrument approach procedures 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. Currently, there are no instrument approach procedures published for Gila Bend Municipal Airport. Therefore, the airport is essentially closed to arrivals when visual flight can no longer be conducted.

SOCIOECONOMIC CHARACTERISTICS

Socioeconomic characteristics are collected and examined to derive an understanding of the dynamics of growth within the study area. This information assists in determining aviation service level requirements, as well as forecasting the number of based aircraft and aircraft activity at the airport. Aviation forecasts are typically related to the population base, economic strength of the region, and the ability of the region to sustain a strong economic base over an extended period of time.

POPULATION

Historical population totals, which were obtained from the U.S. Census Bureau, are presented in **Table 1F**. According to the U.S. Census Bureau, the State of Arizona had more than 5.1 million residents in 2000. This is an increase of nearly 1.5 million residents since 1990, which represents an average annual growth rate of 3.4 percent. Between 2000 and 2010, the state grew at an annual rate of 2.2 percent, adding an additional 1.2 million residents. Much of Arizona's population is concentrated in limited areas around major cities.

The population for Maricopa County was also examined. Historically, the county's growth rate has been fairly consistent with that experienced statewide. Between 1990 and 2000, Maricopa County experienced an average growth rate of 3.8 percent, adding 950,000 residents. Between 2000 and 2010, the county added 745,000 residents, with a growth rate identical to that of the state (2.2 percent). More than half the state's population presides in Maricopa County, which includes the cities of Phoenix, Mesa, Glendale, Scottsdale, Tempe, Chandler, Peoria, and Gilbert.

TABLE 1F
Historical Population

Area	1990	2000	2010	Avg. Annual Growth Rate (1990-2000)	Avg. Annual Growth Rate (2000-2010)
Arizona	3,665,200	5,130,600	6,392,000	3.4%	2.2%
Maricopa Co.	2,122,100	3,072,100	3,817,100	3.8%	2.2%
Gila Bend	1,750	1,940	1,920	1.1%	-0.1%

Source: U.S. Census Bureau.

Historical population for the Town of Gila Bend was also examined. In 1990, Gila Bend reported 1,750 residents. Between 1990 and 2000, the town experienced a growth rate of 1.1 percent, adding nearly 200 residents, for a total population of 1,940 in 2000. Since 2000 the town's population has fallen slightly, with a reported 1,920 residents in 2010.

Population projections for the forecast period are presented in **Table 1G**. The most recent population projections for the state and the county were obtained from the 2012 Woods & Poole Economics, Inc. According to Woods & Poole, Arizona's population is projected to grow at an average annual rate of 1.6 percent between 2010 and 2040, totaling over 10.2

million residents by 2040. Maricopa County's population is projected to grow at only a slightly higher rate (1.7%) over this 30-year period, totaling approximately 6,368,400 residents by 2040.

Population projections for the Town of Gila Bend were obtained from the Maricopa Association of Governments (MAG) Regional Transportation Plan, which was published in July 2010. MAG's projections used an estimated population total of 1,920 in 2010 for the base year of their forecasts. MAG projects the town's population to reach 9,070 by 2030, which represents an average annual growth rate of 2.6 percent over a 20-year period.

TABLE 1G
Forecast Population

Area	2010	2020	2030	2040	Avg. Annual Growth Rate (2010-2040)
Arizona	6,392,000	7,672,200	8,954,300	10,226,700	1.6%
Maricopa Co.	3,817,100	4,666,200	5,519,900	6,368,400	1.7%
Gila Bend	1,920	3,950	9,070	N/A	-

Sources: 2012 Woods & Poole Economics; MAG Regional Transportation (July 2010).

EMPLOYMENT

Analysis of a community's employment base can provide valuable insight to the overall well-being of the community. In most cases, the community makeup and health is significantly impacted by the availability of jobs, variety of employment opportunities, and types of wages provided by local employers. Civilian labor force data, which was obtained from the Arizona Workforce Informer and the U.S. Bureau of Labor Statistics, is presented in **Table 1H**.

TABLE 1H
Civilian Labor Force Data

	1990	2000	2012*
Maricopa County			
Civilian Labor Force	1,127,200	1,595,000	1,888,796
Employment	1,076,800	1,542,800	1,743,051
Unemployment	50,400	52,200	145,745
Unemployment Rate	4.5%	3.3%	7.7%
State of Arizona			
Civilian Labor Force	1,806,300	2,505,300	3,005,977
Employment	1,707,300	2,404,900	2,745,534
Unemployment	99,000	100,400	260,443
Unemployment Rate	5.5%	4.0%	8.7%
United States			
Civilian Labor Force	125,840,000	142,583,000	154,871,000
Employment	118,793,000	136,891,000	142,065,000
Unemployment	7,047,000	5,692,000	12,806,000
Unemployment Rate	5.6%	4.0%	8.3%

Source: Arizona Workforce Informer; U.S. Bureau of Labor Statistics.
*Data as of February 2012.

Historically, Maricopa County's unemployment rate has been lower than that of the State of Arizona and the United States. However, unemployment rates for each of these areas are at an all-time high, more than twice what they were in 2000. These high unemployment rates can mainly be attributed to the recent economic crisis.

Table 1J presents the major employers in Maricopa County, several of which utilize Gila Bend Municipal Airport. This list was compiled from the Maricopa Association of Governments, and includes both full-time and part-time employment.

While Maricopa County was previously maintained by tourism and resource-based sectors, it has evolved into highly technical manufacturing, including electronics and aerospace. The county is also well-known as a center for customer service, distribution, and other services. A number of large corporations have relocated their headquarters into this metropolitan area. As shown in **Table 1J**, the government sector accounts for a majority of employment in the county. The largest employers in the private sector are varied industries such as healthcare, banking and finance, manufacturing, computer technology, and grocery distribution.

TABLE 1J
Top Ten Employers (2010)
Maricopa County

Employer Name	Industry	# of Employees
State of Arizona	Government	24,200
Banner Health	Medical/Healthcare	18,100
City of Phoenix	Government	15,800
Wal-Mart	Grocery/Retail Store	14,300
Honeywell Aerospace	Aerospace	13,500
County of Maricopa	Government	12,500
Fry's Food Stores	Grocery/Retail Store	12,200
Arizona State University	University/Education	11,800
Wells Fargo Bank N.A.	Banking/Finance	9,500
Bank of America N.A.	Banking/Finance	9,500

Source: Maricopa Association of Governments.

DOCUMENT SOURCES

As previously mentioned, 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 the 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 tenants also contributed to the inventory effort.

2012 Woods & Poole Economics, Inc.

Airport/Facility Directory, Southwest U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, February 9, 2012 Edition.

National Plan of Integrated Airport Systems (NPIAS), U.S. Department of Transportation, Federal Aviation Administration (2011-2015).

Phoenix Sectional Chart, U.S. Department of Transportation, Federal Aviation Administration (Effective May 13, 2011 – May 12, 2012).

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

Arizona Department of Transportation (ADOT):
www.azdot.gov/

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

AirNav:
www.airnav.com

FAA:
www.faa.gov

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

Maricopa Association of Governments (MAG):
http://www.azmag.gov/

Town of Gila Bend:
http://www.gilabendaz.org/

U.S. Bureau of Labor Statistics:
www.bls.gov/

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

CHAPTER TWO

FORECASTS

GILA BEND MUNICIPAL AIRPORT

Forecasts

An important factor in facility planning involves a definition of demand that may reasonably be expected to occur during the useful life of the facility's key components. For Gila Bend Municipal Airport, this involves projecting potential aviation demand for a 20-year timeframe. In this report, forecasts of annual operations, based aircraft, and based aircraft fleet mix will serve as the basis for facility planning.

The resulting forecast may be used for several purposes, including facility needs assessments, airfield capacity evaluation, and environmental evaluations. The forecasts will be reviewed and approved by the Federal Aviation Administration (FAA) to ensure that they are reasonable projections of aviation activity. The intent is to permit the Town of Gila Bend to make the necessary planning adjustments to ensure the facility meets projected demands in an efficient and cost-effective manner.

Because aviation activity can be affected by many influences at the local, regional, and national levels, it is important to remember that forecasts are to serve only as guidelines, and planning must remain flexible enough to respond to unforeseen facility needs.

NATIONAL AVIATION FORECASTS

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

The current edition when this chapter was prepared was FAA Aerospace Forecast - *Fiscal Years 2012-2032*, published in March 2012. 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.

ECONOMIC OUTLOOK

The aviation industry in the United States has experienced an event-filled decade. Since the turn of the century, the industry has faced the impacts of the events of September 11, 2001, scares from pandemics such as SARS, the bankruptcy of five network air carriers, all-time high fuel prices, and a serious economic downturn with global ramifications. The Bureau of Economic Research has determined that the worst economic recession in the post-World War II era began in December 2007. Eight of the world's top 10 economies were in recession by January 2009.

As the recession began, unemployment in the United States was at 5.0 percent. While it grew through 2008, unemployment intensified in 2009, until peaking at 10.1 percent in October, although the recession officially ended in June of that year. As of the end of 2011, unemployment stood at 8.6 percent of the labor force.

This recession did not face the high inflationary environment of the recession in the early 1980s or the high-energy costs of the mid-1970s recession. While recessions during the post-war era have average 10 months in duration, this one lasted 19 months. Continued levels of high debt, a weak housing market, and tight credit are expected to keep the recovery modest by most standards. The resolution of those factors will determine the future path of the recovery.

The nation's gross domestic product (GDP) is the primary measure of overall economic growth. The GDP growth rate for federal fiscal year (FY) 2011 was 2.1 percent, indicating that the economy was still in a slow recovery phase. An even slower growth rate of 1.6 percent was forecast for FY 2012. The FAA forecasts are based upon a 3.1 percent annual average growth in GDP from FY 2013 through FY 2017. For the long term, the FAA forecasts are based upon real GDP growth slowing to 2.5 percent annually.

Economic growth on the global scale is expected to be higher, with Asia/Pacific and Latin America leading the way. The global GDP was projected to grow at an average of 3.3 percent over the 20-year forecast period.

GENERAL AVIATION INDUSTRY FORECAST

Following more than a decade of decline, the general aviation industry was revitalized with the passage of the *General Aviation Revitalization Act* in 1994. This legislation limits the liability on general aviation aircraft to 18 years from the date of manufacture. This sparked an interest to renew the manufacture of general aviation aircraft due to the reduction in product liability, as well as renewed optimism for the industry. The high cost of product liability insurance had been a major factor in the decision by many American aircraft manufacturers to slow or discontinue the production of general aviation aircraft.

In the seven years prior to the events of September 11, 2001, the U.S. civil aviation industry experienced unprecedented growth in demand and profits. The impacts to the economy and aviation industry from the events of 9/11 were immediate and significant. The economic climate and aviation industry had been recovering until early 2008, when it became clear that an economic downturn was underway. High oil prices and an economic recession caused general aviation activity at FAA air traffic facilities to fall sharply in 2008, declining by 5.6 percent.

The extended downturn in the economy has had a negative impact on general aviation aircraft production, and the industry has been slow to recover. Aircraft manufacturing declined for three straight years from 2008 through 2010. Since 2008, manufacturing is down more than 61 percent. General aviation billings were down 21 percent between 2008 and 2009, but showed growth in 2010. **Table 2A** presents historical data related to aircraft shipments. This information was obtained from the *General Aviation Manufacturers Association 2011 Stat Book*. As the U.S. and world economy recovers, general aviation demand is anticipated to rebound and grow.

TABLE 2A
Annual General Aviation Aircraft Shipments

Year	Single Engine Piston	Multi-Engine Piston	Turboprop	Jet	Total	Net Billings ($millions)
2000	1,877	103	415	752	3,147	$13,496
2001	1,645	147	422	784	2,998	$13,868
2002	1,591	130	280	676	2,677	$11,778
2003	1,825	71	272	518	2,686	$9,998
2004	1,999	52	319	591	2,961	$11,918
2005	2,326	139	375	750	3,590	$15,156
2006	2,513	242	412	886	4,053	$18,815
2007	2,417	258	459	1,136	4,270	$21,826
2008	1,943	176	535	1,313	3,967	$24,766
2009	893	70	441	870	2,274	$19,465
2010	781	108	363	763	2,015	$19,705

Source: General Aviation Manufacturers Association 2011 Stat Book.

As of 2012, there are an estimated 222,690 active general aviation aircraft in the United States. **Exhibit 2A** depicts the FAA forecast for active general aviation aircraft. The FAA projects an average annual increase of 0.6 percent through 2032, resulting in 253,205 active aircraft. Active piston-powered aircraft (including rotorcraft) are expected to decline from 157,115 in 2012 to 155,395 by 2032, for a net average annual decrease of 0.1 percent. Single engine fixed-wing piston aircraft are projected to decrease at 0.1 percent annually, and multi-engine fixed-wing piston aircraft are projected to decrease by 0.5 percent per year. This is due, in part, to declining numbers of multi-engine piston aircraft and the expectation that the new, light sport aircraft and the relatively inexpensive very light jets (VLJ) will dilute or weaken the replacement market for piston aircraft.

New models of business jets are also stimulating interest for the high-end market. The FAA expects the business segment to expand at a faster rate than personal/sport flying. Safety and security concerns combined with increased processing time at commercial terminals make business/corporate flying an attractive alternative. Turbine-powered aircraft (turboprop and jet) are expected to grow at an average annual rate of 2.9 percent through 2032. Even more significant, the jet portion of this fleet is expected to grow at an average annual growth rate of 4.1 percent. The total number of jets in the general aviation fleet is projected to grow from 12,050 in 2012 to 26,935 by 2032.

With the advent of the relatively inexpensive twin-engine VLJ, many questions have arisen as to the future impact they may have. The lower acquisition and operating costs of the VLJs were believed to have the potential to revolutionize the business jet market, particularly by being able to sustain a true on-demand air-taxi service. While initial forecasts called for over 400 aircraft to be delivered each year, events such as the recession, along with the bankruptcy of VLJ manufacturer, Eclipse, and the Florida air-taxi start-up, DayJet, have led the FAA to temper more recent forecasts. The recent introduction of the Embraer's Phenom 100 to the market has helped boost the turbine market. Despite that, the impacts of the recession have led to dampened expectations.

In 2005, a new category called "light sport" aircraft was created that was not previously included in FAA registry counts. As of 2012, a total of 6,930 aircraft are estimated to be in this category. Down from earlier forecasts, the FAA estimates this fleet will increase by approximately 2.5 percent per year until 2017, then slow to about 1.8 percent per year. By 2032, a total of 10,195 light sport aircraft are projected to be in the fleet.

Aircraft utilization rates are projected to increase through the forecast period. The number of general aviation hours flown is projected to increase at 1.7 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 3.6 percent annually, compared to just 0.03 percent for piston-powered aircraft. Jet aircraft hours flown are projected to increase at 5.3 percent annually over the next 20 years. The increasing size of the business jet fleet, resulting in longer flights along with the improved utilization rates, account for much of this increase. At the other end of the spectrum, the light sport aircraft fleet is anticipated to experience a 5.4 percent average annual growth rate in hours flown through 2032, primarily reflecting the anticipated growth in the light sport aircraft.

The total general aviation pilot population is projected to increase by 35,000 in the next 20 years, reaching 510,295 in 2032. This represents an average annual growth rate of 0.3 percent. The student pilot population is forecast to decline at an annual rate of 0.1 percent, from 118,657 in 2011 to 116,720 in 2032. The growth rate for the private pilot category is forecast at 0.1 percent, while the commercial pilot growth rate is projected at 0.4 percent.

RISKS TO THE FORECASTS

While the FAA is confident that its forecasts for aviation demand and activity can be achieved, this hinges on a number of factors, including the strength of the global economy, security (including the threat of international terrorism), and the level of oil prices. Higher oil prices could lead

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U.S. Active General Aviation Aircraft

	2012	2017	2022	2027	2032
FIXED WING					
Piston					
Single Engine	137,600	133,650	132,010	132,660	135,340
Multi-Engine	15,735	15,425	15,010	14,680	14,350
Turbine					
Turboprop	9,505	9,870	10,300	10,860	11,445
Turbojet	12,050	14,470	17,620	21,760	26,935
ROTORCRAFT					
Piston	3,780	4,250	4,680	5,180	5,705
Turbine	6,940	8,180	9,465	10,965	12,550
EXPERIMENTAL					
	24,480	26,165	27,825	29,480	31,140
SPORT AIRCRAFT					
	6,930	7,845	8,630	9,410	10,195
OTHER					
	5,670	5,635	5,605	5,575	5,545
TOTAL	**222,690**	**225,490**	**231,145**	**240,570**	**253,205**

Source: FAA Aerospace Forecasts, Fiscal Years 2012-2032.

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

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

to further shifts in consumer spending away from aviation, dampening a recovery in air transport demand. In the long term, the FAA foresees a competitive and profitable industry characterized by increasing demand for air travel and airfares growing more slowly than inflation.

AVIATION FORECAST METHODOLOGY

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

Beyond five years, the predictive reliability of the forecasts can diminish. Therefore, it is prudent for the airport to update the forecasts, reassess the assumptions originally made, and revise the forecasts based on the current airport and industry conditions. Facility and financial planning usually require at least a 10-year preview, since it often takes several years to complete a major facility development program. However, it is important to use forecasts which do not overestimate revenue-generating capabilities or understate demand for facilities needed to meet public (user) needs.

A wide range of factors are known to influence the aviation industry and can have significant impacts on the extent and nature of activity occurring in both the local and national markets. Technological advances in aviation have historically altered and will continue to change the growth rates in aviation demand over time. A recent example is the substantial growth in the production and delivery of business jet aircraft, which resulted in a growth rate that far exceeded expectations. Such changes are difficult to predict, but over time reasonable growth trends can be identified. Using a broad spectrum of demographic, economic, and industry data, forecasts for Gila Bend Municipal Airport have been developed. Several standard statistical methods have been employed to generate various projections of aviation demand.

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

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

Regression analysis measures the statistical relationship between dependent and independent variables, yielding a "correlation coefficient." The correlation coefficient (Pearson's "r") measures association between the changes in a dependent variable and independent variable(s). If the r-squared (r^2) value (coefficient determination) is greater than 0.90, it indicates good predictive reliability. A value below

0.90 may be used with the understanding that the predictive reliability is lower.

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

Utilizing these statistical methods, available existing forecasts, and analyst expertise, forecasts of aviation demand for Gila Bend Municipal Airport have been developed. The remainder of this chapter presents the aviation demand forecasts and includes activity in two broad categories: based aircraft and annual operations.

STATE FORECASTS

The Arizona Department of Transportation - Multimodal Planning Division - Aeronautics Group (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 *2008 Arizona State Airports System Plan*, which includes forecasts of aviation activity in the state. This study is referenced throughout this chapter.

BASED AIRCRAFT

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft, the growth of aviation activities at the airport can be projected. Aircraft basing at the airport is somewhat dependent upon the nature and degree of aircraft ownership in the local service area. As a result, aircraft registrations in the area were reviewed and forecast first.

REGISTERED AIRCRAFT FORECASTS

Table 2B outlines the historic registered aircraft in Maricopa County between 2001 and 2011. This information was obtained from records of the FAA's Aircraft Registry. According to the FAA, there were 4,850 aircraft registered in Maricopa County in 2001. This number has since increased, with 5,218 registered aircraft reported in the county at the end of 2011. This represents an annual average growth rate of 0.7 percent over the ten-year period. There are no recently prepared forecasts of registered aircraft to examine and compare. As a result, a projection of county registrations was developed for this study.

TABLE 2B
Historical Registered Aircraft
Maricopa County

Year	Registered Aircraft	Annual % Change
2001	4,850	-
2002	4,875	0.5%
2003	5,129	5.2%
2004	5,148	0.4%
2005	5,205	1.1%
2006	5,299	1.8%
2007	5,476	3.3%
2008	5,504	0.5%
2009	5,413	-1.7%
2010	5,333	-1.5%
2011	5,218	-2.2%

Source: FAA

Time-series and regression analyses were performed, but yielded correlation coefficients too low to have any predictive reliability. Therefore, none of the time-series or regression analyses were carried forward in this study, and other methods were used to provide projections of registered aircraft.

The first method considered the county's market share of U.S. active general aviation aircraft. This market share analysis compared the county's aircraft ownership trends versus national aircraft ownership trends. As evidenced in **Table 2C**, the county's share of U.S. active general aviation aircraft has fluctuated between a low of 2.29% in 2001 to a high of 2.45% in 2003. The county's market share in 2011 was 2.35 percent. From this, a constant market share projection was applied to the forecast years and yields 5,940 registered aircraft in Maricopa County by 2032.

TABLE 2C
Registered Aircraft Forecasts
Maricopa County

Year	Maricopa Co. Registered Aircraft	U.S. Active GA Aircraft	% of U.S. Active GA Aircraft	Maricopa Co. Population	AC Per 1,000 Residents
2001	4,850	211,500	2.29%	3,139,500	1.54
2002	4,875	211,300	2.31%	3,208,400	1.52
2003	5,129	209,600	2.45%	3,278,900	1.56
2004	5,148	219,300	2.35%	3,350,800	1.54
2005	5,205	224,300	2.32%	3,424,400	1.52
2006	5,299	221,900	2.39%	3,499,600	1.51
2007	5,476	231,600	2.36%	3,576,400	1.53
2008	5,504	228,700	2.41%	3,654,900	1.51
2009	5,413	223,900	2.42%	3,735,100	1.45
2010	5,333	223,400	2.39%	3,817,100	1.40
2011	5,218	222,500	2.35%	3,908,700[1]	1.33
Constant Market Share of U.S. Active GA Aircraft					
2017	5,290	225,500	2.35%		
2022	5,420	231,100	2.35%		
2027	5,640	240,600	2.35%		
2032	5,940	253,200	2.35%		
Average Market Share (2007-2011) of U.S. Active GA Aircraft					
2017	5,370	225,500	2.38%		
2022	5,500	231,100	2.38%		
2027	5,730	240,600	2.38%		
2032	6,030	253,200	2.38%		
Constant Ratio Projection Per 1,000 Residents (Maricopa County)					
2017	5,870			4,393,300	1.33
2022	6,440			4,825,700	1.33
2027	7,010			5,248,600	1.33
2032	7,580			5,680,000	1.33
Average Ratio Projection (2007-2011) Per 1,000 Residents (Maricopa County)					
2017	6,330			4,393,300	1.44
2022	6,950			4,825,700	1.44
2027	7,560			5,248,600	1.44
2032	8,180			5,680,000	1.44

[1]Estimate by 2012 Woods & Poole.
Source: Historical Registered Aircraft – FAA; Historical and Forecast U.S. Active GA Aircraft - FAA *Aerospace Forecasts, Fiscal Years 2012-2032* (March 2012); Historical Population – U.S. Census Bureau; Forecast Population – 2012 Woods & Poole.

Due to the fluctuation in the county's market share in recent years, an average market share projection was also developed. Between 2007 and 2011, the county's market share of U.S. active general aviation aircraft averaged 2.38 percent. This percentage was applied to the forecast years and yields 6,030 registered aircraft in Maricopa County by 2032.

The population of Maricopa County has also been used as a comparison with registered aircraft in the county. This forecast method examines historical registered aircraft as a ratio of 1,000 residents in the county. As shown in **Table 2C**, this ratio has fluctuated between a high of 1.56 aircraft per 1,000 residents in 2003 to a low of 1.33 aircraft per 1,000 residents in 2011. A constant ratio projection of 1.33 was applied to the forecast years and yields 7,580 aircraft registered in the county by 2032.

Similar to the previous forecast, an average ratio projection was also developed. Applying the average ratio between 2007 and 2011 (1.44) to the forecast years yields 8,180 registered aircraft in Maricopa County by the end of the planning period.

Another forecast method examined the historical growth rate of registered aircraft in Maricopa County. As previously mentioned, registered aircraft grew at an average annual rate of 0.7 percent between 2001 and 2011. This growth rate was applied to the forecast years and yields 6,000 registered aircraft in the county by 2032.

Table 2D and **Exhibit 2B** summarize the registered aircraft forecasts for Maricopa County. The selected planning forecast is an average of the five newly developed forecasts. With the decrease in registered aircraft over the past few years, this forecast projects a modest increase of registered aircraft in the short term and gradually increases throughout the planning period. This selected planning forecast results in 6,750 registered aircraft by 2032, which represents an average annual growth rate of 1.2 percent.

TABLE 2D
Summary of Registered Aircraft Forecasts
Maricopa County

	2011	2017	2022	2027	2032
Market Share of U.S. Active GA Aircraft					
Constant Market Share		5,870	6,440	7,010	7,580
Average Market Share (2007-2011)		6,330	6,950	7,560	8,180
Registered Aircraft Per 1,000 Residents (Maricopa Co.)					
Constant Ratio Projection		5,290	5,420	5,640	5,940
Average Ratio Projection (2007-2011)		5,370	5,500	5,730	6,030
0.7% Historical Growth Rate (2001-2011)		5,440	5,630	5,830	6,000
Selected Planning Forecast (1.2% AAGR)	**5,218**	**5,660**	**5,990**	**6,350**	**6,750**

Based Aircraft Forecasts

According to the previous Airport Master Plan, there were three aircraft based at Gila Bend Municipal Airport in 2003. Airport records at the end of 2011 indicated 10 based aircraft. Historical based aircraft totals for the intermediate years were not available for this study; therefore, time-series and regression analyses could not be performed.

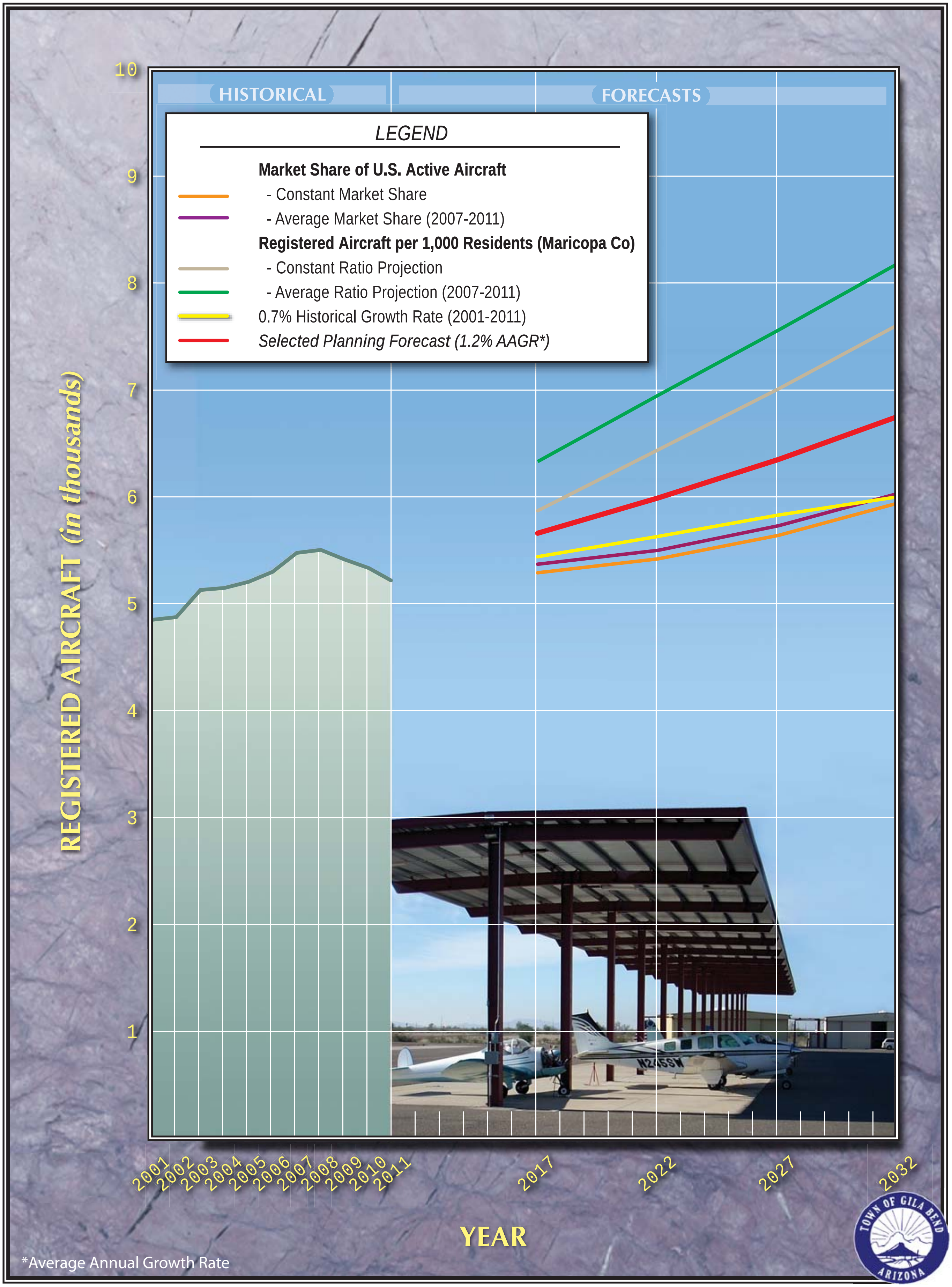


Exhibit 2B
REGISTERED AIRCRAFT IN MARICOPA COUNTY
FORECAST SUMMARY

The based aircraft forecast is a function of the registered aircraft forecast completed in the previous section. **Table 2E** presents the airport's based aircraft market share of registered aircraft in Maricopa County. As shown in the table, the ten based aircraft at Gila Bend Municipal Airport currently account for 0.19 percent of the aircraft registered in the county.

TABLE 2E
Based Aircraft Market Share Forecasts

Year	Gila Bend Based Aircraft	Maricopa County Registered Aircraft	Market Share of Reg. AC
2003	3	5,129	0.06%
2011	10	5,218	0.19%
Constant Market Share Projection			
2017	11	5,660	0.19%
2022	11	5,990	0.19%
2027	12	6,350	0.19%
2032	13	6,750	0.19%
Increasing Market Share Projection			
2017	11	5,660	0.20%
2022	13	5,990	0.22%
2027	15	6,350	0.24%
2032	18	6,750	0.27%

Source: Historical Based Aircraft – Airport Records; Historical Registered Aircraft – FAA.

A constant market share projection was first developed and applies the existing (0.19 percent) market share to the forecast years, yielding 13 based aircraft at the airport by 2032. An increasing market share forecast was also developed to represent the historical trend at the airport. This increasing market share forecast yields 18 based aircraft at the airport by 2032. These two forecasts are presented in **Table 2E**.

Two additional forecasts were also examined, including the *2003 Airport Master Plan* and the *2008 Arizona State Airports System Plan* (SASP). The 2003 Plan developed both a low and a high forecast based on different projections of population growth. The low forecast projected a total of six based aircraft at Gila Ben Municipal Airport by 2022, while the high forecast projected 16 based aircraft. Meanwhile, the 2008 Arizona SASP used a base number of three based aircraft in 2007 and projected five based aircraft at the airport by 2030.

The 2012 FAA *Terminal Area Forecast* (TAF) was also examined. However, the 2012 FAA TAF currently lists zero based aircraft at Gila Bend Municipal Airport and projects zero aircraft through the end of the planning period.

Table 2F and **Exhibit 2C** summarizes the previous based aircraft forecasts for Gila Bend Municipal Airport, as well as the newly developed forecasts. The selected planning forecast is the one which represents an increasing market share of registered aircraft in Maricopa County, similar to the historical trend at the airport. This forecast results in 18 based aircraft by 2032, which represents an average annual growth rate of 3.0 percent.

TABLE 2F Summary of Based Aircraft Forecasts Gila Bend Municipal Airport	2011	2017	2022	2027	2032
2003 Airport Master Plan					
Low Forecast		5	6	N/A	N/A
High Forecast		12	16	N/A	N/A
2008 Arizona State Airports System Plan		4	4	5	N/A
Market Share of Reg. Aircraft (Maricopa Co.)					
Constant Market Share Projection					
Increasing Market Share Projection		11	11	12	13
(Selected Planning Forecast – 3.0% AAGR)	**10**	**11**	**13**	**15**	**18**

[1]Interpolated

It is important to note that the actual percentage of area-wide aircraft that base at Gila Bend Municipal Airport in the future will depend on availability of hangars, rental rates, and services offered by airport businesses.

Based Aircraft Fleet Mix

While the total number of general aviation aircraft based at Gila Bend Municipal Airport is projected to increase, it is also important to know the type of aircraft expected to base at the airport. This will ensure the planning of proper facilities in the future. According to airport records, the current mix of aircraft based at the airport consists of nine single engine aircraft and one multi-engine aircraft. It should be noted that five ultralight/experimental aircraft are also based at the airport. However, these aircraft have not been included in this analysis as they do not have a significant effect on airport operations.

The forecast mix of based aircraft was determined by comparing existing and forecast U.S. general aviation fleet trends to the fleet mix at Gila Bend Municipal Airport. The national trend in general aviation is toward a greater percentage of larger, more sophisticated aircraft as part of the national fleet.

While an increase in single engine aircraft at the airport can be expected, their percentage of the total fleet mix will likely decrease. Meanwhile, the airport's percentage of multi-engine aircraft is projected to more than double by the end of the planning period. Due to its existing runway length, it could also be expected that Gila Bend Municipal Airport's based aircraft mix will include some turbine aircraft in the future. The fleet mix projections for Gila Bend Municipal Airport are presented in **Table 2G**.

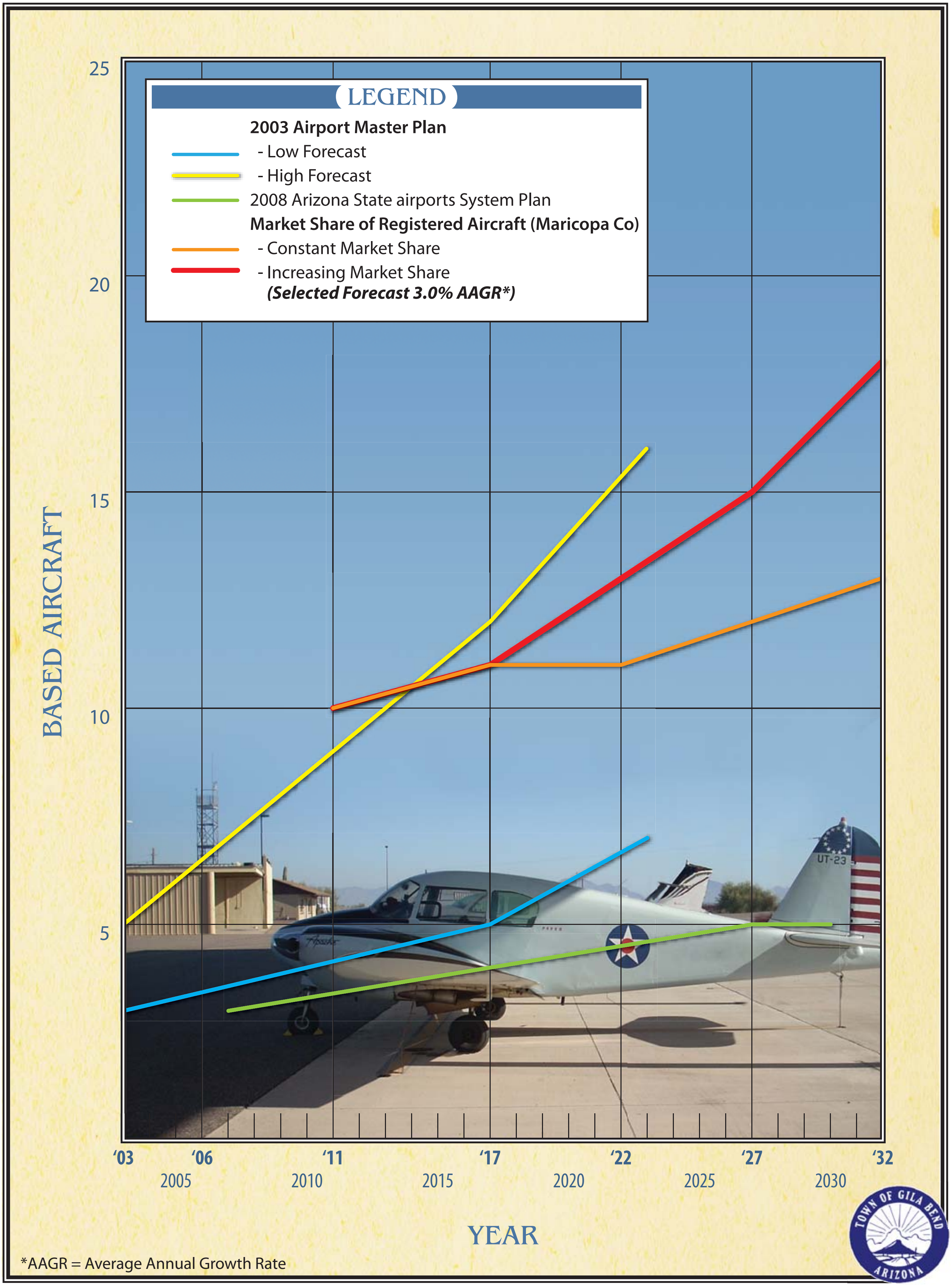


Exhibit 2C
BASED AIRCRAFT

TABLE 2G
Based Aircraft Fleet Mix
Gila Bend Municipal Airport

Year	Total	Single Engine	Multi-Engine	Turbine
2011	10	9	1	0
2011	100.0%	90.0%	10.0%	0.%
2017	11	9	2	0
2022	13	10	2	1
2027	15	10	3	2
2032	18	12	4	2
Change	+8	+3	+3	+2
2017	100.0%	80.0%	20.0%	0.0%
2022	100.0%	74.0%	22.0%	4.0%
2027	100.0%	68.0%	22.0%	10.0%
2032	100.0%	66.0%	24.0%	10.0%

Source: Historical Based Aircraft – Airport Records.

GENERAL AVIATION OPERATIONS

General aviation operations are classified 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. Generally, local operations are characterized by training operations. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. Typically, itinerant operations increase with business and commercial use, since business aircraft are not typically used for large scale training activities.

When tower reports are not available, the FAA Statistics and Forecast Branch recommends using the *Model for Estimating General Aviation Operations at Non-Towered Airports* (July 2001). This report develops and presents a regression model for estimating general aviation (GA) operations at non-towered airports. Independent variables used in the equation include airport characteristics (i.e., number of based aircraft, number of flight schools, population totals, and geographic location).

While there are currently no flight schools at Gila Bend Municipal Airport, several of the flight schools in the Phoenix area utilize Gila Bend Municipal Airport for flight training operations. For this analysis, it was determined that five Phoenix-area flight schools utilize Gila Bend Municipal Airport on a regular basis. Applying this into the equation yields an initial total of 35,700 annual general aviation operations. Of this total, it is estimated that flight training accounts for approximately 27,800 local operations each year.

As shown in **Table 2H**, the estimated 35,700 annual general aviation operations equates to 3,570 operations per based aircraft. It is important to note that while this is presented as "operations per based aircraft" in the table, this number also includes the training operations performed by aircraft based at other airports in the Phoenix area.

From this base number, a constant ratio projection was developed and yields 64,300 annual general aviation operations by 2032. This represents an average annual growth rate of 3.0 percent. Due to the extensive number of training operations taking place at Gila Bend Municipal Airport, it is estimated that the current operational split is 15 percent itinerant and 85 percent local. This selected planning forecast is presented in **Table 2H**.

TABLE 2H
General Aviation Operations Per Based Aircraft Forecasts
Gila Bend Municipal Airport

Year	Based Aircraft	Itinerant Operations	Local Operations	Total Operations	Operations Per Based Aircraft
2011	10	5,360	30,340	35,700[1]	3,570
Constant Ratio Projection					
2017	11	5,900	33,400	39,300	3,570
2022	13	6,960	39,440	46,400	3,570
2027	15	8,040	45,560	53,600	3,570
2032	18	9,650	54,650	64,300	3,570

[1]2011 Estimate of operations – Derived from *Model for Estimating General Aviation Operations at Non-Towered Airports, Equation #15*, FAA Statistics and Forecast Branch (July 2001).

Previous forecasts were also examined, including those in the *2003 Airport Master Plan*, the *2008 Arizona State Airports System Plan*, and the 2012 FAA *Terminal Area Forecasts*. However, none of these forecasts take into consideration the training operations performed at Gila Bend Municipal Airport and were therefore not considered reliable.

PEAKING CHARACTERISTICS

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

- **Peak Month –** The calendar month when peak activity occurs.
- **Design Day –** The average day in the peak month. This indicator is derived by dividing the peak month activity by the number of days in the month.
- **Busy Day –** The busy day of a typical week in the peak month.
- **Design Hour –** The peak hour within the design day.

It is important to realize that only the peak month is an absolute peak within the year. Each of the other periods will be exceeded at various times during the year. However, each provides reasonable planning standards that can be applied without overbuilding or being too restrictive.

General Aviation Peaks

Typically, the peak month for general aviation operations represents between 10 and 15 percent of the airport's annual operations. For this analysis, the peak month was estimated at 12 percent of annual operations, which equates to 4,280 monthly operations for the base year. Forecasts of peak month activity have been developed by applying this percentage to the forecasts of annual operations.

Design day operations were calculated by dividing the total number of operations in the peak month by the number of days in the month. The design hour is projected as 15 percent of the design day operations. Busy day operations were calculated at 15 percent busier than the design day activity. **Table 2J** summarizes the general aviation peak activity forecasts for Gila Bend Municipal Airport.

TABLE 2J
Peak Period Forecasts
Gila Bend Municipal Airport

		FORECASTS			
	2011	**2017**	**2022**	**2027**	**2032**
General Aviation Operations					
Annual	35,700	39,300	46,400	53,600	64,300
Peak Month (12.0%)	4,280	4,720	5,570	6,430	7,720
Design Day	140	160	190	210	260
Busy Day	180	200	230	270	320
Design Hour (15.0%)	21	24	28	32	39

AIR TAXI OPERATIONS

The total annual operations by aircraft operating under F.A.R. Part 135 (air taxi) have also been examined since a percentage of the locally based aircraft operate under Part 135. Part 135 operations were estimated at ten percent of itinerant operations, which is typical for general aviation airports of this size. This equates to an estimated 540 air taxi operations for the base year. **Table 2K** presents the air taxi operations forecast at Gila Bend Municipal Airport. Assuming air taxi operations will continue to equate to ten percent of itinerant operations, approximately 970 air taxi operations are projected by the end of the planning period.

TABLE 2K
Air Taxi Operations Forecast
Gila Bend Municipal Airport

Year	Air Taxi Operations
2011	540
2017	590
2022	700
2027	800
2032	970

ANNUAL INSTRUMENT APPROACHES

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

Currently, there are no published instrument approaches at Gila Bend Municipal Airport. This means that the airport is essentially closed to arrivals when flight conditions are below minimums. However, visual flight conditions occur approximately 99 percent of the time in the region. Therefore, if the airport were to establish an instrument approach procedure, it would be required a very limited amount of time. For this analysis, it is expected that annual instrument approaches at Gila Bend Municipal Airport would represent one percent of total itinerant operations. Applying this percentage to the forecast years yields approximately 100 annual instrument approaches by 2032.

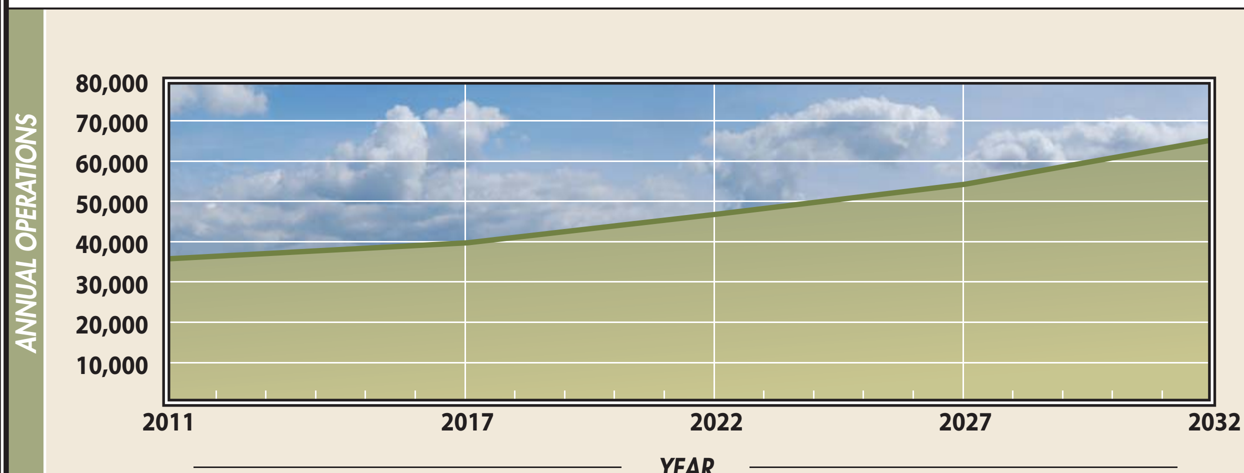
SUMMARY

This chapter has provided forecasts for each sector of aviation demand anticipated over the planning period. A summary of the aviation forecasts developed for Gila Bend Municipal Airport is presented on **Exhibit 2D**.

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

11-MP-07-1B-03/20/12

CATEGORY	BASE YEAR 2011	FORECASTS 2017	2022	2027	2032
ANNUAL OPERATIONS					
Itinerant					
Air Taxi	540	590	700	800	970
General Aviation	5,360	5,900	6,960	8,040	9,650
Total Itinerant	**5,900**	**6,490**	**7,660**	**8,840**	**10,620**
Local					
General Aviation	30,340	33,400	39,440	45,560	54,650
Total Local	**30,340**	**33,400**	**39,440**	**45,560**	**54,650**
Total Operations	***36,240***	***39,890***	***47,100***	***54,400***	***65,270***
BASED AIRCRAFT					
Single Engine	9	9	10	10	12
Multi-Engine	1	2	2	3	4
Turboprops/Jets	0	0	1	2	2
Total Based Aircraft	***10***	***11***	***13***	***15***	***18***
ANNUAL INSTRUMENT APPROACHES	***55***	***60***	***70***	***80***	***100***



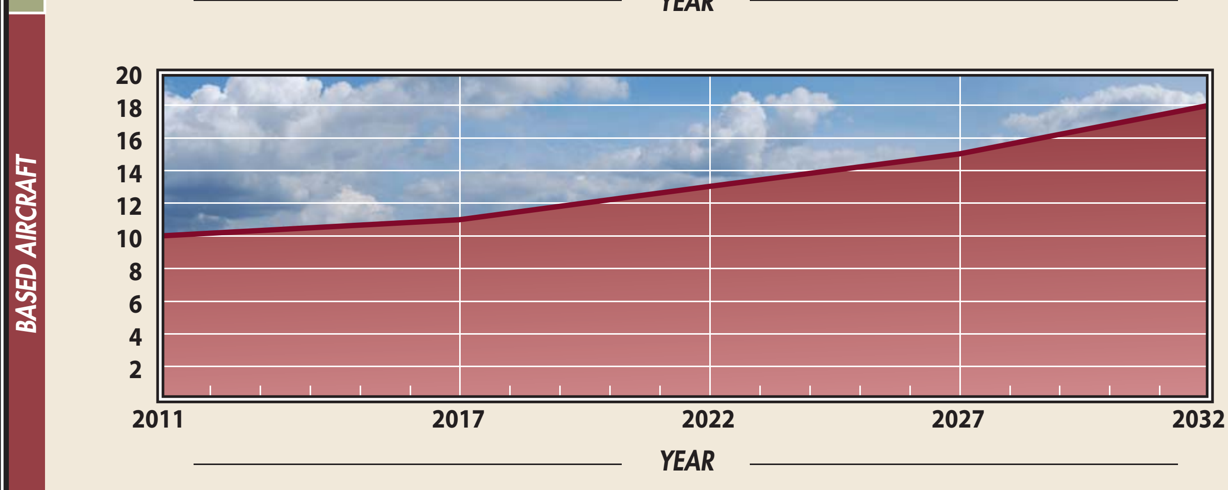


Exhibit 2D
FORECAST SUMMARY

CHAPTER THREE

FACILITY REQUIREMENTS

GILA BEND MUNICIPAL AIRPORT

Facility Requirements

To properly plan for the future of Gila Bend Municipal Airport, it is necessary to translate forecast aviation demand into the specific types and quantities of facilities that can adequately serve this identified demand. This chapter uses the results of the forecasts conducted in Chapter Two, as well as established planning criteria, to determine the airfield (i.e., runways, taxiways, navigational aids, marking and lighting) and landside (i.e., hangars, general aviation terminal building, aircraft parking apron) facility requirements.

The objective of this effort is to identify, in general terms, the adequacy of the existing airport facilities, outline what new facilities may be needed, and determine when these 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 cost-effective and efficient means for implementation.

The cost-effective, efficient, and orderly development of an airport should rely more upon actual demand at an airport than on a time-based forecast figure. In order to develop a master plan that is demand-based rather than time-based, a series of planning horizon milestones have been established for Gila Bend Municipal Airport that take into consideration the reasonable range of aviation demand projections prepared in Chapter Two. It is important to consider that the actual activity at the airport may be higher or lower than projected activity levels. By planning according to activity milestones, the resultant plan can accommodate unexpected shifts or changes in the area's aviation demand.

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

TABLE 3A
Planning Horizon Activity Levels
Gila Bend Municipal Airport

	2011	Short Term	Intermediate Term	Long Term
ANNUAL OPERATIONS				
Itinerant				
Air Taxi	540	590	700	970
General Aviation	5,360	5,900	6,960	9,650
Total Itinerant	**5,900**	**6,490**	**7,660**	**10,620**
Local				
General Aviation	30,340	33,400	39,440	54,650
Total Local	**30,340**	**33,400**	**39,440**	**54,650**
Total Operations	**36,340**	**39,890**	**47,100**	**65,270**
Based Aircraft	**10**	**11**	**13**	**18**

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

AIRFIELD DESIGN STANDARDS

The Federal Aviation Administration (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 code, the airport reference code (ARC), has two components. The first component, depicted by a letter, is the aircraft approach speed (operational characteristic). The second component, depicted by a Roman numeral, is the airplane design group (ADG) 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) 150/530-13, *Airport Design*, an aircraft's approach category is based upon 1.3 times its stall speed in landing configuration at that aircraft's maximum certificated weight. The five approach categories used in airport planning are as follows:

Category A: Speed less than 91 knots.

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

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

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

Category E: Speed greater than 166 knots.

The ADG is based upon the aircraft's wingspan and tail height. The six ADGs used in airport planning are as follows:

Group I: Up to but not including 49 feet wingspan or tail height up to but not including 20 feet.

Group II: 49 feet up to but not including 79 feet wingspan or tail height from 20 up to but not including 30 feet.

Group III: 79 feet up to but not including 118 feet wingspan or tail height from 30 up to but not including 45 feet.

Group IV: 118 feet up to but not including 171 feet wingspan or tail height from 45 up to but not including 60 feet.

Group V: 171 feet up to but not including 214 feet wingspan or tail height from 60 up to but not including 66 feet.

Group VI: 214 feet up to but not including 262 feet wingspan or tail height from 66 up to but not including 80 feet.

In order to determine facility requirements, an ARC should first be determined, and then appropriate airport design criteria can be applied. This begins with a review of the type of aircraft using and expected to use Gila Bend Municipal Airport. **Exhibit 3A** provides a listing of typical aircraft and their associated ARCs.

CRITICAL AIRCRAFT

The FAA recommends designing airfield facilities to meet the requirements of the airport's most demanding aircraft, or critical aircraft. The critical design aircraft is defined as the most demanding category of aircraft which conducts 500 or more annual operations at the airport.

Planning for future aircraft use is of particular importance since design standards are used to plan separation distances between facilities. These standards must be determined now, since the relocation of these facilities will likely be extremely expensive at a later date.

Aircraft operating at Gila Bend Municipal Airport include all types of general aviation aircraft, ranging from small single and multi-engine aircraft, which fall within approach categories A and B and ADGs I and II, and business turboprop and jet aircraft, which fall within approach categories B, C, and D and ADGs I and II. The majority of based aircraft fall within ARCs A-I and B-II. Helicopters are not included in this determination as they are not assigned an ARC.

Critical Design Aircraft Conclusion

In some cases, more than one aircraft comprise the airport's critical aircraft. Such is the case for Gila Bend Municipal Airport. Combining the operations of the most demanding aircraft to operate at Gila Bend Municipal Airport (business jets, turboprop aircraft, and multi-engine piston aircraft), the airport can currently be classified as an ARC B-II facility. This ARC includes all general aviation aircraft, as well as the majority of the business aircraft currently operating at the airport.

While aircraft in higher ARCs may use the airport, they are limited by weight and takeoff and landing requirements. The forecasts anticipate increasing utilization by small single engine and multi-engine aircraft, as well as business turboprop and jet aircraft throughout the planning period. This potential mix of aircraft will continue to place the airport in the B-II category.

AIRPORT IMAGINARY SURFACES

The FAA has established several imaginary 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 RSA is "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 an excursion from the runway." An object free area is an area on the ground centered on the runway, taxiway, or centerline, provided to enhance the safety of aircraft operations, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. An obstacle free zone is a volume of airspace that is required to be clear of objects, except for frangible items required for navigation of aircraft. It is centered along the runway and extended runway centerline. The RPZ is defined as an area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape and centered about the extended runway centerline. The dimensions of an RPZ are a function of the runway ARC and approach visibility minimums.

The FAA has placed a higher significance on maintaining adequate RSAs at all airports. On October 1, 1999, the FAA established Order 5200.8, *Runway Safety Area Program*. The order states 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.

Table 3B summarizes the FAA safety area design standards as they apply to Gila Bend Municipal Airport. The FAA expects these areas to be under the control of the airport and free from obstructions. Presently, the existing RPZs on both runway ends extend beyond the existing airport property. Whenever possible, the airport should maintain positive control over the RPZs through fee simple acquisition; however, avigation easements (acquiring control of designated airspace rights within the RPZ) can be pursued if fee simple acquisition is not feasible.

11-MP-07-1B-03/20/12

A-I

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

C-I, D-I

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

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

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

C-II, D-II

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

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

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

C-III, D-III

- ERJ-170, 190
- CRJ 700, 900
- Boeing Business Jet
- **B 737-300 Series**
- MD-80, DC-9
- Fokker 70, 100
- A319, A320
- Gulfstream V
- Global Express

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

- Super King Air 350
- Beech 1900
- Jetstream 31
- Falcon 10, 20, 50
- Falcon 200, 900
- **Citation II**, III, IV, V
- Saab 340
- Embraer 120

C-IV, D-IV

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

A-III, B-III

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

D-V

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

Note: Aircraft pictured is identified in bold type.

Exhibit 3A
AIRPORT REFERENCE CODES

TABLE 3B **Airfield Safety Area Dimensional Standards** **Gila Bend Municipal Airport**	**FAA Design Standards**
Airport Reference Code Approach Visibility Minimums	**B-II** **Visual and/or ≥ ¾ Mile**
Runway Width	75'
Runway Centerline To: Holding Position Parallel Taxiway Centerline Aircraft Parking Area	 200' 240' 250'
Runway Safety Area (RSA) Width Length Prior to Landing Threshold Length Beyond Runway End	 150' 300' 300'
Runway Object Free Area (OFA) Width Length Beyond Runway End	 500' 300'
Runway Obstacle Free Zone (OFZ) Width Length Beyond Runway End	 400' 200'
Runway Protection Zone (RPZ) Inner Width Outer Width Length	 500' 700' 1,000'
Source: FAA AC 150/5300-13, *Airport Design*.	

AIRFIELD REQUIREMENTS

As indicated earlier, airfield facilities include those facilities that are related to the arrival, departure, and ground movement of aircraft. These components include:

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

RUNWAYS

The adequacy of the existing runway system at Gila Bend Municipal Airport has been analyzed from a number of perspectives, including runway orientation, runway length, pavement strength, width, and adherence to safety area standards. From this information, requirements for runway improvements were determined for the airport.

Runway Orientation

Runway use is normally dictated by wind conditions. The direction of take-offs and landings is generally determined by the speed and direction of the wind. For the operational safety and efficiency of an airport, it is desirable for the principal runway of an airport's runway system to be oriented as close as possible to the direction of the prevailing wind. This reduces the impact of crosswind components during landing or takeoff.

Gila Bend Municipal Airport is currently served by primary Runway 4-22, which is oriented in a northeast-southwest direction. FAA design standards specify that additional runway configurations are needed when the primary runway configuration provides less than 95 percent wind coverage at specific crosswind components. The 95 percent wind coverage is computed on the basis of crosswinds not exceeding 10.5 knots for small aircraft weighing less than 12,500 pounds and from 13 to 20 knots for aircraft weighing over 12,500 pounds.

A ten-year period of observations is recommended for determining wind coverage. However, Gila Bend Municipal Airport only had one year of available wind data. Therefore, data from the nearest weather station at Gila Bend Air Force Auxiliary Airport (located 5 nm southwest) was used to supplement wind data.

Exhibit 3B presents the wind rose for the airport and summarizes wind coverage based on this data. According to the wind summary presented on this exhibit, Runway 4-22 provides greater than 97 percent wind coverage for all crosswind components. Therefore, no additional runway orientation is needed at Gila Bend Municipal Airport.

Runway Length

Runway length requirements for an airport are based on five primary factors: airport elevation, mean daily maximum temperature of the hottest month, runway gradient (difference in runway elevation of each runway end), critical aircraft type expected to use the airport, and stage length of the longest nonstop trip destination.

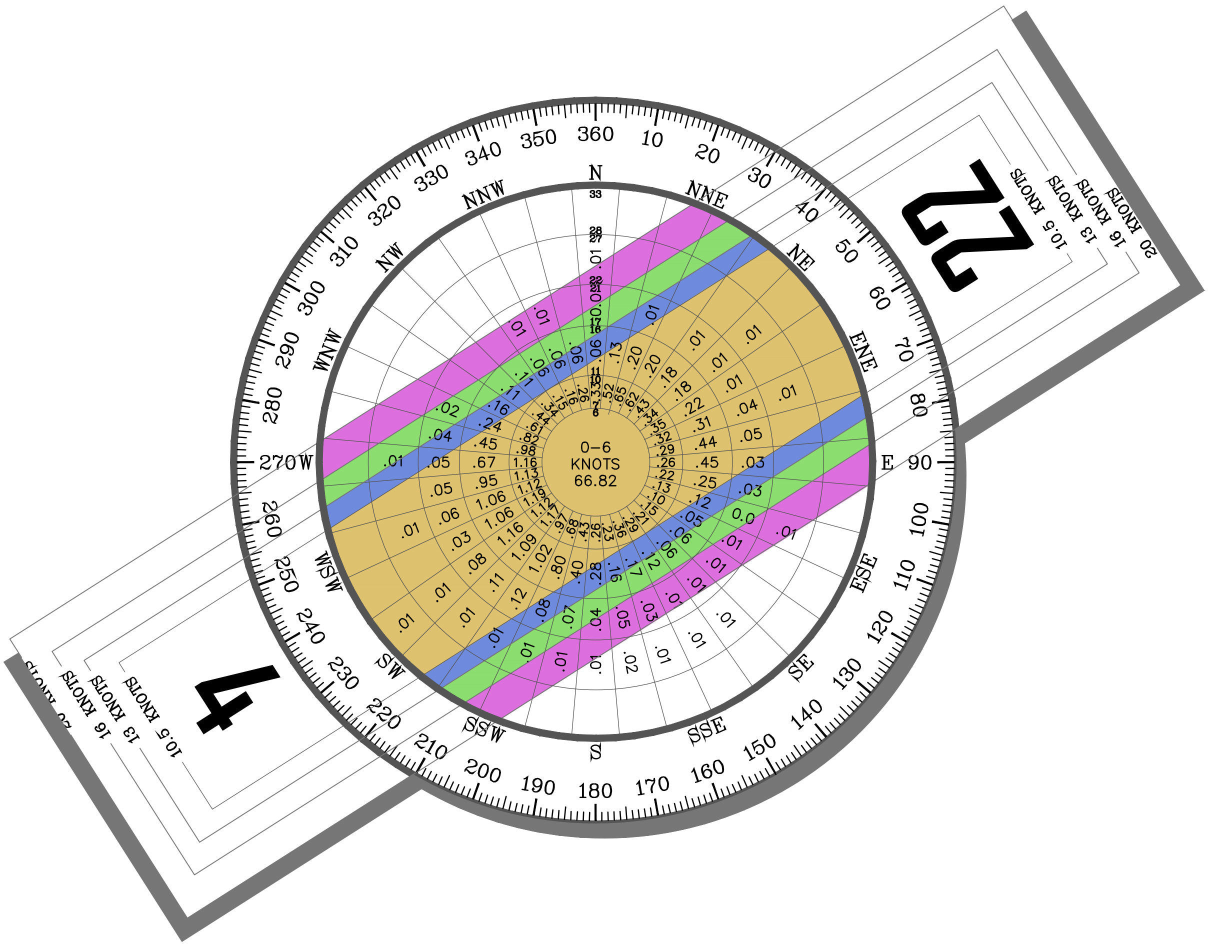
Aircraft performance declines as each of these factors increase. Summertime temperatures and stage lengths are the primary factors in determining runway length requirements. For calculating runway length requirements at Gila Bend Municipal Airport, the airport elevation is 789 feet above mean sea level (MSL) and the mean maximum temperature of the hottest month is 108.6 degrees Fahrenheit (F). Runway end elevations vary by approximately 15 feet, which results in a longitudinal gradient of 0.3 percent. This conforms to FAA design standards, which specify the longitudinal gradient for aircraft in approach categories A and B cannot exceed two percent.

Using the site-specific data described above, runway length requirements for the various classifications of aircraft that may operate at the airport were examined using the FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*. The program groups general aviation aircraft into several categories, reflecting the percentage of the fleet within each category. As previously discussed, the runway design should be based upon the most critical aircraft (or group of aircraft) performing at least 500 annual itinerant operations.

Table 3C summarizes the FAA's generalized recommended runway lengths determined for Gila Bend Municipal Airport. As shown in the table, local conditions call for a runway length of at least 4,800 feet to accommodate all small airplanes. For the majority of business jets (refer to 75 percent of large airplanes at 60 percent useful load), a runway length of 5,300 feet is required.

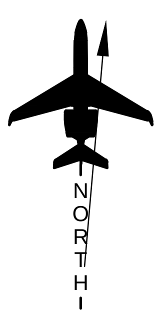
ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 4-22	*97.49%*	*98.88%*	*99.71%*	*99.91%*



SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Gila Bend AAF, 2000-2008;
Gila Bend Municipal Airport, 2011
Gila Bend, Arizona

OBSERVATIONS:
34159 All Weather Observations
2000-2008, 2011



Magnetic Declination
11° 0' East (January 2012)
Annual Rate of Change
00° 06' West (January 2012)

TABLE 3C Runway Length Requirements Gila Bend Municipal Airport	
AIRPORT AND RUNWAY DATA	
Airport elevation	789 feet
Mean daily maximum temperature of the hottest month	108.6° F
Maximum difference in runway centerline elevation	15 feet
Length of haul for airplanes of more than 60,000 pounds	500 miles
RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with less than 10 passenger seats	
95 percent of these small airplanes	3,600 feet
100 percent of these small airplanes	4,200 feet
Small airplanes with 10 or more passenger seats	4,800 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	5,200 feet
Reference: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design.*	

Based upon the FAA's Advisory Circular, Runway 4-22 can accommodate 100 percent of small general aviation aircraft, as well as 75 percent of large aircraft at 60 percent useful load at its existing length of 5,200 feet. Therefore, no extension to the runway is justified at this time. However, it is important to note that some aircraft may experience payload and/or fuel limitations when attempting longer stage lengths during the warmest summer months. Only when a specific aircraft is identified as having more than 500 annual itinerant operations that require greater length than the "75 percent of large airplanes at 60 percent useful load" category will greater runway lengths be considered.

Runway Width

Runway width is based upon the planning ARC for each runway. The planning ARC for Runway 4-22 is B-II, whose design standards specify a runway width of 75 feet for visual runways and runways with not lower than ¾-statute mile approach visibility minimums. At its current width of 75 feet, Runway 4-22 meets this standard.

Runway Pavement Strength

The most important feature of airfield pavement is its ability to withstand repeated use by aircraft of significant weight on a regular basis. While the pavement strength rating is not the maximum weight limit, aircraft weighing more than the certified strength can only operate on the runway on an infrequent basis. Heavy aircraft operations can shorten the life span of airport pavements. Runway 4-22 has a current strength rating of 12,500 pounds single wheel loading (SWL). The airport should consider upgrading to pavement strengths of 15,000 pounds SWL and 60,000 pounds dual wheel loading (DWL) to support some of the larger aircraft that may operate at the airport in future years.

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 the runways, whereas other taxiways become necessary as activity increases at an airport to provide safe and efficient use of the airfield. The FAA has established standards for taxiway width and runway/taxiway separation distances.

Taxiway width is determined by the ADG of the most demanding aircraft to use the taxiway. As previously mentioned, the most demanding aircraft operating at Gila Bend Municipal Airport fall within ADG II. According to FAA design standards, the minimum taxiway width for ADG II is 35 feet. Runway 4-22 is served by a full-length parallel taxiway (Taxiway A) and six connecting taxiways. Each of these taxiways are a minimum of 40 feet wide, meeting FAA design standards.

Design standards for the separation distances between runways and parallel taxiways are based primarily on the ARC for that particular runway and the type of instrument approach capability. ARC B-II design standards for visual runways and runways with not lower than ¾-statute mile approach visibility minimums specify a runway/taxiway separation distance of 240 feet. Taxiway A is located 250 feet from the Runway 4-22 centerline, meeting this requirement.

Holding aprons provide an area for aircraft to prepare for departure off the taxiway and allow aircraft that are ready for departure to bypass other aircraft. The addition of holding aprons to both ends of Runway 4-22 is recommended.

AIRFIELD LIGHTING, MARKING, AND SIGNAGE

Currently, there are a number of lighting and pavement marking aids serving pilots at Gila Bend Municipal Airport. These lighting systems and marking aids assist pilots in locating the airport at night or during poor weather conditions, as well as enhancing the effective ground movement of aircraft.

Identification Lighting

Gila Bend Municipal Airport is equipped with a rotating beacon, which assists pilots in locating the airport at night. The existing rotating beacon is located on a 40-foot high steel frame tower adjacent to the terminal building. The installation of a new airport beacon has been included in the latest Airport Capital Improvement Program (ACIP).

Runway and Taxiway Lighting

Airport lighting systems provide critical guidance to pilots during nighttime and low-visibility operations, as well as enhancing the effective ground movement of aircraft. Runway 4-22 is presently equipped with medium intensity runway lighting (MIRL), while Taxiway A and its connecting taxiways are equipped with medium intensity taxiway lighting (MITL).

Over time, the airport should consider removing the incandescent airfield signage and runway and taxiway edge lighting systems and replacing them with light emitting diode (LED) technology. LEDs have many advantages, including lower energy consumption, longer lifetime, tougher construction, reduced size, greater reliability, and faster switching. While an initial investment is required upfront, the energy savings and reduced maintenance costs will outweigh any costs in the long run.

Visual Approach Lighting

In most instances, the landing phase of any flight must be conducted in visual conditions. To provide pilots with visual descent information during landings, visual glide slope indicators are commonly provided at airports. A precision approach path indicator (PAPI-2L) is installed on both ends of Runway 4-22 for this purpose and should be maintained through the planning period.

Runway End Identification Lighting

Runway end identification lights (REILs) provide pilots with a rapid and positive identification of the approach ends of a runway. The airport is not currently equipped with any REILs. However, the installation of REILs to both ends of Runway 4-22 has been included in the latest ACIP.

Pilot-Controlled Lighting

Gila Bend Municipal Airport is equipped with pilot-controlled lighting (PCL). This allows pilots to control the intensity of runway and taxiway lighting using the radio transmitter in the aircraft. PCL also provides for more efficient use of lighting systems by turning the runway and taxiway lighting off or to a lower intensity when not in use. This system should be maintained through the planning period, and all airfield lighting components should be connected to this system.

Pavement Markings

Runway markings are designed according to the type of instrument approach available on the runway. FAA AC 150/5340-1J, *Marking of Paved Areas on Airports*, provides the guidance necessary to design an airport's markings. Nonprecision markings currently exist on Runway 4-22. These markings should be sufficient through the planning period.

Taxiway and apron areas also require marking. Yellow centerline stripes are currently painted on all taxiway surfaces at the airport to provide this guidance to pilots. The apron areas have centerline markings to indicate the alignment of taxilanes within these areas. Besides routine maintenance of the taxiway striping, these markings will be sufficient through the planning period.

Aircraft Holding Positions

The current hold positions for Runway 4-22 are marked 125 feet from the runway centerline on all connecting taxiways. This does not meet the 200-foot separation standard for ARC B-II runways.

Airfield Signage

Airfield signage provides another means of notifying pilots as to their location on the airport. A system of signs placed at several airfield intersections on the airport is the best method available to provide this guidance. The lighted signage system at Gila Bend Municipal Airport includes runway and taxiway designations, routing/directional, and runway exits. This lighting system is sufficient and all panels were replaced in May 2012. It should be maintained through the planning period and will need to be updated as additional facilities are added.

INSTRUMENT APPROACH PROCEDURES

Instrument approach procedures 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. Presently, Gila Bend Municipal Airport is not served by an instrument approach; therefore, the airport is effectively closed to arrivals when visual flight can no longer be conducted. Facility planning should include establishing a GPS approach at the airport, so that the airport is accessible during poor weather conditions.

WEATHER REPORTING FACILITIES

The airport is equipped with a lighted wind cone, which provides pilots with information about wind conditions, and a segmented circle, which provides pilots with traffic information. These facilities are required when the airport is not served by a 24-hour airport traffic control tower (ATCT).

An Automated Weather Observation System (AWOS) has been included in the latest ACIP. An AWOS automatically records weather conditions such as wind speed, gusts, wind direction, temperature, dew point, altimeter setting, and density altitude. A summary of the airside needs at Gila Bend Municipal Airport is presented on **Exhibit 3C**.

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 capacities of the various components of each area were examined in relation to projected demand to identify future landside facility needs. This includes:

- General Aviation Terminal Building
- Aircraft Storage Hangars
- Aircraft Parking Apron
- Vehicle Parking
- Airport Support Facilities

GENERAL AVIATION TERMINAL BUILDING

General aviation terminal facilities provide an area for waiting passengers, a pilots' lounge, flight planning, concessions, management, storage, and various other needs. This space is not necessarily limited to a single, separate terminal building, but can include space offered by fixed base operators (FBOs) for these functions and services. The existing terminal building at Gila Bend Municipal Airport totals approximately 600 square feet and includes a pilot's lounge, the airport's electrical equipment vault, a storage room, and two restrooms.

The methodology used in estimating general aviation terminal facility needs is based on the number of airport users expected to utilize general aviation facilities during the design hour. General aviation space requirements were based upon providing 120 square feet per design hour

11-MP-07-1B-03/20/12

	Available	Future
Runways and Design Standards		
	**Runway 4-22** 5,200' x 75' 12,500 SWL ARC B-II	**Runway 4-22** 5,200' x 75' **30,000 SWL * 60,000 DWL** ARC B-II
Taxiways and Separation Standards		
	**Runway 4-22** Full-Length Parallel Taxiway A - 40' wide (250' From Runway Centerline) Taxiways B,C,D,E,F,G - 40'-80' wide	**Runway 4-22** Full-Length Parallel Taxiway A - 40' wide (250' From Runway Centerline) Taxiways B,C,D,E,F,G - 40'-80' wide **Holding Aprons - At Each End**
Navigational Aids		
	ATIS, Weather Equipment **Runway 4-22** PAPI-2L	ATIS, **AWOS** **Runway 4-22** PAPI-2L **REILs** **GPS Approach - Runway 22** (1 Mile Visibility, 300' Cloud Ceilings)
Lighting and Marking		
	Rotating Beacon, Lighted Wind Cone, Segmented Circle, Airfield Signage **Runway 4-22** MIRL MITL Pilot-Controlled Lighting Non-Precision Marking Hold Lines - 125’	Rotating Beacon, Lighted Wind Cone, Segmented Circle, Airfield Signage **Runway 4-22** MIRL MITL Pilot-Controlled Lighting Non-Precision Marking **Hold Lines - 200’**

SWL - Single Wheel Loading
DWL - Double Wheel Loading
PAPI - Precision Approach Path Indicator
REILs - Runway End Identifier Lights
GPS - Global Positioning System
MIRL - Medium Intensity Runway Lights
MITL - Medium Intensity Taxiway Lights

Exhibit 3C
AIRSIDE REQUIREMENTS

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 is used to account for the likely increase in larger, more sophisticated aircraft using the airport.

Future terminal building requirements are presented on **Exhibit 3D** and indicate a need for additional area. Future needs could be met with the development of a new facility or expansion of the existing facility. The alternatives analysis will examine this in more detail in the following chapter.

AIRCRAFT STORAGE HANGARS

Utilization of hangar space varies as a function of local climate, security, and owner preferences. The trend in general aviation aircraft, whether single or multi-engine, is towards more sophisticated aircraft (and, consequently, more expensive aircraft); therefore, many aircraft owners prefer enclosed hangar space to outside tie-downs.

The demand for aircraft storage hangars is dependent upon the number and type of aircraft expected to be based at the airport in the future. For planning purposes, it is necessary to estimate hangar requirements based upon forecast operational activity. However, hangar development should be based upon actual demand trends and financial investment conditions. 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 should not be planned for each based aircraft. At Gila Bend Municipal Airport, approximately 60 percent of the based aircraft are currently stored in enclosed (or covered) hangar facilities. It is estimated that the percentage of based aircraft stored in hangars will increase through the planning period.

Hangars are typically classified as either T-Hangars (individual spaces within a larger contiguous structure that allow privacy and individual access to their space) or executive/conventional hangars (small to very large units which accommodate multiple aircraft).

The majority of hangared aircraft at Gila Bend Municipal Airport are currently stored in executive/box hangars, which are designed for multiple aircraft storage. As the trend towards more sophisticated aircraft continues throughout the planning period, it is important to determine the need for more executive/box hangars. For these types of hangars, a planning standard of 1,200 square feet was used for single engine aircraft, while a planning standard of 3,000 square feet was used for multi-engine, turboprops, and jets. These planning standards recognize that some of the larger business jets require a greater amount of space.

A smaller portion of hangared aircraft at Gila Bend Municipal Airport is currently stored in T-hangars. A planning standard of 1,200 square feet per based aircraft has been used to determine future requirements for T-hangars.

In addition, because portions of executive/box hangars are also used for aircraft maintenance and servicing, requirements for a maintenance/service hangar area were estimated using a planning standard of approximately 15 percent of the total hangar space needs.

Future hangar requirements for the airport are summarized on **Exhibit 3D** and indicate a need for additional hangar area through the planning period. It should be noted that these hangar requirements are general in nature based on the aviation demand forecasts. Actual need for hangar space will depend on the actual usage within hangars. The alternatives will examine the options available for hangar development at the airport and determine the best location for each type of hangar facility.

AIRCRAFT PARKING APRON

A parking apron should provide for the number of locally based aircraft that are not stored in hangars, as well as for those aircraft used for air taxi and training activity. Parking should be provided for itinerant aircraft as well. As previously mentioned, approximately 60 percent of based aircraft at Gila Bend Municipal Airport are currently stored in hangars, and that percentage is expected to increase through the planning period.

For planning purposes, 20 percent of the based aircraft total will be used to determine the parking apron requirements of local aircraft, due to some aircraft requiring both hangar storage and parking apron space. Since the majority of locally based aircraft are stored in hangars, the area requirement for parking of locally based aircraft is smaller than for transient aircraft. Therefore, a planning criterion of 650 square yards per aircraft was used to determine the apron requirements for local aircraft. Transient aircraft parking needs must also be considered when determining apron requirements. A planning criterion of 800 square yards was used for single and multi-engine itinerant aircraft and 1,600 square yards for itinerant jets.

Current apron area at Gila Bend Municipal Airport totals approximately 18,600 square yards with 35 aircraft tie-down positions. Future aircraft parking apron requirements are presented on **Exhibit 3D**. According to these recommendations, the existing apron area should be sufficient through the planning period. However, additional apron area may be needed as new hangar areas are developed on the airport which are not contiguous with the existing apron areas.

VEHICLE PARKING

A small unimproved automobile parking area is located directly north of the terminal building. Limited parking is available in this area. A Park 'n Ride lot is located farther north. This paved lot totals approximately 42,500 square feet and provides parking for approximately 105 vehicles. While the Park 'n Ride lot is mainly used by commuters, it is also available to airport employees, as well as those visiting the airport.

Future vehicle parking requirements have been determined based on industry standards and are presented on **Exhibit 3D**. The Park 'n Ride lot should satisfy parking demand at the airport through the planning period.

AIRPORT SUPPORT FACILITIES

Various facilities that do not logically fall within classifications of airfield, terminal building, or general aviation areas have also been identified. These other areas provide certain functions related to the

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AIRCRAFT STORAGE HANGAR REQUIREMENTS

	AVAILABLE	SHORT TERM NEED	INTERMEDIATE TERM NEED	LONG TERM NEED
Aircraft to be Hangared		8	10	15
T-Hangar (s.f.)		1,800	3,600	4,800
Box / Executive Hangar Area (s.f.)		10,800	13,800	24,000
Maintenance Area		1,900	2,600	4,300
Total Hangar Area (s.f.)	**9,800**	**14,500**	**20,000**	**33,100**

AIRCRAFT PARKING APRON REQUIREMENTS

	AVAILABLE	SHORT TERM NEED	INTERMEDIATE TERM NEED	LONG TERM NEED
Single, Multi-Engine Transient Aircraft Positions		5	6	8
Apron Area (s.y.)		4,000	4,800	6,400
Transient Business Jet Positions		1	2	2
Apron Area (s.y.)		1,600	3,200	3,200
Locally Based Aircraft Positions		2	3	4
Apron Area (s.y.)		1,300	2,000	2,600
Total Positions	**35**	**8**	**11**	**14**
Total Apron Area (s.y.)	**18,600**	**6,900**	**10,000**	**12,200**

GENERAL AVIATION TERMINAL AREA FACILITIES

	AVAILABLE	SHORT TERM NEED	INTERMEDIATE TERM NEED	LONG TERM NEED
General Aviation Building Space (s.f.)	**600**	**1,300**	**1,400**	**2,300**

VEHICLE PARKING REQUIREMENTS

	AVAILABLE	SHORT TERM NEED	INTERMEDIATE TERM NEED	LONG TERM NEED
Design Hour Passengers		7	8	13
Terminal Vehicle Spaces		13	18	32
Parking Area (s.f.)		5,200	7,200	12,800
General Aviation Parking Spaces		6	7	9
General Aviation Parking Area (s.f.)		2,400	2,800	3,600
Total Parking Spaces	**105***	**19**	**25**	**41**
Total Parking Area (s.f.)	**42,500**	**7,600**	**10,000**	**16,400**

*Includes park-n-ride lot. Limited parking is available in unimproved parking lot.

Exhibit 3D
LANDSIDE REQUIREMENT SUMMARY

overall operation of the airport and include the following:

- Aircraft Rescue and Firefighting
- Fuel Storage
- Maintenance/Storage Facilities
- Aircraft Wash Facility

Aircraft Rescue and Firefighting

Presently, there is no dedicated airport rescue and firefighting (ARFF) facility at Gila Bend Municipal Airport. Requirements for ARFF services at an airport are established under Federal Aviation Regulations (FAR) Part 139, which applies to the certification and operation of land airports served by any scheduled or unscheduled passenger operation of an air carrier using an aircraft with more than nine seats. Since the airport does not operate under Part 139 and the airport does not intend to pursue Part 139 Certification, the establishment of dedicated ARFF facilities is not justified or required.

Fuel Storage

Gila Bend Municipal Airport does not currently have fuel capability. Fuel storage requirements are typically based upon maintaining a two-week supply of fuel during the peak month.

Maintenance/Storage Facilities

The airport does not currently have a building dedicated to maintenance or storage. The alternatives analysis will evaluate various locations for the development of a maintenance facility.

Aircraft Wash Facility

Currently, there is not a designated aircraft wash facility at Gila Bend Municipal Airport. Consideration should be given to establishing such a facility at the airport. This would provide for the collection of used aircraft oil and other hazardous materials, as well as provide a covered area for aircraft washing and light maintenance.

SUMMARY

The intent of this chapter has been to outline the facilities required to meet potential aviation demands projected for Gila Bend Municipal Airport through the long term planning horizon. The next step is to develop alternatives for development to best meet these projected needs. The remainder of the airport master plan will be devoted to outlining this direction, its schedule, and costs.

CHAPTER FOUR

AIRPORT DEVELOPMENT ALTERNATIVES

GILA BEND MUNICIPAL AIRPORT

Airport Development Alternatives

In the previous chapter, airside and landside facility needs that would satisfy projected demand over the planning period were identified. The next step in the master planning process is to evaluate the various ways these facilities can be provided. In this chapter, the facility needs will be applied to a series of airport development alternatives. The possible combination of alternatives can be endless, so some intuitive judgment must be applied to identify the alternatives which have the greatest potential for implementation. The alternatives analysis is an important step in the planning process since it provides the underlying rationale for the final master plan recommendations.

The alternatives presented in this chapter provide a series of options for meeting short and long-term facility needs. Since the levels of general aviation activity can vary from forecast levels, flexibility must be considered in the plan. If activity levels vary significantly within a five-year period, the Town of Gila Bend should consider updating the plan to reflect the changing conditions.

Since the combination of alternatives can be endless, only the more prudent and feasible alternatives were examined. The alternatives presented in this chapter will be reviewed with the Planning Advisory Committee (PAC) to allow for further refinement.

In conjunction with the alternatives, an environmental evaluation has also been completed and included as an appendix to this report. The purpose of the evaluation is to obtain information regarding environmental sensitivities on or near airport property and to identify any potential environmental concerns that must be addressed prior to program implementation. Only informal consultation with various federal and state agencies occurs (if needed) at this time to document environmental sensitivities.

Following the preparation of an updated airport layout plan drawing, a capital improvement program will be developed. However, a final decision with regard to pursuing a particular development plan which meets the needs of general aviation users rests with the Town of Gila Bend.

PAST PROJECTS

Prior to presenting airport development alternatives, it is helpful to review some of the previous airport planning efforts and the development that has occurred during the intervening years. Recounting recent (or ongoing) airfield improvements will assist with the identification of current issues affecting future development options.

An airport master plan for Gila Bend Municipal Airport was previously completed in February 2004. Some of the major federal and state-funded improvements completed at the airport since 2004 include: installation of perimeter fencing, installation of apron lighting and terminal area security lighting, installation of a runway visual guidance system, and a thin asphalt overlay on the runway. Additional hangar facilities have also been constructed at the airport.

CONSIDERATION OF NON-DEVELOPMENT ALTERNATIVES

NO ACTION ALTERNATIVE

In analyzing and comparing costs and benefits of various development alternatives, it is important to consider the consequences of no further development. The "no action" alternative essentially considers keeping the airfield in its present condition and not providing for any improvements to existing facilities. The primary result of this alternative, as in any changing air transportation market, would be the eventual inability of the airport to satisfy the increasing demands of the local service area.

The airport's aviation forecasts and the analysis of facility requirements indicated a need to provide additional hangar facilities. Without these improvements to the airport facilities, regular and potential users of the airport would be constrained from taking maximum advantage of the airport's air transportation capabilities.

The ramifications of the "no action" alternative extend into impacts on the economic well-being of the region. If facilities are not maintained and improved so that the airport maintains a pleasant experience to the visitor or business traveler, then these individuals may consider alternate locations.

Thus, the "no action" alternative is inconsistent with the long term transportation system goals of the Town, which are to enhance local and interstate commerce. A policy of "no action" would be considered an irresponsible approach, affecting not only the long term viability of the airport and the investment that has been made in it, but also the economic growth and development of the airport's service area. Therefore, the "no action" alternative was not considered as prudent or feasible.

TRANSFER SERVICES TO ANOTHER AIRPORT

Limiting development at Gila Bend Municipal Airport and relying on other airports to serve aviation demand for the local area is an alternative for consideration. As discussed in the Inventory Chapter, there are five public-use airports located within a 40-mile radius of Gila Bend Municipal Airport. The nearest airport (Buckeye Municipal) is located 28 miles north and is a general aviation facility with a 5,500-foot runway, providing similar services to that of Gila Bend Municipal Airport.

There are two reliever airports located within 40 miles that could theoretically accommodate a portion of the demand from Gila Bend Municipal Airport. However, each of these airports has a role to fill in the regional and national aviation system. Accommodating demand from Gila Bend Municipal Airport could potentially reduce the long term ability of these airports to meet their future demand levels.

It should also be noted that there are numerous private airports within a 40-mile radius of Gila Bend Municipal Airport. However, private airports lack the funding that is available to public-use airports. Growth in new businesses will continue to create a need for local access to the air transportation system. General aviation plays an important role in the way companies conduct their businesses. Gila Bend Municipal Airport's role as a general aviation facility serving the needs of the Town is expected to continue through the planning period. This role is not easily replaced by another airport.

DEVELOPMENT OF A NEW AIRPORT

The alternative of developing an entirely new airport facility to meet the aviation needs of the local area can also be considered. The development of a new airport is generally considered when an airport reaches capacity and it is cost-prohibitive to expand the existing facility. Development of a new airport is not considered necessary at this time, as Gila Bend Municipal Airport can continue to develop and upgrade its current airfield system to serve increasing demands in higher design categories and/or with lower landing minimums.

INITIAL DEVELOPMENT CONSIDERATIONS

Upon completion of the facility needs evaluation, a number of airport development considerations were outlined. These considerations, which have been grouped into airside and landside categories, have been summarized on **Exhibit 4A**.

While many of these development considerations are demand driven (e.g., based aircraft or peak hour demand levels), several are included to upgrade all-weather capabilities, improve airfield safety or efficiency of the airfield system, or to meet current design standards and remain as important considerations in the master planning process.

AIRFIELD CONSIDERATIONS

Airfield facilities are, by their very nature, a focal point of the airport complex. Because of their role, and the fact that they physically dominate a great deal of the airport's property, airfield facility needs are often the most critical factor in the determination of viable airport development alternatives. In particular, the runway system requires the greatest influence on the identification and development of other airport facilities. **Exhibit 4A** has identified a number of airside considerations at Gila Bend Municipal Airport.

AIRPORT DESIGN CRITERIA

There are a number of Federal Aviation Administration (FAA) design criteria that must be considered when looking at airfield improvements. On September 28, 2012, the FAA issued Advisory Circular (AC 150/5300-13A, Airport Design). This AC was substantially revised to fully incorporate all previous changes to AC 150/5300-13, as well as new standards and technical requirements.

RUNWAY DESIGN CODE (RDC)

Airport design first requires selecting the Runway Design Code (RDC) for the desired/planned level of service for each runway and then applying the airport design criteria associated with the RDC. The Aircraft Approach Category (AAC), Airplane Design Group (ADG), and approach visibility minimums are combined to form the RDC of a particular runway. The first component, depicted by a letter, is the AAC and relates to aircraft approach speed. The second component, depicted by a Roman numeral, is the ADG and relates to either the aircraft wingspan or tail height (whichever is most restrictive). The third component relates to the visibility minimums, expressed by values in feet.

The existing runway design code (RDC) for Runway 4-22 (and the facility) is B-II-VIS. This RDC includes most general aviation propeller aircraft, as well as the majority of business aircraft currently using the airport. The forecasts anticipate increasing utilization by small single and multi-engine aircraft, as well as business turboprop and jet aircraft throughout the planning period. The addition of a non-precision instrument approach ($\geq$ ¾ mile visibility) would place the runway (and the facility) in the B-II-4000 category.

SAFETY AREA DESIGN STANDARDS

The FAA has established several safety design standards to protect 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 object clearing criteria, which are discussed in the following paragraphs, are depicted on **Exhibit 4B**.

Runway Safety Area

The FAA requires the RSA to be cleared and graded, drained by grading or storm sewers, capable of accommodating fire and rescue vehicles, and free of obstacles

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AIRFIELD CONSIDERATIONS

- Plan for RDC B-II standards on Runway 4-22.
- Increase runway pavement strength (30,000 S/60,000 D).
- Establish a non-precision instrument approach to Runway 22 with ODALS.
- Replace old incandescent runway lighting and taxiway systems with LED technology.
- Install Runway End Identification Lights (REILs) and holding aprons to Runway 4-22.
- Relocate hold lines to 200' to meet ARC B-II standards.
- Relocate connecting taxiway to comply with FAA standards.
- Install Automated Weather Observation System (AWOS) on airfield.
- Grade Primary Surface.
- Short term property acquisition for Runway Protection Zones (RPZs).
- Long term property acquisition for potential runway extension.



LANDSIDE CONSIDERATIONS

- Waterline extension to the airport for fire protection.
- Provide for expansion/redevelopment of general aviation terminal building.
- Provide parcel development for future aircraft storage needs.
- Provide a separate facility for airport maintenance and storage.
- Development of an aircraft wash rack and tenant maintenance shelter.



TOWN OF GILA BEND ARIZONA

Exhibit 4A
DEVELOPMENT CONSIDERATIONS

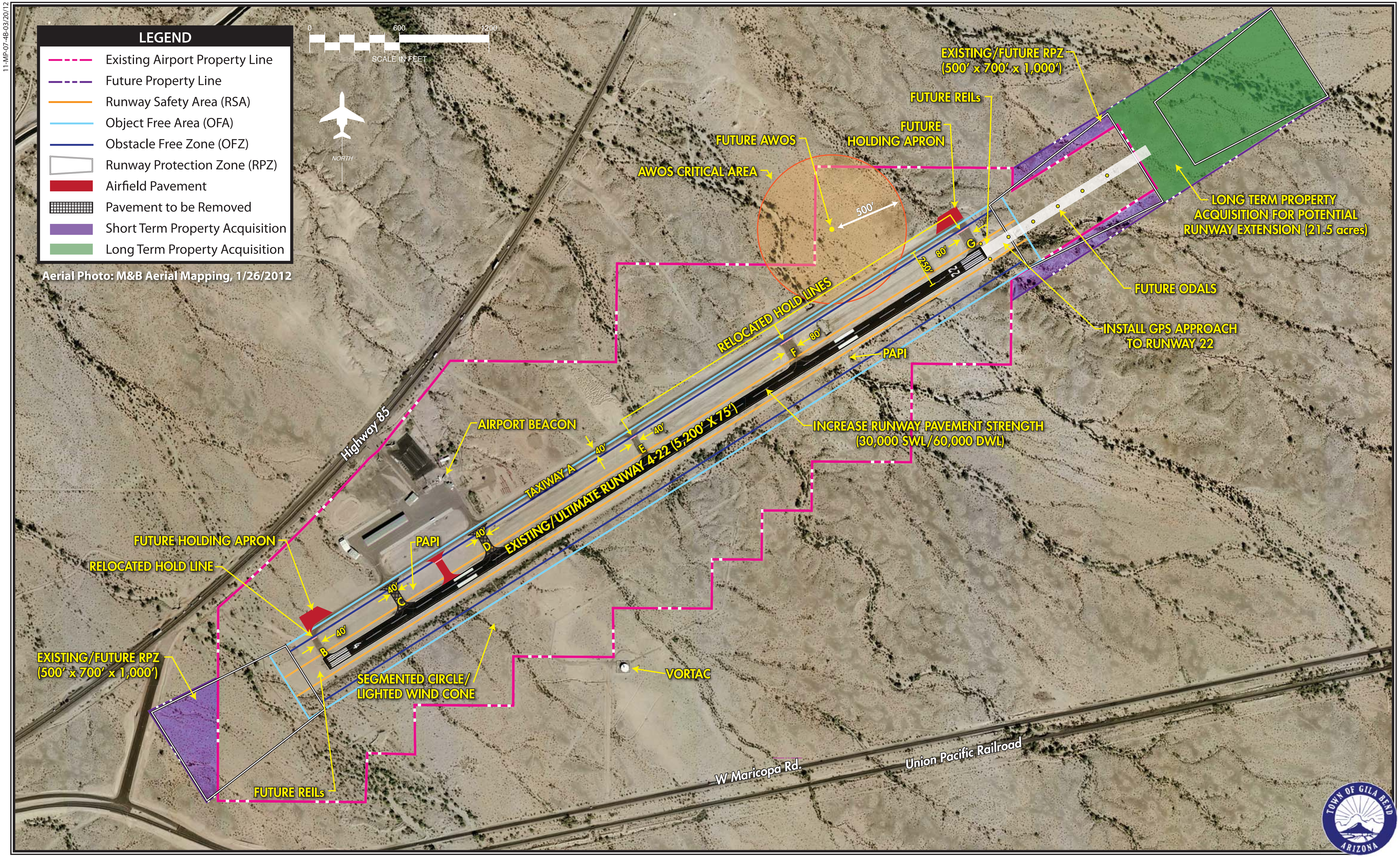

Exhibit 4B
AIRSIDE ALTERNATIVES

not fixed by navigational purpose for a distance of 300 feet beyond the end of the runway. The RSA for Runway 4-22 conforms to all FAA safety design standards as outlined in FAA Advisory Circular (AC) 150/5300-13A, *Airport Design*.

Object Free Area

The runway OFA is defined as an area centered on the runway, extending out in accordance to the critical aircraft design category utilizing the runway. The OFA must provide clearance of all ground-based objects protruding above the RSA edge elevation, unless the object is fixed by function, serving air or ground navigation. The OFA for Runway 4-22 currently conforms to all FAA design standards.

Object Free Zone

The runway must also consider the OFZ, which is a volume of airspace that is required to be clear of objects, except for frangible items required for air navigation of aircraft. It is centered along the runway and extended runway centerline. The OFZ for Runway 4-22 currently conforms to all FAA design standards.

Runway Protection Zone

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 people and property on the ground. The RPZ is comprised of the central portion of the RPZ and the controlled activity area. The central portion of the RPZ extends from the beginning to the end of the RPZ, is centered on the runway, and is the width of the ROFA. The controlled activity area is any remaining portions of the RPZ. The dimensions of the RPZ vary according to the visibility minimums serving the runway and the type of aircraft (design aircraft) operating on the runway.

While the RPZ is intended to be clear of incompatible objects or land uses, some uses are permitted with conditions and other land uses are prohibited. According to AC 150/5300-13A, the following land uses are permissible within the RPZ:

- Farming that meets the minimum buffer requirements.
- Irrigation channels as long as they do not attract birds.
- Airport service roads, as long as they are not public roads and are directly controlled by the airport operator.
- Underground facilities, as long as they meet other design criteria, such as RSA requirements, as applicable.
- Unstaffed navigational aids (NAVAIDs) and facilities, such as required for airport facilities that are fixed-by-function in regard to the RPZ.

Any other land uses considered within RPZ land owned by the airport sponsor must be evaluated and approved by the FAA Office of Airports. The FAA has published, *Interim Guidance on Land Uses within a Runway Protection Zone* (9.27.2012), which identifies several potential land uses that must be evaluated and approved prior to implementation. The specific land uses requiring FAA evaluation and approval include:

- Buildings and structures (residences, schools, churches, hospitals or other medical care facilities, commercial/industrial buildings, etc.).

- Recreational land use (golf courses, sports fields, amusement parks, other places of public assembly, etc.).
- Transportation facilities (rail facilities, public roads/highways, vehicular parking facilities, etc.).
- Fuel storage facilities (above and below ground).
- Hazardous material storage (above and below ground).
- Wastewater treatment facilities.
- Above-ground utility infrastructure (i.e., electrical substations), including any type of solar panel installations.

The *Interim Guidance on Land within a Runway Protection Zone* states, "RPZ land use compatibility also is often complicated by ownership considerations. Airport owner control over the RPZ land is emphasized to achieve the desired protection of people and property on the ground. Although the FAA recognizes that in certain situations the airport sponsor may not fully control land within the RPZ, the FAA expects airport sponsors to take all possible measures to protect against and remove or mitigate incompatible land uses."

Currently, the RPZ review standards are applicable to any new or modified RPZ. The following actions or events could alter the size of an RPZ, potentially introducing an incompatibility:

- An airfield project (e.g., runway extension, runway shift).
- A change in the critical design aircraft that increases the RPZ dimensions.
- A new or revised instrument approach procedure that increases the size of the RPZ.
- A local development proposal in the RPZ (either new or reconfigured).

Since the interim guidance only addresses new or modified RPZs, existing incompatibilities are essentially grandfathered under certain circumstances. While it is still necessary for the airport sponsor to take all reasonable actions to meet the RPZ design standard, FAA funding priority for certain actions, such as relocating existing roads in the RPZ, will be determined on a case by case basis.

For this study, it is recommended that the airport acquire property located within both RPZs in the short term. This will insure both ends of the runway are protected in the future.

LINE OF SIGHT STANDARDS

In FAA AC 150/5300-13A, *Airport Design,* the FAA has developed line of sight standards for runways. Along individual runways, any two points located five feet above the runway centerline must be mutually visible for the entire runway length. However, if a full-length parallel taxiway is available, then the line of sight between any two points (five feet above the runway) need only be half the runway length. Line of sight standards are currently met on Runway 4-22.

RUNWAY CONSIDERATIONS

The facility needs evaluation completed in the previous chapter did not identify the potential need for a runway extension. The current runway length of 5,200 feet accommodates all general aviation aircraft, as well as the majority of the business aircraft currently operating at Gila Bend Municipal Airport. However, it should be noted that these aircraft may experience payload and/or fuel limitations during the warmest summer days, when attempting longer stage lengths. The facility needs also examined the width of the existing runway, which is currently 75 feet. This meets the required width for airport design group (ADG) II facilities.

The airport should also be proactive in preserving/protecting the east end of the runway for long term development. This is imperative, as development on the west end of the runway is limited due to existing roads. **Exhibit 4B** depicts the outline of a potential extension to the Runway 22 end in the long term. Additional property would need to be acquired for this runway extension, the associated safety areas, as well as the RPZ.

The runway pavement strength at Gila Bend Municipal Airport has also been examined. While the pavement strength rating is not the maximum weight limit, aircraft weighing more than the certified strength can only operate on the runway on an infrequent basis. Heavy aircraft operations can shorten the life span of airport pavements. Runway 4-22 has a pavement strength of 12,500 pounds single wheel type loading (S). The airport should consider upgrading to pavement strengths of 30,000 pounds S and 60,000 pounds dual wheel type landing gear (D) to support some of the larger aircraft that may operate at the airport in future years.

TAXIWAY CONSIDERATIONS

Taxiways are primarily constructed to facilitate aircraft movements to and from the runway system. The availability of entrance and exit taxiways can affect the overall airfield efficiency. According to FAA design standards, the minimum taxiway width for ADG II is 35 feet. All of the taxiways at Gila Bend Municipal Airport are 40 feet or wider, meeting this standard.

The layout of the taxiway system was also examined. The FAA suggests that a direct link provided from an aircraft parking apron to an active runway be removed. As shown on **Exhibit 4B**, Taxiways C and D currently allow for direct access to the runway system from the existing parking apron. A portion of these two taxiway stubs south of Taxiway A are shown to be removed in order to increase situational awareness and prevent an aircraft from a direct path to the runway system. A new taxiway stub is proposed between the two old stubs.

The construction of any additional taxiways at the airport should be planned for a minimum width of 35 feet. The exhibit also depicts the runway-taxiway separation. The parallel taxiway lies 250 feet northwest of the runway, which exceeds the 240-foot requirement for ADG II.

INSTRUMENT APPROACH PROCEDURES

Electronic and visual guidance to arriving and departing aircraft enhance safety and utilization of the airfield. Such facilities are vital to the operational success of the airport and enhance the safety of passengers using the airport. While instrument approach aids are especially helpful during poor weather, they often are used by air taxi or commercial pilots when visibility is above instrument flight rule conditions.

Presently, Gila Bend Municipal Airport does not have an established approach procedure; therefore, the airport is effectively closed to arrivals when visual flight can no longer be conducted. An instrument approach procedure is an important component of the overall safety and reliability of Gila Bend Municipal Airport. Establishing an instrument approach procedure would increase the accessibility of the airport by providing procedures for pilots to locate the airport during poor weather conditions. The establishment of a non-precision approach to Runway 22 is recommended.

14 CFR PART 77

Another consideration for airport development is the location and height of structures both on and off the airport. On-airport development typically follows guidelines established by 14 CFR Part 77 (FAA's height and hazard zoning and planning guidelines). Part 77 establishes approach surfaces for each runway end based upon the category of aircraft using the runway and the approach visibility minimums. The approach surface begins 200 feet from each runway end. Based upon the existing visual approaches to each runway end, the existing approach slope for each runway is 20:1. Airports are encouraged to not allow penetrations to these surfaces as it could result in diminished approach capabilities and allowances.

Should an instrument approach procedure be established for the Runway 22 end, the approach slope would increase to 34:1. The location of roads near the Runway 4 end, as well as conflicts with military traffic and overflights of the Town would likely limit approach capabilities to this end. Therefore, consideration is only being given to establishing an instrument approach procedure to Runway 22. An imaginary surfaces drawing will be included with the updated airport layout plan drawings.

WEATHER REPORTING FACILITIES

A National Oceanic and Atmospheric Administration (NOAA) Weather Station is currently located on the northeast end of the airfield. However, limited weather data is available from this station. The facility requirements analysis recommended the installation of an automated weather observation system (AWOS). AWOS units are operated and controlled by the FAA and provide weather forecasting for the safe and efficient operation of aircraft. They are becoming increasingly prevalent due to their efficiency and cost-savings. The AWOS has been included in the latest Airport Capital Improvement Program (ACIP).

VISUAL APPROACH LIGHTING

Along with the upgrade to the GPS Runway 22 approach, improvements can be made to enhance the safety of this planned approach. According to Appendix 16 of FAA AC 150/5300-13A, *Airport Design*, while not required, an approach lighting system is recommended on runways with a nonprecision approach having one mile visibility minimums. While several approach lighting systems would be acceptable, the most basic system would be the omnidirectional approach lighting system (ODALS), which is noted by a single row of lights (300 feet on center) extending a total distance of 1,500 feet into the approach.

It also recommended removing the old incandescent runway and taxiway edge lighting systems and replacing them with light emitting diode (LED) technology.

While an initial investment is required upfront, the energy savings and reduced maintenance costs will outweigh any costs in the long run.

RUNWAY END IDENTIFICATION LIGHTING

Runway end identification lights (REILs) provide pilots with a rapid and positive identification to the approach ends of a runway. The installation of REILs to both ends of Runway 4-22 is recommended and has been included in the latest ACIP.

AIRFIELD MARKINGS

Pavement markings aid in the movement of aircraft along airport surfaces and identify closed or hazardous areas on the airport. Runway markings are designed according to the type of approach available on the runway. FAA *Advisory Circular 150/5340-1J*, *Standards for Airport Markings*, provides the guidance necessary to design an airport's markings. Nonprecision markings are in place on Runway 4-22. These markings will be sufficient for the recommended GPS approach to Runway 22.

ARC B-II standards require holding position markings on the entrance taxiways and are required to be a minimum of 200 feet from the centerline of the runway. The existing markings on the airfield are 125 feet from the centerline and will need to be relocated to comply with design standards. **Exhibit 4B** depicts the location of the relocated hold lines.

HOLDING APRONS

Holding aprons provide a location for aircraft to prepare for departure and/or bypass other aircraft. Currently, there are no hold aprons on Runway 4-22. As depicted on **Exhibit 4B**, the construction of new holding aprons is being proposed for both ends of the runway.

LANDSIDE CONSIDERATIONS

The primary general aviation functions to be accommodated at Gila Bend Municipal Airport include the expansion/relocation of the general aviation terminal building, parcel development for future aircraft storage needs, a designated facility for airport maintenance/storage, and the development of an aircraft wash rack.

The interrelationship of these functions is important in defining a long-range landside layout for general aviation uses at the airport. An overview of the landside considerations is provided in the following paragraphs. **Exhibit 4C** depicts the landside considerations for Gila Bend Municipal Airport.

TERMINAL BUILDING AND VEHICLE PARKING

A 600 square-foot general aviation terminal building is located on the northeast end of the aircraft parking apron and includes a pilot's lounge, the airport's electrical equipment, a storage room, and two restrooms. The facility requirements analysis indicated the need for as much as 2,300 square feet in the long term. **Exhibit 4C** depicts the expansion of the existing terminal building.

A small unimproved automobile parking area is located directly north of the terminal building. Limited parking is available in this area. A Park 'n Ride lot is located farther north. This paved lot totals approximately 6,000 square yards and provides parking for approximately 105 vehicles. While the Park 'n Ride lot is mainly used by commuters, it is also available to airport employees, as well as those visiting the airport. The facility requirements analysis did not indicate the need for additional vehicle parking. The Park 'n Ride lot should satisfy parking demand at the airport through the planning period.

HANGAR DEVELOPMENT

Consideration must be given to providing for adequate hangar space for a wide variety of general aviation needs. This includes corporate aviation, FBOs, and other hangars as well. Storage hangars are normally constructed in small numbers, based upon need and financing capability.

While the facility needs analysis did not indicate an immediate need for additional hangar space, actual need will depend on the actual usage within hangars, as well as the need to replace and/or relocate existing hangars. An area for future lease parcels has been depicted on **Exhibit 4C**.

AIRCRAFT PARKING APRON

Current apron area at Gila Bend Municipal Airport totals approximately 18,600 square yards with 35 aircraft tie-down positions. The facility requirements analysis did not indicate a need for additional apron parking during the planning period. However, additional apron area may be needed as new hangar areas are developed on the airport which are not contiguous with the existing apron areas. **Exhibit 4C** depicts an expansion of the existing aircraft apron, along with a shade canopy for additional aircraft parking.

FUEL STORAGE

Gila Bend Municipal Airport does not currently have fuel capability. The airport will require fuel to continue to attract future business.

MAINTENANCE/STORAGE FACILITY

A dedicated maintenance facility is not currently available at Gila Bend Municipal Airport. The majority of maintenance equipment at the airport is stored in various buildings/hangars. The facility requirements analysis recommended the construction of a consolidated maintenance/storage facility at the airport. **Exhibit 4C** depicts the location of a new facility northeast of the terminal building.

AIRCRAFT WASH FACILITY

The facility requirements analysis indicated the need for a designated aircraft wash facility at Gila Bend Municipal Airport. This would provide for the collection of used aircraft oil and other hazardous materials. It would also provide a covered area for aircraft washing and light maintenance. **Exhibit 4C** depicts an aircraft wash facility northeast of the terminal building.

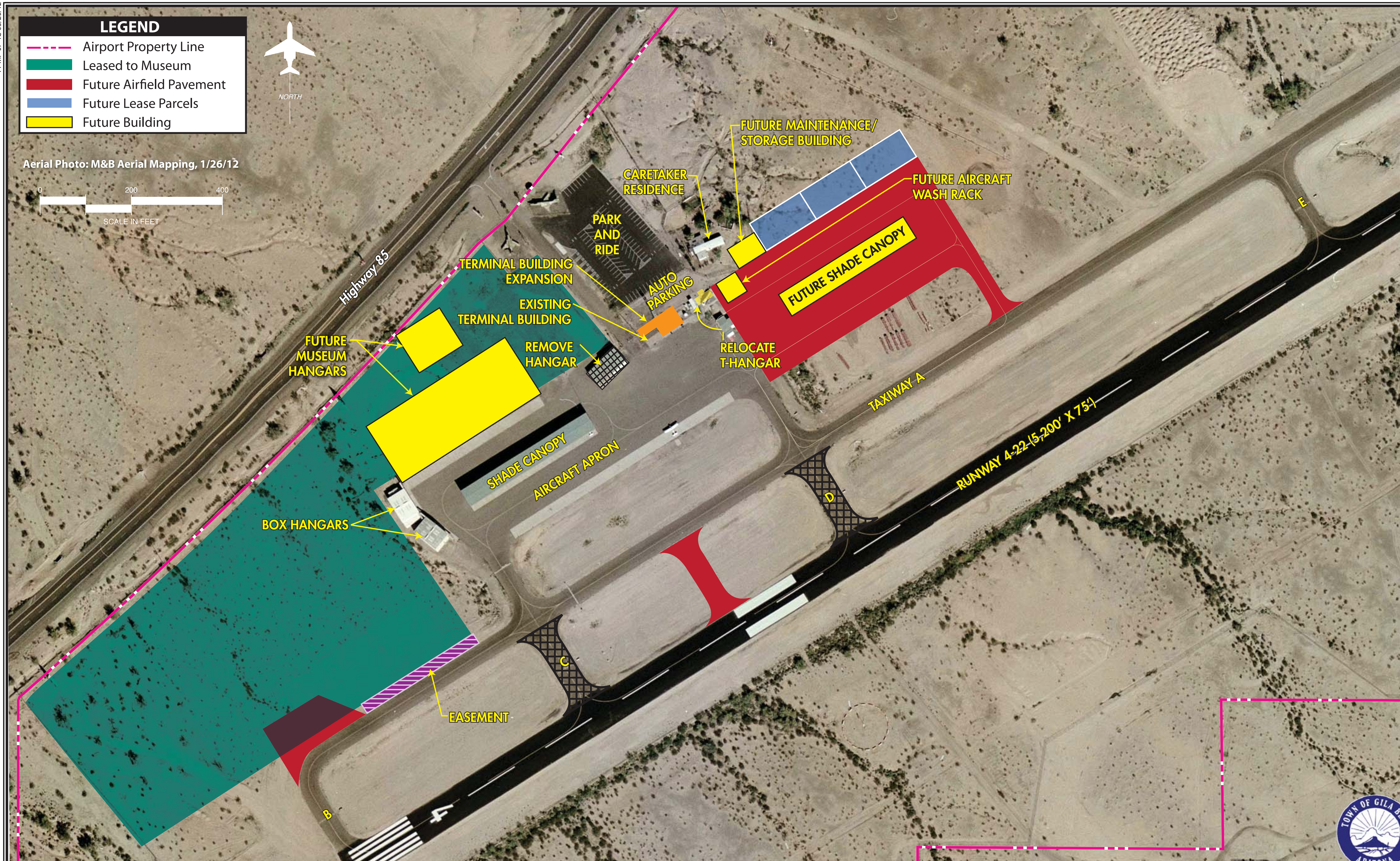

Exhibit 4C
LANDSIDE ALTERNATIVES

SURROUNDING LAND USE PLAN

Land use surrounding an airport is a critical consideration. It is important to protect the airport environment for the safe operations of aircraft and for the safety of people and property on the ground. **Exhibit 4D** depicts land ownership in the vicinity of the airport. As shown on the exhibit, land use surrounding the airport consists of private land, State Trust Land, land owned by the Town, and land owned by the Bureau of Land Management.

STATE ROUTE 85 SAFETY AND ENHANCEMENT PROJECT

The Arizona Department of Transportation (ADOT) has recently completed a $13.5 million project to improve safety and enhance State Route 85 (Pima St.) in Gila Bend. An overview of the project is depicted on **Exhibit 4D**. The project includes construction of a new, elevated intersection at State Route 85 and Business Route 8, a wider bridge over the Union Pacific Railroad, and realigning both State Route 85 and Maricopa Road. Further realignment of State Route 85 is also proposed in the long term.

BUSINESS PARK

Exhibit 4D also depicts a future business park area on the north and south sides of the airport. These areas would be zoned for industrial and business use, with a prime location adjacent to the airport.

GILA BEND-BUCKEYE RAIL CONNECTION

Also depicted on **Exhibit 4D** is a proposed Gila Bend–Buckeye rail connection on the southeast side of the airfield, extending onto airport property. A rail yard is also depicted in this area. However, it is important to note that this rail corridor is not currently sponsored, endorsed, or funded by any government agency or private railroad. At this time, the rail corridor is only a proposal included in the West Valley Rail Corridors Cost Analysis.

SUMMARY

The process utilized in assessing the airside and landside development alternatives involved an analysis of both short and long term requirements and future growth potential. Current airport design standards are reflected in the alternatives. Upon review of this working paper by the Planning Advisory Committee, a final Master Plan concept can be finalized. The resultant plan will represent an airside facility that fulfills safety and design standards and a landside complex that can be developed as demand dictates.

The proposed development plan for the airport must represent a means by which the airport can grow in a balanced manner, both on the airside as well as the landside, to accommodate forecast demand. In addition, it must provide for flexibility in the plan to meet activity growth beyond the long term planning period. The remaining chapters will provide a refinement of the final concept, recommend an implementation schedule, and provide detailed cost estimates and capital program financing assumptions.

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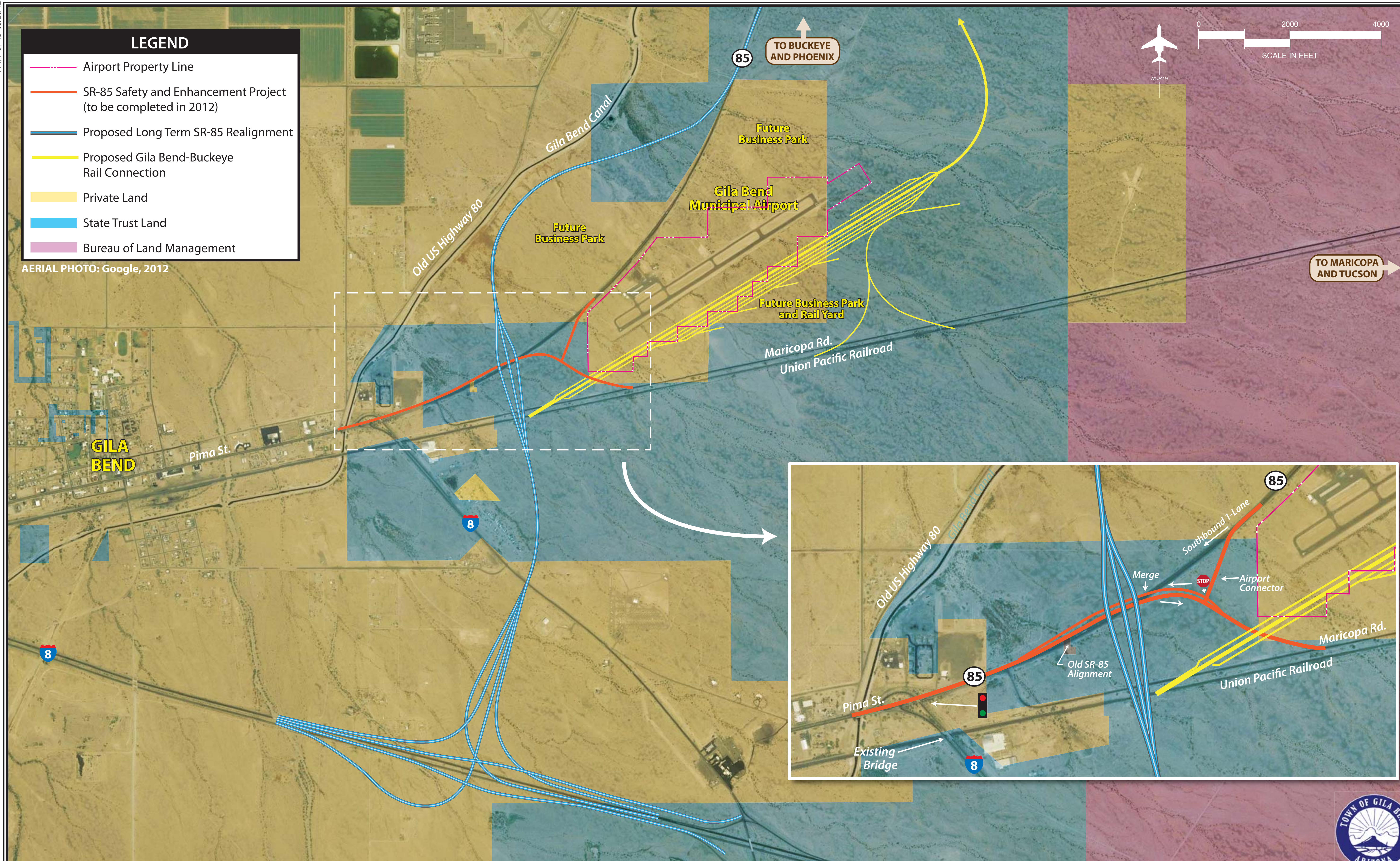

Exhibit 4D
SURROUNDING LAND USE PLAN

CHAPTER FIVE

RECOMMENDED DEVELOPMENT CONCEPT

Recommended Development Concept

The airport master planning process for Gila Bend Municipal Airport has evolved through the development of forecasts of future demand, an assessment of future facility needs, and an evaluation of airport development alternatives to meet those future facility needs. The planning process thus far has included the presentation of two draft phase reports to the Planning Advisory Committee (PAC) and the Town of Gila Bend. These two phase reports represent the first four chapters of the master plan.

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 Gila Bend Municipal Airport. Following the final coordination meeting with the PAC, the draft final document will be presented to the Town of Gila Bend for approval. Upon acceptance of the final master plan document, a final technical report will be prepared.

RECENT AIRPORT IMPROVEMENTS

Since the previous master plan was completed in 2003, the Town has pursued a number of airport improvement projects. This includes the following:

- Installation of additional perimeter fencing.
- Installation of apron lighting/terminal area security lighting.
- Installation of Precision Approach Path Indicators (PAPIs).
- Construction of a shade hangar (14 units).
- Runway overlay, new wind socks, new air-field signage, and drainage improvements.

AIRFIELD DESIGN CRITERIA

The design of numerous airfield elements such as runway length, runway safety area (RSA), object free area (OFA), obstacle free zone (OFZ), runway protection zones (RPZs), as well as various setbacks are based on the applicable airfield design categories which were described in Chapters Three and Four. The ARC system has traditionally been utilized 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.

The FAA has transitioned into a new design guidance document as detailed in the previous chapter (Advisory Circular [AC] 150/5300-13A, *Airport Design*). This document introduces new terminology that is used in conjunction with the ARC classification to include the Runway Design Code (RDC), which is the code that signifies the design standards to which a runway is to be built.

Analysis in Chapter Three concluded that Gila Bend Municipal Airport is presently used by a wide range of general aviation aircraft, as well as business turboprop and jet aircraft. The airport's existing and future RDC was determined to be B-II-NPI-1. **Table 5A** presents the FAA design standards to be applied to the ultimate airfield configuration at Gila Bend Municipal Airport based upon RDC B-II.

TABLE 5A
FAA Design Standards
Gila Bend Municipal Airport

	RUNWAY 4-22
Runway Design Code (RDC)	B-II
Approach Visibility Minimums	Visual (Runway 22) One-Mile (Runway 4)
Runways	
Runway Width	75'
Runway Safety Area (RSA)	
Width	150'
Length Beyond Departure End	300'
Length Prior to Threshold	300'
Object Free Area (OFA)	
Width	500'
Length Beyond Runway End	300'
Length Prior to Threshold	300'
Object Free Zone (OFZ)	
Width	250' existing/400' future
Length Beyond Runway End	200'
Runway Centerline To:	
Hold Line	200'
Parallel Taxiway Centerline	240'
Aircraft Parking Area	250'
Runway Protection Zone (RPZ)	
Inner Width	500'
Outer Width	700'
Length	1,000'
Taxiways	
Width	35'
Taxiway Safety Area	79'
Taxiway OFA	131'
Taxilane OFA	115'

Source: FAA AC 150/5300-13A, *Airport Design*.

RECOMMENDED DEVELOPMENT CONCEPT

The recommended development concept provides a planning outline for development of the Gila Bend Municipal Airport through the next 20 years and beyond. It represents an ultimate configuration for the airport that meets Federal Aviation Administration (FAA) design standards to the extent practicable and provides a variety of landside development options to meet demands on the airport by different aviation activities.

The recommended development concept, depicted on **Exhibit 5A**, is a composite of airside and landside considerations developed in the previous chapter. The following sections will describe, in narrative and graphic form, the recommended plan for the future use of Gila Bend Municipal Airport. A phased program to implement this development concept will be presented in Chapter Six.

AIRSIDE CONSIDERATIONS

Airside facilities are, by their very nature, a focal point of the airport complex. Because of their role, and the fact that they physically dominate a great deal of the airport's property, airside facility needs are often the most critical factor in the determination of viable airport development alternatives. In particular, the runway system requires the greatest influence on the identification and development of other airport facilities. Furthermore, due to the number of aircraft operations, there are a number of FAA design criteria that must be considered when looking at airside improvements. The airside considerations have been identified on **Exhibit 5A** and include:

- Short term property acquisition for Runway Protection Zones (RPZs).
- Long term property acquisition for potential runway extension.
- Establish a non-precision instrument approach to Runway 22 with an Omnidirectional Approach Lighting System (ODALS).
- Relocate connecting taxiway to comply with FAA AC 150/5300-13A.
- Relocate hold lines to 200 feet and increase runway pavement strength (30,000 S/60,000 D), as airport is used by heavier aircraft.
- Install an Automated Weather Observation System (AWOS) on the airfield.
- Grade primary surface.
- New rotating beacon.
- Install Runway End Identification Lights (REILs) and holding aprons to both ends of Runway 4-22.
- Replace old incandescent runway/taxiway lighting with light emitting diode (LED) technology for energy savings.

The previous chapter determined that the existing runway length of 5,200 feet is adequate to serve the majority of the aircraft in the general aviation fleet, as well as a number of business aircraft currently operating at the airport and those expected to operate at the airport in the future. Therefore, no extension to the runway is required at this time based upon the current fleet mix.

However, it is important to note that the outline of a potential extension to the Runway 22 end is depicted on **Exhibit 5A**. It is imperative that the airport protect the east end of the runway for long term development, as development on the west end is limited due to existing roads. As shown on the exhibit, additional property would need to be acquired for this runway extension, the associated safety areas, as well as the RPZ.

Acquiring the property interest of the existing RPZs is also depicted on **Exhibit 5A**. Under FAA design criteria, the airport owner must have sufficient interest in the RPZs to protect them from both obstructions and incompatible land use. This can be obtained by purchasing the approach areas in fee, the purchase of an easement, or through adequate zoning.

Presently, Gila Bend Municipal Airport does not have an established approach procedure, which means the airport is effectively closed to arrivals when visual flight can no longer be conducted. The previous chapter recommended the establishment of a non-precision global positioning system (GPS) approach to Runway 22. This could provide approach visibility minimums as low as one mile. ODALS are also recommended along with the GPS approach to improve visual guidance to Runway 22.

The exhibit also depicts the removal of Taxiways C and D. FAA AC 150/5300-13A suggests that a direct link between an aircraft parking apron and an active runway be removed in order to increase situational awareness and prevent an aircraft from a direct path to the runway system. A new taxiway stub is depicted between the two old stubs.

The recommended development concept also includes upgrading the runway pavement strength to 30,000 pounds S/60,000 D to support some of the larger aircraft that may operate at the airport in the future.

A location for an AWOS is depicted on **Exhibit 5A**. AWOS units are operated and controlled by the airport and provide weather forecasting for the safe and efficient operation of aircraft. They are becoming increasingly prevalent due to their efficiency and cost-savings. The AWOS has been included in the most recent ACIP for Gila Bend Municipal Airport.

The exhibit also depicts an area of high terrain adjacent to the Runway 22 threshold. This will need to be graded in order to remove the material that lies within the primary surface, as well as the transitional surface.

Also included in the most recent ACIP is a new airport beacon to replace the existing one. Other improvements on the airfield include the installation of REILs and holding aprons to both ends of the runway, and replacing the incandescent runway and taxiway lighting systems with light emitting diode (LED) technology.

LANDSIDE CONSIDERATIONS

The landside plan has been devised to safely, securely, and efficiently accommodate potential aviation demand. The landside considerations for Gila Bend Municipal Airport are also identified on **Exhibit 5A** and include:

- Waterline extension to the airport for fire protection.
- Expansion/redevelopment of general aviation terminal building.
- Future general aviation development/long term expansion potential on the north side of the runway with provision for lease parcels adjacent to the new apron.
- Construct facility for airport maintenance/storage.
- Construct aircraft wash rack and tenant maintenance shelter.

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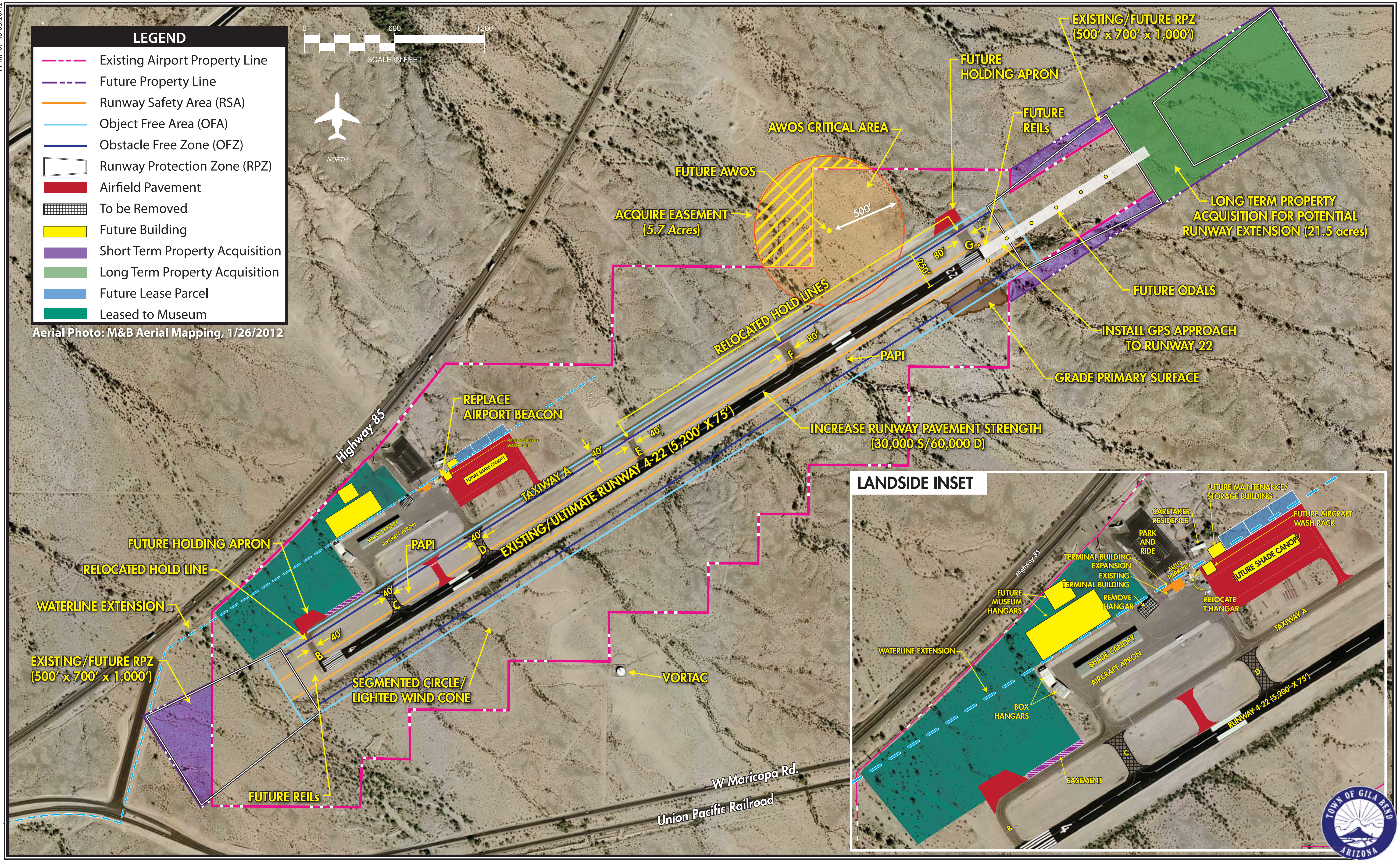


Exhibit 5A
RECOMMENDED DEVELOPMENT CONCEPT

The most critical landside need is the extension of water to the airport for fire protection. The airport currently has no fire protection waterline, is supported by a volunteer fire department, and has limited water capacity to protect the hangars and terminal. A 7,100-foot extension will be required to reach the airport. An environmental review has already been initiated for this project. The alignment of the waterline will follow the new AZ 85 route.

The existing general aviation terminal building is located on the northeast end of the aircraft parking apron and totals approximately 600 square feet. The facility requirements indicated the need for as much as 2,300 square feet in the long term. An expansion of the existing terminal building is depicted on **Exhibit 5A**.

While the facility requirements analysis did not indicate the need for additional aircraft parking throughout the planning period, the exhibit depicts an expansion of the existing aircraft apron, as well as a shade canopy. This may be necessary as new hangar areas are developed which are not contiguous with existing apron areas. Adjacent to the future apron expansion, the exhibit depicts space for lease parcels that could be developed with fixed base operator (FBO) facilities or conventional hangars in the future.

A dedicated maintenance facility is not currently available at Gila Bend Municipal Airport. The majority of maintenance equipment at the airport is stored in various buildings/hangars. The previous chapter recommended the construction of a consolidated maintenance/storage facility at the airport. **Exhibit 5A** depicts the location of a new facility northeast of the existing terminal building.

An aircraft wash rack and tenant maintenance shelter is also planned northeast of the terminal building. This would provide an area for aircraft cleaning and the proper collection of the aircraft cleaning solvents and contaminants removed from the aircraft hull during cleaning.

Also depicted on the exhibit is an area leased for the development of an aircraft museum on the airfield. This is being developed by private owners, with two hangars currently planned, and the potential for additional hangars on the leasehold.

MULTIMODAL PLANNING CONCEPTS

In 2012, the Arizona and Nevada Departments of Transportation began a two-year study on Interstate 11 (I-11) and the Intermountain West Corridor. Serving the nation's north-south transportation needs from Mexico to Canada, the proposed Intermountain West Corridor will provide a vital connection between Phoenix and Las Vegas and to promote possible freight linkages north to Canada and south to Mexico.

Developing a new north-south corridor through Nevada and Arizona could supplement the existing system and relieve freight congestion on I-5. The Corridor is proposed to include an upgraded highway facility, but could be paired with rail as well as other major infrastructure components (energy, telecommunications) to serve the nation's needs.

The CANAMEX Corridor, established under the North American Free Trade Agreement, has been designated as such a parallel route, due to gaps in a continuous route. Implementation of the Intermountain West Corridor can fill this gap, allowing significant commerce, tourism, and international trade opportunities across the Western U.S.

SUMMARY

The resultant plan represents an airfield facility that fulfills corporate and general aviation needs and preserves long range viability while conforming to safety and design standards. It also maintains a landside complex that can be developed as demand dictates. The primary goal is for the airport to maintain a self-supporting position without sacrificing service to the public.

The following chapter will consider strategies for funding the recommended improvements and will provide a reasonable schedule for undertaking the projects based on demand over the course of the next 20 years.

CHAPTER SIX

CAPITAL IMPROVEMENT PROGRAM

GILA BEND MUNICIPAL AIRPORT

Capital Improvement Program

The previous analyses outlined airport development needs on both the airside and landside to meet projected aviation demand for the next 20 years based on forecast activity, facility needs, and operational safety and efficiency. In this chapter, basic economic, financial, and management rationale is applied to the development items so that the feasibility of each item contained in the plan can be assessed.

The capital program has been organized into three sections. First, the airport's capital program needs are categorically recognized. Second, the capital improvement program (CIP) projects and their allocated cost estimates are itemized into planning horizons that extend through the planning period of the Master Plan Update, and finally, funding sources on the federal, state, and local levels are identified and discussed. The vision of the Master Plan Update is based on the airport achieving specific demand-based triggers, such as growth in based aircraft and an increase in aviation and potential non-aviation business development.

The Gila Bend Airport Master Plan Update has been developed according to a demand-based schedule. Demand-based planning establishes guidelines for capital investments at the airport based upon airport activity levels instead of subjective factors such as dates 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 the Master Plan Update is that facility improvements needed to serve new levels of demand should only be undertaken when the levels of demand experienced at the airport justify their implementation. Obviously, some projects related to maintenance efforts will follow more closely to a timeline schedule due to general wear and tear requiring routine upkeep. Airport maintenance projects have been factored into the CIP and should be closely monitored by airport management.

As discussed, many development items included in the Recommended Development Concept will need to follow demand indicators. For example, the plan includes the construction of a new apron and taxiway, as well as future lease parcels leading to potential aviation infrastructure development. An increasing number of based aircraft and business aviation demand will be the indicator for these needs. If based aircraft growth occurs as projected, additional hangars will need to be constructed to meet the demand; thus, taxiway development would be necessary to access hangar construction. If growth slows or does not occur as projected, these projects can be delayed

Other projects, especially those related to the continued development of airside facilities such as a runway extension, will also be demand-driven and tied directly to the number of annual aircraft operations and types of aircraft that may utilize Gila Bend Municipal Airport. As a result, capital expenditures will be undertaken as needed, which leads to a responsible use of capital assets.

A demand-based Master Plan Update does not specifically require the implementation of any of the demand-based improvements. Instead, it is envisioned that implementation of any improvements would be examined against the demand levels prior to implementation. The Master Plan Update establishes a plan for the use of airport facilities consistent with the potential aviation needs and capital needs required to support that specific use. However, individual projects in the plan are not implemented until the need is demonstrated and the project is approved for funding. **Table 6A** summarizes the key demand milestones for each of the three planning horizons. It should be noted that the aviation museum is expected to include active aircraft which will place additional demands on the airfield.

TABLE 6A
Planning Horizon Summary
Gila Bend Municipal Airport

	Base Year	Short Term	Intermediate Term	Long Term
BASED AIRCRAFT				
Single Engine	9	9	10	12
Multi-Engine	1	2	2	4
Turbine	0	0	1	2
Total Based Aircraft	**10**	**11**	**13**	**18**
AIRCRAFT OPERATIONS				
Itinerant General Aviation	5,360	5,900	6,960	9,650
Local General Aviation	30,340	33,400	39,440	54,650
Total Annual Operations	**35,700**	**39,300**	**46,400**	**64,300**

AIRPORT DEVELOPMENT NEEDS

In an effort to identify capital needs at the airport, this section provides analysis regarding the associated development needs of those projects included in the CIP. While some projects will be demand-based, others will be dictated by design standards, safety, or rehabilitation needs. Each development need is categorized according to this schedule. **Exhibit 6A** depicts the listing of capital projects overlaid onto the airport aerial photograph and broken into the three planning horizons.

It is important to note that some of the projects will require environmental documentation. The level of documentation necessary for each project must be determined in consultation with the Federal Aviation Administration (FAA) and the Arizona Department of Transportation Multimodal Planning Division - Aeronautics Group (ADOT). The Environmental Evaluation presented in **Appendix B** addresses the *National Environmental Policy Act* (NEPA) and provides an evaluation of potential environmental impacts for the airport.

CAPITAL IMPROVEMENT SCHEDULE AND COST SUMMARIES

Once the list of necessary projects was identified and refined, project-specific cost estimates were developed. The cost estimates include design, engineering, construction administration, and 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 sufficient for planning purposes. Cost estimates for each of the development projects listed are in current (2013) dollars. Adjustments will need to be applied over time as construction costs or capital equipment costs change.

Exhibit 6B presents the proposed CIP for Gila Bend Municipal Airport. An estimate of FAA and state funding eligibility has been included, although actual funding is not guaranteed. For those projects that would be eligible for federal funding, Airport Improvement Program (AIP) reauthorization allocates 91.06 percent of the total project cost to Arizona airports. The remaining amount would be equally shared between the state and local sponsor, at 4.47 percent each.

SHORT TERM IMPROVEMENTS

As depicted on **Exhibit 6B**, the short term horizon considers eleven projects for the five-year planning period. The short term planning period is the only planning horizon separated into single years. This is to allow the CIP to be coordinated with the planning cycle of the FAA and ADOT programs.

2014 Projects

The only project included in 2014 is for the design of the water line extension. The airport currently has no fire protection, only a volunteer fire department with limited water capacity.

2015 Projects

The second year project includes the construction of the water line extension, which will provide fire protection for the airport.

2016 Projects

Projects for 2016 include replacing the rotating beacon on the existing tower and the installation of an automated weather observation system (AWOS), along with acquiring an easement of the AWOS critical area (5.7 acres).

2017 Projects

The initial project in the fourth year includes the design and installation of runway end identifier lights (REILs) on both ends of Runway 4-22. Also slated for 2017 is the property acquisition of the runway protection zones (RPZs) (7.2 acres) that extend beyond airport property on both runway ends, as well as any necessary environmental work. An additional project in 2017 includes the removal of material (25,000 cubic yards) located within the primary transitional surface adjacent to the Runway 22 threshold.

2018 Projects

The two projects in 2018 include removing the old incandescent runway and taxiway edge lighting systems and replacing them with light emitting diode (LED) technology.

Short Term Summary

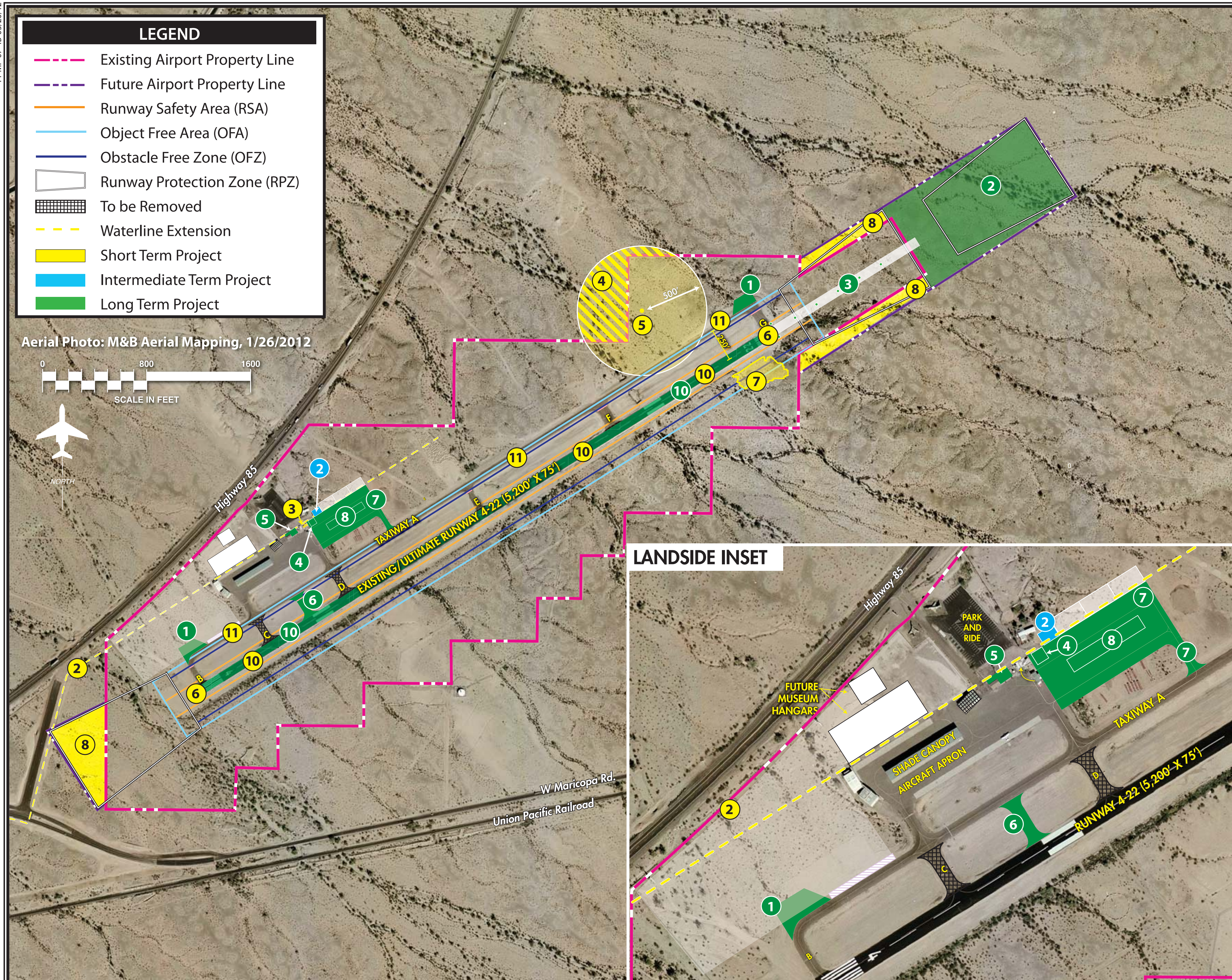
The short term projects total approximately $1.3 million. Approximately $1.2 million is eligible for FAA grant funding. An additional $56,747 is eligible for state matching grants, leaving the remaining $56,747 the responsibility of the airport sponsor and/or private development. Private developers may pursue hangar development under long term land leases with the Town, or assist with infrastructure development in newly designated development parcels, based upon local market conditions.

INTERMEDIATE TERM IMPROVEMENTS

Planning new projects beyond a five-year timeframe can be challenging. Project need is heavily dependent upon local demand and the economic outlook of the aviation industry. Therefore, intermediate term projects are grouped together to represent years 6-10. The use of planning horizons to group potential airport projects provides the airport flexibility to accelerate those projects that are needed immediately and delay those projects that no longer have a high priority. The projects are prioritized based on the aviation forecasts, but these priorities may change.

As depicted on **Exhibit 6B**, five projects are listed for the intermediate term. Initial projects in the intermediate term include a certification flight for the installation of a global positioning system (GPS) approach to Runway 22 and the construction of a maintenance/storage building.

Miscellaneous pavement maintenance/preservation projects are also identified in the intermediate term. Although listed as one project in the intermediate term, it is conceivable that multiple pavement preservation projects could occur during this timeframe, utilizing portions of the funding set-aside in this particular CIP item. Two final projects scheduled in the intermediate term include miscellaneous environmental work and a planning update.



Short Term Program (Years 2013-2017)

FY 2014

1. Water Line Extension (Design Only) - *NP*

FY 2015

2. Water Line Extension (Construction)

FY 2016

3. Replace Rotating Beacon
4. Acquire AWOS Critical Area Easement
5. Install AWOS

FY 2017

6. Install REILs to Runway 4-22
7. Grading Primary Surface
8. Acquire RPZs (7.2 acres)
9. Environmentals - *NP*

FY 2018

10. Convert MIRL to LED
11. Convert MITL to LED

Intermediate Term Program (6-10 Years)

1. Runway 22 GPS Approach - *NP*
2. Construct Maintenance/Storage Building
3. Pavement Preservation - *NP*
4. Environmentals - *NP*
5. Planning Update - *NP*

Long Term Program (11-20 Years)

1. Construct Hold Aprons
2. Acquire Property in Runway 22 Approach
3. Install ODALS (Runway 22 Approach)
4. Construct Aircraft Wash Rack
5. Expand Terminal Building
6. Construct New Exit Taxiway
7. Ramp Expansion and Stub Taxiway
8. Construct Shade Canopy
9. Pavement Preservation - *NP*
10. Strengthening of Existing Pavement
11. Environmentals - *NP*
12. Planning Update - *NP*

NP - Not Pictured

TOWN OF GILA BEND ARIZONA

Exhibit 6A
DEVELOPMENT STAGING

11-MP-07-1B-03/20/12

Project Description	Total Cost	FAA Eligible	ADOT Eligible	Local Share
Short Term Program (Years 2014-2018)				
FY 2014				
Water Line Extension (Design Only)	$45,000	$40,977	$2,012	$2,012
Subtotal FY 2014	***$45,000***	***$40,977***	***$2,012***	***$2,012***
FY 2015				
Water Line Extension (Construction)	$395,000	$359,687	$17,657	$17,657
Subtotal FY 2015	***$395,000***	***$359,687***	***$17,657***	***$17,657***
FY 2016				
Replace Rotating Beacon	$170,000	$154,802	$7,599	$7,599
Acquire AWOS Critical Area Easement (5.7 acres)	$15,000	$13,659	$671	$671
Install AWOS	$200,000	$182,120	$8,940	$8,940
Subtotal FY 2016	***$385,000***	***$350,581***	***$17,210***	***$17,210***
FY 2017				
Install REILs to Runway 4-22	$100,000	$91,060	$4,470	$4,470
Grading Primary Surface (25,000 c.y @ $2.50/c.y.)	$62,500	$56,913	$2,794	$2,794
Acquire RPZs (7.2 acres @ $10,000/acre)	$72,000	$65,563	$3,218	$3,218
Environmental Documentation	$30,000	$27,318	$1,341	$1,341
Subtotal FY 2017	***$264,500***	***$240,854***	***$11,823***	***$11,823***
FY 2018				
Convert MIRL to LED	$80,000	$72,848	$3,576	$3,576
Convert MITL to LED	$100,000	$91,060	$4,470	$4,470
Subtotal FY 2018	***$180,000***	***$163,908***	***$8,046***	***$8,046***
Short Term Program Total	**$1,269,500**	**$1,156,007**	**$56,747**	**$56,747**
Intermediate Term Program (6-10 Years)				
GPS Approach (FAA Certification Flight)	$15,000	$13,659	$671	$671
Construct Maintenance/Storage Building (3,500 S.F. @ $50/S.F.)	$175,000	$159,355	$7,823	$7,823
Pavement Preservation	$500,000	$455,300	$22,350	$22,350
Environmental Documentation	$125,000	$113,825	$5,588	$5,588
Master Plan/ALP Update	$150,000	$136,590	$6,705	$6,705
Intermediate Term Program Total	**$965,000**	**$878,729**	**$43,136**	**$43,136**
Long Term Program (11-20 Years)				
Construct Hold Aprons (3,300 S.Y. @ $125/S.Y.)	$412,500	$375,623	$18,439	$18,439
Acquire Property in Runway 22 Approach (21.5acres @ $10,000/acre)	$215,000	$195,779	$9,611	$9,611
Install ODALS (Runway 22 Approach)	$100,000	$91,060	$4,470	$4,470
Construct Aircraft Wash Rack (2,500 S.F.)	$175,000	$159,355	$7,823	$7,823
Expand Terminal Building (2,500 S.F. @ $150/S.F.)	$375,000	$341,475	$16,763	$16,763
Construct New Exit Taxiway (1,500 S.Y. @ $125/S.Y.)	$187,500	$170,738	$8,381	$8,381
Ramp Expansion and Stub Taxiway (16,000 S.Y. @ $125/S.Y.)	$2,000,000	$1,821,200	$89,400	$89,400
Construct Shade Canopy	$125,000	$0	$0	$125,000
Pavement Preservation	$500,000	$455,300	$22,350	$22,350
Strengthening of Existing Pavement	$1,000,000	$910,600	$44,700	$44,700
Environmental Documentation	$125,000	$113,825	$5,588	$5,588
Master Plan/ALP Update	$150,000	$136,590	$6,705	$6,705
Long Term Program Total	**$5,365,000**	**$4,771,544**	**$234,228**	**$359,228**
TOTAL PROGRAM COSTS	**$7,599,500**	**$6,806,280**	**$334,110**	**$459,110**

Source: Coffman Associates Analysis.
All costs in current (2013) dollars and based upon current federal and state funding programs.

Exhibit 6B
CAPITAL IMPROVEMENT PROGRAM

The intermediate term projects total approximately $965,000. Approximately $878,729 is eligible for FAA grant funding with $43,136 eligible for state matching funds. The remaining $43,136 would be the responsibility of the airport sponsor and/or private development (for hangars and site development costs).

LONG TERM IMPROVEMENTS

As depicted on **Exhibit 6B**, the long term planning horizon considers twelve projects eligible for the ten-year period. Initial projects in the long term include the construction of hold aprons on both ends of the runway and the installation of an omnidirectional approach lighting system (ODALS) to supplement the recommended GPS approach to Runway 22. The construction of a new aircraft wash rack, as well as the expansion of the existing terminal building are also scheduled in the long term.

The construction of a new exit taxiway (and removal of two existing taxiway stubs) is also depicted in the long term. In order to create situational awareness, the FAA recommends that a direct link provided from an aircraft parking apron to an active runway be removed.

Property acquisition on the end of Runway 22 (21.5 acres) is also depicted in the long term. This is necessary to maintain control of the safety areas and RPZ associated with the potential runway extension.

The most significant project scheduled in the long term is the expansion of the ramp for additional aircraft parking. Also included as part of this project would be the construction of an additional shade canopy for aircraft parking, as well as the construction of an additional exit taxiway.

Final projects scheduled in the long term include strengthening of the existing runway pavement, general pavement maintenance/preservation, miscellaneous environmental work, and a planning update.

The long term projects total approximately $5.4 million, of which approximately $4.8 million is eligible for FAA funding. Approximately $234,228 is eligible for state matching grants, and the Town (or private developers in the case of hangars or infrastructure) would be responsible for the remaining $359,228.

CAPITAL IMPROVEMENTS SUMMARY

The CIP is intended as a roadmap of airport improvements to help guide the airport sponsor, the FAA, and ADOT on needed projects. The plan as presented will meet the forecast demand at Gila Bend Municipal Airport over the next 20 years and, in many respects, beyond. It should be noted that the sequence of projects will likely change due to availability of funds or changing priorities. Nonetheless, this is a comprehensive list of capital projects the airport could consider in the next 20 years.

The total 20-year CIP proposes approximately $7.6 million in airport development, of which approximately $6.8 million is eligible for FAA funding. Approximately $334,110 could be eligible for state funding. The local funding requirements for the proposed 20-year CIP is $459,110.

CAPITAL IMPROVEMENT FUNDING SOURCES

While the FAA requires the airport to submit a five-year Airport Capital Improvement Program (ACIP) each year, the planning effort affords the opportunity to examine projects (and their potential financing) beyond the short term planning horizon. Several factors may influence the timing of projects in the intermediate and long term planning periods. Therefore, greater flexibility must be considered with regard to their implementation. The timing for capacity-related projects will need to be based upon activity levels (e.g. operations, based aircraft) and the types of aircraft using the facility. Other projects may focus on the need to improve airport security, terminal or airfield efficiencies, or to rehabilitate pavements or structures on the airport. Consequently, this planning document must remain flexible to unforeseen changes which may occur over time.

Financing capital improvements at the airport will not rely solely on the financial resources of the airport or the county. Capital improvement funding is available through various grant-in-aid programs on both the state and federal levels. Historically, Gila Bend Municipal Airport has received federal and state grants. While some years more funds could be available, the CIP was developed with project phasing in order to remain realistic and within the range of anticipated grant assistance. The following discussion outlines key sources of funding potentially available for capital improvements at Gila Bend Municipal Airport.

FEDERAL GRANTS

Through federal legislation over the years, various grant-in-aid programs have been established to develop and maintain a system of public use airports across the United States. The purpose of this system and its federally based funding is to maintain national defense and to promote interstate commerce.

The most recent legislation affecting federal funding was enacted on February 17, 2012 and is titled the *FAA Modernization and Reform Act of 2012*. The law authorizes FAA's AIP Program at $3.35 billion for fiscal years 2012 through 2015.

The source for AIP funds is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities and equipment, and research and development). The Aviation Trust Fund also finances the operation of the FAA. It is funded by user fees, including taxes on airline tickets, aviation fuel, and various aircraft parts. *The Airport and Airway Trust Fund Reauthorization Act of 2011* extended funding through September 30, 2014.

Entitlement Funds

Federal 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 minimum enplanement levels of at least 10,000 passengers annually. Other entitlement funds are distributed to cargo service airports, states and insular areas (state apportionment), and Alaska airports.

General aviation airports can receive up to $150,000 each year in Non-Primary Entitlement (NPE) funds. It is important to note that inclusion in the NPIAS is required for general aviation entitlement funding. These funds can be carried over and combined for up to four years, thereby allowing for completion of a more expensive project.

The states also receive a direct apportionment based on a federal formula that takes into account area and population. The states can then distribute these funds for projects at various airports throughout the state.

Discretionary Funds

The remaining AIP funds are distributed by the FAA based on the priority of the project for which they have requested federal assistance through discretionary apportionments. A national priority ranking system is used to evaluate and rank each airport project. Those projects with the highest priority from airports across the country are given preference in funding. High priority projects include those related to meeting design standards, capacity improvements, and other safety enhancements.

Under the AIP program, examples of eligible development projects include the airfield, public aprons, and access roads. Additional buildings and structures may be eligible if the function of the structure is to serve airport operations in a non-revenue-generating capacity, such as maintenance facilities. Some revenue-enhancing structures, such as T-hangars, may be eligible if all airfield improvements have been made but the priority ranking of these facilities is very low.

Whereas entitlement monies are guaranteed on an annual basis, discretionary funds are not assured. If the combination of entitlement, discretionary, and airport sponsor match does not provide enough capital for planned development, projects may be delayed.

FAA Facilities and Equipment (F&E) Program

The Airway Facilities Division of the FAA administers the Facilities and Equipment (F&E) Program. This program provides funding for the installation and maintenance of various navigational aids and equipment of the national airspace system. Under the F&E program, funding is provided for FAA airport traffic control towers, enroute navigational aids, on-airport navigational aids, and approach lighting systems.

While F&E still installs and maintains some navigational aids, on-airport facilities at general aviation airports have not been a priority. Therefore, airports often request funding assistance for navigational aids through AIP and then maintain the equipment on their own.

STATE FUNDING PROGRAMS

In support of the state aviation system, the State of Arizona also participates in airport improvement projects. The source for state airport improvement funds is the Arizona Aviation Fund. Taxes levied by the state on aviation fuel, flight property, 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 4.47 percent) of the local share of projects receiving federal AIP funding. The state may also provide 90 percent funding for projects which are typically not eligible for federal AIP funding or have not received federal funding.

Pavement Maintenance Program

The airport system in Arizona is a multi-million dollar investment of public and private funds that must be protected and preserved. State aviation fund dollars are limited and the State Transportation Board recognizes the need to protect and extend the maximum useful life of the airport system's pavement. The Arizona Pavement Preservation Program (APPP) has been established to assist in the preservation of Arizona airports' system infrastructure.

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 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 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 150/5380-7, *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 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.

State Airport Loan Program

The State 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.

One way in which the loan funds can be used is for revenue-generating projects. 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.

LOCAL FUNDING

The balance of project costs, after consideration has been given to grants, must be funded through local resources. Gila Bend Municipal Airport is operated by the Town of Gila Bend, and the goal for the operation of the airport is to generate ample revenues to cover all operating and maintenance costs as well as the local matching share of capital expenditures. As with many airports, this is not possible and other financial methods will be needed.

There are several alternatives for local financing options for future development at the airport, including airport revenues, direct funding from the Town, 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.

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 Gila Bend Municipal Airport. The Capital Improvement Program has assumed that 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.

SUMMARY

The resultant plan represents an airfield facility that fulfills general aviation needs and preserves long range viability while conforming to safety and design standards. It also maintains a landside complex that can be developed as demand dictates. The primary goal is for the airport to maintain a self-supporting position without sacrificing service to the public.

APPENDIX A

GLOSSARY OF TERMS

A

ABOVE GROUND LEVEL: The elevation of a point or surface above the ground.

ACCELERATE-STOP DISTANCE AVAILABLE (ASDA): See declared distances.

ADVISORY CIRCULAR: External publications issued by the FAA consisting of nonregulatory material providing for the recommendations relative to a policy, guidance and information relative to a specific aviation subject.

AIR CARRIER: An operator which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week, and places between which such flights are performed; or (2) transports mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

AIRCRAFT: A transportation vehicle that is used or intended for use for flight.

AIRCRAFT APPROACH CATEGORY: A grouping of aircraft based on 1.3 times the stall speed in their landing configuration at their maximum certificated landing weight. The categories are as follows:

- Category A: Speed less than 91 knots.
- Category B: Speed 91 knots or more, but less than 121 knots.
- Category C: Speed 121 knots or more, but less than 141 knots.
- Category D: Speed 141 knots or more, but less than 166 knots.
- Category E: Speed greater than 166 knots.

AIRCRAFT OPERATION: The landing, takeoff, or touch-and-go procedure by an aircraft on a runway at an airport.

AIRCRAFT OPERATIONS AREA (AOA): A restricted and secure area on the airport property designed to protect all aspects related to aircraft operations.

AIRCRAFT OWNERS AND PILOTS ASSOCIATION: A private organization serving the interests and needs of general aviation pilots and aircraft owners.

AIRCRAFT RESCUE AND FIRE FIGHTING: A facility located at an airport that provides emergency vehicles, extinguishing agents, and personnel responsible for minimizing the impacts of an aircraft accident or incident.

AIRFIELD: The portion of an airport which contains the facilities necessary for the operation of aircraft.

AIRLINE HUB: An airport at which an airline concentrates a significant portion of its activity and which often has a significant amount of connecting traffic.

AIRPLANE DESIGN GROUP (ADG): A grouping of aircraft based upon wingspan. The groups are as follows:

- Group I: Up to but not including 49 feet.
- Group II: 49 feet up to but not including 79 feet.
- Group III: 79 feet up to but not including 118 feet.
- Group IV: 118 feet up to but not including 171 feet.
- Group V: 171 feet up to but not including 214 feet.
- Group VI: 214 feet or greater.

AIRPORT AUTHORITY: A quasi-governmental public organization responsible for setting the policies governing the management and operation of an airport or system of airports under its jurisdiction.

AIRPORT BEACON: A navigational aid located at an airport which displays a rotating light beam to identify whether an airport is lighted.

AIRPORT CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

AIRPORT ELEVATION: The highest point on the runway system at an airport expressed in feet above mean sea level (MSL).

AIRPORT IMPROVEMENT PROGRAM: A program authorized by the Airport and Airway

Improvement Act of 1982 that provides funding for airport planning and development.

AIRPORT LAYOUT DRAWING (ALD): The drawing of the airport showing the layout of existing and proposed airport facilities.

AIRPORT LAYOUT PLAN (ALP): A scaled drawing of the existing and planned land and facilities necessary for the operation and development of the airport.

AIRPORT LAYOUT PLAN DRAWING SET: A set of technical drawings depicting the current and future airport conditions. The individual sheets comprising the set can vary with the complexities of the airport, but the FAA-required drawings include the Airport Layout Plan (sometimes referred to as the Airport Layout Drawing (ALD), the Airport Airspace Drawing, and the Inner Portion of the Approach Surface Drawing, On-Airport Land Use Drawing, and Property Map.

AIRPORT MASTER PLAN: The planner's concept of the long-term development of an airport.

AIRPORT MOVEMENT AREA SAFETY SYSTEM: A system that provides automated alerts and warnings of potential runway incursions or other hazardous aircraft movement events.

AIRPORT OBSTRUCTION CHART: A scaled drawing depicting the Federal Aviation Regulation (FAR) Part 77 surfaces, a representation of objects that penetrate these surfaces, runway, taxiway, and ramp areas, navigational aids, buildings, roads and other detail in the vicinity of an airport.

AIRPORT REFERENCE CODE (ARC): A coding system used to relate airport design criteria to the operational (Aircraft Approach Category) to the physical characteristics (Airplane Design Group) of the airplanes intended to operate at the airport.

AIRPORT REFERENCE POINT (ARP): The latitude and longitude of the approximate center of the airport.

AIRPORT SPONSOR: The entity that is legally responsible for the management and operation of an airport, including the fulfillment of the requirements of laws and regulations related thereto.

AIRPORT SURFACE DETECTION EQUIPMENT: A radar system that provides air traffic controllers with a visual representation of the movement of aircraft and other vehicles on the ground on the airfield at an airport.

AIRPORT SURVEILLANCE RADAR: The primary radar located at an airport or in an air traffic control terminal area that receives a signal at an antenna and transmits the signal to air traffic control display equipment defining the location of aircraft in the air. The signal provides only the azimuth and range of aircraft from the location of the antenna.

AIRPORT TRAFFIC CONTROL TOWER (ATCT): A central operations facility in the terminal air traffic control system, consisting of a tower, including an associated instrument flight rule (IFR) room if radar equipped, using air/ground communications and/or radar, visual signaling and other devices to provide safe and expeditious movement of terminal air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER: A facility which provides en route air traffic control service to aircraft operating on an IFR flight plan within controlled airspace over a large, multi-state region.

AIRSIDE: The portion of an airport that contains the facilities necessary for the operation of aircraft.

AIRSPACE: The volume of space above the surface of the ground that is provided for the operation of aircraft.

AIR TAXI: An air carrier certificated in accordance with FAR Part 121 and FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

AIR TRAFFIC CONTROL: A service operated by an appropriate organization for the purpose of providing for the safe, orderly, and expeditious flow of air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC): A facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the en route phase of flight.

AIR TRAFFIC CONTROL SYSTEM COMMAND CENTER: A facility operated by the FAA which is responsible for the central flow control, the central altitude reservation system, the airport reservation position system, and the air traffic service contingency command for the air traffic control system.

AIR TRAFFIC HUB: A categorization of commercial service airports or group of commercial service airports in a metropolitan or urban area based upon the proportion of annual national enplanements existing at the airport or airports. The categories are large hub, medium hub, small hub, or non-hub. It forms the basis for the apportionment of entitlement funds.

AIR TRANSPORT ASSOCIATION OF AMERICA: An organization consisting of the principal U.S. airlines that represents the interests of the airline industry on major aviation issues before federal, state, and local government bodies. It promotes air transportation safety by coordinating industry and governmental safety programs and it serves as a focal point for industry efforts to standardize practices and enhance the efficiency of the air transportation system.

ALERT AREA: See special-use airspace.

ALTITUDE: The vertical distance measured in feet above mean sea level.

ANNUAL INSTRUMENT APPROACH (AIA): An approach to an airport with the intent to land by an aircraft in accordance with an IFR flight plan when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude.

APPROACH LIGHTING SYSTEM (ALS): An airport lighting facility which provides visual guidance to landing aircraft by radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his final approach and landing.

APPROACH MINIMUMS: The altitude below which an aircraft may not descend while on an IFR approach unless the pilot has the runway in sight.

APPROACH SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 which is longitudinally centered on an extended runway centerline and extends outward and upward from the primary surface at each end of a runway at a designated slope and distance based upon the type of available or planned approach by aircraft to a runway.

APRON: A specified portion of the airfield used for passenger, cargo or freight loading and unloading, aircraft parking, and the refueling, maintenance and servicing of aircraft.

AREA NAVIGATION: The air navigation procedure that provides the capability to establish and maintain a flight path on an arbitrary course that remains within the coverage area of navigational sources being used.

AUTOMATED TERMINAL INFORMATION SERVICE (ATIS): The continuous broadcast of recorded non-control information at towered airports. Information typically includes wind speed, direction, and runway in use.

AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS): A reporting system that provides frequent airport ground surface weather observation data through digitized voice broadcasts and printed reports.

AUTOMATIC WEATHER OBSERVATION STATION (AWOS): Equipment used to automatically record weather conditions (i.e. cloud height, visibility, wind speed and direction, temperature, dew point, etc.)

AUTOMATIC DIRECTION FINDER (ADF): An aircraft radio navigation system which senses and indicates the direction to a non-directional radio beacon (NDB) ground transmitter.

AVIGATION EASEMENT: A contractual right or a property interest in land over which a right of unobstructed flight in the airspace is established.

AZIMUTH: Horizontal direction expressed as the angular distance between true north and the direction of a fixed point (as the observer's heading).

B

BASE LEG: A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. See "traffic pattern."

BASED AIRCRAFT: The general aviation aircraft that use a specific airport as a home base.

BEARING: The horizontal direction to or from any point, usually measured clockwise from true north or magnetic north.

BLAST FENCE: A barrier used to divert or dissipate jet blast or propeller wash.

BLAST PAD: A prepared surface adjacent to the end of a runway for the purpose of eliminating the erosion of the ground surface by the wind forces produced by airplanes at the initiation of takeoff operations.

BUILDING RESTRICTION LINE (BRL): A line which identifies suitable building area locations on the airport.

C

CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute Airport Improvement Program funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

CARGO SERVICE AIRPORT: An airport served by aircraft providing air transportation of property only, including mail, with an annual aggregate landed weight of at least 100,000,000 pounds.

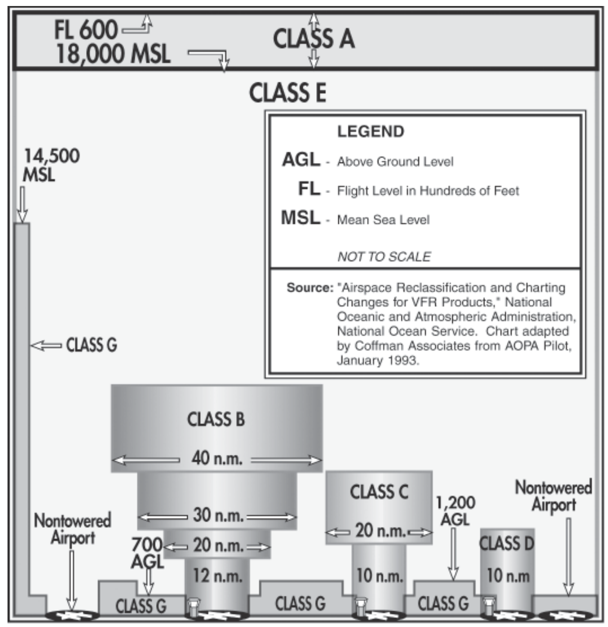
CATEGORY I: An Instrument Landing System (ILS) that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 100 feet above the horizontal plane containing the runway threshold.

CATEGORY II: An ILS that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 50 feet above the horizontal plane containing the runway threshold.

CATEGORY III: An ILS that provides acceptable guidance information to a pilot from the coverage limits of the ILS with no decision height specified above the horizontal plane containing the runway threshold.

CEILING: The height above the ground surface to the location of the lowest layer of clouds which is reported as either broken or overcast.

CIRCLING APPROACH: A maneuver initiated by the pilot to align the aircraft with the runway for landing when flying a predetermined circling instrument approach under IFR.



CLASS A AIRSPACE: See Controlled Airspace.

CLASS B AIRSPACE: See Controlled Airspace.

CLASS C AIRSPACE: See Controlled Airspace.

CLASS D AIRSPACE: See Controlled Airspace.

CLASS E AIRSPACE: See Controlled Airspace.

CLASS G AIRSPACE: See Controlled Airspace.

CLEAR ZONE: See Runway Protection Zone.

COMMERCIAL SERVICE AIRPORT: A public airport providing scheduled passenger service that enplanes at least 2,500 annual passengers.

COMMON TRAFFIC ADVISORY FREQUENCY: A radio frequency identified in the appropriate aeronautical chart which is designated for the purpose of transmitting airport advisory information and procedures while operating to or from an uncontrolled airport.

COMPASS LOCATOR (LOM): A low power, low/medium frequency radio-beacon installed in conjunction with the instrument landing system at one or two of the marker sites.

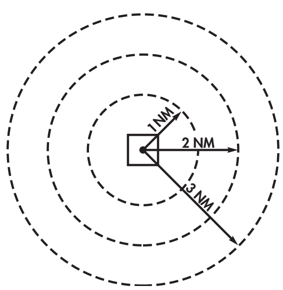
CONICAL SURFACE: An imaginary obstruction-limiting surface defined in FAR Part 77 that extends from the edge of the horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

CONTROLLED AIRPORT: An airport that has an operating airport traffic control tower.

CONTROLLED AIRSPACE: Airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows:

- **CLASS A**: Generally, the airspace from 18,000 feet mean sea level (MSL) up to but not including flight level FL600. All persons must operate their aircraft under IFR.

- **CLASS B**: Generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of air space and is designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.



- **CLASS C**: Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical mile (nm) radius and an outer area with a 10 nautical mile radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.

- **CLASS D**: Generally, that airspace from the surface to 2,500 feet above the air port elevation (charted as MSL) surrounding those airports that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach procedure . Unless otherwise authorized, all persons must establish two-way radio communication.

- **CLASS E**: Generally, controlled airspace that is not classified as Class A, B, C, or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communication with air traffic control.

- **CLASS G**: Generally, that airspace not classified as Class A, B, C, D, or E. Class G airspace is uncontrolled for all aircraft. Class G airspace extends from the surface to the overlying Class E airspace.

CONTROLLED FIRING AREA: See special-use airspace.

CROSSWIND: A wind that is not parallel to a runway centerline or to the intended flight path of an aircraft.

CROSSWIND COMPONENT: The component of wind that is at a right angle to the runway centerline or the intended flight path of an aircraft.

CROSSWIND LEG: A flight path at right angles to the landing runway off its upwind end. See "traffic pattern."

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D

DECIBEL: A unit of noise representing a level relative to a reference of a sound pressure 20 micro newtons per square meter.

DECISION HEIGHT: The height above the end of the runway surface at which a decision must be made by a pilot during the ILS or Precision Approach Radar approach to either continue the approach or to execute a missed approach.

DECLARED DISTANCES: The distances declared available for the airplane's takeoff runway, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are:

- **TAKEOFF RUNWAY AVAILABLE (TORA)**: The runway length declared available and suitable for the ground run of an airplane taking off.

- **TAKEOFF DISTANCE AVAILABLE (TODA)**: The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA.

- **ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)**: The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff.

- **LANDING DISTANCE AVAILABLE (LDA)**: The runway length declared available and suitable for landing.

DEPARTMENT OF TRANSPORTATION: The cabinet level federal government organization consisting of modal operating agencies, such as the Federal Aviation Administration, which was established to promote the coordination of federal transportation programs and to act as a focal point for research and development efforts in transportation.

DISCRETIONARY FUNDS: Federal grant funds that may be appropriated to an airport based upon designation by the Secretary of Transportation or Congress to meet a specified national priority such as enhancing capacity, safety, and security, or mitigating noise.

DISPLACED THRESHOLD: A threshold that is located at a point on the runway other than the designated beginning of the runway.

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.

DNL: The 24-hour average sound level, in Aweighted decibels, obtained after the addition of ten decibels to sound levels for the periods between 10 p.m. and 7 a.m. as averaged over a span of one year. It is the FAA standard metric for determining the cumulative exposure of individuals to noise.

DOWNWIND LEG: A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg. Also see "traffic pattern."

E

EASEMENT: The legal right of one party to use a portion of the total rights in real estate owned by another party. This may include the right of passage over, on, or below the property; certain air rights above the property, including view rights; and the rights to any specified form of development or activity, as well as any other legal rights in the property that may be specified in the easement document.

ELEVATION: The vertical distance measured in feet above mean sea level.

ENPLANED PASSENGERS: The total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and nonscheduled services.

ENPLANEMENT: The boarding of a passenger, cargo, freight, or mail on an aircraft at an airport.

ENTITLEMENT: Federal funds for which a commercial service airport may be eligible based upon its annual passenger enplanements.

ENVIRONMENTAL ASSESSMENT (EA): An environmental analysis performed pursuant to the National Environmental Policy Act to determine whether an action would significantly affect the environment and thus require a more detailed environmental impact statement.

ENVIRONMENTAL AUDIT: An assessment of the current status of a party's compliance with applicable environmental requirements of a party's environmental compliance policies, practices, and controls.

ENVIRONMENTAL IMPACT STATEMENT (EIS): A document required of federal agencies by the National Environmental Policy Act for major projects are legislative proposals affecting the environment. It is a tool for decision-making describing the positive and negative effects of a proposed action and citing alternative actions.

ESSENTIAL AIR SERVICE: A federal program which guarantees air carrier service to selected small cities by providing subsidies as needed to prevent these cities from such service.

F

FEDERAL AVIATION REGULATIONS: The general and permanent rules established by the executive departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are the aviation subset of the Code of Federal Regulations.

FEDERAL INSPECTION SERVICES: The provision of customs and immigration services including passport inspection, inspection of baggage, the collection of duties on certain imported items, and the inspections for agricultural products, illegal drugs, or other restricted items.

FINAL APPROACH: A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. See "traffic pattern."

FINAL APPROACH AND TAKEOFF AREA (FATO). A defined area over which the final phase of the helicopter approach to a hover, or a landing is completed and from which the takeoff is initiated.

FINAL APPROACH FIX: The designated point at which the final approach segment for an aircraft landing on a runway begins for a non-precision approach.

FINDING OF NO SIGNIFICANT IMPACT (FONSI): A public document prepared by a Federal agency that presents the rationale why a proposed action will not have a significant effect on the environment and for which an environmental impact statement will not be prepared.

FIXED BASE OPERATOR (FBO): A provider of services to users of an airport. Such services include, but are not limited to, hangaring, fueling, flight training, repair, and maintenance.

FLIGHT LEVEL: A designation for altitude within controlled airspace.

FLIGHT SERVICE STATION: An operations facility in the national flight advisory system which utilizes data interchange facilities for the collection and dissemination of Notices to Airmen, weather, and administrative data and which provides pre-flight and in-flight advisory services to pilots through air and ground based communication facilities.

FRANGIBLE NAVAID: A navigational aid which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.

G

GENERAL AVIATION: That portion of civil aviation which encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity, and large aircraft commercial operators.

GENERAL AVIATION AIRPORT: An airport that provides air service to only general aviation.

GLIDESLOPE (GS): Provides vertical guidance for aircraft during approach and landing. The glideslope consists of the following:

1. Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or

2. Visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.

GLOBAL POSITIONING SYSTEM (GPS): A system of 24 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude.

GROUND ACCESS: The transportation system on and around the airport that provides access to and from the airport by ground transportation vehicles for passengers, employees, cargo, freight, and airport services.

H

HELIPAD: A designated area for the takeoff, landing, and parking of helicopters.

HIGH INTENSITY RUNWAY LIGHTS: The highest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

HIGH-SPEED EXIT TAXIWAY: A long radius taxiway designed to expedite aircraft turning off the runway after landing (at speeds to 60 knots), thus reducing runway occupancy time.

HORIZONTAL SURFACE: An imaginary obstruction- limiting surface defined in FAR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.

I

INITIAL APPROACH FIX: The designated point at which the initial approach segment begins for an instrument approach to a runway.

INSTRUMENT APPROACH PROCEDURE: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR): Procedures for the conduct of flight in weather conditions below Visual Flight Rules weather minimums. The term IFR is often also used to define weather conditions and the type of flight plan under which an aircraft is operating.

INSTRUMENT LANDING SYSTEM (ILS): A precision instrument approach system which normally consists of the following electronic components and visual aids:

1. Localizer.
2. Glide Slope.
3. Outer Marker.
4. Middle Marker.
5. Approach Lights.

INSTRUMENT METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions that are less than the minimums specified for visual meteorological conditions.

ITINERANT OPERATIONS: Operations by aircraft that are not based at a specified airport.

K

KNOTS: A unit of speed length used in navigation that is equivalent to the number of nautical miles traveled in one hour.

L

LANDSIDE: The portion of an airport that provides the facilities necessary for the processing of passengers, cargo, freight, and ground transportation vehicles.

LANDING DISTANCE AVAILABLE (LDA): See declared distances.

LARGE AIRPLANE: An airplane that has a maximum certified takeoff weight in excess of 12,500 pounds.

LOCAL AREA AUGMENTATION SYSTEM: A differential GPS system that provides localized measurement correction signals to the basic GPS signals to improve navigational accuracy integrity, continuity, and availability.

LOCAL OPERATIONS: Aircraft operations performed by aircraft that are based at the airport and that operate in the local traffic pattern or within sight of the airport, that are known to be departing for or arriving from flights in local practice areas within a prescribed distance from the airport, or that execute simulated instrument approaches at the airport.

LOCAL TRAFFIC: Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument approach procedures. Typically, this includes touch and-go training operations.

LOCALIZER: The component of an ILS which provides course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA): A facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.

LONG RANGE NAVIGATION SYSTEM (LORAN): Long range navigation is an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for en route navigation.

LOW INTENSITY RUNWAY LIGHTS: The lowest clas- sification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

M

MEDIUM INTENSITY RUNWAY LIGHTS: The middle classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

MICROWAVE LANDING SYSTEM (MLS): An instrument approach and landing system that provides precision guidance in azimuth, elevation, and distance measurement.

MILITARY OPERATIONS: Aircraft operations that are performed in military aircraft.

MILITARY OPERATIONS AREA (MOA): See special-use airspace

MILITARY TRAINING ROUTE: An air route depicted on aeronautical charts for the conduct of military flight training at speeds above 250 knots.

MISSED APPROACH COURSE (MAC): The flight route to be followed if, after an instrument approach, a landing is not affected, and occurring normally:

1. When the aircraft has descended to the decision height and has not established visual contact; or

2. When directed by air traffic control to pull up or to go around again.

MOVEMENT AREA: The runways, taxiways, and other areas of an airport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports with a tower, air traffic control clearance is required for entry onto the movement area.

N

NATIONAL AIRSPACE SYSTEM: The network of air traffic control facilities, air traffic control areas, and navigational facilities through the U.S.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS: The national airport system plan developed by the Secretary of Transportation on a biannual basis for the development of public use airports to meet national air transportation needs.

NATIONAL TRANSPORTATION SAFETY BOARD: A federal government organization established to investigate and determine the probable cause of transportation accidents, to recommend equipment and procedures to enhance transportation safety, and to review on appeal the suspension or revocation of any certificates or licenses issued by the Secretary of Transportation.

NAUTICAL MILE: A unit of length used in navigation which is equivalent to the distance spanned by one minute of arc in latitude, that is, 1,852 meters or 6,076 feet. It is equivalent to approximately 1.15 statute mile.

NAVAID: A term used to describe any electrical or visual air navigational aids, lights, signs, and associated supporting equipment (i.e. PAPI, VASI, ILS, etc.)

NAVIGATIONAL AID: A facility used as, available for use as, or designed for use as an aid to air navigation.

NOISE CONTOUR: A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.

NON-DIRECTIONAL BEACON (NDB): A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his or her bearing to and from the radio beacon and home on, or track to, the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a Compass Locator.

NON-PRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB, or LOC.

NOTICE TO AIRMEN: A notice containing information concerning the establishment, condition, or change in any component of or hazard in the National Airspace System, the timely knowledge of which is considered essential to personnel concerned with flight operations.

O

OBJECT FREE AREA (OFA): An area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

OBSTACLE FREE ZONE (OFZ): The airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be kept clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance for aircraft landing or taking off from the runway, and for missed approaches.

ONE-ENGINE INOPERABLE SURFACE: A surface emanating from the runway end at a slope ratio of 62.5:1. Air carrier airports are required to maintain a technical drawing of this surface depicting any object penetrations by January 1, 2010.

OPERATION: The take-off, landing, or touch-and-go procedure by an aircraft on a runway at an airport.

OUTER MARKER (OM): An ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline, indicating to the pilot that he/she is passing over the facility and can begin final approach.

P

PILOT CONTROLLED LIGHTING: Runway lighting systems at an airport that are controlled by activating the microphone of a pilot on a specified radio frequency.

PRECISION APPROACH: A standard instrument approach procedure which provides runway alignment and glide slope (descent) information. It is categorized as follows:

- **CATEGORY I (CAT I)**: A precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than 1/2 mile or Runway Visual Range (RVR) 2400 (RVR 1800) with operative touchdown zone and runway centerline lights.

- **CATEGORY II (CAT II)**: A precision approach which provides for approaches with a decision height of not less than 100 feet and visibility not less than 1200 feet RVR.

- **CATEGORY III (CAT III)**: A precision approach which provides for approaches with minima less than Category II.

PRECISION APPROACH PATH INDICATOR (PAPI): A lighting system providing visual approach slope guidance to aircraft during a landing approach. It is similar to a VASI but provides a sharper transition between the colored indicator lights.

PRECISION APPROACH RADAR: A radar facility in the terminal air traffic control system used to detect and display with a high degree of accuracy the direction, range, and elevation of an aircraft on the final approach to a runway.

PRECISION OBJECT FREE AREA (POFA): An area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFA is a clearing standard which requires the POFA to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for frangible NAVAIDS). The POFA applies to all new authorized instrument approach procedures with less than 3/4 mile visibility.

PRIMARY AIRPORT: A commercial service airport that enplanes at least 10,000 annual passengers.

PRIMARY SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 that is specified as a rectangular surface longitudinally centered about a runway. The specific dimensions of this surface are a function of the types of approaches existing or planned for the runway.

PROHIBITED AREA: See special-use airspace.

PVC: Poor visibility and ceiling. Used in determining Annual Service Volume. PVC conditions exist when the cloud ceiling is less than 500 feet and visibility is less than one mile.

R

RADIAL: A navigational signal generated by a Very High Frequency Omni-directional Range or VORTAC station that is measured as an azimuth from the station.

REGRESSION ANALYSIS: A statistical technique that seeks to identify and quantify the relationships between factors associated with a forecast.

REMOTE COMMUNICATIONS OUTLET (RCO): An unstaffed transmitter receiver/facility remotely controlled by air traffic personnel. RCOs serve flight service stations (FSSs). RCOs were established to provide ground-to-ground communications between air traffic control specialists and pilots at satellite airports for delivering en route clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/landing times.

REMOTE TRANSMITTER/RECEIVER (RTR): See remote communications outlet. RTRs serve ARTCCs.

RELIEVER AIRPORT: An airport to serve general aviation aircraft which might otherwise use a congested air-carrier served airport.

RESTRICTED AREA: See special-use airspace.

RNAV: Area navigation - airborne equipment which permits flights over determined tracks within prescribed accuracy tolerances without the need to overfly ground-based navigation facilities. Used en route and for approaches to an airport.

RUNWAY: A defined rectangular area on an airport prepared for aircraft landing and takeoff. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees. For example, a runway with a magnetic heading of 180 would be designated Runway 18. The runway heading on the opposite end of the runway is 180 degrees from that runway end. For example, the opposite runway heading for Runway 18 would be Runway 36 (magnetic heading of 360). Aircraft can takeoff or land from either end of a runway, depending upon wind direction.

RUNWAY ALIGNMENT INDICATOR LIGHT: A series of high intensity sequentially flashing lights installed on the extended centerline of the runway usually in conjunction with an approach lighting system.

RUNWAY DESIGN CODE: A code signifiying the design standards to which the runway is to be built.

RUNWAY END IDENTIFICATION LIGHTING (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 REFERENCE CODE: A code signifying the current operational capabilities of a runway and associated taxiway.

RUNWAY SAFETY AREA (RSA): A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.

RUNWAY VISIBILITY ZONE (RVZ): An area on the airport to be kept clear of permanent objects so that there is an unobstructed line of- site from any point five feet above the runway centerline to any point five feet above an intersecting runway centerline.

RUNWAY VISUAL RANGE (RVR): An instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

S

SCOPE: The document that identifies and defines the tasks, emphasis, and level of effort associated with a project or study.

SEGMENTED CIRCLE: A system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

SHOULDER: An area adjacent to the edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface; support for aircraft running off the pavement; enhanced drainage; and blast protection. The shoulder does not necessarily need to be paved.

SLANT-RANGE DISTANCE: The straight line distance between an aircraft and a point on the ground.

SMALL AIRPLANE: An airplane that has a maximum certified takeoff weight of up to 12,500 pounds.

SPECIAL-USE AIRSPACE: Airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Special-use airspace classifications include:

- **ALERT AREA**: Airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.

- **CONTROLLED FIRING AREA**: Airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.

- **MILITARY OPERATIONS AREA (MOA)**: Designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.

- **PROHIBITED AREA**: Designated airspace within which the flight of aircraft is prohibited.

- **RESTRICTED AREA**: Airspace designated under Federal Aviation Regulation (FAR) 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.

- **WARNING AREA**: Airspace which may contain hazards to nonparticipating aircraft.

STANDARD INSTRUMENT DEPARTURE (SID): A preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.

STANDARD INSTRUMENT DEPARTURE PROCEDURES: A published standard flight procedure to be utilized following takeoff to provide a transition between the airport and the terminal area or en route airspace.

STANDARD TERMINAL ARRIVAL ROUTE (STAR): A preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.

STOP-AND-GO: A procedure wherein an aircraft will land, make a complete stop on the runway, and then commence a takeoff from that point. A stop-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

STOPWAY: An area beyond the end of a takeoff runway that is designed to support an aircraft during an aborted takeoff without causing structural damage to the aircraft. It is not to be used for takeoff, landing, or taxiing by aircraft.

STRAIGHT-IN LANDING/APPROACH: A landing made on a runway aligned within 30 degrees of the final approach course following completion of an instrument approach.

T

TACTICAL AIR NAVIGATION (TACAN): An ultrahigh frequency electronic air navigation system which provides suitably-equipped aircraft a continuous indication of bearing and distance to the TACAN station.

TAKEOFF RUNWAY AVAILABLE (TORA): See declared distances.

TAKEOFF DISTANCE AVAILABLE (TODA): See declared distances.

TAXILANE: The portion of the aircraft parking area used for access between taxiways and aircraft parking positions.

TAXIWAY: A defined path established for the taxiing of aircraft from one part of an airport to another.

TAXIWAY DESIGN GROUP: A classification of airplanes based on outer to outer Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distance.

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.

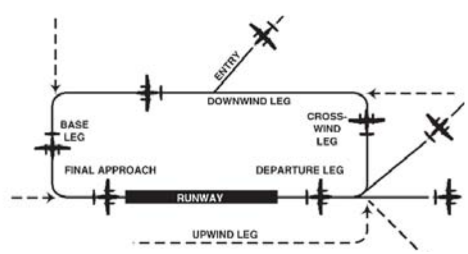
TOUCHDOWN AND LIFT-OFF AREA (TLOF): A load bearing, generally paved area, normally centered in the FATO, on which the helicopter lands or takes off.

TOUCHDOWN ZONE (TDZ): The first 3,000 feet of the runway beginning at the threshold.

TOUCHDOWN ZONE ELEVATION (TDZE): The highest elevation in the touchdown zone.

TOUCHDOWN ZONE (TDZ) LIGHTING: Two rows of transverse light bars located symmetrically about the runway centerline normally at 100- foot intervals. The basic system extends 3,000 feet along the runway.

TRAFFIC PATTERN: The traffic flow that is prescribed for aircraft landing at or taking off from an airport. The components of a typical traffic pattern are the upwind leg, crosswind leg, downwind leg, base leg, and final approach.



U

UNCONTROLLED AIRPORT: An airport without an air traffic control tower at which the control of Visual Flight Rules traffic is not exercised.

UNCONTROLLED AIRSPACE: Airspace within which aircraft are not subject to air traffic control.

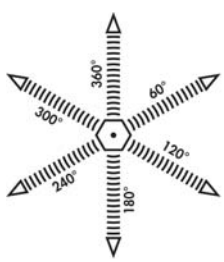
UNIVERSAL COMMUNICATION (UNICOM): A nongovernment communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOM's are shown on aeronautical charts and publications.

UPWIND LEG: A flight path parallel to the landing runway in the direction of landing. See "traffic pattern."

V

VECTOR: A heading issued to an aircraft to provide navigational guidance by radar.

VERY HIGH FREQUENCY/ OMNIDIRECTIONAL RANGE (VOR): A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the national airspace system. The VOR periodically identifies itself by Morse Code and may have an additional voice identification feature.



VERY HIGH FREQUENCY OMNI-DIRECTIONAL RANGE/ TACTICAL AIR NAVIGATION (VORTAC): A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.

VICTOR AIRWAY: A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.

VISUAL APPROACH: An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

VISUAL APPROACH SLOPE INDICATOR (VASI): An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that he is on path if he sees red/white, above path if white/white, and below path if red/red. Some airports serving large aircraft have three-bar VASI's which provide two visual guide paths to the same runway.

VISUAL FLIGHT RULES (VFR): Rules that govern the procedures for conducting flight under visual conditions. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

VISUAL METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.

VOR: See "Very High Frequency Omnidirectional Range Station."

VORTAC: See "Very High Frequency Omnidirectional Range Station/Tactical Air Navigation."

W

WARNING AREA: See special-use airspace.

WIDE AREA AUGMENTATION SYSTEM: An enhancement of the Global Positioning System that includes integrity broadcasts, differential corrections, and additional ranging signals for the purpose of providing the accuracy, integrity, availability, and continuity required to support all phases of flight.

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)

AOA: Aircraft Operation Area

APV: instrument approach procedure with vertical guidance

ARC: airport reference code

ARFF: aircraft rescue and fire fighting

ARP: airport reference point

ARTCC: air route traffic control center

ASDA: accelerate-stop distance available

ASR: airport surveillance radar

ASOS: automated surface observation station

ATCT: airport traffic control tower

ATIS: automated terminal information service

AVGAS: aviation gasoline - typically 100 low lead (100L)

AWOS: automatic weather observation station

BRL: building restriction line

CFR: Code of Federal Regulation

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

DWL: runway weight bearing capacity of aircraft with dual-wheel type landing gear

DTWL: runway weight bearing capacity of aircraft with dual-tandem type landing gear

FAA: Federal Aviation Administration

FAR: Federal Aviation Regulation

FBO: fixed base operator

FY: fiscal year

GPS: global positioning system

GS: glide slope

HIRL: high intensity runway edge lighting

IFR: instrument flight rules (FAR Part 91)

ILS: instrument landing system

IM: inner marker

LDA: localizer type directional aid

LDA: landing distance available

LIRL: low intensity runway edge lighting

LMM: compass locator at ILS outer marker

LORAN: long range navigation

MALS: midium intensity approach lighting system with indicator lights

MIRL: medium intensity runway edge lighting

MITL: medium intensity taxiway edge lighting

MLS: microwave landing system

MM: middle marker

MOA: military operations area

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 rule making

ODALS: omnidirectional approach lighting system

OFA: object free area

OFZ: obstacle free zone

OM: outer marker

PAC: planning advisory committee

PAPI: precision approach path indicator

PFC: porous friction course

PFC: passenger facility charge

PCL: pilot-controlled lighting

PIW public information workshop

PLASI: pulsating visual approach slope indicator

POFA: precision object free area

PVASI: pulsating/steady visual approach slope indicator

PVC: poor visibility and ceiling

RCO: remote communications outlet

RRC: Runway Reference Code

RDC: Runway Design Code

REIL: runway end identification lighting

RNAV: area navigation

RPZ: runway protection zone

RSA: runway safety area

RTR: remote transmitter/receiver

RVR: runway visibility range

RVZ: runway visibility zone

SALS: short approach lighting system

SASP: state aviation system plan

SEL: sound exposure level

SID: standard instrument departure

SM: statute mile (5,280 feet)

SRE: snow removal equipment

SSALF: simplified short approach lighting system with runway alignment indicator lights

STAR: standard terminal arrival route

SWL: runway weight bearing capacity for aircraft with single-wheel tandem type landing gear

TACAN: tactical air navigational aid

TAF: Federal Aviation Administration (FAA) Terminal Area Forecast

TDG: Taxiway Design Group

TLOF: Touchdown and lift-off

TDZ: touchdown zone

TDZE: touchdown zone elevation

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

APPENDIX B

ENVIRONMENTAL EVALUATION

Appendix B
ENVIRONMENTAL EVALUATION

Airport Master Plan Update
Gila Bend Municipal Airport

Analysis of the potential environmental impacts of proposed airport development projects, as discussed in Chapter Five and depicted in Exhibit 5A, is an important component of the Airport Master Plan process. The primary purpose of this appendix is to provide an inventory of environmental sensitivities on, or near, the airport property and to evaluate the development program to determine whether proposed actions could individually or collectively affect the quality of the environment.

Construction of the improvements depicted on the recommended development concept plan will require compliance with the *National Environmental Policy Act* (NEPA) *of 1969*, as amended, to receive federal financial assistance. For projects not "categorically excluded" under Federal Aviation Administration (FAA) Order 1050.1E, *Environmental Impacts: Policies and Procedures*, compliance with NEPA is generally satisfied through the preparation of an Environmental Assessment (EA). In instances where significant environmental impacts are expected, an Environmental Impact Statement (EIS) may be required. While this portion of the master plan is not designed to satisfy the NEPA requirements for a categorical exclusion, EA, or EIS, it is intended to supply a preliminary review of environmental issues that would need to be analyzed in more detail within the NEPA process. This evaluation considers all environmental categories required for the NEPA process as outlined in FAA Order 1050.1E and Order 5050.4B, *National Environmental Policy Act* (NEPA) *Implementation Instructions for Airport Actions.*

AIR QUALITY

The United States (U.S.) Environmental Protection Agency (EPA) has adopted air quality standards that specify the maximum permissible short-term and long-term concentrations of various air contaminants based on potential health effects. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants, which include: ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxide (NO), particulate matter (PM_{10} and $PM_{2.5}$), and lead (Pb). Potentially significant air quality impacts associated with an FAA project or action is demonstrated by the project or action exceeding one or more of the NAAQS for any of the time periods analyzed.

To ensure that a federal action complies with the NAAQS, the *Clean Air Act* (CAA) establishes a General Conformity Rule for all general federal actions, including airport improvement projects, if the action is located within a nonattainment area. Gila Bend Municipal Airport is located within Maricopa County, Arizona, which is classified as a nonattainment area for O_3 and particulates less than 10 micrometers in diameter (PM_{10}) by the EPA.[1] However, according to the Maricopa County Air Quality Department's Planning Area Maps, these designations apply primarily to the Phoenix metropolitan area. Gila Bend, and specifically the Gila Bend Municipal Airport, are not located within the 1-hour O_3, 8-hour O_3, or PM_{10} nonattainment areas of Maricopa County.[2] Thus, for a specific development project at Gila Bend Municipal Airport, some levels of review may not apply under the CAA. The entire County is designated as an attainment area for the remaining NAAQS criteria pollutants.

Under NEPA, the FAA requires that an air quality emissions inventory be prepared for federal actions at airports where forecast general aviation operations exceed 180,000. At this time, as discussed in Chapter Two of this Airport Master Plan update, the airport is forecast to have future operations of 65,270 by the year 2032. Therefore, operational air quality emission inventories would not be required for future projects under NEPA. However, air quality impacts could still occur as a result of proposed airport development projects in the short-term. Construction-related air quality impacts are discussed below in the section on Construction Impacts.

Additionally, of growing concern is the impact of proposed projects on climate change. Greenhouse gases (GHGs) are those that trap heat in the earth's atmosphere. Greenhouse gases can be either naturally occurring or anthropogenic (man-made) and include water vapor (H_2O) and carbon dioxide (CO_2). Several classes of halogenated substances that contain fluorine, chlorine, or bromine are also GHGs, but they are, for the most part, solely a product of industrial activities. All GHG inventories measure CO_2 emissions, but beyond CO_2, different inventories include different greenhouse gases (such as methane [CH_4], nitrous oxide [N_2O], and O_3).

No significance thresholds for the creation of GHG have been promulgated to date. However, research has shown that there is a direct link between fuel combustion and GHG emissions. Therefore, sources that require fuel or power at an airport are the primary sources

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[1] http://www.epa.gov/oar/oaqps/greenbk/anay_az.html, accessed September 6, 2012.
[2] http://www.maricopa.gov/aq/divisions/planning_analysis/PlanningAreaMaps.aspx, accessed September 6, 2012.

that would generate GHGs. Aircraft are probably the most often cited air pollutant source, but they produce the same types of emissions as cars. Aircraft jet engines, like many other vehicle engines, produce CO_2, H_2O, nitrogen oxides (NO_x), CO, oxides of sulfur (SO_x), unburned or partially combusted hydrocarbons (known as volatile organic compounds, VOCs), particulates, and other trace compounds.

The scientific community is developing areas of further study to enable them to more precisely estimate aviation's effects on the global atmosphere. The FAA is currently leading or participating in several efforts intended to clarify the role that commercial aviation plays in greenhouse gases and climate changes. The most comprehensive and multi-year program geared towards quantifying climate change effects of aviation is the Aviation Climate Change Research Initiative (ACCRI) funded by the FAA and the National Aeronautics and Space Administration (NASA). ACCRI hopes to reduce key scientific uncertainties in quantifying aviation-related climate impacts and provide timely scientific input to inform policy-making decisions. The FAA also funds Project 12 of the Partnership for Air Transportation Noise & Emissions Reduction (PARTNER) Center of Excellence research initiative to quantify the effects of aircraft exhaust and contrails on global and U.S. climate and atmospheric composition.

COASTAL RESOURCES

Federal activities involving or affecting coastal resources are governed by the *Coastal Barriers Resource Act* (CBRA), the *Coastal Zone Management Act* (CZMA), and Executive Order (E.O.) 13089, *Coral Reef Protection*.

The Gila Bend Municipal Airport is not located within a Coastal Management Zone or Coastal Barrier Area. The Town of Gila Bend lies approximately 262 miles east of the Pacific Ocean.

COMPATIBLE LAND USE/NOISE

The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of the airport's noise impacts. Typically, significant impacts will occur over noise-sensitive areas within the 65 decibel (dB) day-night noise exposure level (DNL) contour. (DNL is the metric currently accepted by the FAA, the EPA, and the Department of Housing and Urban Development [HUD] as an appropriate measure of cumulative noise exposure.) FAA Orders 1050.1E and 5050.4B define a significant noise impact as one which would occur if the proposed action would cause noise-sensitive areas to experience an increase in noise of 1.5 DNL or more at or above the 65 DNL noise contour when compared to a No Action alternative for the same timeframe. Noise-sensitive land uses include residences, schools, hospitals, and places of worship.

Existing condition and projected noise contours associated with the proposed Airport Master Plan update are depicted in **Exhibit B1**. As shown on the exhibit, the existing (2012) and future (2032) noise 65 DNL noise contours are contained completely within the airport boundaries. There is no noise-sensitive land use within the 65 DNL in either the existing (2012) or future (2032) scenarios.

Compatible land use also addresses nearby features that could pose a threat to safe aircraft operations. These features include land uses that attract wildlife (for example, landfills and water features) or structures within approach and departure zones. There are no wildlife attractants such as landfills or water features located near the airport. The closest such features are three evaporation ponds associated with the Panda Gila River Power Station, located approximately 1.5 mile to the northwest.[3]

Generalized existing and future land use near the airport is discussed in Chapter One, Inventory, of the Airport Master Plan update; Exhibit 1B shows land ownership of individual parcels surrounding the airport. The land surrounding the airport is vacant and is owned by the Town of Gila Bend or by the State of Arizona within its State Land Trust.

CONSTRUCTION IMPACTS

Airport construction impacts can include dust, air emissions, traffic, storm water runoff, and noise. Construction-related dust impacts are typically mitigated below a level of significance through the use of best management practices (BMPs), some of which are identified in Maricopa County Code Fugitive Dust Rules 310 and 310.01, Arizona Administrative Code R18-2-604 through 607, and FAA Advisory Circular (AC) 150/5371-10, *Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control*.

In addition, the Maricopa County Air Quality Department issues Dust Control permits for activities that will disturb a surface area equal to or greater than 0.1 acre or involve the demolition of buildings. These permits require the permittee to identify and implement dust control measures as well. All sites with disturbed surface areas, regardless of size, must maintain compliance with Rule 310.

A generalized list of BMPs is as follows:

<u>Site Preparation and Construction</u>

- Minimize land disturbance
- Suppress dust on traveled paths which are not paved through wetting, use of watering trucks, chemical dust suppressants, or other reasonable precautions to prevent dust from entering ambient air
- Cover trucks when hauling soil
- Minimize soil track-out by washing or cleaning truck wheels before leaving construction site
- Stabilize the surface of soil piles
- Create windbreaks

[3] http://www.slthermal.com/pdf/Gila%20Bend,%20Arizona%20_TECO-Panda%20Energy,%20Gila%20River_.pdf, accessed on September 6, 2012.

11-MP-07-B1-10/26/12

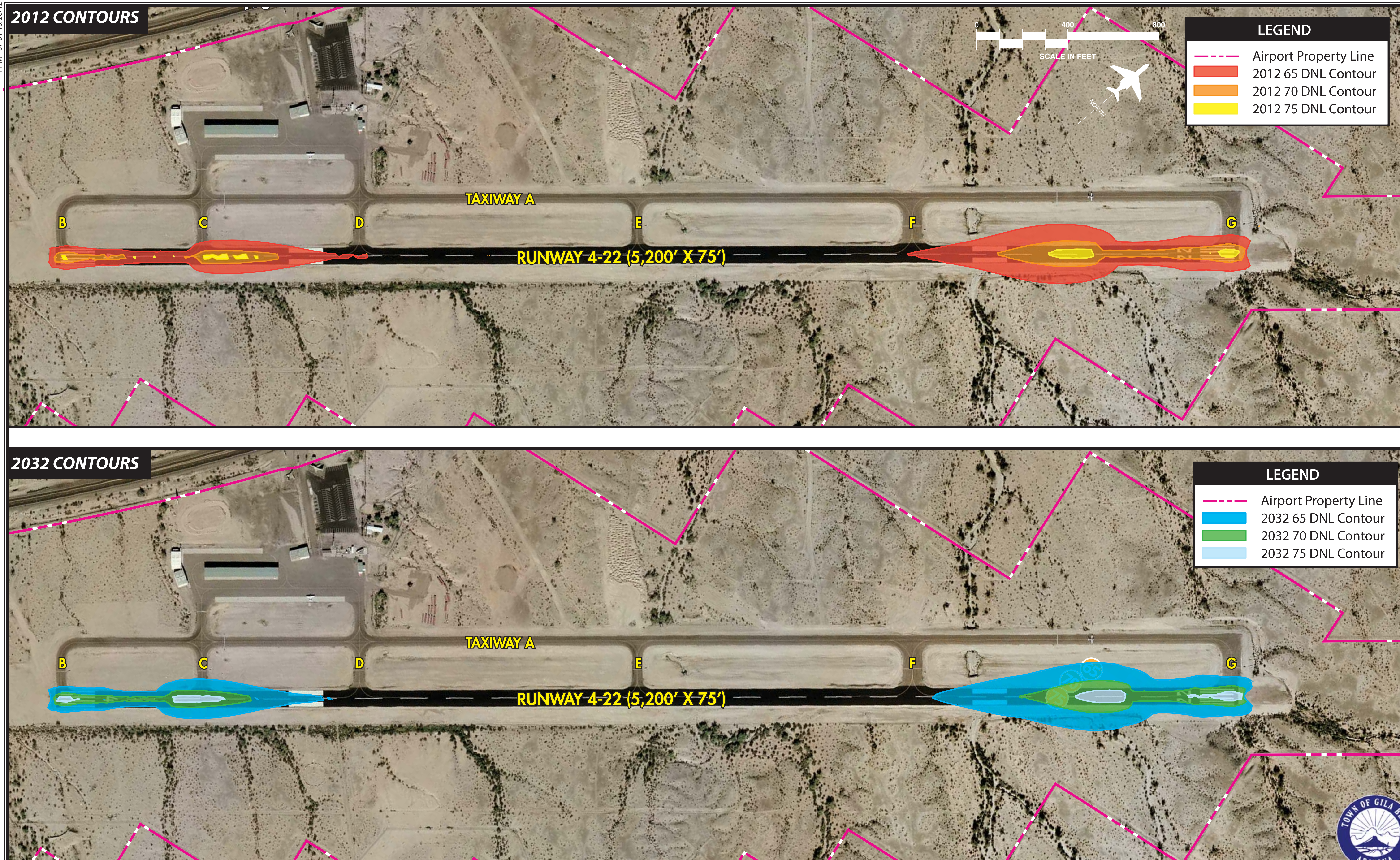


Exhibit B1
EXISTING AND FUTURE
NOISE CONTOURS

Site Restoration

- Revegetate or stabilize any disturbed land not used
- Remove unused material
- Remove soil piles via covered trucks or stockpile dirt in a protected area

In addition to the creation of dust, construction projects planned at the airport could have temporary air quality impacts due to emissions from the operation of construction vehicles and equipment. Air emissions related to construction activities, although short-term in nature, should be included in any air emission inventories required for NEPA documentation efforts. Emissions from mobile sources, including construction equipment, are also regulated by Arizona Administrative Code R18-2-804.

Construction traffic impacts occur when trucks or heavy equipment need to access the site through a residential neighborhood, other sensitive area, or on already congested streets or intersections. In the case of Gila Bend Municipal Airport, no construction traffic impacts would occur since access to the airport occurs directly via Highway 85.

Water quality concerns occur if there are storm events during the construction period. There are several southeast to northwest trending ephemeral washes that cross the airport. Drainage in the area ultimately drains into the Gila River, located approximately 3.5 miles to the north and west. Under the *Clean Water Act* (CWA), the State of Arizona has been given authority by the EPA to establish water quality standards, control discharges, and regulate other issues concerning water quality. The use of BMPs during construction is a requirement of construction-related permits such as Arizona Pollutant Discharge Elimination System (AZPDES) Construction General Permit (AZG2003-001) and is incorporated into general or project-specific storm water pollution prevention plans (SWPPPs). As previously mentioned, FAA AC 150/5371-10 also requires the implementation of BMPs to control erosion and siltation. BMPs could include temporary measures such as the use of berms, fiber mats, gravels, mulches, and slope drains.

Finally, construction-related noise at the airport is not expected to be significant since the only noise-sensitive land use in the area is the on-airport caretaker's residence.

DEPARTMENT OF TRANSPORTATION (DOT) ACT: SECTION 4(f)

Section 4(f) of the *Department of Transportation Act of 1966* (49 USC 303) protects against the loss of significant publicly owned parks and recreation areas, publicly owned wildlife and waterfowl refuges, and historic sites as a result of federally funded transportation projects. The Act states that a project that requires the "use" of such lands shall not be approved unless there is no "feasible and prudent" alternative and the project includes all possible planning to minimize harm from such use. In addition, the term "use" includes not only the physical taking of such lands, but "constructive use" of such lands. "Constructive use" of lands occurs when "a project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired" (23 CFR Part 771.135).

According to the *SR 85 at Gila Bend Draft Environmental Assessment and Section 4(f) Evaluation* (FHWA, ADOT 2009), the following Section 4(f) resources are located within the vicinity of the Gila Bend Municipal Airport as shown on **Exhibit B2**: the Gila Bend Canal; the Tucson, Cornelia, and Gila Bend Railroad; the Union Pacific Railroad (UPRR) (Gila Bend to Maricopa line); the Gila Bend Overpass; the Gila Bend Rodeo Ground; and *Recreation and Public Purpose Act* (R&PP) patented land adjacent to the airport. The following information is taken from the above referenced 2009 Section 4(f) Evaluation for SR 85.

Gila Bend Canal: This historic canal is located on the former Paloma Ranch and is managed by Southwest Agribusiness Services. The canal system was constructed between 1892 and 1893 and is approximately 35 miles long and 12 feet deep. At its closest point, the canal is located approximately 0.7 mile northwest of Runway 4-22. The canal is eligible for inclusion on the National Register of Historic Places (NRHP) under Criterion A (property or feature associated with events that have made a significant contribution to the broad patterns of our history).

Tucson, Cornelia, and Gila Bend Railroad: This railroad was constructed between July 1915 and April 1916 and was originally envisioned as a line connecting Tucson, Ajo, and Gila Bend for the purpose of carrying copper ore from Ajo. The northern junction of this railroad with the UPRR is located approximately 1.8 miles southwest of the southern end of Runway 4-22.

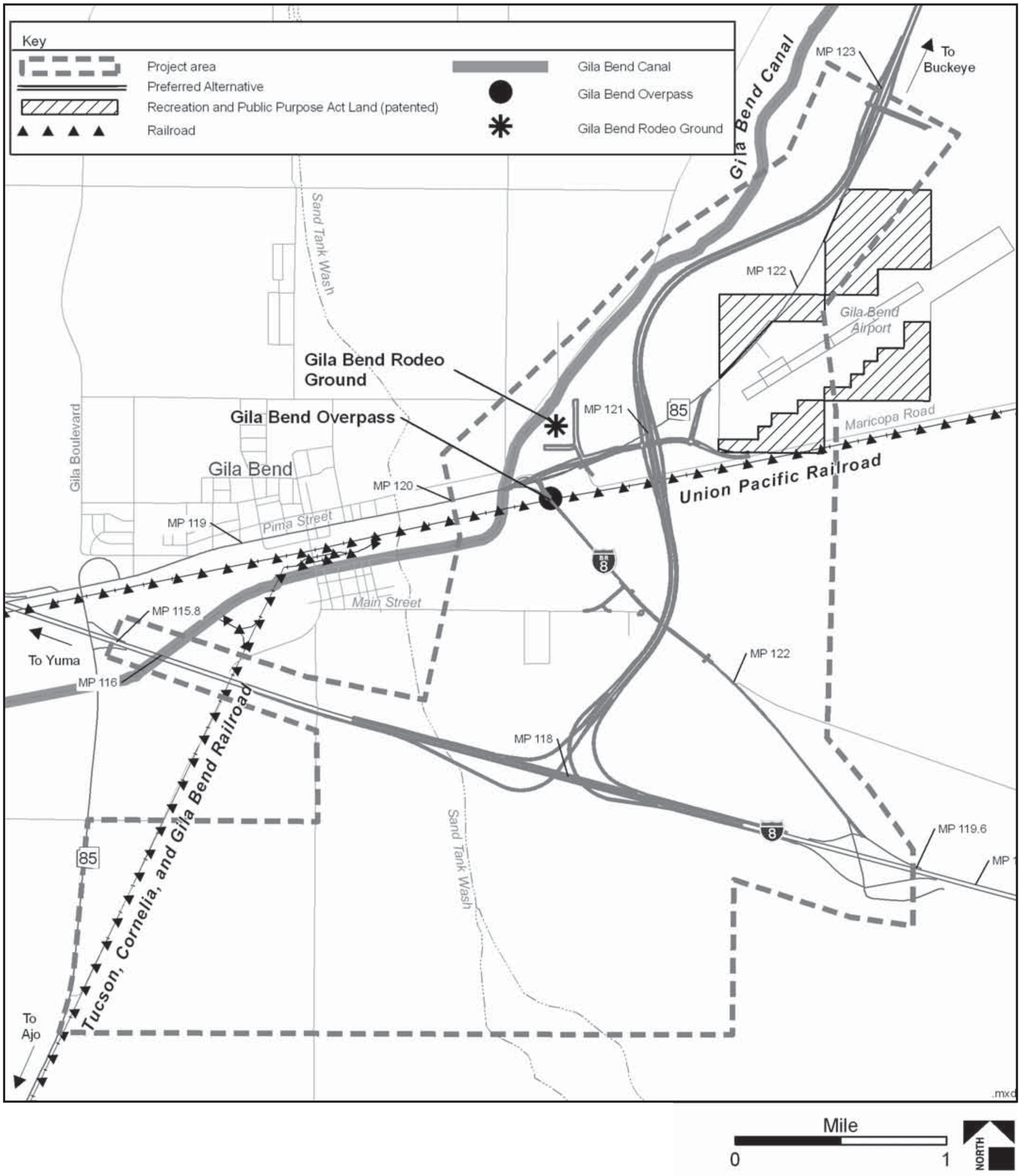
Union Pacific Railroad (Gila Bend to Maricopa line): The UPRR (also known as the Southern Pacific Railroad) was the second transcontinental railroad to be constructed in the United States and it connected Los Angeles, California, with Deming, New Mexico. Construction began in 1877 and was completed in 1881. This property is listed in the NRHP under Criterion A. The UPRR runs in a northeasterly alignment just south of Maricopa Road approximately 0.25 mile from Runway 4-22.

Gila Bend Overpass: The Gila Bend Overpass is located within the Town of Gila Bend approximately one mile from the south end of Runway 4-22. This historic bridge over the eastbound UPRR was constructed in 1934. The Gila Bend Overpass is listed in the NRHP under Criterion A and Criterion C (property or feature that embodies the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master, or that possesses high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction).

Gila Bend Rodeo Ground: The Gila Bend Rodeo Ground is located approximately one mile southwest of the southern end of Runway 4-22 on Arizona State Land Department (ASLD) land. It is a publicly owned recreation area that is managed by the Town of Gila Bend and, thus, qualifies as a Section 4(f) resource.

Recreation and Public Purpose Act Patented Land: Land located adjacent to the airport on both the northwest and southeast was entitled to Gila Bend pursuant to the R&PP of June 14, 1926 (44 Statute 741), as amended by the Act of June 4, 1954 (68 Statute 173; 43 USC 869). Since the Bureau of Land Management (BLM) granted the Town this land for municipal park purposes only, the area is considered a Section 4(f) resource. No park improve-

11MP07-B2-09/20/12



Source: FHWA, ADOT 2009. *SR 85 at Gila Bend Draft Environmental Assessment and Section 4(f) Evaluation*

Exhibit B2
SECTION 4(f) RESOURCES NEAR THE AIRPORT

ments have been constructed to date although Gila Bend has plans for recreational facilities in the area. The preferred alternative for the SR 85 project would utilize approximately 1.6 acres of the area for a Maricopa Road connection to the SR 85/Pima Street traffic interchange. The use of 1.6 acres of a Section 4(f) resource for highway improvements was found to have a *de minimis* impact on the resource (FHWA, ADOT 2009).

No direct impact to Section 4(f) land would occur as a result of the Airport Master Plan update. In addition, no constructive use of Section 4(f) lands are expected since existing and future 65 DNL noise contours would remain on the airport property. The closest Section 4(f) land to the airport is the Town of Gila Bend's R&PP lands and these have yet to actually be developed with recreational facilities; therefore, no constructive use of the lands could occur as a result of airport noise.

FARMLAND

Based on the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service's soil survey map for Maricopa County, there are three soil complexes at the airport: Growler-Momoli complex, 1 to 3 percent slopes; Gunsight-Chuckawalla complex, 1 to 15 percent slopes; and Why-Carrizon complex, 0 to 3 percent slopes. None of these soils are prime farmland; the Growler-Momoli and Why-Carrizon complexes are considered farmland of unique importance (**Exhibit B3**).[4] Unique farmland is land other than prime farmland that is used for the production of specific high value food and fiber crops.[5] However, no crop production currently occurs at the airport.

Although the USDA's Farmland Conversion Impact Rating (Form AD-1006) would need to be completed for any airport projects occurring in the unique farmland areas of the airport, it is not expected that significant impacts to farmland protected under the *Farmland Protection Policy Act* (7 USC 4201 et seq.) would occur as a result of the Airport Master Plan update. The airport is not irrigated or cultivated and the amount of unique farmland lost for any specific airport development project is likely to be minimal.

FISH, WILDLIFE, AND PLANTS

Section 7 of the *Endangered Species Act* (ESA), as amended, applies to federal agency actions and sets forth requirements for consultation to determine if a proposed action "may affect" a federally endangered or threatened species. If an agency determines that an action "may affect" a federally protected species, then Section 7(a)(2) requires the agency to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of any federally listed endangered or threatened species, or result in the destruction or adverse modification of critical habitat. If a species has been listed as a candidate species, Section 7(a)(4) states that each agency must confer with the USFWS.

[4] http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, accessed September 6, 2012.
[5] http://soils.usda.gov/technical/handbook/contents/part622.html, accessed September 7, 2012.

The *Fish and Wildlife Coordination Act* requires that agencies consult with the state wildlife agencies and the Department of the Interior concerning the conservation of wildlife resources where the water of any stream or other water body is proposed to be controlled or modified by a federal agency or any public or private agency operating under a federal permit.

The *Migratory Bird Treaty Act* (MBTA) prohibits private parties and federal agencies in certain judicial circuits from intentionally taking a migratory bird, their eggs, or nests. The MBTA prohibits activities which would harm migratory birds, their eggs, or nests unless the Secretary of the Interior authorizes such activities under a special permit.

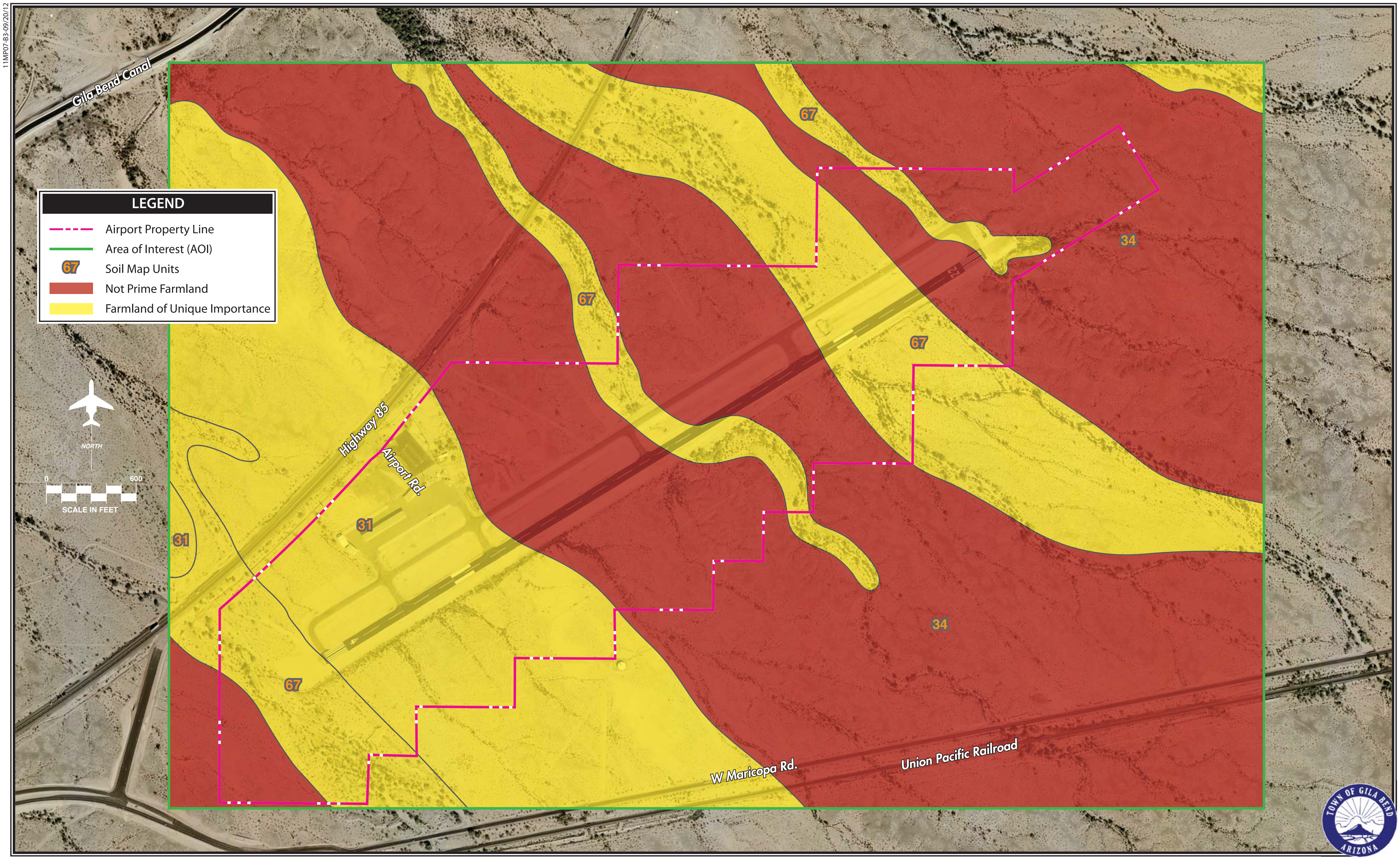
E.O. 13112, *Invasive Species*, directs federal agencies to use relevant programs and authorities, to the extent practicable and subject to available resources, to prevent the introduction of invasive species and provide for restoration of native species and habitat conditions in ecosystems that have been invaded. FAA is to identify proposed actions that may involve risks of introducing invasive species on native habitat and populations. "Introduction" is the intentional or unintentional escape, release, dissemination, or placement of a species into an ecosystem as a result of human activity. "Invasive species" are alien species whose introduction does, or is likely to, cause economic or environmental harm or harm to human health.

Finally, the *Arizona Native Plant Law* (Arizona Revised Statutes [ARS], Section 3-904) protects certain native plants classified by the Arizona Department of Agriculture (ADA). This law states that protected plants cannot be removed from any lands, including private lands, without permission and a permit from the ADA. Four categories of protected plants include: highly safeguarded, salvage restricted, salvage assessed, and harvest restricted. Some plants are in more than one category. The types of desert plants protected include various types of cacti, ocotillo, and trees like ironwood, palo verde, and mesquite.

The project area is located within the Lower Colorado River Valley subdivision of the Sonoran desertscrub biotic community (Turner and Brown 1994). This subdivision is the largest and most arid subdivision of the Sonoran Desert. Although portions of the airport are disturbed, undisturbed areas between drainages could include the following types of vegetation: creosotebush (*Larrea tidentata*), triangle-leaf bursage (*Ambrosia deltoidea*), and invasive grasses and forbs (e.g., red brome (*Bromus rubens*). Onsite drainages may contain such species as foothills paloverde (*acercidium microphyllum*), ironwood (*Olneya tesota*), and velvet mesquite (*Prosopis velutina*) (FHWA, ADOT 2009).

Table B1 identifies federally listed species for Maricopa County as published on the USFWS Arizona Ecological Service's data base, dated January 19, 2012.[6] There are currently ten endangered species, one threatened species, and five candidate species known to occur in Maricopa County. Of these species, none of the species listed as endangered or threatened are expected to occur at the airport. The airport is either beyond the known geographic or elevation range of the species, or it does not contain vegetation or landscape features known to support these species, or both.

[6] http://www.fws.gov/southwest/es/arizona/Threatened.htm#CountyList, accessed September 7, 2012.



Source: USDA, Natural Resources Conservation Service's Web Soil Survey, accessed 9/6/2012.

Exhibit B3

FARMLAND OF UNIQUE IMPORTANCE

One candidate species, the Tuscon shovel-nosed snake (*Chionactis occipitalis klauberi*), is known to occur within Sonoran desertscrub habitats. According to the Arizona Department of Game and Fish's On-line Environmental Review Tool, there are known occurrences of the Tucson shovel-nosed snake within two miles of the airport.[7] Therefore, the USFWS will need to be apprised of airport development projects per Section 7(a)(4) of the ESA and biological surveys of impact areas may be required.

TABLE B1
Threatened, Endangered, and Candidate Species
Maricopa County, Arizona

Common Name	Habitat	Status	Potential for Occurrence[1]
Arizona cliffrose	Found in rolling, limestone hills in Sonoran desertscrub, usually on white Tertiary limestone lakebed deposits high in lithium, nitrates, and magnesium.	Endangered	Unlikely to occur
California least tern	Occurs in bays and lagoons and forms breeding colonies in the adjacent open sandy beaches, dunes, or disturbed sites within their normal range; however, also documented to use open, sandy flat areas along shorelines of inland watercourses.	Endangered	Unlikely to occur
Desert pupfish	Found in shallow waters of desert springs, small streams, and marshes at elevations below 5,000 feet above mean sea level (msl).	Endangered	Unlikely to occur
Desert tortoise, Sonoran population	Found primarily in rock hillsides and bajadas of Mohave and Sonoran desertscrub. Washes and valley bottoms may be used in dispersal.	Candidate	Unlikely to occur
Gila topminnow	Occurs in small streams, springs, and cienegas at elevations below 4,500 feet msl, primarily in shallow areas with aquatic vegetation and debris for cover.	Endangered	Unlikely to occur
Lesser long-nosed bat	Found in southern Arizona from the Picacho Mountains southwesterly to the Agua Dulce Mountains and southeasterly to the Galiuro and Chiricahua mountains at elevations between 1,600 and 11,500 feet msl.	Endangered	Unlikely to occur
Mexican spotted owl	Found in mature, montane forests and woodlands and steep, shady, wooded canyons. Can also be found in mixed-conifer and pine-oak vegetation types. Generally nests in older forests of mixed conifers or ponderosa pine–Gambel oak. Nests in live trees on natural platforms (e.g., dwarf mistletoe brooms), snags, and canyon walls at elevations between 4,100 and 9,000 feet msl.	Threatened	Unlikely to occur
Razorback sucker	Found in backwaters, flooded bottomlands, pools, side channels, and other slower-moving habitats at elevations below 6,000 feet msl.	Endangered	Unlikely to occur
Roundtail Chub	Found in cool to warm water, mid-elevation streams and rivers (between 1,210 and 7,220 msl) adjacent to swifter riffles and runs. Cover is usually present and consists of large boulders, tree rootwads, submerged large trees and branches, undercut cliff walls, or deep water. Smaller chubs generally occupy shallower, low velocity water adjacent to overhead bank cover. Also inhabits large reservoirs.	Candidate	Unlikely to occur

[7] http://www.azgfd.gov/hgis/, accessed September 7, 2012.

TABLE B1 (Continued)
Threatened, Endangered, and Candidate Species
Maricopa County, Arizona

Common Name	Habitat	Status	Potential for Occurrence[1]
Sonoran pronghorn	Found in Sonoran desertscrub within broad, intermountain alluvial valleys with creosote-bursage and paloverde–mixed cacti associations at elevations between 2,000 and 4,000 feet msl.	Endangered	Unlikely to occur
Southwestern willow flycatcher	Found in dense riparian habitats along streams, rivers, and other wetlands where cottonwood, willow, boxelder, saltcedar, Russian olive, buttonbush, and arrowweed are present. Habitat occurs at elevations below 8,500 feet msl.	Endangered	Unlikely to occur
Sprague's pipit	Strong preference to native grasslands with vegetation of intermediate height and lacking woody shrubs.	Candidate	Unlikely to occur
Tucson shovel-nosed snake	Sonoran desertscrub; associated with soft, sandy soils having sparse gravel.	Candidate	May occur
Woundfin	Found in shallow, warm, turbid, fast flowing rivers at elevations below 4,500 feet msl.	Endangered	Unlikely to occur
Yellow-billed cuckoo	Typically found in riparian woodland vegetation (cottonwood, willow, or saltcedar) at elevations below 6,600 feet msl. Dense understory foliage appears to be an important factor in nest site selection.	Candidate	Unlikely to occur
Yuma clapper rail	In Arizona, found at elevations below 4,500 feet msl in freshwater marshes often dominated by cattails, bulrushes, and sedges.	Endangered	Unlikely to occur

Source: USFWS, Arizona Ecological Services, dated January 19, 2012. Available at: http://www.fws.gov/southwest/es/arizona/Threatened.htm#CountyList, accessed September 7, 2012.

[1] Resource is "unlikely to occur" if the airport is either beyond the known geographic or elevation range of the species, or it does not contain vegetation or landscape features known to support these species, or both.

Migratory birds protected under the MBTA may or may not be present at the airport. If birds protected under the MBTA are identified at the airport and ground disturbance is planned during the nesting period for such birds, a certified biologist should conduct pre-construction surveys for the presence of the protected nesting bird species within 500 feet of the construction areas. If active nests are found, further coordination with the USFWS to address the requirements of the MBTA should occur.

No invasive species are likely to be introduced into native habitats as a result of airport development projects. The ADA "Notice of Intent to Clear Land" form will be required if the construction of airport projects requires the removal of any protected plants, for example, saguaro cacti. It is recommended that this form be completed and submitted to the ADA at least 60 days prior to vegetation-removal activities, in accordance with the *Arizona Native Plant Law*. If native plants will be salvaged and replanted in the project area, then the applicant needs to include this information with the "Notice of Intent to Clear Land" form at the time of its submittal and request salvage permits.

FLOODPLAINS

As defined in FAA Order 1050.1E, agencies are required to "make a finding that there is no practicable alternative before taking action that would encroach on a base floodplain based on a 100-year flood." E.O. 11988, *Floodplain Management,* directs federal agencies 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 the floodplains. Natural and beneficial values of floodplains include providing ground water recharge, water quality and maintenance, fish, wildlife and plants, open space, natural beauty, outdoor recreation, agriculture, and forestry. FAA Order 1050.1E (9.2b) indicates that "if the proposed action and reasonable alternatives are not within the limits of, or if applicable, the buffers of a base floodplain, a statement to that effect should be made"; no further analysis is necessary. The limits of base floodplains are determined by Flood Insurance Rate Maps (FIRMs) prepared by the Federal Emergency Management Agency (FEMA).

According to FIRM No. 04013C3485, the airport is located within Zone X, Other Flood Areas. This area is defined as areas of 0.2% chance flood (i.e., the 500-year flood); areas of 1% (i.e., the 100-year flood) with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees for 1% annual chance flood.[8]

No airport development projects are proposed within a 100-year Special Flood Hazard Area. Therefore, the Airport Master Plan update is consistent with FAA Order 1050.1E and E.O. 11988; no impacts related to floodplains would occur. Potential impacts to "waters of the U.S." are discussed in the section on Wetlands and Waters of the U.S.

HAZARDOUS MATERIALS, POLLUTION PREVENTION, AND SOLID WASTE

There are four primary federal laws that govern the handling and disposal of hazardous materials, chemicals, substances, and wastes, all of which fall under the jurisdiction of the U.S. EPA. 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 Response, Compensation, and 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. Other laws include the *Hazardous Materials Transportation Act*, which regulates the handling and transport of hazardous materials and wastes, and the *Toxic Substances Control Act* (TSCA), which regulates and controls the use of polychlorinated biphenyls (PCBs) as well as other chemicals or toxic substances in commercial use.

[8] http://map1.msc.fema.gov/idms/IntraView.cgi?ROT=0&O_X=7204&O_Y=5179&O_ZM=0.069511&O_SX=1001&O_SY=720&O_DPI=400&O_TH=56444405&O_EN=56444405&O_PG=1&O_MP=1&CT=0&DI=0&WD=14408&HT=10358&JX=1259&JY=780&MPT=56533212&MPS=1&ACT=0&KEY=56387018&ITEM=1&MKMPT=PDF, accessed September 7, 2012.

Per FAA Order 1050.1E, Appendix A, thresholds of significance are typically only reached when a resource agency 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).

According to the EPA's Enviromapper EJView Tool, there are no Superfund or NPL sites, or businesses that report to the EPA regarding the handling or disposal of hazardous materials under RCRA or ACRES (Assessment, Cleanup and Redevelopment Exchange System) located at the Gila Bend Municipal Airport.[9] The closest RCRA site is over one mile away along S. Butterfield Trail.

Construction of airport development projects would result in earthwork disturbances. Some areas planned to be disturbed are currently undeveloped and in a natural state. Other projects would involve the reuse of paved or graded areas. In any case, previous construction at the airport has not resulted in the uncovering of hazardous materials; therefore, it is unlikely that future airport development projects would do so. Future airport operations occurring as part of the Airport Master Plan update could involve the use of additional hazardous materials at the airport. Airport facilities and businesses would be required to comply with all applicable laws and permitting requirements.

Pollution prevention at the airport is regulated through several laws including the hazardous materials regulations cited above and an AZPDES Multi-sector General Action permit (Non-mining) (AZMSG2010-02). In addition, as discussed further in the Construction Impacts and Water Quality sections, water quality concerns are regulated under the CWA. The use of BMPs during construction is a requirement of construction-related permits such as AZPDES Construction General Permit (AZG2003-001) and is incorporated into general and/or project-specific SWPPPs.

Finally, the closest landfill to the airport is the Southwest Regional Landfill at 24427 S. Highway 85 in Buckeye, Arizona. The creation of additional solid waste is likely to occur as a result of future airport growth, but is not expected to cause significant impacts to the capacity of the landfill.

HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Historical, architectural, and archaeological resources as well as Native American cultural resources are protected by several different federal laws including, but not limited to, the *Archaeological Resources Protection Act* (ARPA) *of 1979*, the *National Historic Preservation Act of 1966*, and the *Native American Graves Protection & Repatriation Act*. In particular, Section 106 of the *National Historic Preservation Act* requires the FAA to consider the effects of proposed actions on sites listed on, eligible for listing on, or potentially eligible for listing on, the NRHP. To assist with this determination, an area of potential effect (APE) is

[9] http://epamap14.epa.gov/ejmap/ejmap.aspx?wherestr=1500%20N.%20Highway%2085%2C%20Gila%20Bend%2C%20AZ , accessed September 7, 2012.

defined in consultation with the State Historic Preservation Officer (SHPO). The APE includes the areas that will be directly or indirectly impacted by proposed actions. Once the APE is defined, an inventory is taken of NRHP-eligible properties within the APE and an assessment of impacts is undertaken. The determination regarding significant impacts on protected resources occurs in consultation with the SHPO as well.

Unless the airport property has already been surveyed for cultural resources, impacts could occur if potentially eligible cultural resources are disturbed. Therefore, prior to implementation of planned improvements, a cultural resources records search would be necessary. Projects identified on the recommended development concept plan for the airport that would occur in previously undisturbed and unsurveyed areas of the airport are likely to require a field survey as well. Impacts may occur when the proposed project causes an adverse effect on a property which has been identified (or is unearthed during construction) as having historical, architectural, archaeological, or cultural significance.

LIGHT EMISSIONS AND VISUAL EFFECTS

Airport lighting is characterized as either airfield lighting (i.e., runway, taxiway, approach and landing lights) or landside lighting (i.e., security lights, building interior lighting, parking lights, and signage). In the case of Gila Bend Municipal Airport, the following airfield lighting is in place:

- A rotating beacon that projects two beams of light, one white and one green, 180 degrees apart, located adjacent to parking lot for the terminal building;
- Medium intensity runway lighting (MIRL) on Runway 4-22;
- Medium intensity taxiway lighting (MITL);
- Precision approach path indicator lights (PAPI-2L) located on either side of Runway 4-22;
- A lighted wind cone located on the southeast side of Runway 4; and
- Lighted airfield signs located throughout the airfield system.

All airfield lighting systems at the airport are controlled through a pilot-controlled lighting system (PCL) which allows the pilot to turn on, or increase the intensity of, various airfield systems from the aircraft using the aircraft's transmitter. Limited security and building lights are also present landside.

Visual and lighting impacts relate primarily to the presence of sensitive visual receptors in proximity to the airport. These would normally be residents or users of a designated scenic resource such as a scenic corridor. The visual sight of aircraft, aircraft contrails, or aircraft or airport lighting, especially from a distance that is not normally intrusive, is not assumed to be an adverse impact.

FAA significance thresholds for light emissions are generally when an action's light emissions create an annoyance that would interfere with normal activities. For example, if a high intensity strobe light, such as a runway end identifier lighting (REIL) system, would produce glare on any adjoining site, particularly residential uses, this could constitute a significant adverse impact. For visual effects, an action is considered significant when consultation with federal, state, or local agencies, tribes, or the public shows that visual effects contrast with the existing environments and the agencies state the effect is objectionable.

Gila Bend Municipal Airport is surrounded by undeveloped open space on all sides with long-range views of the Sand Tank and Sauceda Mountains to the south, the Maricopa Mountains to the east, and the Gila Bend Mountains to the west; there are no sensitive visual receptors or designated scenic corridors located near to the airport.[10] Proposed airport long-term development projects under the Airport Master Plan update include the construction of additional holding aprons at each end of the runway, additional hangars, terminal area, and vehicle parking, the strengthening of airfield pavement, installation of a water line, and the eventual installation of an Automated Weather Observation System (AWOS). New airfield lighting proposed as part of the Airport Master Plan update includes a REIL system (two synchronized flashing lights located laterally on each side of the runway threshold) facing the approaching aircraft.

Additional lighting related to REILs, new holding aprons, AWOS, and hangars are not expected to noticeably change the night appearance of the airport from a distance. Visually, the airport will continue to maintain its appearance as a general aviation airport.

NATURAL RESOURCES AND ENERGY

The FAA considers an action to have a significant impact on natural resources and energy when an action's construction, operation, or maintenance would cause demands that exceed available or future (project year) natural resource or energy supplies. Therefore, in instances when proposed actions necessitate the expansion of utilities, power companies or other suppliers of natural resources and energy would need to be contacted to determine if the proposed project demands can be met by existing or planned facilities.

The use of energy and natural resources would occur both during construction of planned facilities and during operation of the airport as it grows. However, none of the planned development projects at the airport are anticipated to result in significant increases in the demand for natural resources or energy consumption beyond what is readily available by service providers.

SECONDARY (INDUCED) IMPACTS

FAA Order 1050.1E, Appendix A, states that secondary impacts should be addressed when the proposed project is a major development proposal that could involve shifts in patterns of population movement and growth, public service demands, and changes in business and economic activity due to airport development. As stated in the Airport Master Plan update, the primary purpose of the update is to "provide a clear vision of necessary airport improvements over the next 20 years."

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[10] http://www.maricopa.gov/planning/Resources/Plans/ScenicCorridor.aspx, accessed September 10, 2012.

Based on the forecast analysis summarized in Exhibit 2H of this Airport Master Plan update, the airport is expected to have a growth in annual operations of approximately three percent through the year 2032; annual growth in based aircraft is expected to be less than one additional aircraft per year. This amount of annual growth at the airport for the next 20+ years would not be expected to result in secondary impacts on the Town of Gila Bend.

SOCIOECONOMIC IMPACTS, ENVIRONMENTAL JUSTICE, AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

Socioeconomic impacts known to result from airport improvements are often associated with relocation activities or other community disruptions, including alterations to surface transportation patterns, division or disruption of existing communities, interferences with orderly planned development, or an appreciable change in employment related to the project. Social impacts are generally evaluated based on areas of acquisition and/or areas of significant project impact, such as areas encompassed by noise levels in excess of 65 DNL.

Per FAA Order 1050.1E, Appendix A, the thresholds of significance for this impact category are reached if the project negatively affects a disproportionately high number of minority or low-income populations or if children would be exposed to a disproportionate number of health and safety risks. E.O. 12898, *Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations,* and the accompanying Presidential Memorandum, and DOT Order 5610.2, *Environmental Justice*, require FAA to provide for meaningful public involvement by minority and low-income populations as well as analysis that identifies and addresses potential impacts on these populations that may be disproportionately high and adverse.

Pursuant to E.O. 13045, *Protection of Children from Environmental Health Risks and Safety Risks,* federal agencies are directed to identify and assess environmental health and safety risks that may disproportionately affect children. These risks include those that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products to which they may be exposed.

The acquisition of residences and farmland is required to conform with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* (Uniform Act). These regulations mandate that certain relocation assistance services be made available to homeowners/tenants of affected properties. This assistance includes help finding comparable and decent substitute housing for the same cost, moving expenses, and in some cases, loss of income.

The U.S. Census taken in 2010 provides information regarding socioeconomic conditions in the Gila Bend area. General population and employment data are discussed in Chapter One of the Airport Master Plan update. The percentage of minority populations by block group and persons living below the poverty level by census tracts that include, or are near, the airport are shown on **Exhibit B4**. Approximately 72 percent of the population in the block group that contains the airport is from minority groups; approximately 37 percent of the households in the same census tract as the airport are below the poverty rate.

However, since the Airport Master Plan update does not involve expanding airport operations beyond the existing airport boundaries, no relocation of housing or businesses would be necessary to implement the recommended development concept plan. Existing communities, transportation patterns, and planned development would not be disrupted. The airport's projected three percent annual growth for the next 20+ years would not significantly change future growth in the Gila Bend area or have disproportionate adverse impacts on minority or low-income populations or on children.

WATER QUALITY

As discussed previously, water quality in Arizona is monitored and protected by the U.S. EPA and the Arizona Department of Environmental Quality (ADEQ) under the authority of the CWA and the AZPDES permitting process. The airport is located within the Lower Gila-Painted Rock watershed (Subwatershed HUC 12, Gila Bend Municipal Airport Area). The closest CWA Section 303(d) Impaired Water to the airport is the Painted Rock Reservoir, which is listed for pesticides contamination.[11]

An updated AZPDES Multi-sector General Action non-mining permit (AZMSG2010-02) became effective in 2011. This is one large permit divided into numerous separate sectors and is designed for discharges of storm water from certain industrial sites that are of a non-construction nature. Each sector represents a different type of activity and is dependent upon its Standard Industrial Classification (SIC) code or narrative description. Airports are classified as a Sector S industry by the ADEQ.

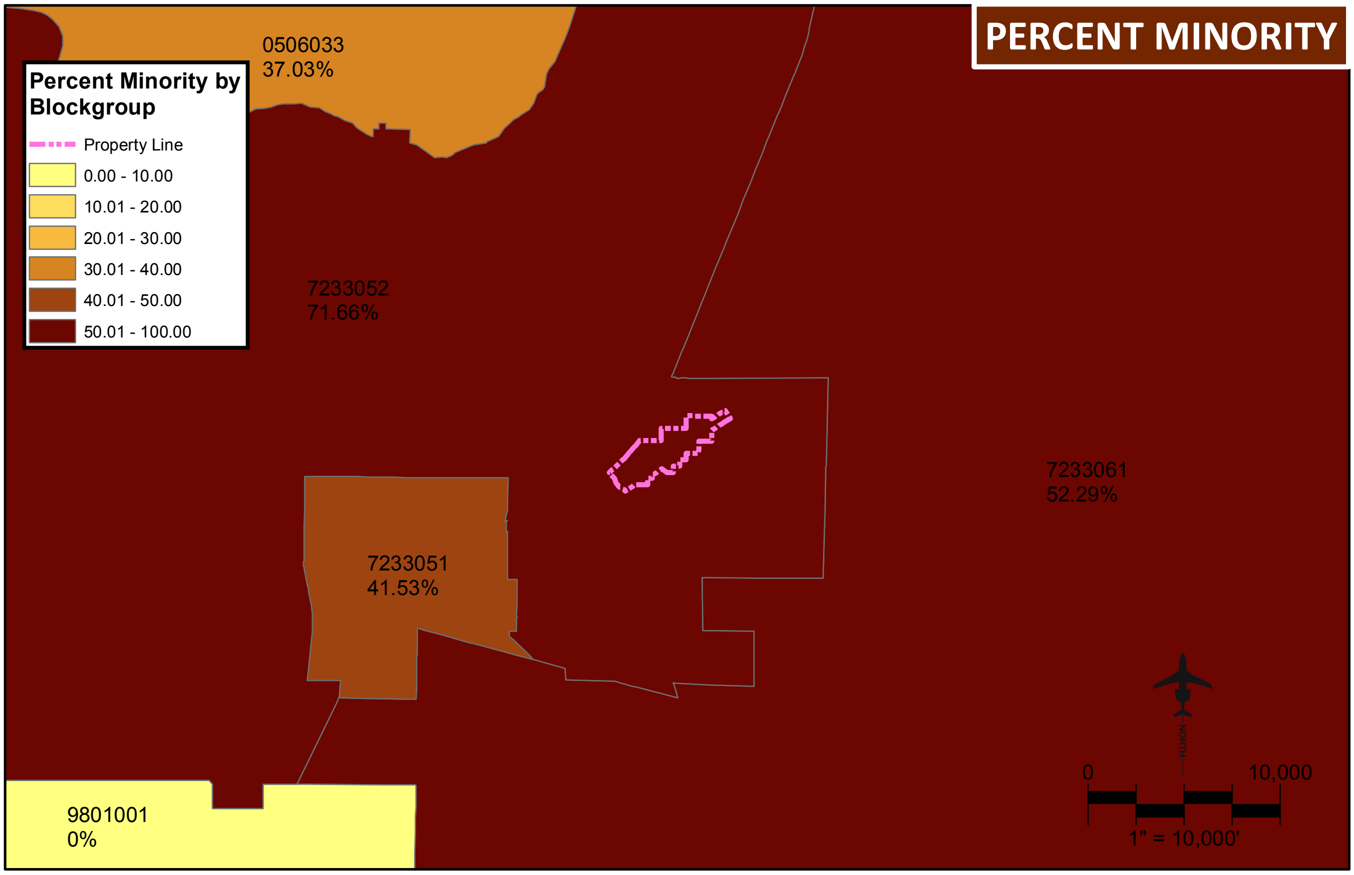
Future development projects of the Airport Master Plan update should be evaluated to address their interface with the airport's storm water drainage system and should be incorporated into a SWPPP. The construction and maintenance of additional storm water drainage features would be required, as necessary, to limit the potential for storm water runoff to cross exposed, sloping areas, and to control the release of storm water. Conditions of the AZMSG permit would be applicable to all new development at the airport.

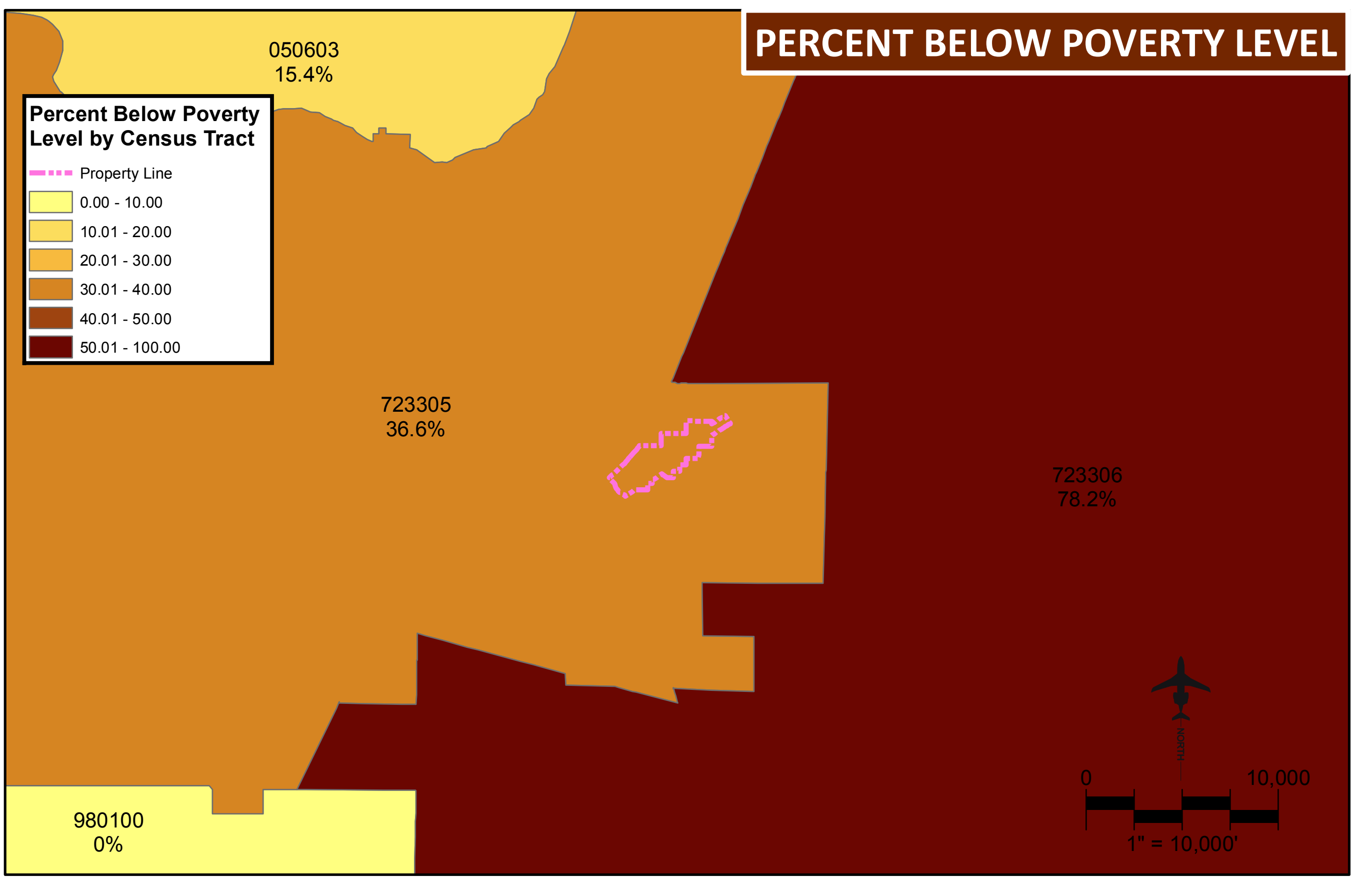
Short-term water quality issues related to construction of airport development projects have been discussed in the section on Construction Impacts.

WETLANDS AND WATERS OF THE U.S.

Certain drainages (both natural and human-made) come under the purview of the U.S. Army Corps of Engineers (USACE) under Section 404 of the CWA; wetlands are also protected. There are no aquatic features or hydric soils present at the airport that would indicate

[11] http://watersgeo.epa.gov/mwm/, accessed September 10, 2012.





Source: Blockgroup shapefile and Census data for Minority Map are from 2010 Census.
Census Tract shapefile and Census data for Poverty Map are from 2010 Census.

Exhibit B4

MINORITY AND LOW INCOME POPULATIONS

the potential for wetland habitat.[12, 13] However, there are several ephemeral, unnamed washes that traverse the airport property from southeast to northwest. Some fill may be required within these drainages for implementation of the Airport Master Plan update. It is expected that the USACE would allow these additional impacts under Nationwide Permit (NWP) 39 of the CWA, as long as the area of impact is less than ½ acre or 300 linear feet of stream bed. This assumption would need to be confirmed with the USACE at the time that the projects move forward. Jurisdictional delineations would be required at that time.

WILD AND SCENIC RIVERS

The State of Arizona has two designated Wild and Scenic Rivers: Verde River and Fossil Creek. The Verde River is approximately 125 miles to the northeast of Gila Bend Municipal Airport; Fossil Creek is even farther. The airport is located in a separate drainage basin and separated from these resources by several mountain ranges. Thus, no impacts to designated Wild and Scenic Rivers would occur as a result of proposed airport development.

CONCLUSION

Table B2 summarizes the environmental evaluation for the proposed Airport Master Plan update for Gila Bend Municipal Airport. In general, the recommended development plan would provide for an additional three percent annual growth at the airport through the year 2032.

Environmental sensitivities at the airport that should be considered include the presence of ephemeral washes that are likely to be considered "waters of the U.S." and native plants protected under the *Arizona Native Plant Law*. Other environmental sensitivities potentially present at the airport are: candidate species for the ESA; migratory birds protected under the MBTA; and cultural resources.

REFERENCES

FHWA (Federal Highway Administration), ADOT (Arizona Department of Transportation), 2009. *SR 85 at Gila Bend Draft Environmental Assessment and Section 4(f) Evaluation*, August.

Turner, R. M., and D. E. Brown. 1994. Sonoran Desertscrub. In *Biotic Communities: Southwestern United States and Northwestern Mexico*, edited by D. E. Brown, 181–221. University of Utah Press, Salt Lake City, Utah.

[12] http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, accessed September 6, 2012.
[13] http://watersgeo.epa.gov/mwm/, accessed September 10, 2012.

TABLE B2
Summary of Potential Environmental Concerns
Gila Bend Municipal Airport Master Plan Update

FAA Resource Category	Potential Concern	Mitigation Measures
Air Quality	None. Gila Bend is in an attainment area for all NAAQS and the airport's projected growth forecast is below NEPA levels for requiring an air emissions inventory.	None necessary.
Coastal Resources	None. Gila Bend Municipal Airport is not located within the Coastal Zone.	None necessary.
Compatible Land Use/Noise	None. The airport is the pre-existing land use and no noise-sensitive land use is located within the 65 DNL. There are no nearby features that would pose a threat to safe aircraft.	None necessary.
Construction Impacts	BMPs would be incorporated to minimize dust, emissions, and water quality concerns. Construction should be limited to normal daytime hours. All construction site access would occur via the airport access road to Highway 85.	None necessary.
DOT Act: Section 4(f)	None. No use, including "constructive" use, is anticipated to occur to potential Section 4(f) resources.	None necessary.
Farmland	None. There is no prime farmland or farmland of state or local importance located at the airport. Unique farmland at the airport is not irrigated or under cultivation.	None necessary.
Fish, Wildlife, and Plants	There are no federally listed species known to occur at the airport. One candidate species for ESA protection, MBTA-protected bird species, and native plants protected under the *Arizona Native Plant Law* may be present.	USFWS and other agencies with expertise in protected species should be contacted as airport development occurs. Additional biological surveys may be necessary. If the Tucson shovel-nosed snake becomes officially listed and is present at the airport, formal Section 7 consultation with the USFWS may be required.
Floodplains	None. No airport development projects are proposed within a 100-year Special Flood Hazard Area.	None necessary.
Hazardous Materials, Pollution Prevention, and Solid Waste	None. Prior construction at the airport has not resulted in the uncovering of any hazardous materials and future use of hazardous materials would be required to comply with all applicable laws and permitting requirements. The airport also operates under an AZPDES permit. No issues with solid waste disposal are expected.	None necessary.

TABLE B2 (Continued)
Summary of Potential Environmental Concerns
Gila Bend Municipal Airport Master Plan Update

FAA Resource Category	Potential Concern	Mitigation Measures
Historic, Architectural, Archaeological, and Cultural Resources	Unless the airport property has already been surveyed for cultural resources, impacts may occur if potentially eligible cultural resources are disturbed by airport development projects.	Prior to implementation of planned improvements, a cultural resources records search would be necessary. Projects identified on the recommended development concept plan that would occur in previously undisturbed and unsurveyed areas are likely to require a field survey.
Light Emissions and Visual Effects	None. Additional lighting related to the new hangars and other improvements are not expected to noticeably change the night appearance of the airport. Visually, the airport will continue to maintain its appearance as a general aviation airport.	None necessary.
Natural Resources and Energy	None. Planned development projects at the airport are not anticipated to result in a demand for natural resources or energy consumption beyond what is available by service providers.	None necessary.
Secondary (Induced) Impacts	None. An annual three percent growth at the airport for the next 20+ years would not be expected to result in secondary impacts on the Town of Gila Bend.	None necessary.
Socioeconomic Impacts, Env. Justice, and Children's Env. Health and Safety Risks	No long-term socioeconomic impacts are expected. The Airport Master Plan update does not involve expanding airport operations beyond the existing airport boundaries.	None necessary.
Water Quality	Future development projects of the Airport Master Plan update should be evaluated to address their interface with the airport's storm water drainage system and should be incorporated into an SWPPP. Conditions of the AZMSG2010-02 permit would be applicable to all new development at the airport.	The construction and maintenance of additional storm water drainage features would be required, as necessary, to limit the potential for storm water runoff to cross exposed, sloping areas, and to control the release of storm water.
Wetlands and Waters of the U.S.	Projects may involve fill within jurisdictional waters; a project-specific or nationwide permit may be applicable, depending on the extent of the disturbance.	Jurisdictional delineations would be required for projects proposed within onsite drainages.
Wild and Scenic Rivers	None. The airport is located in a separate drainage basin from the closest designated Wild and Scenic Rivers.	None necessary.

APPENDIX C

AIRPORT LAYOUT DRAWINGS

GILA BEND MUNICIPAL AIRPORT

AIRPORT MASTER PLAN

AIRPORT LAYOUT PLAN SET

INDEX OF DRAWINGS

PREPARED FOR THE
TOWN OF GILA BEND

Coffman Associates
Airport Consultants
www.coffmanassociates.com

Coffman Associates 00 ELOY COV.DWG 04/22/2014

RUNWAY DATA	RUNWAY 4-22			
	EXISTING		ULTIMATE	
	4	22	4	22
AIRCRAFT APPROACH CATEGORY-DESIGN GROUP	B-II		B-II	
FAR PART 77 CATEGORY	VISUAL	VISUAL	SAME	NON-PREC
APPROACH VISIBILITY MINIMUMS	+1 Mile	+1 Mile	SAME	SAME
DESIGN CRITICAL AIRCRAFT	KING AIR 200		SUPER KING AIR	
WINGSPAN OF DESIGN AIRCRAFT	45.9'		54.5'	
UNDERCARRIAGE WIDTH OF DESIGN AIRCRAFT	14.6'		SAME	
APPROACH SPEED (KNOTS) OF DESIGN AIRCRAFT	103		110	
MAXIMUM CERTIFIED TAKEOFF WEIGHT (LBS) OF DESIGN AIRCRAFT	12,500		15,000	
RUNWAY EFFECTIVE GRADIENT	0.3%		SAME	
RUNWAY MAXIMUM GRADIENT	0.4%		SAME	
PAVEMENT DESIGN STRENGTH (in thousand lbs.)[1]	12.5(S)		30(S)/ 60(D)	
APPROACH SLOPE	20:1	20:1	SAME	34:1
RUNWAY END ELEVATION (MSL)	774.2'	788.7'	SAME	SAME
RUNWAY TOUCHDOWN ZONE ELEVATION (MSL)	782.0'	788.7'	SAME	SAME
RUNWAY HIGH POINT ELEVATION (MSL)	788.7'		SAME	
RUNWAY LOW POINT ELEVATION (MSL)	774.2'		SAME	
LINE OF SIGHT REQUIREMENT MET	YES		SAME	
RUNWAY LENGTH	5200'		SAME	
RUNWAY WIDTH	75'		SAME	
RUNWAY BEARING (TRUE)	57.51°	237.52°	SAME	SAME
RUNWAY SAFETY AREA LENGTH BEYOND STOP END OF RUNWAY	300'	300'	SAME	SAME
RUNWAY SAFETY AREA WIDTH	150'		SAME	
RUNWAY OBJECT FREE AREA LENGTH BEYOND STOP END OF RUNWAY	300'	300'	SAME	SAME
RUNWAY OBJECT FREE AREA WIDTH	500'		SAME	
RUNWAY OBSTACLE FREE ZONE LENGTH BEYOND RUNWAY END	200'	200'	SAME	SAME
RUNWAY OBSTACLE FREE ZONE WIDTH	250'		400'	
DISTANCE FROM RUNWAY CENTERLINE TO HOLD BARS AND SIGNS	125'		200'	
RUNWAY MARKING	NP	NP	SAME	SAME
STANDARD SEPARATION - RUNWAY CL TO PARALLEL TAXIWAY CL	240'		SAME	
STANDARD SEPARATION - TAXIWAY CL TO FIXED OR MOVABLE OBJECT	65.5'		SAME	
RUNWAY SURFACE/PAVEMENT MATERIAL	Asphalt		SAME	
RUNWAY PAVEMENT SURFACE TREATMENT	None		SAME	
RUNWAY LIGHTING	MIRL		MIRL	
TAXIWAY WIDTH	35'		SAME	
TAXIWAY SURFACE MATERIAL	Asphalt		SAME	
TAXIWAY OBJECT FREE AREA WIDTH	131'		SAME	
TAXIWAY SAFETY AREA WIDTH	79'		SAME	
TAXIWAY WINGTIP CLEARANCE	26'		SAME	
TAXIWAY MARKING	Centerline		SAME	
TAXIWAY LIGHTING	MITL		SAME	
RUNWAY NAVIGATIONAL AIDS	PAPI 2		GPS/PAPI 2	
RUNWAY VISUAL AIDS	Airport Beacon Segmented Circle Wind Cone		SAME SAME SAME	

[1]Pavement strengths are expressed in Single(S), Dual(D), and Dual Tandem (DT) wheel loading capacities.

DEVIATIONS FROM FAA AIRPORT DESIGN STANDARDS

DEVIATION DESCRIPTION	EFFECTED DESIGN STANDARD	STANDARD	EXISTING	PROPOSED DISPOSITION
Distance from Runway Centerline to Hold Bars and Signs	AC 150/5300-13A	200'	125'	Relocate Hold Bars and Signs

AIRPORT DATA

GILA BEND MUNICIPAL AIRPORT (E63)

OWNER: GILA BEND, ARIZONA	AIRPORT NPIAS CODE: GA
CITY: GILA BEND, ARIZONA	COUNTY: MARICOPA
RANGE: R 20 W	TOWNSHIP: T 14 N

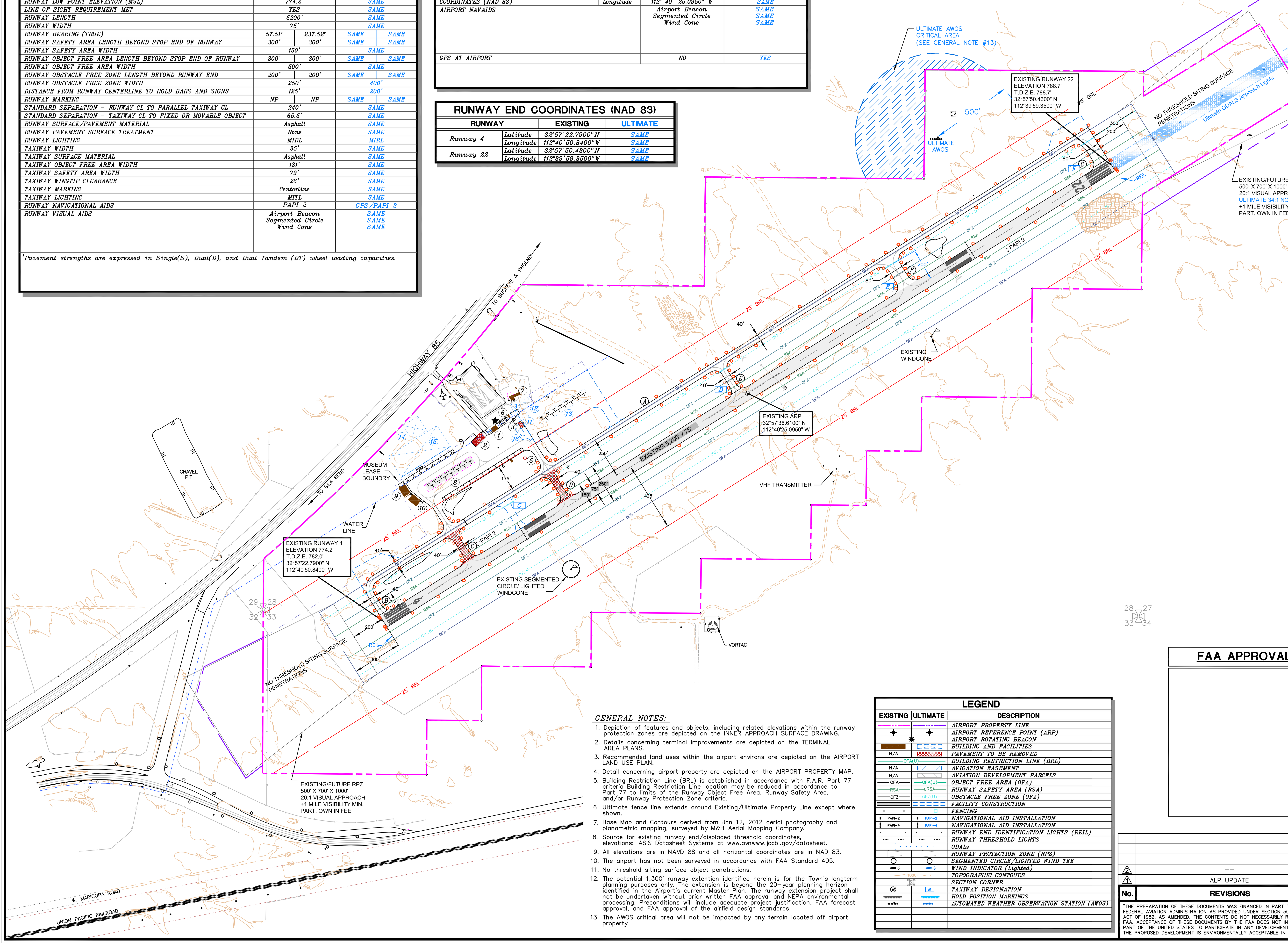
		EXISTING	ULTIMATE
AIRPORT REFERENCE CODE		B-II	SAME
AIRPORT ELEVATION (MSL)		788.7'	SAME
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		108.0° F JULY	SAME
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	Latitude	32° 57' 36.6100" N	SAME
	Longitude	112° 40' 25.0950" W	SAME
AIRPORT NAVAIDS		Airport Beacon Segmented Circle Wind Cone	SAME SAME SAME
GPS AT AIRPORT		NO	YES

RUNWAY END COORDINATES (NAD 83)

RUNWAY		EXISTING	ULTIMATE
Runway 4	Latitude	32°57'22.7900"N	SAME
	Longitude	112°40'50.8400"W	SAME
Runway 22	Latitude	32°57'50.4300"N	SAME
	Longitude	112°39'59.3500"W	SAME

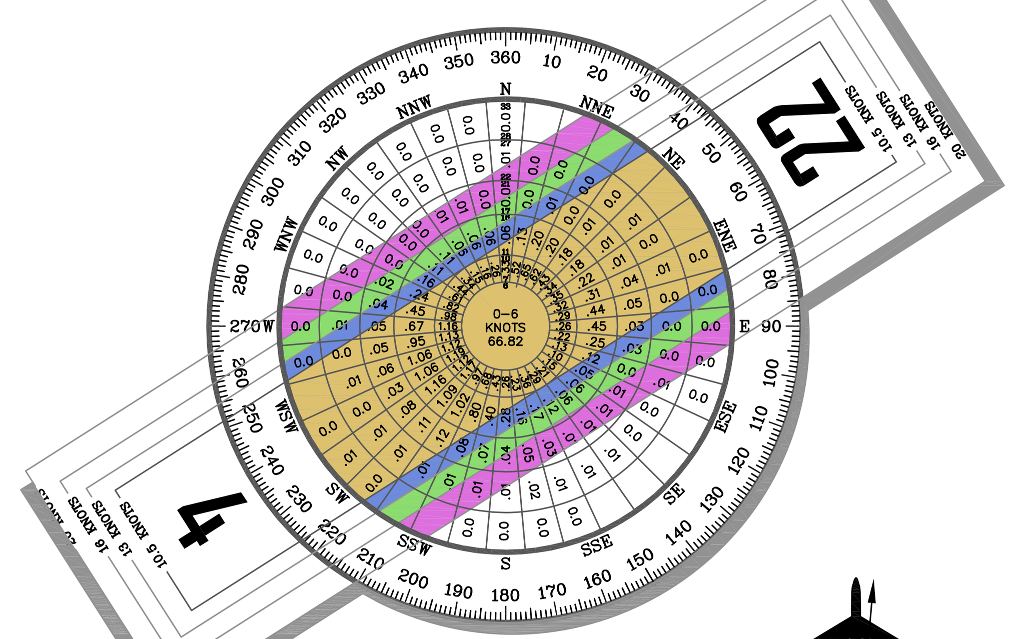
BUILDINGS/FACILITIES

EXISTING	ULTIMATE	DESCRIPTION	ELEV.
1	1	TERMINAL BUILDING	785.0'
2		BOX HANGAR (TO BE REMOVED)	786.6'
3	3	T-HANGAR (TO BE RELOCATED)	784.2'
~~4~~		~~AVIATION FUEL PAD (TO BE REMOVED)~~	~~NA~~
5		GAZEBO (TO BE REMOVED)	1526.0'
6		AUTO PARKING	NA
7		CARETAKER'S RESIDENCE	781.8'
8		SHADE CANOPY	794.3'
9		BOX HANGAR	788.0'
10		BOX HANGAR	788.8'
	11	AIRCRAFT WASHRACK	NA
	12	BOX HANGAR	±786.0'
	13	SHADE CANOPY	±794.0'
	14	MUSEUM HANGAR	±800.0'
	15	MUSEUM HANGAR	±800.0''
	16	FUEL FARM	0'



ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 4-22	97.49%	98.88%	99.71%	99.91%



SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Gila Bend AAF, 2000-2008;
Gila Bend Municipal Airport, 2011
Gila Bend, Arizona

OBSERVATIONS:
34159 All Weather Observations
2000-2008, 2011

NORTH

Magnetic Declination
11° 0' East (May 2013)
Annual Rate of Change
00° 06' West (May 2013)

GENERAL NOTES:

1. Depiction of features and objects, including related elevations within the runway protection zones are depicted on the INNER APPROACH SURFACE DRAWING.
2. Details concerning terminal improvements are depicted on the TERMINAL AREA PLANS.
3. Recommended land uses within the airport environs are depicted on the AIRPORT LAND USE PLAN.
4. Detail concerning airport property are depicted on the AIRPORT PROPERTY MAP.
5. Building Restriction Line (BRL) is established in accordance with F.A.R. Part 77 criteria Building Restriction Line location may be reduced in accordance to Part 77 to limits of the Runway Object Free Area, Runway Safety Area, and/or Runway Protection Zone criteria.
6. Ultimate fence line extends around Existing/Ultimate Property Line except where shown.
7. Base Map and Contours derived from Jan 12, 2012 aerial photography and planametric mapping, surveyed by M&B Aerial Mapping Company.
8. Source for existing runway end/displaced threshold coordinates, elevations: ASIS Datasheet Systems at www.avnwww.jccbi.gov/datasheet.
9. All elevations are in NAVD 88 and all horizontal coordinates are in NAD 83.
10. The airport has not been surveyed in accordance with FAA Standard 405.
11. No threshold siting surface object penetrations.
12. The potential 1,300' runway extention identified herein is for the Town's longterm planning purposes only. The extension is beyond the 20-year planning horizon identified in the Airport's current Master Plan. The runway extension project shall not be undertaken without prior written FAA approval and NEPA environmental processing. Preconditions will include adequate project justification, FAA forecast approval, and FAA approval of the airfield design standards.
13. The AWOS critical area will not be impacted by any terrain located off airport property.

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		BUILDING AND FACILITIES
N/A		PAVEMENT TO BE REMOVED
OFA(U)		BUILDING RESTRICTION LINE (BRL)
N/A		AVIGATION EASEMENT
N/A		AVIATION DEVELOPMENT PARCELS
OFA	OFA(U)	OBJECT FREE AREA (OFA)
RSA	uRSA	RUNWAY SAFETY AREA (RSA)
OFZ	OFZ(U)	OBSTACLE FREE ZONE (OFZ)
		FACILITY CONSTRUCTION
		FENCING
PAPI-2	PAPI-2	NAVIGATIONAL AID INSTALLATION
PAPI-4	PAPI-4	NAVIGATIONAL AID INSTALLATION
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		ODALs
		RUNWAY PROTECTION ZONE (RPZ)
		SEGMENTED CIRCLE/LIGHTED WIND TEE
		WIND INDICATOR (Lighted)
1080		TOPOGRAPHIC CONTOURS
29 28 32 33		SECTION CORNER
B	B	TAXIWAY DESIGNATION
		HOLD POSITION MARKINGS
		AUTOMATED WEATHER OBSERVATION STATION (AWOS)

FAA APPROVAL STAMP

SUBMITTED BY:
Coffman Associates

FOR APPROVAL BY:

APPROVED BY: ON THE DATE OF:

Director of Public Works

No.	REVISIONS	DATE	BY	APP'D.
2	--	--	-	-
1	ALP UPDATE	4/20/00	-	FAA

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

GILA BEND MUNICIPAL AIRPORT

AIRPORT LAYOUT PLAN

GILA BEND, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Beaver
APPROVED BY: James M. Harris, P. E.

April 22, 2014 | SHEET 1 OF 8

Coffman Associates
Airport Consultants
www.coffmanassociates.com

BUILDINGS/FACILITIES

EXISTING	ULTIMATE	DESCRIPTION	ELEV.
1	1	TERMINAL BUILDING	785.0'
2		BOX HANGAR (TO BE REMOVED)	786.6'
3	3	T-HANGAR (TO BE RELOCATED)	784.2'
~~4~~		~~AVIATION FUEL PAD (TO BE REMOVED)~~	~~NA~~
5		GAZEBO (TO BE REMOVED)	1526.0'
6		AUTO PARKING	NA
7		CARETAKER'S RESIDENCE	781.8'
8		SHADE CANOPY	794.3'
9		BOX HANGAR	788.0'
10		BOX HANGAR	788.8'
	11	AIRCRAFT WASHRACK	NA
	12	BOX HANGAR	±786.0'
	13	SHADE CANOPY	±794.0'
	14	MUSEUM HANGAR	±800.0'
	15	MUSEUM HANGAR	±800.0''
	16	FUEL FARM	0'

GENERAL NOTES:

1. Depiction of features and objects, including related elevations within the runway protection zones are depicted on the INNER APPROACH SURFACE DRAWING.
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3. Recommended land uses within the airport environs are depicted on the AIRPORT LAND USE PLAN.
4. Detail concerning airport property are depicted on the AIRPORT PROPERTY MAP.
5. Building Restriction Line (BRL) is established in accordance with F.A.R. Part 77 criteria Building Restriction Line location may be reduced in accordance to Part 77 to limits of the Runway Object Free Area, Runway Safety Area, and/or Runway Protection Zone criteria.
6. Ultimate fence line extends around Existing/Ultimate Property Line except where shown.
7. Base Map and Contours derived from Jan 12, 2012 aerial photography and planametric mapping, surveyed by M&B Aerial Mapping Company.
8. Source for existing runway end/displaced threshold coordinates, elevations: ASIS Datasheet Systems at www.avnwww.jccbi.gov/datasheet.
9. All elevations are in NAVD 88 and all horizontal coordinates are in NAD 83.
10. The airport has not been surveyed in accordance with FAA Standard 405.
11. No threshold siting surface object penetrations.

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		BUILDING AND FACILITIES
N/A		PAVEMENT TO BE REMOVED
OFA(U)		BUILDING RESTRICTION LINE (BRL)
N/A		AVIGATION EASEMENT
N/A		AVIATION DEVELOPMENT PARCELS
OFA	OFA(U)	OBJECT FREE AREA (OFA)
RSA	uRSA	RUNWAY SAFETY AREA (RSA)
OFZ	OFZ	OBSTACLE FREE ZONE (OFZ)
		FACILITY CONSTRUCTION
		FENCING
PAPI-2	PAPI-2	NAVIGATIONAL AID INSTALLATION
PAPI-4	PAPI-4	NAVIGATIONAL AID INSTALLATION
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		ODALs
		RUNWAY PROTECTION ZONE (RPZ)
		SEGMENTED CIRCLE/LIGHTED WIND TEE
		WIND INDICATOR (Lighted)
1080		TOPOGRAPHIC CONTOURS
29 28 32 33		SECTION CORNER
B	B	TAXIWAY DESIGNATION
		HOLD POSITION MARKINGS
		AUTOMATED WEATHER OBSERVATION STATION (AWOS)

No.	REVISIONS	DATE	BY	APP'D.
2	--	--	–	–
1	ALP UPDATE	4/20/00	–	FAA

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GILA BEND MUNICIPAL AIRPORT

TERMINAL AREA PLAN

GILA BEND, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Beaver
APPROVED BY: James M. Harris, P. E.

April 22, 2014

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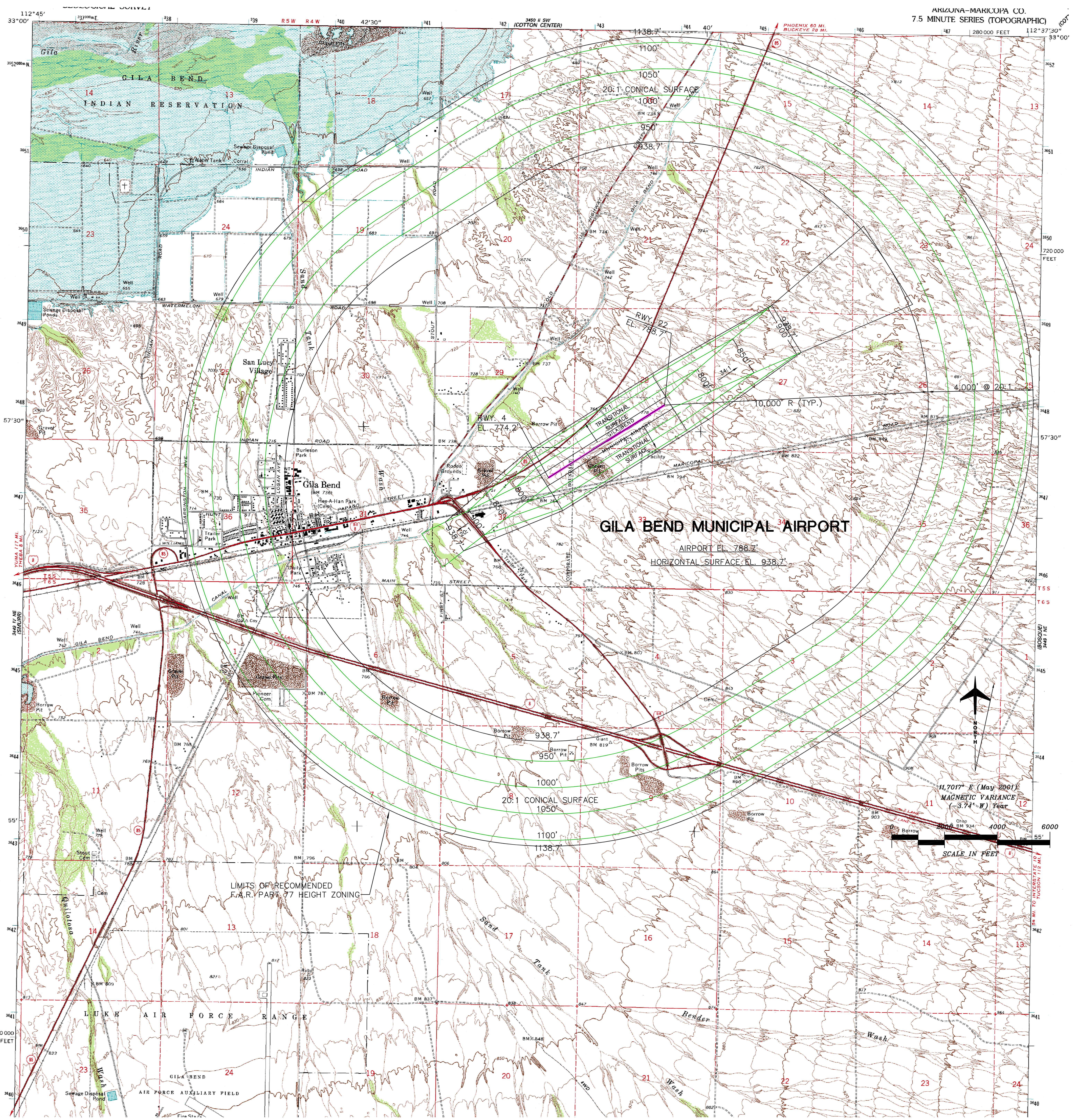

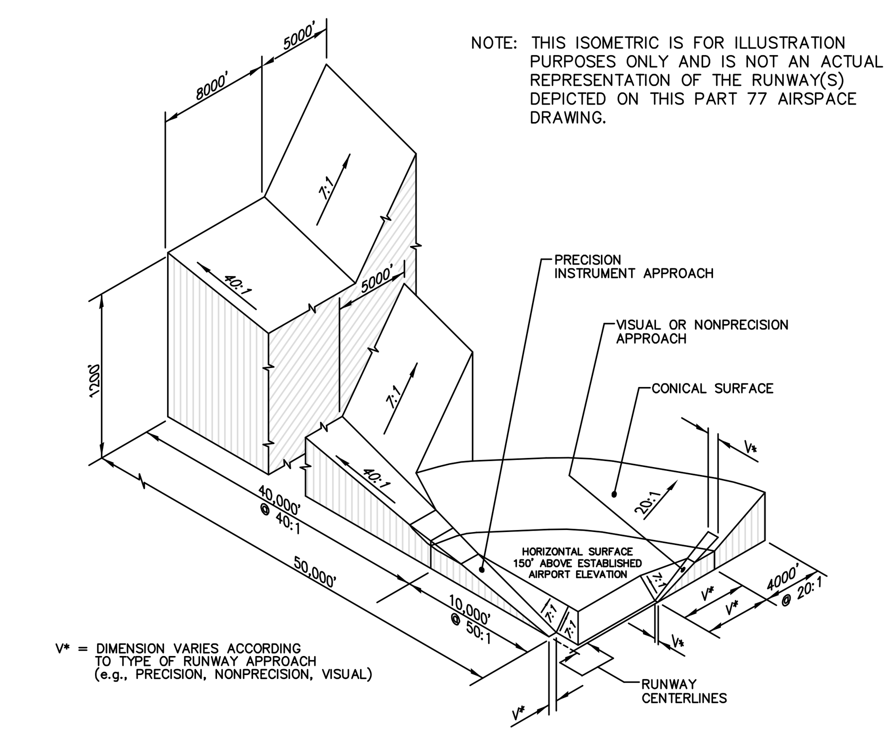

ISOMETRIC VIEW OF SECTION THRU CENTERLINE OF RUNWAYS

N.T.S.

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, are illustrated on the AIRPORT AIRSPACE PLAN, this sheet.
3. Depiction of features and objects within the inner portion of the approach surfaces, are illustrated on the PROTECTION ZONES PLAN, Sheet 6 of these plans.
4. Depiction of features and objects within the outer portion of the approach surfaces, are illustrated on the APPROACH ZONES PROFILES, Sheet 5 of these plans.
5. Additional obstruction data is illustrated on National Ocean Survey document OC 5945, AIRPORT OBSTRUCTION CHART.

No.	REVISIONS	DATE	BY	APP'D.
2	--	--	–	–
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GILA BEND MUNICIPAL AIRPORT

F.A.R. PART 77 AIRPORT AIRSPACE DRAWING

GILA BEND, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Beaver
APPROVED BY: James M. Harris, P. E.

April 22, 2014 SHEET 3 OF 8

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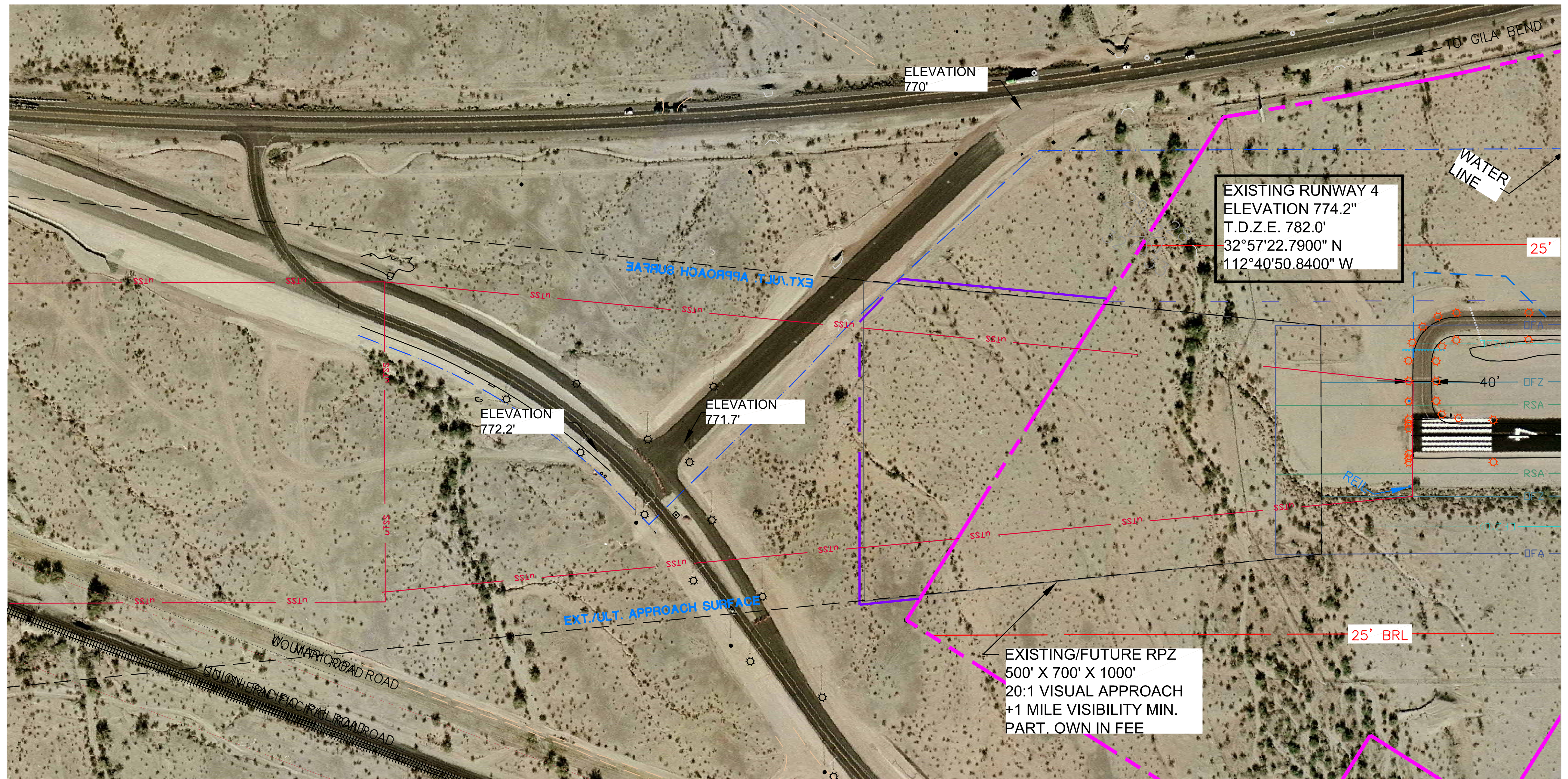
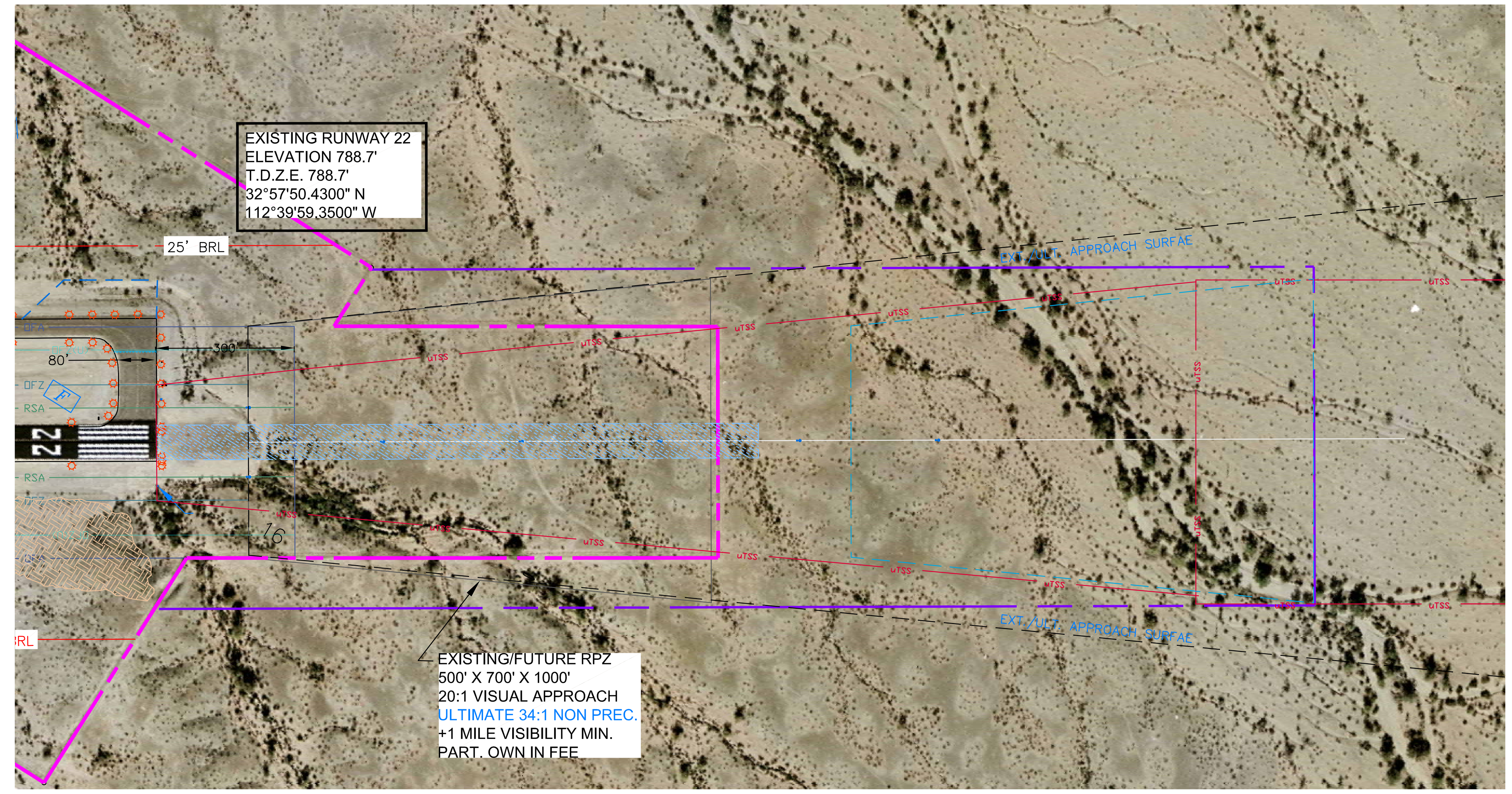
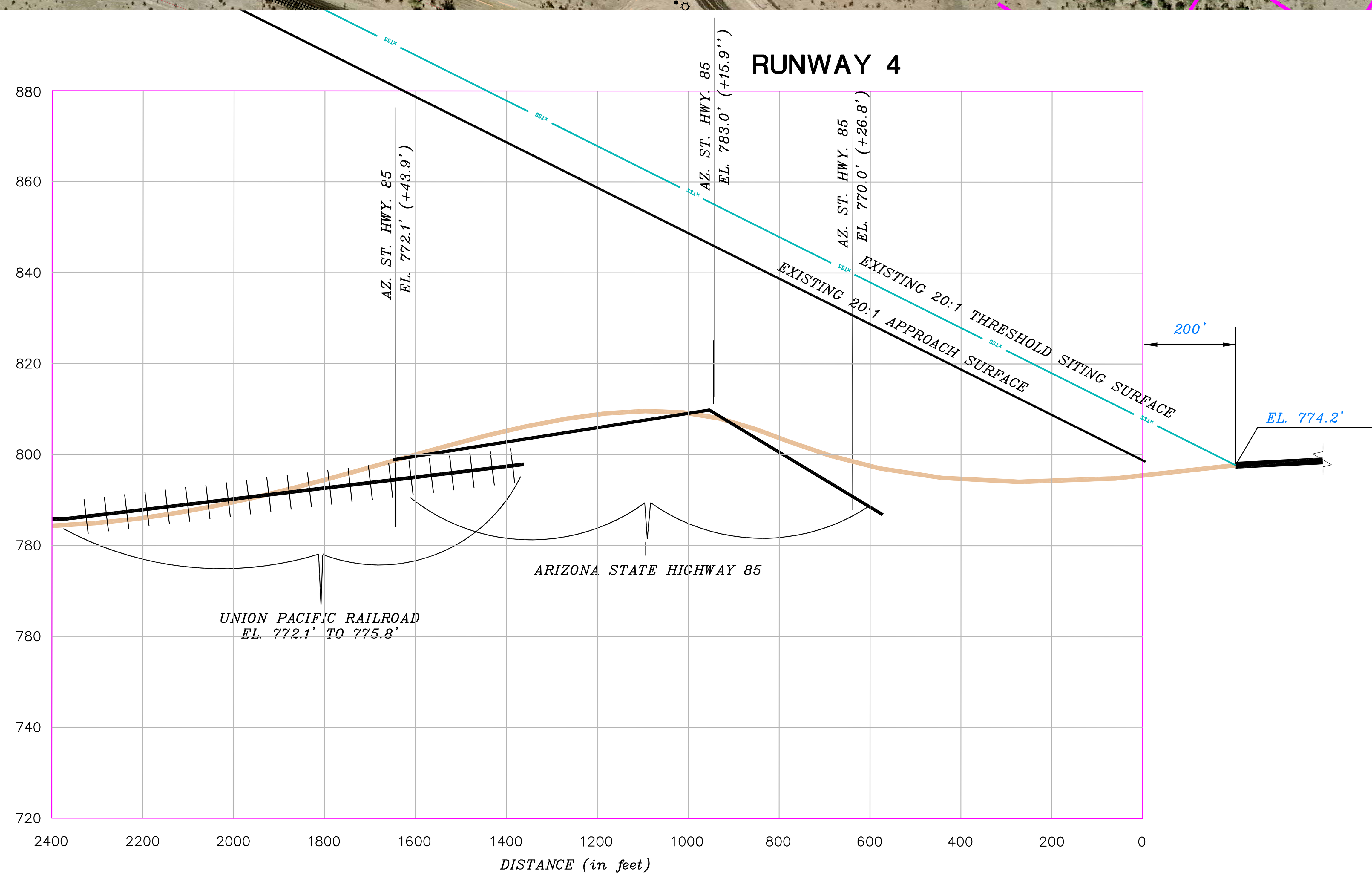
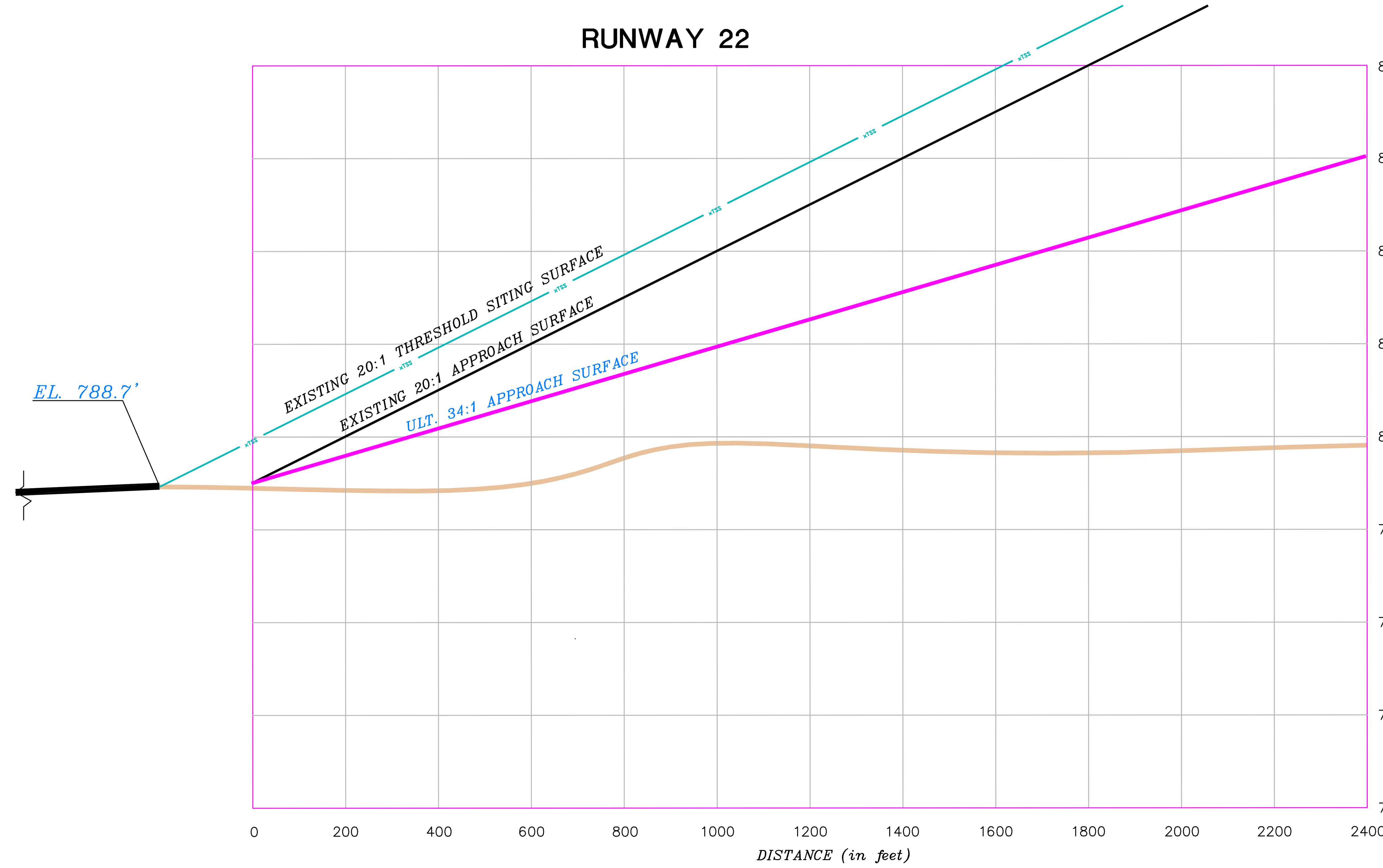




RUNWAY 4



RUNWAY 22



GENERAL NOTES:

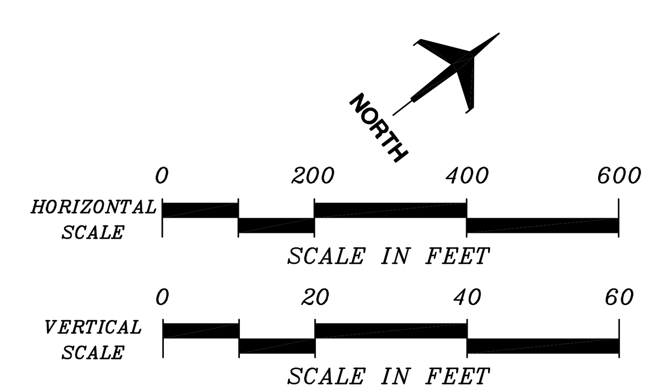
1. Obstructions, clearances, and locations are calculated from existing runway end elevations and existing approach surfaces, unless otherwise noted.
2. Depiction of features and objects within the primary, transitional, and horizontal Part 77 surfaces, is illustrated on the AIRPORT AIRSPACE DRAWING, sheet 2 of these plans.

RUNWAY 4 OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE FOUND WITHIN APPROACH SURFACE	-	-	-	-	-

RUNWAY 22 OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE FOUND WITHIN APPROACH SURFACE	-	-	-	-	-



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GILA BEND MUNICIPAL AIRPORT

RUNWAY 4-22 INNER APPROACH SURFACE DRAWING

GILA BEND, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Beaver
APPROVED BY: James M. Harris, P. E.

April 22, 2014 — SHEET 4 OF 8

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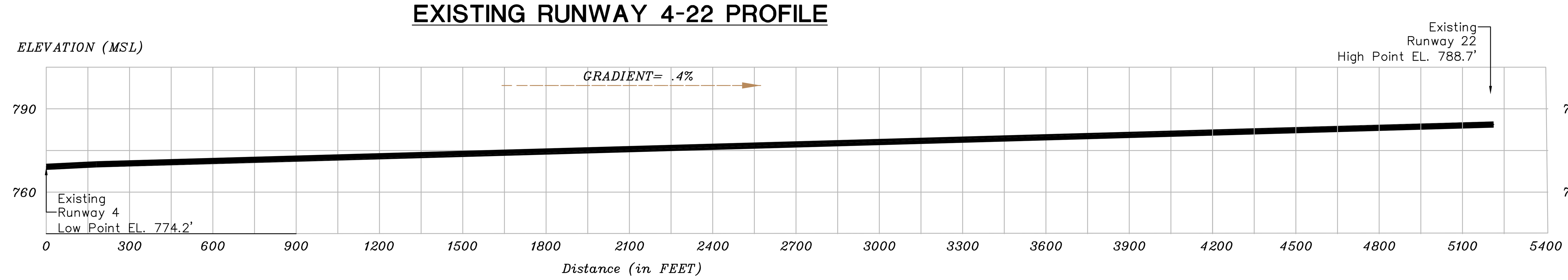

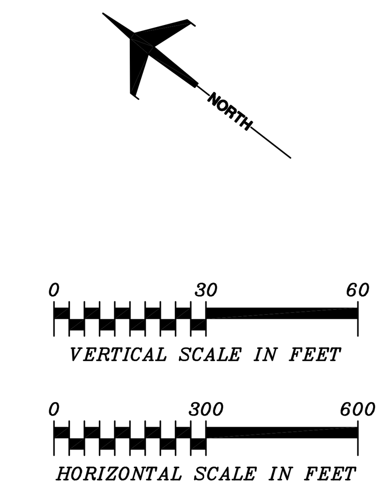

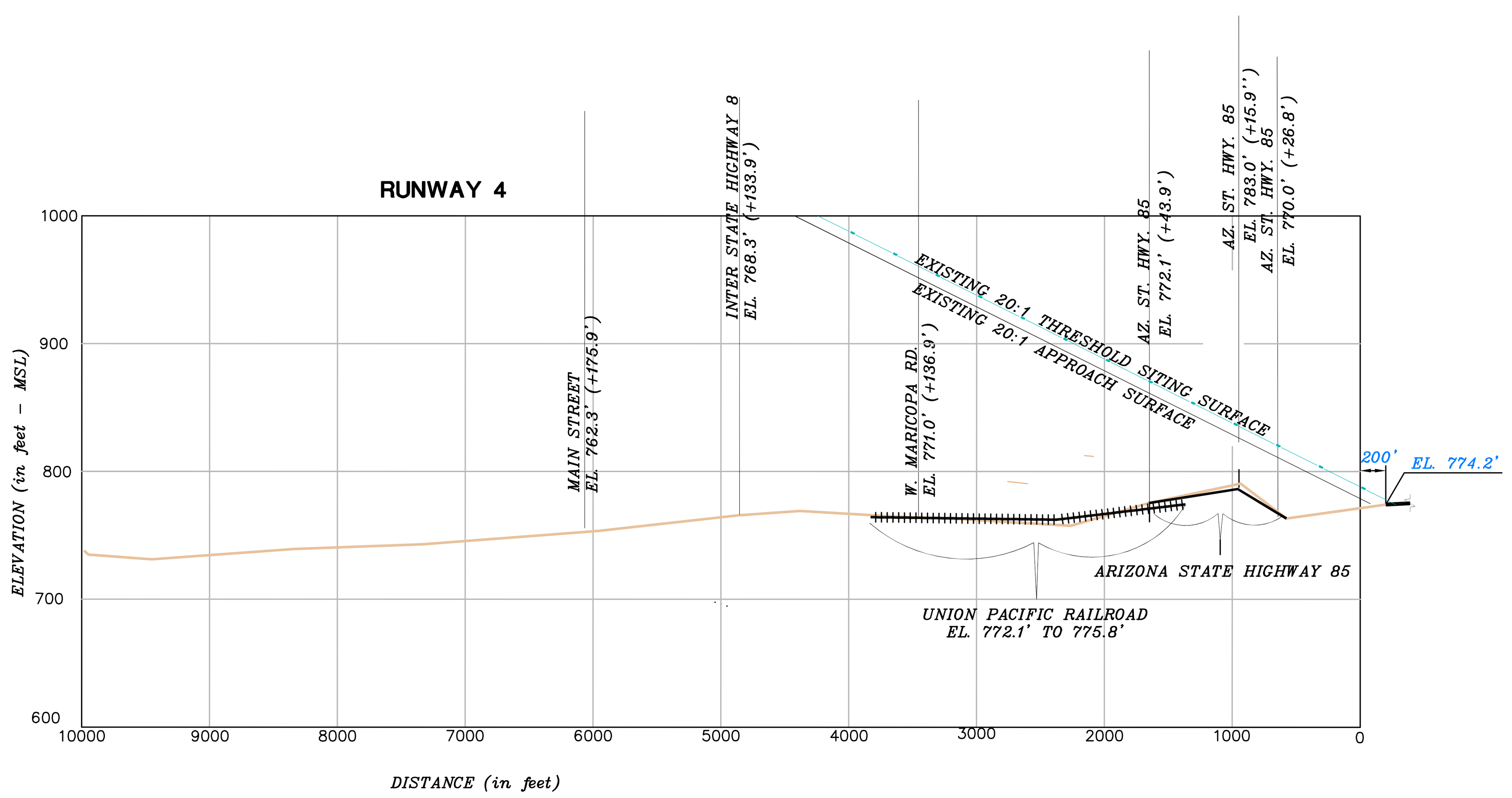

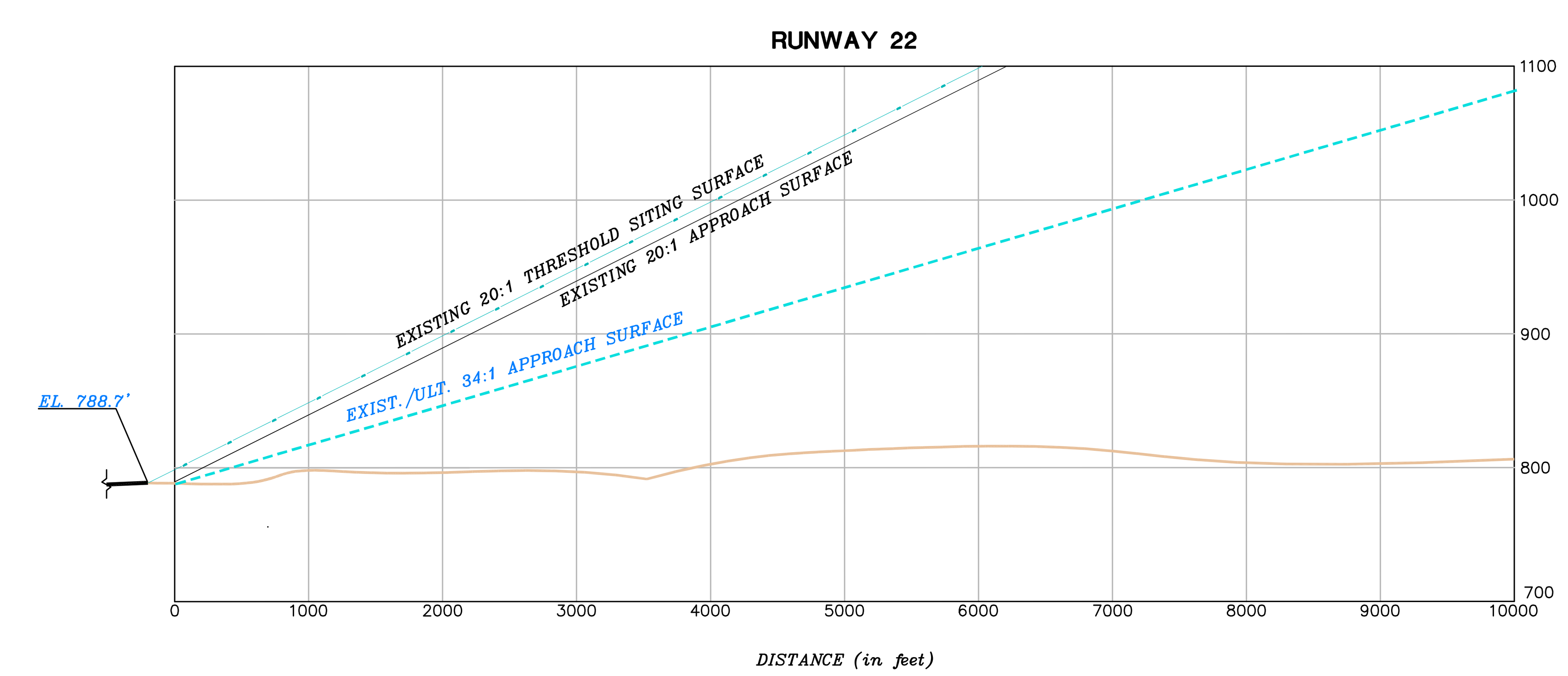

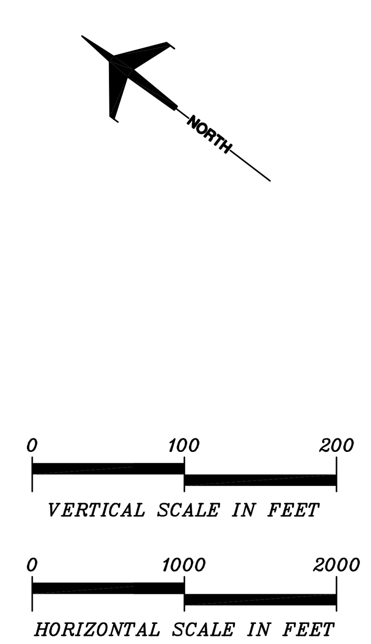

OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1. ----	--	--	--	--	--
2.	--	--	--	--	--

No.	REVISIONS	DATE	BY	APP'D.
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GILA BEND MUNICIPAL AIRPORT
OUTER PORTION OF
RUNWAY 4-22 APPROACH
SURFACE DRAWING
GILA BEND, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Beaver
APPROVED BY: James M. Harris, P. E.

April 22, 2014 SHEET 5 OF 8

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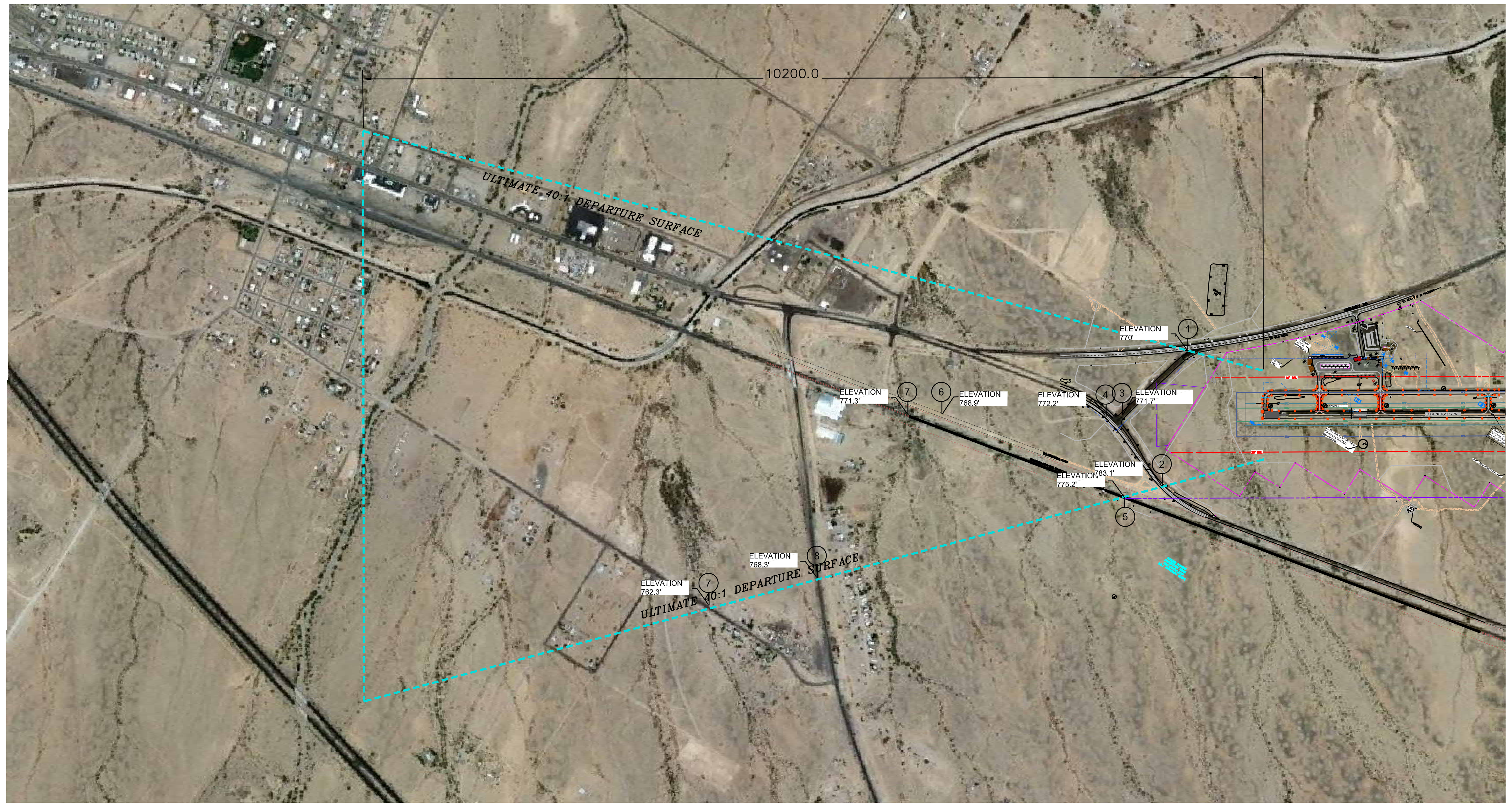

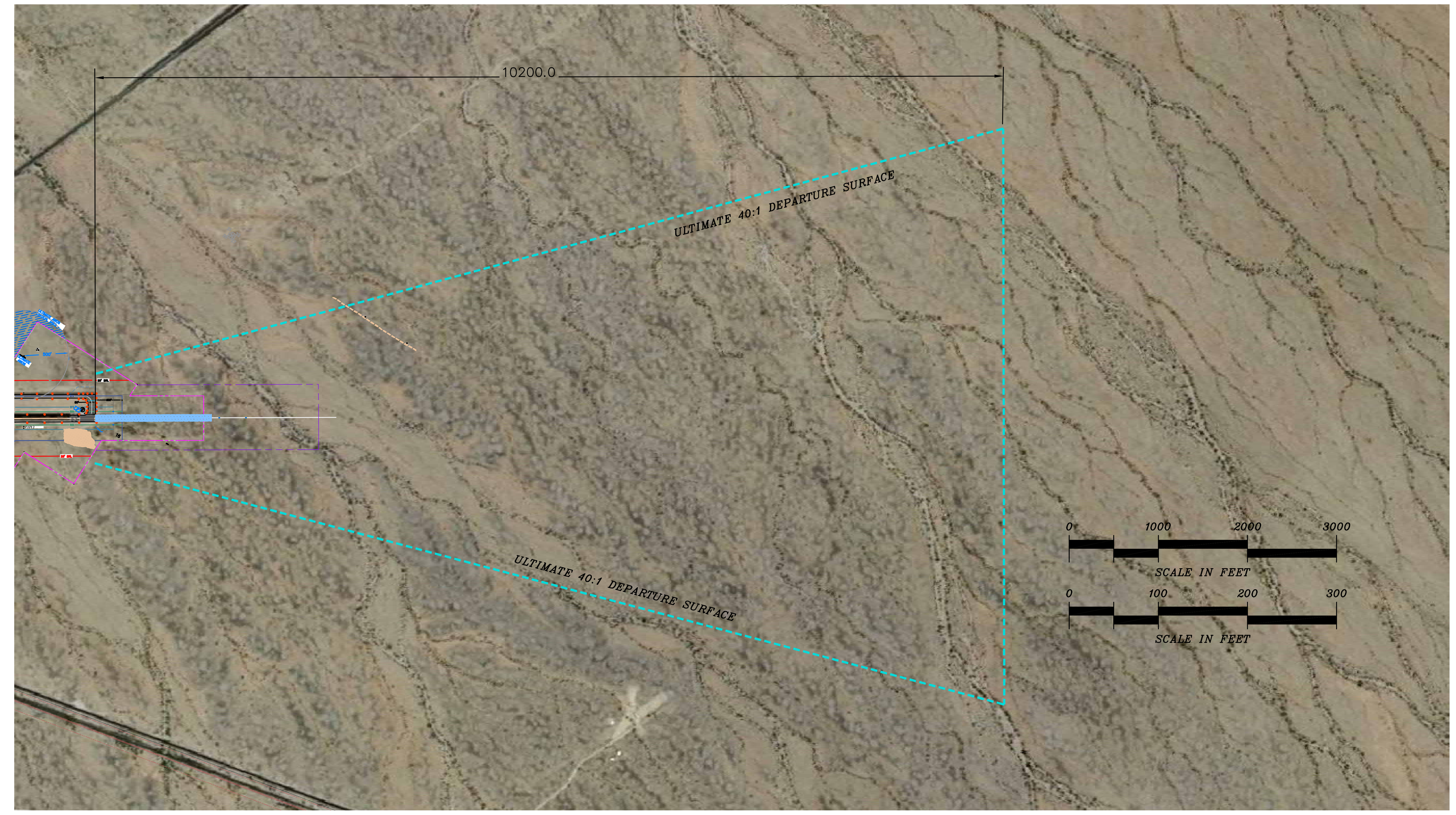

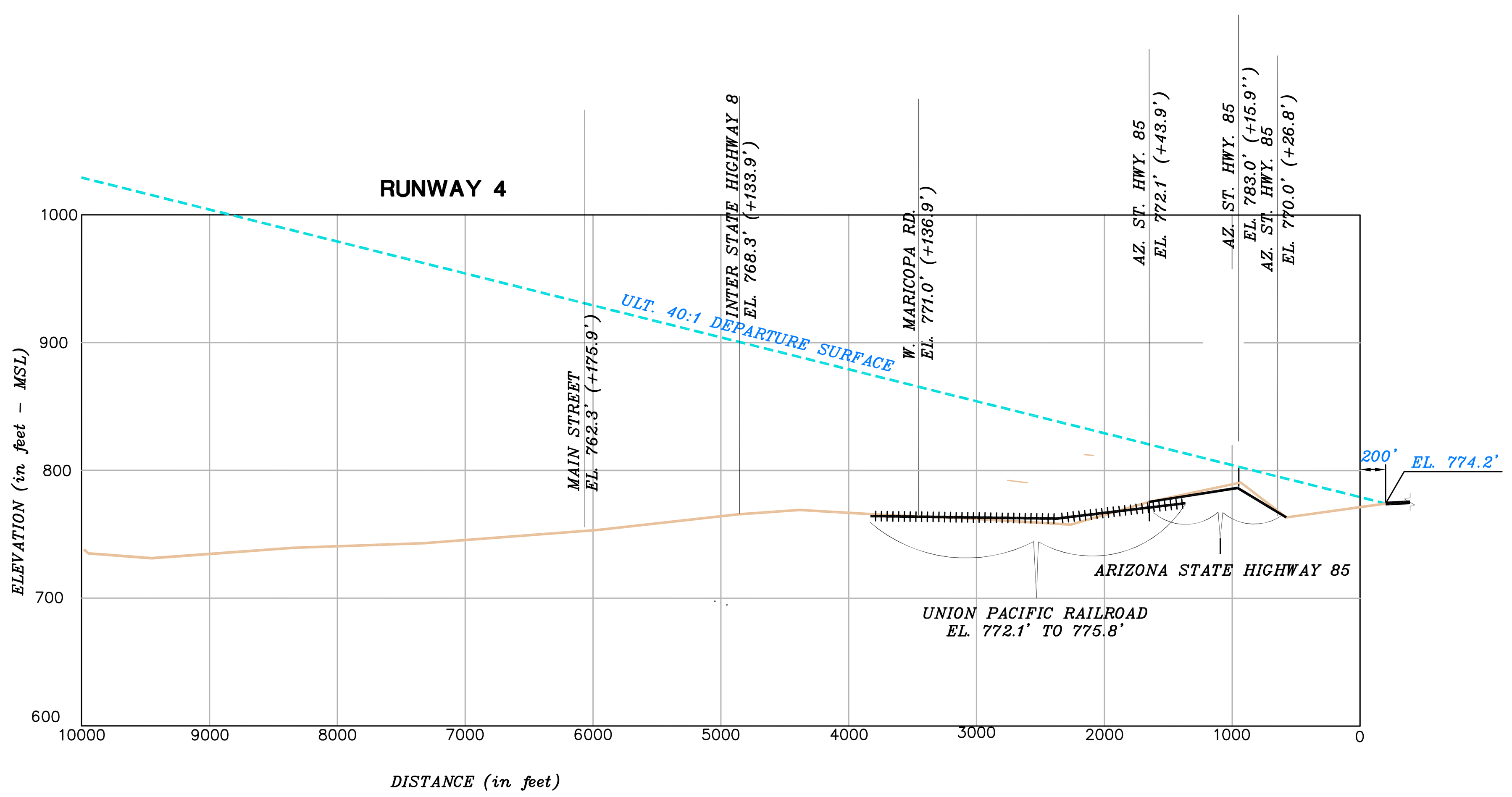

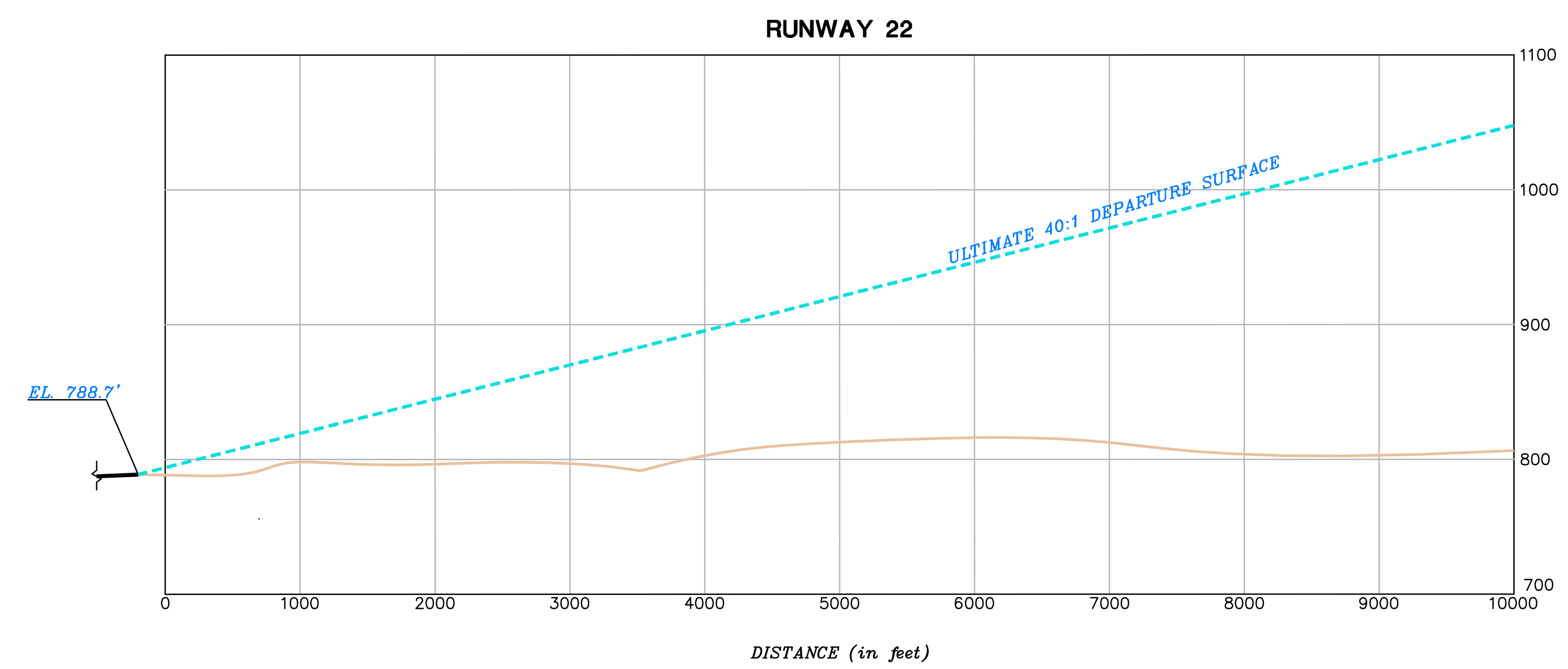

OBSTACLE IDENTIFICATION SURFACE (OIS)

Object Description/Elevation	40:1 Departure Surface Elevation	40:1 Departure Surface Penetrations	Obstacle Clearance Requirements (Remove, Relocate, or Lower Object)
– None	–	–	–
– –	–	–	–
– –	–	–	–
– –	–	–	–
– –	–	–	–
– –	–	–	–
– –	–	–	–
– –	–	–	–
– –	–	–	–

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt roads or private roads, 15' for noninterstate roads, 17' for interstate roads, and 23' for railroad.
2. Standard in AC 150/5300-13 Appendix 2, Runway End Siting Requirements are not appliable for identifying objects affecting navigable airspace. See CFR Part 77 Title 14.
3. Roads and Buildings Clearance of more than 50 feet AGL are not detail in Departure Surface Profiles.
4. Aerial Photo Google Earth 2012.

No.	REVISIONS	DATE	BY	APP'D.
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GILA BEND MUNICIPAL AIRPORT

RUNWAY 4-22 DEPARTURE SURFACE DRAWING

GILA BEND, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Beaver
APPROVED BY: James M. Harris, P. E.

April 22, 2014 SHEET 6 OF 8

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ON-AIRPORT LAND USE LEGEND

AO — AIRFIELD OPERATIONS (± 227.36 ACRES)

GA — GENERAL AVIATION (± 8.05 ACRES)

COM — COMMERCIAL (± 15.55 ACRES)

BASE MAP: AERIAL PHOTO TAKEN JANUARY 2012

GENERAL NOTES:

1. Depiction of features and objects, including related elevations within the runway protection zones are depicted on the INNER APPROACH SURFACE DRAWING.
2. Details concerning terminal improvements are depicted on the TERMINAL AREA PLANS.
3. Recommended land uses within the airport environs are depicted on the AIRPORT LAND USE PLAN.
4. Detail concerning airport property are depicted on the AIRPORT PROPERTY MAP.
5. Building Restriction Line (BRL) is established in accordance with F.A.R. Part 77 criteria Building Restriction Line location may be reduced in accordance to Part 77 to limits of the Runway Object Free Area, Runway Safety Area, and/or Runway Protection Zone criteria.
6. Ultimate fence line extends around Existing/Ultimate Property Line except where shown.
7. Base Map and Contours derived from Jan 12, 2012 aerial photography and planametric mapping, surveyed by M&B Aerial Mapping Company.
8. Source for existing runway end/displaced threshold coordinates, elevations: ASIS Datasheet Systems at www.avnwww.jccbi.gov/datasheet.
9. All elevations are in NAVD 88 and all horizontal coordinates are in NAD 83.
10. The airport has not been surveyed in accordance with FAA Standard 405.
11. No threshold siting surface object penetrations.

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		BUILDING AND FACILITIES
N/A		PAVEMENT TO BE REMOVED
OFA(U)		BUILDING RESTRICTION LINE (BRL)
N/A		AVIGATION EASEMENT
N/A		AVIATION DEVELOPMENT PARCELS
OFA	OFA(U)	OBJECT FREE AREA (OFA)
RSA	uRSA	RUNWAY SAFETY AREA (RSA)
OFZ	OFZ	OBSTACLE FREE ZONE (OFZ)
		FACILITY CONSTRUCTION
		FENCING
PAPI-2	PAPI-2	NAVIGATIONAL AID INSTALLATION
PAPI-4	PAPI-4	NAVIGATIONAL AID INSTALLATION
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		ODALs
		RUNWAY PROTECTION ZONE (RPZ)
		SEGMENTED CIRCLE/LIGHTED WIND TEE
		WIND INDICATOR (Lighted)
1080		TOPOGRAPHIC CONTOURS
29 28 32 33		SECTION CORNER
B	B	TAXIWAY DESIGNATION
		HOLD POSITION MARKINGS
		AUTOMATED WEATHER OBSERVATION STATION (AWOS)

No.	REVISIONS	DATE	BY	APP'D.
2	--	--	-	-
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GILA BEND MUNICIPAL AIRPORT

ON-AIRPORT LAND USE PLAN

GILA BEND, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Beaver
APPROVED BY: James M. Harris, P. E.

April 22, 2014

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RECORDING INFORMATION (County Assessor - Maricopa County, Arizona.)						
Parcel	Owner	Acreage	Date Recorded	Recording Information	Grantor/Method	Notes
1	TOWN OF GILA BEND	±245.64	NA	NA NA	NA NA	--
2	NA NA	NA	NA	NA NA	NA NA	NA NA
3	NA NA	NA	NA	NA NA	NA NA	NA NA
Total Acreage	± 245.64					

Please note: The total acreage shown in this table is the cumulative sum of the above described parcels, whose individual acreages were obtained from the County of Maricopa, Arizona Graphic Information Systems.

LEGEND:

EXISTING AIRPORT PROPERTY (245.64 Acres)

PROPERTY TO BE ACQUIRED

PARCEL LINE

LEGEND		
EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		BUILDING AND FACILITIES
N/A		PAVEMENT TO BE REMOVED
OFA(U)		BUILDING RESTRICTION LINE (BRL)
N/A		AVIGATION EASEMENT
N/A		AVIATION DEVELOPMENT PARCELS
OFA	OFA(U)	OBJECT FREE AREA (OFA)
RSA	uRSA	RUNWAY SAFETY AREA (RSA)
OFZ	OFZ	OBSTACLE FREE ZONE (OFZ)
		FACILITY CONSTRUCTION
		FENCING
PAPI-2	PAPI-2	NAVIGATIONAL AID INSTALLATION
PAPI-4	PAPI-4	NAVIGATIONAL AID INSTALLATION
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		ODALs
		RUNWAY PROTECTION ZONE (RPZ)
		SEGMENTED CIRCLE/LIGHTED WIND TEE
		WIND INDICATOR (Lighted)
1080		TOPOGRAPHIC CONTOURS
29 28 32 33		SECTION CORNER
B	B	TAXIWAY DESIGNATION
		HOLD POSITION MARKINGS
		AUTOMATED WEATHER OBSERVATION STATION (AWOS)

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GILA BEND MUNICIPAL AIRPORT

EXHIBIT "A" AIRPORT PROPERTY MAP

GILA BEND, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Beaver
APPROVED BY: James M. Harris, P. E.

April 22, 2014 SHEET 8 OF 8

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APPENDIX D

FAA FORECAST APPROVAL

U.S. Department
of Transportation
**Federal Aviation
Administration**

Federal Aviation Administration
Phoenix Airports Field Office

2800 N 44th Street
Suite 510
Phoenix, AZ 85008

June 4, 2013

Mr. Bill Menard
Public Works Director
City of Gila Bend
644 W Pima St
P.O Box A
Gila Bend, AZ 85337

Dear Mr. Menard:

Gila Bend Municipal Airport (E63), Gila Bend, Arizona
Aviation Activity Forecast Approval

The Federal Aviation Administration (FAA) has reviewed the aviation forecast for the airport master plan for Gila Bend Municipal Airport (E63) dated May 10, 2013. The FAA approves this forecast for airport planning purposes, including Airport Layout Plan development.

In summary, while the difference between the FAA TAF and Gila Bend's forecast update regarding total operations isn't within the 10 percent and 15 percent allowance for 5 and 10 year planning horizons, the airport forecast update appropriately explains these differences which can be attributed to uncounted flight training operations. For future TAF reporting years please ensure that flight training operations are included in the airport's annual operation counts.

The forecast was developed using current data and appropriate methodologies, therefore the FAA locally approves this forecast for planning purposes at Gila Bend Municipal Airport. It is important to note that the approval of this forecast doesn't guarantee future funding for large scale capital improvements as future projects will need to be justified by current activity levels reached at the time the projects are proposed for implementation.

If you have any questions about this forecast approval, please call me at 602-379-3023.

Sincerely,

Kyler Erhard
Airport Planner

cc: Mr. Scott Driver, ADOT, Airport Grant Manager

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Airport Consultants

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Suite 235
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