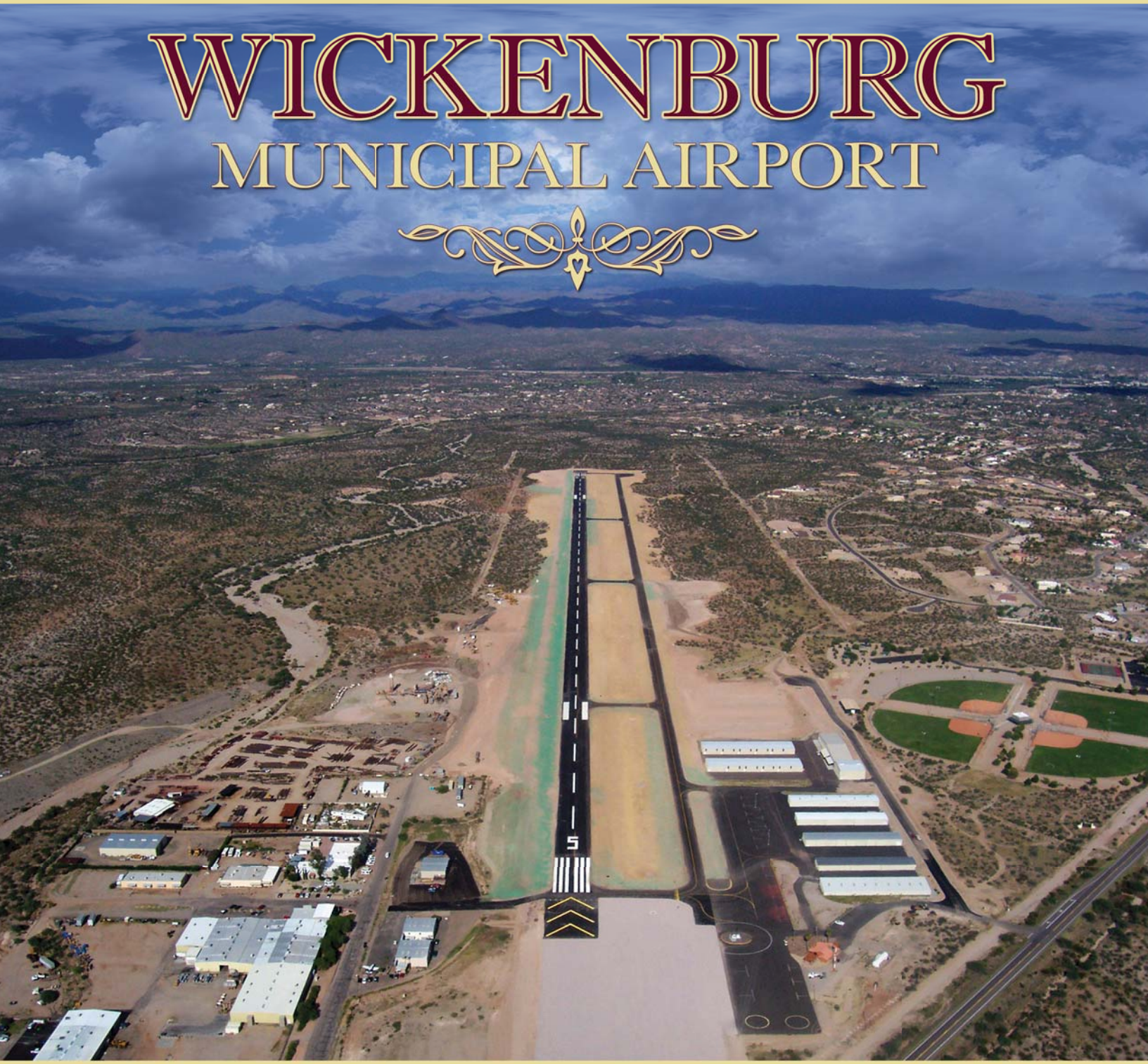
WICKENBURG
MUNICIPAL AIRPORT



AIRPORT MASTER PLAN

AIRPORT MASTER PLAN UPDATE

for

WICKENBURG MUNICIPAL AIRPORT
Wickenburg, Arizona

FINAL REPORT

Prepared for

The Town of Wickenburg

by

Coffman Associates, Inc.

Accepted by the Town Council on April 1, 2013

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"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."

WICKENBURG
MUNICIPAL AIRPORT

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WICKENBURG MUNICIPAL AIRPORT

INTRODUCTION

INTRODUCTION

The Wickenburg 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 Wickenburg 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 Wickenburg 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, Wickenburg 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 Wickenburg 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 2003 for the last Airport Master Plan and the more recent Airport Layout Plan revisions in 2009 and Environmental Assessment completed in October 2010.

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:

- Research factors likely to affect air transportation demand in the Wickenburg 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.

- Recommend improvements which enhance Wickenburg 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 2030.

- Analyzing socioeconomic factors likely to affect air transportation demand in the Town of Wickenburg, 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 consideration 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:

- Wickenburg Municipal Airport will continue to operate as a general aviation airport through the planning period.

- Wickenburg 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 Two).

- 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 Wickenburg 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 Wickenburg Municipal Airport through the year 2030. 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 C – Airport Layout 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 Wickenburg 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, Wickenburg 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 Wickenburg 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) reviewed phase reports and provided comments throughout the study 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 phased 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 was developed.

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Master Plan Process

PAC Kick-off

INVENTORY

- Airport Facilities
- Airspace and Air Traffic Activity
- Area Socioeconomic Data
- Local Planning and Land Use
- Airport Access and Parking, Utilities, and Aerial Photography

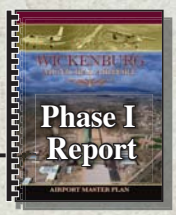
FORECASTS

- Based Aircraft and Fleet Mix
- Annual Operations

PAC Phase I

FACILITY REQUIREMENTS

- Design Categories
- Runway Length and Strength
- Support Facilities
- Taxiways
- Hangar Facilities
- Terminal Building
- Aprons
- Navigational Aids



AIRPORT ALTERNATIVES

- Evaluate Development Scenarios
  - Airside
  - Landside

PAC Phase II

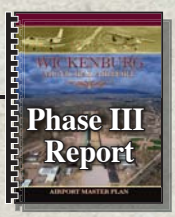
RECOMMENDED MASTER PLAN CONCEPT ENVIRONMENTAL OVERVIEW

- Detailed Master Plan Facility and Land Use Plans
- Review/Evaluation of NEPA Environmental Categories
- Noise Exposure

FINANCIAL PLAN / CAPITAL IMPROVEMENTS

- Airport Development Schedule
- Cost Estimates
- Funding Sources

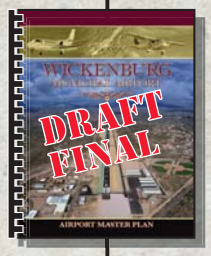
PAC Phase III



AIRPORT LAYOUT PLANS

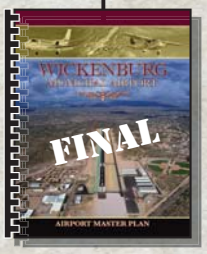
- Airport Layout Plan
- Landside Drawing
- Property Map
- Airspace/Approach Drawings
- On-Airport Land Use Plan
- Public Airport Disclosure Map

Public Information Workshop



Town Approval

FAA ALP Approval



WICKENBURG MUNICIPAL AIRPORT

Exhibit IA
MASTER PLAN PROCESS

WICKENBURG MUNICIPAL AIRPORT

Chapter One

INVENTORY

WICKENBURG MUNICIPAL AIRPORT

INVENTORY

The purpose of the airport master plan is to provide the Town of Wickenburg, the Arizona Department of Transportation (ADOT) - Aeronautics Group, 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 previous master plan was completed in 2003. The Airport Layout Plan (ALP) was updated in 2009. It should also be noted that an Environmental Assessment for a new aircraft parking apron was completed in October 2010.

AIRPORT PLANNING ROLE

Airport planning exists on many levels: national, state, and local. Each level has a different emphasis and purpose. On the national level, Wickenburg 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 the next five years, 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. Wickenburg 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 approximately $3.8 million in development needs over the next five years for Wickenburg 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 (2012-2016) identifies $6.0 million in development needs over the next five years at Wickenburg 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.

AIRPORT HISTORY AND ADMINISTRATION

The original Wickenburg Airport, which was located north of town, served as a fuel stop for northern travelers that were headed south to the Phoenix area. In 1968, a feasibility study was performed and this site was abandoned in favor of the current location west of town, with land donated by the Wellik family. The initial Wickenburg Municipal Airport consisted of a 4,500-foot lighted runway and a small apron area. A number of significant improvements have been made to the airport since then.

The airport is owned and operated by the Town of Wickenburg. The airport has an airport advisory commission composed of seven members. One member is an elected member of the Town Council, appointed by the mayor, and subject to approval of the council. The remaining six members are citizens, which are appointed by the mayor and subject to the approval of the council. At least five of the citizens must be residents of the Town, and all members must live within 10 miles of the Town limits. Council representatives serve a two-year term, while the citizen members serve staggered three-year terms. The commission acts in an advisory role to the Town Council, making recommendations on the use, operation, and development of the airport.

Since the completion of the previous Airport Master Plan in 2003, several major improvements have been made at the facility, including:

- 1,050-foot runway extension (and associated taxiway extension).
- Improvements to the Runway Safety Areas.
- New perimeter fencing installed.
- New automated weather equipment (AWOS-III) installed.
- New hangars built.

AIRPORT SETTING AND ACCESS

The Town of Wickenburg, Arizona is located approximately 60 miles northwest of the Phoenix metropolitan area, near the northern edge of Maricopa County. The Town lies in the foothills of the Bradshaw Mountains, along the banks of the Hassayampa River. Wickenburg was named after Henry Wickenburg, a German immigrant who, in 1863, joined a team of prospectors searching for gold in the surrounding hills. He discovered the Vulture Mine, which became the richest gold-producing mine in Arizona history.

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.

Wickenburg Municipal Airport is located at the western edge of the town limits, north of and adjacent to U.S. Highway 60. The location of the airport in its regional setting is depicted on **Exhibit 1A**.

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.

The regional climate is characteristic of the high desert region of central Arizona; winters are warm and pleasant and summers are hot and dry. July is the hottest month, with an average daily maximum temperature of 104 degrees Fahrenheit (°F), and January is the coldest month, with an average daily maximum temperature of 31°F. Average precipitation in Wickenburg is approximately 11 inches per year. **Table 1A** summarizes monthly climatic data for the Town of Wickenburg.

TABLE 1A
Climate Conditions
Wickenburg, Arizona

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Avg. High Temp (°F)	65	68	73	81	91	100	104	101	96	86	73	65
Avg. Low Temp (°F)	31	34	38	43	50	59	70	69	60	48	38	32
Average Precipitation (in.)	1.19	1.23	1.05	0.49	0.17	0.13	1.30	1.92	1.14	0.66	0.76	1.18

Source: Western Regional Climate Center (03/1/1908 – 3/31/2008).

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 public-use airports within 40 nautical miles of Wickenburg 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 1B** identifies the major characteristics of each airport.

TABLE 1B
Vicinity Airports

Airport Name	Distance (nm)	NPIAS* Role	Longest Runway	Based Aircraft	Annual Operations[1]	Instrument Approaches
Pleasant Valley	29 ESE	Private (Non-NPIAS)	4,200' (Dirt)	33	75,000	No
Buckeye Municipal	34 S	GA	5,500'	44	53,000	No
Glendale Municipal	37 SE	Reliever	7,150'	220	82,200	Yes
Phoenix Goodyear	39 SSE	Reliever	8,500'	218	146,100	Yes
Phoenix Deer Valley	39 ESE	Reliever	8,197'	987	368,700	Yes

Source: FAA 5010 Form
*National Plan of Integrated Airport Systems.
[1]FAA Tower Reports (2010), except Pleasant Valley & Buckeye, which are estimated.

Pleasant Valley Airport is a privately-owned airport located approximately 29 nautical miles east-southeast of Wickenburg Municipal Airport. The airport is served by several dirt runways, the longest of which is 4,200 feet. There is no control tower at Pleasant Valley Airport, and there are no published instrument approaches available. A total of 33 aircraft are based at the airport and annual operations are estimated at 74,800. Services available include aircraft tiedowns and fuel sales (100LL).

Buckeye Municipal Airport (owned by the Town of Buckeye) is located approximately 34 nautical miles south of Wickenburg Municipal Airport. The airport is served by a single 5,500-foot runway. There is no control tower at the airport

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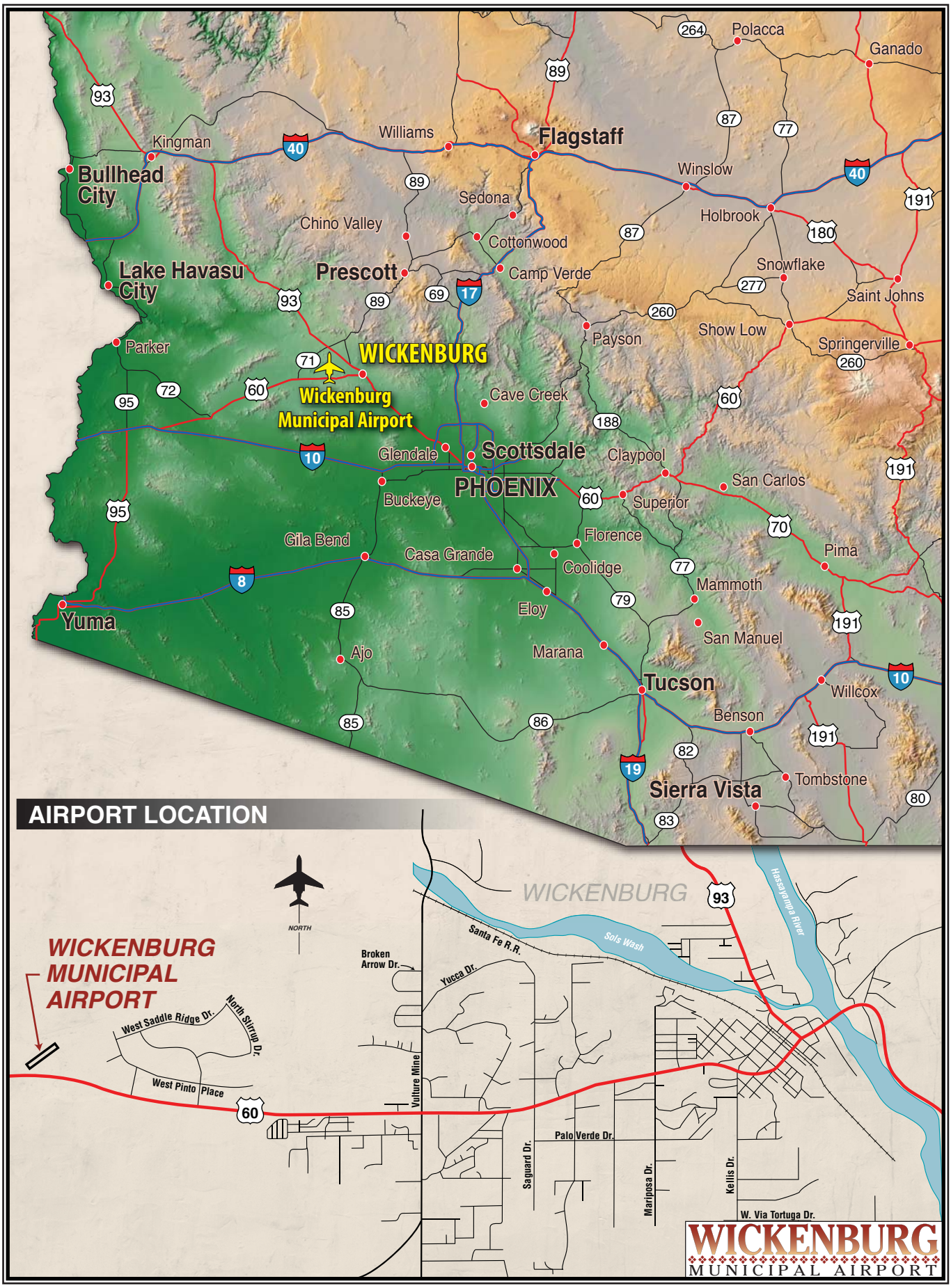


Exhibit 1A
AIRPORT LOCATION

and there are no published instrument approaches available. There are 44 aircraft based at Buckeye Municipal Airport and annual operations are estimated at 52,900. Services available include aircraft tiedowns, fuel sales (Jet A and 100LL), and minor aircraft maintenance.

Glendale Municipal Airport (owned by the City of Glendale) is located approximately 37 nautical miles southeast of Wickenburg 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 82,200 annual operations in 2010. Services available include aircraft tiedowns, fuel sales (Jet A and 100LL), and aircraft maintenance.

Phoenix Goodyear Airport (owned by the City of Phoenix) is located approximately 39 nautical miles south-southeast of Wickenburg Municipal Airport. The airport is served by two runways, the longest of which is 8,500 feet. A total of 218 aircraft are based at Phoenix Deer Valley Airport and one published instrument approach is available. The airport is served by a control tower, which reported 146,100 annual operations in 2010. Services available include aircraft tiedowns, fuel sales (Jet A and 100LL), and aircraft maintenance.

Phoenix Deer Valley Airport (owned by the City of Phoenix) is located approximately 39 nautical miles east-southeast of Wickenburg Municipal Airport. A total of 987 aircraft are based at Phoenix Goodyear Airport and four published instrument approaches are available. The airport is served by a control tower, which reported 368,700 annual operations in 2010. Services available include aircraft tiedowns, fuel sales (Jet A and 100LL), and aircraft maintenance.

Located approximately 45 miles north-northeast in Prescott, Arizona, **Ernest A. Love Field Airport** is the nearest commercial service airport. The airport is served by three runways, the longest of which is 7,616 feet. Approximately 239 aircraft are based at Ernest A. Love Field and five published instrument approaches are approved for use into the airport. The airport is served by a control tower, which reported 231,700 annual operations in 2010. One major fixed base operator (FBO) is located on the airfield that provides a full array of general aviation services.

LOCATION OF REGISTERED AIRCRAFT

When discussing the general aviation service area, the main component is the airport's ability to attract aircraft registered in the area. Almost universally, registered aircraft owners choose to base at an airport nearer their home or business. Convenience is the most common reason for basing in close proximity.

Exhibit 1B depicts the location of registered aircraft in the vicinity of Wickenburg Municipal Airport by the registered aircraft owner's address. This data was compiled from the FAA Aircraft Registry. As shown on the exhibit, a total of 90 registered aircraft are located within a 20-mile radius of the airport, with the majority in Maricopa County.

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 and ordinances have some jurisdiction over the airport environment.

Land use surrounding Wickenburg Municipal Airport is varied and includes a mix of open space, industrial development, and residential areas. The Wickenburg Industrial Air Park is located just north of the Runway 5 end and includes several manufacturing and industrial facilities. The remaining land located north of the airport is undeveloped and includes Hartman Wash.

The southwestern edge of the airport is bounded by U.S. Highway 60 and much of the area further south is undeveloped. To the southeast, lies Sunset Park, a multi-use community park that includes ball fields and other recreational areas. Further east is the Saddle Ridge West residential subdivision. **Exhibit 1C** depicts land ownership of individual parcels surrounding the airport.

FUTURE LAND USE

A General Plan was completed by the Town of Wickenburg in 2003. This plan, which included a future land use element, is currently in the process of being updated.

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 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.

HEIGHT AND HAZARD ZONING

Article 14-20, Section 14-20-11 of the Town of Wickenburg Land Use Code, specifies building height limitations in the vicinity of the airport. Specifically, building heights within 500 feet of the runway centerline are limited to 20 feet. This includes the area along the extended runway centerline, 1,000 feet from each runway end. Beyond 1,000 feet, building heights must remain below an upward sloping 40:1 approach surface. This approach surface rises one foot for each 40-foot increment the approach surface extends from the beginning of the surface, which originates 200 feet from the runway end.

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.

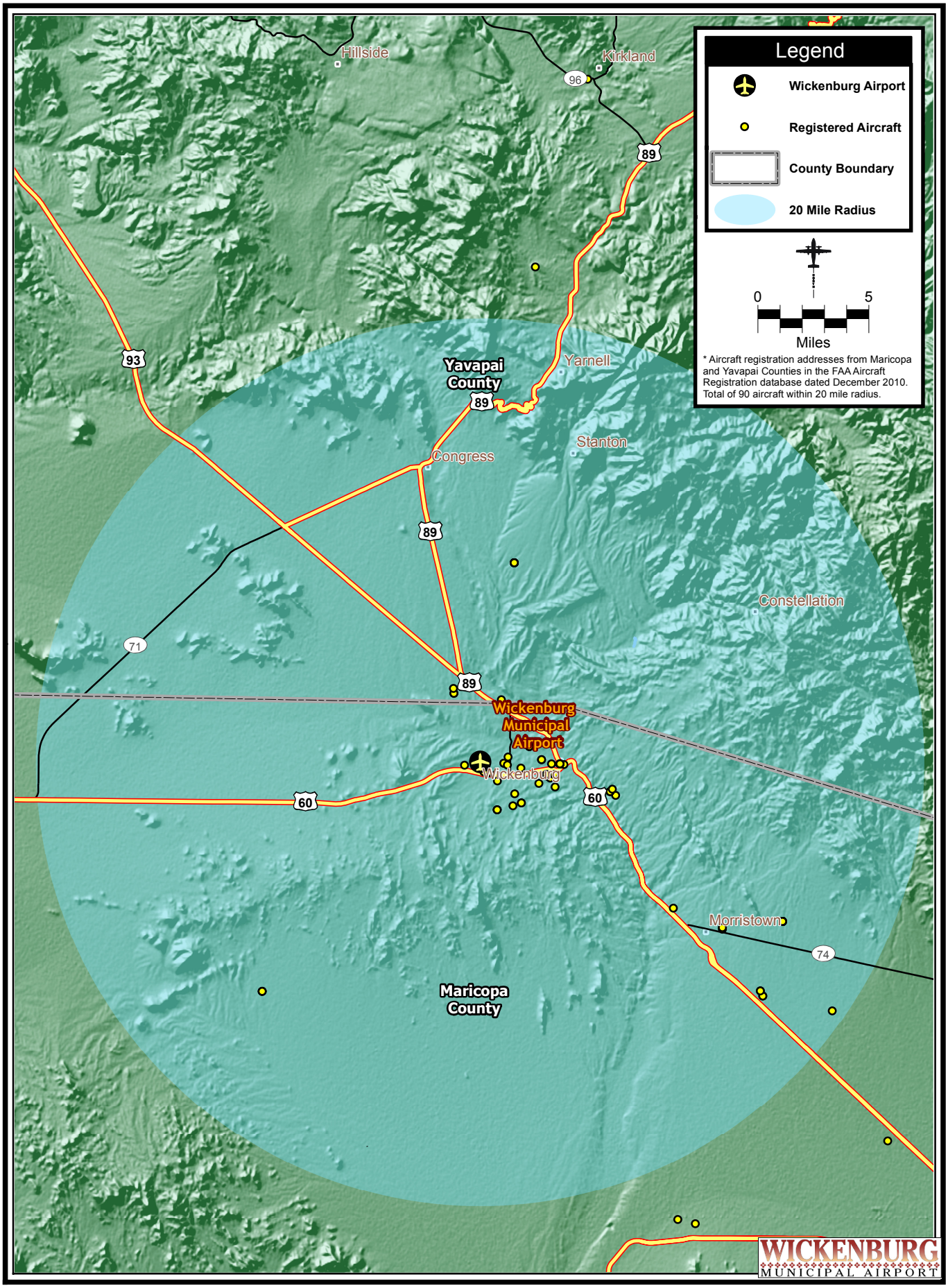


Exhibit 1B
LOCATION OF REGISTERED AIRCRAFT

Legend

Property Line

Souce: Maricopa County Assessor Website

Number	Parcel ID	NAME	Deed Number	Date
1	505-04-034	WICKENBURG TOWN OF	910531080	11/13/1991
2	505-04-020	WICKENBURG TOWN OF	10949-0013	12/12/1974
3	505-04-035	WICKENBURG TOWN OF	910531080	11/13/1991
4	505-04-014-A	WICKENBURG TOWN OF	920634269	11/6/1992
5	505-04-038	WICKENBURG TOWN OF	920634270	11/6/1992
6	505-54-001	ARIZONA STATE OF	No Official Document	
7	505-04-014-B	ARIZONA STATE OF	No Official Document	
8	505-41-038	WICKENBURG TOWN OF	12813-0025	4/3/1978
9	505-41-152	BENNER-NAWMAN INC	940232440	3/23/1994
10	505-41-008-U	WICKENBURG TOWN OF	14856-0179	11/26/1980
11	505-41-126	ELMS JACK M/CYNTHIA J	50272261	3/4/2005
12	505-41-128	DUBOIS DARRELL L/SUSAN E	91097665	11/30/2009
13	505-41-129	R L PAINTING INC	101142314	12/30/2010
14	505-41-130	BYRD PAMELA JOY	71273587	12/3/2007
15	505-41-127	EDWIN P DILLARD AND VIVIAN R	80919919	10/24/2008
16	505-41-006-Q	SSTS INC	61533746	11/22/2006
17	505-41-123	SOWARDS LEWIS/TAZIOLI JEAN P TR	101084272	12/14/2010
18	505-41-124	JEB CUSTOM HOMES LLC	50704398	5/26/2005
19	505-41-125	HENRICHSEN CHRISTOPHER M/JILL	100919950	10/21/2010
20	505-41-122	MARCO FOUNDATION	110000635	1/3/2011
21	505-41-121			
22	505-41-120	GROTE PATRICK AARON/SHELI L	50923517	7/5/2005
23	505-41-006-G	HILL F KENNETH TR	61295517	9/29/2006
24	505-41-019	SONJA GREEN ESTATE REVOCABLE TRU	51959921	12/29/2005
25	505-41-020	SONJA GREEN ESTATE REVOCABLE TRU	51959921	12/29/2005
26	505-41-026	SPICER DAVID/JEFFERY/TAMARA	960504104	7/18/1996
27	505-41-025	RICVIC LLC	50422759	4/4/2005

Number	Parcel ID	NAME	Deed Number	Date
28	505-41-024	REGUSA RICHARD A	41472322	12/15/2004
29	505-41-023	REGUSA RICHARD A	41472322	12/15/2004
30	505-41-022	HUMANE SOCIETY OF WICKENBURG	80414464	5/9/2008
31	505-41-021	HUMANE SOCIETY OF WICKENBURG	70718019	6/22/2007
32	505-41-033	HAMMER JERRY/LURLINE	705701	9/13/2000
33	505-41-031	HANGGI MEINRAD & BETTY TR	31129180	8/18/2003
34	505-41-030	HAMMER JERRY	990247737	3/16/1999
35	505-41-029	WICKENBURG BUSINESS CENTER LLC	80298231	4/4/2008
36	505-41-028	CROTHERS JOHN/SHARON F TR	80937947	10/30/2008
37	505-41-006-C	WICKENBURG TOWN OF	14856-0179	11/26/1980
38	505-41-017	WICKENBURG TOWN OF	910418397	9/9/1991
39	505-41-006-N	THE WELLIK FOUNDATION	60174700	2/7/2006
40	505-41-035	WICKENBURG TOWN OF	910122235	3/25/1991
41	505-41-016	WICKENBURG TOWN OF	910418397	9/9/1991

Number	Parcel ID	NAME	Deed Number	Date
42	505-41-006-L	WICKENBURG TOWN OF	910122235	3/25/1991
43	505-41-006-P	WICKENBURG TOWN OF	910122236	3/25/1991
44	505-41-037	WICKENBURG TOWN OF	910418395	9/9/1991
45	505-41-008-J	WICKENBURG TOWN OF	12090-0402	2/24/1977
46	505-41-008-S	WICKENBURG TOWN OF	830279415	7/18/1983
47	505-41-008-R	WICKENBURG TOWN OF	No Official Document	
48	505-41-009-L	WELLIK VIOLA F	890274807	1/15/1989
49	505-41-009-F	WICKENBURG TOWN OF	890586556	12/21/1989
50	505-41-009-K	WICKENBURG TOWN OF	90432910	9/26/1990
51	505-41-083	JONES BRIAN G/WENDY L	40412575	4/19/2004
52	505-41-082	GRACE HOWARD W SR/NANCY JO	30880630	7/7/2003
53	505-41-081	GRACE HOWARD W SR/NANCY JO	30880630	7/7/2003
54	505-41-080-A	WARRICK REVOCABLE TRUST	80102502	2/5/2008
55	505-40-021-A	WICKENBURG TOWN OF	910122237	3/25/1991
56	505-41-078	WARRICK RICHARD L/ZINA Y TR	80515552	6/11/2008
57	505-41-077	DAVIS LARRY C/JANET M	51282737	9/1/2005
58	505-41-009-G	WICKENBURG TOWN OF	910053053	2/7/1991
59	505-41-062	ALLENDER JOEL J/SONJA K	50110598	1/27/2005
60	505-41-063	BOWIE THURMAN A/SUSAN YVETTE	80479166	5/30/2008
61	505-41-064	GRAHAM LARRY L/HALE STEPHANIE A	50091321	1/24/2005
62	505-41-065	HALL JAMES/MARLA	61309082	10/3/2006
63	505-41-066	SUTLIFF CAROLYN/FALLANG CHRIS	50707458	5/26/2005
64	505-41-067	SIMPSON CATTLE COMPANY LIMITED P	41500557	12/21/2004
65	505-41-068	MARCUCCELLI SALVATORE ANTHONY/CA	50391271	3/29/2005
66	505-41-069	GRIFFITH EMMETT M/JUDITH A	40823339	7/19/2004
67	505-41-070	GRACE JOHN M/LENORE	40497483	5/5/2004
68	505-41-071	GRACE JOHN M/LENORE	40497483	5/5/2004
69	505-41-072	SACHER KARY/PAMELA	50365757	3/25/2005

Number	Parcel ID	NAME	Deed Number	Date
70	505-41-073	MILLS MICHAEL/VALERIE	50731662	6/1/2005
71	505-41-076	ROBERTS MICHAEL D/KATHRYN J	50486248	4/15/2005
72	505-41-074	WEIDENAAR ROBERT/CHARLENE	50464483	4/12/2005
73	505-41-075	GRACE HOWARD W/NANCY J TR	110158526	2/23/2011
74	505-41-032	HANGGI MEINRAD/BETTY TR	31129181	8/18/2003
75	505-41-027	CROTHERS JOHN/SHARON F TR	80937947	10/30/2008
76	505-41-006-K	WICKENBURG TOWN OF	880601923	12/12/1988
77	505-41-151	PALOS VERDES INDUSTRIAL PARK 2 L	101061419	12/6/2010
78	505-41-150	PALOS VERDES INDUSTRIAL PARK	80229208	3/14/2008
79	505-41-015	THIELEN DAVID F	900059560	2/8/1990
80	505-41-014-B	SCHUCK DEVELOPMENT CORP	618884	8/14/2000
81	505-41-012-C	SO GREEN INCORPORATED	940902630	12/30/1994
82	505-41-014-E	SCHUCK DEVELOPMENT CORPORATIO	31451877	10/17/2003
83	505-41-014-D	KROPF LYLE A/NANCY R	60260117	2/27/2006
84	505-41-010-A	JAMESTOWN PLASTICS INC	940575453	7/29/1994
85	505-41-012-D	GREEN SONJA TR	940754646	10/20/1994
86	505-41-012-A	SMITH JAMES O/PENNY L	30457420	4/11/2003
87	505-41-008-Q	WICKENBURG TOWN OF	No Official Document	
88	505-41-007-C	WICKENBURG TOWN OF	910053053	2/7/1991
89	505-04-036	WICKENBURG TOWN OF	910531080	11/13/1991
90	505-41-034	THE WELLIK FOUNDATION	60174700	2/7/2006
91	505-41-036	THE WELLIK FOUNDATION	60174700	2/7/2006
92	Unknown	ARIZONA STATE OF		
93	Unknown	WICKENBURG TOWN OF		
94	505-41-041	WICKENBURG TOWN OF	920634267	11/6/1992
95	505-41-039	WICKENBURG TOWN OF	910531081	11/13/1991
96	505-41-040	WICKENBURG TOWN OF	920634266	11/6/1992
97	505-04-037	WICKENBURG TOWN OF	920634268	11/6/1992

WICKENBURG MUNICIPAL AIRPORT

Exhibit 1C
PARCEL MAP

AIRSIDE FACILITIES

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

TABLE 1C
Airside Facilities Data
Wickenburg Municipal Airport

	Runway 5-23
Runway Length	6,100'
Runway Width	75'
Runway Surface Material	Asphalt
Condition	Good
Pavement Markings	Non-Precision
Runway Load-Bearing Strength (lbs.)	
Single Wheel Loading (SWL)	30,000
Dual Wheel Loading (DWL)	60,000
Runway Lighting	MIRL
Taxiway Lighting	MITL
Approach Aids	PAPI-4L REIL
Instrument Approach Procedures	None
Weather or Visual Aids	AWOS-III Segmented Circle & Lighted Wind Cone Rotating Beacon

AWOS – Automated Weather Observation System
MIRL – Medium Intensity Runway Lighting
MITL – Medium Intensity Taxiway Lighting
PAPI – Precision Approach Path Indicator
REIL – Runway End Identification Lights

Source: *Airport Facility Directory; Southwest U.S.* (November 18, 2010).

Runway/Taxiway System

Wickenburg Municipal Airport is served by a single asphalt runway. Runway 5-23 is 6,100 feet long, 75 feet wide, and oriented in a northeast-southwest manner. This runway has pavement strength of 30,000 pounds single wheel loading (SWL) and 60,000 pounds dual wheel loading (DWL). SWL refers to the design of certain aircraft landing gear which has a single wheel on each main landing gear strut. DWL refers to certain aircraft landing gear which has two wheels on each main landing gear strut. The difference in runway end elevations for the runway is 71 feet, which results in a 1.2 percent runway gradient (elevation difference between the runway high and low points divided by the length of the runway).

Runway 5-23 is served by full length parallel Taxiway A, which is located 240 feet from the runway centerline. Taxiway A is served by five connecting taxiways (B, C, D, E, F). Taxiway A and its associated connecting taxiways all have a width of 35 feet.

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 5-23 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 Wickenburg Municipal Airport is located adjacent to the terminal building.

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 5-23 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 5-23 are aided by the presence of precision approach path indicator lights (PAPI-4L), 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.

Runway End Identification Lights (REILs): A REIL system has been installed at each end of Runway 5-23. REILs provide rapid and positive identification of the approach ends of a runway. A REIL consists of two synchronized flashing lights, located laterally on each side of the runway threshold, facing the approaching aircraft.

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 Wickenburg 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.

10MP09-1D-3/06/11

LEGEND

Airport Property Line

0 600 1,200

SCALE IN FEET

NORTH

PHOTO DATE: December 2010

Hartman Wash

AWOS

Segmented Circle / Lighted Wind Cone

Blast Pad

F ← 35′

Hold Apron

PAPI-4

A

E ← 35′

240′

35′

Runway 5-23 (6,100′ x 75′)

D ← 35′

Aircraft Parking Apron with Access Road and Vehicle Parking *(to be completed in 2012)*

PAPI-4

C ← 35′

Wickenburg Industrial Air Park

Conventional Hangars

B ← 35′

Blast Pad

Fuel Island

Helipads

Airport Beacon

Solar Panels

Terminal Building

Above-Ground Fuel Tanks

A

T-Hangars

Conventional Hangar

T-Hangars

Sunset Park

U.S. Highway 60

Percheron Rd.

West Saddle Ridge Dr.

North Silver Spur Dr.

West Palomino Dr.

West Pinto Place

North Stirrup Dr.

3 Crosses Rd.

W. Lupine Ln.

Longhorn Rd.

W. Highridge Rd.

Ironwood Pl.

WICKENBURG MUNICIPAL AIRPORT

Exhibit 1D
AIRPORT FACILITIES

Helipad

Wickenburg Municipal Airport is equipped with two helipads, which are located on the southwest end of the aircraft parking apron. The majority of helicopter operations at the airport are performed by the air ambulance operator Lifenet. Their facility is located adjacent to the helipads.

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 near the end of Runway 23, on the north side of the runway.

Wickenburg Municipal Airport is also equipped with an Automated Weather Observation System (AWOS-III). An AWOS automatically records weather conditions such as wind speed, wind gusts, wind direction, temperature, dew point, altimeter setting, and density altitude. In addition, the AWOS-III will record visibility, precipitation, and cloud height. This information is then transmitted at regular intervals.

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**.

Terminal Building

The terminal building for Wickenburg Municipal Airport is located south of the Runway 5 end. This building was constructed in 1970 and totals approximately 1,200 square feet. Services provided in the terminal building include a pilot's lounge, flight planning, concessions, restrooms, storage, management, and various other needs.

Vehicle parking for the terminal building is located directly east and provides approximately 15 spaces. This parking lot constitutes the only designated parking area at the airport and serves the general public, terminal area employees, and general aviation pilots.

Specialty Operators

A variety of services are available to general aviation aircraft owners and operators at Wickenburg Municipal Airport. This includes aircraft maintenance and repair, aircraft painting, and flight instruction.

Aircraft Storage Facilities

General aviation facilities at Wickenburg Municipal Airport have been developed along the southwestern end of the airfield and are depicted on **Exhibit 1D**. The majority of hangar space available at the airport consists of T-hangars, which provide individual aircraft storage. Executive/conventional hangar space, which provides a large open space for multiple aircraft storage, is also available at the airport. Currently, approximately 60 hangar spaces are provided at Wickenburg Municipal Airport.

Aircraft Parking Apron

Existing apron area at the airport is located adjacent to Taxiway A, near the Runway 5 end. This apron totals approximately 17,000 square yards with 25 aircraft tiedown positions. An additional apron, totaling approximately 30,000 square yards, is planned for construction further east. Once completed, this apron will provide an additional 27 aircraft tiedown positions, as well as five commercial lease parcels.

Fuel Storage Facilities

Fuel storage and dispensing facilities at the airport are owned by the Town of Wickenburg for the daily operation of fuel sales. Fuel is dispensed from the fuel island located north of the terminal building and includes a single 22,000-gallon above ground tank. A wall inside the tank divides it into 10,000 gallons of 100LL AvGas and 12,000 gallons of Jet A fuel. A 1,500-gallon truck of Jet A fuel is also provided for aircraft refueling.

Aircraft Rescue and Firefighting

There is no dedicated airport rescue and firefighting (ARFF) facility at Wickenburg Municipal Airport. The nearest fire department is located approximately three miles east of the airport entrance, along U.S. Highway 60.

AIRSPACE CHARACTERISTICS

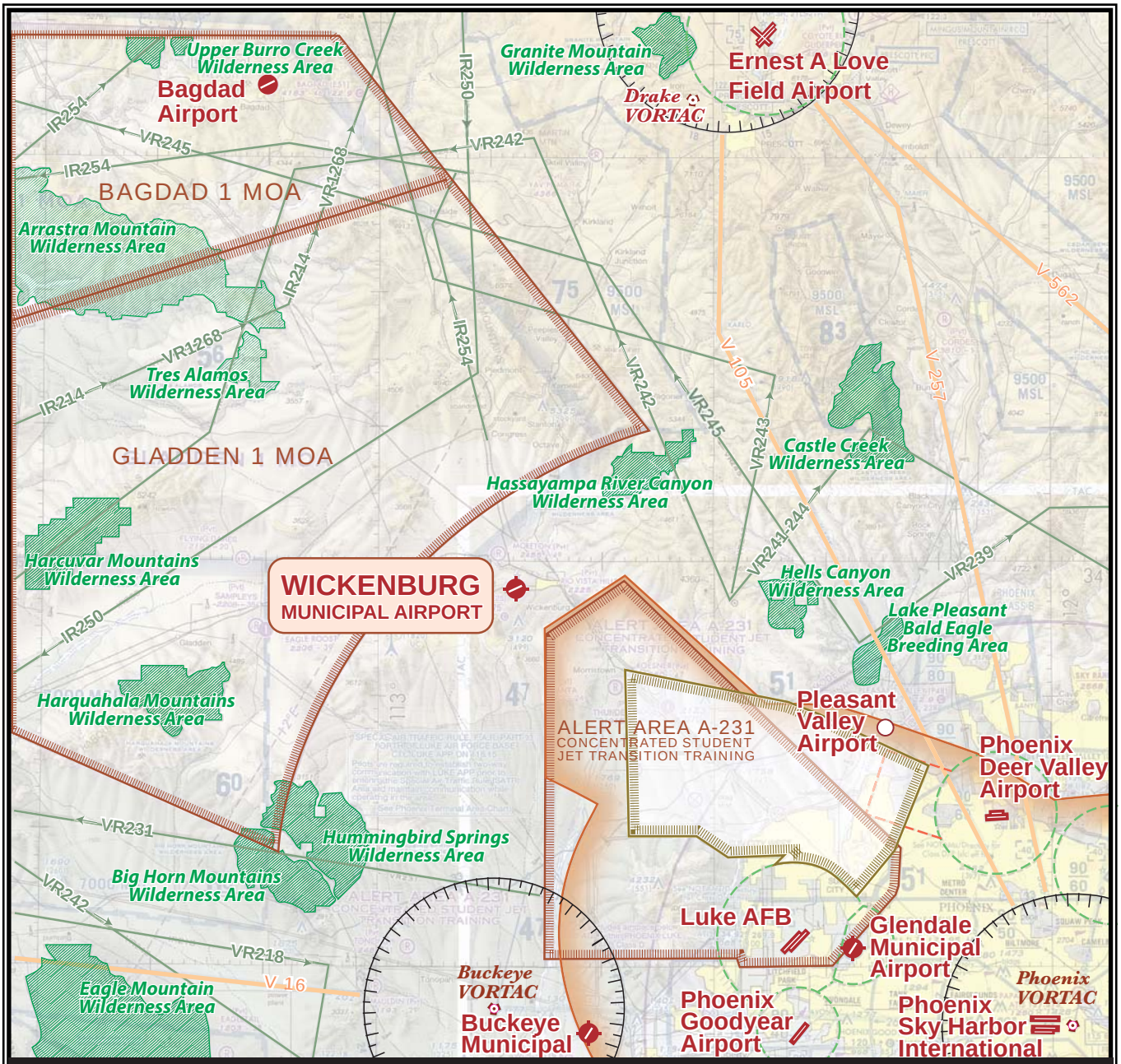
To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the National Airspace System. The U.S. airspace structure provides two basic categories of airspace, controlled and 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 Wickenburg Municipal Airport is depicted on **Exhibit 1E**. Class E airspace surrounds the airport, with the floor beginning at 1,200 feet above ground level (AGL) and extending to 18,000 feet mean sea level (MSL). This Class E airspace also encompasses the low altitude Victor Airways in the vicinity of the airport. Victor Airways are corridors of airspace eight miles wide that extend upward from 1,200 AGL to 18,000 feet MSL and extend between VOR navigational facilities. There are no Victor Airways directly to Wickenburg Municipal Airport. The Victor Airways in the vicinity of the airport emanate from the Buckeye, Drake, and Phoenix VORTACs.

SPECIAL USE AIRSPACE

Exhibit 1E also depicts two Military Operations Areas (MOAs) northwest of

10MP09-1E-12/16/10



LEGEND

- Airport with other than hard-surfaced runways
- Airport with hard-surfaced runways 1,500' to 8,069' in length
- Airports with hard-surfaced runways greater than 8,069' or some multiple runways less than 8,069'
- VORTAC
- Compass Rose
- Wilderness Areas
- Victor Airways
- Class D Airspace
- Class E Airspace
- Class E Airspace with floor 700' above surface
- Military Operations Area
- Prohibited, Restricted and Warning Area
- Military Training Route

NORTH

NOT TO SCALE

Source: Phoenix North and South Sectional Chart, US Department of Commerce, National Oceanic and Atmospheric Administration, 10/21/10

WICKENBURG MUNICIPAL AIRPORT

Exhibit 1E
VICINITY AIRSPACE

Wickenburg Municipal Airport. These include the Gladden 1 MOA and the Bagdad 1 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.

Alert Area A-231 is located approximately five miles southeast of Wickenburg 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 (shaded white 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 wildlife 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 Wickenburg 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 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 multistate 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

Wickenburg Municipal Airport is situated at 2,377 feet mean sea level (MSL). The traffic pattern altitude for all aircraft operating at the airport is 1,000 feet above airfield elevation (3,377 feet MSL). Runway 5 utilizes a left-hand traffic pattern. In this manner, aircraft approaching the Runway 5 end follow a series of left-hand turns. Runway 23 utilizes a right-hand traffic pattern, where aircraft approaching the Runway 23 end follow a series of right-hand turns. By designating the traffic pattern in this manner, all aircraft traffic is maintained northwest of the runway, away from the residential areas to the southeast.

Runway use is dictated by wind conditions. Ideally, it is desirable for aircraft to land directly into the wind. Generally, aircraft use is split evenly between each runway end.

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 Wickenburg 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. The Buckeye VORTAC, located approximately 31 nautical miles south of the airport, can be utilized by pilots flying to or from the airport. **Exhibit 1E** depicts the location of the Buckeye VORTAC in relation to the airport.

GPS is an additional navigational aid for pilots. GPS was initially developed by the United States Department of Defense for military navigation around the world. GPS differs from 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. There are currently no instrument approach procedures published for Wickenburg 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 1D**. 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.

TABLE 1D
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%
Wickenburg	4,515	5,082	6,363	1.2%	2.3%

Source: U.S. Census Bureau.

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.

Historical population for the Town of Wickenburg was also examined. Between 1990 and 2000, the town's growth rate was less than half that of both Maricopa County and the State of Arizona. However, Wickenburg's growth rate nearly doubled over the past ten years, even exceeding that of the county and the state by 0.1 percent. In 2010, Wickenburg had a reported population of 6,363.

Population projections for the forecast period are presented in **Table E**. The most recent population projections for the state and the county were obtained from the 2011 Woods & Poole Economics. According to Woods & Poole, Arizona's population is projected to grow at an average annual rate of 1.5 percent between 2015 and 2030, totaling over 9.1 million residents by 2030. Maricopa County's population is projected to grow at the same rate during this time, totaling approximately 5,548,000 residents by 2030.

Population projections for the Town of Wickenburg 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 11,022 in 2010 for the base year of their forecasts. It should be noted that this number is higher than the 6,363 reported by the U.S. Census Bureau in 2010. MAG projects the town's population to reach 17,700 by 2030, which represents an average annual growth rate of 2.6 percent between 2015 and 2030.

TABLE 1E
Forecast Population

Area	2015	2020	2025	2030	Avg. Annual Growth Rate (2015-2030)
Arizona	7,311,000	7,921,000	8,539,000	9,158,000	1.5%
Maricopa Co.	4,449,000	4,811,000	5,179,000	5,548,000	1.5%
Wickenburg	12,100	13,300	15,400	17,700	2.6%

Source: 2011 Woods & Poole Economics, MAG Regional Transportation Plan (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 1F**.

TABLE 1F
Civilian Labor Force Data

	1990	2000	2010
Maricopa County			
Civilian Labor Force	1,116,400	1,595,300	1,999,900
Employment	1,068,500	1,542,800	1,827,100
Unemployment	47,900	52,500	172,800
Unemployment Rate	4.3%	3.3%	8.6%
State of Arizona			
Civilian Labor Force	1,806,300	2,505,300	3,171,100
Employment	1,707,300	2,404,900	2,868,500
Unemployment	99,000	100,400	302,600
Unemployment Rate	5.5%	4.0%	9.5%
United States			
Civilian Labor Force	125,840,000	142,583,000	153,889,000
Employment	118,793,000	136,891,000	139,064,000
Unemployment	7,047,000	5,692,000	14,825,000
Unemployment Rate	5.6%	4.0%	9.6%

Source: Arizona Workforce Informer; U.S. Bureau of Labor Statistics.

As shown in the table, the State of Arizona and the United States had nearly identical unemployment rates at the end of 2010, with 9.5 percent and 9.6 percent, respectively. Meanwhile, the county's unemployment rate was at 8.6 percent. While this was an all-time high for the county, it was still slightly below that of the state and the country. These high unemployment rates can mainly be attributed to the recent economic crisis.

Table 1G presents the major employers in the Town of Wickenburg, several of which utilize Wickenburg Municipal Airport. This list was compiled from the town's website, and includes both full-time and part-time employment.

As shown in the table, two of the top three employers in Wickenburg are treatment facilities. With 326 employers, Remuda Ranch is the largest employer in Wickenburg, as well as the nation's largest eating disorder treatment facility. Another treatment center, The Meadows, employs 151 people and is the third largest employer in the town. The Wickenburg School District and the Rancho De Los Caballeros resort round out the top four employers in the town, with 223 and 130 employees, respectively. Other principal industries in Wickenburg include healthcare, government, retail, and manufacturing.

TABLE 1G
Major Employers
Town of Wickenburg

Employer Name	Industry	# of Employees
Remuda Ranch	Treatment Facility	326
Wickenburg School District	Education	223
The Meadows	Treatment Facility	151
Rancho De Los Caballeros	Resort	130
Wickenburg Community Hospital	Medical/Healthcare	119
Safeway, Inc.	Grocery/Retail Store	90
Town of Wickenburg	Government	90
Bashas'	Grocery/Retail Store	66
Bear Cat Manufacturing	Manufacturing	45
Benner-Nawman, Inc.	Manufacturing	15

Source: Town of Wickenburg Website.

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.

Airport/Facility Directory, Southwest U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, January 13, 2011 Edition.

National Plan of Integrated Airport Systems (NPIAS), U.S. Department of Trans-

portation, Federal Aviation Administration (2009-2013).

Phoenix Sectional Chart, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, October 21, 2010.

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

Arizona Department of Commerce:
www.azcommerce.com

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 Wickenburg:
http://www.ci.wickenburg.az.us/

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

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

WICKENBURG MUNICIPAL AIRPORT

Chapter Two

Forecasts

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 Wickenburg Municipal Airport, this involves projecting potential aviation demand for a 20-year timeframe. In this report, forecasts of annual operations, based aircraft, based aircraft fleet mix, and annual instrument approaches 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 Wickenburg 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.

FAA FORECASTS AND TRENDS

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 2011-2031*, published in February 2011. 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 National Bureau of Economic Research indicated that the U.S. officially entered a recession in December 2007. To help revive the economy, lawmakers enacted the American Recovery and Reinvestment Act (ARRA) in February 2009. This bill included a combination of individual tax cuts, investment incentives, aid to people directly hurt by the recession, state fiscal relief, and direct government investment spending. Following the enactment of this bill, the economy grew for the first time during the fourth quarter of FY 2009 (up 1.6 percent) and 2.2 percent for all of FY 2010.

The global economy is growing once again, reviving the demand for air travel. Profitability for the U.S. carriers will hinge on several factors, including a stable environment for fuel prices, an increase in demand for corporate air travel, the ability to pass along fare increases to leisure travels, and the generation of ancillary revenues.

NATIONAL TRENDS

Historically, aviation activity has closely followed the national economic outlook. Over the past decade, the commercial air carrier industry has suffered several major setbacks, including the terrorist attacks of September 11th, concerns about international pandemics, airline bankruptcies, record high fuel prices, and the most significant economic downturn since the Great Depression. To lower operating costs during this volatile time, carriers eliminated unprofitable routes and grounded older, less fuel efficient aircraft. To increase operating revenues, carriers began charging separately for services that were historically included in the price of a ticket (e.g., meal service, baggage fees), as well as for services that were not previously available (e.g., premium boarding and fare lock fees). The impact from these initiatives bolstered the industry to profitability for the first time since 2007.

The number of passengers traveling is forecast to continue to grow over the long term, demonstrating the value of air transportation. In fact, the level of activity and demand is expected to eclipse those published in last year's FAA forecast. The 2011 FAA forecast calls for one billion passengers to be flown in 2021, two years earlier than projected in last year's forecast.

The economic downturn has also dampened the near-term prospects for the general aviation industry, but the long term outlook remains favorable. Growth in the demand for business aviation is expected to be driven by a growing economy. As the fleet grows, the number of general aviation hours flown is projected to increase an average of 2.2 percent a year through 2031.

GENERAL AVIATION TRENDS

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.

Despite signs of an economic recovery since then, the general aviation industry experienced a difficult year in 2010. **Table 2A** presents historical data of general aviation aircraft shipments and billings. Based on figures released by the General Aviation Manufacturers Association (GAMA), U.S. manufacturer shipments declined for the third straight year in 2010, down an estimated 22.1 percent since 2007. Billings also declined between 2008 and 2009. However, they experienced a slight increase (1.2 percent) in 2010, which can be attributed to the shipment of more sophisticated aircraft.

TABLE 2A
Annual General Aviation Airplane Shipments and Billings

Year	Single Engine	Multi-Engine	Turboprop	Jets	Total	Net Billings (in Millions)
2000	1,877	103	415	752	3,147	$13,496
2001	1,645	147	422	784	2,988	$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: 2010 GAMA Statistical Databook & Industry Outlook.

Exhibit 2A depicts the FAA forecast for active general aviation aircraft. The FAA defines an active aircraft as one that flies at least one hour during the year. In 2010, there were an estimated 224,172 active general aviation aircraft in the United States. Forecasts project an average annual increase of 0.9 percent through 2031, resulting in 270,920 active aircraft. The more expensive and sophisticated turbine-powered fleet (including rotorcraft) is projected to grow at an average of 3.0 percent a year over the forecast period, with the turbine jet portion increasing at 4.2 percent annually.

Beginning in 2005, a new category of aircraft that was previously not included in the FAA's aircraft registry counts was created: "light sport" aircraft. At the end of 2009, a total of 6,547 aircraft were estimated to be in this category. The forecast assumes this fleet will increase by approximately 450 aircraft per year until 2013, tapering off to about 300 per year after that. A total of 13,870 light sport aircraft are projected by 2031.

After experiencing rapid growth during the past decade, the demand for business jet aircraft has slowed over the past two years as a result of the recession. However, the forecast for the business jet market calls for robust growth in the long term, driven by higher corporate profits and continued concerns about safety/security and flight delays, as well as the increased

attractiveness of business aviation relative to commercial air travel. It is expected that the business usage of general aviation aircraft will expand at a faster rate than that for personal/recreational use.

Aircraft utilization rates are projected to increase through the forecast period. The number of general aviation hours flown is projected to increase by 2.2 percent annually over the forecast period, with much of the long term increase reflected by strong growth in the rotorcraft and turbine jet category.

The total general aviation pilot population is projected to increase by 42,000 (0.4 percent annually) over the forecast period, reaching 527,660 by 2031. Commercial pilots are projected to increase from 123,705 in 2010 to 136,300 (0.5 percent annually) by 2031. The number of private pilots is projected to grow at an average annual rate of 0.3 percent over the forecast period to a total of 214,500 by 2031. In addition, the FAA is projecting a total of 12,850 sport pilots will be certified by the end of the forecast period. At the end of 2009, the number of sport pilot certificates issued totaled 3,682, which reflects a steady increase in this new "entry level" pilot certificate that was only created in 2005.

Another important aspect of general aviation, as well as the aviation industry as a whole, is student pilots. Student pilot numbers had been in decline for a number of years. However, in 2010 the FAA increased the validity of student pilot certificates from 36 to 60 months (for pilots under the age of 40). As a result of this, the number of student pilot certificates at the end of 2010 increased by 64.8 percent, or approximately 47,000 pilots, over the previous year. The total number of student pilots is forecast to increase 0.1 percent annually over the forecast period, increasing from 119,119 in 2010 to 120,600 by 2031.

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 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,

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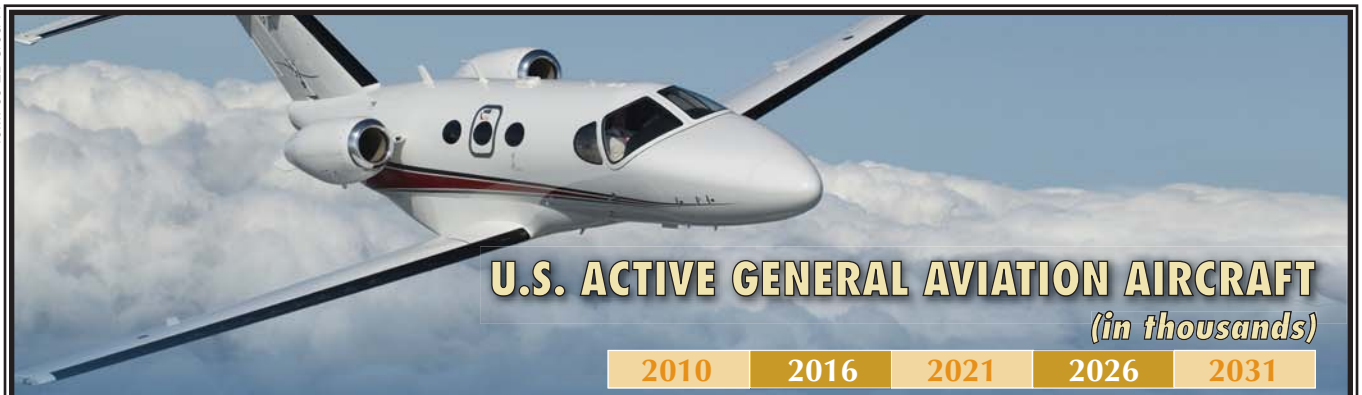
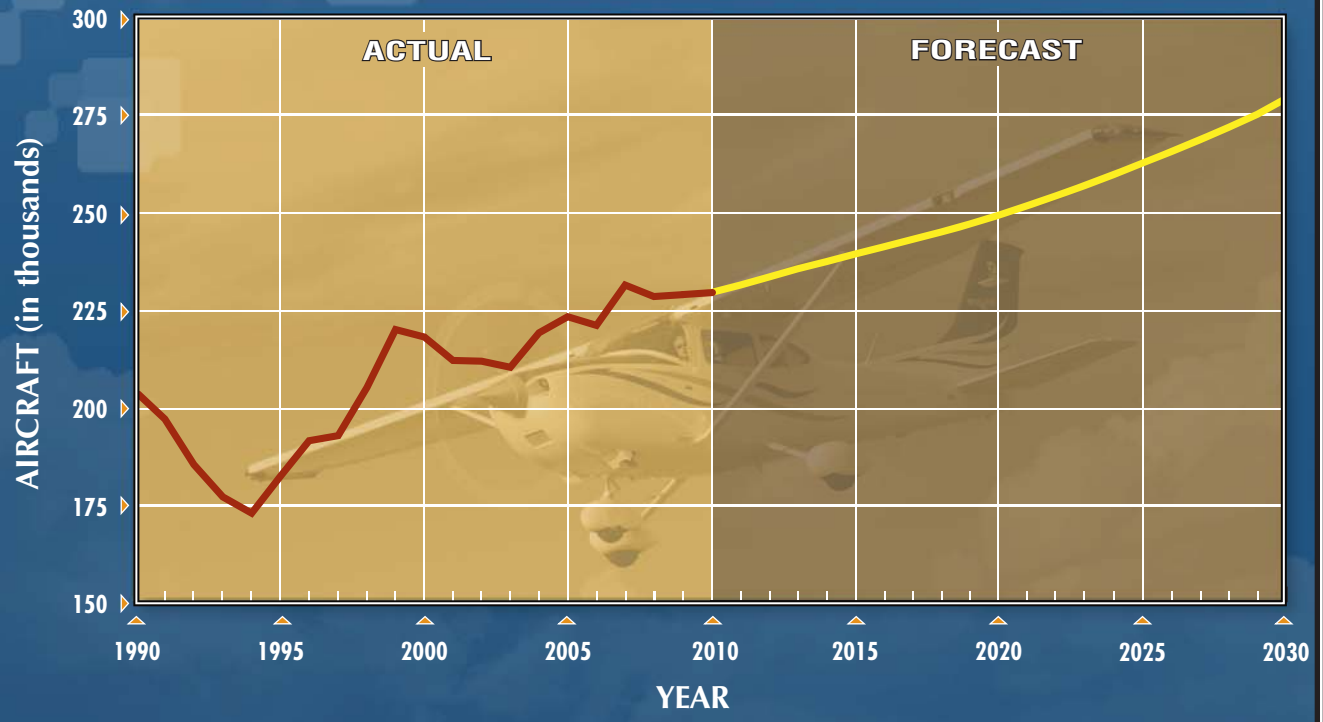


U.S. ACTIVE GENERAL AVIATION AIRCRAFT

(in thousands)

	2010	2016	2021	2026	2031
FIXED WING					
PISTON					
Single Engine	139.8	136.5	137.3	141.2	147.7
Multi-Engine	16.3	15.5	14.8	14.2	13.6
TURBINE					
Turboprop	9.2	10.0	10.7	11.4	12.3
Turbojet	11.7	14.7	18.2	22.4	27.4
ROTORCRAFT					
Piston	3.6	4.3	5.0	5.8	6.6
Turbine	6.6	7.6	8.6	9.7	10.8
EXPERIMENTAL	24.6	27.2	29.1	31.1	33.0
SPORT AIRCRAFT	7.0	9.4	10.9	12.4	13.9
OTHER	5.5	5.5	5.4	5.4	5.4
TOTAL	224.2	230.7	240.4	253.5	270.9



Source: FAA Aerospace Forecasts, Fiscal Years 2011-2031.

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

WICKENBURG MUNICIPAL AIRPORT

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

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 Wickenburg 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 Wickenburg 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 (ADOT) - Aeronautics Group 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 over the past ten years. This information was obtained from records of the FAA's Aircraft Registry. According to the FAA, there were 4,668 aircraft registered in Maricopa County in 2000. This number has since increased, with 5,306 registered aircraft reported in the county at the end of 2010. This represents an annual average growth rate of 1.3 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.

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.

TABLE 2B
Historical Registered Aircraft
Maricopa County

Year	Registered Aircraft	Annual % Change
2000	4,668	-
2001	4,850	3.9%
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	5,306	-2.0%

Source: FAA Aircraft Registry.

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 2.15% in 2000 to a high of 2.45% in 2003. The county's market share in 2010 was 2.37 percent. From this, a constant market share projection was applied to the forecast years and yields 6,320 registered aircraft in Maricopa County by 2030.

Due to the fluctuation in the county's market share in recent years, an average market share projection was also developed. Between 2006 and 2010, the county's market share of U.S. active general aviation aircraft averaged 2.39 percent. This percentage was applied to the forecast years and yields 6,380 registered aircraft in Maricopa County by 2030.

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 1.53 aircraft per 1,000 residents in 2001 to a low of 1.35 aircraft per 1,000 residents in 2009. In 2010, there were 1.39 aircraft per 1,000 residents in Maricopa County. A constant ratio projection of 1.39 was applied to the forecast years and yields 7,710 aircraft registered in the county by 2030.

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
2000	4,668	217,500	2.15%	3,072,100	1.52
2001	4,850	211,500	2.29%	3,165,600	1.53
2002	4,875	211,300	2.31%	3,261,900	1.49
2003	5,129	209,600	2.45%	3,361,100	1.53
2004	5,148	219,300	2.35%	3,463,400	1.49
2005	5,205	224,400	2.32%	3,568,800	1.46
2006	5,299	221,900	2.39%	3,677,300	1.44
2007	5,476	231,600	2.36%	3,789,200	1.45
2008	5,504	228,700	2.41%	3,904,500	1.41
2009	5,413	223,900	2.42%	4,023,300	1.35
2010	5,306	224,200	2.37%	3,817,100	1.39
Constant Market Share Projection of U.S. Active GA Aircraft					
2015	5,420	229,100	2.37%		
2020	5,630	237,800	2.37%		
2025	5,930	250,600	2.37%		
2030	6,320	267,100	2.37%		
Average Market Share Projection of U.S. Active GA Aircraft					
2015	5,480	229,100	2.39%		
2020	5,680	237,800	2.39%		
2025	5,990	250,600	2.39%		
2030	6,380	267,100	2.39%		
Constant Ratio Projection Per 1,000 Residents (Maricopa County)					
2015	6,180			4,449,000	1.39
2020	6,690			4,811,000	1.39
2025	7,200			5,179,000	1.39
2030	7,710			5,548,000	1.39
Average Ratio Projection Per 1,000 Residents (Maricopa County)					
2015	6,270			4,449,000	1.41
2020	6,780			4,811,000	1.41
2025	7,300			5,179,000	1.41
2030	7,820			5,548,000	1.41

Source: Historical Registered Aircraft – FAA; Historical and Forecast U.S. Active GA Aircraft - FAA *Aerospace Forecasts, Fiscal Years 2011-2031* (February 2011); Historical Population – U.S. Census Bureau; Forecast Population – 2011 Woods & Poole Economics, Inc.

Similar to the previous forecast, an average ratio projection was also developed. Applying the average ratio between 2006 and 2010 (1.41) to the forecast years

yields 7,820 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 1.3 percent between 2000 and 2010. This growth rate was applied to the forecast years and yields 6,870 registered aircraft in the county by 2030.

Table 2D and **Exhibit 2B** summarize the registered aircraft forecasts for Maricopa County. The average market share projection of U.S. active general aviation aircraft was chosen as the selected planning forecast. With the decrease in registered aircraft over the previous two years, this forecast projects a modest increase of registered aircraft in the short term and gradually increasing throughout the planning period.

TABLE 2D
Summary of Registered Aircraft Forecasts
Maricopa County

	2010	2015	2020	2025	2030
1.3 % Historical Growth Rate (2000-2010)		5,700	6,000	6,400	6,900
Registered Aircraft Per 1,000 Residents (Maricopa Co.)					
Constant Ratio Projection		6,200	6,700	7,200	7,700
Average Ration Projection		6,300	6,800	7,300	7,800
Market Share of U.S. Active GA Aircraft					
Constant Market Share Projection					
Average Market Share Projection		5,400	5,600	5,900	6,300
(Selected Planning Forecast) (0.9% AAGR)	**5,306**	**5,500**	**5,700**	**6,000**	**6,400**

The selected planning forecast best represents the county's overall trend over the past ten years and results in 6,400 registered aircraft in Maricopa County by 2030. This is an increase of over 1,000 aircraft in the county over the planning period, which represents an average annual growth rate of 0.9 percent.

Based Aircraft Forecasts

According to the previous Airport Master Plan, there were 43 aircraft based at Wickenburg Municipal Airport in 2000. Airport records at the end of 2010 indicate 53 based aircraft, which represents an average annual growth rate of 2.1 percent over the past ten years. Limited historical based aircraft totals between 2000 and 2010 were available for this study; therefore, time-series and regression analyses could not be performed.

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 53 based aircraft at Wickenburg Municipal Airport currently account for 1.00 percent of the aircraft registered in the county. This is a slight increase from the 0.92 percent market share the airport captured in 2000.

A constant market share projection was first developed and applies the existing (1.00 percent) market share to the forecast years, yielding 64 based aircraft at the airport by 2030. An increasing mar-

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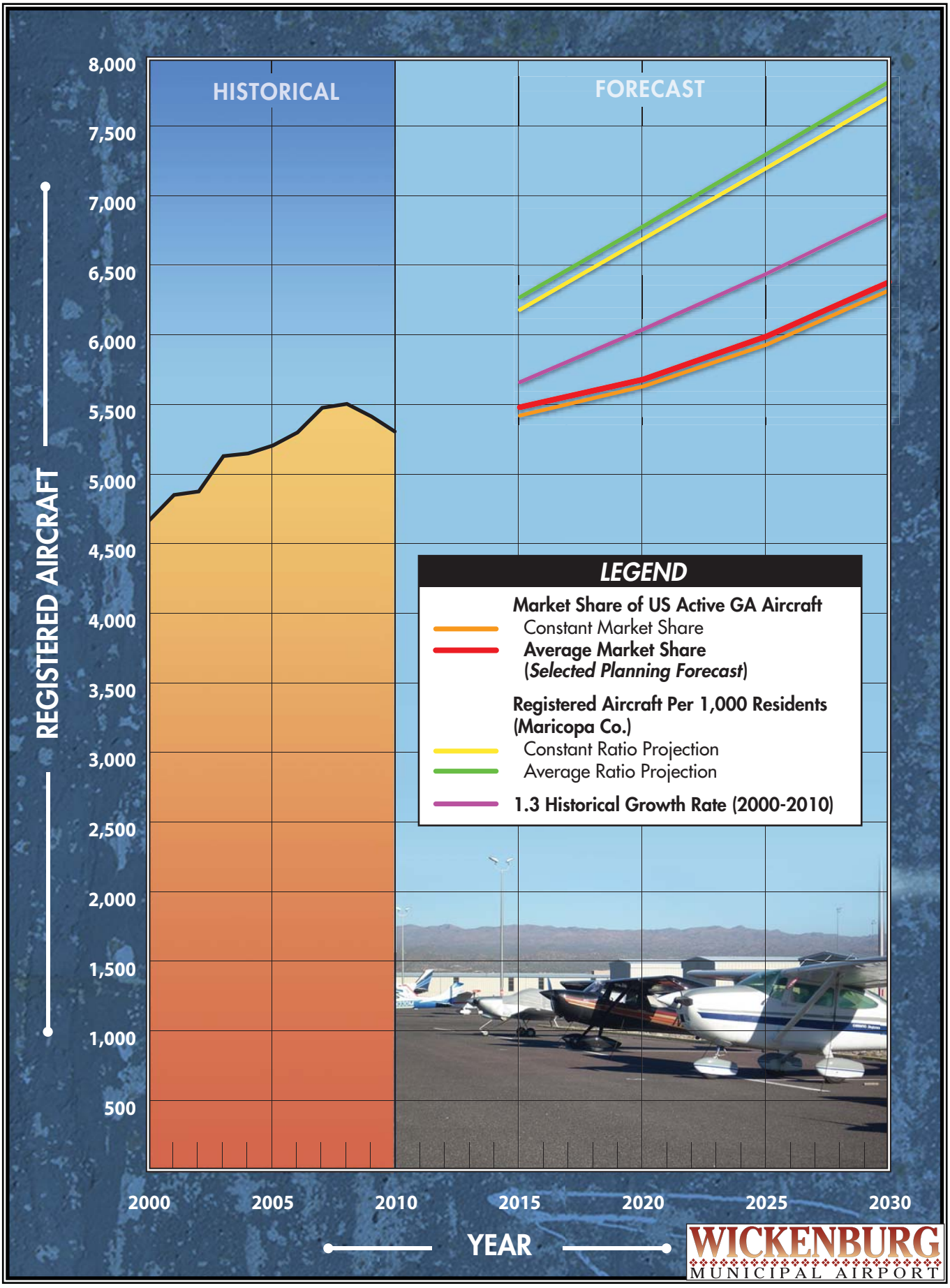

Exhibit 2B
MARICOPA COUNTY REGISTERED
AIRCRAFT FORECAST SUMMARY

ket share forecast was also developed to represent the historical trend at the airport. This increasing market share forecast yields 74 based aircraft at the airport by 2030. These two forecasts are presented in **Table 2E**.

TABLE 2E
Based Aircraft Market Share Forecast (Maricopa County)

Year	Wickenburg Based Aircraft	Maricopa County Registered Aircraft	Market Share of Reg. AC
2000	43	4,668	0.92%
2010	53	5,306	1.00%
Constant Market Share Projection			
2015	55	5,500	1.00%
2020	57	5,700	1.00%
2025	60	6,000	1.00%
2030	64	6,400	1.00%
Increasing Market Share Projection			
2015	57	5,500	1.04%
2020	62	5,700	1.08%
2025	67	6,000	1.12%
2030	74	6,400	1.16%

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

Another forecast method examined the historical growth rate of the airport's based aircraft. As previously mentioned, based aircraft grew at an average annual rate of 2.1 percent between 2000 and 2010. Applying this growth rate to the forecast years yields 81 based aircraft at Wickenburg Municipal Airport by 2030.

The forecasts completed in the *2003 Airport Master Plan* were also examined for this study. This plan used a base year of 43 based aircraft in 2000 and projects 85 based aircraft at Wickenburg Municipal Airport by 2025.

Two additional forecasts were also examined, including the *2008 Arizona State Airports System Plan* (SASP) and the FAA's *2010 Terminal Area Forecast* (TAF). The *2008 Arizona SASP* used a base number of 47 based aircraft in 2007 and projects 64 based aircraft at the airport by 2030. The *2010 FAA TAF* used a base year of 2009, with an estimated 52 based aircraft and shows a flat line forecast through 2030.

Table 2F and **Exhibit 2C** summarize the based aircraft forecasts for Wickenburg Municipal Airport. The selected planning forecast is an average of the three newly developed forecasts and results in 75 based aircraft at the airport by 2030. This is an increase of 22 aircraft over the planning period, which represents an average annual growth rate of 1.8 percent.

TABLE 2F
Summary of Based Aircraft Forecasts
Wickenburg Municipal Airport

	2010	2015	2020	2025	2030
Market Share of Reg. Aircraft (Maricopa Co.)					
Constant Market Share Projection		55	57	60	64
Increasing Market Share Projection		57	62	67	74
2.1% Historical Growth Rate (2000-2010)		59	65	72	81
2003 Airport Master Plan		70	77[1]	85	N/A
2008 Arizona State Airports System Plan		52[1]	56[1]	60[1]	64
2010 FAA Terminal Area Forecast		52	52	52	52
Selected Planning Forecast (1.8% AAGR)	**53**	**57**	**60**	**65**	**75**

[1]Interpolated

It is important to note that the actual percentage of area-wide aircraft that base at Wickenburg 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 Wickenburg 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 41 single engine aircraft, seven multi-engine aircraft, two helicopters, and three ultralights.

The forecast mix of based aircraft was determined by comparing existing and forecast U.S. general aviation fleet trends to the fleet mix at Wickenburg 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 can be expected, their percentage of the total fleet mix will likely decrease. Meanwhile, the percentage of multi-engine aircraft is projected to increase by nearly seven percent by the end of the planning period. The percentage of helicopters and ultralight aircraft at the airport is expected to remain fairly constant through 2030. It could also be expected that Wickenburg Municipal Airport's based aircraft mix will include some jets in the future. The fleet mix projections for Wickenburg Municipal Airport are presented in **Table 2G**.

TABLE 2G
Based Aircraft Fleet Mix
Wickenburg Municipal Airport

Year	Total	Single Engine	Multi-Engine	Jets	Helicopters	Ultralights/ Others
2010	53	41	7	0	2	3
2010	100.0%	77.4%	13.2%	0.0%	3.8%	5.6%
2015	57	43	9	0	2	3
2020	60	43	10	1	3	3
2025	65	44	12	2	3	4
2030	75	49	15	3	4	4
Change	+22	+8	+8	+3	+2	+1
2015	100.0%	76.0%	16.0%	0.0%	3.0%	5.0%
2020	100.0%	72.0%	17.0%	2.0%	4.0%	5.0%
2025	100.0%	68.0%	19.0%	3.0%	4.0%	6.0%
2030	100.0%	65.0%	20.0%	4.0%	5.0%	6.0%

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. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. Generally, local operations are characterized by training operations.

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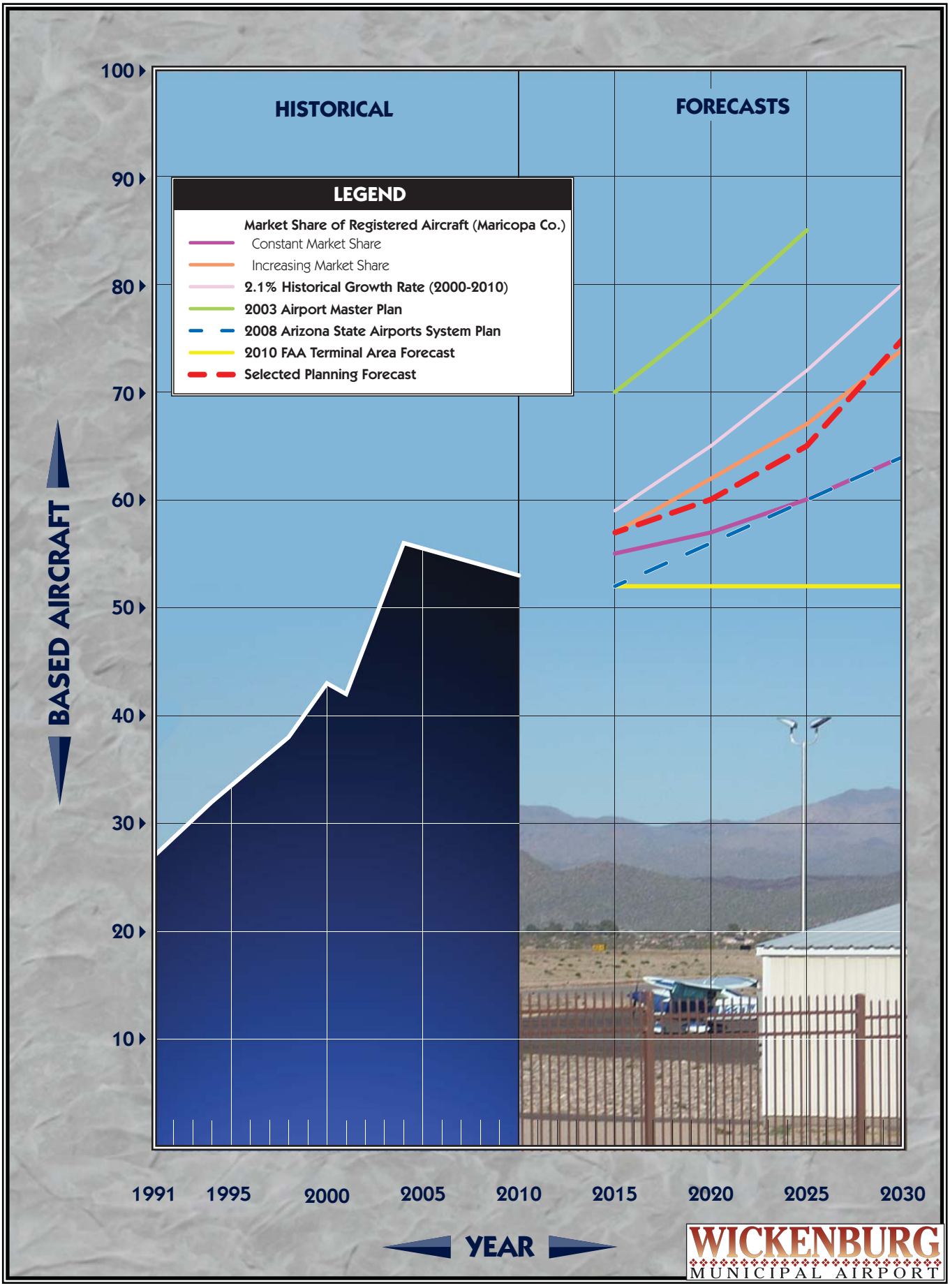

Exhibit 2C
BASED AIRCRAFT
FORECAST SUMMARY

There are currently three flight schools/training groups that use Wickenburg Municipal 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).

Applying this equation yields an initial total of 35,000 annual general aviation operations. Of this total, it is estimated that flight training at Wickenburg accounts for approximately 16,700 local operations each year. A review of activity at the airport over a period of time appears to substantiate these operational numbers.

The estimated 35,000 annual general aviation operations equates to 660 operations per based aircraft. From this base number, a constant projection of 660 operations per based aircraft was developed and yields 49,500 annual general aviation operations by 2030. It was estimated that the current operational split is 55 percent itinerant and 45 percent local. This forecast is presented in **Table 2H**.

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

Year	Based Aircraft	Itinerant Operations	Local Operations	Total Operations	Ops Per Based Aircraft
2010	53	19,200	15,800	35,000[1]	660
Constant Ratio Projection					
2015	57	20,700	16,900	37,600	660
2020	60	21,800	17,800	39,600	660
2025	65	23,600	19,300	42,900	660
2030	75	27,200	22,300	49,500	660

[1]2010 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. The *2003 Airport Master Plan* used a base year of 2000, with an estimated 22,300 general aviation operations. This plan projects 66,900 annual general aviation operations by 2025, which represents a 4.5 percent annual growth rate.

The *2008 Arizona SASP* used a base year of 2007, with an estimated 17,500 general aviation operations. The medium forecast in the *2008 Arizona SASP* projects 36,600 annual general aviation operations by 2030, which represents a 3.3 percent annual growth rate.

The *2010 FAA TAF* estimates 50,000 annual general aviation operations at Wickenburg Municipal Airport. The FAA TAF shows a flat line forecast through 2030.

Table 2J presents a summary of the three previously prepared forecasts, as well as the newly developed forecast. The selected planning forecast is the newly developed forecast, which used the FAA model to determine a base number of operations. This selected planning forecast projects 49,500 annual general aviation operations at Wickenburg Municipal Airport by 2030, which represents an average annual growth rate of 1.7 percent. It was estimated that the operational split of 55 percent itinerant and 45 percent local will remain through the planning period.

TABLE 2J
General Aviation Operations Forecast Summary
Wickenburg Municipal Airport

	2010	2015	2020	2025	2030
2003 Airport Master Plan		50,000	57,800[1]	66,900	N/A
2008 Arizona SASP		22,600[1]	26,500[1]	31,200[1]	36,600
2010 FAA TAF		50,000	50,000	50,000	50,000
Constant Operations Per Based Aircraft (Selected Planning Forecast)	**35,000**	**37,600**	**39,600**	**42,900**	**49,500**

[1]Interpolated

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 4,200 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 2K** summarizes the general aviation peak activity forecasts for Wickenburg Municipal Airport.

TABLE 2K
Peak Period Forecasts
Wickenburg Municipal Airport

		FORECASTS			
	2010	2015	2020	2025	2030
General Aviation Operations					
Annual	35,000	37,600	39,600	42,900	49,500
Peak Month (12.0%)	4,200	4,510	4750	5,150	5,940
Design Day	140	150	160	170	200
Busy Day	175	190	200	215	250
Design Hour (15.0%)	21	23	24	26	30

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 1,900 air taxi operations for the base year. **Table 2L** presents the air taxi operations forecast at Wickenburg Municipal Airport. Assuming air taxi operations will continue to account for ten percent of itinerant operations, approximately 2,700 air taxi operations are projected by the end of the planning period.

TABLE 2L
Air Taxi Operations Forecast
Wickenburg Municipal Airport

Year	Air Taxi Operations
2010	1,900
2015	2,100
2020	2,200
2025	2,400
2030	2,700

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 Wickenburg 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 Wickenburg Municipal Airport would represent one percent of total itinerant operations. Applying this percentage to the forecast years yields approximately 300 instrument approaches in 2030.

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

In the following section, 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.

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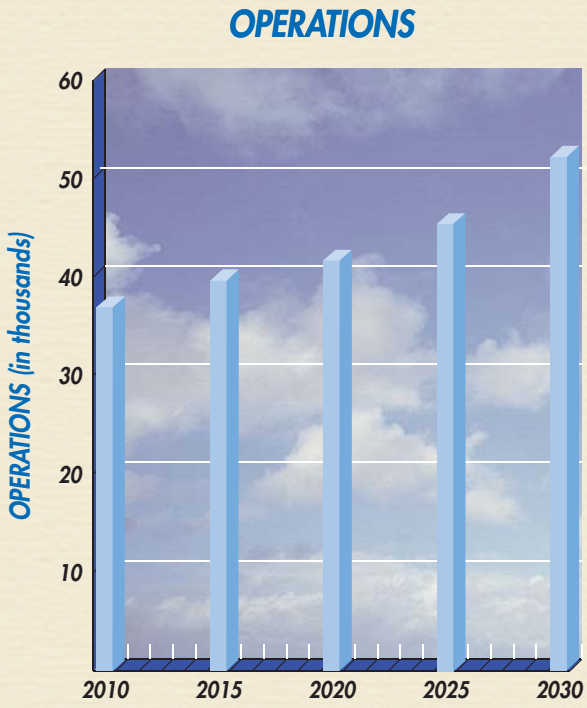
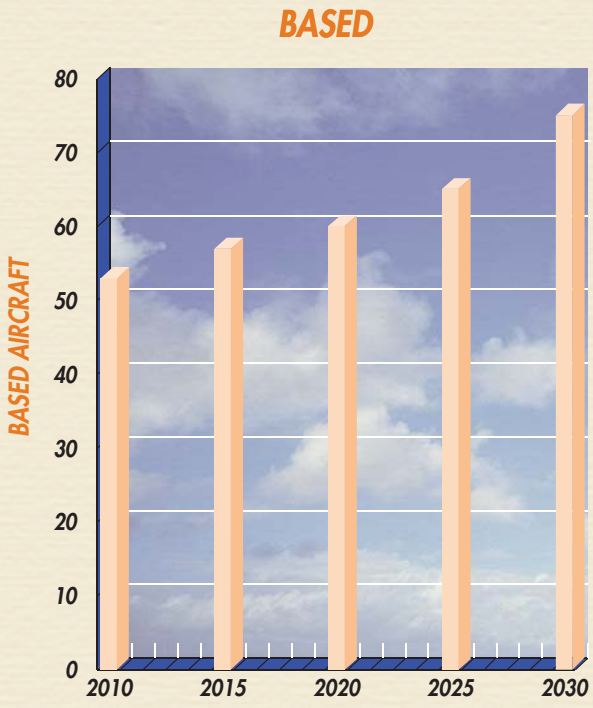
CATEGORY	BASE YEAR 2010	FORECASTS 2015	2020	2025	2030
ANNUAL OPERATIONS					
Itinerant					
Air Taxi	1,900	2,100	2,200	2,400	2,700
General Aviation	19,200	20,700	21,800	23,600	27,200
Total Itinerant	**21,100**	**22,800**	**24,000**	**26,000**	**29,900**
Local					
General Aviation	15,800	16,900	17,800	19,300	22,300
Total Local	**15,800**	**16,900**	**17,800**	**19,300**	**22,300**
Total Operations	***36,900***	***39,700***	***41,800***	***45,300***	***52,200***
BASED AIRCRAFT					
Single Engine	41	43	43	44	49
Multi-Engine	7	9	10	12	15
Jets	0	0	1	2	3
Helicopters	2	2	3	3	4
Ultralights/Other	3	3	3	4	4
Total Based Aircraft	***53***	***57***	***60***	***65***	***75***
ANNUAL INSTRUMENT APPROACHES	***210***	***230***	***240***	***260***	***300***





WICKENBURG MUNICIPAL AIRPORT

Exhibit 2D
FORECAST SUMMARY

WICKENBURG MUNICIPAL AIRPORT

Chapter Three

FACILITY REQUIREMENTS

WICKENBURG MUNICIPAL AIRPORT

FACILITY REQUIREMENTS

To properly plan for the future of Wickenburg 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 Wickenburg 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
Wickenburg Municipal Airport

	2010	Short Term	Intermediate Term	Long Term
ANNUAL OPERATIONS				
Itinerant				
Air Taxi	1,900	2,100	2,400	2,700
General Aviation	19,200	20,700	23,600	27,200
Total Itinerant	**21,100**	**22,800**	**26,000**	**29,900**
Local				
General Aviation	15,800	16,900	19,300	23,300
Total Local	**15,800**	**16,900**	**19,300**	**23,300**
Total Operations	**36,900**	**39,700**	**45,300**	**52,200**
Based Aircraft	**53**	**57**	**65**	**75**

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 Wickenburg 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 Wickenburg 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. The airport is also used by a limited number of Air Tractor aircraft in support of aerial firefighting activities, which varies by fire season. Air Tractor aircraft typically fall within ARC A-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 Wickenburg Municipal

Airport. Combining the operations of the most demanding aircraft to operate at Wickenburg 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 Wickenburg Municipal Airport. The FAA expects these areas to be under the control of the airport and free from obstructions. Presently, Runway 5-23 does not fully meet ARC B-II OFA design standards, as a portion of three conventional hangars located north of the Runway 5 end lie within the OFA. A portion of the segmented circle is also located within the OFA. The alternatives analysis will examine options for conforming to these FAA design standards and eliminating these obstructions.

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A-I

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

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

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

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

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

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

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

A-III, B-III

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

C-I, D-I

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

C-II, D-II

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

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

C-IV, D-IV

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

D-V

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

Note: Aircraft pictured is identified in bold type.
* Aircraft in shaded ARCs are generally too large to operate at Wickenburg Municipal Airport.

WICKENBURG MUNICIPAL AIRPORT

Exhibit 3A
AIRPORT REFERENCE CODES

TABLE 3B
Airfield Safety Area Dimensional Standards
Wickenburg Municipal Airport

	FAA Design Standards
Airport Reference Code	**B-II**
Approach Visibility Minimums	**Visual and/or ≥ ¾ Mile**
Runway Width	75’
Runway Centerline To:	
Holding Position	200’
Parallel Taxiway Centerline	240’
Aircraft Parking Area	250’
Runway Safety Area (RSA)	
Width	150’
Length Prior to Landing Threshold	300’
Length Beyond Runway End	300’
Runway Object Free Area (OFA)	
Width	500’
Length Beyond Runway End	300’
Runway Obstacle Free Zone (OFZ)	
Width	400’
Length Beyond Runway End	200’
Runway Protection Zone (RPZ)	
Inner Width	500’
Outer Width	700’
Length	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 Wickenburg 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 re-

duces the impact of crosswind components during landing or takeoff.

Wickenburg Municipal Airport is currently served by primary Runway 5-23, 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.

An AWOS-III was installed at Wickenburg Municipal Airport in 2007, which means only three years of wind data was available at the time of this report. A ten-year period of observations is recommended for determining wind coverage. Therefore, data from the nearest weather station in Aguila, Arizona (located 26 miles west) was used for this analysis.

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 5-23 provides greater than 97 percent wind coverage for all crosswind components. Therefore, no additional runway orientation is needed at Wickenburg Municipal Airport.

Runway Length

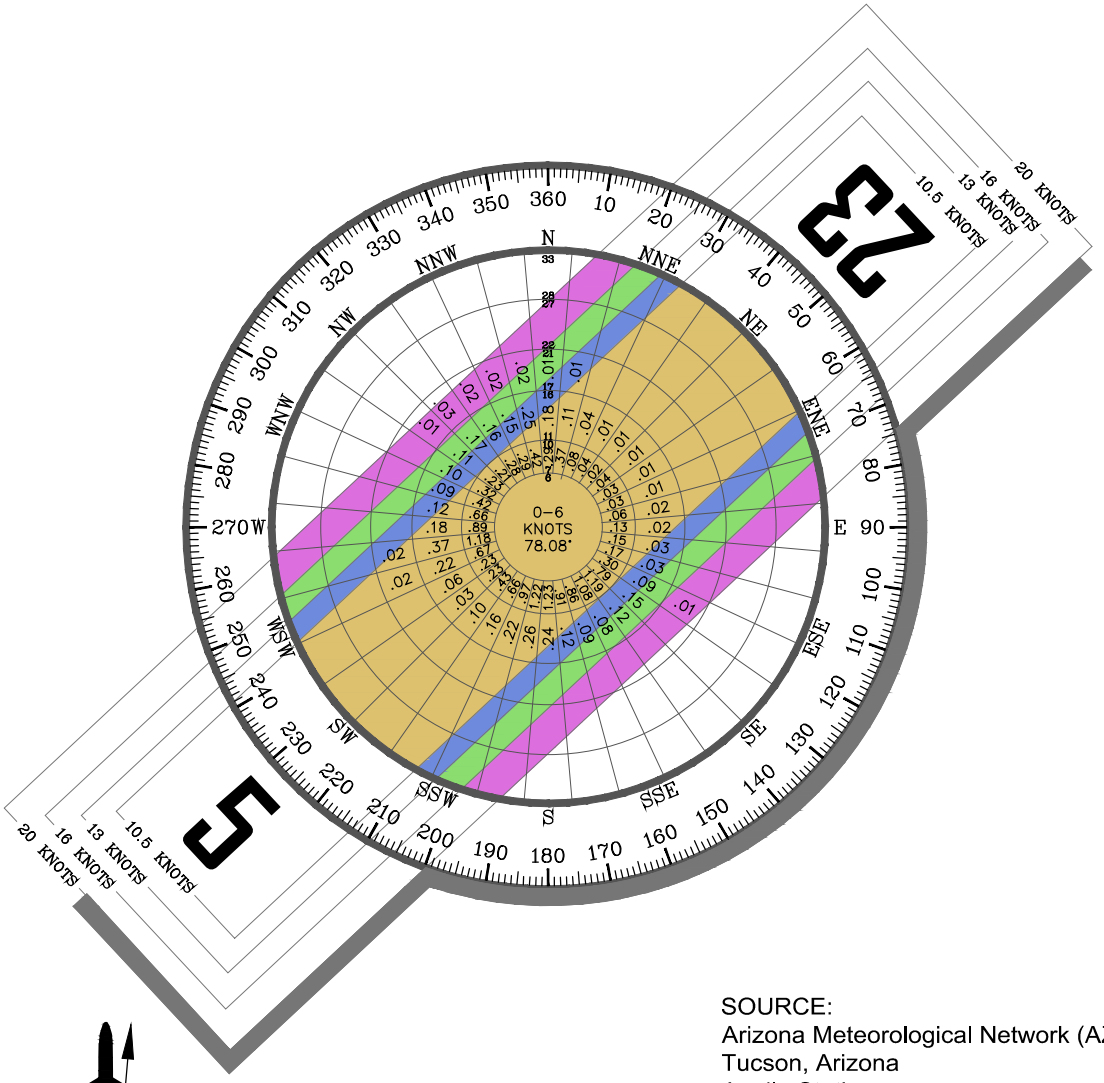
Runway length requirements for an airport are based on five primary factors: airport elevation, mean daily maximum temperature of the hottest month, runway gradient (difference in runway elevation of each runway end), critical aircraft type expected to use the airport, and stage length of the longest 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 Wickenburg Municipal Airport, the airport elevation is 2,377 feet above mean sea level (MSL) and the mean maximum temperature of the hottest month is 105.0 degrees Fahrenheit (F). Runway end elevations vary by approximately 71 feet, which results in a longitudinal gradient of 1.2 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 Wickenburg Municipal Airport. As shown in the table, local conditions call for a runway length of at least 5,000 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 6,100 feet is required.

ALL WEATHER WIND COVERAGE				
Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 5–23	*97.94%*	*99.01%*	*99.83%*	*99.97%*



SOURCE:
Arizona Meteorological Network (AZMET)
Tucson, Arizona
Aguila Station
Aguila, Arizona

OBSERVATIONS:
87,432 Observations
January 2001 - December 2010

Magnetic Declination
11° 18' East (January 2011)
Annual Rate of Change
00° 06' West (January 2011)

WICKENBURG MUNICIPAL AIRPORT

Exhibit 3B
WINDROSE

TABLE 3C
Runway Length Requirements
Wickenburg Municipal Airport

AIRPORT AND RUNWAY DATA	
Airport elevation	2,377 feet
Mean daily maximum temperature of the hottest month	105.0° F
Maximum difference in runway centerline elevation	71 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	4,300 feet
100 percent of these small airplanes	4,900 feet
Small airplanes with 10 or more passenger seats	5,000 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	6,100 feet
100 percent of these large airplanes at 60 percent useful load	7,600 feet

Reference: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design.*

For comparison, runway length requirements for various business jets operating at Wickenburg Municipal Airport (and included in the FAA's 75% business jet mix), as well as a number of the airport's based aircraft, were also examined. This includes aircraft within the Cessna Citation family of business jets, Bombardier/Learjet, Dassault/Falcon, and Beechjet aircraft, as well as several others. The required take-off and landing lengths for maximum load and range (adjusted for temperature and elevation) for several of these aircraft are presented in **Table 3D**.

TABLE 3D
Runway Length Requirements – Individual Aircraft Performance

Aircraft Make & Model	Required Take-off Length (feet)	Required Landing Length (feet)
Aero Commander 690C*	**2,610'**	**2,110'**
Beechcraft E55 Baron*	**3,800'**	**3,800'**
Beechcraft 58 Baron*	**4,100'**	**4,300'**
Beechcraft 400A	6,500'	6,000'
Beechcraft King Air C90A*	**4,100'**	**3,500'**
Beechcraft Premier IA	6,300'	5,400'
Bombardier Challenger 300	7,800'	4,400'
Bombardier Learjet 45	7,200'	4,500'
Cessna 310*	**3,700'**	**3,100'**
Cessna 340A*	**3,100'**	**1,300'**
Cessna 501 Citation I	5,300'	4,100'
Cessna 525 Citation CJ1	5,500'	4,400'
Cessna 525A Citation CJ2	5,700'	5,100'
Cessna 525B Citation CJ3	5,400'	4,700'
Cessna 550 Citation Bravo	5,700'	5,100'
Cessna 560 Citation Excel	6,000'	5,400'
Cessna 680 Citation Sovereign	6,100'	4,500'
Dassault Falcon 50	7,700'	3,700'
Eclipse 500	4,200'	3,800'
IAI 1124 Westwind	6,500'	3,100'
Swearingen SA 26-AT*	**5,100'**	**5,510'**

Note: Individual aircraft performance characteristics with distances adjusted for temperature and elevation (2,377 ft. MSL and 105.0 ºF), runway gradient, and **maximum load and range**.
*Aircraft in bold type are based at Wickenburg Municipal Airport.

Based upon the FAA's Advisory Circular and the individual aircraft performance data, Runway 5-23 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 6,100 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 ultimate planning ARC for Runway 5-23 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 5-23 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 5-23 has a current strength rating of 30,000 pounds SWL and 60,000 pounds DWL. This should be sufficient through the planning period.

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 Wickenburg Municipal Airport fall within ADG II. According to FAA design standards, the minimum taxiway width for ADG II is 35 feet. Runway 5-23 is served by a full-length parallel taxiway (Taxiway A) and five connecting taxiways (B, C, D, E, F). All of these taxiways are 35 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 240 feet from the Runway 5-23 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. A holding apron is currently available on both ends of Runway 5-23.

AIRFIELD LIGHTING, MARKING, AND SIGNAGE

Currently, there are a number of lighting and pavement marking aids serving pilots at Wickenburg 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

Wickenburg Municipal Airport is equipped with a rotating beacon, which assists pilots in locating the airport at night. The existing rotating beacon, located on top of the terminal building, is adequate and should be maintained in the future.

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 5-23 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 old incandescent 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-4L) is installed on both ends of Runway 5-23 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. REILs are currently installed at both ends of Runway 5-23 and should be maintained through the planning period.

Pilot-Controlled Lighting

Wickenburg 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. Basic markings currently exist on Runway 5-23. Nonprecision markings will be required if the airport upgrades to a nonprecision approach.

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.

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. Lighted directional signs are installed at Wickenburg Municipal Airport. This lighting will need to be updated through the planning period as additional facilities are added.

Distance Remaining Signs

Distance remaining signs are commonly installed at airports when there are a significant number of business aircraft operations. Distance remaining signs are located at 1,000-foot intervals from each runway threshold and indicate to pilots the length of runway remaining. The lighted distance remaining signs at Wickenburg Municipal Airport should be maintained through the planning period.

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, Wickenburg Municipal Airport does not have an established approach procedure, which means the airport is essentially closed to arrivals when visual flight can no longer be conducted. The establishment of a non-precision global positioning system (GPS) approach is recommended, so that the airport is accessible during poor weather conditions. An omni directional approach lighting system (ODALS) is recommended along with the GPS approach to improve visual guidance.

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). The airport is also equipped with an Automated Weather Observation System (AWOS-III), which was installed in 2007. The AWOS automatically records weather conditions such as wind speed, gusts, wind direction, temperature, dew point, altimeter setting, and density altitude. In addition, the AWOS-III records visibility, precipitation, and cloud height. These facilities are sufficient and should be maintained in the future. A summary of the airside needs at Wickenburg 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 Wickenburg Municipal Airport, which is located south of the Runway 5 end, was constructed in 1970 and totals approximately 1,200 square feet.

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 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**. As indicated on the exhibit, additional area could be supported through the planning period. 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 Wickenburg Municipal Airport, approximately 90 percent of the based aircraft are currently stored in enclosed 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 Wickenburg Municipal Airport are currently stored in T-hangars. A planning standard of 1,200 square feet per based aircraft has been used to determine future requirements.

A smaller portion of hangared aircraft is currently stored in conventional/executive 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 conventional/executive hangars. For executive/conventional 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, jet, and helicopters. These planning standards recognize that some of the larger business jets require a greater amount of space.

Since portions of conventional/executive 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 90 percent of based aircraft at Wickenburg Municipal

10MP09-3C-05/16/11

CATEGORY	AVAILABLE	SHORT TERM	LONG TERM
Runways and Design Standards	**Runway 5-23** 6,100' x 75' 30,000 SWL * 60,000 DWL ARC B-II Standard RSA Non-Standard OFA	**Runway 5-23** 6,100' x 75' 30,000 SWL * 60,000 DWL ARC B-II Standard RSA **Improve OFA to Meet Standards**	**Runway 5-23** 6,100' x 75' 30,000 SWL * 60,000 DWL ARC B-II Standard RSA and OFA
Taxiways and Separation Standards	**Runway 5-23** Full-Length Parallel Taxiway A - 35' wide (240' From Runway Centerline) Taxiways B,C,D,E,F - 35' wide Holding Aprons - At Each End	**Runway 5-23** Full-Length Parallel Taxiway A - 35' wide (240' From Runway Centerline) Taxiways B,C,D,E,F - 35' wide Holding Aprons - At Each End	**Runway 5-23** Full-Length Parallel Taxiway A - 35' wide (240' From Runway Centerline) Taxiways B,C,D,E,F - 35' wide Holding Aprons - At Each End
Navigational Aids	AWOS-III, ATIS **Runway 5-23** PAPI-4L REILs **ODALS**	AWOS-III, ATIS **Runway 5-23** PAPI-4L REILs ODALS **Add GPS Approach - Runway 23** (1 Mile Visibility, 300' Cloud Ceilings)	AWOS-III, ATIS **Runway 5-23** PAPI-4L REILs ODALS GPS Approach - Runway 23 (1 Mile Visibility, 300' Cloud Ceilings)
Lighting and Markings	Rotating Beacon, Lighted Wind Cone, Segmented Circle, Airfield Signage **Runway 5-23** MIRL MITL Pilot-Controlled Lighting Non-Precision Marking Distance Remaining Signs	Rotating Beacon, Lighted Wind Cone, Segmented Circle, Airfield Signage **Runway 5-23** MIRL MITL Pilot-Controlled Lighting Non-Precision Marking Distance Remaining Signs	Rotating Beacon, Lighted Wind Cone, Segmented Circle, Airfield Signage **Runway 5-23** MIRL MITL Pilot-Controlled Lighting Non-Precision Marking Distance Remaining Signs

KEY

ARC - Airport Reference Code
ATIS - Automated Terminal Information Service
AWOS - Automated Weather Observation Station
DWL - Dual Wheel Landing Gear Aircraft
GPS - Global Positioning System
MIRL - Medium Intensity Runway Edge Lighting
MITL - Medium Intensity Taxiway Edge Lighting
ODALS - Omni-Directional Approach Lighting System
PAPI - Precision Approach Path Indicator
REIL - Runway End Identifier Lighting
SWL - Single Wheel Landing Gear Aircraft

WICKENBURG
MUNICIPAL AIRPORT

Exhibit 3C
AIRSIDE REQUIREMENTS

	Currently Available	Short Term Need	Intermediate Term Need	Long Term Need
General Aviation Administration Building Area (s.f.)				
G.A. Administration Building Area Space (s.f.)	1,200	7,800	10,000	14,400
Vehicle Parking Requirements				
Design Hour Passengers		24	29	36
Terminal Vehicle Spaces Parking Area (s.f.)		46 18,400	60 24,000	91 36,400
General Aviation Spaces Parking Area (s.f.)		29 11,600	33 13,200	38 15,200
Total Parking Spaces **Total Parking Area (s.f.)**	**15*** **6,000**	**75** **30,000**	**93** **37,200**	**129** **51,600**

* Limited automobile parking currently available at administration building; no parking is available next to storage hangars.

	Currently Available	Short Term Need	Intermediate Term Need	Long Term Need
Aircraft Storage Requirements				
Aircraft to be Hangared	48	52	60	71
T-Hangar Positions Executive/Conventional Hangar Positions	43 5	38 14	39 21	45 26
T-Hangar Area (s.f.) Executive/Conventional Hangar Area (s.f.) Maintenance Area	74,500 13,200 N/A	45,600 42,000 13,100	46,800 63,000 16,500	54,000 78,000 19,800
Total Hangar Area (s.f.)	**87,700**	**100,700**	**126,300**	**151,800**

	Currently Available	Short Term Need	Intermediate Term Need	Long Term Need
General Aviation Aircraft Parking Requirements				
Single, Multi-Engine Transient Aircraft Positions Apron Area (s.y.)		18 14,400	21 16,800	24 19,200
Transient Jet Aircraft Positions Apron Area (s.y.)		5 8,000	5 8,000	6 9,600
Locally-Based Aircraft Positions Apron Area (s.y.)		11 7,200	13 8,500	15 9,800
Total Positions **Total Apron Area (s.y.)**	**52*** **47,000**	**34** **29,600**	**39** **33,300**	**45** **38,600**

*Includes apron planned for construction in 2012.

WICKENBURG MUNICIPAL AIRPORT

Exhibit 3D
LANDSIDE FACILITY REQUIREMENTS

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 Wickenburg Municipal Airport totals approximately 17,000 square yards with 25 aircraft tie-down positions. An additional apron, totaling approximately 30,000 square yards with 27 aircraft tie-down positions, is currently planned for construction farther east and scheduled to be completed in 2012. Once completed, apron area at the airport will total approximately 47,000 square yards with 52 aircraft positions.

Future aircraft parking apron requirements are presented on **Exhibit 3D**. According to these recommendations, the existing apron areas 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.

Facility planning should also consider the development of additional aircraft parking areas to accommodate the numerous aerial firefighting aircraft that utilize Wickenburg Municipal Airport during the summer months. While battling wild fires, trailers and additional support equipment are brought onto the airport and set up on the west end of the apron. This, in turn, eliminates several aircraft parking spots for prolonged periods of time. The alternatives analysis will examine the options available for additional apron area.

VEHICLE PARKING

There is only one area designated for vehicle parking at Wickenburg Municipal Airport, located directly east of the terminal building. This area totals approximately 6,000 square feet and provides 15 vehicle parking spaces. This parking area serves the general public, airport employees, and general aviation pilots.

Future vehicle parking requirements have been determined based on industry standards and are presented on **Exhibit 3D**. As shown on the exhibit, there is a significant need for additional parking area through the planning period. This would include additional parking areas adjacent to the terminal building, as well as parking for aircraft owners adjacent to tiedowns and hangars.

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

overall operation of the airport and include the following:

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

Aircraft Rescue and Firefighting

Presently, there is no dedicated airport rescue and firefighting (ARFF) facility at Wickenburg Municipal Airport. The Town operates a volunteer fire department system from a facility located approximately four miles east of the airport entrance, along U.S. Highway 60.

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 County does not intend to pursue Part 139 Certification, the establishment of dedicated ARFF facilities is not justified or required.

Fuel Storage

Fuel storage and dispensing facilities at the airport are owned by the Town of Wickenburg for the daily operation of fuel sales. Fuel is dispensed from the fuel island located north of the terminal building and includes a single 22,000-gallon above ground tank. A wall inside the tank divides it into 10,000 gallons of 100LL AvGas and 12,000 gallons of Jet A fuel. A 1,500-gallon truck of Jet A fuel is also provided for aircraft refueling.

Fuel storage requirements are typically based upon maintaining a two-week supply of fuel during the peak month. The airport is not projected to exceed this requirement.

Maintenance/Storage Facilities

The majority of maintenance equipment at Wickenburg Municipal Airport is stored in various buildings/hangars. The alternatives analysis will evaluate various locations for the development of a separate facility for airport maintenance and storage.

Aircraft Wash Facility

Currently, there is not a designated aircraft wash facility at Wickenburg 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 and provide a covered area for aircraft washing and light maintenance.

Helicopter Facilities

Wickenburg Municipal Airport is equipped with two helipads, which are located on the southwest end of the aircraft parking apron. The majority of helicopter operations at the airport are performed by the air ambulance operator Lifenet. Their facility is located adjacent to the helipads.

Facility planning should include establishing a separate area dedicated solely to helicopter operations.

SUMMARY

The intent of this chapter has been to outline the facilities required to meet potential aviation demands projected for Wickenburg 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.

WICKENBURG MUNICIPAL AIRPORT

Chapter Four

AIRPORT DEVELOPMENT ALTERNATIVES

WICKENBURG 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-range 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 Wickenburg should consider updating the plan to reflect the changing conditions.

Since the combination of alternatives can be endless and the budgeted time for alternative evaluation is limited, 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.

After the alternatives have been evaluated and a recommended development concept prepared, an environmental evaluation will be completed and included as an appendix to the final report. The purpose of the evaluation is to obtain information regarding environmental sensitivities on or near airport property and identify any

potential environmental concerns that must be addressed prior to program implementation. Informal consultation with various federal and state agencies will occur only if needed information is not available through other resources.

Following environmental reviews and 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 Wickenburg.

BACKGROUND

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 Wickenburg Municipal Airport was adopted by the Town Council in September 2003 and an environmental assessment was completed in 2004. More recently, an environmental assessment for a proposed midfield aircraft parking apron was completed in October 2010.

The most significant improvement made since the previous master plan includes the reconstruction and extension of Runway 5-23 to 6,100 feet. In addition to eliminating the displaced threshold, this length better serves the current mix of based and transient aircraft. Along with the runway extension, Taxiway A was also extended and reconstructed 40 feet southeast to provide a runway/taxiway centerline separation of 240 feet, meeting FAA's B-II design standards. An automated weather observation system (AWOS-III) and additional perimeter fencing were also installed. Several 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 county, 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 Wickenburg 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 four public-use airports located within a 40-mile radius of Wickenburg Municipal Airport. The nearest airport (Buckeye Municipal) is located 34 miles south and is a general aviation facility with a 5,500-foot runway, providing similar services to that of Wickenburg Municipal Airport. The other three airports (Glendale Municipal, Phoenix Goodyear, and Phoenix Deer Valley) are all reliever airports. The longest runway at any of these airports is at Phoenix Goodyear Airport, which has a runway length of 8,500 feet.

While the three reliever airports could theoretically accommodate a portion of the demand from Wickenburg Municipal Airport, each of these airports has a role to fill in the regional and national aviation system. Accommodating demand from Wickenburg 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 Wickenburg Municipal Airport. While many of these private airports offer the same type of services, they 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. Wickenburg 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.

DEVELOP 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 Wickenburg Municipal Airport can continue to develop and upgrade to serve increasing demands. However, developing or upgrading an airport in the system to serve the increasing demands of higher design categories and/or with lower landing minimums is certainly a possibility.

INITIAL DEVELOPMENT CONSIDERATIONS

Upon completion of the facility needs evaluation and a subsequent meeting with the Planning Advisory Committee for

the master plan study, 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, several are included to improve airfield safety or efficiency of the airfield system, or to meet current design standards. Each of the items is important considerations in the 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. Furthermore, due to the number of aircraft operations, there are a number of Federal Aviation Administration (FAA) design criteria that must be considered when looking at airfield improvements. **Exhibit 4B** has identified a number of airside considerations.

Airport Reference Code (ARC) Designation

Safety area design standards and adjacent development can ultimately impact the viability of various alternatives. These criteria, depending upon existing constraints around the airport, can have a significant impact on the viability of various alternatives which are designed to meet airfield needs. The existing airport reference code (ARC) for Runway 5-23 (and the facility) is B-II. This ARC 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 potential mix of aircraft will however, continue to place the airport in the B-II category.

Airport Imaginary Surfaces

The FAA has established several imaginary surfaces 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**.

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 not fixed by navigational purpose for a distance of 300 feet beyond the end of the runway. The facility requirements analysis in the previous chapter indicated that the RSA for Runway 5-23 conforms to all FAA safety design standards as outlined in FAA AC 150/5300-13, *Airport Design,* for ARC B-II runways with visual and/or greater than ¾-statute mile approach visibility minimums.

The runway OFA is defined in FAA Advisory Circular 150/5300-13, *Airport Design*, as an area centered on the runway

10MP09-4A-8/16/11

AIRFIELD CONSIDERATIONS

- Remove/relocate hangars within the existing Runway 5-23 OFA.
- Installation of a GPS Approach on Runway 23 with ODALS.
- Replace old incandescent runway lighting and taxiway systems with light emitting diode (LED) technology.

LANDSIDE CONSIDERATIONS

- Provide for expansion/redevelopment of general aviation terminal building.
- Provide additional aircraft storage hangars to support individual needs and/or the replacement of existing hangars.
- Provide additional apron area for future aircraft parking needs.
- Provide designated area for helicopter operations.
- Provide additional automobile parking adjacent to terminal building, as well as additional areas on the airfield.
- Alternate airport access road.
- Alternates for future general aviation development/long term expansion potential on south side of runway.
- Provide a separate facility for airport maintenance and storage.
- Development of an aircraft wash rack and tenant maintenance shelter.
- Additional opportunities for revenue enhancement on airport property.

WICKENBURG
MUNICIPAL AIRPORT

Exhibit 4A
DEVELOPMENT
CONSIDERATIONS

10MP09-4B-8/06/11

LEGEND

- Existing/Future Airport Property Line
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Obstacle Free Zone (OFZ)
- Runway Protection Zone (RPZ)

NORTH

0 600 1,200
SCALE IN FEET

PHOTO DATE: December 2010

SUMMARY

1. Remove/Relocate Hangars
2. Install GPS Approach to Runway 23
3. Install ODALS to Runway 23
4. Replace Runway/Taxiway Lighting with LED Technology

AWOS
Hartman Wash
PAPI-4
Existing/Future RPZ (500' x 700' x 1,000')
Existing/Ultimate Runway 5-23 (6,100' x 75')
Aircraft Parking Apron with Access Road and Vehicle Parking *(to be completed in 2012)*
Wickenburg Industrial Air Park
Sunset Park
Existing/Future RPZ (500' x 700' x 1,000')
U.S. Highway 60
Percheron Rd.
West Saddle Ridge Dr.
North Silver Spur Dr.
West Palomino Dr.
West Pinto Place
North Stirrup Dr.
3 Crosses Rd.
Ironwood Pl.
W. Highridge Rd
Longhorn Rd.
W. Lupine Ln.

WICKENBURG MUNICIPAL AIRPORT

Exhibit 4B
AIRSIDE ALTERNATIVES

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 previous chapter indicated that Runway 5-23 does not fully meet ARC B-II OFA design standards. Presently, a portion of three conventional hangars located north of the Runway 5 end lie within the OFA. It is recommended that these hangars ultimately be removed or relocated.

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 standard dimension of the OFZ for runways serving large airplanes is 400 feet wide, extending 200 feet beyond the runway end. The OFZ at Wickenburg Municipal Airport meets these standards.

Whenever an airport master plan study is undertaken, an evaluation of land uses in the RPZ should be a normal consideration, especially if there are existing objects in the RPZ, including roads. The RPZ is a trapezoidal area centered on the runway and typically beginning 200 feet beyond the runway end. The RPZ has been established by the FAA to provide an area clear of obstructions and incompatible land uses in order to enhance the protection of approaching aircraft as well as people and property on the ground. The dimensions of the RPZ vary according to the visibility minimums serving the runway, and in some instances, the type of aircraft operating on the runway.

The current and future RPZ for Runway 5-23 is for "not lower than one mile" visibility conditions for ARC B-II aircraft and is 500 feet (inner width) by 700 feet (outer width) by 1,000 feet (length). It should be noted that U.S. Highway 60 currently runs through the RPZ on the southwest end of the runway, but at a lower grade elevation than the runway. While it is desirable to clear all objects from the RPZ, some uses are permitted, provided they do not attract wildlife, are outside of the OFA, and do not interfere with navigational aids.

Considering all of the aforementioned FAA design criteria, the airfield alternatives will present ultimate development designed to accommodate future aviation demand at Wickenburg Municipal Airport.

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 6,100 feet accommodates all general aviation aircraft, as well as the majority of the business aircraft currently operating at Wickenburg 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.

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. Parallel Taxiway A, as well as each of the connecting taxiways at Wickenburg Municipal Airport, is each 35 feet wide, meeting this standard. The construction of any additional taxiways at the airport should be planned for a 35-foot width. The exhibit also depicts the runway-taxiway separation. The parallel taxiway lies 240 feet southeast of the runway, which meets the design standards 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, Wickenburg 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 Wickenburg Municipal Airport. Establishing an instrument approach procedure would increase the accessibility of the airport by providing procedures for pilots to locate the proper runway during poor weather conditions and provide guidance for a safe landing. The establishment of a non-precision approach to Runway 23 is recommended at Wickenburg Municipal Airport.

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 23 end, the approach slope would increase to 34:1. Existing terrain features west of Runway 5 would likely limit approach capabilities to this runway end. Therefore, consideration is only being given to establishing an instrument approach procedure to Runway 23. An imaginary surfaces drawing will be included with the updated airport layout plan drawings.

Visual Approach Lighting

Along with the upgrade to the GPS Runway 23 approach, improvements can be made to enhance the safety of this planned approach. According to *Advisory Circular 150/5300-13*, *Appendix 16*, while

not required, an approach lighting system is recommended on runways with a non-precision 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.

The facilities requirement chapter 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.

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 5-23. These markings will be sufficient for the recommended GPS approach to Runway 23.

Holding position markings on the entrance taxiways are required to be a minimum of 200 feet from the centerline of the runway. The existing markings on the airfield meet this requirement. New holding position markings will need to be added to any taxiway additions. It should be noted that the 200-foot distance may need to be increased when the tail height of critical aircraft is taken into account.

LANDSIDE CONSIDERATIONS

The primary general aviation functions to be accommodated at Wickenburg Municipal Airport include commercial general aviation facilities, aircraft storage hangars, aircraft parking aprons, and other aviation-related development. The interrelationship of these functions is important in defining a long-range landside layout for general aviation uses at the airport. The following briefly describes landside facility requirements.

Commercial General Aviation Facilities

This essentially relates to providing areas for the development of facilities associated with aviation businesses providing services to general aviation pilots, passengers, and users. This typically includes businesses involved with (but not limited to) aircraft rental and flight training, aircraft charters, aircraft maintenance, line service, and aircraft fueling. High levels of activity characterize businesses such as these, with a need for apron space for the storage and circulation of aircraft. These facilities are best placed along ample apron frontage with good visibility from the runway system for transient aircraft. The facilities commonly associated with businesses such as these include large conventional hangars that hold several aircraft. Utility services are needed for these types of facilities, as well as automobile parking areas and public access roads.

Aviation-Related Commercial/Industrial Facilities

Aviation-related commercial/industrial facilities are distinguished from commercial general aviation facilities in that these types of uses are associated with non-service providers to the general aviation industry. This can include, but is not limited to, aircraft manufacturing, aircraft component manufacturing, aviation trade organizations, or aircraft financial services. While aircraft manufacturers may need access to the airfield, many aviation-related businesses do not need airfield access. Both users with a need for airfield access and those without a need for airfield access may be considered. These types of users need all utility services, as well as public access roads.

Corporate/Executive Hangars

Corporate/executive aviation facilities are characterized by co-located hangar and office complexes for individually owned or corporate-owned aircraft storage, maintenance, and administration. Corporate/executive aviation facilities are different from commercial general aviation facilities. Corporate/executive aviation facilities generally have lower levels of activity that do not require visibility from the runways or taxiways for transient aircraft identification and location as these facilities generally do not provide services to the public. Utility services are needed for these types of facilities, as well as automobile parking areas and a public access road.

T-hangars/Box Hangars

T-hangars/box hangars are specifically designed hangar facilities that provide for segregated individual storage areas within a single hangar complex. This is in contrast with the hangars described in the previous paragraphs, which allow for multiple aircraft storage in the same area.

Segregated Vehicular Access/Air-field Security

A planning consideration for any master plan is the segregation of vehicles and aircraft operational areas. This is both a safety and security consideration for the airport. Aircraft safety is reduced and accident potential increased when vehicles and aircraft share the same pavement surfaces. Vehicles contribute to the accumulation of debris on aircraft operational surfaces, which increases the potential for foreign object damage (FOD). The potential for runway incursions is increased as vehicles may inadvertently access active runway or taxiway areas if they become disoriented once on the aircraft operational area (AOA). Finally, airfield security is compromised as there is loss of control over the vehicles as they enter the secure AOA. The greatest concern is for public vehicles such as delivery vehicles and visitors, which may not fully understand the operational characteristics of aircraft and the markings in place to control vehicle access. The best solution is to provide dedicated vehicle access roads to each landside facility that is separated from the aircraft operational areas with security fencing.

The segregation of vehicle and aircraft operational areas is further supported by FAA AC 150/5210-20, *Ground Vehicle Operations on Airports*, which states "The control of vehicular activity on the airside of an airport is of the highest importance." The AC further states, "An airport operator should limit vehicle operations on the

movement areas of the airport to only those vehicles necessary to support the operational activity of the airport." Special attention must be given to ensure public access routes to commercial general aviation operators' facilities. Commercial general aviation operators' facilities are focal points for users who are not familiar with aircraft operations (i.e., delivery vehicles, charter passengers, etc.).

The *Aviation and Transportation Security Act*, which was passed in November 2001, created the Transportation Security Administration (TSA) to administer the security of public-use airports across the country. In cooperation with representatives of the general aviation community, the TSA published security guidelines for general aviation airports. These guidelines are contained in the publication entitled *Security Guidelines for General Aviation Airports,* published in May 2004. Within this publication, the TSA recognized that general aviation is not a specific threat to national security. However, the TSA does believe that general aviation may be vulnerable to misuse by terrorists as security is enhanced in the commercial portions of aviation and at other transportation links.

To assist in defining which security methods are most appropriate for a general aviation airport, the TSA defined a series of airport characteristics that potentially affect an airport's security posture. These include:

1. **Airport Location** – An airport's proximity to areas with over 100,000 residents or sensitive sites can affect its security posture. Greater security emphasis should be given to airports within 30 miles of mass population centers (areas with over 100,000 residents) or sensitive areas such as military installations, nuclear and chemical plants, centers of government, national monuments, and/or international ports.

2. **Based Aircraft** – A smaller number of based aircraft increases the likelihood that illegal activities will be identified more quickly. Airports with based aircraft over 12,500 pounds warrant greater security.

3. **Runways** – Airports with longer paved runways are able to serve larger aircraft. Shorter runways are less attractive as they cannot accommodate the larger aircraft which have more potential for damage.

4. **Operations** – The number and type of operations should be considered in the security assessment.

LANDSIDE ALTERNATIVES

Two landside alternatives have been developed and are presented on **Exhibits 4C** and **4D**. The landside alternatives shown are mainly limited to the area south of Runway 5-23. The area north of the runway is constrained by the Hartman Wash and an abandoned landfill and is without utilities, roadway access, and airfield taxiway access. In addition, development north of the runway would require land acquisition, as there is not sufficient area between the runway and existing property line for significant facility development. An overview of the two landside alternatives is provided in the following paragraphs.

General Aviation Terminal Building

The existing general aviation terminal building, which was constructed in 1970, totals approximately 1,200 square feet and provides space for a pilot's lounge, flight planning, concessions, restrooms, storage, management, and various other needs. The previous chapter indicated a need for a general aviation terminal building between 7,000 and 10,000 square feet in the intermediate term. This is a typical size for a general aviation terminal.

The methodology used in estimating this need is based on the number of airport users expected to utilize general aviation facilities during the design hour. An increasing passenger count is used to account for the likely increase in larger, more sophisticated aircraft using the airport. A larger terminal building could be considered in the long term if the demand exists.

Exhibit 4C (Landside Alternative A) depicts the expansion of the existing terminal building on the south and east sides. However, due to space constraints in this location, only a small portion of the identified need could be met by expanding the existing terminal building. Additional parking would also be limited in this location.

Exhibit 4D (Landside Alternative B) identifies an alternate location for the development of a new general aviation terminal building. On this exhibit, a new terminal building is depicted along the southern edge of the aircraft parking apron that is currently under construction. A 14,000 square-foot terminal building is depicted at this location. A building of this size would meet the long term need identified in the facility requirements analysis.

Future general aviation terminal needs could also be met by those areas with hangar expansion currently planned, those areas under lease or option, as well as a fixed base operator (FBO).

Hangar Development

Two alternatives for hangar development at Wickenburg Municipal Airport have been developed. Future hangar development is mainly concentrated east of the existing T-Hangars.

The layout depicted on **Exhibit 4C** provides for 28 additional hangars. This includes 20 T-Hangars and 8 corporate/executive hangars totaling approximately 51,000 square feet. This exhibit also depicts three hangars on the north side of the runway. This is to replace or relocate the three hangars that currently lie within the OFA.

The layout depicted on **Exhibit 4D** provides for 48 additional hangars. This includes 30 T-Hangars and 18 corporate/executive hangars totaling approximately 90,200 square feet. The replacement/relocation of the hangars that lie within the OFA on the north side of the runway has also been depicted on this exhibit.

Along with the future lease parcels depicted adjacent to the new apron on both exhibits, either of these alternatives will satisfy the long term need for hangar facilities.

10MP09-4C-8/06/11

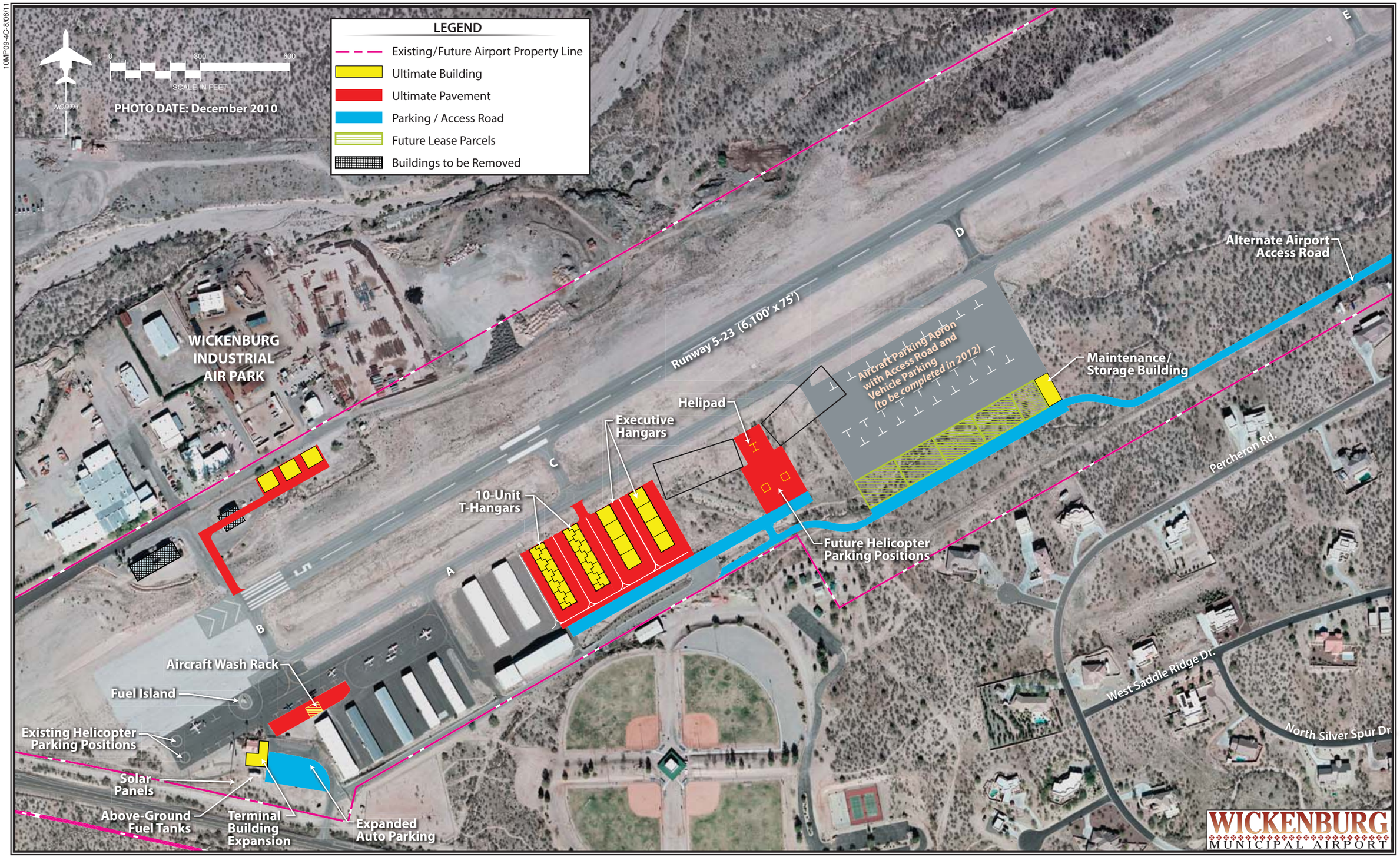


Exhibit 4C
LANDSIDE ALTERNATIVE A

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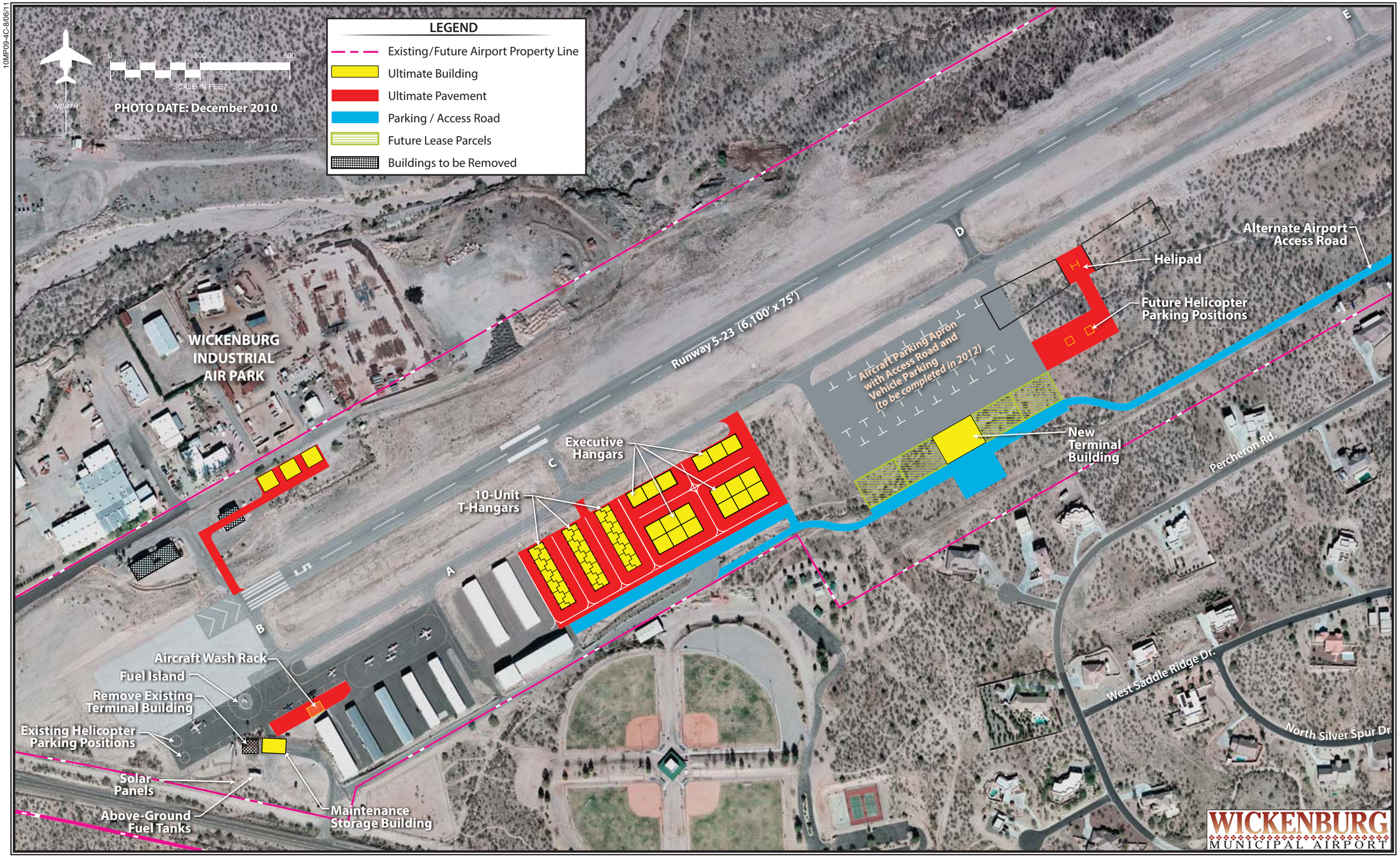


Exhibit 4D
LANDSIDE ALTERNATIVE B

Aircraft Parking Apron

Current apron area at Wickenburg Municipal Airport totals approximately 17,000 square yards with 25 aircraft tie-down positions. As depicted on **Exhibits 4C** and **4D**, an additional apron, totaling approximately 30,000 square yards with 27 aircraft tie-down positions, is currently planned for construction farther east. This apron is scheduled to be completed in 2012 if FAA funding is available. Once complete, apron area at the airport will total approximately 47,000 square yards and 52 aircraft parking positions. According to the facility requirements presented in the previous chapter, this should adequately meet the airport's long term needs. 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.

Automobile Parking

Designated automobile parking at Wickenburg Municipal Airport is located directly east of the terminal building. This parking area, which serves the general public, airport employees, and general aviation pilots, totals approximately 6,000 square feet and provides 15 vehicle parking spaces. Future parking demands were determined in the previous chapter and indicated a need for more than 45,000 square feet of parking space in the long term.

Exhibit 4C depicts the expansion of the parking lot located adjacent to the existing terminal building. **Exhibit 4D** depicts a new parking lot located south of the proposed terminal building. In conjunction with additional parking adjacent to aviation businesses and hangars, either alternative should satisfy future parking demands through the end of the planning period.

Airport Access

Exhibit 4C and 4D also depict an alternate airport access road along the south side of the airfield. This access road would connect with 3 Crosses Road just north of the Runway 23 end. This road would improve vehicle access in and out of the airport and would also allow for future hangar development on the southeast end of the airfield.

Helipad and Helicopter Parking Positions

Existing helicopter facilities at Wickenburg Municipal Airport consists of two helicopter parking positions located on the southwest end of the apron near Runway 5. The majority of helicopter operations at the airport are performed by the air ambulance operator Lifenet.

The facility requirements analysis recommended establishing a separate area dedicated solely to helicopter operations. Two alternatives have been proposed. **Exhibit 4C** depicts a helipad and two helicopter parking positions located between the proposed hangar development and the new apron. **Exhibit 4D** depicts a helipad along with two helicopter parking positions integrated onto the northeast portion of the new apron.

Maintenance/Storage Facilities

Currently, any miscellaneous maintenance equipment or spare parts are stored in a small room/locker in the terminal building.

The facility requirements analysis recommended a separate facility dedicated solely to airport maintenance and storage. Two alternatives have been presented.

Exhibit 4C depicts a separate building on the southeast corner of the new apron, adjacent to the future lease parcels. **Exhibit 4D** depicts an alternate location, located adjacent to the existing terminal building. This location would only work with the relocation of the terminal building.

Aircraft Wash Facility

The facility requirements analysis indicated the need for a designated aircraft wash facility at Wickenburg 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.

Exhibits 4C and **4D** both depict an aircraft wash facility northeast of the existing terminal building, adjacent to the aircraft parking apron. Additional pavement would be required for the construction of an aircraft wash facility in this location.

Regulatory Permits

Permits issued by the U.S. Army Corp of Engineers authorize various types of development projects in wetlands and other waters of the United States. The Corps' regulatory process involves two types of permits: general permits for actions by private landowners that are similar in nature and will likely have a minor effect on wetlands and individual permits for more significant actions. The Corps uses general permits to minimize the burden of its regulatory program by authorizing landowners to proceed with a project without the time-consuming need to obtain standard individual permits in advance. Approximately 90 percent of the Corps' regulatory workload is processed in the form of general permits.

A Nationwide Permit (NWP) is one type of general permit. The purpose of the NWP is to streamline the evaluation and approval process throughout the nation for certain types of activities that have only minimal impacts to the aquatic environment. NWPs are issued for five-year periods and thereafter must be renewed.

Due to drainage issues on and near the airport, a NWP will be needed if more than .5 acres is developed in the short term (five years). The aircraft parking apron currently slated for completion in 2012 uses .31 acres of this total, leaving only .19 acres available for development in the short term without requiring a NWP. This regulatory permit process will be discussed more thoroughly in the associated Environmental Evaluation.

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.

WICKENBURG MUNICIPAL AIRPORT

Chapter Five

RECOMMENDED DEVELOPMENT CONCEPT

WICKENBURG MUNICIPAL AIRPORT

RECOMMENDED DEVELOPMENT CONCEPT

The airport master planning process for Wickenburg 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 Wickenburg. 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 Wickenburg Municipal Airport. Following the final coordination meeting with the PAC, the draft final document will be presented to the Town of Wickenburg. Upon acceptance of the final master plan document, a final technical report will be prepared for the study.

An Environmental Overview has also been conducted to identify any potential environmental concerns that must be addressed prior to program implementation. This Environmental Overview has been included as **Appendix B**.

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:

- A 1,050-foot extension (and reconstruction) of Runway 5-23 for an ultimate length of 6,100 feet.

- Extension and reconstruction of Taxiway A to meet separation standards (240 feet from runway) and widening of Taxiway A to 35 feet.
- Installation of automated weather observation system (AWOS-III).
- Installation of REILs on both ends of Runway 5-23.
- Installation of additional perimeter fencing.
- Construction of additional hangar facilities.

AIRFIELD DESIGN STANDARDS

The FAA has established design criteria to define the physical dimensions of runways and taxiways, as well as the imaginary surfaces surrounding them which protect the safe operation of aircraft at the airport. These design standards also define the separation criteria for the placement of landside facilities.

As discussed previously, the design criteria primarily center on the airport's critical design aircraft. The critical aircraft is the most demanding aircraft or family of aircraft which currently, or are projected to, conduct 500 or more itinerant operations (take-offs and landings) per year at the airport. Factors included in airport design are an aircraft's wingspan, approach speed, tail height and, in some cases, the instrument approach visibility minimums for each runway. The FAA has established the Airport Reference Code (ARC) to relate these critical aircraft factors to airfield design standards.

Analysis conducted in Chapter Three - Facility Requirements concluded that the existing/future critical aircraft is represented by activity that falls in ARC B-II. **Table 5A** presents the design standards to be applied at Wickenburg Municipal Airport.

TABLE 5A
FAA Design Standards
Wickenburg Municipal Airport

	RUNWAY 5-23
Airport Reference Code (ARC)	B-II
Critical Aircraft	Cessna Citation III
Approach Visibility Minimums	Visual (Runway 5) One-Mile (Runway 23)
Runways	
Runway Width	75'
Runway Length (Existing/Ultimate)	6,100'
Runway Safety Area (RSA)	
Width	150'
Length Beyond Runway End	300'
Length Prior to Landing	300'
Object Free Area (OFA)	
Width	500'
Length Beyond Runway End	300'
Object Free Zone (OFZ)	
Width	400'
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'
Safety Area Width	79'
Object Free Area Width	131'
Taxilane Object Free Area	115'

Source: FAA AC 150/5300-13, *Airport Design,* Change 18.

RECOMMENDED DEVELOPMENT CONCEPT

The airport master planning process has evolved through efforts in the previous chapters to analyze future aviation demand, establish airside and landside facility needs, and evaluate options for the future development of the airside and landside facilities. The development alternatives have been considered for refinement into a single recommended master plan concept. The planning process has included the development of phased reports, which were distributed to the Planning Advisory Committee (PAC) and discussed at the coordination meetings held during the study process.

The recommended development concept provides for anticipated facility needs over the next 20 years. The concept, depicted on **Exhibit 5A**, is a composite of airside and landside considerations developed in the last chapter. The following sections summarize these considerations.

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 airfield considerations are identified on **Exhibit 5A** and include:

- Installation of a GPS approach to Runway 23 with omnidirectional approach lighting system (ODALS).

- Replace old incandescent runway lighting and taxiway lighting systems with light emitting diode (LED) technology.

- Remove hangars within the obstacle free area (OFA).

The previous chapter determined that the existing runway length 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 shown.

Presently, Wickenburg 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 23. ODALS are also recommended along with the GPS approach to improve visual guidance to Runway 23.

Additional improvements on the airfield include replacing the incandescent runway and taxiway lighting systems with light emitting diode (LED) technology. This would provide energy savings, as well as reduced maintenance costs.

A review of safety areas in the previous chapter indicated that the object free area

(OFA) standard is not currently met at Wickenburg Municipal Airport. As depicted on **Exhibit 5A**, a portion of three hangars on the north side of the runway currently lies within the OFA. These hangars will ultimately need to be removed in order to comply with safety area standards.

LANDSIDE CONSIDERATIONS

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

- Construction of a new general aviation terminal building and automobile parking at a new location adjacent to apron currently under design and construction.
- Additional aircraft storage hangars (nested T's and box) and apron area.
- Future general aviation development/long term expansion potential on south side of runway with provision for lease parcels adjacent to new apron.
- Separate facility for airport maintenance and storage (west end).
- Future joint-use fire facility (across from Industrial Air Park).
- Aircraft wash rack (west end).
- Designated area for helicopter operations (helipad/parking positions).
- Develop alternate airport access road to create loop road connection with 3 Crosses Road. This will require acquisition of property from the State of Arizona.

The existing general aviation terminal building is located south of the Runway 5 end and totals approximately 1,200 square feet. The facility requirements indicated the need for as much as 7,000-10,000 square feet in the immediate term. Due to space constraints in the existing location, **Exhibit 5A** depicts a new terminal building along the southern edge of the proposed aircraft parking apron. Sufficient area for vehicle parking would be available immediately adjacent to the terminal building.

The demands presented in the facility requirements chapter also indicated the need for the development of additional aircraft storage hangars at Wickenburg Municipal Airport. Storage hangars are normally constructed in small numbers, based upon need and financing capability. Most aircraft currently based on the airfield are stored in hangars, and aircraft basing at the airport in the future are expected to need similar storage facilities. The sizing of hangars will need to be responsive to demand; however, the layouts as proposed on the exhibit have flexibility in meeting varying size requirements. The layouts as depicted generally provide a minimum of 75 feet of separation (between facing hangars) to provide efficient aircraft taxiing between hangars.

Several new hangar facilities are depicted on **Exhibit 5A**. The development of two 10-unit T-Hangars is shown south of Runway 5-23, adjacent to the existing T-Hangars. The layout for this hangar area continues southeast and provides for the ultimate development of as many as 24 executive hangars. Additional taxiways are also depicted to serve this area.

10MP09-5A-11/13/13

LEGEND

- Existing Airport Property Line
- Property Aquisition
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Obstacle Free Zone (OFZ)
- Runway Protection Zone (RPZ)
- Ultimate Building
- Ultimate Pavement
- Parking / Access Road
- Future Lease Parcels
- Buildings to be Removed

NORTH

0 600 1200

SCALE IN FEET

PHOTO DATE: December 2010

Property Acquisition

ODALS

Existing/Future RPZ
500'x1,000'x700'

Upgrade to LED Lighting (taxiway)

Future Helipad

Future Helicopter Parking Positions

Runway 5-23 (6,100' x 75')

Aircraft Parking Apron with Access Road and Vehicle Parking (75'x291')

Ultimate Fuel Island

New Terminal Building Area

Percheron Rd.

WICKENBURG INDUSTRIAL AIR PARK

N Sabin Brown Rd.

Executive Hangars

10-Unit T-Hangars

Existing/Future RPZ
500'x1,000'x700'

Future Joint-Use Fire Facility

Future Holding Apron

Aircraft Wash Rack

Existing Fuel Island

Existing Terminal Building (retain for storage)

W Wickenburg Way/Hwy 60

Existing Helicopter Parking Positions

Relocated Fuel Tanks

Solar Panels

Existing Above-Ground Fuel Tanks

Temporary Fuel Island Relocation

Future Maintenance Storage Building

Sunset Park

West Saddle Ridge Dr.

North Silver Spur Dr.

Three Crosses Rd.

WICKENBURG MUNICIPAL AIRPORT

Exhibit 5A
RECOMMENDED DEVELOPMENT CONCEPT

Three executive hangars are also proposed on the north side of the runway. These three hangars would replace the three existing hangars on the north side of the runway that currently lie within the OFA and need to be removed and/or relocated to comply with safety area standards.

Airfield improvements made since the previous master plan in 2003, including the extension of Runway 5-23 to 6,100 feet and the relocation of Taxiway A 40 feet southeast, resulted in a loss of aircraft parking apron north and west of the terminal area. Aircraft parking apron was further reduced with the construction of two 10-unit T-hangars. This results in the need to provide replacement and additional aircraft parking areas.

A 30,000 square-yard parking apron on the south side of Runway 5-23 at midfield is currently planned for construction during this year. The construction of this apron will require the relocation and channelization of a wash located within the project site. An environmental evaluation was completed in 2010 in conjunction with this apron project. Once completed, this apron will provide approximately 21 aircraft tie-down positions for based and transient aircraft. This midfield apron project is depicted on **Exhibit 5A**. The exhibit also depicts the relocation of the fuel island to southeast corner of this apron.

Adjacent to the future midfield parking apron, the exhibit also depicts space for up to four commercial lease parcels that could be developed with fixed base operator (FBO) facilities or conventional hangars in the future. Landside vehicle access to this area would be provided initially by an extension of the existing access road located on the south side of the airport, and ultimately could be accessed from the extension with 3 Crosses Road.

Presently, the airport's miscellaneous maintenance equipment and spare parts are stored in a small room/locker in the terminal building. It is recommended that the airport have a separate facility dedicated solely to airport maintenance and storage. **Exhibit 5A** depicts such a 3,500 square-foot facility just east of the existing terminal building. However, this location would only work with the ultimate relocation of the terminal building.

Currently, there is no dedicated airport rescue and firefighting (ARFF) facility at Wickenburg Municipal Airport. As a general aviation facility, the airport is not required to have on-airport firefighting capability. However, the presence of such a facility would provide increased safety on the airfield. **Exhibit 5A** depicts a 3,600 square-foot joint-use fire facility on the north side of the airfield. However, this location would only work with the removal of the two hangars that currently lie within the OFA.

An aircraft wash rack is planned northeast of the existing terminal building. The aircraft wash rack 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.

Although a final location has not been established, the Town is also evaluating the relocation and replacement of the existing aviation fuel storage tank.

Exhibit 5A also depicts the development of a new helipad and two helicopter parking pads southeast of the planned apron area. This helipad would provide a designated area dedicated solely to helicopter

operations that could be properly marked and lighted for public use on the airfield.

Exhibit 5A also depicts an alternate airport loop road access along the south side of the airfield. This access road connects with 3 Crosses Road across property presently owned by the State of Arizona and managed by the State Land Department. This will improve emergency vehicle access in and out of the airport and would also allow for improved access to future hangar development on the southeast end of the airfield.

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.

WICKENBURG MUNICIPAL AIRPORT

Chapter Six

CAPITAL IMPROVEMENT PROGRAM

WICKENBURG MUNICIPAL AIRPORT

CAPITAL IMPROVEMENT PROGRAM

The analyses completed in previous chapters evaluated development needs at the airport over the next 20 years and beyond, based on forecast activity and operational efficiency. While it is necessary for scheduling and budgeting purposes to consider the timing of airport development, the actual needs will be established by airport activity. This chapter will provide guidance for the Town of Wickenburg, the ADOT MPD-Aeronautics Group, and the Federal Aviation Administration (FAA) for implementing the plan recommendations.

AIRPORT DEVELOPMENT SCHEDULE

Now that the recommended concept has been developed and specific needs and improvements for the airport have been established, the next step is to determine a realistic schedule (implementation timeline) and the associated costs for the plan. The recommended improvements are grouped by planning horizon: short term, intermediate term, and long term. The short term planning horizon is further subdivided into yearly increments. **Table 6A** summarizes key activity milestones for the three planning horizons.

TABLE 6A
Planning Horizon Summary
Wickenburg Municipal Airport

	2010	Short Term	Intermediate Term	Long Term
ANNUAL OPERATIONS				
Itinerant				
Air Taxi	1,900	2,100	2,400	2,700
General Aviation	19,200	20,700	23,600	27,200
Total Itinerant	**21,100**	**22,800**	**26,000**	**29,900**
Local				
General Aviation	15,800	16,900	19,300	23,300
Total Local	**15,800**	**16,900**	**19,300**	**23,300**
Total Operations	**36,900**	**39,700**	**45,300**	**52,200**
Based Aircraft	**53**	**57**	**65**	**75**

CAPITAL IMPROVEMENT PROGRAM SUMMARY

The FAA requires the airport to submit a five-year Airport Capital Improvement Program (ACIP) each year. However, the planning effort affords the opportunity to examine projects (and their potential financing) beyond the short term planning horizon.

It is important to note that 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. The current capital improvement program for Wickenburg Municipal Airport is summarized on **Exhibit 6A**. This exhibit separates the planning period into short, intermediate, and long term periods. Projects eligible for federal or state funding participation have been noted, and discussion in the following paragraphs explains these programs in more detail. However, as noted in the discussion, these programs cannot be assumed to exist in their present form throughout the planning period. Availability of funds will be contingent on authorizations and appropriations by federal and state legislatures on a year-to-year basis.

Due to the conceptual nature of a master plan, implementation of capital projects will only occur after further refinement of their design and costs through engineering analyses. Under normal conditions, the cost estimates reflect an allowance for engineering and contingencies that may be anticipated on the project. Although the capital costs presented in this chapter should be viewed only as estimates and are subject to further refinement, they are considered sufficiently accurate for performing feasibility analyses.

10MP09-6A-9/16/12

Project Description	Total Cost	FAA Share	ADOT Eligible	Local Share
Short Term Program (Years 2013-2017)				
FY 2013				
Construct Mid-Field Apron - Site Prep, Utilities, & Drainage (Phase I & II)	$2,400,000	$2,185,440	$107,280	$107,280
Extend Access Road (Phase I)	$600,000	$546,360	$26,820	$26,820
Install GPS Approach to Runway 23 (No On-Field Equipment Required)	$0	$0	$0	$0
Subtotal FY 2013	***$3,000,000***	***$2,731,800***	***$134,100***	***$134,100***
FY 2014				
Extend Access Road (Phase II)	$200,000	$182,120	$8,940	$8,940
T-Hangar Development Area (Site Prep, Grading, Drainage, & Taxilanes) - Design Only	$150,000	$136,590	$6,705	$6,705
Wash Rack - Design Only	$26,250	$23,903	$1,173	$1,173
Subtotal FY 2014	***$376,250***	***$342,613***	***$16,818***	***$16,818***
FY 2015				
Hangar Development Area (Site Prep, Grading, Drainage, & Taxilanes)	$1,500,000	$1,365,900	$67,050	$67,050
Construct T-Hangars (10-Unit)	$500,000	$0	$0	$0
Construct Wash Rack (50' x 50')	$175,000	$159,355	$7,823	$7,823
Install ODALS To Runway 23 - Design Only	$15,000	$13,659	$671	$671
Subtotal FY 2015	***$2,190,000***	***$1,538,914***	***$75,543***	***$75,543***
FY 2016				
Construct T-Hangars (10-Unit)	$500,000	$0	$0	$0
Install ODALS To Runway 23	$100,000	$91,060	$4,470	$4,470
Upgrade Runway & Taxiway Lighting (LED) - Design Only	$34,500	$31,416	$1,542	$1,542
Subtotal FY 2016	***$634,500***	***$122,476***	***$6,012***	***$6,012***
FY 2017				
Upgrade Runway & Taxiway Lighting (LED)	$230,000	$209,438	$10,281	$10,281
Subtotal FY 2017	***$230,000***	***$209,438***	***$10,281***	***$10,281***
Short Term Program Total	**$6,430,750**	**$4,945,241**	**$242,755**	**$242,755**
Intermediate Term Program (6-10 Years)				
Remove Hangars In Object Free Area (3)	$70,000	$63,742	$3,129	$3,129
Utilities For New Terminal Building	$250,000	$227,650	$11,175	$11,175
Construct New Terminal Building (10,000 S.F. @ $200/S.F.)	$2,000,000	$1,821,200	$89,400	$89,400
Construct New Vehicle Parking (2,100 S.Y. @ $75/S.Y.)	$157,500	$143,420	$7,040	$7,040
Construct First Phase of Executive Hangars (12 Hangars @ $35/S.F.)	$1,155,000	$0	$0	$0
Apron/Taxiway for First Phase of Executive Hangar Construction (5,100 S.Y. @ $125/S.Y.)	$637,500	$580,508	$28,496	$28,496
Construct New Maintenance/Storage Building (3,500 S.F. @ $100/S.F.)	$350,000	$318,710	$15,645	$15,645
Environmental Assessment (Construct Heliport/Helicopter Parking & Washrack)	$200,000	$182,120	$8,940	$8,940
Construct Heliport & Helicopter Parking - Design Only	$180,000	$163,908	$8,046	$8,046
Construct Heliport & Helicopter Parking	$1,200,000	$1,092,720	$53,640	$53,640
Pavement Preservation	$1,000,000	$910,600	$44,700	$44,700
Intermediate Term Program Total	**$7,200,000**	**$5,504,577**	**$270,212**	**$270,212**
Long Term Program (11-20 Years)				
Construct Second Phase of Executive Hangars (12 Hangars @ $35/S.F.)	$1,155,000	$0	$0	$0
Apron/Taxiway for Second Phase of Executive Hangar Construction (7,100 S.Y. @ $125/S.Y.)	$887,500	$808,158	$39,671	$39,671
Construct Executive Hangars on North Side of Runway (3 Hangars @ $35/S.F.)	$262,500	$0	$0	$0
Construct Taxilane on North Side of Runway (2,900 S.Y. @ $125/S.Y.)	$362,500	$330,093	$16,204	$16,204
ARFF and/or Maintenance Equipment	$500,000	$455,300	$22,350	$22,350
Pavement Preservation	$1,000,000	$910,600	$44,700	$44,700
Long Term Program Total	**$4,167,500**	**$2,504,150**	**$122,925**	**$122,925**
TOTAL PROGRAM COSTS	**$17,798,250**	**$12,953,968**	**$635,891**	**$635,891**

Source: Wickenburg Municipal Airport ACIP (Short Term Program) and Coffman Associates Analysis.
All costs in current (2013) dollars and based upon current federal and state funding programs.

WICKENBURG MUNICIPAL AIRPORT

CAPITAL IMPROVEMENT FUNDING SOURCES

Financing of capital improvements at the airport will not rely exclusively upon the financial resources of the Town of Wickenburg. Capital improvement funding is available through various grants-in-aid programs at both the federal and state levels. A summary of capital improvement projects completed at Wickenburg Municipal Airport since 2001 is presented in **Table 6B**.

TABLE 6B
Historical AIP Grant History
Wickenburg Municipal Airport

Fiscal Year	Grant Number	Grant Total	Description of Project
2001	10	$227,650	Rehabilitate Runway 5-23, Drainage Improvements, Airport Master Plan Update.
2002	11	$150,000	Runway Extension, Construct Taxiway.
2003	12	$150,000	Runway Extension, Construct Taxiway.
2005	13	$150,000	Runway Extension.
2005	14	$4,500,000	Runway & Taxiway Extension, Improve Runway Safety Area, Install Perimeter Fencing, Install Runway & Taxiway Lighting.
2006	16	$1,200,000	Runway & Taxiway Extension.
2007	17	$207,224	Install Automated Weather Observation System.
2009	18	$123,693	Environmental Assessment.
2010	19	$210,000	Airport Master Plan Update.

Source: FAA

While some years more funds could be available, the current Airport Improvement Program (AIP) was developed with project phasing in order to remain realistic and within the range of anticipated grant assistance. The following discussion outlines the key sources for capital improvement funding.

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.

Legislation affecting federal funding was enacted in late 2003 and is titled, *Century of Flight Authorization Act of 2003,* or Vision 100*.* The four-year bill covered FAA fiscal years 2004, 2005, 2006, and 2007. AIP funding was authorized at $3.4 billion in 2004, $3.5 billion in 2005, $3.6 billion in 2006, and $3.7 billion in 2007. This bill provided the FAA the opportunity to plan for longer term projects versus one-year reauthorizations. Several (23) continuing resolutions maintained funding for priority airport projects through 2011.

On February 17, 2012, the President signed the *FAA Modernization and Reform Act of 2012*. The law authorizes the FAA's AIP Program at $3.35 billion for fiscal years 2012 through 2015. The most significant

change in the new law is that FAA grants provide for up to 90 percent funding with a required local match of 10 percent. Under the new AIP Reauthorization, the FAA funding percentage for the State of Arizona is 91.06 percent. ADOT's share will be split evenly with the sponsor's share at 4.47 percent each. The estimated project cost sharing totals in the CIP for the airport have been updated to reflect this change.

The source for AIP funds is the Airport and Airway Trust Fund. The Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities and equipment, and research and development). The 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 Financing Reauthorization 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 commercial service airports based upon minimum enplanement levels of at least 10,000 passengers annually.

General aviation airports can receive up to $150,000 each year in Non-Primary Entitlement (NPE) funds (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. In the past, Wickenburg Municipal Airport has received NPE funding.

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 Air Traffic Control Towers (ATCTs), enroute navigational aids, on-airport navigational aids, and approach lighting systems.

While the F&E Program 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 PROGRAM

In support of the state aviation system, the State of Arizona also participates in airport improvement projects. The source for state airport improvement funds is the Arizona Aviation Fund. Taxes levied by the state on aviation fuel, flight property, aircraft registration tax, and registration fees (as well as interest on these funds) are deposited in the Arizona Aviation Fund. The State Transportation Board establishes the policies for distribution of these state funds.

Under the State of Arizona's grant program, an airport can receive funding for one-half of the local share of projects receiving federal AIP funding. The state also provides 90 percent funding for projects which are typically not eligible for federal AIP funding or have not received federal funding.

State Airport Loan Program

The ADOT 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 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.

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 MPD-Aeronautics Group 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 MPD-Aeronautics Group ensures that the APMS database is kept current, in compliance with FAA requirements.

Every year, ADOT MPD-Aeronautics Group, 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 MPD-Aeronautics Group to participate in the APPP.

LOCAL FUNDING

The balance of project costs, after consideration has been given to grants, must be funded through local resources. Wickenburg Municipal Airport is operated by the Town of Wickenburg, 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 Wickenburg 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 best means to begin implementation of the recommendations in this master plan is to first recognize that planning is a continuous process that does not end with completion and approval of this document. Rather, the airport should implement measures that allow them to track various demand indicators, such as based aircraft and operations, as well as those times when the main apron is full. Operations will be important when providing justification for several projects in the future.

The real value of a usable master plan is in keeping the issues and objectives in the minds of the managers and decision-makers so that they are better able to rec-

ognize change and its effect. In addition to adjustments in aviation demand, decisions made as to when to undertake the improvements recommended in this master plan update will impact the period that the plan remains valid. The format used in this plan is intended to reduce the need for formal and costly updates by simply adjusting the timing. The issues upon which this master plan update is based will remain valid for a number of years. The primary goal is for the airport to best serve the air transportation needs of the region, while continuing to be economically self-sufficient.

WICKENBURG MUNICIPAL AIRPORT

Appendix A

GLOSSARY OF TERMS

Glossary of Terms

A

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ALERT AREA: See special-use airspace.

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

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

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

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

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

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

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

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

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

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.

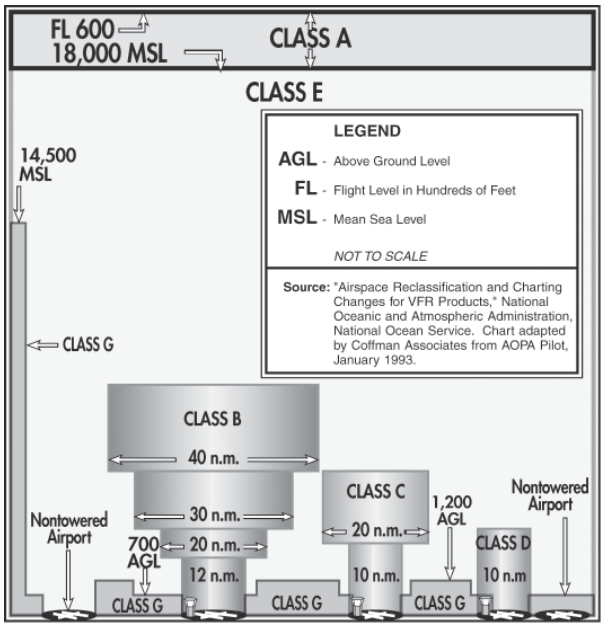
CATEGORY I: An Instrument Landing System (ILS) that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 100 feet above the horizontal plane containing the runway threshold.

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.

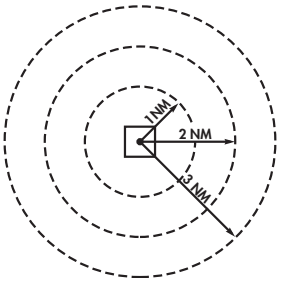
CONICAL SURFACE: An imaginary obstruction-limiting surface defined in FAR Part 77 that extends from the edge of the horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

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."

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.

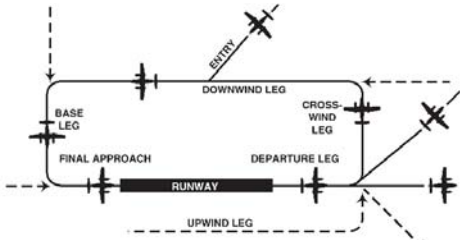
TOUCHDOWN AND LIFT-OFF AREA (TLOF): A load bearing, generally paved area, normally centered in the FATO, on which the helicopter lands or takes off.

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.

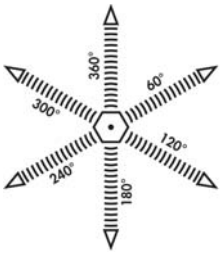
UNCONTROLLED AIRSPACE: Airspace within which aircraft are not subject to air traffic control.

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

WICKENBURG MUNICIPAL AIRPORT

Appendix B

ENVIRONMENTAL EVALUATION

Appendix B
ENVIRONMENTAL EVALUATION

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 would be 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. Wickenburg 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. Wickenburg is 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 Wickenburg 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 75,000 by the year 2030. 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

[1] http://www.epa.gov/oar/oaqps/greenbk/anay_az.html, accessed March 5, 2012.
[2] http://www.maricopa.gov/aq/divisions/planning_analysis/PlanningAreaMaps.aspx, accessed March 7, 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 Wickenburg Municipal Airport is not located within a Coastal Management Zone or Coastal Barrier Area. The Town of Wickenburg lies approximately 270 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) noise 65 DNL noise contours are contained completely within the airport property and the

65 DNL for the year 2030 extends slightly off airport property to the north. There is no noise-sensitive land use within the 65 DNL in either the existing (2012) or future (2030) 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 old Wickenburg Landfill was located adjacent to the airport along its northern boundary. However, this landfill is now closed and covered. There are ponds and other wetland features located in the Hassayampa River Preserve, but that property is located approximately six miles southeast of the airport.

Article 14-20, Section 14-20-11 of the Town of Wickenburg Land Use Code, specifies building height limitations in the vicinity of the airport. Building heights are limited to 20 feet within 500 feet of the runway centerline, including an area along the extended runway centerline 1,000 feet from each runway end. Beyond a distance of 1,000 feet, building heights must remain below an upward sloping 40:1 approach surface (i.e., the approach surface rises one foot for each 40-foot increment the approach surface extends from the beginning of the surface, which originates 200 feet from the runway end).

Generalized existing and future land use near the airport is discussed in Chapter One, Inventory, of the Airport Master Plan update; Exhibit 1C shows land ownership of individual parcels surrounding the airport.

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

10MP09-B1-11/13/13

LEGEND

- Airport Property Line
- 2012 Noise Contours
- 2030 Noise Contours
- DNL (Day-Night Noise Level)
- Arrival Flight Tracks
- Departure Flight Tracks
- Touch-n-Go Flight Tracks

PHOTO: Courtesy of Google Earth; 2012

0 1500 3000

SCALE IN FEET

NORTH

65 70 75

Hartman Wash

Runway 3-21 (5,100' x 75')

Aircraft Parking Apron with Access Road and Vehicle Parking (to be completed at 2030)

Wickenburg Industrial Air Park

Terminal Building

Sunset Park

U.S. Highway 60

Peeples Valley Rd.

West Saddle Ridge Dr.

North Silver Spur Dr.

West Palomino Dr.

West Photo Place

S. Cooper Rd.

Ironwood Dr.

Long Mountain Rd.

W. Lariat Ln.

WICKENBURG MUNICIPAL AIRPORT

Exhibit B1
2012 and 2030 NOISE CONTOURS
AND FLIGHT TRACKS

- 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

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 or other sensitive area or on already congested streets or intersections. In the case of Wickenburg Municipal Airport, construction traffic impacts are not expected as long as access to the airport occurs directly via U.S. 60. If the airport access road is ultimately connected to 3 Crosses Road, as is shown on the airport development plan, construction-related heavy trucks and equipment should still be routed via the airport access road to U.S. 60 to avoid impacts to residential neighborhoods.

Water quality concerns occur if there are storm events during the construction period. There are several ephemeral washes located on or adjacent to the airport. 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.

Short-term noise impacts could occur with construction of proposed airport development projects due to the presence of sensitive receptors in proximity to the airport. The Saddle Ridge West residential subdivision, as well as Sunset Park, are located immediately south of the airport. However, construction-related noise impacts are not normally considered significant unless construction is being undertaken during early morning, evening, or nighttime hours.

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).

Sunset Park, a publicly owned recreation area, is located immediately adjacent to the airport. Future airport projects under the Airport Master Plan update would not directly affect this potential Section 4(f) resource. In addition, this park is located outside the airport's 65 DNL noise contour as shown in **Exhibit B1**. Thus, ambient noise levels would not result in a "constructive" use of the park.

According to the National Register of Historic Places (NRHP), there are several properties listed on the NRHP located within the Town of Wickenburg.[3] None of these resources are located near the airport. The closest such properties, the MacLennan House, the Jacobs House, and the Cactus Inn, are located approximately three miles to the east of the airport. As mentioned previously, the closest waterfowl or wildlife refuge, the Nature Conservancy's Hassayampa River Preserve, is located approximately six miles southeast of the airport and is privately owned.

No Section 4(f) resources would be adversely impacted by development of airport projects proposed as part of this Airport Master Plan update (also see the section on Historical, Architectural, Archaeological, and Cultural Resources).

FARMLAND

Based on the U.S. Department of Agriculture Natural Resources Conservation Service's soil survey map for Maricopa County, there is no prime farmland or farmland of state or local importance located at the airport.[4] Soils at the airport are generally of the Eba-Continental-Cave association, low precipitation, 3 to 20 percent slopes.

[3] http://nrhp.focus.nps.gov/natreg/docs/Download.html, accessed March 6, 2012.
[4] http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, accessed March 7, 2012.

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.

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* (ARS §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.

Vegetation in the airport environs is typical of the Sonoran desertscrub biotic community. Vegetation in the undisturbed upland areas includes creosote bush, velvet mesquite, triangle-leaf bursage, whitethorn acacia, barrel cactus, and fluffgrass. In onsite ephemeral washes, catclaw acacia and threeawn are also present. In disturbed areas of the airport, vegetation includes desert broom, flatcrown buckwheat, and globemallow (SWCA 2010). Non-native vegetation includes prickly Russian thistle (*Salsola tragus*).

No agaves, aquatic habitats (including stock ponds), broadleaf deciduous riparian vegetation communities (i.e., communities containing willow, cottonwood, or ash, etc.), or potential bat roost sites (e.g., natural caves or mine features) occur in the project area. There is a multi-armed saguaro (*Carnegiea gigantea*) located within the mid-field aircraft parking apron project area. The Wickenburg-Hassayampa Wildlife Corridor is located approximately three miles from the airport.

Table B1 identifies federally listed species for Maricopa County as published on the USFWS Arizona Ecological Service's data base, dated January 19, 2012.[5] 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.

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	May 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

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

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

Common Name	Habitat	Status	Potential for Occurrence[1]
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
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 March 6, 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.

Two candidate species, the Sonoran desert tortoise (*Gopherus agassizii*) and the Tuscon shovel-nosed snake (*Chionactis occipitalis klauberi*), are 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 Sonoran desert tortoise within three miles of the airport.[6] Therefore, the USFWS will need to be apprised of airport

[6] http://www.azgfd.gov/hgis/, accessed March 6, 2012.

development projects per Section 7(a)(4) of the ESA and biological surveys of impact areas may be required.

Although significant impacts to federally listed threatened or endangered species are not expected as a result of the Airport Master Plan update, an action need not involve a threat to extinction of federally listed species to result in a significant impact; lesser impacts, including impacts on non-listed species, could also constitute a significant impact. Consultation with agencies or organizations having jurisdiction or special expertise concerning the protection and/or management of the species should be utilized in cases such as this. If the above candidate species' statuses change and they become listed, then formal consultation under Section 7 of the ESA may be necessary as well.

Migratory birds protected under the MBTA may or may not be present at the airport. A previous EA done on airport projects in 2004 stated that "impacts to migratory birds are not anticipated since the habitat surrounding the Airport is not suitable for nesting activities due to the lack of water features and nesting sites" (Town of Wickenburg 2004). However, in 2010, the EA on the proposed mid-field aircraft parking apron project indicated that a preconstruction survey for the presence of raptors or other nesting bird species might be required (FAA 2011). 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 preconstruction 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, floodplains consist of "lowland and relatively flat areas adjoining inland and coastal water including flood prone areas of offshore islands, including at a minimum, that area subject to one percent or greater chance of flooding in any given year." 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 (12)(c) indicates that "if the proposed action and reasonable alternatives are not within the limits of a base floodplain (100-year flood area)," it may be assumed that there are no floodplain impacts. 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. 04013C0235G, a small portion of airport property located approximately 200 feet north of the centerline of the runway is within the 100-year floodplain (**Exhibit B2**).[7] This floodplain is associated with Hartman Wash and is mapped by FEMA as Special Flood Hazard Areas Subject to Inundation by the 1% Annual Chance Flood. The floodway of the wash is located outside airport property.

The remainder of airport property 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.

No airport development projects are proposed within the 100-year Special Flood Hazard Area. Therefore, the Airport Master Plan update is consistent with 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.

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 several businesses located at the Wickenburg Industrial Air Park that report to the EPA regarding the handling or disposal of hazardous materials under RCRA or ACRES (Assessment, Cleanup and Redevelop-

[7] https://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1 =1007&JY=650&MPT=52697661&MPS=1&OBJMX=222&OBJMY=216&ACT=0&KEY=51894785&ITEM=1, accessed March 6, 2012.

ment Exchange System). These include the old Wickenburg Landfill located just north of the airport. This 45-acre former Brownfield property is listed as "Ready for Reuse," which means that it has either been investigated and requires no further action or has been cleaned up to meet site-specific cleanup goals. There are no Superfund or NPL sites near the airport.[8]

Construction of airport development projects will result in earthwork disturbances. Many areas planned to be disturbed are currently undeveloped and in a natural state. Other projects involve the removal of an existing building or 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 will 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 will 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. 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.

On February 1, 2011, new (2010) AZPDES Multi-sector General Action permits (MSGPs) (Mining and Non-mining) became effective.[9] Existing facilities such as the Wickenburg Municipal Airport were allowed 120 days from the effective date (i.e., until May 31, 2011) to prepare an SWPPP and submit a Notice of Intent (NOI) to the Arizona Department of Environmental Quality (ADEQ) to obtain coverage under one of the MSGP 2010 permits.

Finally, the creation of additional solid waste is likely to occur as a result of future airport growth. Currently, Sickles Sanitation, located in the Wickenburg Industrial Air Park, serves as a recycling center and collection site for certain types of solid waste. Ultimately, however, solid waste is hauled to the Northwest Regional Landfill at 19401 W. Deer Valley Road in Surprise.[10] No impacts to the capacities and operations of Sickles Sanitation or the Northwest Regional Landfill are anticipated as a result of future airport growth.

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

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[8] http://epamap14.epa.gov/ejmap/ejmap.aspx?wherestr=4081%20N.%20Industrial%20Road%2C%20Wickenburg%2C%20AZ, accessed March 6, 2012.

[9] http://www.azdeq.gov/environ/water/permits/msgp.html, accessed March 5, 2012.

[10] http://www.ci.wickenburg.az.us/index.aspx?NID=456, accessed March 6, 2012.

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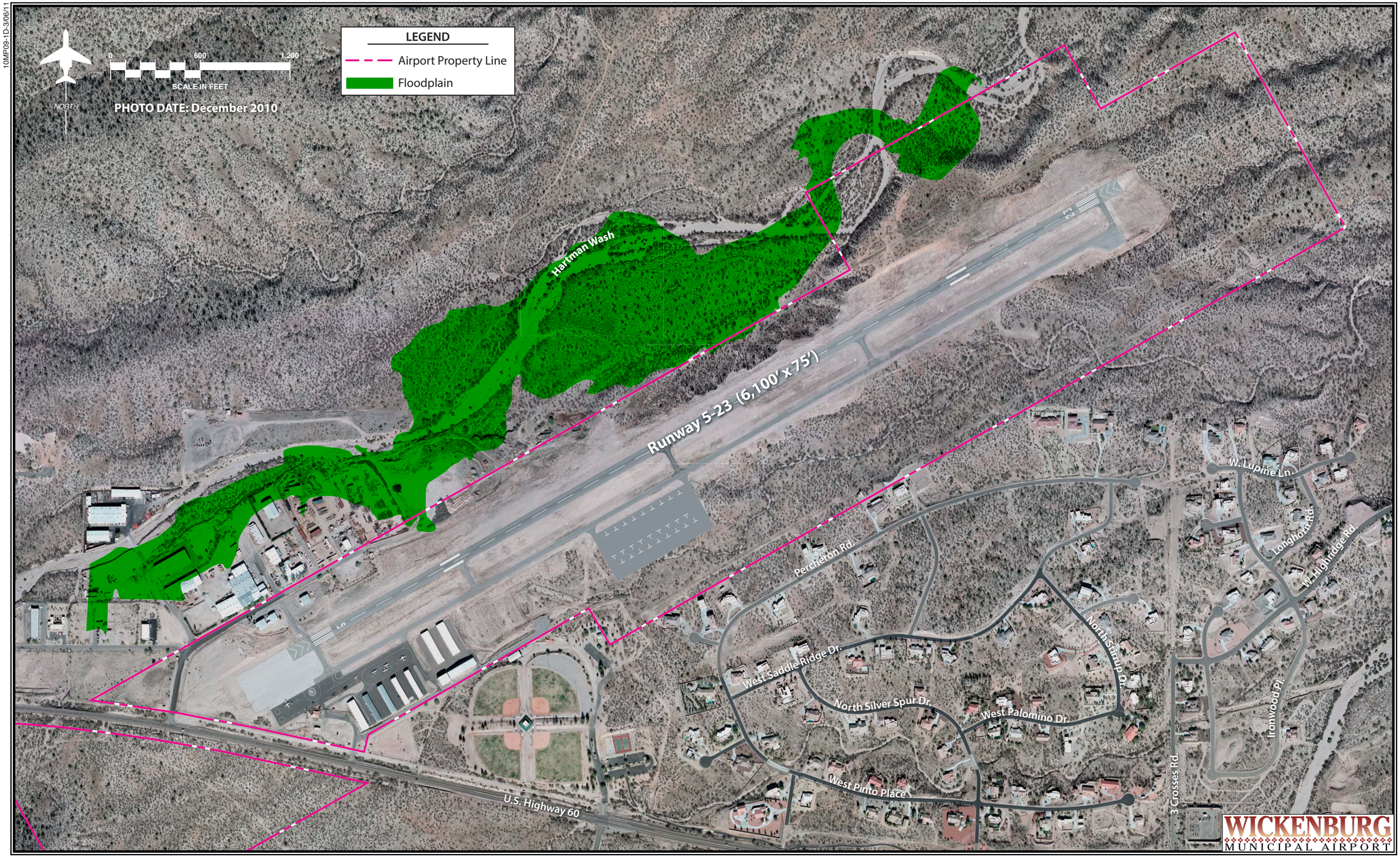

Source: FEMA, Flood Insurance Rate Map September 30, 2005

Exhibit B2
100-YEAR FLOODPLAIN

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 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.

In February 2010, an archaeological survey was completed by SWCA Environmental on 13.4 acres of airport property located mid-field to the south of the runway. In addition to the survey, SWCA completed archival research on all previous cultural resource studies conducted within one mile of the airport. Including the 2010 survey, there have been ten archaeological surveys of areas within one mile of the airport. As a result, five cultural sites have been identified. None of the sites are located within the airport boundaries. **Exhibit B3** shows the portions of airport property that have been surveyed to date.

Of the five previously recorded archaeological sites within one mile of the airport, only one was determined to be eligible for listing on the NRHP. This site includes nine segments of historic U.S. 60. The site has not yet been listed. The closest listed NRHP sites to the airport are approximately three miles east within the Town of Wickenburg.

Since not all of the airport property has been surveyed for cultural resources, impacts could occur if potentially eligible cultural resources are disturbed. Therefore, prior to implementation of the planned improvements, coordination with the SHPO will be needed to determine if field surveys are warranted. 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.

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 Wickenburg 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 the terminal building;
- Medium intensity runway lighting (MIRL) on Runway 5-23;
- Medium intensity taxiway lighting (MITL);
- Precision approach path indicator lights (PAPI-4L) located at both ends of Runway 5-23;

- A runway end identifier lighting (REIL) system (two synchronized flashing lights located laterally on each side of the runway threshold at each end of Runway 5-23) facing the approaching aircraft;
- A lighted wind cone located near the end of Runway 23 on the north side;
- 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.

In addition to the airport, lighting in the area includes lights for four multi-use fields at Sunset Park. The Park's basketball and tennis courts are also lit. Sunset Park serves the local adult softball and soccer leagues, youth soccer and baseball leagues, and school-sponsored games, practices, and tournaments.[11]

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 an REIL, 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.

Wickenburg Municipal Airport is surrounded by industrial development and undeveloped or developed open space on three sides. To the southeast, however, there is low density residential land use. Approximately 24 residences currently have views of the airport with additional lots still to be developed along Percheron Road, W. Saddle Ridge Lane, and W. Lupine Lane. These residences were constructed after the airport, which has been an established land use in Wickenburg since the late 1960s. Long-range views in the area include those of the Bradshaw Mountains and Vulture Peak. There are no scenic corridors within the viewshed of the airport.

Proposed airport development projects under the Airport Master Plan update include the construction of additional hangars and a new terminal building along the south side of the airport. In addition, a future helipad and extension of the airport's access road would also occur along the airport's southern boundary. On the north side of the airport, a joint-use fire facility and three box hangars are planned. New airfield lighting proposed as part of the Airport Master Plan update includes an omni-directional approach lighting system

[11] http://www.ci.wickenburg.az.us/index.aspx?NID=75, accessed March 13, 2012.

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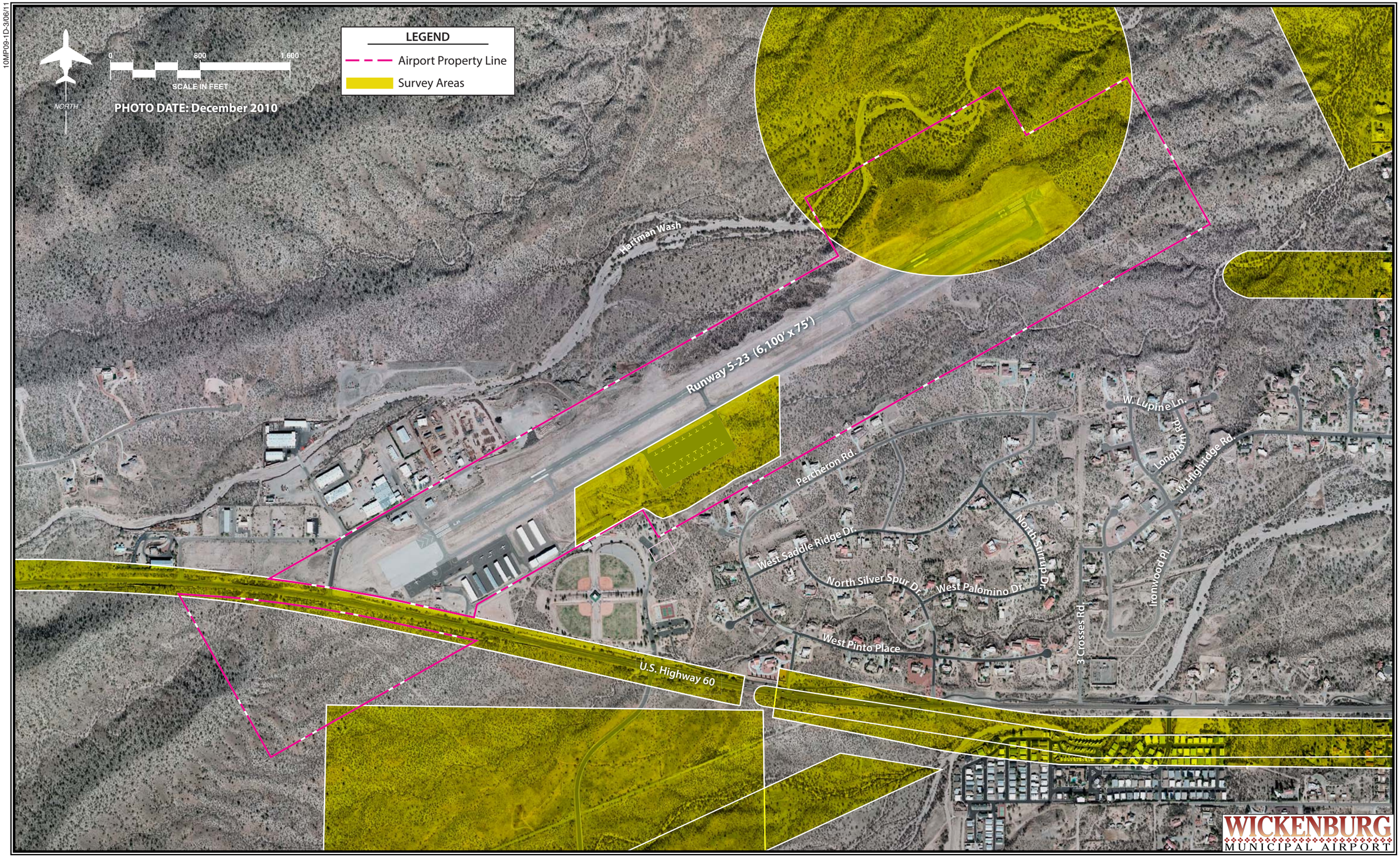


Source: SWCA Environmental, Archaeological Survey of the Wickenburg Municipal Airport Midfield Apron Project in Maricopa County, Arizona, February 2010.

Exhibit B3
PREVIOUSLY SURVEYED AREAS

(ODALS), which would consist of a sequence of five flashing lights, 300 feet apart, leading toward the runway, and would be located in the runway protection zone for Runway 23. Additional lighting related to ODALS and the new hangars and other buildings 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.

Residents of the Saddle Ridge West subdivision that are living immediately adjacent to the airport's southern boundary will experience a change in their short-range views. Long-range views of the Bradshaw Mountains, Vulture Peak, and other scenery in the area will not be affected. Currently, the closest airport development is the edge of the airfield located approximately 700 feet to the northwest of the airport property line. However, in some instances along Percheron Road, the airport property line abuts the corners of the closest structures or yards. With implementation of the already approved mid-field aircraft parking apron and the new terminal and access road extension to be constructed as part of the Airport Master Plan update, airport development will be within 100 to 200 feet of these homes.

This change will be the most noticeable where the mid-field aircraft parking apron is to be constructed. On October 13, 2010, the public review period for the EA on that project was initiated. No comments were received from private landowners in the area and a Finding of No Significant Impact (FONSI) was issued by the FAA for the project on April 12, 2011. Since potentially significant impacts related to lighting and visual effects were not identified for the mid-field apron project, no significant visual impacts related to other components of the proposed development concept plan for the Airport Master Plan update are anticipated.

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 will 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 objectives of the update are to develop a program that 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."
Based on the forecast analysis summarized in Exhibit 2D of this Airport Master Plan update, the airport is expected to have a growth in annual operations of approximately two percent through the year 2030. An approximate two percent annual growth in based aircraft is also expected (i.e., three to five additional aircraft per year.) An annual two percent growth at the airport for the next 20+ years would not be expected to result in secondary impacts on the Town of Wickenburg.

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 they may be exposed to.

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 Wickenburg area. General population and employment data are discussed in Chapter One of the Airport Master Plan update. The percentage of persons living below the poverty level and the percentage of minority populations within census tracts that include, or are near, the airport are shown on **Exhibit B4**. The percentage of households below the poverty rate ranges from 12 to 21 percent; minority populations in areas surrounding the airport are below 20 percent. Thus, there is not a disproportionate number of low-income or minority populations located in proximity to the airport.

Construction impacts could have a disproportionate impact on children due to the location of a park adjacent to the airport. The City will need to take appropriate measures to ensure that children do not have access to construction areas at the airport. In addition, the City may decide to temporarily restrict use of the Sunset Park playground while portions of the access road are being constructed to reduce children's exposure to construction noise, dust, and emissions.

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 two percent annual growth for the next 20+ years would not significantly change future growth in the Wickenburg area.

WATER QUALITY

As discussed previously, water quality in Arizona is monitored and protected by the U.S. EPA and the ADEQ under the authority of the CWA and the AZPDES permitting process. The Wickenburg area is located within the Hassayampa watershed; the Hassayampa River itself is located approximately three miles east of the airport. There are two segments of the Hassayampa River (11 miles from its headwaters to Copper Creek and 2.3 miles from the Buckeye Canal to the Gila River) that are on the EPA's CWA Section 303(d) List of Impaired Waters (reporting year 2008).[12] The lower segment of the River (i.e., Buckeye Canal to the Gila River), is also on the draft 2010 State of Arizona's Impaired Waters list.[13] Neither of these Hassayampa River segments is close to the airport or its environs.

On February 1, 2011, new (2010) AZPDES Multi-sector General Action permits became effective.[14] Existing facilities such as Wickenburg Municipal Airport were allowed 120 days from the effective date (i.e., until May 31, 2011) to prepare a SWPPP and submit an NOI to ADEQ to obtain coverage under one of the MSGP 2010 permits. The MSGP 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 Classifica-

[12] http://iaspub.epa.gov/tmdl_waters10/attains_watershed.control?p_huc=15070103&p_cycle=&p_report_type=T , accessed March 5, 2012.
[13] http://www.azdeq.gov/environ/water/assessment/download/303d_list.pdf, accessed March 5, 2012.
[14] http://www.azdeq.gov/environ/water/permits/msgp.html, accessed March 5, 2012.

tion (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 MSGP 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.

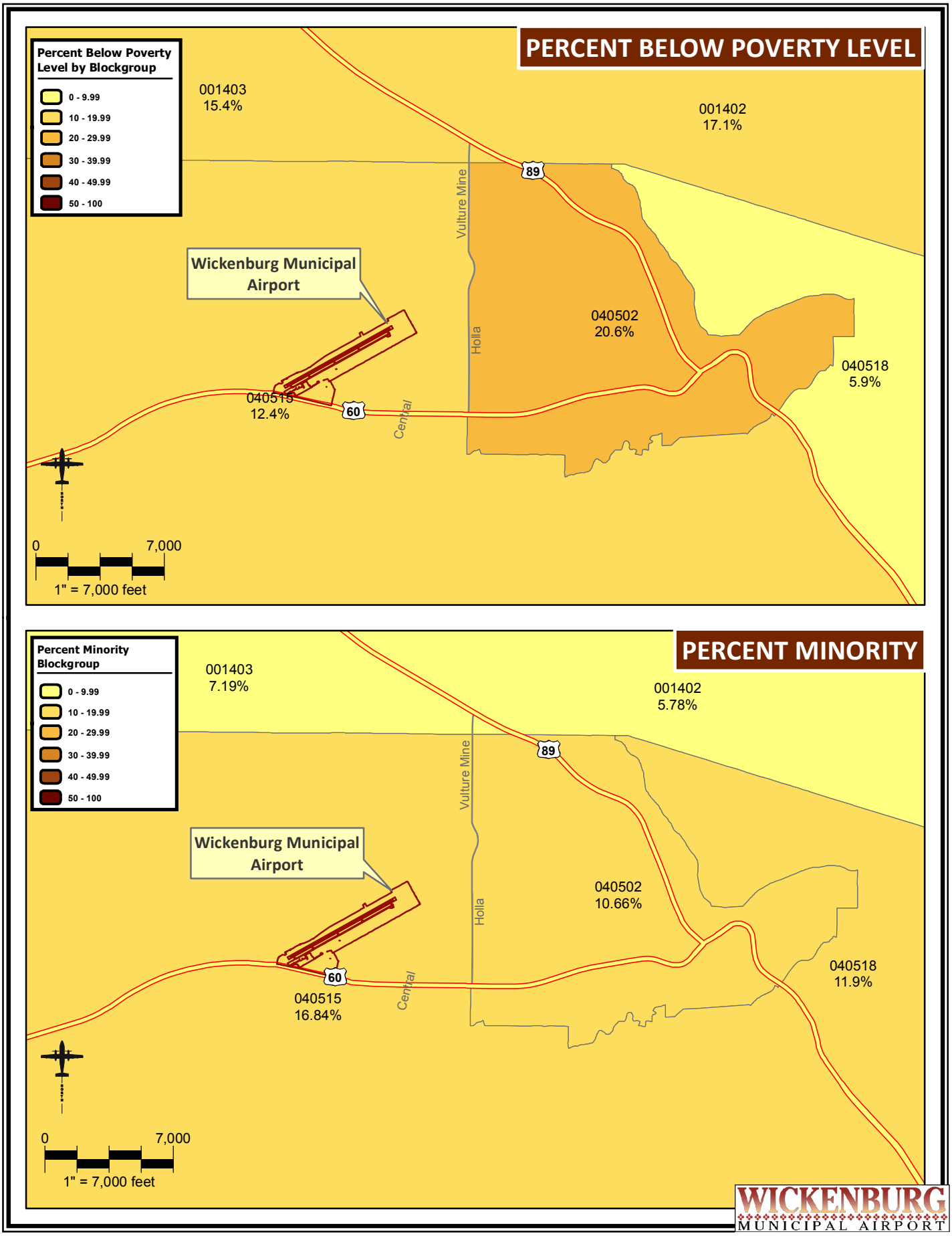
Certain drainages (both natural and human-made) come under the purview of the U.S. Army Corps of Engineers (USACE) under Section 404 of the CWA; wetlands are also protected. Wickenburg Municipal Airport lies between several ephemeral washes, Hartman Wash on the north and two connected washes on the south (Wash A and Wash A1). There is also a series of interconnected washes in the airport's southeastern corner (**Exhibit B5**). Hartman Wash crosses airport property in two locations along the airport's northeastern border; the unnamed washes are located on airport property between the airfield and the airport's southern property fence. The washes flow east into Sols Wash, which then flows into the Hassayampa River. There are no aquatic features or hydric soils present at the airport that would indicate the potential for wetland habitat.[15]

A preliminary jurisdictional delineation of portions of the two unnamed washes was completed in 2010 for the mid-field aircraft parking apron project. The widths of the ordinary high-water marks for each drainage were measured at various locations within the survey area. Based on the survey, the two drainages total 0.64-acre and are considered potential "waters of the U.S."; no wetlands are present. In addition, two non-jurisdictional features (culverts) were identified.

As part of the mid-field aircraft parking apron project, Wash A will be partially filled and culverted; approximately 0.31 acres of jurisdictional "waters of the U.S." will be removed. This action will take place under USACE Nationwide Permit (NWP) 39 for Commercial and Institutional Developments. The Town of Wickenburg will pay in-lieu fees to the Nature Conservancy's Hassayampa River Preserve as mitigation for the "waters of the U.S." that will be removed. The mitigation payment will be used to preserve 0.31 acre within the Nature Conservancy property.

Most of the development projects associated with the Airport Master Plan update would avoid the washes on the airport property. However, small amounts of fill are likely to be necessary within Wash A and Wash A1 when the access road is extended east of the mid-

[15] http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, accessed March 12, 2012.



Source: Census Tract data is from the 2010 US Census Bureau,
SF3 tables and American Community Survey.
Census Tract shapefiles are from US Census Bureau.

Tract Number / Percentage

Exhibit B4
LOW INCOME AND MINORITY POPULATIONS

10MP09-1D-3/06/11

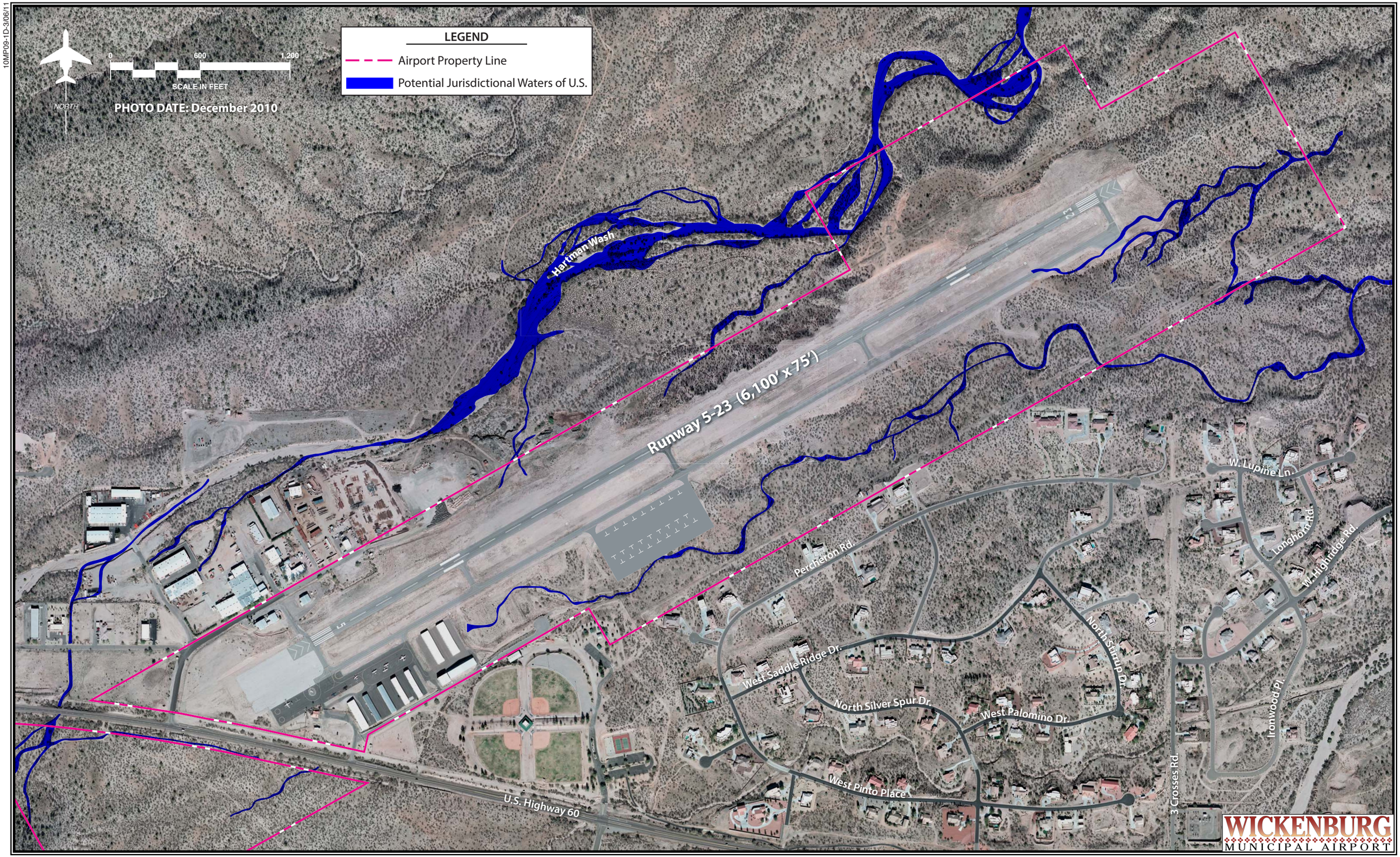


Exhibit B5
POTENTIAL JURISDICTIONAL WATERS IN THE VICINITY

field aircraft parking apron area and when the future helipad is constructed, respectively. It is expected that the USACE would allow these additional impacts under NWP 39, subject to a similar mitigation approach. This assumption will need to be confirmed with the USACE at the time that the projects move forward. Additional jurisdictional delineations may also be required.

WILD AND SCENIC RIVERS

The State of Arizona has two designated Wild and Scenic Rivers: Fossil Creek and the Verde River. Fossil Creek is approximately 68 miles and the Verde River is approximately 62 miles to the northeast and east of Wickenburg Municipal Airport, respectively. The airport is located in a separate drainage basin and separated from these resources by the Bradshaw Mountains. 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 Wickenburg Municipal Airport. In general, the recommended development plan would provide for an additional two percent annual growth at the airport through the year 2030. The primary potential impacts are related to the construction phase of various projects due to the proximity of a park and residential land uses. In both cases, the airport is the pre-existing land use; however, BMPs must still be utilized to reduce dust, erosion and other impacts as much as feasible.

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.

TABLE B2
Summary of Potential Environmental Concerns
Wickenburg Municipal Airport Master Plan Update

FAA Resource Category	Potential Concern	Mitigation Measures
Air Quality	None. Wickenburg 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. Wickenburg 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 operations and the Town of Wickenburg has building height limitations in the vicinity of the airport.	None necessary.
Construction Impacts	The construction of airport projects may create temporary impacts to nearby park users and residents, including construction traffic once the airport access road is connected to 3 Springs Road. Water quality concerns could occur if there are storm events during the construction period.	BMPs would be required to minimize dust, emissions, and water quality concerns. Construction should be limited to normal daytime hours. All construction site access should occur via the airport access road directly to U.S. 60 only.
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.	None necessary.
Fish, Wildlife, and Plants	There are no federally listed species known to occur at the airport. Two 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 candidate species of the ESA become officially listed and are present at the airport, formal Section 7 consultation with the USFWS may be required.
Floodplains	None. No airport development projects are proposed within the 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 currently exist in the Town of Wickenburg.	None necessary.

TABLE B2
Summary of Potential Environmental Concerns
Wickenburg Municipal Airport Master Plan Update

FAA Resource Category	Potential Concern	Mitigation Measures
Historic, Architectural, Archaeological, and Cultural Resources	Since not all of the airport property has been surveyed for cultural resources, impacts may occur if potentially eligible cultural resources are disturbed by airport development projects.	Coordination with the SHPO will be needed to determine if surveys are warranted. 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 ODALS and the new hangars and other buildings 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 two percent growth at the airport for the next 20+ years would not be expected to result in secondary impacts on the Town of Wickenburg.	None necessary.
Socioeconomic Impacts, Env. Justice, and Children's Env. Health and Safety Risks	Construction impacts could have a disproportionate impact on children due to the location of a park adjacent to the airport. No long-term socioeconomic impacts are expected. The Airport Master Plan update does not involve expanding airport operations beyond the existing airport boundaries.	The City should ensure that children do not have access to construction areas. The City may also decide to temporarily restrict use of the Sunset Park playground while portions of the access road are being constructed.
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 MSGP 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.	Most of the development projects associated with the Airport Master Plan update would avoid the washes on the airport property. However, small amounts of fill are likely to be necessary within Wash A and Wash A1 when the access road is extended east of the mid-field aircraft apron area and when the future helipad is constructed.	It is expected that the USACE would allow fill in Washes A and A1 under NWP 39, subject to in-lieu mitigation fees. This will need to be confirmed with the USACE. Additional jurisdictional delineations may also be required.
Wild and Scenic Rivers	None. The airport is located in a separate drainage basin from the closest designated Wild and Scenic Rivers.	None necessary.

REFERENCES

Federal Aviation Administration (FAA), 2011. *Finding of No Significant Impact and Final Environmental Assessment for Proposed Mid-Field Aircraft Parking Apron*, April.

SWCA Environmental Consultants (SWCA), 2010. *Biological Evaluation of the Wickenburg Municipal Airport Midfield Apron Project in Maricopa County, Arizona,* prepared for the Town of Wickenburg, February.

Town of Wickenburg, 2004. *Final Environmental Assessment, Proposed Runway 5-23 1,500-Foot Extension and Associated Improvements*, May.

WICKENBURG
MUNICIPAL AIRPORT

Appendix C

AIRPORT LAYOUT PLANS

AIRPORT MASTER PLAN

WICKENBURG, ARIZONA

WICKENBURG

MUNICIPAL AIRPORT

AIRPORT LAYOUT PLAN SET

INDEX OF DRAWINGS

1. AIRPORT LAYOUT PLAN
2. TERMINAL AREA DRAWING
3. AIRPORT AIRSPACE DRAWING
4. INNER PORTION OF THE RUNWAY 5-23 APPROACH SURFACE DRAWING
5. RUNWAY 5-23 APPROACH SURFACE DRAWING
6. ON-AIRPORT LAND USE DRAWING
7. AIRPORT PROPERTY MAP
8. DEPARTURE SURFACE DRAWING

PREPARED FOR
TOWN OF WICKENBURG

MARCH 3, 2014

Coffman Associates
Airport Consultants
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RUNWAY DATA

	RUNWAY 5-23	
	EXISTING	ULTIMATE
RUNWAY CATEGORY/AIRCRAFT DESIGN GROUP	B-II	SAME
CRITICAL DESIGN AIRCRAFT	KINGAIR	CJ3
UNDERCARRIAGE WIDTH (FEET)	9.04'	9.04'
WINGSPAN OF DESIGN AIRCRAFT	54.0'	53.5'
APPROACH SPEED OF DESIGN AIRCRAFT (KNOTS)	103	114
MAXIMUM TAKE OFF WEIGHT (lb.)	12.500lbs	13,870lbs
RUNWAY AZIMUTH	60.423	SAME
RUNWAY BEARING (TRUE)	S60°25'12"W	SAME
RUNWAY DIMENSIONS	6,101' X 75'	SAME
ELEVATION OF RWY. TOUCH DOWN ZONE (MSL)	2378.6'/2344.0'	SAME
ELEVATION OF RUNWAY HIGH POINT (above MSL)	2378.4'	SAME
ELEVATION OF RUNWAY LOW POINT (above MSL)	2307.3'	SAME
ELEVATION OF RUNWAY END (NAVD 88)	2378.4'/2307.3'	SAME
WIND COVERAGE IN MPH/KNOTS	12.1/10.5-97.94% / 15/13-99.01% / 16/16-99.83% / 20/23-99.97%	
APPROACH VISIBILITY MINIMUMS	VISUAL/VISUAL	VISUAL/1 MILE
14 CFR PART 77 CATEGORY	VISUAL/VISUAL	VISUAL/NONPREC
RUNWAY INSTRUMENTATION	VISUAL/VISUAL	VISUAL/NONPREC
RUNWAY APPROACH SURFACES	20:1/20:1	20:1/34:1
RUNWAY THRESHOLD DISPLACEMENT	NONE	SAME
RUNWAY SAFETY AREA WIDTH (RSA)	150'	SAME
RSA DISTANCE BEYOND EACH RUNWAY END	300'/300'	SAME
RUNWAY OBJECT FREE AREA WIDTH (OFA)	500'	SAME
OFA DISTANCE BEYOND EACH RUNWAY END	300'/300'	SAME
RUNWAY OBSTACLE FREE ZONE WIDTH (OFZ)	250	400'
OFZ DISTANCE BEYOND EACH RUNWAY END	200'/200'	SAME
LINE OF SITE REQUIREMENT MET	YES	SAME
RUNWAY PAVEMENT MATERIAL	ASPHALT	SAME
RUNWAY PAVEMENT SURFACE TREATMENT	NONE	SAME
PAVEMENT STRENGTH (in thousand lb.)	30.0(S)/60 (D)	SAME
RUNWAY EFFECTIVE GRADIENT (in %)	0.07%	SAME
MAXIMUM GRADIENT (in %)	0.34%	SAME
RUNWAY LIGHTING	MIRL	SAME
RUNWAY MARKINGS	NONPREC./NONPREC.	SAME
RUNWAY APPROACH LIGHTING	NONE	ODALS(23)
RUNWAY TAXIWAY SEPARATION	240'	SAME
TAXIWAY PAVEMENT MATERIAL	ASPHALT	SAME
TAXIWAY WINGTIP CLEARANCE	28'	SAME
TAXIWAY LIGHTING	MITL	SAME
TAXIWAY MARKING	CENTERLINE, HOLD LINES	SAME
TAXIWAY OBJECT FREE AREA	131'	SAME
TAXIWAY SAFETY AREA WIDTH	79'	SAME
TAXIWAY CL TO FIXED OR MOVEABLE OBJECT	65.5'	SAME
DISTANCE FROM RWY. CL TO HOLD BARS	200'	SAME
DISTANCE FROM RWY. CL TO AIRCRAFT PARKING	250'	310'
TYPE OF SURVEY NEEDED FOR NON-PRECISION APPROACH	--	NVG
VISUAL AIDS	PAPI-4s REILs	SAME SAME
NAVIGATIONAL AIDS	ROTATING BEACON --	SAME GPS

† Pavement strengths are expressed in Single(S), Dual(D), Dual Tandem(DT), and/or Double Dual Tandem(DDT) wheel loading capacities.

AIRPORT DATA

WICKENBURG MUNICIPAL AIRPORT (E25)

CITY: WICKENBURG, ARIZONA — COUNTY: MARICOPA

RANGE: 5 WEST — TOWNSHIP: 7 NORTH — CIVIL TOWNSHIP: GILA & SALT RIVER BASE & MERIDIAN

		EXISTING	ULTIMATE
AIRPORT SERVICE LEVEL		GENERAL AVIATION	SAME
DESIGN AIRCRAFT		KINGAIR	CJ3
AIRPORT REFERENCE CODE		B-II	SAME
AIRPORT ELEVATION (MSL) (NAVD 88)		2378.6'	SAME
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		102.4°F (JULY)	SAME
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD-83)	Latitude	33°58'14.2656"N	SAME
	Longitude	112°47'42.3233"W	SAME
AIRPORT and TERMINAL NAVIGATIONAL AIDS		ROTATING BEACON REILs PAPI-4	SAME SAME SAME
GPS AT AIRPORT		NO	YES

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		BUILDING AND FACILITIES
BRL		BUILDING RESTRICTION LINE (BRL)
OFA	OFA(U)	OBJECT FREE AREA (OFA)
RSA	RSA(U)	RUNWAY SAFETY AREA (RSA)
OFZ	OFZ(U)	OBSTACLE FREE ZONE (OFZ)
		PAVEMENT CONSTRUCTION
		FENCING
PAPI-4	PAPI-4	NAVIGATIONAL AID INSTALLATION
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		RUNWAY PROTECTION ZONE (RPZ)
		SEGMENTED CIRCLE/LIGHTED WIND TEE
		WIND INDICATOR (Lighted)
1080	1080	TOPOGRAPHIC CONTOURS
		SECTION CORNER
B	B	TAXIWAY DESIGNATION
		HOLD POSITION MARKINGS
H	H	HELIPAD

EXISTING BUILDINGS/FACILITIES

NUMBER	DESCRIPTION	ELEVATION
1	TERMINAL BUILDING	2381.0'
2	FUEL ISLAND	2378.7'
3	ABOVE GROUND FUEL STORAGE	2383.3'
4	T-HANGARS	2380.9'
5	T-HANGARS	2376.6'
6	T-HANGARS	2377.8'
7	T-HANGARS	2376.3'
8	T-HANGARS	2376.0'
9	10-UNIT NESTED T-HANGARS	2370.3'
10	10-UNIT NESTED T-HANGARS	2369.3'
11	T-HANGAR	2369.3'
12	T-HANGARS	2371.1'
13	HELICOPTER PARKING	NA
14	COMMERICAL HANGARS (TO BE REMOVED)	2395.0'
15	COMMERICAL HANGARS (TO BE REMOVED)	2392.0'
16	COMMERICAL HANGARS (TO BE REMOVED)	2390.0'
--	--	

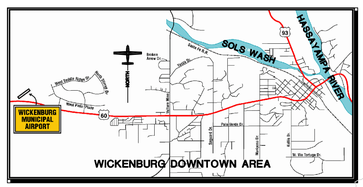
ULTIMATE BUILDINGS/FACILITIES

NUMBER	DESCRIPTION	ELEVATION
20	MAINTANACE BUILDING	±2,386'
21	JOINT USE FIRE FIGHTING FACILITY	±2,386'
22	EXECTUTIVE HANGARS	±2,386'
23	T-HANGARS	±2,386'
24	T-HANGARS	±2,376'
25	BOX HANGARS	±2,376'
26	TERMINAL BUILDING	±2,376'
27	HELIPAD	±2,376'
28	COMMERICAL HANGAR LEASE PARCELS	NA
29	RELOCATED ABOVE GROUND FUEL STORAGE	NA
30	WASH RACK	NA
31	HELICOPTER PARKING	

* ESTIMATE

RUNWAY END COORDINATES (NAD 83)

RUNWAY		EXISTING	ULTIMATE
Runway 5	Latitude	33°57'59.3754"N	SAME
	Longitude	112°48'13.8203"W	SAME
Runway 23	Latitude	33°58'29.1557"N	SAME
	Longitude	112°47'10.8263"W	SAME



LOCATION MAP

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 5-23	97.94%	99.01%	99.83%	99.97%

SOURCE:
Arizona Meteorological Network (AZMET)
Tucson, Arizona
Aguila Station
Aguila, Arizona

OBSERVATIONS:
87,432 Observations
January 2001 - December 2010

NORTH

Magnetic Variance 11° 18' East (2012)
Annual Rate of Change 00° 06' West (2012)

DEVIATIONS FROM FAA AIRPORT DESIGN STANDARDS

DEVIATION DESCRIPTION	EFFECTED DESIGN STANDARD	STANDARD	EXISTING	PROPOSED DISPOSITION
BUILDINGS AND FENCE IN OFA	B-II OFA	500'	480'	REMOVE

APPROVED BY: ON THE DATE OF:

JOSHUA H. WRIGHT
TOWN MANAGER

NORTH
MAG

MAGNETIC VARIANCE 11°29' E
RATE OF CHANGE 00° 06' WEST (2012)

0 300 600 900
SCALE IN FEET

FAA APPROVAL STAMP

GENERAL NOTES:

1. Depiction of features and objects, including related elevations within the runway protection zones are depicted on the INNER PORTION OF THE APPROACH SURFACE DRAWING.
2. Details concerning terminal improvements are depicted on the TERMINAL AREA DRAWING.
3. Recommended land uses on the airport are depicted on the ON-AIRPORT LAND USE DRAWING.
4. Detail concerning airport property is depicted on the AIRPORT PROPERTY MAP.
5. The Building Restriction Lines (BRL) are set for the ultimate runway condition. The BRL's encompass the runway protection zones, the runway object free area, the runway visibility zone, Navaid critical areas and areas required for terminal instrument procedures. Prior to constructing any building or object on the airport a F.A.R. Part 77 obstruction analysis should be conducted.
6. Ultimate fence line extends around Existing/Ultimate Property Line except where shown.
7. Base map, ground contours, and building elevations derived from aerial photo and aerial survey taken 2/15/2011.
8. Source for runway elevations, Aerial Survey, AVN Datasheet (http://www.avndatasheet.gov) in NAVD88.
9. Source for runway end coordinates and runway bearing, AVN Datasheet.

No.	REVISIONS	DATE	BY	APP'D.
7	--	--	--	--
6	Airport Master Plan Update	03/03/14	S.B.	--
5	Revised for Master Plan Update	07/06/04	M.J.R.	FAA
4	Revised Land Acquisition for Runway 23 Rpz	01/27/00	C.A.M.	FAA
3	Revised NAD 27 to NAD 83; Magnetic Variation	6/10/93	C.A.M.	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."

WICKENBURG MUNICIPAL AIRPORT

AIRPORT LAYOUT PLAN

WICKENBURG, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Beaver
APPROVED BY: James M. Harris P. E.

March 3, 2014 — SHEET 1 OF 8

Coffman Associates
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LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		BUILDING AND FACILITIES
BRL		BUILDING RESTRICTION LINE (BRL)
OFA	OFA(U)	OBJECT FREE AREA (OFA)
RSA	RSA(U)	RUNWAY SAFETY AREA (RSA)
OFZ	OFZ(U)	OBSTACLE FREE ZONE (OFZ)
		PAVEMENT CONSTRUCTION
		FENCING
PAPI-4	PAPI-4	NAVIGATIONAL AID INSTALLATION
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		RUNWAY PROTECTION ZONE (RPZ)
		SEGMENTED CIRCLE/LIGHTED WIND TEE
		WIND INDICATOR (Lighted)
1080	1080	TOPOGRAPHIC CONTOURS
34 35 3 2		SECTION CORNER
B	B	TAXIWAY DESIGNATION
		PRIMARY AIRPORT CONTROL STATION (PACS)
		SECONDARY AIRPORT CONTROL STATION (SACS)
		HOLD POSITION MARKINGS
H	H	HELIPAD

EXISTING BUILDINGS/FACILITIES

NUMBER	DESCRIPTION	ELEVATION
1	TERMINAL BUILDING	2381.0'
2	FUEL ISLAND	2378.7'
3	ABOVE GROUND FUEL STORAGE	2383.3'
4	T-HANGARS	2380.9'
5	T-HANGARS	2376.6'
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15	COMMERCIAL HANGARS (TO BE REMOVED)	2392.0'
16	COMMERCIAL HANGARS (TO BE REMOVED)	2390.0
--	--	

EXIST./ULT. RUNWAY 6,101' X 75' S 60°25'12" W (TRUE)

EXIST./ULT. HIGH PT.
RWY. END EL. 2378.4'
33°57'59.3754" N
112°48'13.8203" W
TDZE 2378.6'

EXIST./ULT. ARP
33°58'14.2636" N
112°47'52.3233" W

ULT. AIRPORT ACCESS ROAD

RECREATIONAL

ULTIMATE BUILDINGS/FACILITIES

NUMBER	DESCRIPTION	ELEVATION*
20	MAINTANACE BUILDING	±2,386'
21	JOINT USE FIRE FIGHTING FACILITY	±2,386'
22	EXECTUTIVE HANGARS	±2,386'
23	T-HANGARS	±2,386'
24	T-HANGARS	±2,376'
25	BOX HANGARS	±2,376'
26	TERMINAL BUILDING	±2,376'
27	HELIPAD	±2,376'
28	COMMERICAL HANGAR LEASE PARCELS	NA
29	RELOCATED ABOVE GROUND FUEL STORAGE	NA
30	WASH RACK	NA
31	HELICOPTER PARKING	--

* ESTIMATE

NORTH
MAG

0 100 200 300
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
7	--	--	--	--
6	Airport Master Plan Update	03/03/14	S.B.	--
5	Revised for Master Plan Update	07/06/04	M.J.R.	FAA
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WICKENBURG MUNICIPAL AIRPORT

TERMINAL AREA PLAN

WICKENBURG, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Beaver
APPROVED BY: James M. Harris P. E.

March 3, 2014 | SHEET 2 OF 8

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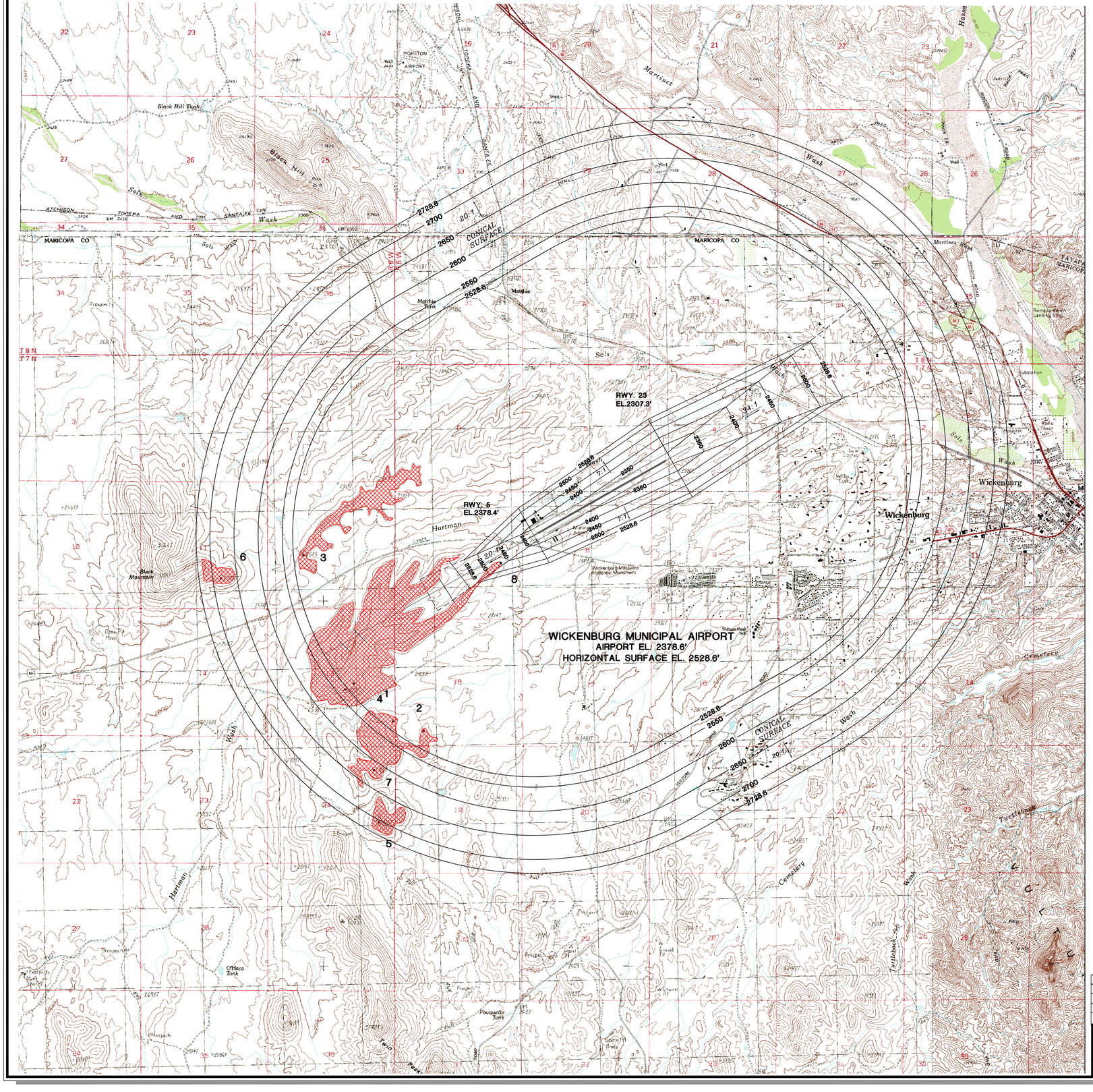
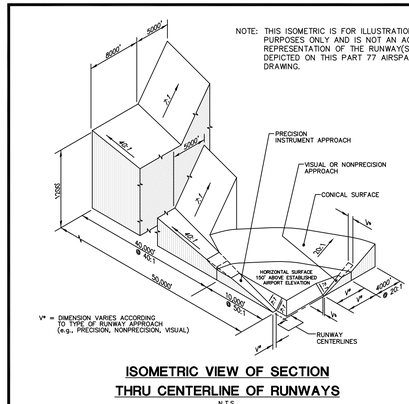


OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1. TERRAIN	UP TO 2680'	HORIZONTAL SURFACE	2528.50'	152'	NO CHANGE
2. TERRAIN	UP TO 2660'	HORIZONTAL SURFACE	2528.50'	132'	NO CHANGE
3. TERRAIN	UP TO 2560'	HORIZONTAL SURFACE	2528.50'	32'	NO CHANGE
4. TERRAIN	UP TO 2701'	CONICAL SURFACE	2550'	151'	NO CHANGE
5. TERRAIN	UP TO 2715'	CONICAL SURFACE	2600'	115'	NO CHANGE
6. TERRAIN	UP TO 2780'	CONICAL SURFACE	2692'	88'	NO CHANGE
7. TERRAIN	UP TO 2865'	CONICAL SURFACE	2717'	148'	NO CHANGE
8. TERRAIN	UP TO 2580'	APPROACH SURFACE	2565'	15'	NO CHANGE



ISOMETRIC VIEW OF SECTION
THRU CENTERLINE OF RUNWAYS
N.T.S.

OBSTRUCTION LEGEND

1 OBSTRUCTION

TOPOGRAPHIC OBSTRUCTION

NORTH
MAG

MAGNETIC VARIANCE12°28' E
RATE OF CHANGE -3.06' WEST (JULY 2002)

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 outer portion of the approach surfaces, is illustrated on the RUNWAY APPROACH SURFACE PROFILES, sheet 5 of 7.
3. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF THE RUNWAY 5–23 APPROACH SURFACE DRAWING, sheet 4 of 7.
4. Article 14–20, Section 14–20–11 of the Town of Wickenburg Land Use Code provides for building height limitations.

0 2000 4000
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
7	--	--	--	--
6	Airport Master Plan Update	03/03/14	S.B.	--
5	Revised for Master Plan Update	07/06/04	M.J.R.	FAA
4	Revised Land Acquisition for Runway 23 Rpz	01/27/00	C.A.M.	FAA
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WICKENBURG MUNICIPAL AIRPORT

AIRPORT AIRSPACE DRAWING

WICKENBURG, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Beaver
APPROVED BY: James M. Harris P. E.
March 3, 2014 SHEET 3 OF 8

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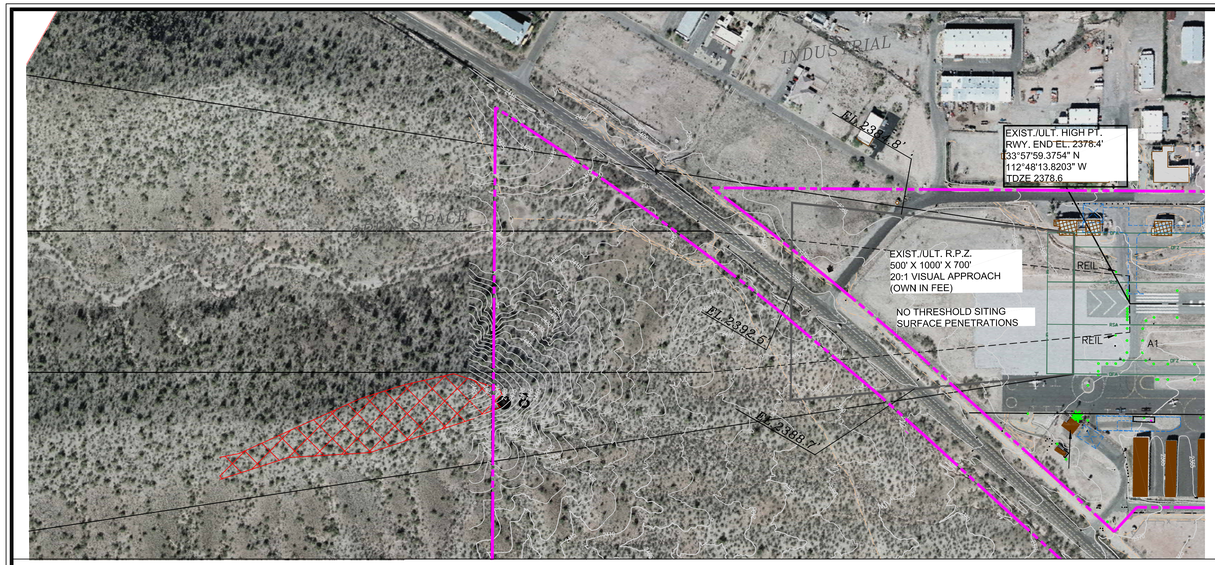
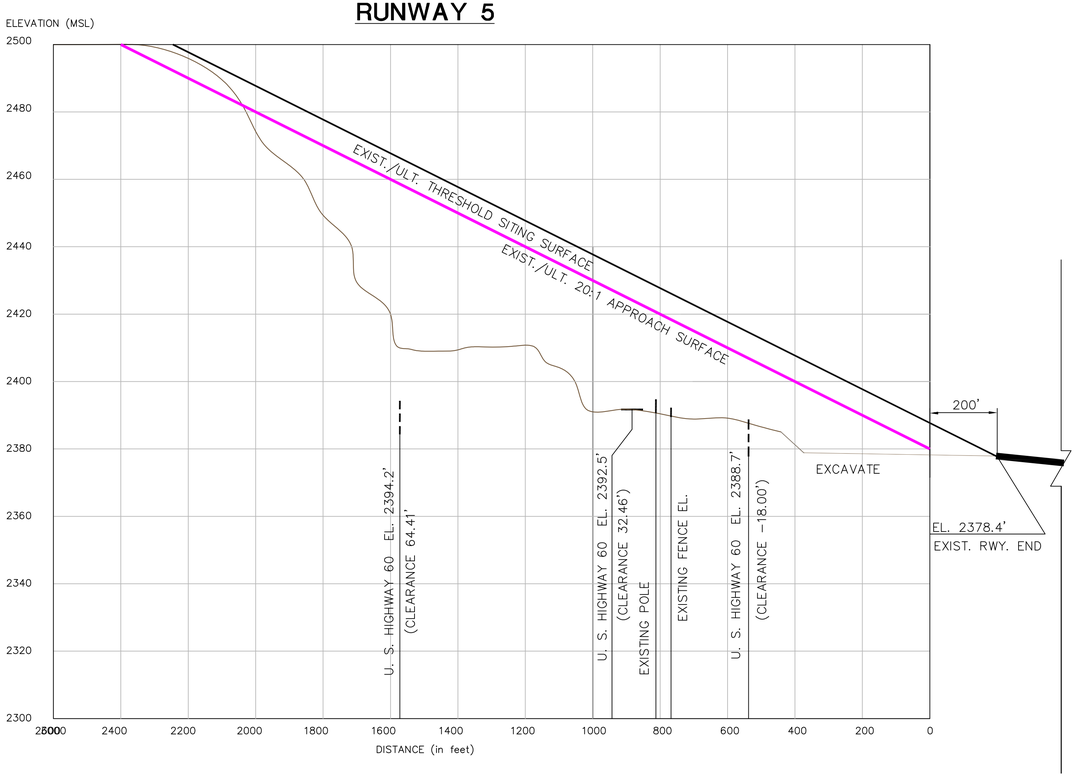
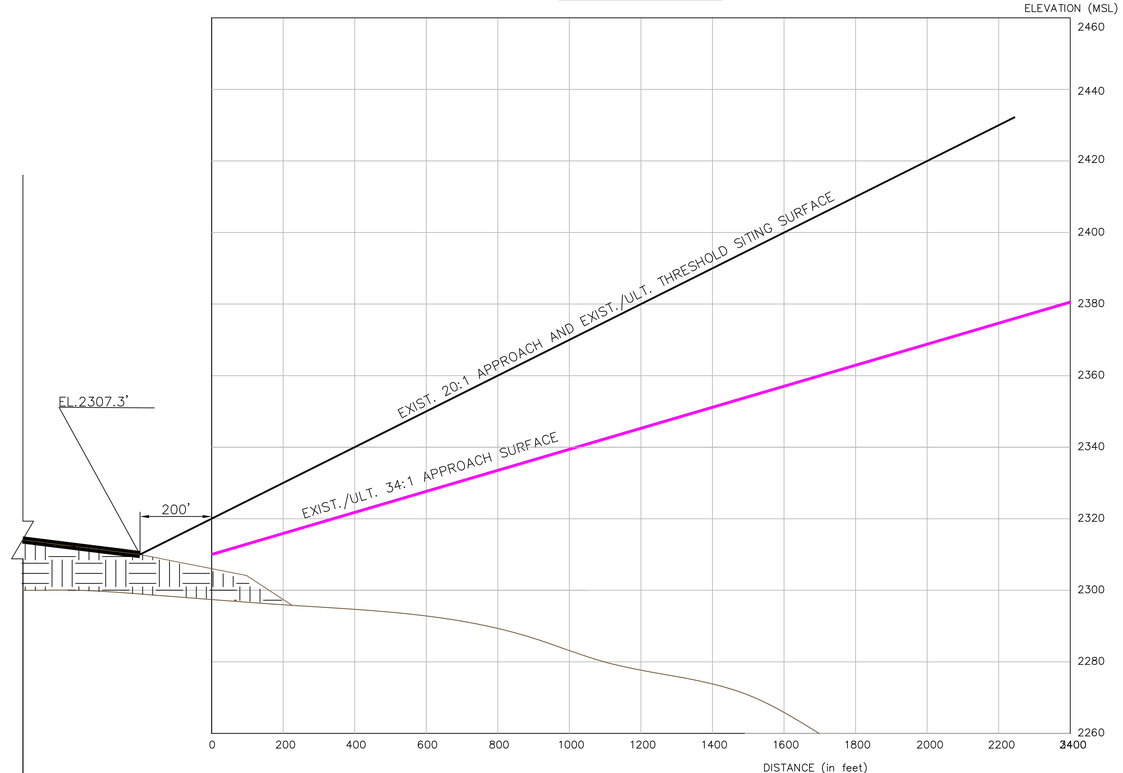


RUNWAY 5



RUNWAY 23



OBSTRUCTION TABLE						
	Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
8.	TERRAIN	UP TO 2580'	APPROACH SURFACE	2565'	15'	NO CHANGE

HORIZONTAL SCALE
0 200 400 600
SCALE IN FEET

NORTH

VERTICAL SCALE
0 20 40 60
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
7	--	--	--	--
6	Airport Master Plan Update	03/03/14	S.B.	--
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WICKENBURG MUNICIPAL AIRPORT
INNER PORTION OF THE RUNWAY 5-23 APPROACH SURFACE DRAWING
WICKENBURG, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Beaver
APPROVED BY: James M. Harris P. E.
March 3, 2014

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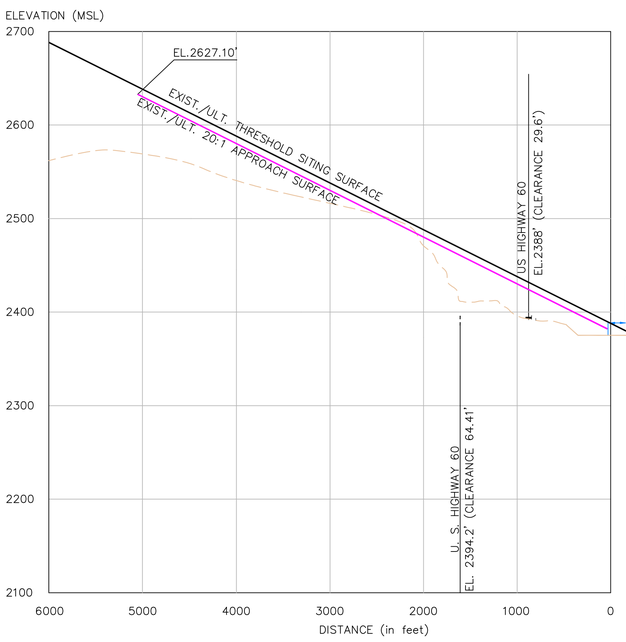
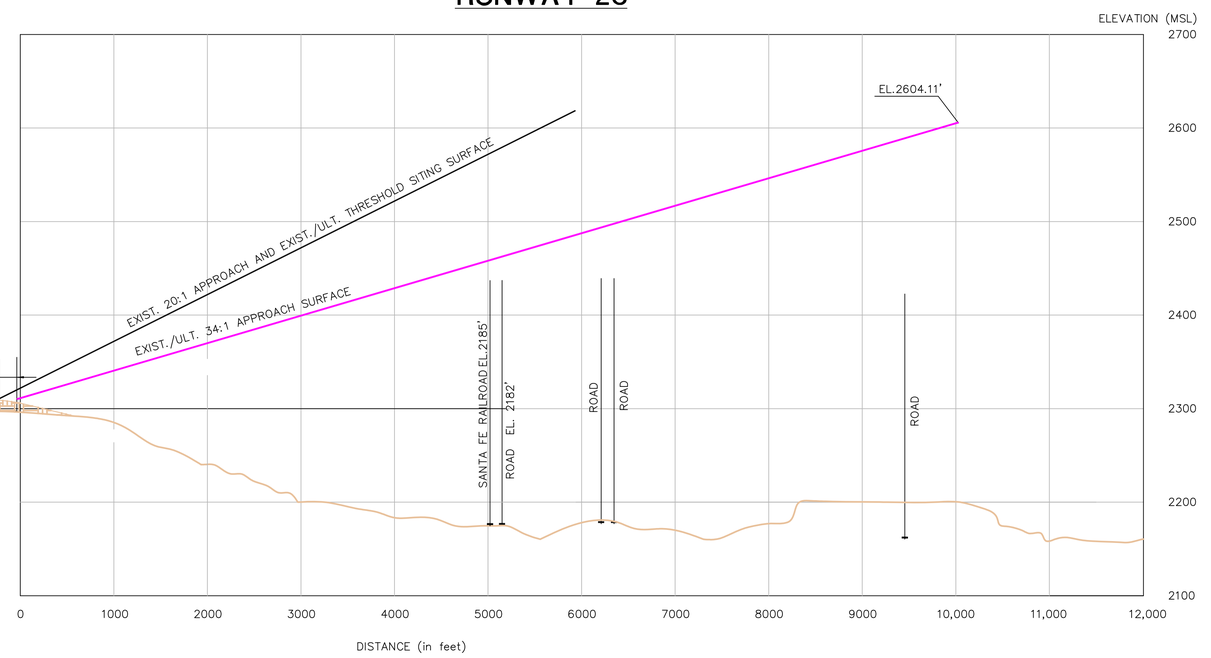
RUNWAY 5

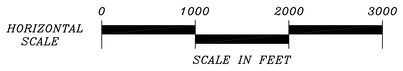


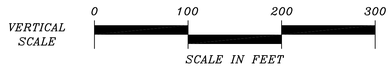
RUNWAY 23



RUNWAY 5-23 APPROACH SURFACE

OBSTRUCTION TABLE						
	Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
8.	TERRAIN	UP TO 2580'	APPROACH SURFACE	2565'	15'	NO CHANGE





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WICKENBURG MUNICIPAL AIRPORT

RUNWAY 5-23 APPROACH SURFACE DRAWING

WICKENBURG, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Beaver
APPROVED BY: James M. Harris P. E.

March 3, 2014

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ON-AIRPORT LAND USE LEGEND

/OPEN SPACE (261.90 ACRES)

GENERAL AVIATION (60.40 ACRES)

PHOTO TAKEN: JAN. 14TH 2009

LEGEND

EXISTING AIRPORT PROPERTY LINE

ULTIMATE AIRPORT PROPERTY LINE

EXISTING R.P.Z. 500' X 1000' X 700' 20:1 NONPRECISION APPROACH (OWN IN FEE)

ULTIMATE R.P.Z. 500' X 1000' X 700' 34:1 NONPRECISION APPROACH (OWN IN FEE)

EXIST./ULT. LOW PT. RWY. END EL. 2307.3' 33°58'29.1557" N 112°47'10.8263" W TDZE 2344.0'

EXIST./ULT. ARP 33°58'14.2656" N 112°47'42.3233" W

EXIST./ULT. HIGH PT. RWY. END EL. 2378.4' 33°57'59.3754" N 112°48'13.8203" W TDZE 2378.6'

EXIST./ULT. R.P.Z. 500' X 1000' X 700' 20:1 VISUAL APPROACH (OWN IN FEE)

NO THRESHOLD SITING SURFACE PENETRATIONS

EL 2392.6'

EL 2389.7'

EL 2382.8'

LANDFILL

WASH

TAXIWAY "A"

RUNWAY 5-23

PAPI-4

MALSR

REMOTE TRANSMITTER/RECEIVER

EXISTING SEGMENTED CIRCLE

ROTATING BEACON

WINDSOCK

RECREATIONAL

INDUSTRIAL

NORTH

0 400 800 900

SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
5	--	--	--	--
4	Airpor Master Plan Update	03/03/14	S.B.	--
3	Revised for Master Plan Update	07/06/04	M.J.R.	FAA
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WICKENBURG MUNICIPAL AIRPORT

ON AIRPORT LAND-USE DRAWING

WICKENBURG, ARIZONA

PLANNED BY: Stephen C. Wagner

DETAILED BY: Maggie Beaver

APPROVED BY: James M. Harris P.E.

March 3, 2014 SHEET 6 OF 8

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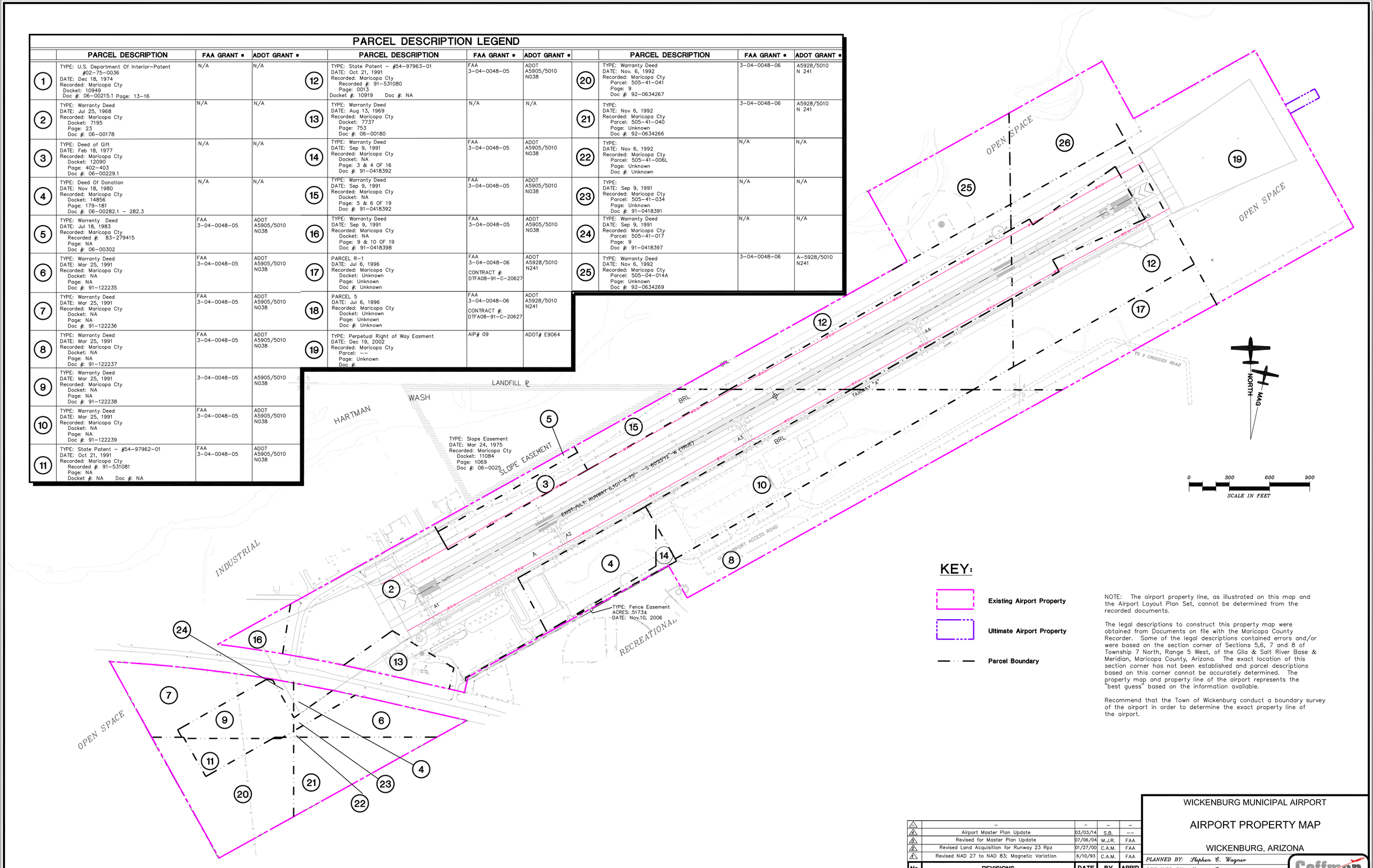
PARCEL DESCRIPTION LEGEND

	PARCEL DESCRIPTION	FAA GRANT #	ADOT GRANT #
1	TYPE: U.S. Department Of Interior–Patent #02–75–0036 DATE: Dec 18, 1974 Recorded: Maricopa Cty Docket: 10949 Doc #: 06–00215.1 Page: 13–16	N/A	N/A
2	TYPE: Warranty Deed DATE: Jul 25, 1968 Recorded: Maricopa Cty Docket: 7195 Page: 23 Doc #: 06–00178	N/A	N/A
3	TYPE: Deed of Gift DATE: Feb 18, 1977 Recorded: Maricopa Cty Docket: 12090 Page: 402–403 Doc #: 06–00229.1	N/A	N/A
4	TYPE: Deed Of Donation DATE: Nov 18, 1980 Recorded: Maricopa Cty Docket: 14856 Page: 179–181 Doc #: 06–00282.1 – 282.3	N/A	N/A
5	TYPE: Warrenty Deed DATE: Jul 18, 1983 Recorded: Maricopa Cty Recorded #: 83–279415 Page: NA Doc #: 06–00302	FAA 3–04–0048–05	ADOT A5905/5010 N038
6	TYPE: Warranty Deed DATE: Mar 25, 1991 Recorded: Maricopa Cty Docket: NA Page: NA Doc #: 91–122235	FAA 3–04–0048–05	ADOT A5905/5010 N038
7	TYPE: Warranty Deed DATE: Mar 25, 1991 Recorded: Maricopa Cty Docket: NA Page: NA Doc #: 91–122236	FAA 3–04–0048–05	ADOT A5905/5010 N038
8	TYPE: Warranty Deed DATE: Mar 25, 1991 Recorded: Maricopa Cty Docket: NA Page: NA Doc #: 91–122237	FAA 3–04–0048–05	ADOT A5905/5010 N038
9	TYPE: Warranty Deed DATE: Mar 25, 1991 Recorded: Maricopa Cty Docket: NA Page: NA Doc #: 91–122238	3–04–0048–05	A5905/5010 N038
10	TYPE: Warranty Deed DATE: Mar 25, 1991 Recorded: Maricopa Cty Docket: NA Page: NA Doc #: 91–122239	FAA 3–04–0048–05	ADOT A5905/5010 N038
11	TYPE: State Patent – #54–97962–01 DATE: Oct 21, 1991 Recorded: Maricopa Cty Recorded #: 91–531081 Page: NA Docket #: NA Doc #: NA	FAA 3–04–0048–05	ADOT A5905/5010 N038
12	TYPE: State Patent – #54–97963–01 DATE: Oct 21, 1991 Recorded: Maricopa Cty Recorded #: 91–531080 Page: 0013 Docket #: 10919 Doc #: NA	FAA 3–04–0048–05	ADOT A5905/5010 N038
13	TYPE: Warranty Deed DATE: Aug 13, 1969 Recorded: Maricopa Cty Docket: 7737 Page: 753 Doc #: 06–00180	N/A	N/A
14	TYPE: Warranty Deed DATE: Sep 9, 1991 Recorded: Maricopa Cty Docket: NA Page: 3 & 4 OF 16 Doc #: 91–0418392	FAA 3–04–0048–05	ADOT A5905/5010 N038
15	TYPE: Warranty Deed DATE: Sep 9, 1991 Recorded: Maricopa Cty Docket: NA Page: 5 & 6 OF 19 Doc #: 91–0418392	FAA 3–04–0048–05	ADOT A5905/5010 N038
16	TYPE: Warranty Deed DATE: Sep 9, 1991 Recorded: Maricopa Cty Docket: NA Page: 9 & 10 OF 19 Doc #: 91–0418398	FAA 3–04–0048–05	ADOT A5905/5010 N038
17	PARCEL R–1 DATE: Jul 6, 1996 Recorded: Maricopa Cty Docket: Unknown Page: Unknown Doc #: Unknown	FAA 3–04–0048–06 CONTRACT #: DTFA08–91–C–20627	ADOT A5928/5010 N241
18	PARCEL 5 DATE: Jul 6, 1996 Recorded: Maricopa Cty Docket: Unknown Page: Unknown Doc #: Unknown	FAA 3–04–0048–06 CONTRACT #: DTFA08–91–C–20627	ADOT A5928/5010 N241
19	TYPE: Perpetual Right of Way Easment DATE: Dec 19, 2002 Recorded: Maricopa Cty Parcel: –– Page: Unknown Doc #:	AIP# 09	ADOT# E9064
20	TYPE: Warranty Deed DATE: Nov. 6, 1992 Recorded: Maricopa Cty Parcel: 505–41–041 Page: 9 Doc #: 92–0634267	3–04–0048–06	A5928/5010 N 241
21	TYPE: DATE: Nov 6, 1992 Recorded: Maricopa Cty Parcel: 505–41–040 Page: Unknown Doc #: 92–0634266	3–04–0048–06	A5928/5010 N 241
22	TYPE: DATE: Nov 6, 1992 Recorded: Maricopa Cty Parcel: 505–41–006L Page: Unknown Doc #: Unknown	N/A	N/A
23	TYPE: DATE: Sep 9, 1991 Recorded: Maricopa Cty Parcel: 505–41–034 Page: Unknown Doc #: 91–0418391	N/A	N/A
24	TYPE: Warranty Deed DATE: Sep 9, 1991 Recorded: Maricopa Cty Parcel: 505–41–017 Page: 9 Doc #: 91–0418397	N/A	N/A
25	TYPE: Warranty Deed DATE: Nov 6, 1992 Recorded: Maricopa Cty Parcel: 505–04–014A Page: Unknown Doc #: 92–0634269	3–04–0048–06	A–5928/5010 N241



KEY:

- Existing Airport Property
- Ultimate Airport Property
- Parcel Boundary

NOTE: The airport property line, as illustrated on this map and the Airport Layout Plan Set, cannot be determined from the recorded documents.

The legal descriptions to construct this property map were obtained from Documents on file with the Maricopa County Recorder. Some of the legal descriptions contained errors and/or were based on the section corner of Sections 5,6, 7 and 8 of Township 7 North, Range 5 West, of the Gila & Salt River Base & Meridian, Maricopa County, Arizona. The exact location of this section corner has not been established and parcel descriptions based on this corner cannot be accurately determined. The property map and property line of the airport represents the "best guess" based on the information available.

Recommend that the Town of Wickenburg conduct a boundary survey of the airport in order to determine the exact property line of the airport.

No.	REVISIONS	DATE	BY	APP'D.
7	–	–	–	–
6	Airport Master Plan Update	03/03/14	S.B.	––
5	Revised for Master Plan Update	07/06/04	M.J.R.	FAA
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WICKENBURG MUNICIPAL AIRPORT

AIRPORT PROPERTY MAP

WICKENBURG, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Braver
APPROVED BY: James M. Harris P. E.

March 3, 2014 SHEET 7 OF 8

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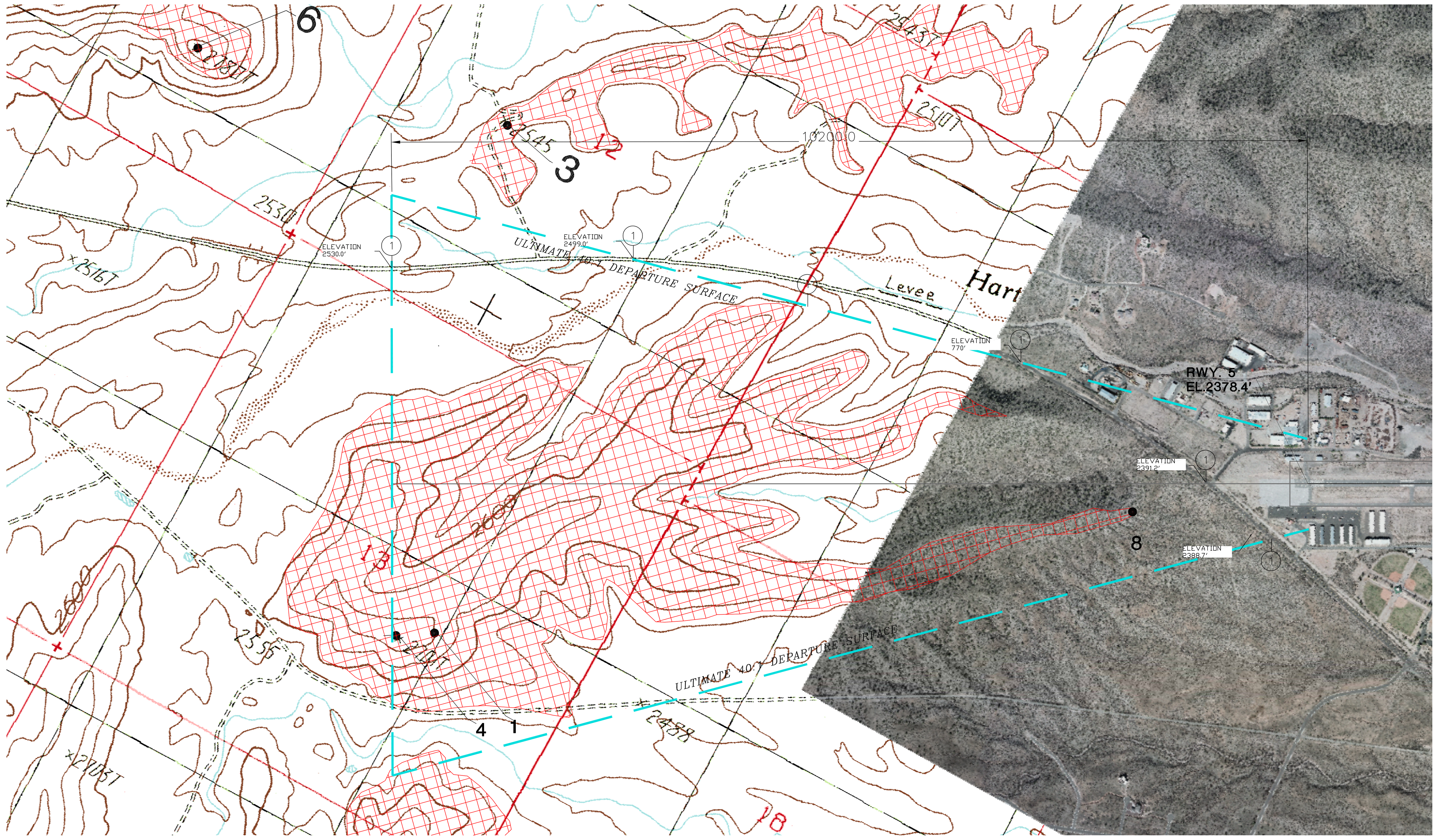
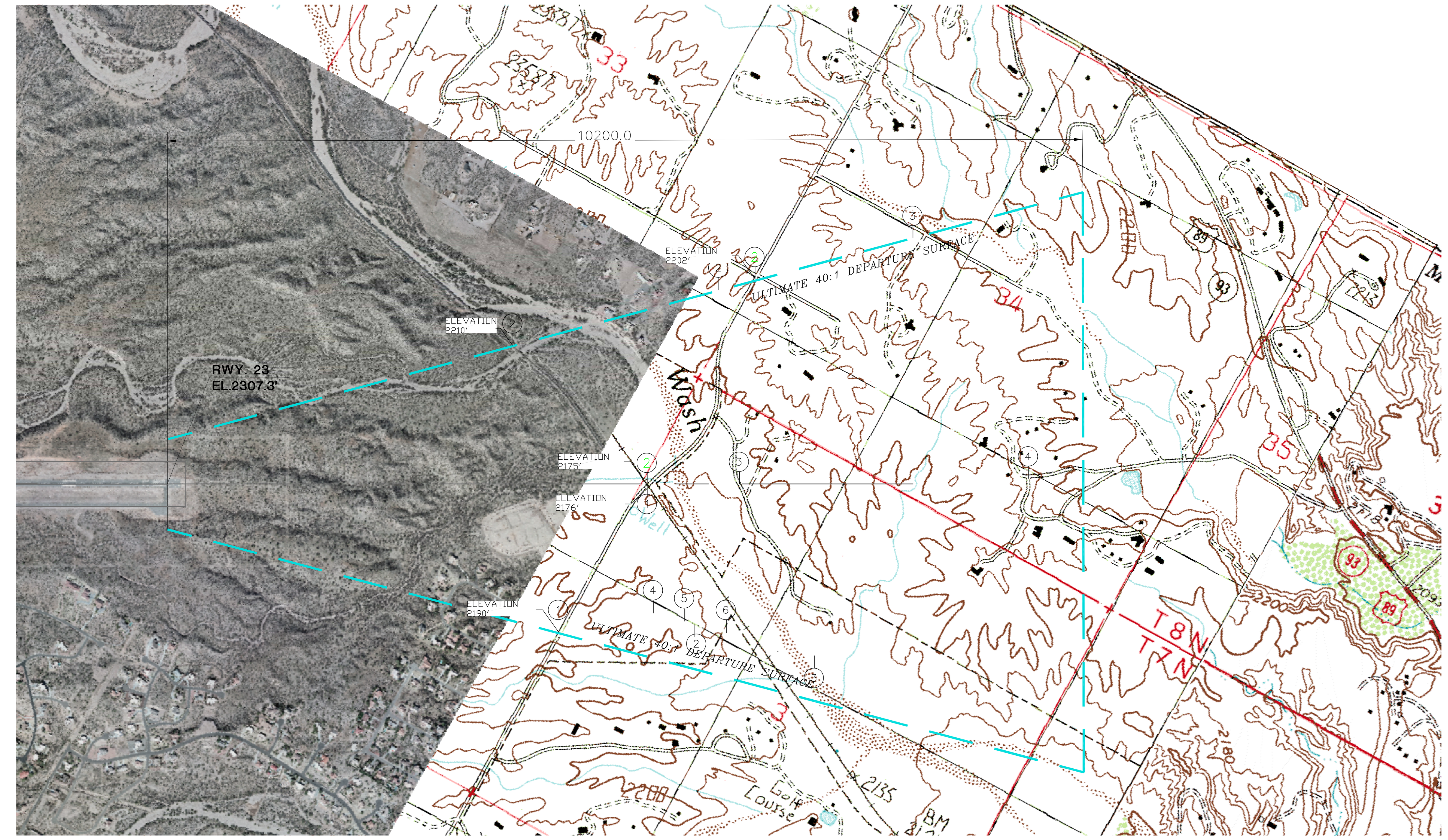
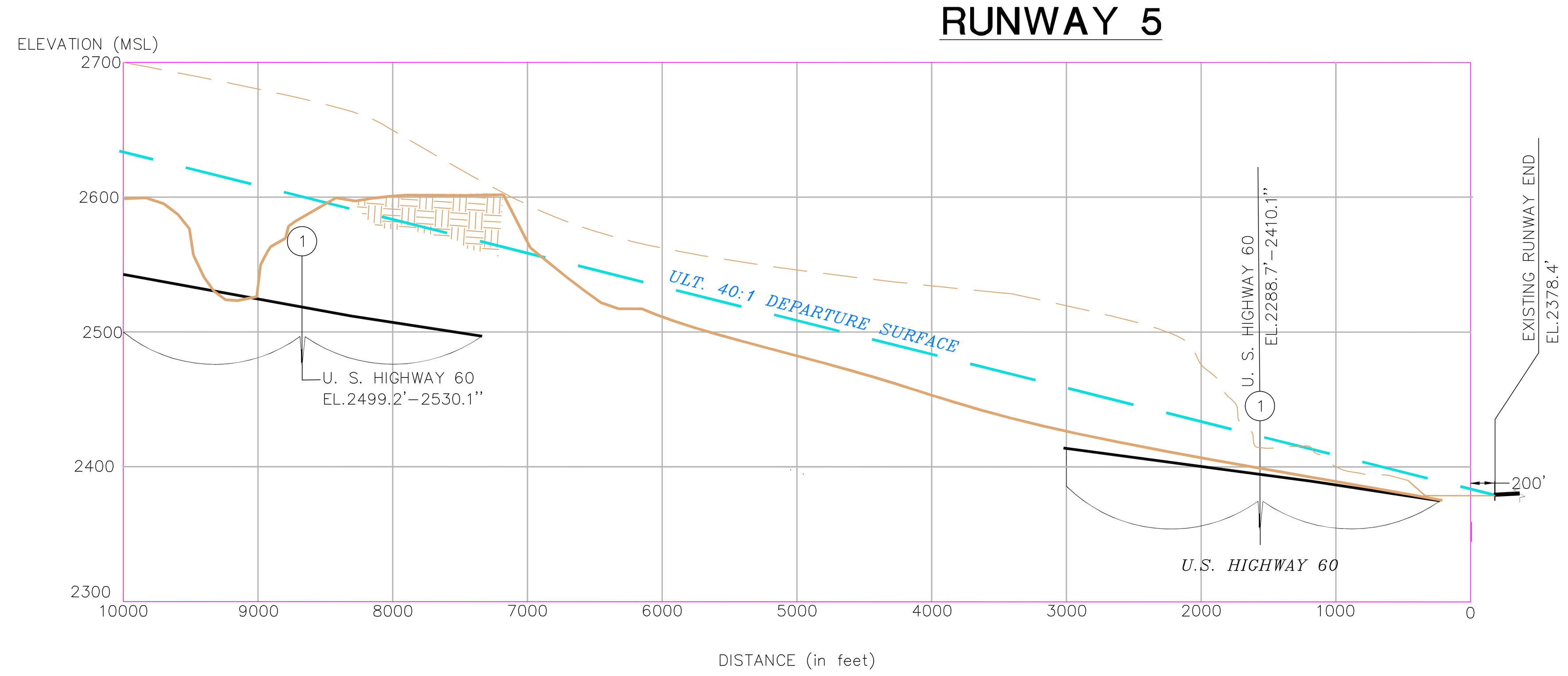
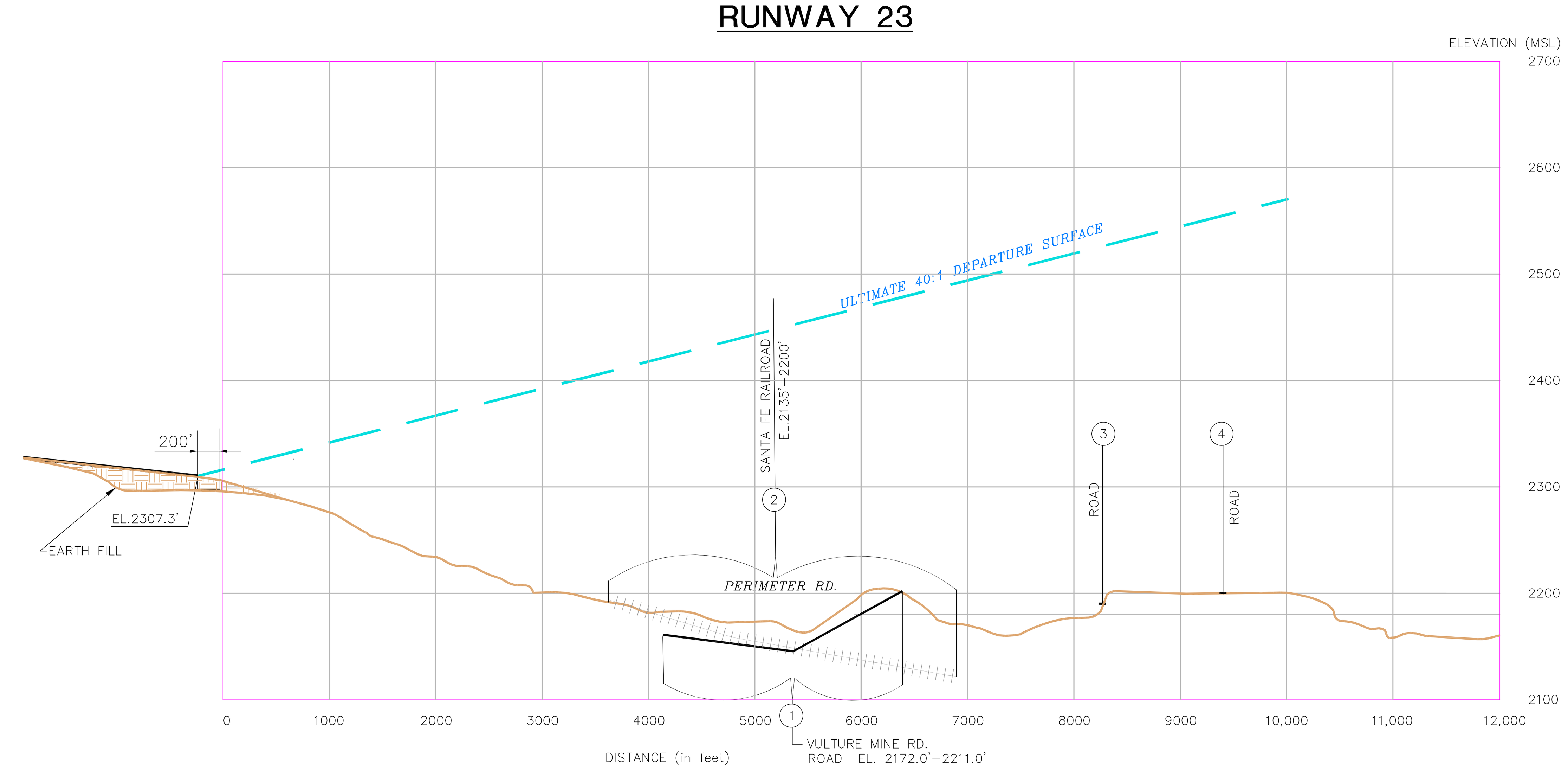




RUNWAY 5



RUNWAY 23



OBSTACLE IDENTIFICATION SURFACE (OIS)

	Object Description	Object Elevation	Obstructed 40:1 Departure Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1.	TERRAIN	UP TO 2680'	DEPARTURE SURFACE	2628.50'	52'	NO CHANGE
4.	TERRAIN	UP TO 2701'	DEPARTURE SURFACE	2650'	51'	NO CHANGE
8.	TERRAIN	UP TO 2580'	DEPARTURE SURFACE	2465'	55'	NO CHANGE

0 1000 2000 3000
SCALE IN FEET

0 100 200 300
SCALE IN FEET

GENERAL NOTES:

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.

Standard in AC 150/5300–13 CHG 11 Appendix 2, Runway End Siting Requirements are not appliable for identifying objects affecting navigable airspace. See CFR Part 77 Title 14.

Roads and Buildings Clearance of more than 50 feet AGL are not detail in Departure Surface Profiles.

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WICKENBURG MUNICIPAL AIRPORT

DEPARTUE SURFACE DRAWING

WICKENBURG, ARIZONA

PLANNED BY: Stephen C. Wagner
DETAILED BY: Maggie Beaver
APPROVED BY: James M. Harris P. E.

March 3, 2014 SHEET 8 OF 8

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