AIRPORT MASTER PLAN

Ak-Chin
REGIONAL AIRPORT

Final Report

AK-CHIN REGIONAL AIRPORT

MARICOPA, ARIZONA | APRIL 2015

ARMSTRONG

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INTRODUCTION

AK-CHIN REGIONAL AIRPORT
AIRPORT MASTER PLAN

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INTRODUCTION

INTRODUCTION

The Community, as the Airport Sponsor, is continuing its effort to plan for future development of the Ak-Chin Regional Airport in Maricopa, Arizona. This development is designed to enhance air and ground operations, improve safety and enhance airport services and as a public use airport.

PURPOSE

The purpose of the airport master plan is to provide a framework to guide future airport development that will cost-effectively satisfy aviation demand, while considering potential environmental and socioeconomic impacts. The airport master plan considers the possible environmental and socioeconomic costs associated with alternative development concepts, as well as, the possible means of avoiding, minimizing, or mitigating impacts to sensitive resources at the appropriate level of detail for facilities planning.

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

OBJECTIVES

The primary objectives of the AMP are to produce an attainable phased development plan concept that will satisfy the airport needs in a safe, efficient, economical and environmentally sound manner. The plan serves as a guide to decision makers, airport users and the general public for implementing airport development actions while considering both airport concerns and objectives. There are a number of objectives that Ak-Chin Regional Airport would like to achieve as a result of this AMP.

Specific goals and objectives of the project include, but are not limited to:

- Document the issues that the proposed development will address.
- Justify the proposed development through the technical, economic, and environmental investigation of concepts and alternatives.
- Provide an effective graphic presentation of the development of the airport and anticipated land uses in the vicinity of the airport.
- Establish a realistic schedule for the implementation of the development proposed in the plan, particularly the short-term capital improvement program.
- Propose an achievable financial plan to support the prioritized implementation schedule.
- Provide sufficient project definition and detail for subsequent environmental evaluations that may be required before the project is approved.
- Present a plan that adequately addresses the issues and satisfies local, state and Federal regulations.
- Document policies and future aeronautical demand to support local deliberations on spending, debt, land use controls and other policies necessary to preserve the integrity of the airport and its surroundings.

- Set the stage and establish the framework for a continuing planning process that will monitor key conditions and permit changes in plan recommendations as required.

AIRPORT MASTER PLAN PROCESS AND SCHEDULE

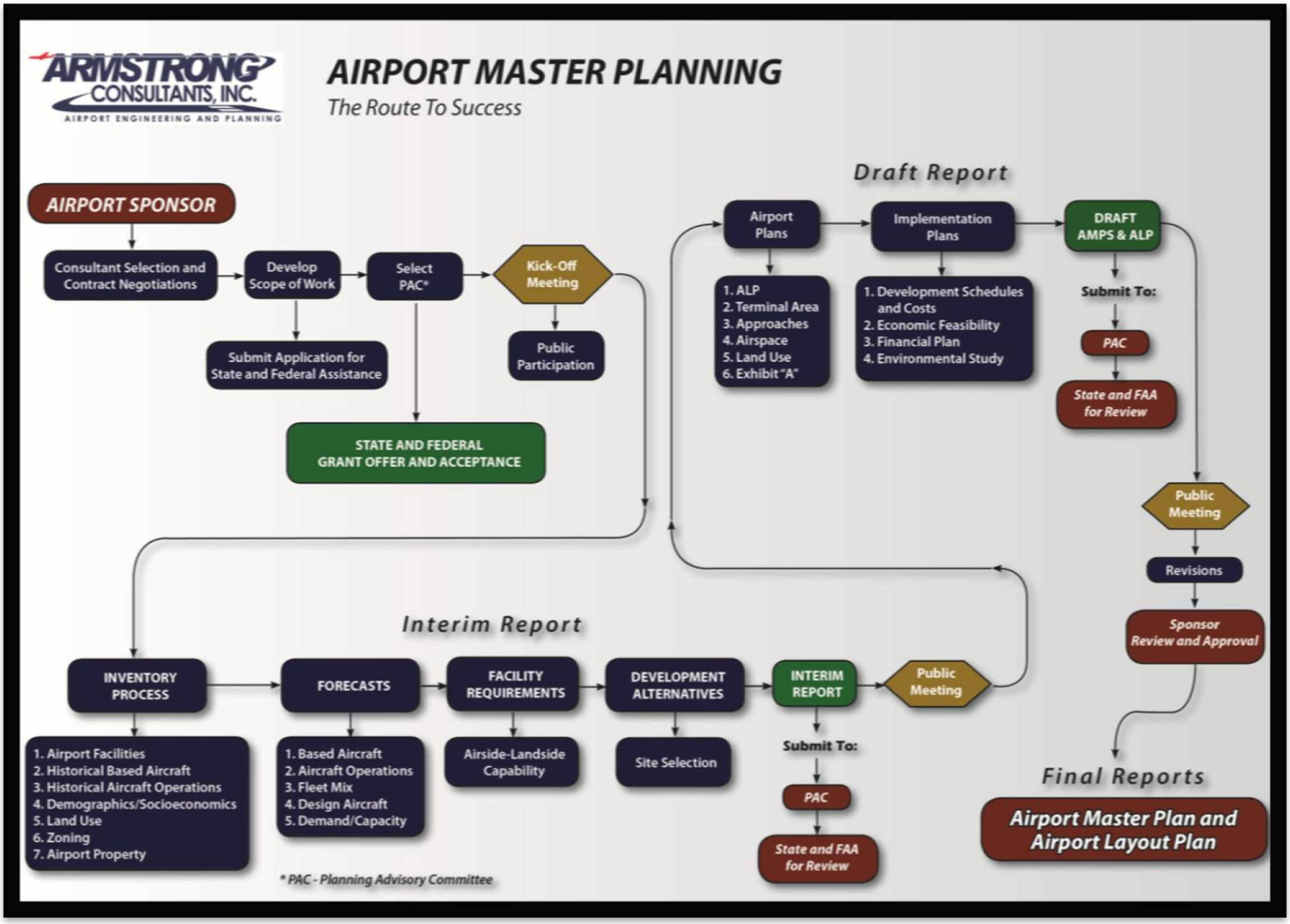
Airport planning takes place at the national, state, regional and local levels. These plans are formulated on the basis of overall transportation demands and are coordinated with other transportation planning and comprehensive land use planning. The National Plan of Integrated Airport Systems (NPIAS)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

PLANNING ADVISORY COMMITTEE

The Ak-Chin Regional Airport Planning Advisory Committee (PAC) consists of members representing varied interests in the airport. Their involvement throughout the AMP process will help to keep interested parties informed and will foster consensus for future development actions.

PAC REPRESENTATIVES

Phil Entz	Ak-Chin Industrial Park Board
Maria Hernandez	Ak-Chin Industrial Park Board
Jerry Owen	Ak-Chin Community, Planning and Development Director
Leonard Gold	Industrial Park Board
Franklin Sam	Industrial Park Board
Charles L. Carlyle	Chairman of the Ak-Chin Industrial Park Board


ARMSTRONG CONSULTANTS, INC.
AIRPORT ENGINEERING AND PLANNING
AIRPORT MASTER PLANNING
The Route To Success
AIRPORT SPONSOR
Consultant Selection and Contract Negotiations
Develop Scope of Work
Select PAC*
Kick-Off Meeting
Submit Application for State and Federal Assistance
Public Participation
STATE AND FEDERAL GRANT OFFER AND ACCEPTANCE
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Public Meeting
Submit To:
PAC
State and FAA for Review
Final Reports
Airport Master Plan and Airport Layout Plan
* PAC - Planning Advisory Committee

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CHAPTER

1

INVENTORY

AK-CHIN REGIONAL AIRPORT
AIRPORT MASTER PLAN

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CHAPTER ONE
INVENTORY

1.1 INTRODUCTION AND AIRPORT HISTORY

The collection of data regarding existing airport conditions and factors influencing its users are critical to master planning. The development of this AMP requires the collection and evaluation of baseline information relating to the airport's property, facilities, services and local vicinity. The information presented in this chapter will serve as the basis in determining any necessary airport improvements or expansions that are indicated by evaluating forecasted aviation demand against existing facility capacity. Data was obtained during visits and interviews with airport management, tribal staff, airport tenants and users. Airport and other public documents were also examined.

Ak-Chin Regional Airport is a publicly owned public use airport located in the Santa Cruz Valley of Southern Arizona. The airport is located approximately eight miles southeast of the City of Maricopa and in the northwestern portion of Pinal County, as shown in **Figure 1-1**. The airport is approximately 44 miles southeast of Phoenix and approximately 82 miles northwest of Tucson.

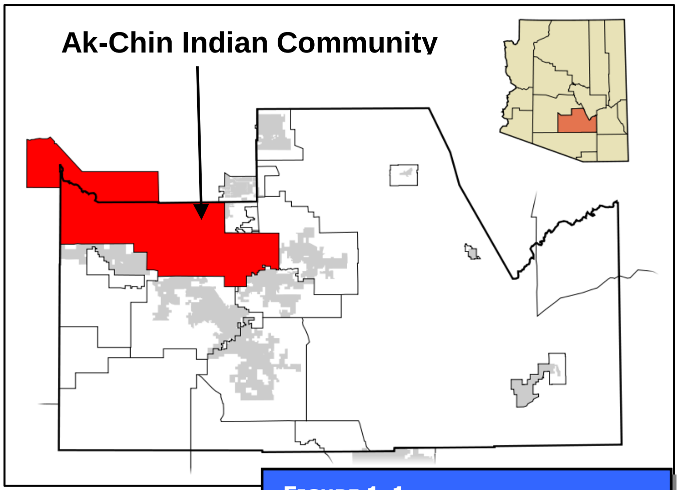


FIGURE 1-1
AK-CHIN INDIAN COMMUNITY

Ak-Chin is an O'odham word which translates to "mouth of the wash" or "place where the wash loses itself in the sand or ground." The term refers to a type of farming that relies on washes, such as seasonal floodplains created by winter snows and summer rains. The Ak-Chin Indian Community is also represented by a seal, adopted in 1961. In the seal itself has several unique images that depict the Community's ideals; the arrow represents the Ak-Chin Indian Community as Native Americans, the scales represent equality and justice to the Community, the rising sun represents the belief in a brighter tomorrow and the lightning represents inspiration and energy to uphold the ideals of the Community.

In May 1912, President Taft authorized 47,700 acres for the reservation. However, the acreage was reduced to just less than 22,000 acres the following year. The tribe's government was formally organized in 1961 under the Indian Reorganization Act of 1934. The Ak-Chin Indian Community is governed by a five member Tribal Council; which oversees governmental operations and departments of the Community. Ak-Chin has an enrollment of over 1,000 tribal members. The Ak-Chin Indian Community owns and operates ACES, Ak-Chin Farms and the Ak-Chin Him Dak Eco-Museum. The Ak-Chin Indian Community entered into the gaming industry in 1994 with Harrah's Ak-Chin Casino and Resort, a subsidiary of Caesar's Entertainment.

Ak-Chin Regional Airport was originally constructed in 1999 as the Phoenix Regional Airport. The airport was originally a privately owned airport with plans for mixed use development surrounding the airport including a recreational lake, commercial, industrial and fly-in residences. The airport was purchased by the Ak-Chin Indian Community in 2006 and encompassed an area of approximately 406 acres of which 244 acres are considered airport property with one 5,000 foot by 50 foot runway, parallel taxiway, apron, Fixed Base Operator (FBO)/terminal building and fuel system. The pavement materials were oxidized and experiencing severe shrinkage cracking. The airport was renamed Ak-Chin Regional Airport after a month-long Airport Renaming Contest held in the Community. In the summer of 2012, the Community made a series of improvements to enhance the safety and utility of the airport, including crack sealing, seal coating and remarking the pavement surfaces, installation of perimeter fencing and upgrading the fuel system.

1.2 SERVICE LEVEL

The airport service level reflects the type of public use the airport provides. The service level also reflects the funding categories established by Congress to assist in airport development. The following list identifies the different types of airport service levels:

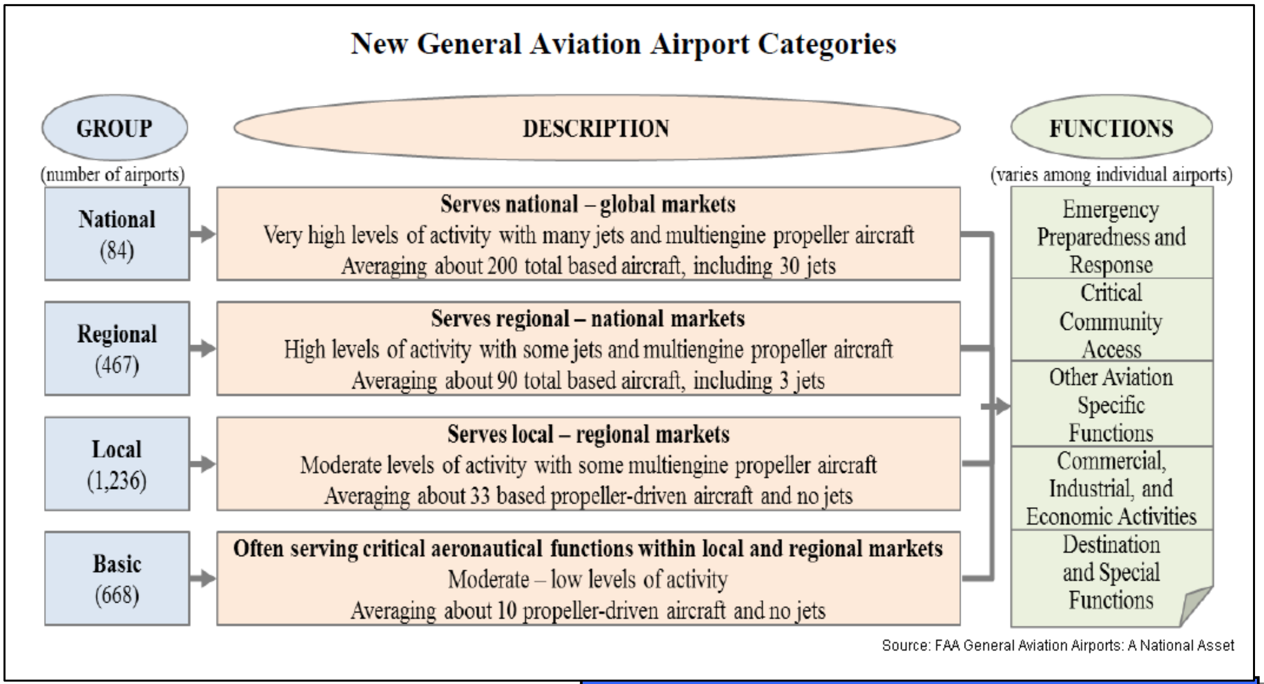
Commercial Service Airports

Public airports that enplane 2,500 or more passengers annually and receive aircraft offering scheduled passenger service. Commercial service airports are either:

- Primary - an airport that enplanes more than 10,000 passengers annually; or
- Nonprimary - an airport that enplanes between 2,500 and 10,000 passengers annually.

General Aviation Airports

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



New General Aviation Airport Categories

GROUP (number of airports)	DESCRIPTION
National (84)	**Serves national – global markets** Very high levels of activity with many jets and multiengine propeller aircraft Averaging about 200 total based aircraft, including 30 jets
Regional (467)	**Serves regional – national markets** High levels of activity with some jets and multiengine propeller aircraft Averaging about 90 total based aircraft, including 3 jets
Local (1,236)	**Serves local – regional markets** Moderate levels of activity with some multiengine propeller aircraft Averaging about 33 based propeller-driven aircraft and no jets
Basic (668)	**Often serving critical aeronautical functions within local and regional markets** Moderate – low levels of activity Averaging about 10 propeller-driven aircraft and no jets

FUNCTIONS
(varies among individual airports)
Emergency Preparedness and Response
Critical Community Access
Other Aviation Specific Functions
Commercial, Industrial, and Economic Activities
Destination and Special Functions

Source: FAA General Aviation Airports: A National Asset

FIGURE 1-2 NEW GENERAL AVIATION AIRPORT CATEGORIES

Ak-Chin Regional Airport is currently included in the NPIAS. According to the FAA, the airport has not yet been classified. A Basic Classification is anticipated based on the current number of based aircraft at the airport. Since the Ak-Chin Regional Airport is classified as a nonprimary general aviation airport it is eligible to receive Federal grants under the Airport Improvement Program (AIP); including $150,000 a year of nonprimary entitlement money and also eligible to receive larger amounts of state apportionment funding.

1.3 AIRPORT ROLE

The 2008 Arizona State Airports System Plan is divided into categories determined by size and usage: (1) Primary System Airports and (2) Secondary System Airports.

A Primary System Airport must be open to the public and meet at least one of the following criteria:

- Have 10 or more based aircraft and/or 2,000 or more annual operations; or
- Have scheduled air carrier service; or
- Receive commuter service regularly; or
- Projected to meet any of the above criteria within 10 years.

A Secondary System Airport is one that satisfies both of the following criteria:

- Recognized by the FAA as an airport per Form 5010-1, *Airport Master Record*; and
- Open to the public.

Primary and Secondary System Airports are further classified into the following categories:

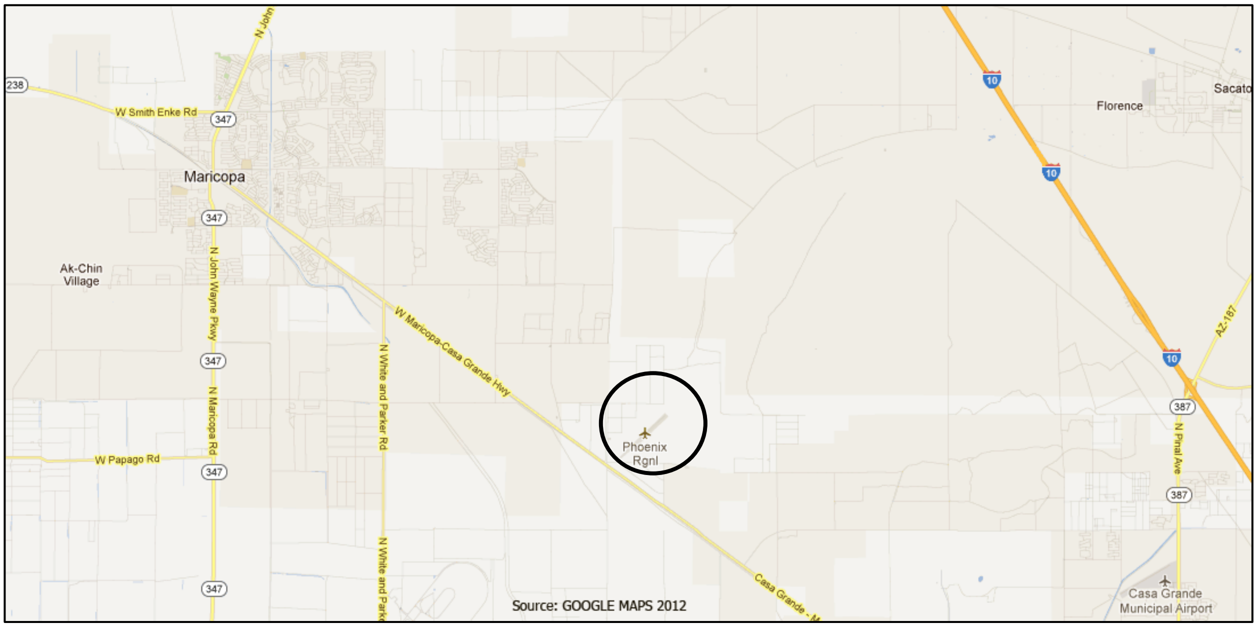
- **Commercial Service Airport:** a publicly owned airport which enplanes 2,500 or more passengers annually and receives a scheduled passenger air service.
- **Reliever Airport:** an airport that serves as a "relief of General Aviation traffic congestion for a Commercial Service airport, providing more general aviation access to the overall community. The Reliever Airport should have a current or forecast activity level of 50 based aircraft and a minimum of 25,000 annual itinerant operations (or 35,000 local operations).
- **General Aviation Airports:** the remaining airports which do not fall into either Commercial Service or Reliever statuses are referred to as a General Aviation airport. This category includes privately owned and/or private use airports/heliports. For system planning purposes, the General Aviation Airports may be divided into the following types:

    - **Community Airport:** an airport within the State of Arizona serving an incorporated community with a population more than 1,000 people.
    - **Rural Airport:** an airport within the State of Arizona serving an incorporated community with less than 1,000 population.
    - **Emergency Airport:** an airport/facility or area within the State of Arizona that currently has, or can demonstrate, a need for an emergency or "air evacuation" airport. These airports may serve general aviation, recreation, and/or emergency services.
- **New Urban Airport:** the construction of a new airport within 24 statute miles of the Urbanized Area Boundary of Phoenix, Tucson, Yuma, and Flagstaff requires the approval of the State Transportation Board.

Ak-Chin Regional Airport is classified as a Primary System, General Aviation, Public Community Airport based on the criteria described in the 2008 Arizona State Aviation System Plan.

1.4 AIRPORT LOCATION

Ak-Chin Regional Airport is located within the jurisdiction of unincorporated Pinal County on non-trust land outside the boundary of the Reservation between the cities of Maricopa and Casa Grande in Pinal County. The community is currently in the process of converting the airport and surrounding property to Indian Trust status. The airport is situated in Section 14, Township 5 South, Range 4 East of the Gila and Salt River Meridian. **Figure 1-3** provides a graphic depiction of the location of Ak-Chin Regional Airport. The airport is designated by the FAA as site number 00751.55*A with a 3-letter identifier, A39. The airport location is Latitude 32˚59'26.90" North and Longitude 111˚55'06.70" West according to FAA Form 5010-1, *Airport Master Record*. The airport elevation is 1,300 feet above Mean Sea Level (MSL). The proposed airport property encompasses 244 acres which is owned and operated by the Ak-Chin Indian Community.



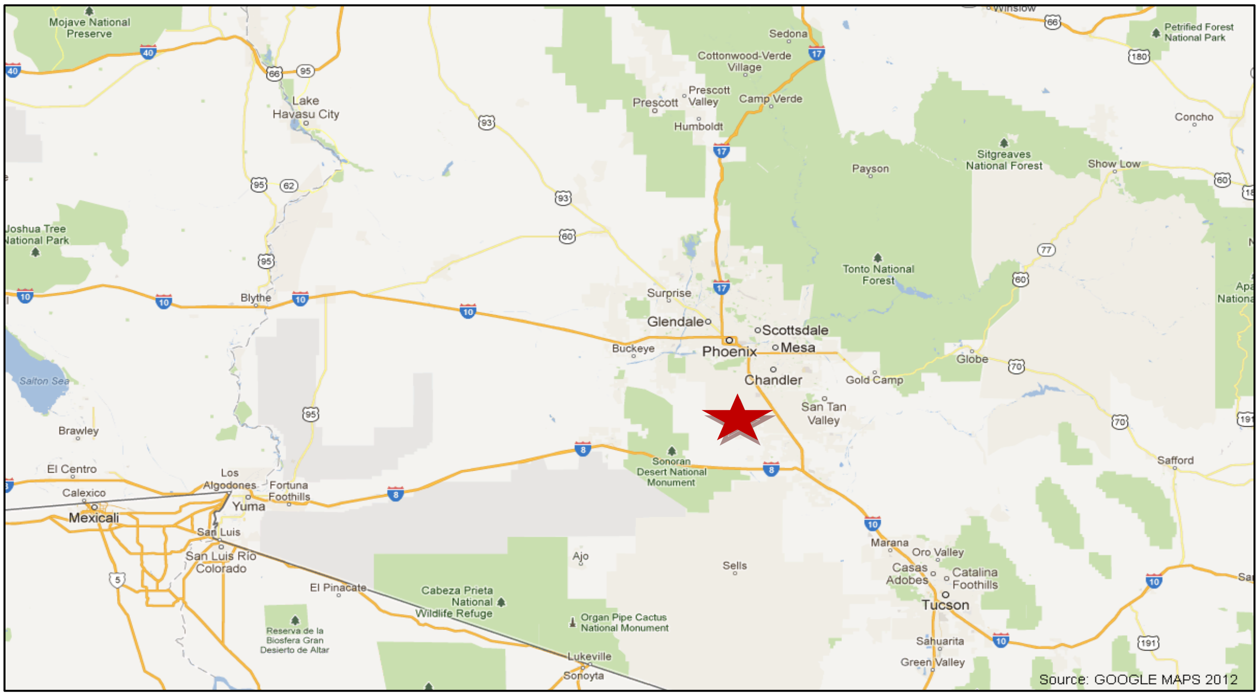
Source: GOOGLE MAPS 2012

FIGURE 1-3
LOCATION MAP

1.5 REGIONAL SETTING

Pinal County encompasses 5,375 square miles and has two distinct economic and geographic regions. The eastern portion is characterized by mountains with elevations up to 6,000 feet and serves the copper mining industry. The western area is primarily low desert valleys and accommodates irrigated agriculture. The State of Arizona is the county's largest landholder owning 35 percent, followed by individuals and corporations at 22 percent; Indian reservations at 23 percent; the U.S. Forest Service and Bureau of Land Management (BLM) at 14 percent, with the remaining 6 percent being other public lands.

Approximately 15 nautical miles northeast of the airport are the San Tan Mountains which peaks at 3,104 feet above MSL. The airport's regional setting is shown in **Figure 1-4**.



Source: GOOGLE MAPS 2012

FIGURE 1-4
REGIONAL SETTING

1.6 COMPATIBLE LAND USE

Surrounding land use compatibility conflicts are a common problem around many airports and smaller general aviation facilities. In urban areas, as well as some rural settings, airport owners find that essential expansion to meet the demands of airport traffic is difficult to achieve due to the nearby development of incompatible land uses. Aircraft noise is generally a deterrent to residential development and other noise sensitive property. In accordance with FAA and State of Arizona airport compatibility legislation, residential development should be placed outside of the 65 Day-Night Average Noise Level (DNL) noise contour.

Land use conflicts may also exist in the protection of runway approach/departure and transition zones which assure the safety of both the flying public and the adjacent property owners. Adequate land for these zones should be either owned in fee or controlled in easements, as recommended in future sections of this AMP.

All of the unincorporated areas of Pinal County have been zoned. The purpose of zoning is to guide the development of land in accordance with the County's Comprehensive Plan, and to promote the public health, safety and general welfare of the County's residents. Zoning districts specify permitted land uses, minimum lot sizes, and certain site development standards. Pinal County encompasses a large and diverse area with 34 individual zoning districts. However, for general purposes, the majority of these zoning districts can be classified into three broad groupings: Rural, Residential and Commercial/Industrial. **Figure 1-5** shows the airport is located and surrounded by Residential zoning.

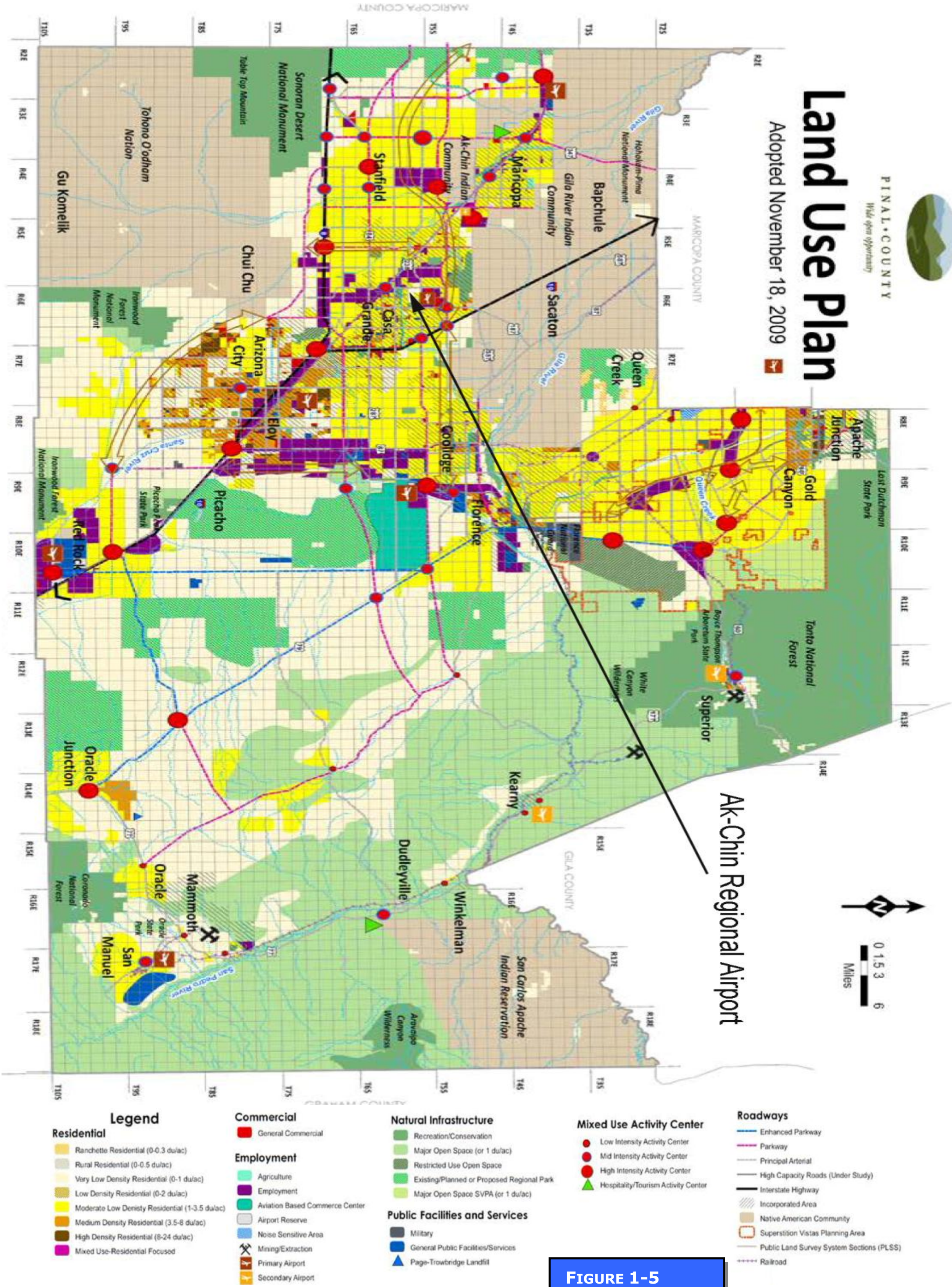


FIGURE 1-5
LAND USE PLAN

1.7 SOCIOECONOMIC CHARACTERISTICS

Examining the specific socioeconomic and community characteristics of Pinal County will help determine the factors influencing aviation activity in the area and the extent to which aviation facility developments are needed. Characteristics, such as employment, demographic patterns and income will provide a foundation upon which to base the potential growth rate of aviation activity at the airport.

The Ak-Chin Industrial Park Board was formally established on September 21, 2005 by the Ak-Chin Community Council to develop, operate and manage the following Community industrial properties: Adobe Office Suites, Ak-Chin Regional Airport and an interstitial property know as the "Bunger Property," which includes the Santa Cruz Office Center.

The Community owns the 100-acre Ak-Chin Santa Cruz Commerce Center located west of the airport between the cities of Maricopa and Casa Grande on the northeast corner of Murphy Road and Maricopa-Casa Grande Highway. The Commerce Center is suitable for light and agricultural related industry. The infrastructure of the property consists of a fully improved sewer, water and roads (curb and gutter) and underground electric and telephone. The existing tenants consist of Hickman's Egg Ranch and M & S Equipment. Other companies located near the airport consist of Mobile Mini, a Nissan testing facility and a Volkswagen testing facility. **Figure 1-6** is an advertisement in a popular business magazine.

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A PROJECT OF THE AK-CHIN INDIAN COMMUNITY

FIGURE 1-6
INDUSTRIAL PARK ADVERTISEMENT

The Saddleback Industrial Park (**Figure 1-7**) is located to the east of and adjacent to the Ak-Chin Regional Airport. There is a connector road/access taxiway extending from Taxiway A into the industrial park. The tenants/landowners of the Saddleback Industrial Park consist of airport users with a combination of aviation maintenance shops, hangars, industrial uses and residences. A July 10, 2009 report prepared by the Law Offices of Strickland & Strickland concluded the Industrial Park tenants have no legal rights or privileges for access to the airport property or aircraft operational areas, including the runway, taxiway, apron or fuel. The original owner of the airport had marketed the Industrial Park properties with the intent of providing access; however, the legal registration of the users association was dissolved by the State due to lack of proper filing and failure to meet the reporting requirements. According to the Pinal County Records Office, the primary vehicular access to the airport is provided by Bud Road, which runs through the Saddleback Industrial Park.

FIGURE 1-7
SADDLEBACK INDUSTRIAL PARK

1.7.1 LOCAL PROFILE

The largest employer in Pinal County is Harrah's Ak-Chin Casino and Resort. The Tribal's economy is based on the Casino's gaming and leisure operations, Ak-Chin Industrial Park, Ak-Chin Farms and tourism. The community has capitalized on the Casino with major attractions including a golf course, pool, entertainment, dining and gaming. **Figure 1-8** shows the Southern Dunes Golf Course. The community recently completed a multi-million dollar entertainment center which will include a movie complex, bowling and restaurants.

FIGURE 1-8
SOUTHERN DUNES GOLF COURSE

1.7.2 POPULATION

The 2010 U.S. Census reported 375,770 people residing in Pinal County. According to population data from the U.S. Census Bureau, the population has increased significantly in Pinal County from 2000-2010. **Table 1-1** shows the increasing population trend.

TABLE 1-1 POPULATION

	2000	2010	AVERAGE ANNUAL INCREASE 2000-2010
Ak-Chin	669	862	-
Casa Grande	25,224	48,571	92.6%
City of Maricopa	1,040	43,482	4,081%
Pinal County	179,727	375,770	109.1%
Arizona	5,130,632	6,392,017	24.6%

Source: U.S. Census Bureau, 2010

The Arizona Department of Economic Security developed population projections for Pinal County and State of Arizona in 2006. Population projections as shown in **Table 1-2**, indicate an 11.4 percent annual population increase for 2016 through 2031.

TABLE 1-2 POPULATION PROJECTIONS

	2016	2021	2026	2031	AVERAGE ANNUAL GROWTH 2016-2031
Casa Grande	65,654	83,312	100,843	118,348	12%
City of Maricopa	51,108	65,317	79,432	91,798	12%
Pinal County	511,011	634,338	756,555	876,091	11.4%
Arizona	8,088,417	8,941,402	9,740,504	10,499,302	8.7%

NOTE: These projections were made in 2006 by the Population Statistics Units at the Department of Economic Security

Source: Arizona Department of Economic Security - 2006-2055 Population Projections

1.7.3 EMPLOYMENT

Harrah's Ak-Chin Casino and Resort is the largest employer in Pinal County. The Casino is an important provider of jobs, wages and taxes to the local economy. According to the 2010 Ak-Chin Indian Community Economic Impact Analysis, the casino and government jobs exceed the current average wage of $40,400 for Pinal County. The Ak-Chin Indian Community is showing growth and making an economic impact in Pinal County by supplying employment to the county. **Table 1-3** shows the Top 10 Industries by Employment and Ak-Chin Rank in Pinal County.

TABLE 1-3 TOP 10 INDUSTRIES BY EMPLOYMENT AND AK-CHIN RANK

	EMPLOYMENT	OUTPUT
Employment and payroll only (state & local Government, non-education)	13,399	$782,644,608
Employment and payroll only (state & local Government, education)	4,979	$279,768,160
Food services and drinking places	3,485	$198,089,536
Facilities support services	2,775	$309,269,120
Retail Stores - General merchandise	2,278	$142,470,128
AK-CHIN DIRECT EMPLOYMENT	**1,898**	**$305,205,033**
Real estate establishments	1,847	$213,675,984
Employment and payroll only (federal Government, non-military)	1,463	$181,424,320
Transport by truck	1,404	$177,612,352
Retail Stores - Food and beverage	1,386	$83,969,192
Mining copper, nickel, lead, and zinc	1,315	$660,430,656

Source: 2010 Ak-Chin Indian Community Economic Impact Analysis

Table 1-4 shows the Top 10 industries in Pinal County which create the most jobs.

TABLE 1-4 TOP 10 INDUSTRIES IMPACTED BY AK-CHIN ECONOMIC ACTIVITIES

Construction
Food services and drinking places
Real estate establishments
Retail Stores - General merchandise
Retail Stores - Food and beverage
Civic, social, professional, and similar organizations
Offices of physicians, dentists, and other health practitioners
Other amusement and recreation industries
Private hospitals
Architectural, engineering, and related services

Source: 2010 Ak-Chin Indian Community Economic Impact Analysis

1.7.4 INCOME

The median household income in Arizona was slightly lower than the national average for 2009. According to the 2010 U.S. Census, the median income for a household in Pinal County was $51,310. The median household income for the State of Arizona was $50,448. The average number of persons per household for Pinal County is 2.56, while the average for Arizona is 2.63 and 2.59 for the national average. The per capita income in 2010 was $21,716 for the county and $25,680 for the State of Arizona. The percentage of families living below the poverty line in 2010 was 13.5 percent for Pinal County and 15.3 percent for the State of Arizona.

1.8 CERTIFICATED PILOTS AND REGISTERED AIRCRAFT

The FAA databases of certificated airmen and registered aircraft were reviewed to determine the current distribution of pilots and registered aircraft in Pinal County.

This data indicates that there are 647 certificated pilots and 416 aircraft registered in Pinal County as shown in **Table 1-5**. Aircraft are not always based where they are registered, of the 416 registered aircraft in the Pinal County, 14 are based at the Ak-Chin Regional Airport according to airport management records. A total of six aircraft are stored in the Saddleback Industrial Park adjacent to the airport property.

TABLE 1-5 CERTIFIED PILOTS AND REGISTERED AIRCRAFT

	AIRCRAFT REGISTERED	CERTIFICATED PILOTS
Pinal County	416	647

Source: FAA, 2012

1.9 AIRCRAFT OPERATIONS

The majority of the aircraft utilizing the airport are predominately single engine and multi-engine piston aircraft. Other users also include rotorcraft, gliders and ultralights. Currently at the airport, the users include flight training, business and personal transportation along with recreational operations. **Table 1-6** lists the current level of aviation activity at Ak-Chin Regional Airport.

TABLE 1-6 HISTORICAL AK-CHIN REGIONAL AIRPORT BASED AIRCRAFT AND OPERATIONS

	ITINERANT OPERATIONS					LOCAL OPERATIONS			
YEAR	AIR CARRIER	AIR TAXI & COMMUTER	GENERAL AVIATION	MILITARY	TOTAL	GENERAL AVIATION	MILITARY	TOTAL OPERATIONS	BASED AIRCRAFT
2008[1]	0	0	3,650	0	3,650	10,950	0	10,950	11
2012[2]	0	0	2,000	0	2,000	1,000	0	1,000	14

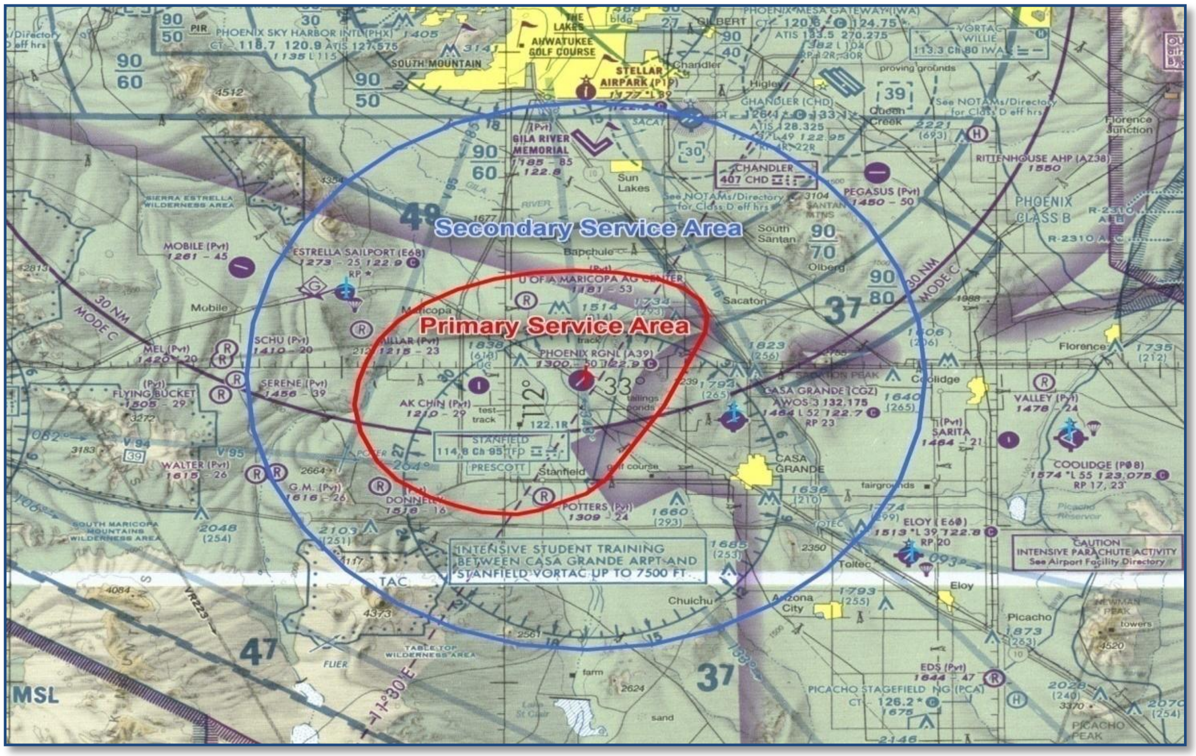
[1] Arizona State Airports System Plan, 2008

[2] FAA Form 5010-1, *Airport Master Record*, 2012

1.10 INVENTORY OF EXISTING AIRPORT FACILITIES

1.10.1 AREA AIRPORTS/SERVICE AREA

An airport service area is defined by the communities and surrounding areas served by the airport facility. For example, factors such as the airport's surrounding topographical features (mountains, rivers, etc.), proximity to its users, quality of ground access, required driving time to the airport and the proximity of the facility to other airports that offer the same or similar services can all affect the size of a particular airport's service area. To define the service area for Ak-Chin Regional Airport, the airports in the area and their specific services and facilities were reviewed. The nearest public airport with a paved surface and an instrument approach is located approximately eight nautical miles east at Case Grande Municipal Airport (CGZ). The primary service area includes the area within half the distance of the nearest airport from Ak-Chin Regional Airport. The secondary service area within 20 miles/30-minute drive time of Ak-Chin Regional Airport Users within this area may choose the Ak-Chin Regional Airport over other airports if there are economic or other advantages at the airport such as lower lease rates, less expensive fuel or hangar availability. **Figure 1-9** shows the primary and secondary service areas. **Table 1-7** shows the surround airports near Ak-Chin Regional Airport.



Source: Armstrong Consultants, Inc., 2012

FIGURE 1-9
SERVICE AREA

TABLE 1-7 AK-CHIN REGIONAL AIRPORT AND SURROUNDING AIRPORTS

	IDENTIFIER	DISTANCE (NAUTICAL MILES)	DISTANCE (HIGHWAY MILES)	NPIAS STATUS	RUNWAY LENGTH(S) WIDTH(S)	PAVEMENT TYPE	INSTRUMENT APPROACHES	FUEL
Ak-Chin Regional Airport, Maricopa, AZ	A39	-	-	N/A	5,035'x50'	Asphalt	None	100LL
Case Grande Municipal Airport, Casa Grande, AZ	CGZ	7.9 E	13	GA	5,200'x100'	Asphalt	ILS, LOC/DME, GPS, VOR	100LL Jet-A
Chandler Municipal Airport, Chandler, AZ	CHD	17.5 N	35	R	4,870'x75' 4,401'x75'	Asphalt Asphalt	GPS, VOR, NDB	100LL Jet-A
Stellar Airpark, Chandler, AZ	P19	18.5 N	32	N/A	3,913'x60'	Asphalt	VOR. GPS	100LL
Phoenix-Mesa Gateway Airport, Mesa, AZ	IWA	23.2 NE	49	P	10,401'x150' 10,201'x150' 9,300'x150'	Concrete Asphalt Concrete	ILS, LOC, GPS, VOR, TACAN	100LL Jet-A
Coolidge Municipal Airport, Coolidge, AZ	P08	25 E	36	GA	5,528'x150' 3,861'x75'	Asphalt Asphalt	GPS, VOR/DME	100LL Jet-A

Source: Airnav.com, 2012

GA - General Aviation
R - Reliever

ILS - Instrument Landing System
LOC - Localizer
GPS - Global Positioning System

VOR - Very High Frequency Omnidirectional Range
TACAN - Tactical Aircraft Control and Navigation
DME - Distance Measuring Equipment
NDB - Non-Directional Radio Homing Beacon

1.10.2 TOPOGRAPHY AND TERRAIN

The elevation of Ak-Chin Regional Airport is 1,300 feet above MSL. The Airport is located within the Santa Cruz Valley of Southern Arizona with higher terrain bordering the airport to the northwest and northeast as shown in **Figure 1-10**. The terrain surrounding Ak-Chin Regional Airport is generally flat with the exception of a few foothills east of the airport. The Sierra Estrella Mountains are approximately 15 nautical miles northwest of the airport and peak at 4,512 feet above MSL at Hayes Peak. The San Tan Mountains are located approximately 14 nautical miles northeast of the airport and peak at 3,104 feet above MSL.

Ak-Chin Regional Airport

SOURCE: GOOGLE MAPS 2012

FIGURE 1-10
TOPOGRAPHY

1.11 DESIGN STANDARDS

FAA AC 150/5300-13A, *Airport Design*, establishes design standards for airports based on the Airport Reference Code (ARC) of the airport. When design standard deficiencies exist, the FAA recommends correction of such deficiencies as soon as practicable. Design standards are based on the ARC and approach visibility minimums of the airport. The ARC is a combination of the wingspan, tail height and approach speed of the critical aircraft and lowest visibility minimums available at the airport. The current ARC for Ak-Chin Regional Airport is B-I (small). A more detailed discussion of ARCs is included in Chapter 3.

1.11.1 SAFETY AREAS

Runway and Taxiway Safety Areas (RSAs and TSAs) are defined surfaces surrounding the runways and taxiway prepared specifically to reduce the risk of damage to aircraft in the event of an undershoot, overshoot or excursion from the runway or taxiway. The Safety Areas must be:

- Cleared and graded and have no potentially hazardous surface variations;
- Drained so as to prevent water accumulation;

- Capable, under dry conditions, of supporting snow removal equipment, ARFF equipment and the occasional passage of aircraft without causing structural damage to the aircraft; and
- Free of objects, except for objects that need to be located in the runway or taxiway safety area because of their function.

The existing RSA at Ak-Chin Regional Airport is 120 feet wide longitudinally centered on the runway centerline and extends 240 feet beyond each runway end, are in good condition and satisfy the requirements defined by the standards.

1.11.2 OBSTACLE FREE ZONE AND OBJECT FREE AREA

The Obstacle Free Zone (OFZ) is a three dimensional volume of airspace which supports the transition of ground to airborne aircraft operations. The clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual Navigational Aids (NAVAIDs) that need to be located in the OFZ because of their function. The OFZ is similar to the Part 77 Primary Surface insofar that it represents the volume of space longitudinally centered on the runway centerline. The OFZ extends 200 feet beyond the end of each runway and has a width of 250 feet. The Runway Object Free Area (ROFA) is a two-dimensional ground area surrounding the runway. It extends 240 feet beyond the end of each runway and has a width of 250 feet. The ROFA standard precludes parked airplanes, agricultural operations and objects, except for objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes.

1.11.3 RUNWAY PROTECTION ZONE

According to FAA AC 150/5300-13A, *Airport Design*, the Runway Protection Zone (RPZ) is trapezoidal in shape and centered on the extended runway centerline. The RPZ dimension for a particular runway end is a function of the type of aircraft and approach visibility minimum associated with that runway end. The existing RPZs at Ak-Chin Regional Airport begin 200 feet from the runway threshold and extend for 1,000 feet. The RPZs are 250 feet wide at the inner end and 450 feet wide at the outer end. The Runway 4 approach RPZ and Runway 22 departure RPZ are collocated; however, the Runway 4 departure RPZ and Runway 22 approach RPZ are off-set by 290 feet as a result of the displaced threshold. Land uses which are not compatible within the RPZ include residences, fuel storage and places of public assembly (churches, schools, hospitals, office buildings, shopping centers and other uses with similar concentrations of persons typify places of public assembly). The FAA recommends the Sponsor control the RPZs through fee simple ownership or avigation easements. Most of the RPZ on the southwest end of the runway is mostly owned by the community. Runway 22 has an approach RPZ for aircraft landing on Runway 22 and a departure RPZ for aircraft departing on Runway 4. This is due to the displaced threshold of 290 feet on Runway 22. The Runway 22 approach RPZ and Runway 4 departure RPZ are partially located on and off airport property. The portion that is located off airport property is uncontrolled by the airport. Both RPZs are considered compatible land use according to the FAA. **Figure 1-11** shows the displaced threshold on Runway 22 and **Figure 1-12** shows Runway 4 end.

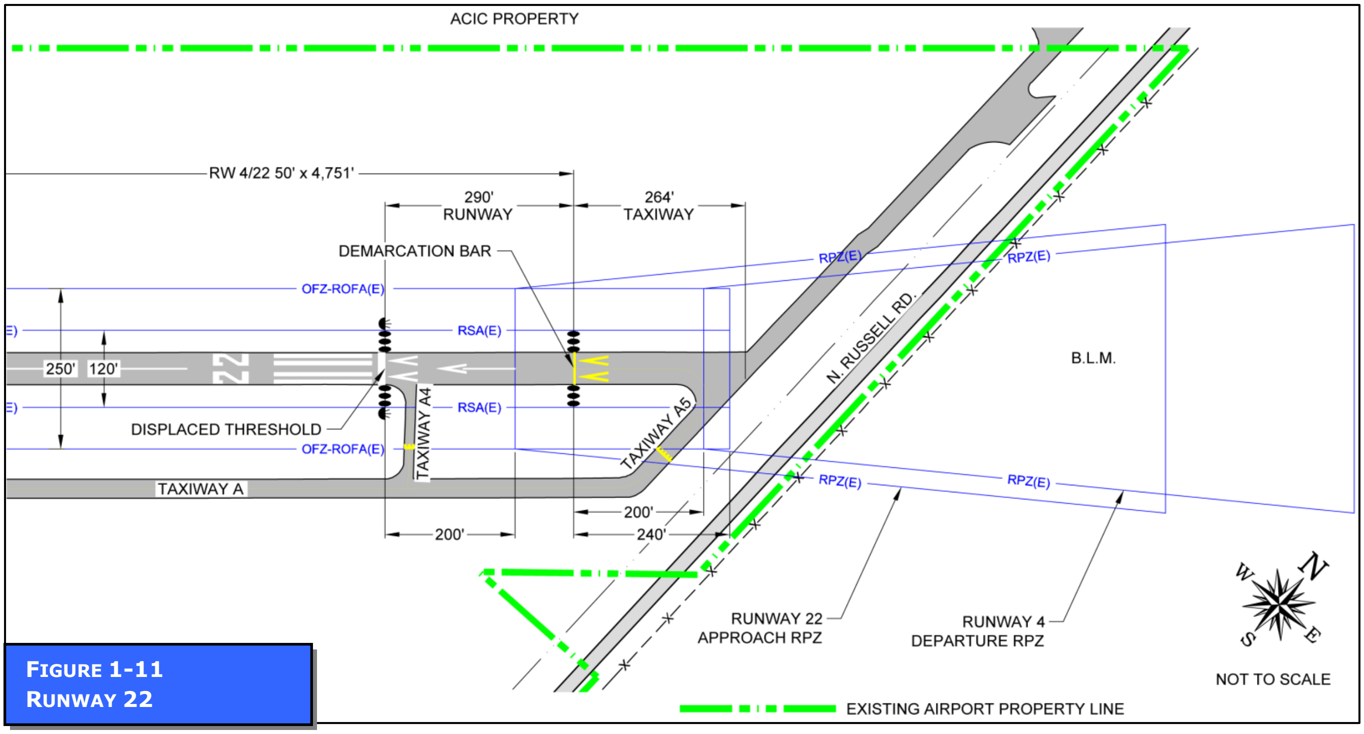


FIGURE 1-11
RUNWAY 22

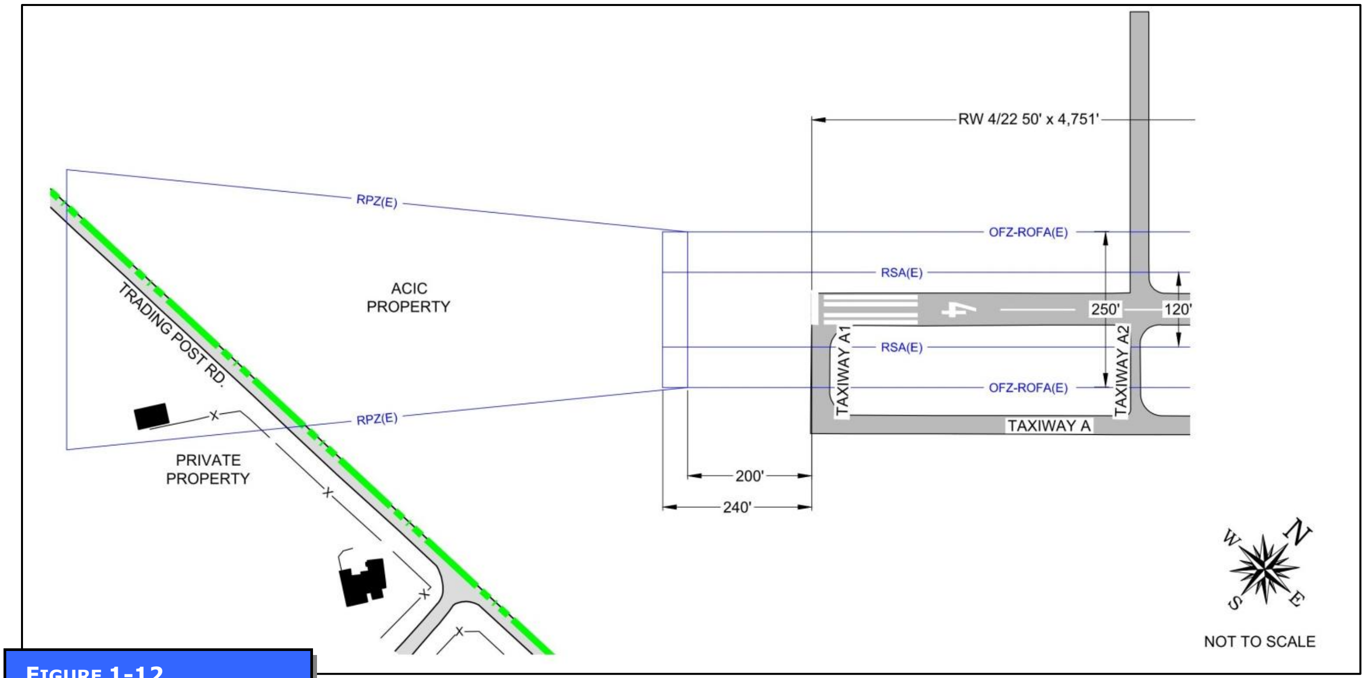


FIGURE 1-12
RUNWAY 4

A summary of design standards for AK-Chin Regional Airport are shown in **Table 1-8**.

TABLE 1-8 SUMMARY OF DESIGN STANDARDS

	RUNWAY 4/22
Description	B-I (small)
Runway Centerline to parallel TW centerline	150' (185' Actual)
Runway Centerline to aircraft parking apron	125' (245' Actual)
Runway Width	60' (50' actual)
Runway Safety Area width	120'
Runway Safety Area length beyond RW end	240'
Runway Object Free Area width	250'
Runway Object Free Area beyond RW end	240'
Runway Obstacle Free Zone width	250'
Runway Centerline to aircraft hold lines	125'
Runway Obstacle Free Zone length beyond RW end	200'
Runway Protection Zone	1,000' x 250' x 450'
Taxiway Width	25' (30' Actual)
Taxiway Safety Area width	49'
Taxiway Object Free Area width	59'
Taxiway Centerline to Parallel Taxiway/Taxilane Centerline	69'
Taxilane Object Free Area width	79'

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

1.11.4 TITLE 14 CODE OF FEDERAL REGULATIONS (CFR) PART 77 IMAGINARY SURFACES

Title 14 Code of Federal Regulations (CFR) Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspaces*, establishes several Imaginary Surfaces that are used as a guide to provide a safe, unobstructed operating environment for aviation. The Primary, Approach, Transitional, Horizontal and Conical Surfaces identified in Part 77 are applied to each runway. For the purpose of this section, a visual/utility runway is a runway that is intended to be used by propeller driven aircraft of 12,500 pound maximum gross weight and less. A non-precision instrument/utility runway is a runway that is intended to be used by aircraft of 12,500 pounds maximum gross weight and less with a straight-in instrument approach procedure and instrument designation indicated on an FAA approved ALP, a military service approved military ALP or by any planning document submitted to the FAA by competent authority. A non-precision instrument/larger-than-utility runway is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure.

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

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

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

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

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

A summary of Part 77 Imaginary Surface Dimensions for Ak-Chin Regional Airport are shown in **Table 1-9**.

TABLE 1-9 14 CFR PART 77 AIRSPACE SURFACES FOR RUNWAY 4/22

14 CFR PART 77 CATEGORY	RUNWAY 4/22 EXISTING
	Visual, Utility
Primary Surface width	250'
Primary Surface length beyond runway ends	200'
Approach Surface Dimensions	250' x 1,250' x 5,000'
Approach Surface slope	20:1
Transitional Surface slope	7:1
Horizontal Surface radius from runway	5,000'
Conical Surface width	4,000'
Conical Surface slope	20:1

Source: 14 CFR Part 77

1.11.5 THRESHOLD SITING SURFACE

According to FAA AC 150/5300-13A, the runway threshold should be located at the beginning of the full-strength runway pavement or runway surface. However, displacement of the threshold may be required when an object obstructs the airspace required for landing airplanes and is beyond the airport owner's power to remove, relocate or lower. Thresholds may also be displaced for environmental considerations such as noise abatement or to provide the standard RSA and ROFA lengths.

Based on the visual approach and size of aircraft using the Ak-Chin Regional Airport, in order to meet FAA design standards, no object should penetrate a surface that starts at the threshold of the elevation of the runway centerline at the threshold and slopes upward from the threshold at a slope of 20 feet (horizontal) to 1 foot (vertical). In the plan view, the centerline of this surface extends 2,250 feet along the extended runway centerline. This surface extends laterally 125 feet on each side of the centerline at the threshold and increases in width to 350 feet on each side of the centerline at a point 2,250 feet from the threshold and continues at width of 350 feet for an additional 2,750 feet. The Runway 22 threshold is displaced 290 feet and there are no objects penetrating this surface.

1.12 AIRSIDE FACILITIES

The airside facilities of an airport are described as the runway configuration, the associated taxiway system, the ramp and aircraft parking area and any visual or electronic approach navigational aids. **Figure 1-13** depicts the existing airside facilities at Ak-Chin Regional Airport.

1.12.1 RUNWAY

Ak-Chin Regional Airport currently has a single-runway configuration. Runway 4/22 is constructed of asphalt and is 4,751 feet long and 50 feet wide with no published pavement strength. The standard width for a B-I (small) runway is 60 feet; therefore, Runway 4/22 does not meet design standards. The pavement is in good condition and was crack sealed, fog sealed and remarked. Runway 4/22 has non-precision markings that are in good condition.

Runway 22 has a 300 foot aligned taxiway from the northeast end of the runway pavement. The aligned taxiway is marked with a yellow centerline, two yellow arrowheads and a yellow demarcation bar to differentiate between the runway and the taxiway. The aligned taxiway was required on the northeast end of the runway to provide an adequate RSA and ROFA to meet design standards. The Runway 22 threshold is displaced 290 feet from the taxiway demarcation bar to provide an unobstructed threshold siting surface for aircraft on approach for landing on Runway 22. The displaced threshold is marked with a white arrow and two white arrowheads.

1.12.2 DECLARED DISTANCES

The purpose of declared distances in airport design is to provide an equivalent RSA, ROFA, the threshold siting surface clearance or RPZ in accordance with FAA design standards at existing constrained airports where it is otherwise impracticable to meet standards by other means. Declared distances are also employed when there are obstructions in the runway approaches and/or departure surface that are beyond the ability of the airport owner to remove and result in a displaced runway threshold or change in the departure end of the runway. Ak-Chin Regional Airport has an aligned taxiway provided on Runway 22 because of the RSA and ROFA. The displaced threshold is provided because of the road penetrating the threshold siting surface.

Table 1-10 shows the declared distances currently published for Runway 22 at Ak-Chin Regional Airport, the existing road and the ditch located at the northwest runway end does not provide a full-length RSA or ROFA along with penetration of the threshold siting surface.

- **Takeoff Run Available** (TORA) – the length of runway declared available and suitable for satisfying takeoff run requirements.
- **Takeoff Distance Available** (TODA) – the TORA plus the length of any remaining runway or clearway beyond the far end of the TORA available for satisfying takeoff distance requirements.
- **Accelerate-Stop Distance Available** (ASDA) – the length of runway plus stopway declared available and suitable for satisfying accelerate-stop distance requirements.
- **Landing Distance Available** (LDA) – the length of runway declared available and suitable for satisfying landing distance requirements.

TABLE 1-10 DECLARED DISTANCES

	RUNWAY 4	**RUNWAY 22**
Takeoff Run Available (TORA)	4,751'	4,751'
Takeoff Distance Available (TODA)	4,751'	4,751'
Accelerate-Stop Distance Available (ASDA)	4,751'	4,751'
Landing Distance Available (LDA)	4,751'	4,461’

1.12.3 TAXIWAYS

Taxiways provide a surface for aircraft to access the parking apron to and from the runways. They expedite aircraft departures from the runway and increase operational safety and efficiency. The Ak-Chin Regional Airport has a full length parallel taxiway (Taxiway A) which is 30 feet wide and does not have an existing published pavement strength. A width of 25 feet is the design standard for a Group I taxiway. Therefore the parallel taxiway width exceeds the minimum FAA design standards. The taxiway centerline is located 185 feet from the runway centerline. The standard separation for an ARC B-I (small) runway centerline to taxiway centerline is 150 feet; therefore the existing taxiway exceeds FAA design standards. Connector taxiways between parallel taxiways increase aircraft circulation and reduce time an aircraft spends on the runway. **Table 1-11** shows the width of the connector taxiways at Ak-Chin Regional Airport.

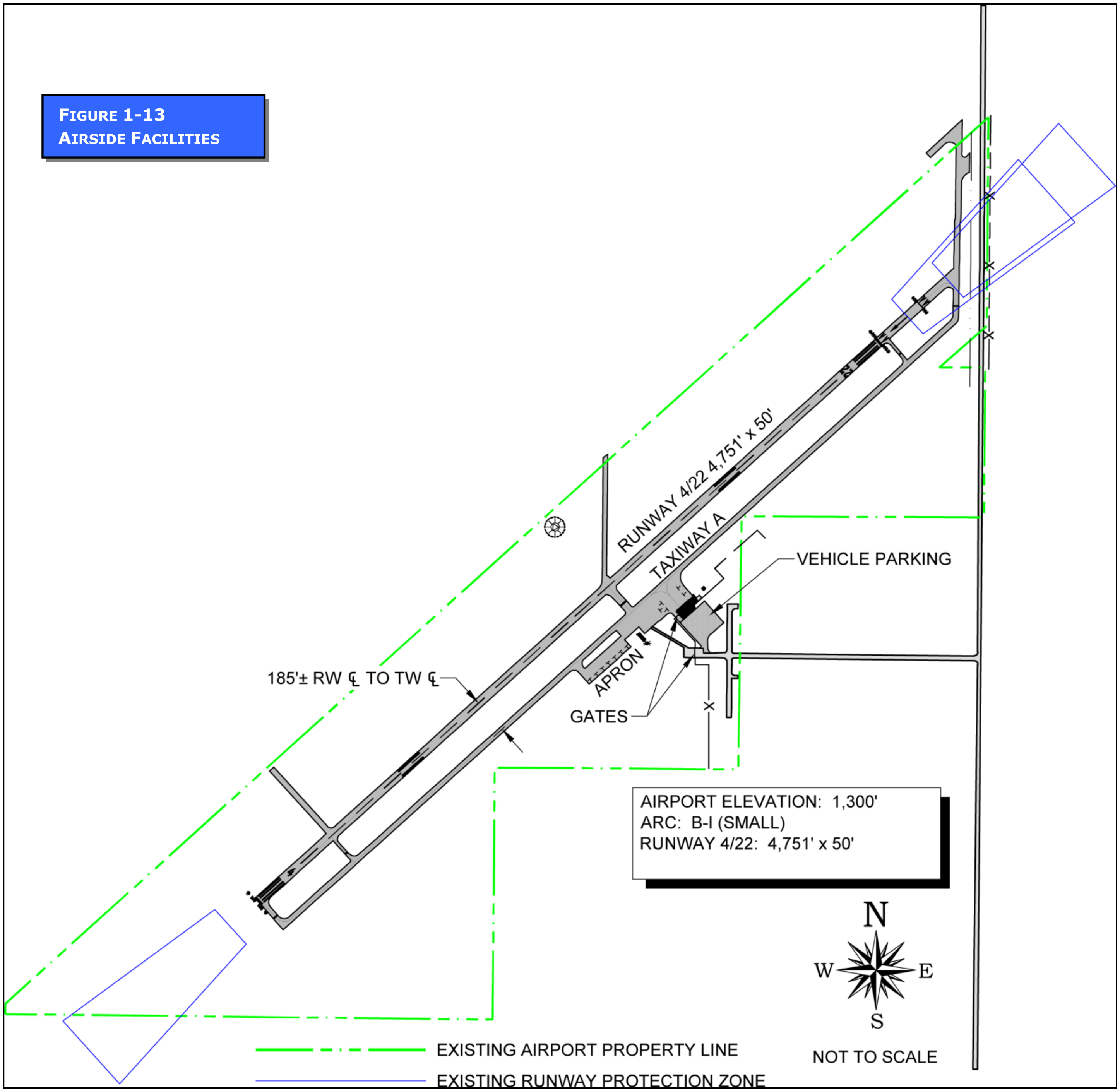
TABLE 1-11 CONNECTOR TAXIWAYS

	WIDTH
A1	30'
A2	15'
A3	44'
A4	15'
A5	30'

1.12.4 AIRCRAFT APRON

The aircraft apron provides an area for aircraft to park. Aprons are typically connected to the runway via taxiways or taxilanes. A typical aircraft parking apron has marked parking positions identified by a yellow "T" also known as a tiedown position. At the ends of each tiedown "T" are typically ropes or chains used to secure an airplane by attaching a rope or chain to the underside of each wing and to the aircraft tail section. The ropes or chains are either attached to an anchor placed in the pavement or a cable that lies across the pavement. The aircraft parking apron at Ak-Chin Regional Airport has approximately 54,280 square feet (sq ft) of area, accommodates 12 tiedowns and is in good condition. The apron markings are in good condition. The apron is currently used for transient and tenant aircraft parking.

FIGURE 1-13
AIRSIDE FACILITIES



AIRPORT ELEVATION: 1,300'
ARC: B-I (SMALL)
RUNWAY 4/22: 4,751' x 50'

NOT TO SCALE

EXISTING AIRPORT PROPERTY LINE
EXISTING RUNWAY PROTECTION ZONE

1.12.5 WEATHER REPORTING

An Automated Weather Observation System (AWOS) uses various sensors, a voice synthesizer and a radio transmitter to provide real-time weather data. There are four types of AWOS. An AWOS-A only reports altimeter setting. AWOS-I measures and reports altimeter, wind speed, direction, gusts, temperature and dew point. AWOS-II provides visibility information in addition to all information reported by an AWOS-I. The most capable system, the AWOS-III also includes cloud and ceiling data. The AWOS transmits over a VHF frequency or the voice portion of a NAVAID. The transmission can be received within 25 nautical miles of the site or above 3,000 feet Above Ground Level (AGL). The frequency for the AWOS is published on aeronautical charts as well as in the airport facilities directory. The AWOS is typically connected to the telephone service allowing pilots to check current weather conditions at the airport.

Ak-Chin Regional Airport currently does not have an AWOS to provide local weather information. The nearest AWOS is located at Casa Grande Municipal Airport, approximately eight nautical miles to the east. The AWOS-III information at Casa Grande Municipal Airport can be obtained via radio frequency 132.175 Megahertz (MHz) or via telephone at 1-(520)-836-9952. The installation of an AWOS was approved by the Planning and Zoning Department and Tribal Council in 2014.

1.12.6 AIRFIELD LIGHTING, SIGNAGE AND VISUAL AIDS

Guidance on airport lighting standards is provided in FAA AC 150/5340-30F, *Design and Installation Details for Airport Visual Aids.* Airport lighting enhances safety during periods of inclement weather and nighttime operations by providing visual guidance to pilots in the air and on the ground. Several common airfield lighting and visual aid features of general aviation airports include a rotating beacon, pilot-controlled runway lights (activated by aircraft radio signal) and threshold lights. Common visual aids include Runway End Identifier Lights (REILs) which mark the runway threshold with flashing strobe lights, Precision Approach Path Indicators (PAPIs) to provide visual descent guidance information during an approach to the runway, wind cones and segmented circles.

Airfield lighting at Ak-Chin Regional Airport consists of a rotating beacon, lighted wind cone and segmented circle. The holding position bars on the connector taxiways are located 125' from runway centerline

1.12.7 NAVIGATIONAL AIDS AND INSTRUMENT APPROACH PROCEDURES

A NAVAID is any ground based visual or electronic device used to provide course or altitude information to pilots. NAVAIDs include Very High Frequency Omnidirectional Range (VORs), Very High Frequency Omnidirectional Range with Tactical Information (VOR-TACs), Nondirectional Beacons (NDBs) and Tactical Air Navigational Aids (TACANs). There are no existing published instrument approach procedures or NAVAIDs located at the airport. Ak-Chin Regional Airport does not have an Air Traffic Control Tower (ATCT). The nearest NAVAID is the Stanfield VORTAC located approximately seven nautical miles south of Ak-Chin Regional Airport along the 343-degree radial.

1.13 LANDSIDE FACILITIES

The landside facilities of an airport consist of those facilities not included as airside characteristics. Examples of landside facilities include any structure adjoining the airfield, terminal buildings, hangars, access routes to and from the airport, automobile parking areas, airport fencing, utilities, airport maintenance and support facilities and fuel provisions. Landside facilities at Ak-Chin Regional Airport are shown in **Figure 1-14**.

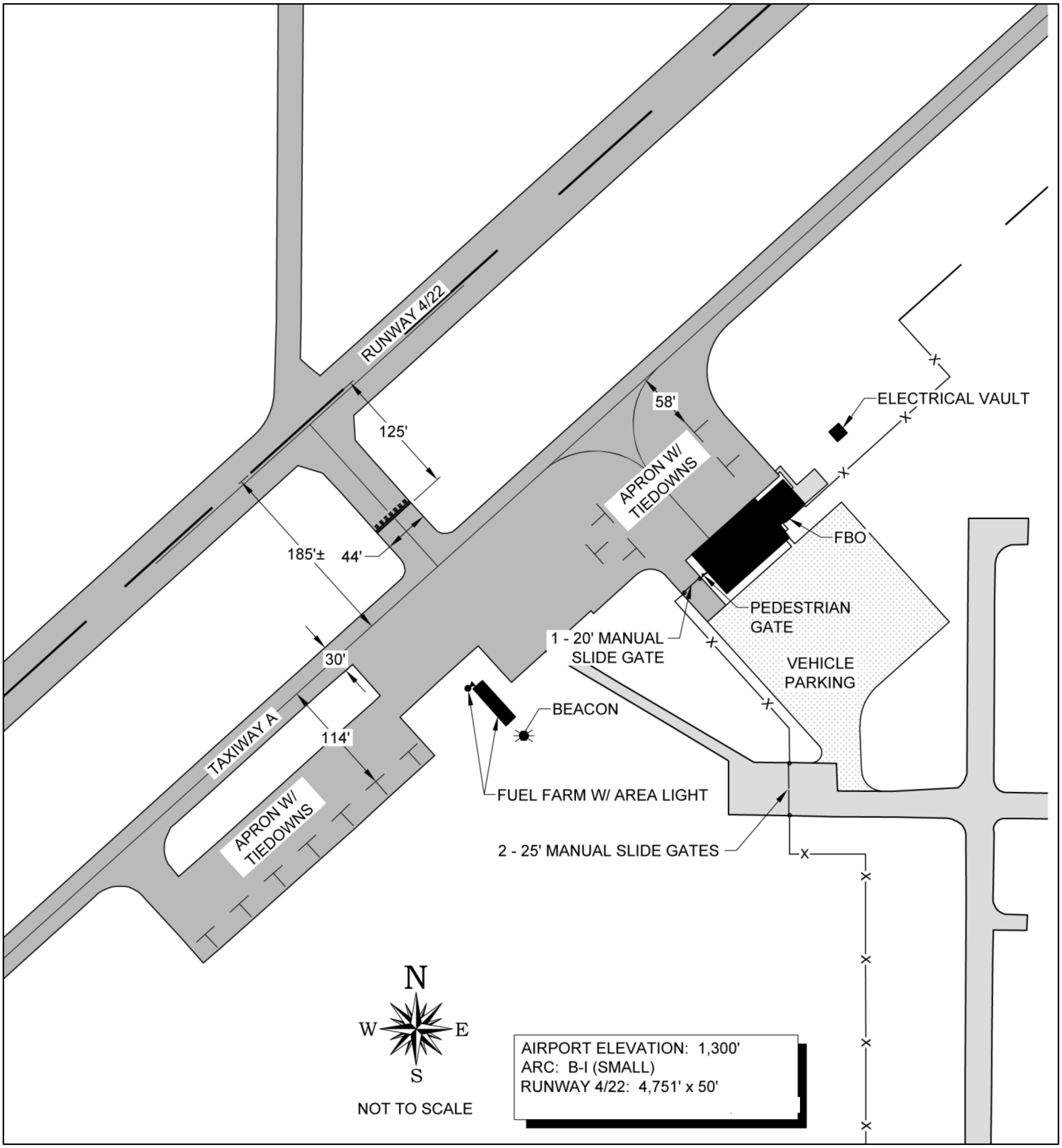


FIGURE 1-14
LANDSIDE FACILITIES

1.13.1 AIRPORT SERVICES/FIXED BASE OPERATOR

A FBO is usually a private enterprise that leases land from the airport sponsor on which to provide services for based and transient aircraft. The extent of the services provided varies from airport to airport; however, these services frequently include aircraft fueling, minor maintenance and repair, aircraft rental, charter services, flight instruction, pilot lounge, flight planning facilities, aircraft tiedown and hangar storage. The Ak-Chin Indian Community owns and operates the existing fuel system. Other aviation services including mechanic service and aircraft rental is available just off the airport in the Saddleback Industrial Park.

1.13.2 TERMINAL BUILDING

The terminal building was constructed in 2004. It is a 7,025 square foot, two story building with airport management office space, pilot lounge and hangar area. The building is in good condition.

1.13.3 AIRPORT MANAGEMENT

The Ak-Chin Regional Airport is owned and operated by the Ak-Chin Indian Community. The airport is managed and maintained by the airport manager. Some of these initial duties include:

- Responsible for managing the day-today operations at the airport
- Performs aircraft fueling, towing and marshaling
- Enforces airport rules, regulations and operating standards
- Attends meetings and conferences with governmental officials and industry organizations
- Provides excellent customer service and assistance to pilots, passengers, visitors and tenants
- Develops and facilitates airport public information programs
- Performs other duties, as needed or assigned.

1.13.4 AIRPORT POLICIES

Minimum Standards are set forth to foster, encourage and ensure the economic stability and orderly development of aviation activities and businesses at the Airport; as well as control the level and quality of services offered and to insure adequate service and facilities to Airport users. The airport does currently participate in the Aeronautics Division Pavement Management Program (PMMP). Currently, the airport has no Storm Water Pollution Prevention Plan (SWPPP) or a Spill Prevention Control and Countermeasure (SPCC) Plan. Both plans should be developed and implemented. There are no existing records kept on runway incursions for the airport. Runway Safety Area Surveys have not been conducted. There are no minimum standards currently established for the Ak-Chin Regional Airport.

1.13.5 HANGARS

Hangars are typically classified as either T-hangar (small multi-unit storage complexes that usually accommodate one single engine aircraft in each unit) or conventional hangars, which accommodate a variety of aircraft types or corporate fleets. Shade hangars are a variation of the T-hangar without exterior walls. Conventional hangars are also known as box hangars. The number of aircraft that each conventional hangar can hold varies according to the manufacturers and the specifications of the airport owner and operators. The terminal building at the airport is connected to the large box hangar. There are currently no other hangars on airport property.

1.13.6 GROUND ACCESS, SIGNAGE AND PARKING

Ak-Chin Regional Airport is accessed by West Maricopa-Casa Grande Highway. Traffic approaching the airport on West Maricopa-Casa Grande Highway is directed off the highway and on North Russell Road and connects to Bud Road, which is the entrance to the airport through Saddleback Industrial Park. Bud Road provides vehicle access to the parking lot and FBO building and serves as a through-the-fence taxiway for aircraft parked at the Saddleback Industrial Park to access the airport.

1.13.7 AUTOMOBILE PARKING

The automobile gravel parking is approximately 29,270 square feet and adjacent to the terminal building. The area can accommodate area 50 automobiles and includes a space designated for a loading and unloading area for passenger drop off.

1.13.8 UTILITIES

Available utilities at Ak-Chin Regional Airport include power, water and sanitary sewer, natural gas and phone. Electricity is provided by Electric District 3, telephone services are provided by CenturyLink and natural gas is provided by Southwest Gas Corporation. Water is provided by the City of Casa Grande and sewer is provided by private septic systems. A map depicting existing utility lines is shown in **Figure 1-15**.

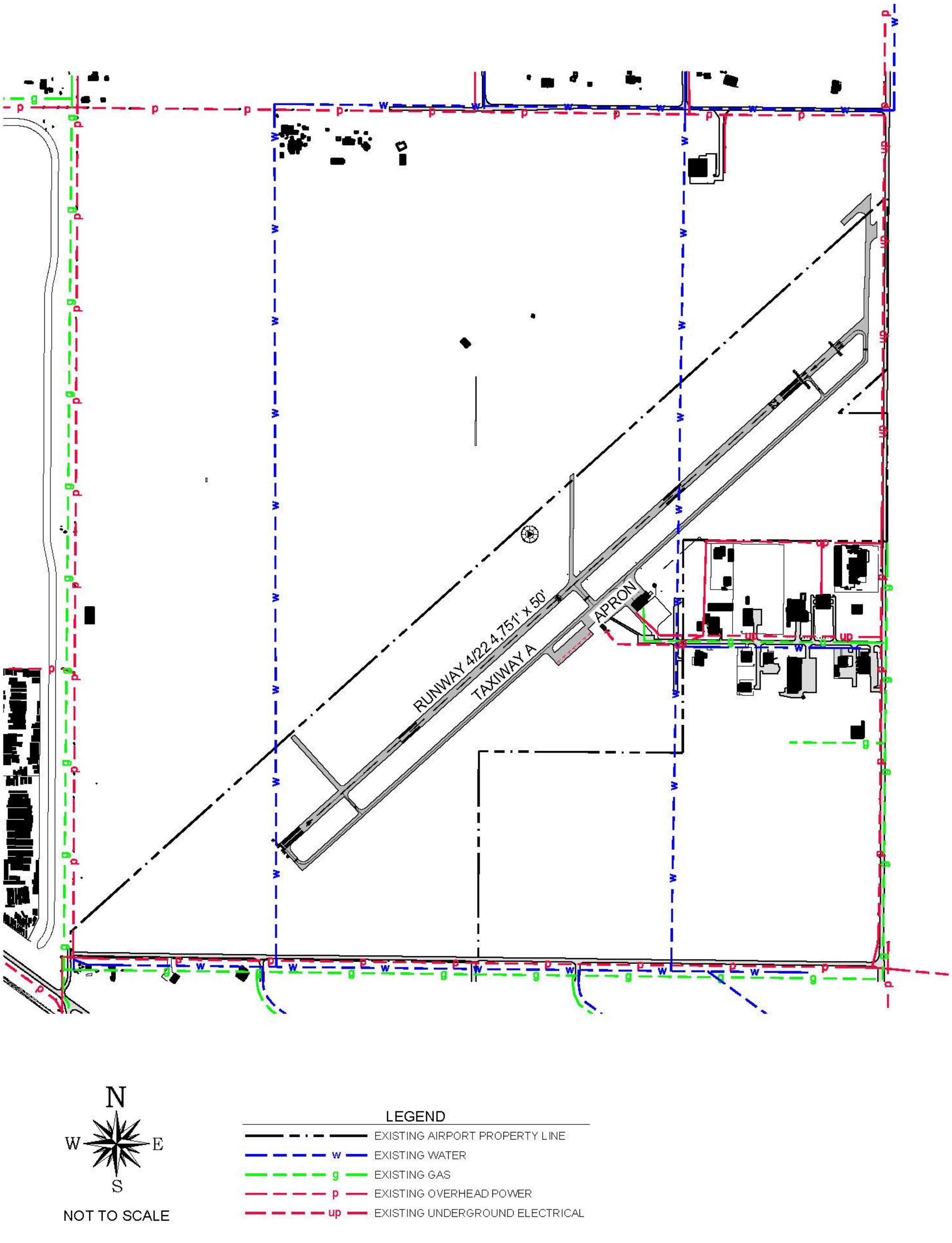


FIGURE 1-15
EXISTING UTILITY LINES

1.13.9 FENCING

The primary purpose of airport fencing is to prevent unauthorized intrusions by persons or animals on airport property. Airport fencing provides increased safety and security for the airport. It is normally installed along the perimeter of the airport property and outside any of the safety areas defined by the FAA in AC 150/5300-13A, *Airport Design* and 14 CFR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspaces*. The fence provides segregation between aircraft operations and ground vehicle operations. Usually the fence is located between hangars to provide clear separations between airside and landside areas. This type of fence configuration allows users to access hangars without the need to drive their vehicles onto the airside. A vehicle parking area on the landside side of the fence is usually provided. In some other cases users require to have vehicle access to the airside. This access is generally controlled by electronic access gates which allow access only to authorized users.

The airport property boundary is currently not fenced. The installation of a perimeter fence was approved by the Planning and Zoning Department and Tribal Council in 2014. The entrance of the airport is enclosed with a 1,141 foot long eight foot chain link fence with two sliding gates. A 50 foot manual gate allows aircraft access to the airport from Bud Road. A 20 foot manual sliding gate allows vehicle access to the ramp. The users at Saddleback Industrial Park currently have access to the airport by the use of Bud Road. There are currently no formal legal authority or through-the-fence agreements providing this access.

1.13.10 FUEL FACILITIES

The existing aircraft fueling system consists of a 20,000 gallon 100 Low Lead (LL) AvGas Aboveground Storage Tank (AST) located near the existing apron. The fuel tank was recently upgraded to current industry standards for quality control, delivery, dispensing, spill prevention, secondary containment, environmental regulations, retail self-service sales and inspections. The tank is equipped with a self-service credit card reader and allows fueling 24 hours a day, 7 days a week.

1.13.11 AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF) EQUIPMENT & STORAGE BUILDING

Aircraft Rescue and Fire Fighting (ARFF) equipment is not required at airports that do not serve scheduled passenger service with aircraft having 10 or more passenger seats. Local municipal or volunteer fire departments typically provide fire protection to general aviation airports in their district. Mutual aid agreements may also be provided and developed with nearby fire departments to assist in emergency situations. In any case, procedures should be in place to ensure emergency response in case of an accident or emergency at the airport. Although statistically very safe, the most likely emergency situations at general aviation airports are an aircraft accident, fuel or aircraft fire or a hazardous material spill, such as fuel.

The level of protection recommended in FAA Advisory Circular 150/5210-6D, *Aircraft Fire and Rescue Facilities and Extinguisher Agents*, for small general aviation airports is 190 gallons of aqueous film forming foam (AFFF) supplemented with 300 pounds of dry chemical. Proximity suits should be utilized for fire fighter protection. Aviation rated fire extinguishers should be immediately available in the vicinity of the aircraft apron and fueling facilities. Adequate facilitates should be provided to store any ARFF vehicle(s) or equipment that is acquired in the future. There is no existing ARFF equipment or personnel based at Ak-Chin Regional Airport nor are any required for a general aviation airport. Emergency response is provided by the Ak-Chin Fire Department.

1.13.12 EMERGENCY SERVICES

Casa Grande Regional Medical Center is the primary care provider for the region and is located approximately 16 miles southeast of the airport.

The nearest fire department is the Ak-Chin Fire Department. The Ak-Chin Fire Department is approximately seven miles from the airport and the response time is 10 minutes. The typical response team to an emergency consists of: two captains, one advance life support, six EMTs and four paramedics. The current equipment at Ak-Chin Fire Department consist of: two engines, two Class A Pumpers, Class A Ladder with a 2,000 gallon Pumper, Type 6 Brush truck and four rescue vehicles and aqueous film forming foams (AFFF) supplemented with 300 pounds of dry chemical.

1.13.13 THROUGH THE FENCE (TTF) OPERATIONS

TTF operations are defined by the FAA as any activity or use of real property of an aeronautical or non-aeronautical nature that is located outside (or off) of airport property but has access to the airport's runway and/or taxiway system. Airport property is property owned by the airport sponsor and shown on an FAA approved ALP. TTF operations occur from property that is immediately adjacent to the airport but which is owned by corporations, businesses or private parties. These properties are not under control in any manner by the airport sponsor.

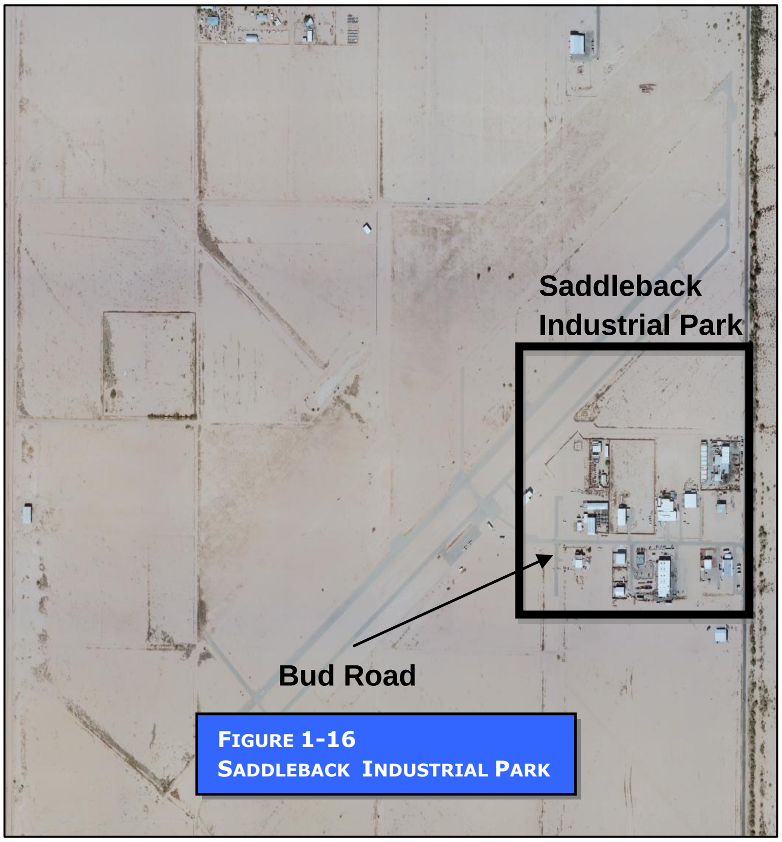


FIGURE 1-16
SADDLEBACK INDUSTRIAL PARK

Under existing federal law, there is no requirement for a public airport sponsor to provide access to the airport from private property adjacent to the airport.

There are several different types of TTF operations:

The first is an airpark or residential environment where private parties construct a residence most often with an aircraft hangar and are provided access to the airport infrastructure.

The second is a private party or company that owns land next to the airport with access to the airport infrastructure and constructs facilities with the intent of providing commercial aeronautical services to the public that often compete with existing or future on-airport businesses.

The third is a business that owns property adjacent to the airport with access to the airport infrastructure but which does not provide any commercial services to the public and whose aircraft use of the airport is incidental to such business.

The existing TTF activity at Ak-Chin Regional Airport allows Saddleback Industrial Park to freely access the airport. There currently is no written recorded access between the airport and Saddleback Industrial Park and the access could be terminated at any time. **Figure 1-16** shows the entrance of the airport through Bud Road and the existing Saddleback Industrial Park.

1.13.14 SECURITY MEASURES

The Transportation Security Administration (TSA) publishes security guidelines for general aviation airports. These recommended practices are intended to provide general aviation airport owners, operators, and users with guidelines and recommendations that address aviations security concepts, technology and enhancements. The seven functional areas of a general aviation airport security include:

- Personnel
- Surveillance
- Specialty Operations
- Aircraft and Facilities
- Security Plans and Communications

Ak-Chin Regional Airport currently does not meet the standards for the TSA security guidelines for general aviation airports by not possessing surveillance equipment or security plans and communication.

TABLE 1-12 AK-CHIN REGIONAL AIRPORT INVENTORY

IDENTIFIER	**FAA SITE NUMBER**	**ARC**	**OWNER/SPONSOR**	**AIRPORT ELEVATION**
A39	00751.55*A	B-I (Small)	Ak-Chin Indian Community	1,300' MSL
RUNWAY 4/22				
	Length	4,751' (Fair)		
	Width	50' (60' Standard)		
	Surface	Asphalt Runway 22 - Displaced Threshold (290')		
	Pavement Strength	Unpublished		
	Marking	Non-Precision		
	Runway Lighting	None		
TAXIWAY				
	Full Length Parallel Taxiway	30' x 4,751' Fair (25' Standard)		
	Taxiway Lighting	None		
APRON				
	Aircraft Apron	54,280 sq ft		
	Tie Down	12		
OTHER				
	Navigational Aids	None		
	Approach Minimums	Visual		
	Visual Aids	Rotating Beacon, Segmented Circle and Lighted Wind Cone		
	Weather Equipment	None		
	Fuel	20,000 Gallon Above Ground Self-Service 100 LL AvGas		
	Facilities	Terminal Building/Hangar		
	FBO	Ak-Chin Indian Community		
	Automobile Parking	50 (Gravel)		
	Perimeter Fencing	7' Chain Link with 1' Barbed Wire		
	Utilities	Power, water, natural gas and telephone		

1.14 AIRSPACE CHARACTERISTICS

The National Airspace System consists of various classifications of airspace that are regulated by the FAA. Airspace is either controlled or uncontrolled. Pilots flying in controlled airspace are subject to Air Traffic Control (ATC) and must follow either Visual Flight Rule (VFR) or Instrument Flight Rule (IFR) requirements. These requirements include combinations of operating rules, aircraft equipment and pilot certification and vary depending on the Class of airspace and are described in 14 CFR Part 71, *Designation of Class A, Class B, Class C, Class D and Class E Airspace Areas; Airways; Routes*; and Reporting Points and 14 CFR Part 91, *General Operating and Flight Rules*. **Figure 1-17** shows the different airspace classes and gives a graphical representation of them.

General definitions of the Classes of airspace are provided below:

- **Class A Airspace**: Airspace from 18,000 feet above MSL up to and including Flight Level (FL) 600 (60,000 feet above MSL).
- **Class B Airspace**: Airspace from the surface to 10,000 feet MSL surrounding the nation’s busiest airports in terms of IFR operations or passenger enplanements.
- **Class C Airspace**: Generally, airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower, are serviced by radar approach control and that have a certain number of IFR operations or passenger enplanements. The airspace usually consists of a five nautical mile radius core surface area that extends from the surface up to 1,200 feet above the airport elevation and a 10 nm radius shelf area that extends from 1,200 feet up to 4,000 feet above the airport elevation.
- **Class D Airspace**: Airspace from the surface up to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports with an operational control tower.
- **Class E Airspace**: Generally, controlled airspace that is not Class A, Class B, Class C or Class D.
- **Class G Airspace**: Generally, uncontrolled airspace that is not designated Class A, Class B, Class C, Class D or Class E.
- **Victor Airways**: These airways are low altitude flight paths between ground based VHF Omnidirectional Receivers (VORs). North-south Victor Airways have odd numbers while east-west airways have even numbers. These are used by both IFR and VFR aircraft. The airspace set aside for a Victor Airway is eight miles wide with a floor at 1,200 feet AGL and extend up to a FL 180.

Figure 1-18 provides a graphical depiction of the airspace surrounding Ak-Chin Regional Airport. The airport is situated within Class G airspace from the ground to 1,200 feet AGL and Class E airspace between 1,200 feet AGL and 18,000 feet MSL.

Victor Airway 105 (V-105) is located directly overhead of the Ak-Chin Regional Airport. V-105 connects the Stanfield VORTAC located approximately eight nautical miles south of the airport with Phoenix VORTAC located approximately 25 nautical miles north of the airport. Increased air traffic can be expected in and around Victor Airways and the originating or terminating VOR.

The traffic patterns at Ak-Chin Regional Airport are standard left traffic for Runway 4 and Runway 22. Traffic Pattern Altitude (TPA) is 2,300 MSL for all aircraft. There are currently no noise abatement procedures in place at the airport.

Figure 1-17
Types of Airspace

1.14.1 AIRSPACE JURISDICTION

Ak-Chin Regional Airport is located within the jurisdiction of the Albuquerque Air Route Control Center (ARTCC) and the Prescott Flight Service Station (FSS). The altitude of radar coverage by the Albuquerque ARTCC may vary as a result of the FAA navigational/radar facilities in operation, weather conditions and surrounding terrain. The Prescott FSS provides additional weather data and other pertinent information to pilots on the ground and enroute.

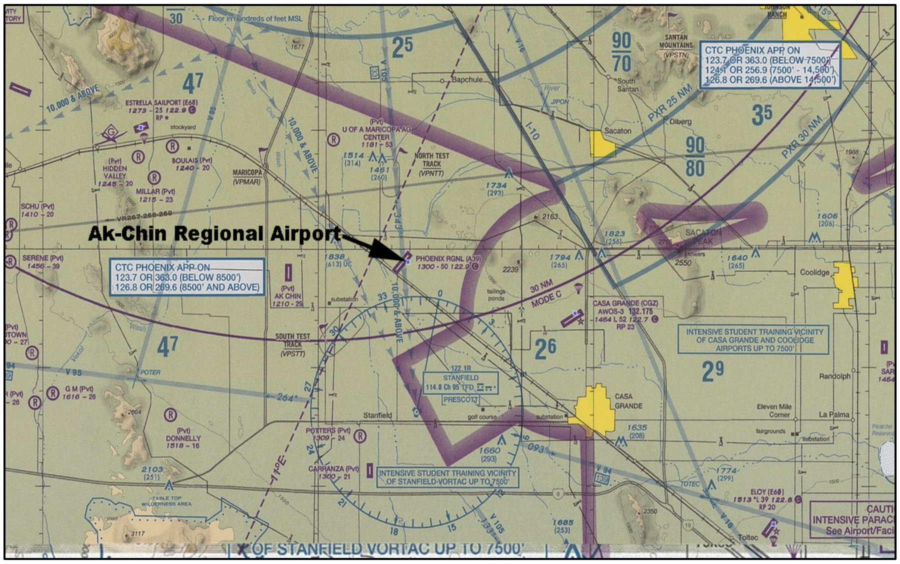


Figure 1-18
Airspace Jurisdiction

1.14.2 AIRSPACE RESTRICTIONS

Military Operation Areas (MOAs) and Military Training Routes (MTRs) are established for the purpose of separating certain military training activities, which routinely necessitate acrobatic or abrupt flight maneuvers, from IFR traffic. Aircraft can be cleared through an active MOA if IFR separation can be provided by Air Traffic Control (ATC), otherwise ATC will reroute or restrict traffic. Restricted areas are defined as “airspace designated under FAR Part 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use and IFR/VFR operations in the area may be authorized by the controlling ATC facility when it is not being utilized by the using agency.” Restricted areas are typically associated with military operations and indicate the existence of unusual, often invisible, hazards to aircraft such as the firing of artillery, aerial gunnery or guided missiles.

Ak-Chin Regional Airport is located approximately 33 nautical miles north of the Sells 1 MOA. The Sells 1 MOA covers the southern central portion of Arizona and includes the airspace from 10,000 feet MSL to 18,000 feet MSL. The Sells 1 MOA is active Monday through Friday from 6:00 a.m. until 7:00 p.m. The Outlaw MOA is located approximately 35 nautical miles north and east of the airport and include the airspace from 8,000 or 3,000 feet AGL, whichever is higher to 18,000 feet MSL. The Outlaw MOA is active Monday through Friday 7:00 a.m. until 6:00 p.m., 6:00 p.m. until 10:00 p.m. by Notice of Airmen (NOTAM) and intermittent weekends by NOTAM. The controlling agency for the MOAs is Albuquerque Center.

Ak-Chin Regional Airport is also located approximately 32 nautical miles east of the R-2310A Restricted Airspace and includes the airspace to 10,000 feet MSL. The R-2310A is active intermittent by NOTAM and as well as 48 hours in advance. R-2310A is part of restricted airspace that is being used for live fire munitions training and Unmanned Aerial Vehicle (UAV) training. The past several years, this restricted area has been used infrequently. This has led to the general practice of assuming it is never in use. R-2310A is now active by NOTAM on a regular basis and increasingly being used for UAV training.

Ak-Chin Regional Airport is also located approximately 33 nautical miles northeast of the R-2304 and approximately 55 nautical miles of the R-2305 airspace and includes the airspaces to flight level 240 feet MSL. The R-2304 is active Monday through Friday from 6:30 a.m. until 12:00 a.m. Ak-Chin Regional Airport is also located approximately 55 nautical miles northeast of the R-2305 airspace and includes the airspace

Ak-Chin Regional Airport is located approximately 83 nautical miles north of the U.S. border with Mexico. Aircraft flying into the U.S. are required to follow the procedures of the Air Defense Identification Zone (ADIZ). An ADIZ is an area of airspace defined by a nation where an aircraft must identify themselves and their location in the interest of national security. An aircraft entering an ADIZ is required to contact ATC and state their planned course, destination and any other information about their trip through the ADIZ.

In addition to MOAs and Restricted Airspace, MTRs poses a potential hazard to civilian aircraft. The MTR program is a joint venture by the FAA and the Department of Defense (DOD). MTRs are mutually developed for use by the military to conduct low-altitude, high-speed training. Increased vigilance is recommended for pilots operating in the vicinity of these training routes. There are two MTRs in the vicinity of the Ak-Chin Regional Airport. Visual MTR (VR 267-268-269) is located approximately four nautical miles north of the airport and runs east/west. Visual MTR (VR 223) is located approximately 24 nautical miles southwest of the airport and runs northeast/southwest.

Special Conservation Areas are also located in the vicinity of the Ak-Chin Regional Airport. This type of airspace surrounds many national parks, wildlife refuges and other noise sensitive areas. Pilots are requested to avoid flight below 2,000 feet AGL in these areas. There are five Special Conservation Areas surrounding the Ak-Chin Regional Airport listed in **Table 1-13**.

TABLE 1-13 SPECIAL CONSERVATION AREAS

SPECIAL CONSERVATION AREA	NAUTICAL MILES	DIRECTION FROM THE AIRPORT
Table Top Wilderness Area	15	Southwest
Sierra Estrella Wilderness Area	17	Northwest
South Maricopa Mountains Wilderness Area	20	West
North Maricopa Mountains Wilderness Area	25	Northwest
Woosley Peak Wilderness	30	Northwest

1.15 METEOROLOGICAL CONDITIONS

Meteorological conditions have a direct impact on the operational characteristics of an airport. These conditions determine the regulations under which operations may be conducted, the frequency of use for each operational configuration and the instrumentation required to assist aircraft in landing or departing.

1.15.1 LOCAL CLIMATIC DATA

Ak-Chin Regional Airport is located in northwest Pinal County in an area that receives approximately 7.98 inches of precipitation annually. The mean maximum temperature of the hottest month, July, is 106 degrees Fahrenheit, while the average minimum temperature of the coldest month, December, is 34 degrees Fahrenheit. The annual average maximum temperature is 87 degrees Fahrenheit and the annual average minimum temperature is 53 degrees Fahrenheit.

1.15.2 CEILING AND VISIBILITY CONDITIONS

Ceiling and visibility conditions are important considerations since the occurrence of low ceiling and/or poor visibility conditions limit the use of the airport. Under poor visibility conditions or Instrument Meteorological Conditions (IMC), the pilot must operate under IFR, rather than VFR. Under IFR, the pilot maneuvers the aircraft through sole reference to instruments in the aircraft and navigational aids on the ground. When flight conditions are visual or Visual Meteorological Conditions (VMC), the pilot can maneuver the aircraft by reference to the horizon and objects on the ground. Afternoon thunderstorms are common in southern Arizona during late summer and early fall during the Monsoon season. **Table 1-14** shows the average rain falls on 32 days each year and the visibility is restricted on 68 days each year.

TABLE 1-14 MEAN NUMBER OF DAYS BY MONTH WITH PRECIPITATION OR OBSTRUCTION TO VISION

	PRECIPITATION (DAYS)	**OBSTRUCTION TO VISION (DAYS)**
January	4	10
February	3	9
March	3	8
April	1	6
May	1	3
June	1	2
July	3	4
August	4	4
September	3	3
October	3	4
November	3	6
December	3	9
ANNUAL TOTAL	**32**	**68**

Source: Western Regional Climate Center, 2012

1.15.3 RUNWAY WIND COVERAGE

TABLE 1-15 CROSSWIND COMPONENT

ALLOWABLE CROSSWIND IN KNOTS	**AIRPORT REFERENCE CODE**
10.5 knots	A-I & B-I
13 knots	A-II & B-II
16 knots	A-III, B-III & C-I through D-III
20 knots	A-IV through D-VI

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

Wind direction and speed determine the desired alignment and configuration of the runway system. Aircraft land and takeoff into the wind and therefore can tolerate only limited crosswind components which is defined as the percentage of wind perpendicular to the runway centerline. The ability to land and takeoff in crosswind conditions varies according to pilot proficiency and aircraft type.

FAA AC 150/5300-13A, *Airport Design*, recommends that a runway should yield 95 percent wind coverage under stipulated crosswind components. If one runway does not meet this 95 percent coverage, then construction of an additional runway may be advisable. The crosswind component of wind direction and velocity is the resultant vector, which acts at a right angle to the runway. It is equal to the wind velocity multiplied by the trigonometric sine of the angle between the wind direction and the runway direction. The allowable crosswind component for each ARC is shown in **Table 1-16**. The allowable crosswind component and corresponding wind coverage percentage at Ak-Chin Regional Airport is shown in **Table 1-17**.

There is no existing historical wind data available for Ak-Chin Regional Airport. The closest wind data available is from Casa Grande Municipal Airport located approximately eight nautical miles southeast of Ak-Chin Regional Airport. Historical wind data from Casa Grande Municipal Airport was used to create a wind rose and corresponding wind coverage data for Ak-Chin Regional Airport as seen in **Figure 1-19.** **Figure 1-20** shows the wind coverage with IFR conditions at the airport

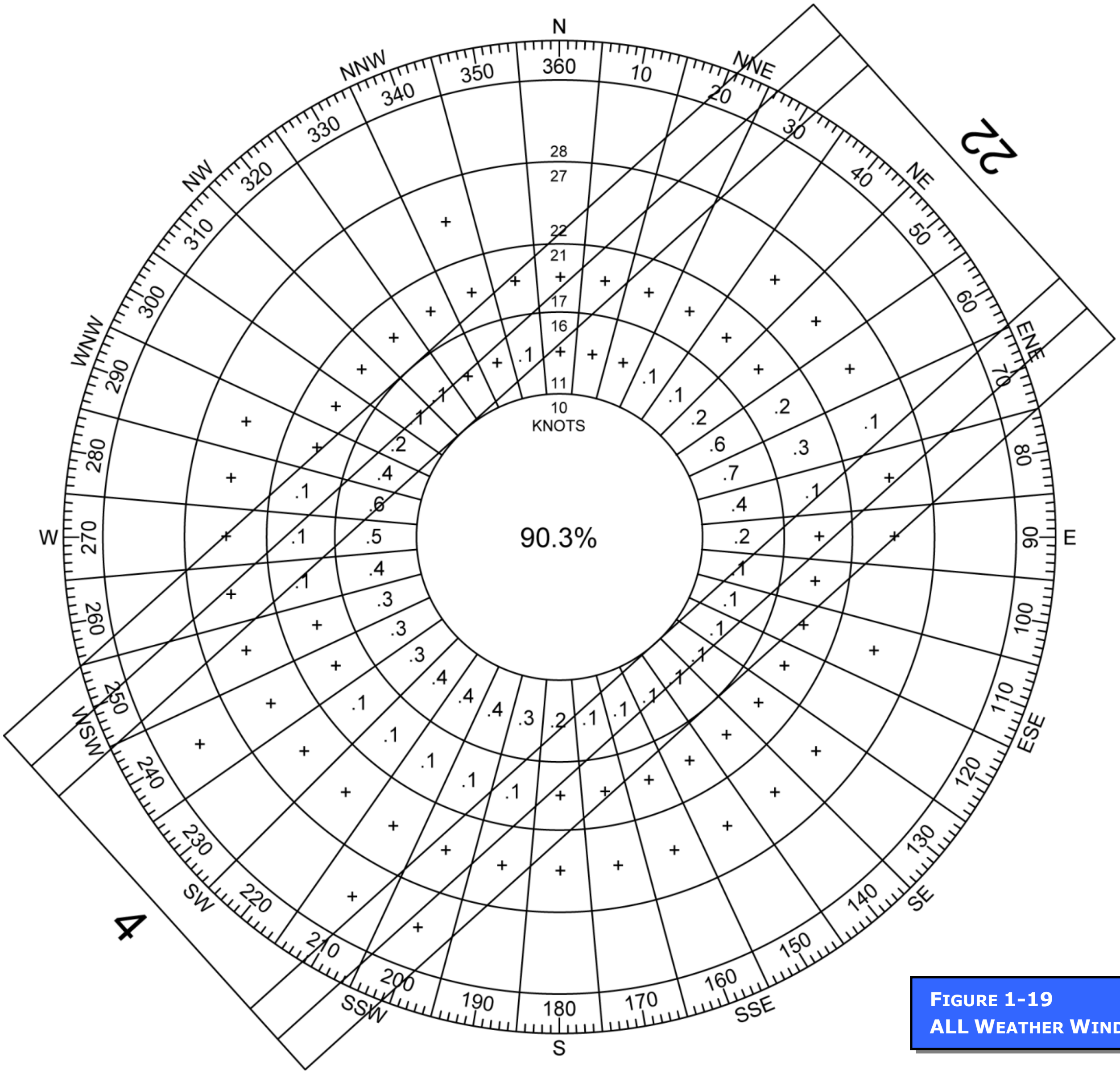


FIGURE 1-19
ALL WEATHER WIND ROSE

NOTE:
CASA GRANDE MUNICIPAL AIRPORT AWOS-3
8 NM E OF A39 AT 1,464' MSL
JANUARY 2001 - DECEMBER 2009
29,986 WIND OBSERVATIONS

Source: National Oceanic and Atmospheric Administration 2012

TABLE 1-16 ALL WEATHER WIND COVERAGE

CROSSWIND	WIND COVERAGE
10.5 knots	97.53%
13 knots	98.97%
16 knots	99.79%

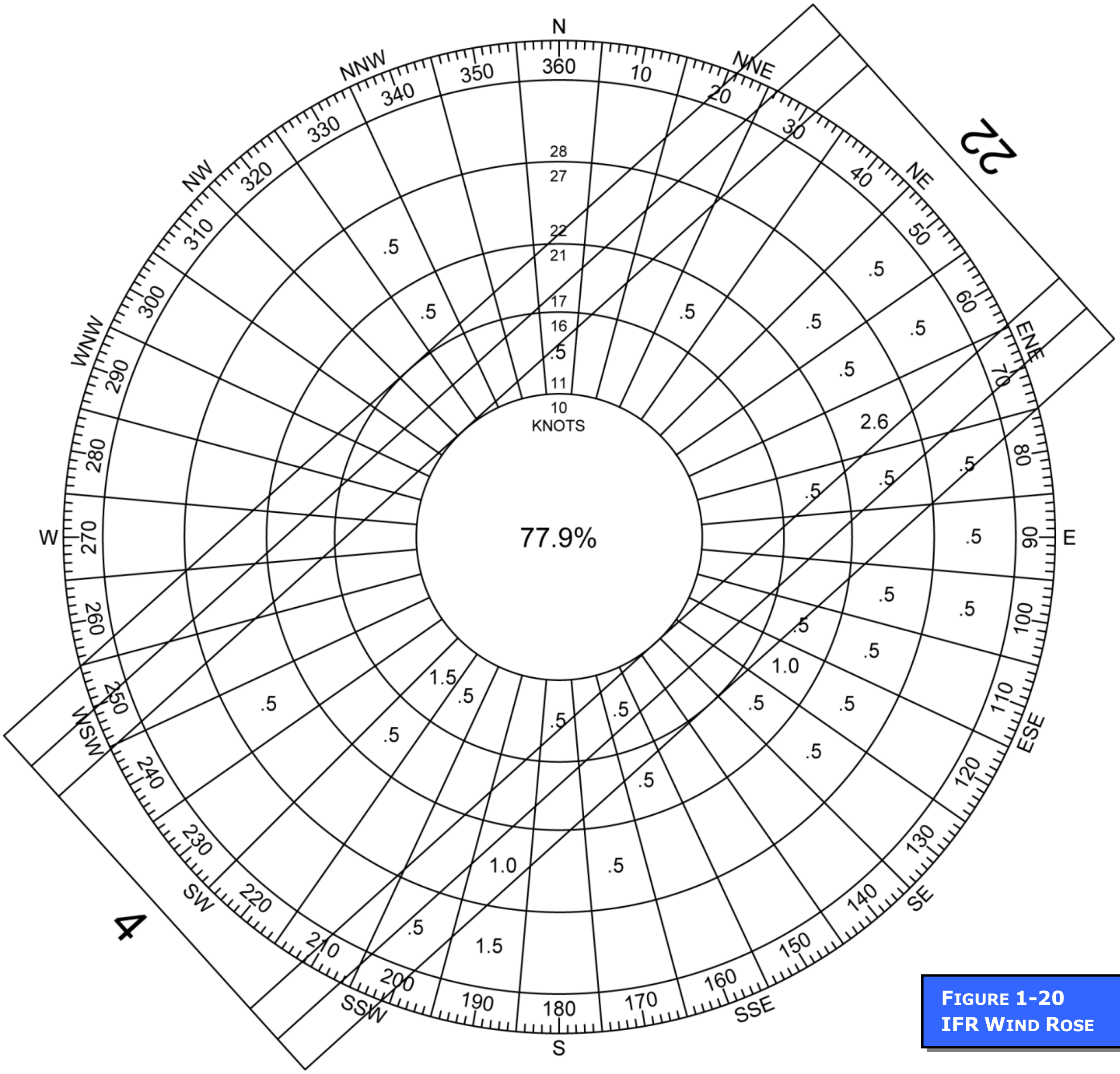


FIGURE 1-20
IFR WIND ROSE

NOTE:
CASA GRANDE MUNICIPAL AIRPORT AWOS-3
8 NM E OF A39 AT 1,464' MSL
JANUARY 2001 - DECEMBER 2009
29,986 WIND OBSERVATIONS

Source: National Oceanic and
Atmospheric Administration 2012

TABLE 1-17 IFR WIND COVERAGE

CROSSWIND	WIND COVERAGE
10.5 knots	86.63%
13 knots	88.42%
16 knots	90.43%

1.16 ENVIRONMENTAL INVENTORY

The purpose of the environmental inventory is to identify key environmental resources that may be affected by potential airport development. The data compiled in this section will be used later in this study in evaluating potential airport development alternatives and to identify environmental related permits that may be required for recommended development projects.

1.16.1 AIR QUALITY

Air quality attainment maps were obtained from the Arizona Department of Environmental Equality. An attainment area is a zone within which level of a pollutant is considered to meet National Ambient Air Quality Standards. The airport is not located within a nonattainment area (**Figure 21 & Figure 22**).

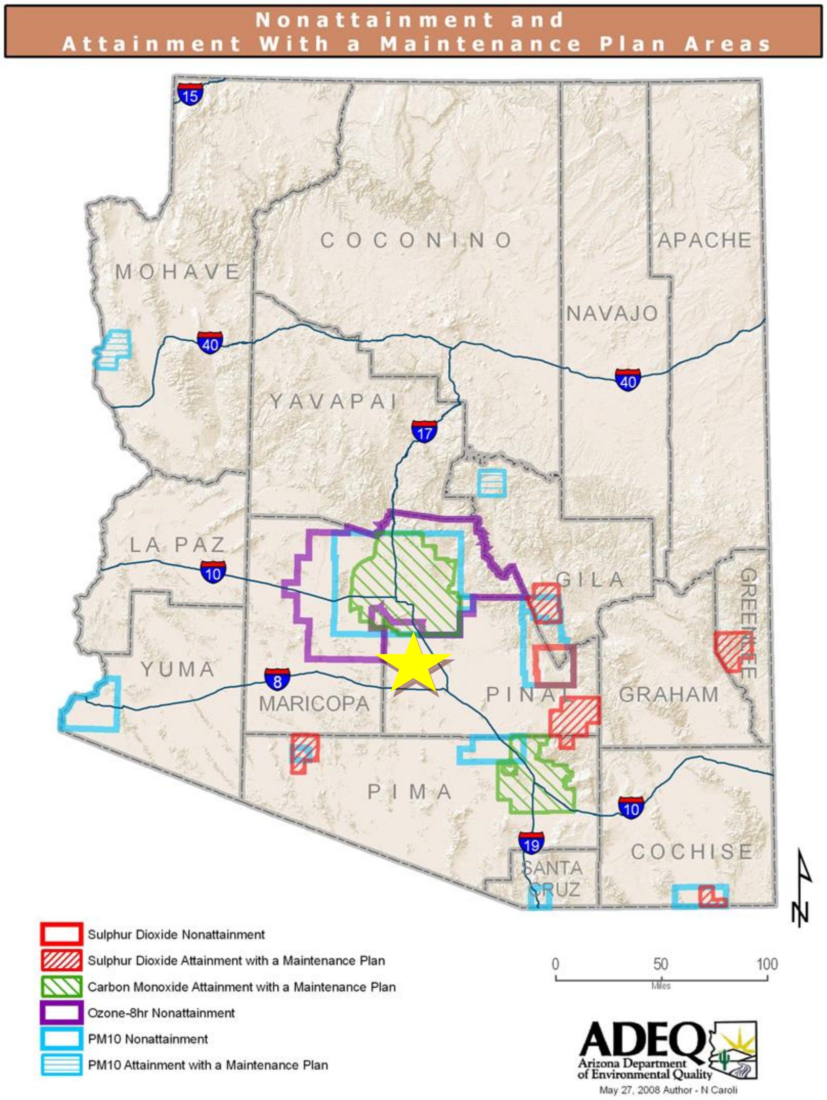
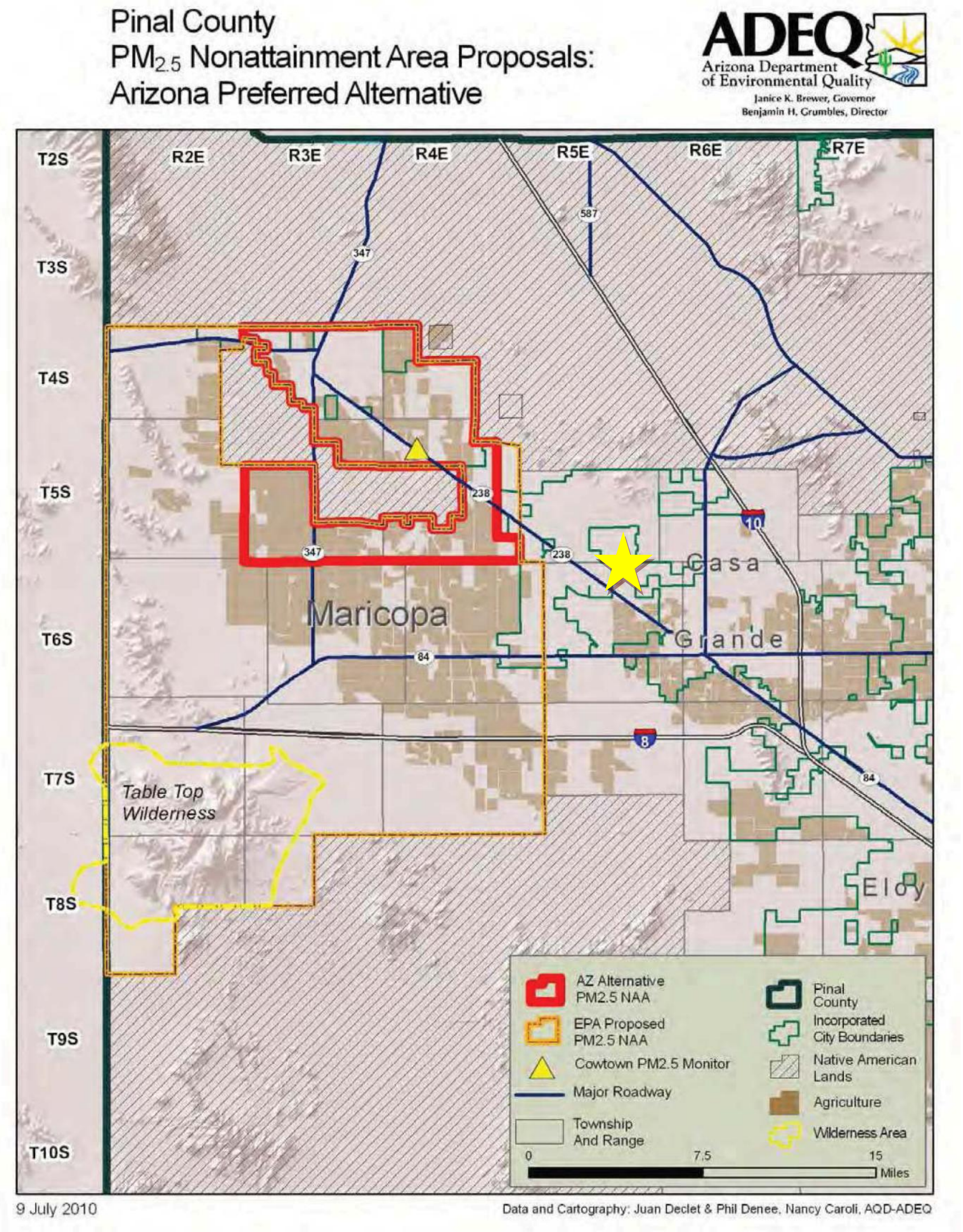


FIGURE 1-21
STATE AIR QUALITY MAP

Figure 2-A. Arizona's Recommended PM2.5 Nonattainment Area Boundary



9 July 2010

Data and Cartography: Juan Declet & Phil Denee, Nancy Caroli, AQD-ADEQ

FIGURE 1-22
COUNTY AIR QUALITY MAP

1.16.2 FISH, WILDLIFE AND PLANTS

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

The species shown on **Table 1-18** are currently listed for Pinal County but do not necessarily occur in the vicinity of Ak-Chin Regional Airport:

TABLE 1-18 THREATENED, ENDANGERED AND CANDIDATE SPECIES

COMMON NAME	**SCIENTIFIC NAME**
ENDANGERED	
Arizona hedgehog cactus	*Enchinocereus triglochidiatus var. arizonicus*
Desert pupfish	*Cyprinodon macularius*
Gila chub	*Gila intermedia*
Gila topminnow	*Poeciliopsis occidentalis occidentalis*
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*
Loach minnow	*Tiaroga cobitis*
Mexican spotted owl	*Strix occidentalis lucida*
Nichol Turk's head cactus	*Enchinocactus horizonthalonius var. nicholi*
Ocelet	*Leopardus pardalis*
Razorback sucker	*Xyrauchen texanus*
Southwestern willow flycatcher	*Empidonax traillii extimus*
Spikedace	*Meda fulgida*
Yuma clapper rail	*Rallus longirostris yumanensis*
CANDIDATE	
Acuna cactus	*Enchinomastus erectocentrus var. acunensis*
Desert tortoise, Sonoran population	*Gopherus agassizii*
Northern Mexican Gartersnake	*Thamnophis eques megalops*
Roundtail chub	*Gila robusta*
Tucson shovelnosed snake	*Chionactis occipitalis klauberi*
Yellow-billed cuckoo	*Coccyzus americanus*
DELISTED	
American peregrine falcon	*Falco pereginus anatum*
Bald eagle	*Haliaeetus leucocephalus*
Cactus ferruginous pygmy-owl	*Glaucidium brasilianum cactorum*
California brown pelican	*Pelecanus occidentalis californicus*

Source: U.S. Fish and Wildlife March, 2012

1.17 FINANCIAL DATA

Airports typically keep financial data records by detailing the annual airport revenues and expenses. **Table 1-19** shows a few examples of the airport revenues and expenses.

TABLE 1-19 TYPICAL AIRPORT REVENUES AND EXPENSES

AIRPORT REVENUES	**AIRPORT EXPENSES**
Fuel Sales	Salaries
Hangar Rental	Utilities
Airport-Access Fees	Office Supplies
Airport Property Leases	Repairs and Maintenance
FBO Sales	Insurance
Commercial Service Agreements	Fuel
Misc. Revenues	Development Capital

The revenues and expenses at Ak-Chin Regional Airport are limited. Currently, there are tiedown fees and a lease rate from the hangars. Fuel sales have averaged 1,200 gallons per month since becoming operational. The expenses at the airport are limited as well. The utilities at the airport are minimal and paid monthly for continual connection. No other revenue or expense sources are documented at the airport.

CHAPTER

2

FORECASTS

AK-CHIN REGIONAL AIRPORT
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER TWO
FORECAST

2.1 INTRODUCTION

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

For this reason, an ongoing program of examination of local airport needs and national and regional trends is recommended and encouraged in order to promote the orderly development of aviation facilities at Ak-Chin Regional Airport.

At airports not served by air traffic control towers, estimates of existing aviation activity are necessary in order to form a basis for the development of realistic forecasts. Unlike towered airports, non-towered general aviation airports have historically not tracked or maintained comprehensive logs of aircraft operations. Estimates of existing aviation activity are based upon a review of based aircraft, available historical data, available local information and regional, state and national data that form the baseline to which forecasted aviation activity trends are applied.

Activity projections are made based upon estimated growth rates, area demographics, industry trends and other indicators. Forecasts are prepared for the Initial-Term (0-5 years), the Intermediate-Term (6-10 years) and the Long-Term (11-20 years) time frames. Utilizing forecasts within these time frames will allow airport improvements to be timed to meet demand, but not so early as to remain idle for an unreasonable length of time.

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

Local operations are defined as aircraft movements (departures or arrivals) for the purpose of training, pilot currency or pleasure flying within the immediate area of the local airport. These operations typically consist of touch-and-go operations, practice instrument approaches, flights to and within local practice areas and pleasure flights that originate and terminate at the airport under study.

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

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

Transient operations are defined as the total operations made by aircraft other than those based at the airport under study. These operations typically consist of business or pleasure flights originating at other airports, with termination or a stopover at the study airport.

The terms transient and itinerant are sometimes erroneously used interchangeably and one should be careful not to “double count” operations. This study will confine the analysis to local and itinerant operations, whether or not they are conducted by based or transient aircraft.

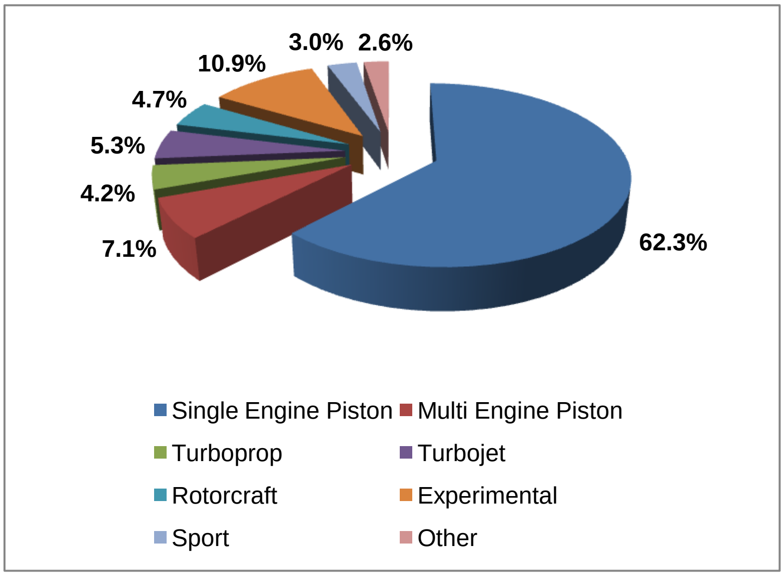
2.2 NATIONAL AND REGIONAL TRENDS

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

The FAA annually convenes expert panels in aviation and develops forecasts for future activity in all areas of aviation, including general aviation. The FAA’s 2012-2032 forecast predicts that the total general aviation fleet will increase at an average annual rate of 0.9 percent during the 20-year forecast period, growing from 222,520 aircraft in 2011 to 250,380 aircraft in 2031. The fleet of jet turbine aircraft is expected to increase at a greater rate than the fleet of piston aircraft; as a result, the number of piston aircraft, while continuing to increase, is expected to represent a smaller percentage of the total general aviation fleet. **Figures 2-1** and **2-2** illustrate this forecasted change to the general aviation fleet that is forecast to occur over the 20-year period.

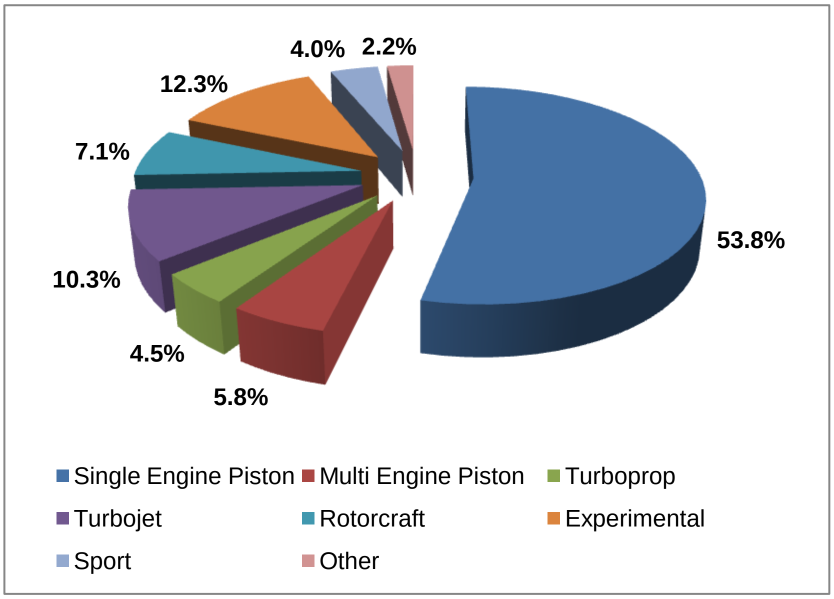
In 2005 the category of “light sport” aircraft was created. At the end of 2006 a total of 1,273 aircraft were included in this category. In 2011 the number of sport aircraft increased to 6,645. By 2031 a total of 10,040 light sport aircraft are projected to be in the fleet.

FIGURE 2-1
EXISTING GA FLEET MIX



Source: FAA Aerospace Forecast Fiscal Years 2012-2032

FIGURE 2-2
FUTURE GA FLEET MIX



Source: FAA Aerospace Forecast Fiscal Years 2012-2032

The General Aviation Manufacturer's Association (GAMA) produces activity forecasts based on general aviation hours flown. As shown in **Table 2-1**, the number of turbojet (TJ) hours is forecast to increase by an average annual growth rate of 5.3 percent between 2011 and 2030. The number of light sport (Sport) hours is forecast to increase at 5.4 percent while the number of multiengine (ME) hours flown will decrease at 0.6 percent.

TABLE 2-1 NATIONAL GENERAL AVIATION FORECAST

	HOURS FLOWN (IN MILLIONS)					
YEAR	SE	ME	TP	TJ	SPORT	TOTAL
2011	**11.4**	**1.8**	**2.5**	**3.6**	**0.3**	**24.3**
2012	11.4	1.8	2.6	4.2	0.4	25.1
2013	**11.2**	**1.8**	**2.6**	**4.8**	**0.4**	**25.8**
2014	11.1	1.8	2.7	5.0	0.4	26.1
2015	**10.9**	**1.7**	**2.7**	**5.3**	**0.4**	**26.4**
2016	10.8	1.7	2.7	5.5	0.5	26.7
2017	**10.8**	**1.7**	**2.7**	**5.8**	**0.5**	**27.1**
2018	10.8	1.6	2.7	6.0	0.5	27.6
2019	**10.8**	**1.6**	**2.8**	**6.3**	**0.5**	**28.0**
2020	10.9	1.6	2.8	6.5	0.6	28.6
2021	**11.0**	**1.6**	**2.8**	**6.8**	**0.6**	**29.2**
2022	11.2	1.6	2.9	7.1	0.6	29.9
2023	**11.4**	**1.6**	**2.9**	**7.4**	**0.6**	**30.6**
2024	11.6	1.6	2.9	7.7	0.7	31.4
2025	**11.9**	**1.6**	**3.0**	**8.0**	**0.7**	**32.3**
2026	12.2	1.6	3.0	8.3	0.7	33.1
2027	**12.5**	**1.6**	**3.1**	**8.7**	**0.8**	**34.1**
2028	12.8	1.7	3.1	9.0	0.8	35.0
2029	**13.1**	**1.7**	**3.2**	**9.4**	**0.8**	**35.9**
2030	13.4	1.7	3.2	9.8	0.9	36.9
Avg. Annual Growth	**0.8%**	**-0.6%**	**1.3%**	**5.3%**	**5.4%**	**2.2%**

The relatively inexpensive twin-engine Very Light Jets (VLJs) (priced between $1 and $2 million) were believed by many to have the potential to redefine the business jet segment by expanding business jet flying and offering performance that could support a true on-demand air-taxi business service. However events since that time have dampened expectations for a rapid penetration of VLJs (**Figure 2-3**) into the market, most notably the bankruptcy of Eclipse and the demise of DayJet. In 2008, VLJ deliveries fell short of assumptions (262 vs. 400). Despite the challenging economy and the uncertainty surrounding the future of Eclipse, the forecast assumes that about 440 VLJs will enter the active fleet in the U.S. over the next 3 years, with an average of 216 aircraft a year for the balance of the forecast period.

FIGURE 2-3
VLJ

The number of active general aviation pilots (excluding air transport pilots) is projected to be 501,295 in 2032, an increase of almost 35,000 (up 0.3 percent yearly) over the forecast period. Commercial pilots are projected to increase from 120,865 in 2011 to 130,100 in 2032, an average annual increase of 0.4 percent. The number of student pilots is forecast to increase at an average annual rate of 0.1 percent over the forecast period, declining from 118,657 in 2011 to 116,720 in 2032. In addition, FAA is projecting that by the end of the forecast period a total of 13,900 sport pilots will be certified. As of December 31, 2011, the estimated number of sport pilot certificates issued was 3,066 reflecting a growing interest in this new "entry level" pilot certificate that was only created in 2005. The number of private pilots is projected to grow at an average yearly rate at 0.1 percent over the forecast period to a total of 199,300 in 2032 from 194,441 in 2011.

The FAA is also projecting that by the end of the forecast period that a total of 13,900 sport pilots will be certified. It is also projected that the estimated number of sport pilot certificates in 2012 was 4,800, reflecting a growing interest in this new "entry level" pilot certificate that was only created in 2005.

Next Generation Air Transportation System (NextGen) is a new era in flight that is transforming how aircraft navigate the sky and is a replacement to the World War II era technology that has until recently been the primary navigation technology. NextGen utilizes satellite technology (**Figures 2-4** and **2-5**) which allows pilots to know the precise locations of other aircraft around them. This allows more planes in the sky while enhancing the safety of air travel. Satellite-based landing procedures also allow pilots arrive at airports more efficiently by providing for more direct flight routes.

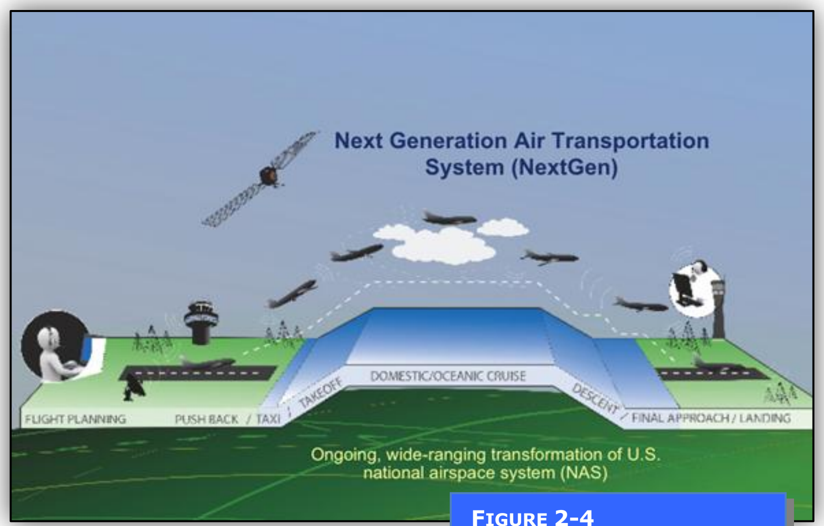


FIGURE 2-4
NEXTGEN TECHNOLOGY

The FAA continues to deploy procedures that improve access to many general aviation airports in almost all weather conditions. Localizer Performance with Vertical Guidance (LPV) are precision GPS approaches, enhanced by Wide Area Augmentation System signals, that provide vertical guidance as low as 200-250 feet above the runway for equipped aircraft.

LPVs are operationally equivalent to Instrument Landing Systems (ILS) approaches but require no costly infrastructure or maintenance. As of February 2012, there were 2,772 LPVs at 1,410

FIGURE 2-5 NEXTGEN PRECISION

2.3 EXISTING AVIATION ACTIVITY

The Ak-Chin Regional Airport has an existing an ARC of B-I (small). The majority of the aircraft utilizing the airport are predominately single engine and multi-engine piston aircraft. Other users also include rotorcraft, gliders and ultralights. Currently at the airport, the users include flight training, business and personal transportation along with recreational operations.

2.4 FACTORS INFLUENCING AVIATION DEMAND

There are several factors influencing aviation demand at the Ak-Chin Regional Airport. These factors include a mix of local and itinerant operations and the attraction of location-neutral businesses. Operations of private businesses, tourism and the government are expected to remain relatively consistent with increased operations over the 20-year planning period. Proximity to the Cities of Phoenix and Tucson, flight training from surrounding flight schools, excellent flying weather conditions and the business development of the Ak-Chin's Industrial Park and Saddleback Industrial Park are major factors in the demand for future airport facilities at the Ak-Chin Regional Airport.

2.4.1 PROXIMITY OF PHOENIX AND TUCSON

The proximity of Phoenix and Tucson to the Ak-Chin Regional Airport contributes to the demand for future airport facilities. Due to increasing air traffic, population and economic reasons for residents of either city may choose Ak-Chin Regional Airport over closer airports. **Figure 2-6** and **Table 2-2** shows the surrounding Counties and the population projections for 2021 and 2031.

TABLE 2-2 COUNTY POPULATION PROJECTIONS

	POPULATION PROJECTIONS	
COUNTY	**2021**	**2031**
Pinal	634,338	876,091
Maricopa	5,374,643	6,294,310
Pima	1,290,058	1,458,104
Cochise	171,741	189,286
Graham	41,469	44,875
Gila	65,012	70,358

Source: Arizona Department of Administration, 2006-2055 Population Projections

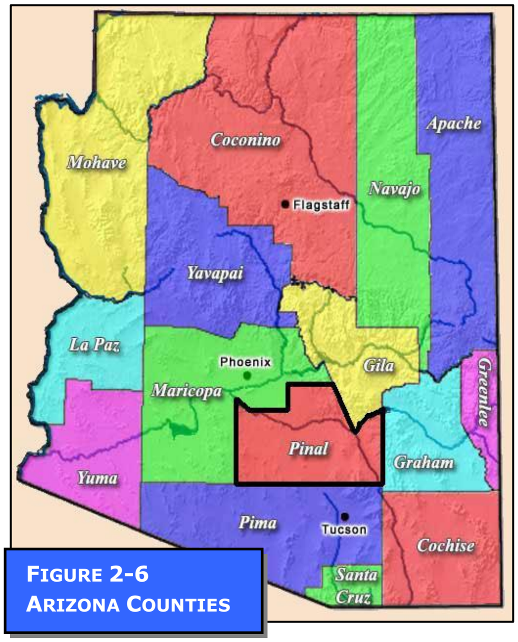


FIGURE 2-6
ARIZONA COUNTIES

2.4.2 FLIGHT SCHOOLS

There are approximately 80 flight schools in Arizona. The State has a reputation for flight training because of the excellent year-round flying conditions. Flight schools require both local and itinerant flights in order to meet flight proficiency requirements for obtaining FAA pilot certifications. These flights include touch-and-goes, local and cross-county flights and simulated approaches. Pilot certifications include Sport, Private, Instrument, Commercial, Instructor and Airline Transport rating.

2.4.3 BUSINESS DEVELOPMENT

Ak-Chin Regional Airport is surrounded by The Ak-Chin Industrial Park and Saddleback Industrial Park. The community is making strong efforts to expand the Ak-Chin Industrial Park by offering low taxation and promoting their close proximity to Maricopa, Casa Grande, Phoenix and Tucson. The Ak-Chin Industrial Park Board develops, operates and manages the Community's industrial properties, which are expected to grow in the future. The increasing number of businesses growing near the Ak-Chin Regional Airport will provide a substantial influence on aviation demand.

2.5 POTENTIAL AVIATION ACTIVITY

Forecasts of aviation activity provide the basis of evaluating the adequacy of existing airport facilities and their capability to handle increased traffic levels or different types of traffic. They are the foundation for effective decision making in airport planning, such as if and when improvements are needed, the level of capital improvements and the timing of the necessary investments.

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

General aviation forecasts are typically based on historical data and broadly accepted industry and governmental estimates of aviation activity, as well as, the primary socio-economic drivers of general aviation activity.

For this reason, an ongoing program of examination of local airport needs and national and regional trends is recommended and encouraged in order to promote the orderly development of aviation facilities at the Ak-Chin Regional Airport.

The number of based aircraft is the most basic indicator of general aviation demand. Assuming a number of Operations Per Based Aircraft (OPBA), the number of annual aircraft operations at the airport can be estimated. It has been determined that population in the airport's service area is a significant driver of aviation demand. In other words, a larger population has a higher propensity for registered aircraft in the market area. The forecasts described below assume an increase in OPBA from the existing 344 to 350 this is consistent with FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*, which states a general guideline is 250 OPBA for rural general aviation airports with little itinerant traffic, 350 OPBA for busier general aviation airports with more itinerant traffic. As the airport continues to make improvements increased itinerant traffic is expected at the airport and therefore an increase from 250 to 350 OPBA was considered appropriate.

An airport service area is defined by the communities and surrounding areas served by the airport facility. For example, factors such as the airport's surrounding topographical features, proximity to its users, quality of ground access, required driving time to the airport and the proximity of the facility to other airports that offer the same or similar services can all affect the size of a particular airport's service area. **Figure 2-7** depicts the airport service area. The Primary Service Area includes the area within half the distance of the nearest airport (Casa Grande Airport) from the Ak-Chin Regional Airport and it extends to the nearest surrounding communities.

The Secondary Service Area is the area within 30-minute drive time of the Ak-Chin Regional Airport. Users within this area may choose the Ak-Chin Regional Airport over other airports if there are economic or other advantages at the Ak-Chin Regional Airport such as lower lease rates, less expensive fuel or hangar availability.

It is assumed that most of the registered aircraft will be based on airports located within the airport service area (primary and secondary). The following tables and figures provide two comparative forecasts for based aircraft and operations at Ak-Chin Regional Airport. The first one is based on the City of Maricopa Airport Feasibility Study and the second is based on the population growth within the airport service area, specifically the cities of Casa Grande and Maricopa which are the largest cities in the airport service area.

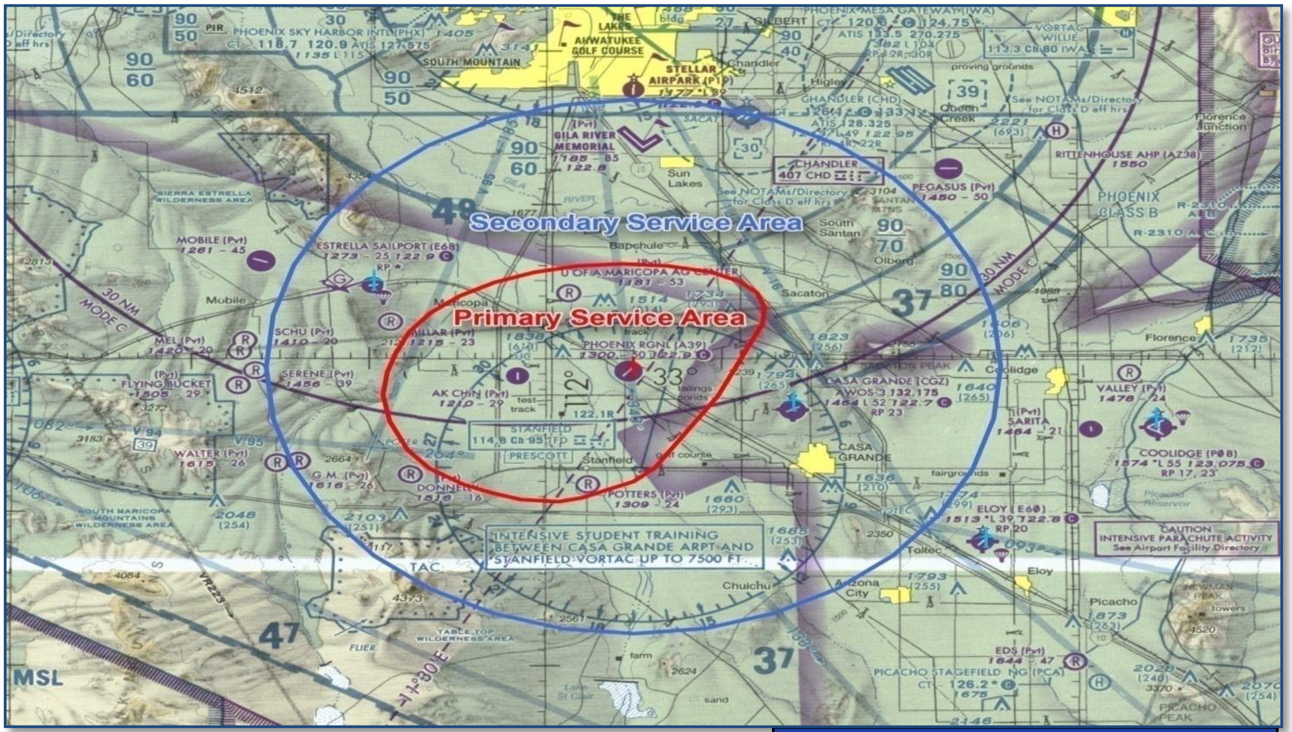


FIGURE 2-7
AK-CHIN REGIONAL AIRPORT SERVICE AREA

2.5.1 METHOD I - MARICOPA AIRPORT FEASIBILITY STUDY

The City of Maricopa, in cooperation with the Arizona Department of Transportation, commissioned an Airport Feasibility and Site Selection Study in 2008 to provide a market, siting, and financial feasibility analysis for a potential general aviation airport to serve the City of Maricopa and western Pinal County. This report included projections for based aircraft and operations developed primarily on population growth in the planning area. If built, this new airport would become the primary competitor for Ak-Chin Regional Airport.

Table 2-3 and **Table 2-4** show the potential number of based aircraft and operations in relation to the portion of based aircraft between the Ak-Chin Regional Airport and the potential City of Maricopa Airport. If the City of Maricopa Airport is built, the Ak-Chin Regional Airport would have a potential to capture between 10 percent to 75 percent of the forecasted based aircraft for the City of Maricopa Airport. If the City of Maricopa Airport is not built, the Ak-Chin Regional Airport would have a potential to capture 75 to 100 percent of the forecasted based aircraft for the City of Maricopa Airport. At this time there is no indication of the City of Maricopa moving forward with the development of the airport. As such, it is reasonable to expect the Ak-Chin Regional Airport to capture a large percentage of this demand.

TABLE 2-3 - POTENTIAL NUMBER OF AK-CHIN REGIONAL AIRPORT BASED AIRCRAFT

YEAR	10% SHARE	25% SHARE	50% SHARE	75% SHARE	100% SHARE
2011	14	23	46	69	92
2016	16	40	80	120	161
2021	27	67	133	199	266
2026	37	93	185	278	371
2031	47	119	237	357	476

Source: Phoenix Regional Airport Feasibility Study - Final Report - March 2010, updated June 2012

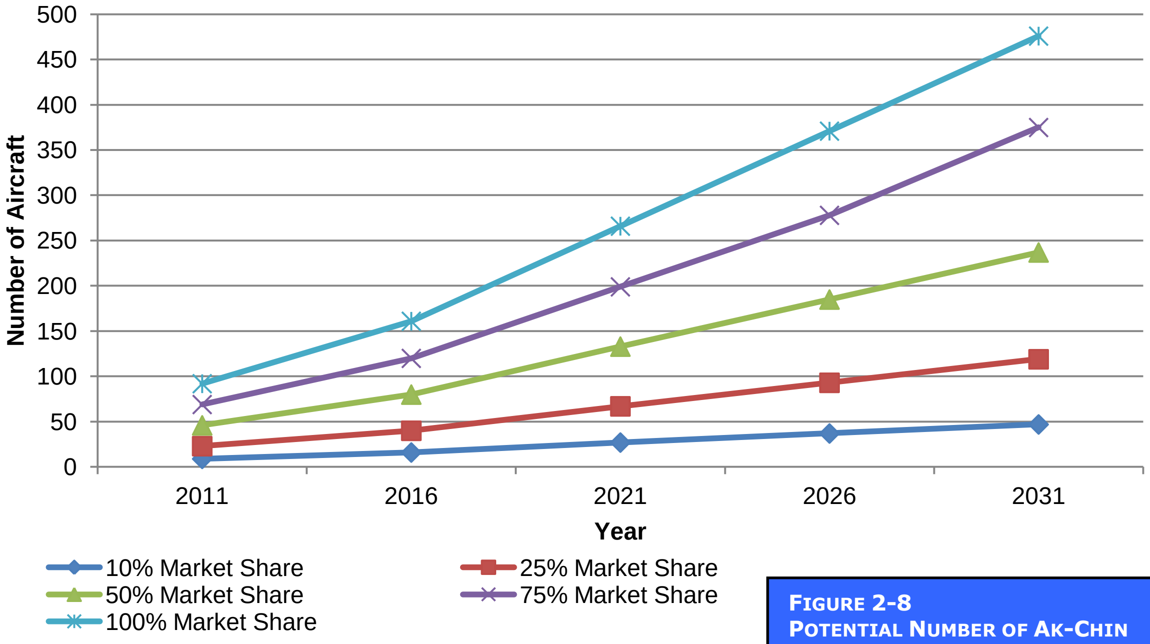


FIGURE 2-8
POTENTIAL NUMBER OF AK-CHIN REGIONAL AIRPORT BASED AIRCRAFT

TABLE 2-4 - POTENTIAL NUMBER OF AK-CHIN REGIONAL AIRCRAFT OPERATIONS

YEAR	10% SHARE	25% SHARE	50% SHARE	75% SHARE	100% SHARE
2011*	4,810	7,912	15,824	23,736	31,648
2016**	5,670	14,140	28,210	42,280	56,350
2021**	9,450	23,520	46,690	69,930	93,100
2026**	12,950	32,620	64,890	97,580	129,850
2031**	16,450	41,720	83,090	125,230	166,600

Source: Phoenix Regional Airport Feasibility Study - Final Report - March 2010, updated June 2012
* Existing 344 OPBA
** Assuming 350 OPBA

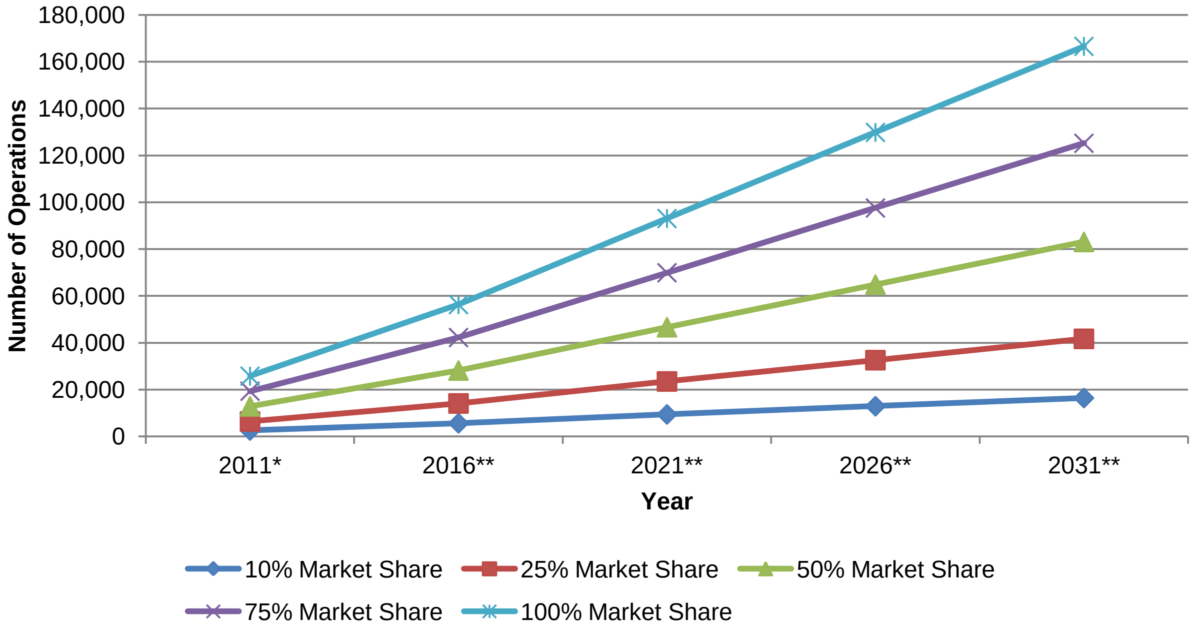


FIGURE 2-9
POTENTIAL NUMBER OF AK-CHIN REGIONAL AIRPORT AIRCRAFT OPERATIONS

2.5.2 METHOD II - SERVICE AREA POPULATION GROWTH

Independent of the construction of the potential City of Maricopa Airport, **Table 2-5** and **Table 2-6** show forecasted based aircraft and operations based on a market share of the total number of registered aircraft in the market area. The number of registered aircraft in the market area increases with population growth. The Ak-Chin Regional Airport has the potential to share 10 percent to 75 percent of the registered aircraft with other airports in the market area. Competition to achieve a certain market share would be difficult since the market area is shared with Casa Grande Municipal Airport and the potential City of Maricopa Airport. Achieving 100 percent market share in the market area is impossible since Casa Grande Municipal Airport already serves a large portion of the market area.

TABLE 2-5 – POTENTIAL NUMBER OF AK-CHIN REGIONAL BASED AIRCRAFT BASED ON POPULATION GROWTH AND SHARE IN THE AIRPORT SERVICE AREA

YEAR	10% SHARE	25% SHARE	50% SHARE	75% SHARE
2011	14	43	85	129
2016	24	60	119	180
2021	31	77	153	230
2026	37	93	186	280
2031	43	109	219	330

Source: Arizona Department of Commerce,2012

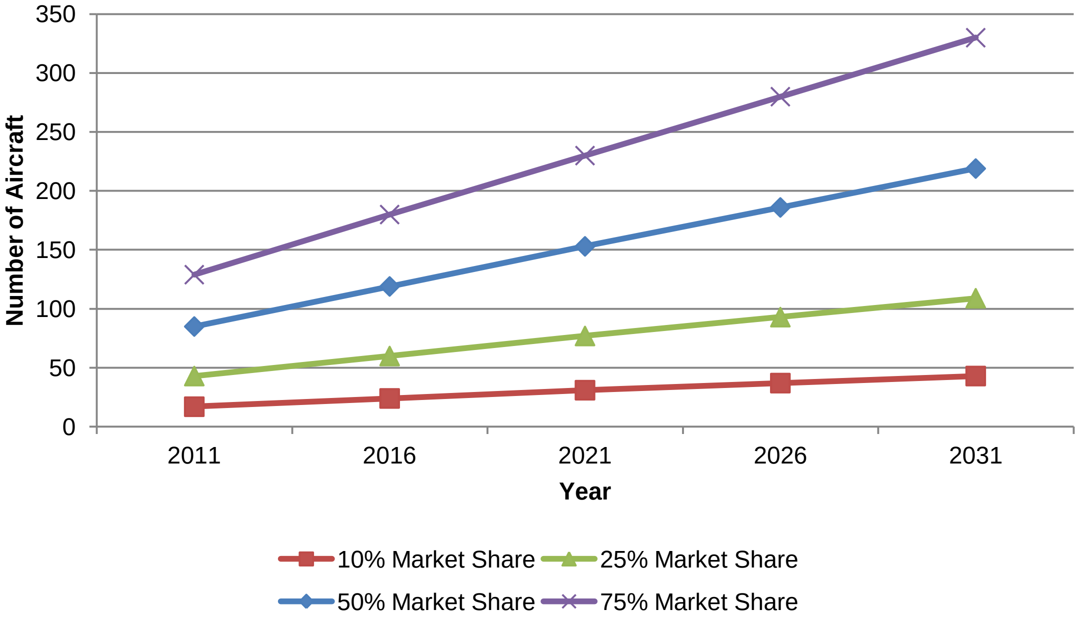


FIGURE 2-10
POTENTIAL NUMBER OF AK-CHIN REGIONAL AIRPORT BASED ON POPULATION GROWTH AND SHARE IN THE AIRPORT SERVICE AREA

TABLE 2-6 - POTENTIAL NUMBER OF AK-CHIN REGIONAL AIRPORT AIRCRAFT OPERATIONS BASED ON POPULATION GROWTH AND SHARE IN THE AIRPORT SERVICE AREA

YEAR	10% SHARE	25% SHARE	50% SHARE	75% SHARE
2011*	4,810	11,990	23,710	35,700
2016**	8,540	21,140	41,930	63,000
2021**	10,920	27,020	53,760	80,500
2026**	13,020	32,620	65,310	98,000
2031**	15,120	38,220	76,860	115,500

* Existing 344 OPBA
** Assuming 350 OPBA

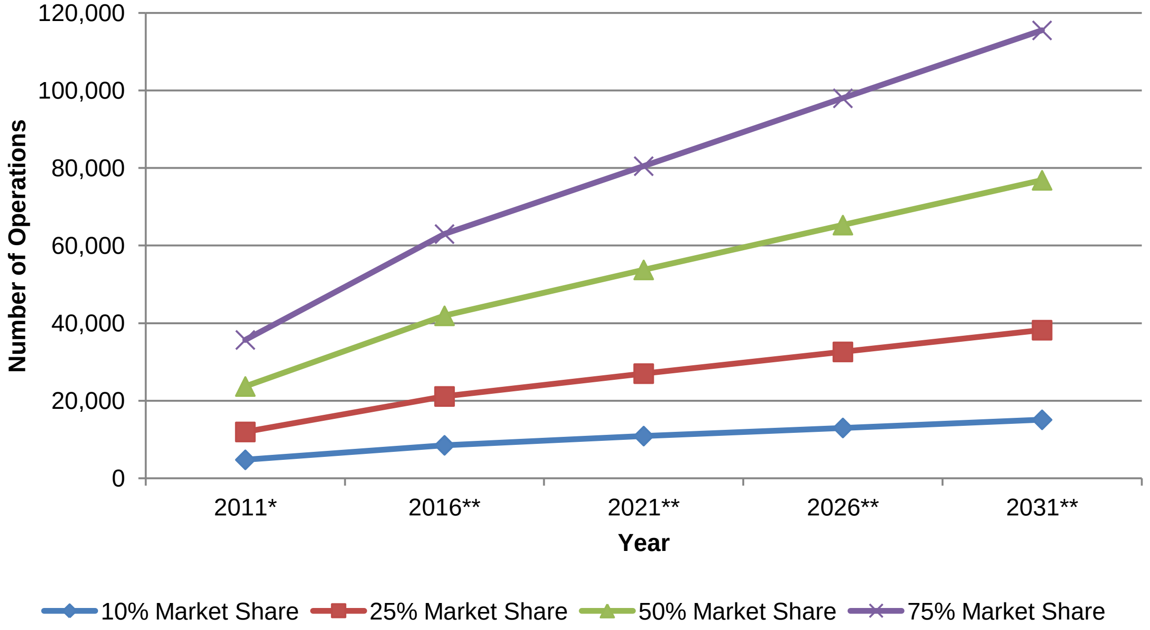


FIGURE 2-11
POTENTIAL NUMBER OF AK-CHIN REGIONAL AIRPORT OPERATIONS BASED ON POPULATION GROWTH AND SHARE IN THE AIRPORT SERVICE AREA

2.5.3 PREFERRED FORECAST

The preferred forecast methodology is one that has been used at other airports and which has some intuitive merit. If no radical change is assumed in the aviation environment recent past, it is possible to estimate future aviation activity based on the premise that the amount of present aviation activity is proportionally related to the most reliable determinant of general aviation activity, which is population growth. All planning forecasts represent a significant "cone of uncertainty" as the planning horizon lengthens; and all forecasts will inevitably be wrong to some degree. A reasonable forecast will guide the development actions as need arises and will not be "so wrong" as to impair the airport's healthy future development.

Table 2-7 shows the preferred forecast for the Ak-Chin Regional Airport. The preferred forecast was determined based on the market share forecast shown on **Table 2-5** and **Table 2-6**. The potential fleet mix can be estimated based on the percentages shown on **Figures 2-12** and **2-13**. Approximately 72 percent of the general aviation fleet consists of piston engine airplanes, which generally are used for personal and business purposes. Experimental and light sport aircraft is a growing market which includes mostly single engine piston aircraft. The turboprop and turbojet airplanes are generally used for corporate transportation purposes. Marketing efforts will be the primary determinant of the fleet mix at the Ak-Chin Regional Airport. Aircraft characteristics associated with each segment in the fleet mix will determine the mix of services and facilities required at the Ak-Chin Regional Airport. Should the actual pace of population growth or aviation demand be less than forecasted, the airport development phasing would be adjusted to match actual demand.

TABLE 2-7 - AK-CHIN REGIONAL AIRPORT PREFERRED FORECAST

YEAR	CAPTURED SHARE	BASED AIRCRAFT	OPERATIONS
2011*	10%	14	4,810
2016**	25%	60	21,140
2021**	50%	153	53,760
2026**	75%	280	98,000
2031**	75%	330	115,500

*Existing 344 OPBA
** Assuming 350 OPBA

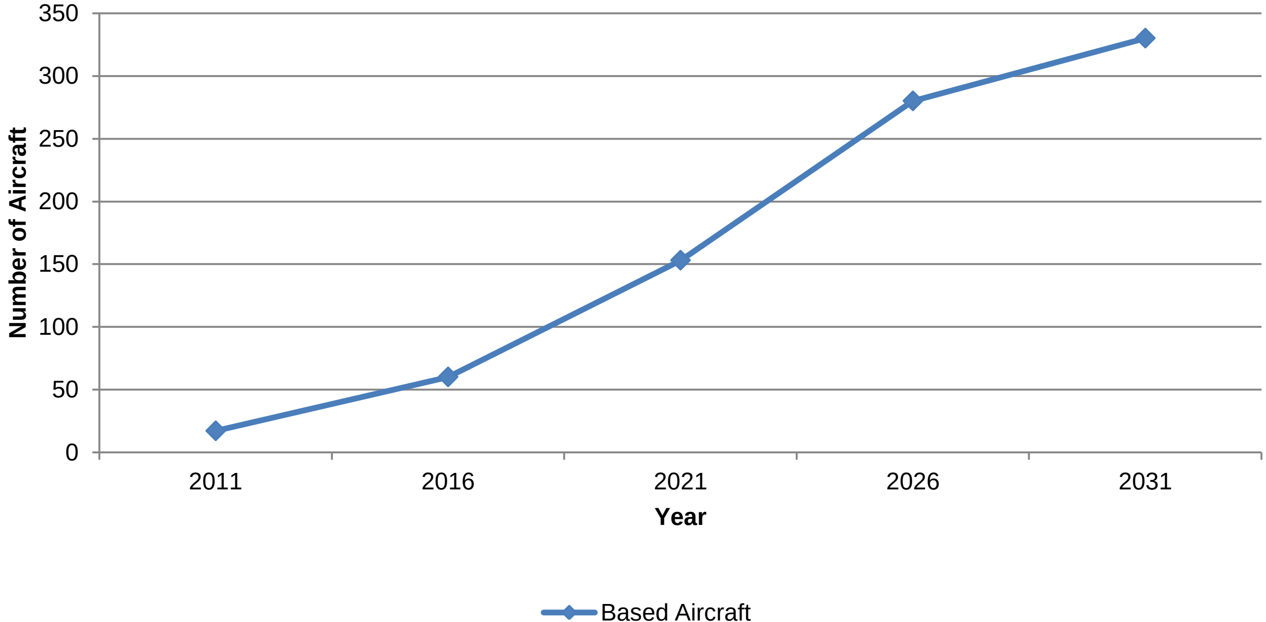


FIGURE 2-12 AK-CHIN REGIONAL AIRPORT PREFERRED FORECAST OF BASED AIRCRAFT

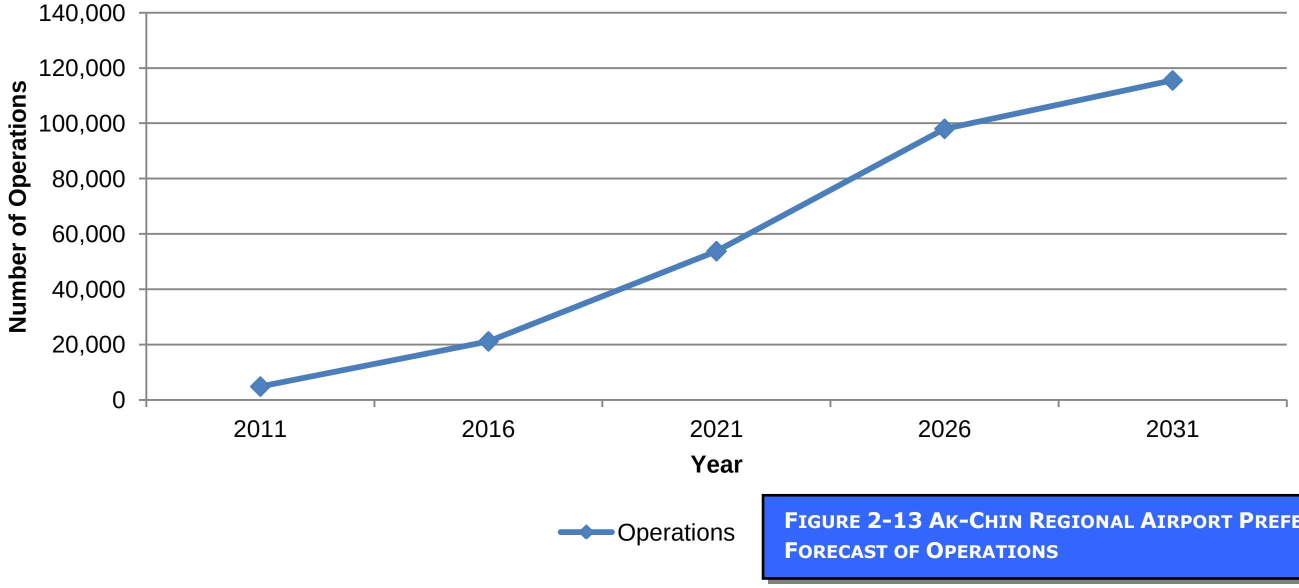


FIGURE 2-13 AK-CHIN REGIONAL AIRPORT PREFERRED FORECAST OF OPERATIONS

2.6 INSTRUMENT OPERATIONS

According to FAA Order 5090.3C, *Field Formulation of the NPIAS*, when forecast data is not available, a satisfactory procedure is to forecast based aircraft using the statewide based aircraft growth rate from the December 2010 Terminal Area Forecast (TAF) and to develop activity statistics by estimating annual operations per based aircraft. The second forecasting method for based aircraft utilized the FAA's Terminal Area Forecast annual growth rate for the State of Arizona of 0.7 percent per year. According to the FAA TAF, 24 percent of the total aircraft operations in Arizona are instrument operations. This number is forecasted to increase to 28 percent by 2031. Since virtually all commercial, corporate and military flights are conducted under IFR, the number of instrument operations does not reflect the occurrence of instrument weather or the provision of instrument approaches at airports. At most general aviation airports with an instrument approach and little or no commercial service or military activity, instrument operations will comprise approximately 2.5 percent of total operations. **Table 2-8** shows the instrument operations at 2.5 percent.

TABLE 2-8 INSTRUMENT OPERATIONS

YEAR	CAPTURED SHARE	OPERATIONS	INSTRUMENT OPERATIONS
2011	10%	4,810	120
2016	25%	21,140	529
2021	50%	53,760	1,344
2026	75%	98,000	2,450
2031	75%	115,500	2,888

2.7 AIRPORT SEASONAL USE DETERMINATION

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

Non-towered airports generally experience a substantially higher number of operations in summer months than off-season months. The average seasonal use trend for FAA towered airports from the 1979-1984 records (total aircraft operations handled by tower facilities nationally from FAA Statistical Handbook of Aviation) was used as a baseline for determining seasonal use trends. As discussed above, the seasonal fluctuation is more pronounced at non-towered airports than towered airports. The seasonal use trend for towered airports was adjusted to approximate seasonal use trends at non-towered airports. The seasonal use trend was developed for Ak-Chin Regional Airport based on the high activity levels during the winter and low during the summer time. This is presented in **Table 2-9** and in **Figure 2-14**.

TABLE 2-9 SEASONAL USE TREND

MONTH	**NON-TOWERED**	**TOWERED**	**AK-CHIN REGIONAL AIRPORT**
January	3.5%	7.2%	12.0%
February	4.0%	8.2%	11.0%
March	4.8%	8.6%	10.0%
April	7.5%	9.0%	8.0%
May	11.3%	9.1%	6.0%
June	13.5%	**9.4%**	4.0%
July	**14.8%**	9.1%	4.0%
August	13.0%	8.7%	4.0%
September	10.0%	8.7%	7.0%
October	8.0%	7.8%	10.0%
November	5.8%	7.1%	11.0%
December	3.8%	7.1%	**13.0%**

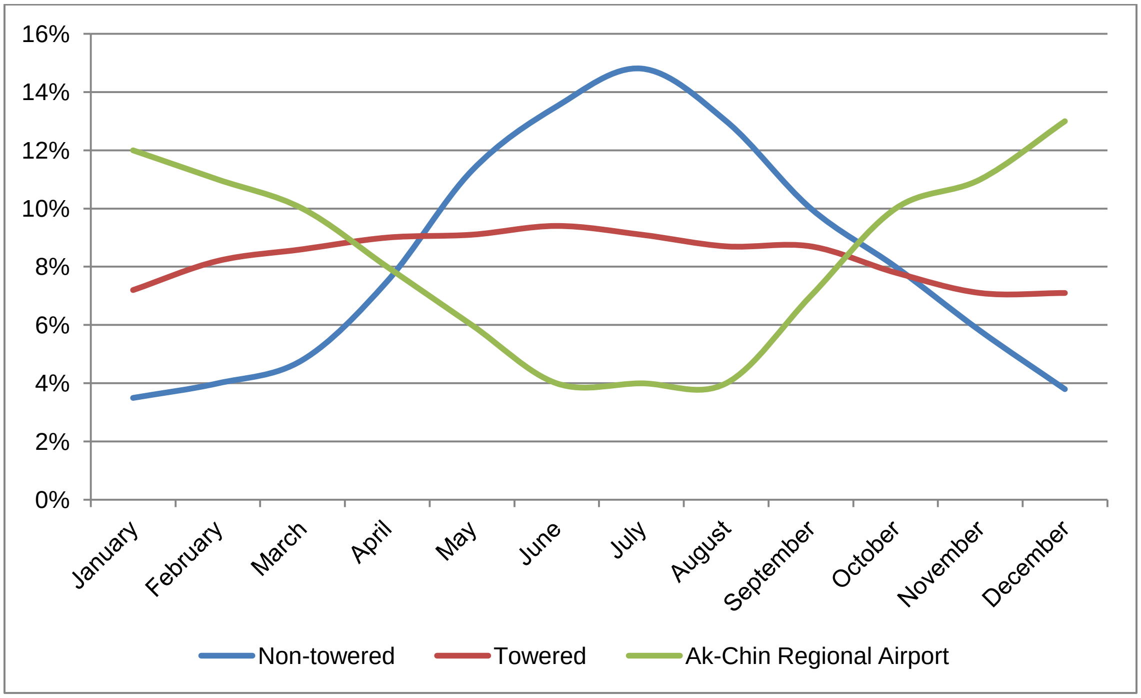


FIGURE 2-14
SEASONAL USE TREND

2.8 HOURLY DEMAND AND PEAKING TENDENCIES

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

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

Design Day: The average day in the peak month derived by dividing the peak month enplanements or operations by the number of days in the month.
Busy Day: The Busy Day of a typical week in the peak month. In this case, the Busy Day is equal to the Design Day.

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

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

The seasonal use trend curve, as presented in **Figure 2-7**, was used as a tool to determine the peaking characteristics for the Ak-Chin Regional Airport. Using the seasonal use information, a formula was derived which will calculate the average daily operations in a given month, based on the percentage of the total annual operations for that month, as determined by the curve. The formula is as follows:

$$M = A\,(T / 100)$$
$$D = M / (365 / 12)$$

Where T = Monthly percent of use (from curve)
M = Average monthly operations
A = Total annual operations
D = Average Daily Operations in a given month

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

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

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

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

The calculations were made for each month of each phase of the planning period. The results of the calculations are shown in **Table 2-10**. As is evident in the Table, the Design Day and Design Hour peak demand in the planning year occurs under VFR weather conditions in the month of December (highlighted in bold in each Table), with 484 daily operations and approximately 40 operations per hour in 2031.

TABLE 2-10 ESTIMATED HOURLY DEMAND/MONTH

PLANNING YEAR: 2016					**PLANNING YEAR: 2021**				
OPERATIONS:	**21,140**				**OPERATIONS:**	**53,760**			
			OPERATIONS					**OPERATIONS**	
MONTH	**% USE**	**MONTHLY**	**DAILY**	**HOURLY**	**MONTH**	**% USE**	**MONTHLY**	**DAILY**	**HOURLY**
January	12.00%	2,537	82	7	January	12.00%	6,451	208	17
February	11.00%	2,325	83	7	February	11.00%	5,914	211	18
March	10.00%	2,114	68	6	March	10.00%	5,376	173	14
April	8.00%	1,691	56	5	April	8.00%	4,301	143	12
May	6.00%	1,268	41	3	May	6.00%	3,226	104	9
June	4.00%	846	28	2	June	4.00%	2,150	72	6
July	4.00%	846	27	2	July	4.00%	2,150	69	6
August	4.00%	846	27	2	August	4.00%	2,150	69	6
September	7.00%	1,480	49	4	September	7.00%	3,763	125	10
October	10.00%	2,114	68	6	October	10.00%	5,376	173	14
November	11.00%	2,325	78	6	November	11.00%	5,914	197	16
December	**13.00%**	**2,748**	**89**	**7**	**December**	**13.00%**	**6,989**	**225**	**19**

PLANNING YEAR: 2026					**PLANNING YEAR: 2031**				
OPERATIONS:	**98,000**				**OPERATIONS:**	**115,500**			
			OPERATIONS					**OPERATIONS**	
MONTH	**% USE**	**MONTHLY**	**DAILY**	**HOURLY**	**MONTH**	**% USE**	**MONTHLY**	**DAILY**	**HOURLY**
January	12.00%	11,760	379	32	January	12.00%	13,860	447	37
February	11.00%	10,780	385	32	February	11.00%	12,705	454	38
March	10.00%	9,800	316	26	March	10.00%	11,550	373	31
April	8.00%	7,840	261	22	April	8.00%	9,240	308	26
May	6.00%	5,880	190	16	May	6.00%	6,930	224	19
June	4.00%	3,920	131	11	June	4.00%	4,620	154	13
July	4.00%	3,920	126	11	July	4.00%	4,620	149	12
August	4.00%	3,920	126	11	August	4.00%	4,620	149	12
September	7.00%	6,860	229	19	September	7.00%	8,085	270	22
October	10.00%	9,800	316	26	October	10.00%	11,550	373	31
November	11.00%	10,780	359	30	November	11.00%	12,705	424	35
December	**13.00%**	**12,740**	**411**	**34**	**December**	**13.00%**	**15,015**	**484**	**40**

2.9 FORECAST SUMMARY

Multiple methods were developed for Ak-Chin Regional Airport to determine a probable range of future aircraft activity levels. Activity estimates were made for based aircraft and annual operations at the airport. The forecasts represent a range of expected activity trends and a preferred forecast was selected for planning purposes. Ak-Chin Regional Airport was recently included in the NPIAS and no FAA forecast is available for the airport. A summary of the forecasts of aviation activity are provided in **Table 2-11**.

Should the airport begin receiving scheduled or unscheduled air carrier aircraft, 14 CFR Part 139 certificate would be required. 14 CFR Part 139 requires FAA to issue airport operating certificates to airports that:

- Serve scheduled and unscheduled air carrier aircraft with more than 30 seats;
- Server scheduled air carrier operations in aircraft within more than 9 seats but less than 31 seats; and
- The FAA Administrator requires having a certificate.

Airport Operating Certificates serve to ensure safety in air transportation. To obtain a certificate, an airport must agree to certain operational and safety standards and provide for such things as firefighting and rescue equipment. These requirements vary depending on the size of the airport and the type of flights available. The regulation, however, does allow FAA to issue certain exemptions to airports that serve few passengers yearly and for which some requirements might create a financial hardship.

Due to the proximity to the Phoenix metropolitan area, the projected growth of Pinal County and Harrah's Ak-Chin Casino constantly is developing attractions to the already popular tourism spot. The airport may consider becoming a 14 CFR Part 139 certificated airport within the 20 year planning period. This would accommodate future commercial air carriers and charters. A 14 CFR Part 139 certificate should be acquired based on actual demand.

TABLE 2-11 FORECAST SUMMARY

YEAR	BASED AIRCRAFT	ITINERANT OPERATIONS	LOCAL OPERATIONS	INSTRUMENT OPERATIONS	TOTAL ANNUAL OPERATIONS
2011	14	1,924	2,886	120	**4,810**
2016	60	8,456	12,684	529	**21,140**
2021	153	21,504	32,256	1,344	**53,760**
2026	280	39,200	58,800	2,450	**98,000**
2031	330	46,200	69,300	2,888	**115,500**

As previously shown in **Figure 2-2**, the FAA annually develops forecasts for future general aviation activity. Ak-Chin Regional Airport is trending towards the FAA's future forecast for general aviation airports. Based on the forecasted types of uses for the airport, local and itinerant operations are expected to be conducted by light single and multi engine, medium to large-sized turboprop and jet aircraft and other (experimental, sport and glider) aircrafts. The forecasted by aircraft type is shown in **Table 2-12**

Table 2-12 Detailed Forecasts by Aircraft Type (based aircraft and operations)

	Existing	**2016**	**2021**	**2026**	**2031**
Based Aircraft	14	60	153	280	330
Operations	4,810	21,140	53,760	98,000	115,500
Single Engine	12	41	104	190	224
Operations	16,256	17,786	40,156	66,640	78,540
Multi Engine Piston	1	5	12	22	26
Operations	710	812	4,306	8,515	9,915
Turbo-Prop Aircraft	0	3	8	14	17
Operations	0	571	2,788	4,900	5,775
Turbo-Jet Aircraft	0	2	5	8	10
Operations	0	485	2,367	2,940	3,465
Rotorcraft	1	4	11	20	23
Operations	715	797	2,176	6,185	6,910
Other	0	5	14	25	30
Operations	629	689	1,967	8,820	10,395

CHAPTER

3

FACILITY REQUIREMENTS

AK-CHIN REGIONAL AIRPORT
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER THREE
FACILITY REQUIREMENTS

3.1 INTRODUCTION

One of the primary objectives of this planning study is to determine the size and configuration of airport facilities needed to accommodate the types and volume of aircraft expected to utilize the airport. Data from Chapter 1 and forecasts from Chapter 2 are coupled with established planning criteria to determine what improvements are necessary to airside and landside areas. Then, having established the facility requirements, alternatives for providing these facilities is provided in Chapter 4 to determine the viability of meeting the facility needs.

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

The facility requirements described in the initial sections of this Chapter are based on those facilities needed to accommodate the existing and forecasted aircraft demand at the airport. The recommended development described in this chapter assumes no physical, environmental, political or financial constraints.

3.2 AIRPORT REFERENCE CODE

The ARC is a system established by the FAA that is used to relate airport design criteria to the operational and physical characteristics of the aircraft currently operating and/or intended to operate at the airport. The ARC is determined by the highest existing Runway Design Code (RDC). The RDC has three components relating to the airport design aircraft. The first component, depicted by a letter, is the Aircraft Approach Category and relates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the Aircraft Design Group and relates to aircraft wingspan and tail height (physical characteristic). The third component relates to the visibility minimums expressed by Runway Visual Range (RVR) values are listed in feet of 1200, 1600, 2400 and 4000.Generally, aircraft approach speed applies to runway dimensional criteria and safety zones prior to and beyond the end of the runway. Aircraft wingspan is primarily associated with separation criteria involving taxiways and taxilanes. **Table 3-1** has been included to provide a definition of both Aircraft Approach Categories and Aircraft Design Groups. **Figure 3-1** shows examples of aircraft and their respective ARC.

TABLE 3-1 RUNWAY DESIGN CODE

APPROACH CATEGORY	APPROACH SPEED (KNOTS)
Category A	less than 91
Category B	91 to 120
Category C	121 to 140
Category D	141 to 165
Category E	166 or more

DESIGN GROUP	WINGSPAN (FT)	TAIL HEIGHT (FT)
Group I	less than 49	Less than 20
Group II	49 to 78	20 to 29
Group III	79 to 117	30 to 44
Group IV	118 to 170	45 to 59
Group V	171 to 213	60 to 65
Group VI	214 to 261	66 to 79

AI

Primarily Single-Engine Propeller Aircraft, some light twins

Example Type: Cessna 172 Skyhawk

BI

Primarily Light Twin-Engine Propeller Aircraft

Example Type: Piper Navajo

BII

(<12,500 lbs)
Primarily Light Turboprops

Example Type: Beechcraft King Air

BII

(>12,500 lbs)
Mid-sized corporate jets and commuter airliners

Example Type: Cessna Citation II

A/BIII

Primarily large commuter-type aircraft

Example Type: De Havilland Dash 8

CI, DI

Primarily small and fast corporate jets

Example Type: Lear Jet 36

C/DII

Large corporate jets and regional-type commuter jets

Example Type: Gulfstream IV

C/DIII

Commercial airliners (approx. 100-200 seats)

Example Type: Boeing 737

C/DIV

Large commercial airliners (approx. 200-350 seats)

Example Type: Boeing 767

DV

Jumbo commercial airliners (approx. 350+ seats)

Example Type: Boeing 747

FIGURE 3-1 AIRCRAFT REFERENCE CODES

To ensure that all airport facilities are designed to accommodate the expected air traffic and to meet FAA criteria, the specific ARC for the airport must be determined. In order to designate a specific ARC for an airport, aircraft in that ARC should perform a minimum of 500 annual itinerant operations. The majority of aircraft currently using Ak-Chin Regional Airport have an ARC of A-I and B-I. Airport users and fleet mix were discussed in Chapter 2. Examples of aircraft with an ARC of A-I and B-I are listed in **Table 3-2**. Examples of aircraft with an ARC of A-II and B-II are listed in **Table 3-3**.

The Ak-Chin Regional Airport has an existing ARC of B-I (small). Examples of existing based aircraft are the Cessna 150 and Cessna 172.

A future ARC of B-II will accommodate the existing and future forecasted fleet mix of small business jets and turbo prop aircraft. Examples of these aircraft are the Beech Super King Air B-200 and Pilatus PC-12.

TABLE 3-2 EXAMPLE AIRCRAFT HAVING AN ARC OF A-I OR B-I

AIRCRAFT	**APPROACH SPEED (KNOTS)**	**WINGSPAN (FEET)**	**TAIL HEIGHT (FEET)**	**MAX T.O. WEIGHT (POUNDS)**
Beech Baron 58P	101	37.8	9.1	6,200
Beech Bonanza V35B	70	33.5	6.6	3,400
Beech King Air B100	111	45.9	15.3	11,799
Cessna 150	55	33.3	8.0	1,670
Cessna 172	60	36.0	9.8	2,200
Cessna 177	64	35.5	8.5	2,500
Cessna 182	64	36.0	9.2	2,950
Cessna 340	92	38.1	12.2	5,990
Cessna 414	94	44.1	11.5	6,750
Cessna Citation I	108	47.1	14.3	11,850
Gates Learjet 28/29	120	42.2	12.3	15,000
Mitsubishi MU-2	119	39.1	13.8	10,800
Piper Archer II	86	35.0	7.4	2,500
Piper Cheyenne	110	47.6	17.0	12,050
Rockwell Sabre 40	120	44.4	16.0	18,650
Swearingen Merlin	105	46.3	16.7	12,500
Raytheon Beechjet	105	43.5	13.9	16,100
Eclipse 500 Jet	90	37.9	13.5	5,920
Cessna Citation Mustang	98	43.2	13.5	8,645

Source: FAA AC 150/5300-13A, *Airport Design* and Aircraft Manufacturer's Data

TABLE 3-3 EXAMPLE AIRCRAFT HAVING AN ARC OF A-II OR B-II

AIRCRAFT	APPROACH SPEED (KNOTS)	WINGSPAN (FEET)	TAIL HEIGHT (FEET)	MAX T.O. WEIGHT (POUNDS)
Air Tractor 802F	105	58.0	11.2	16,000
Beech King Air C90-1	100	50.3	14.2	9,650
Beech Super King Air B200	103	54.5	14.1	12,500
Cessna 441	100	49.3	13.1	9,925
Cessna Citation II	108	51.6	15.0	13,300
Cessna Citation III	114	50.6	16.8	17,000
Cessna Citation Bravo	112	52.2	15.0	14,800
Dassault Falcon 50	113	61.9	22.9	37,480
Dassault Falcon 200	114	53.5	17.4	30,650
Dassault Falcon 900	100	63.4	24.8	45,500
DHC-6 Twin Otter	75	65.0	19.5	12,500
Grumman Gulfstream I	113	78.5	23.0	35,100
Pilatus PC-12	85	52.3	14.0	9,920

Source: FAA AC 150/5300-13A, *Airport Design* and Aircraft Manufacturer's Data

3.3 AIRSIDE FACILITY REQUIREMENTS

The airside facilities of an airport are described as the runway configuration, the associated taxiway system, the ramp and aircraft parking area and any visual or electronic approach aids. As previously described the airside facility requirements and recommendations assume no physical, environmental, political or financial constraints. The actual feasibility of future development from the facility requirements chapter will be further evaluated in Chapter 4.

3.3.1 RUNWAY REQUIREMENTS

Annual Service Volume: The Annual Service Volume (ASV) is a calculated reasonable estimate of an airport's annual capacity; taking into account differences in runway utilization, weather conditions and aircraft mix that would be encountered in one year. When compared to the forecasts or existing operations of an airport, the ASV will give an indication of the adequacy of a facility in relationship to its activity level. The ASV is determined by reference to the charts contained in FAA AC 150/5060-5, *Airport Capacity and Delay*. The ASV for the runway configuration is 230,000 operations per year. Under these conditions, the existing runway facilities will adequately meet the demand within the time frame of this study. The airport is forecasted to reach 115,500 annual operations per year in 2031 and have an hourly capacity of 46 aircrafts. The FAA recommends a second runway when the ASV reaches 60 percent, which will be 138,000 operations per year with an hourly capacity of 92 aircraft.

Runway Length:
FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, provides guidance to determine the recommended runway length for an airport based on numerous factors including: airport elevation, mean maximum temperature of hottest month, runway gradient, ambient air temperature, wind velocity and direction, runway surface (wet or dry), aircraft weight, flap settings, length of haul, presence of obstructions and any imposed noise abatement procedures or other prohibitions.

TABLE 3-4 AIRPLANE WEIGHT CATEGORIZATION FOR RUNWAY LENGTH REQUIREMENTS

Airplane Weight Category Maximum MTOW			Design Approach
≤ 12,500 Pounds	Approach Speed < 30 knots		Family groupings of small airplanes
	Approach Speed ≥ 30 knots, but < 50 knots		Family groupings of small airplanes
	Approach Speed ≥ 50 knots	With < 10 Passengers	Family groupings of small airplanes
		With ≥ 10 Passengers	Family grouping of small airplanes
Over 12,500 pounds, but < 60,000 pounds			Family groupings of large airplanes
≥ 60,000 pounds or more, or Regional Jets[1]			Individual large airplane

Note[1]: All regional jets, regardless of their MTOW, are assigned to the 60,000 pounds or more weight category.

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

The process to determine recommended runway lengths for a selected list of critical design airplanes begins with determining the landing weights of the critical aircraft that are expected to use the airport on a regular basis within the established planning period. For aircraft weighing 60,000 pounds or less, the runway length is determined by family groupings of aircraft having similar performance characteristics. The first family grouping is identified as small airplanes, which is defined by the FAA as airplanes weighing 12,500 pounds or less at Maximum Takeoff Weight (MTOW). The second family grouping is identified as large airplanes, which is defined by the FAA as airplanes exceeding 12,500 pounds but weigh less than 60,000 pounds. For aircraft weighing more than 60,000 pounds, the required runway length is determined by aircraft specific length requirements. **Table 3-4** shows the aircraft families determined by the FAA.

Recommended runway lengths are determined using charts in FAA AC 150/5325-4B based on the seating capacity and the mean daily maximum temperature of the hottest month of the year at the airport. The small airplanes with the approach speed of greater than or equal to 50 knots with less than 10 passengers recommends a runway length of 3,700 feet for 95 percent of the fleet (**Figure 3-2**); 95 percent of fleet category applies to airports that are primarily intended to serve medium size population communities with a diversity of usage and a greater potential for increased aviation activities. Also included in this category are those airports that are primarily intended to serve low-activity locations, small population communities and remote recreational areas. The approach speed of greater than or equal to 50 knots with less than 10 passengers recommends a runway length of 4,400 feet for 100 percent of the fleet (**Figure 3-2**). 100 percent of fleet category is a type of airport that is primarily intended to serve communities located on the fringe of a metropolitan area or a relatively large population remote from a metropolitan area. Runway 4/22's current length of 4,751 feet is sufficient to accommodate 100 percent of the small aircraft fleet mix.

Large aircraft weighing over 12,500 pounds, but less than 60,000 pounds is determined with a certain percentage of useful load. The term useful load is defined by the FAA to be the difference between the maximum allowable structural gross weight and the operating empty weight. A typical operating empty weight includes the airplane's empty weight, crew, baggage, other crew supplies, removable passenger service equipment, removable emergency equipment, engine oil and unusable fuel. **Figure 3-3** shows 75 percent of fleet at 60 and 90 percent useful load. **Figure 3-4** show 100 percent of fleet at 60 and 90 percent useful load. **Table 3-5** provides a runway length sufficient to satisfy the operational requirements of approximately 75 percent fleet at 60 and 90 percent useful load. **Table 3-6** shows the aircraft types that comprise the 75 percent of fleet category and **Table 3-7** shows the remaining 25 percent of airplanes that require longer runway lengths and comprise 100 percent of the large airplane fleet.

TABLE 3-5 RUNWAY LENGTH

Approach Speed ≥ 50 knots	
95 Percent of Fleet	3,700'
100 Percent of Fleet	4,400'
Over 12,500 pounds, but < 60,000 pounds	
75 Percent of Fleet at 60 Percent Useful Load	5,200'
75 Percent of Fleet at 90 Percent Useful Load	8,050'
100 Percent of Fleet at 60 percent useful load	7,000'
100 Percent of fleet at 90 percent useful load	11,000'

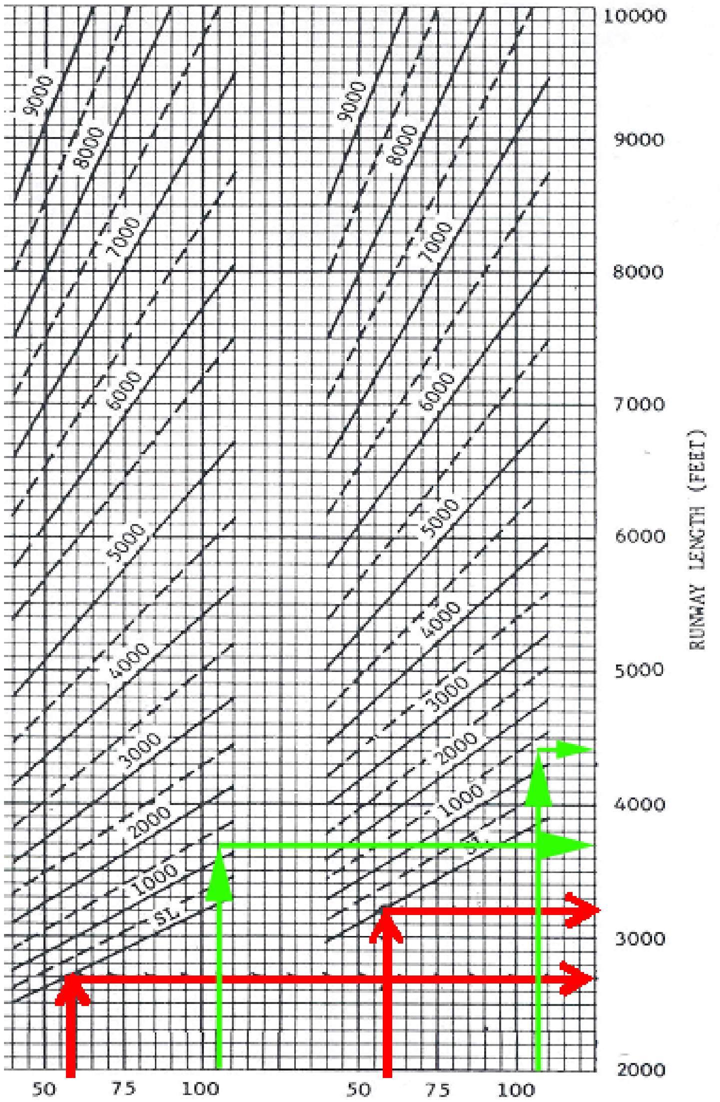


FIGURE 3-2
95 PERCENT OF FLEET (LEFT)
100 PERCENT OF FLEET (RIGHT)

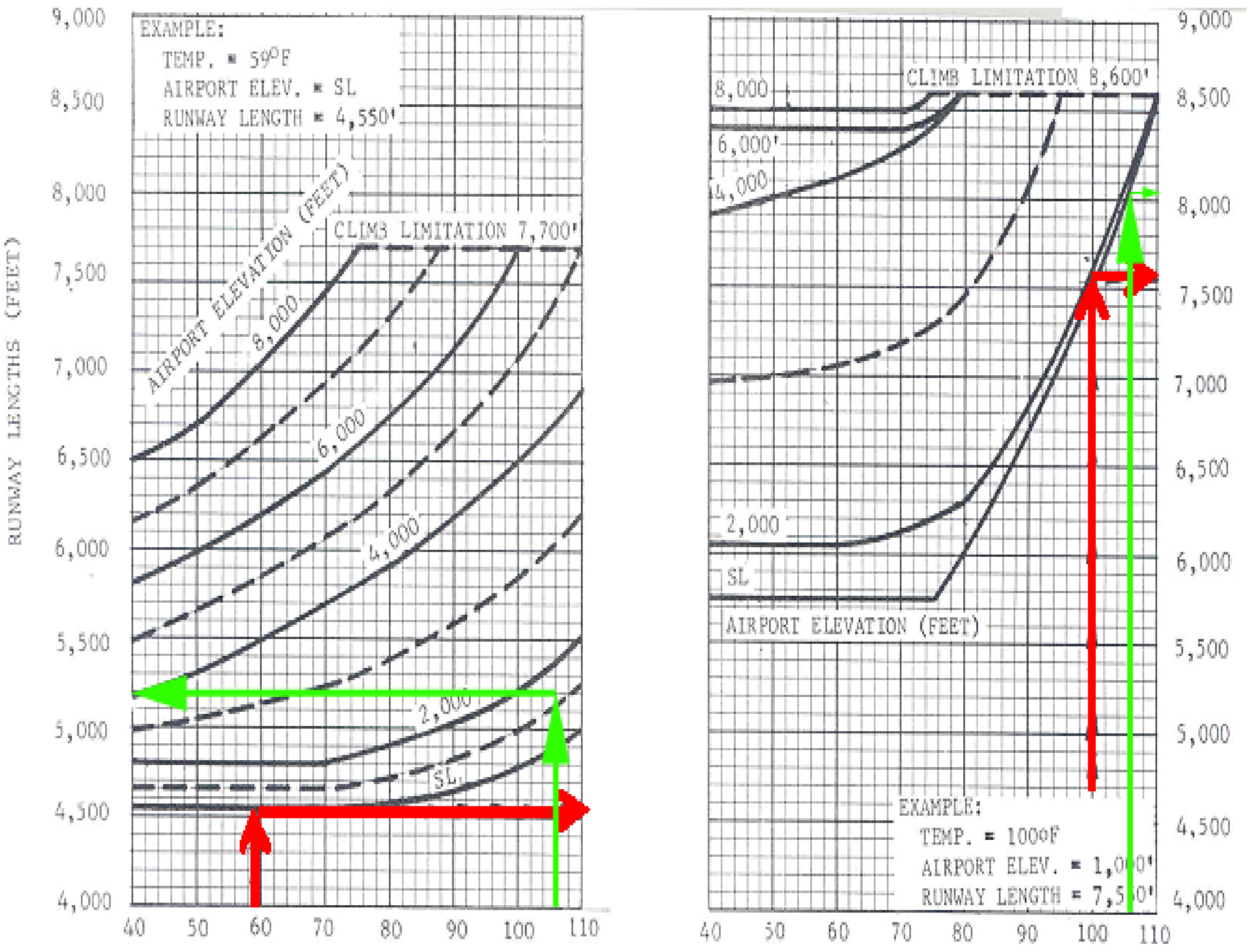


Figure 3-3
75 percent of Fleet at 60 Percent Useful Load (Left)
75 Percent of Fleet at 90 Percent Useful Load (Right)

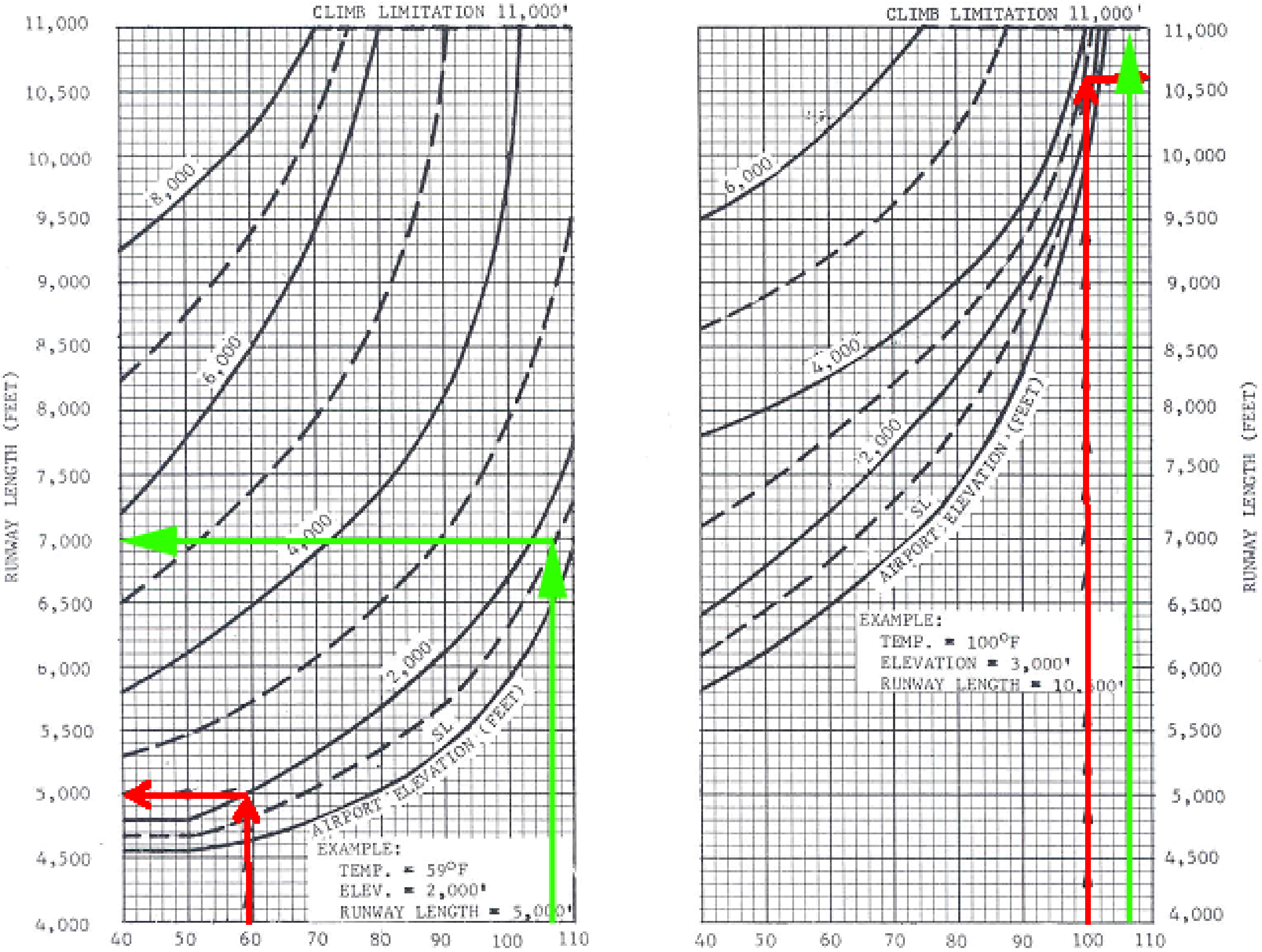


FIGURE 3-4
100 PERCENT OF FLEET AT 60 PERCENT USEFUL LOAD (LEFT)
100 PERCENT OF FLEET AT 90 PERCENT USEFUL LOAD (RIGHT)

TABLE 3-6 AIRPLANES THAT MAKE UP 75 PERCENT OF THE FLEET

MANUFACTURER	MODEL	MANUFACTURER	MODEL
Aerospatiale	Sn-601 Corvette	Dassault	Falcon 10
Bae	125-700	Dassault	Falcon 20
Beech Jet	400A	Dassault	Falcon 50/50 EX
Beech Jet	Premier I	Dassault	Falcon 900/900B
Beech Jet	2000 Starship	Israel Aircraft Industries(IAI)	Jet Commander 1121
Bombardier	Challenger 300	IAI	Westwind 1123/1124
Cessna	500 Citation/501Citation Sp	Learjet	20 Series
Cessna	Citation I/II/III	Learjet	31/31A/31A ER
Cessna	525A Citation II (CJ-2)	Learjet	35/35A/36/36A
Cessna	550 Citation Bravo	Learjet	40/45
Cessna	550 Citation II	Mitsubishi	Mu-300 Diamond
Cessna	551 Citation II/Special	Raytheon	390 Premier
Cessna	552 Citation	Raytheon Hawker	400/400 XP
Cessna	560 Citation Encore	Raytheon Hawker	600
Cessna	560/560 XL Citation Excel	Sabreliner	40/60
Cessna	560 Citation V Ultra	Sabreliner	75A
Cessna	650 Citation VII	Sabreliner	80
Cessna	680 Citation Sovereign	Sabreliner	T-39

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

TABLE 3-7 AIRPLANES THAT MAKE UP THE REMAINING 25 PERCENT OF THE LARGE AIRPLANE FLEET

MANUFACTURER	MODEL	MANUFACTURER	MODEL
Bae	Corporate 800/1000	Israel Aircraft Industries (IAI)	Astra 1125
Bombardier	600 Challenger	IAI	Galaxy 1126
Bombardier	601/601-3A/3ER Challenger	Learjet	45 XR
Bombardier	604 Challenger	Learjet	55/55B/55C
Bombardier	BD-100 Continental	Learjet	60
Cessna	S550 Citation S/II	Raytheon/Hawker	Horizon
Cessna	650 Citation III/IV	Raytheon/Hawker	800/800 XP
Cessna	750 Citation X	Raytheon/Hawker	1000
Dassault	Falcon 900C/900EX	Sabreliner	65/75
Dassault	Falcon 2000/2000EX		

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

The runway length requirements were determined based on data from the aircraft operation manuals, mean maximum temperature of the hottest month, airport elevation and effective gradient of the runway. **Figure 3-5** shows the runway length requirements for ARC A-I through B-II aircraft at Maximum Gross Takeoff Weight.

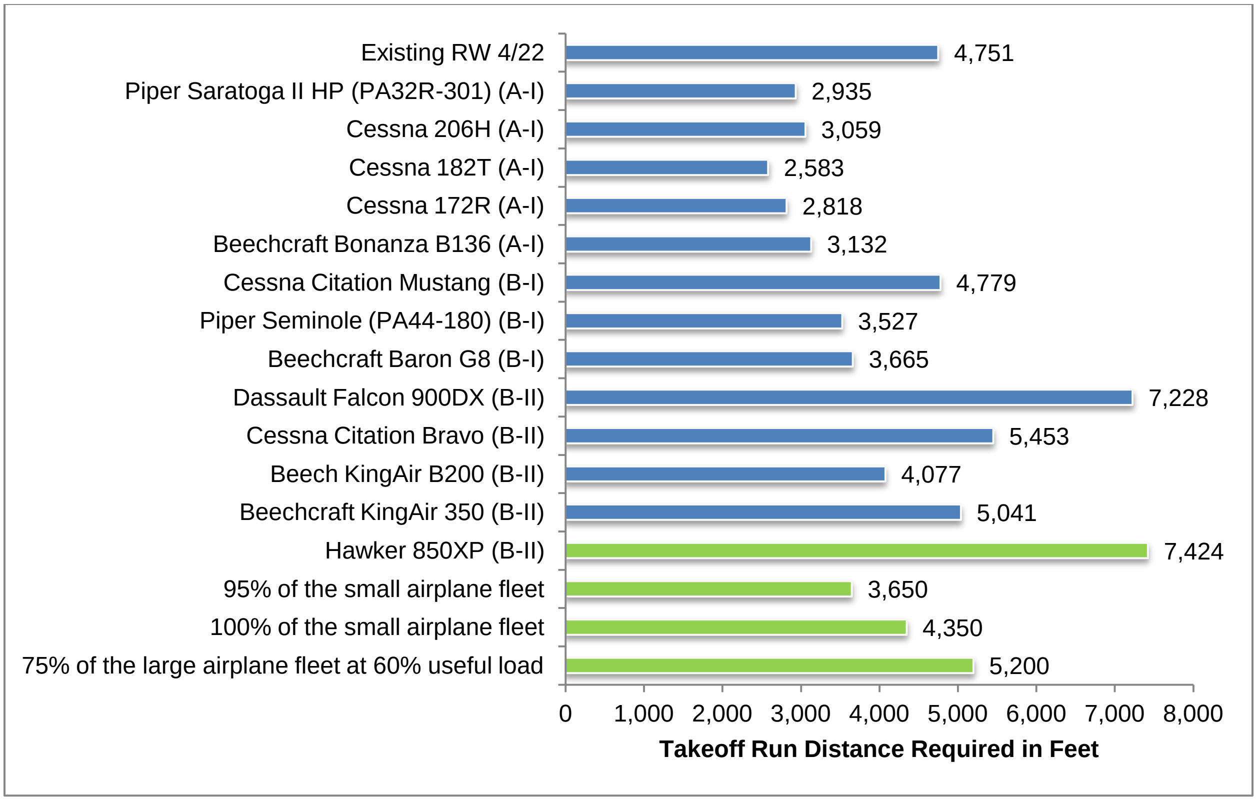


FIGURE 3-5 RUNWAY LENGTH REQUIREMENTS

According to the FAA, general aviation airports have witnessed an increase use of their primary runways by privately owned business jets. Over the years business jets have proved themselves to be a tremendous asset to corporations by satisfying their executive's need for flexibility in scheduling, speed and privacy. In response to those types of needs, general aviation airports that receive regular usage by business jets should provide a runway length adequate to accommodate these types of aircraft.

Takeoff Distance Requirements: When determining runway length requirements for any airport it is necessary to consider the types of aircraft (aircraft design group and critical aircraft) that will be using the airport and their respective takeoff distance requirements. **Figure 3-5** gives examples of takeoff distance requirements for the aircraft currently and projected to use the Ak-Chin Regional Airport. The existing runway length of 4,751 feet accommodates 100 percent of the small aircraft fleet. A length of 5,200 feet would accommodate 75 percent of the large aircraft fleet mix at 60 percent useful load. Based on future airport users and aircraft performance characteristics noted above, a future length of 5,000 feet is recommended.

Runway Strength and Width: Runway strength requirements are normally based upon the design aircraft that may be expected to use the airport on a regular basis. The existing strength of Runway 4/22 is not published. The future pavement strength should initially be 12,500 Single Wheel Gear (SWG) and the ultimate pavement strength should be increased to 30,000 SWG. The timing of the pavement strength increase should be based on actual documented demand by aircraft weighing more than 12,500 pounds.

The FAA design standards for runways serving aircraft having an ARC of B-I (small) requires a runway width of 60 feet. The existing Runway 4/22 is 50 feet wide and does not meet the standard. The future ARC of B-II would require a runway width of 75 feet.

3.3.2 CROSSWIND RUNWAY REQUIREMENTS

The FAA recommends that a runway's orientation provide at least 95 percent crosswind coverage. If the wind coverage of the runway does not meet this 95 percent minimum for the appropriate ARC, then a crosswind runway should be considered. Historical wind data is not available at Ak-Chin Regional Airport. Wind data from Case Grande Municipal Airport located eight nautical miles east of Ak-Chin Regional Airport was used to create a wind rose for Ak-Chin Regional Airport. Runway 4/22 provides currently 97.53 percent wind coverage for a 10.5 knot crosswind component and therefore meets the FAA recommendations.

3.3.3 RUNWAY INCURSIONS

There is no formal runway incursion plan; however runway incursion mitigation measures in place at the Ak-Chin Regional Airport include terminal area fencing and gates. The taxiways connecting the apron to the runway are offset to minimize the risk of runway incursions. There are currently no lighted runway hold position signs. It is recommended that lighted holding position signs be installed to increase awareness of runways.

3.3.4 TAXIWAY REQUIREMENTS

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

According to FAA AC 150/5300-13A, *Airport Design*, the minimum recommended runway centerline to taxiway centerline separation for an airport with an ultimate planning ARC of B-II served by an instrument approach procedure with visibility minimums of 1-mile is 240 feet. The minimum taxiway width for Group I is 25, Group II is 35 feet and Group III is 50 feet. There is currently a full length parallel taxiway serving Runway 4/22. The parallel taxiway is currently 30 feet wide and is separated by 185 feet from runway centerline to taxiway centerline. In order to protect for a future ARC greater than B-II, a future runway centerline to taxiway centerline separation of 400 feet is recommended.

Strength: The strength of the taxiway should be maintained at strength equal to that of the associated runway pavement.

3.3.5 AIRCRAFT APRON

The apron space requirements as shown in this planning document were developed according to recommendations from AC 150/5300-13A, *Airport Design*. Consideration must be made in the overall apron requirements for aircraft parking and tiedown requirements, taxilanes, adjacent taxiways and proximity to all aircraft expected to use the airport.

Apron Requirements: Generally speaking, an apron tiedown area should allow approximately 360 square yards per transient aircraft and 300 square yards per based aircraft. This square yardage per aircraft provides adequate space for tiedowns, circulation and fuel truck movement. Ak-Chin Regional Airport should plan for additional apron expansion and taxilane development.

Future apron should be planned for both transient and based aircraft. The existing aircraft parking apron is considered adequate for the short term. An apron expansion is recommended in the medium and long term to accommodate based and transient aircraft. Based and transient aircraft should be monitored closely and an apron expansion be completed when the ramp reaches 60 percent of capacity.

Tiedown Requirements: Aircraft tiedowns should be provided for those small and medium sized aircraft utilizing the airport. These aircraft risk being damaged or may cause damage or injury in sudden wind gusts if not properly secured. A number of tiedowns are required to accommodate the peak daily transient aircraft and overnight transient aircraft, plus based aircraft that are not hangared. In order to determine the tiedown requirements for Ak-Chin Regional Airport, 10 percent of the based aircraft were set aside for tiedowns. Transient aircraft were calculated by multiplying 70 percent of the tiedowns for based aircraft. The current tiedown layout is based on Group I taxilane OFAs. The future apron layout should be planned to provide an area for Group II taxilane OFAs. Typically large aircraft, including business jets, are not tied down and can usually occupy multiple tiedown spaces.

The Apron and tiedown requirements for the 20-year planning period are listed in **Table 3-8.**

TABLE 3-8 APRON REQUIREMENTS

	2016	2021	2026	2031
BASED AIRCRAFT	60	153	280	330
BASED AIRCRAFT TIEDOWN	6	15	28	33
TRANSIENT AIRCRAFT	10	26	48	56
TOTAL TIEDOWN	**16**	**41**	**76**	**89**
APRON S.Y.	5,400	14,160	25,680	30,060

3.3.6 NAVIGATIONAL AIDS

A Navigation Aid (NAVAID) is any ground based visual or electronic device used to provide course or altitude information to pilots. NAVAIDs include Very High Omnidirectional Range (VORs), Very High Frequency Omnidirectional Range with Tactical Information (VOR-TACs), Distance Measuring Equipment (DME), Nondirectional Beacons (NDBs) and Tactical Air Navigational Aids (TACANs), as examples. There are no existing navigational aids located at Ak-Chin Regional Airport and no ground based navigational aids are recommended.

3.3.7 APPROACH PROCEDURES

Non-precision Global Positioning System (GPS) approaches do not require ground-based facilities on or near the airport for navigation. The GPS receiver uses satellites for navigation. Therefore, it involves little or no cost for the Airport Sponsor. GPS was developed by the United States Department of Defense for military use and is now available for civilian use. GPS Localizer Performance with Vertical Guidance (LPV) approaches are rapidly being commissioned at airports across the United States, approach minimums as low as 250-foot ceilings and ¾ - mile visibility are typical for this type of approach. Instrument approach development would increase the utility of the airport by providing the capability to operate in inclement weather conditions. This is especially important for air ambulance and business flights. It is also useful for conducting training and maintaining instrument currency and proficiency requirements.

A future GPS LPV approach would increase the dimensions of several imaginary surfaces surrounding the airport including 14 CFR Part 77 Airspace surfaces. A future GPS non-precision instrument approach with 1-mile visibility minimums to the Ak-Chin Regional Airport is recommended. The development of a GPS approach will require an obstruction survey and modifications to the runway marking and lighting, but physical improvements associated with the new Runway 4/22 are properly positioned to implement the LPV approach without modification. While the lowest possible instrument approach procedure minimums are ideal (i.e. ½-mile and 200 feet) it is realistically a balance of considering surrounding terrain and the size of required airspace surfaces with land available for airport development. Consideration for ½-mile, ¾-mile or 1-mile visibility minimums will be evaluated in Chapter 4.

3.3.8 AIRFIELD LIGHTING, SIGNAGE, MARKING AND VISUAL AIDS

Airport lighting enhances safety during periods of inclement weather and nighttime operations by providing visual guidance to pilots in the air and on the ground. Lighting and visual aids can consist of a variety of equipment or a combination thereof as described in Chapter 1. Airfield lighting and visual aids includes a rotating airport beacon, runway and taxiway lighting, runway markings, PAPIs, segmented circle, lighted hold position, taxiway signs and REILs.

Runway 4/22 is currently marked with visual runway markings on both ends. The runway markings are in good condition. If an instrument approach is developed for the airport the runway end markings would need to be changed to non-precision markings. The airport has a beacon and segmented circle. The installation of PAPIs, REILs, runway lights, taxiway lights and lighted hold position signs is recommended for the future.

3.4 LANDSIDE FACILITY REQUIREMENTS

Landside facilities are another important aspect of the airport. Landside facilities serve as the processing interface between the surrounding community and the airport operating environment. Likewise, it offers the traveler the first impression of the airport and the local area. Landside facilities house the support infrastructure for airside operations and often generate substantial revenues for the airport. Much like the discussion from the airside facility requirements evaluation, the recommendations for the landside facility requirements assume no physical, environmental, political or financial constraints. The Chapter 4 will further the feasibility of the future development at the airport.

3.4.1 BUILDING AREA

The building area of a typical general aviation airport usually consist of a FBO, offices, box or T-hangars, a pilot lounge, terminal buildings, eating facilities, a maintenance building and other related structures. The only existing permanent building at Ak-Chin Regional Airport is the terminal building. The existing terminal building was built in 2004. The building is a 7,025 square foot, two story building with office space, retail and hangar area. This building is in good condition and is suitable for the operation of airport services such as a fixed based operator (FBO).

3.4.2 HANGAR FACILITIES

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

Based Aircraft Hangar Requirements: The facility requirements for based aircraft typically determine the number of tiedown locations, number of shaded spaces, number of T-hangars and number of conventional type hangars required for the future. Development areas will be identified on the ALP for a mix of T-hangars, box hangars and larger corporate style hangars.

The hangars requirements at Ak-Chin Regional Airport are based upon the assumption that 80 percent of the based aircraft would be stored in hangars, 10 percent would be stored in sunshades and 10 percent would be stored on the open apron.

Transient Aircraft Hangar Requirements: Transient single-engine aircraft operators generally do not require aircraft storage facilities unless there is inclement weather expected (such as hail) or if the operator is planning an extended stay. Some higher performance single-engine and multi-engine aircraft operators may desire overnight aircraft storage in an air conditioned hangar during the summer. There is no existing dedicated transient aircraft hangar space at the airport. It is recommended that a large hangar be provided for overnight transient aircraft storage at the airport.

The hangar facilities for the 20-year planning period are listed in **Table 3-9.**

TABLE 3-9 HANGAR/SUNSHADE REQUIREMENTS

	2016	**2021**	**2026**	**2031**
BASED AIRCRAFT	60	153	280	330
HANGARS	48	122	224	264
SUNSHADES	6	15	28	33
TRANSIENT				
SUNSHADES	8	20	36	43
TOTAL				
HANGARS	48	122	224	264
SUNSHADES	14	35	64	76

3.4.3 AVIATION FUEL FACILITIES

The existing 20,000 gallon AvGas AST is located near the existing apron. It is recommended that the airport add a 12,000 gallon Jet-A AST. **Table 3-10** displays the monthly requirement for fuel storage at Ak-Chin Regional Airport.

TABLE 3-10 FUEL STORAGE REQUIREMENTS

	2016	2021	2026	2031
ANNUAL OPERATIONS	21,140	53,760	98,000	115,500
AVERAGE MONTHLY OPERATIONS	1,762	4,480	8,167	9,625
MONTHLY OPERATIONS				
PISTON	1,374	3494	6370	7,507
TURBINE	388	986	1796	2,118
GALLONS PER OPERATION				
PISTON	2.0 100 LL			
TURBINE	5.0 JET A			
MONTHLY STORAGE REQUIREMENTS				
100 LL	2,749	6,989	12,741	15,014
JET A	1,938	4,928	8,984	10,590

3.4.4 AIRPORT ACCESS AND VEHICLE PARKING

The Ak-Chin Regional Airport is accessed by West Maricopa-Casa Grande Highway and turning on North Russell Road then turning east to Bud Road, which is the existing entrance to the airport through Saddleback Industrial Park. Bud Road leads to the midfield gravel parking lot, adjacent to the airport FBO/terminal building. The parking area can accommodate 50 automobiles. It is recommended that an airport automobile parking lot be able to ultimately accommodate approximately 100 automobiles with 50 paved automobile spaces in the short-term time and an additional 50 in the long-term. These figures were determined using methods most commonly used by the Federal Aviation Administration for calculating parking space requirements. As Bud Road is utilized by aircraft as well vehicles, it is also recommended that a second access road be developed to segregate vehicle traffic from aircraft traffic on Bud Road.

3.4.5 FENCING

The primary purpose of airport fencing is to prevent unwanted intrusions by persons or animals on to airport property. Airport fencing provides increased safety and security for the airport. It is normally installed along the perimeter of the airport property and outside any of the imaginary surfaces as defined by FAA AC 150/5300-13A, *Airport Design* and 14 CFR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspaces*. The Ak-Chin property boundary is currently unfenced. The entrance of the airport is enclosed with a 1,141 linear foot security chain link fence with two sliding gates. One 50 foot (two 25 foot gates) manual slide gate allows aircraft access to the airport from Bud Road. One 20 foot manual slide gate allows vehicle access to the ramp adjacent to the FBO building. It is recommended to construct the remaining portion of the airport boundary fence to connect to the existing security fence line.

3.4.6 AIRPORT RESCUE AND FIRE FIGHTING (ARFF)

ARFF equipment is not required at airports that do not serve scheduled passenger service with aircraft having 10 or more passenger seats. Local municipal or volunteer fire departments typically provide fire protection to general aviation airports in their district. Mutual aid agreements may also be provided for nearby fire departments to assist in emergency situations. In any case, procedures should be in place to ensure emergency response in case of an accident or emergency at the airport. Although statistically very safe, the most likely emergency situations at general aviation airports are an aircraft accident, fuel or aircraft fire or hazardous material (fuel) spill.

The level of protection recommended in FAA Advisory Circular 150/5210-6D, *Aircraft Fire and Rescue Facilities and Extinguisher Agents*, for small general aviation airports is 190 gallons of aqueous film forming foam (AFFF) supplemented with 300 pounds of dry chemical. Proximity suits should be utilized for fire fighter protection. Aviation rated fire extinguishers should be immediately available in the vicinity of the aircraft apron and fueling facilities. Adequate facilities should be provided to store any ARFF vehicle(s) or equipment that is acquired.

There is not currently any ARFF equipment or personnel based at Ak-Chin Regional Airport nor are any required for a general aviation airport. The Ak-Chin Fire Department is equipped with AFFF supplemented with 300 pounds of dry chemical. In the future, if the airport chooses to become Part 139 certified, meeting the requirements in the FAA AC 150/5210-6D is required.

3.4.7 GROUNDS MAINTENANCE EQUIPMENT & STORAGE BUILDING

Multi-function ground maintenance equipment capable of mowing and sweeping is recommended. This type of equipment helps to maintain the safety areas as well as remove objects from the apron, taxiway and runway to minimize foreign object damage (FOD). A storage building to house the maintenance equipment and its accessories is also recommended.

3.5 UTILITIES

Available utilities at Ak-Chin Regional Airport include electrical power, water, septic systems, natural gas and phone. Electricity is provided by Electric District 3, telephone services are provided by CenturyLink and natural gas is provided by Southwest Gas Corporation. Water is provided by the City of Case Grande. It is recommended that the utilities be extended to any future hangar development areas and lease parcels.

3.6 WEATHER REPORTING SYSTEMS

Local weather information is currently not available at the airport. The closest automated weather reporting system is located at Case Grande Municipal Airport. The installation of an Automated Weather Observation System (AWOS) is recommended. AWOS uses various sensors, a voice synthesizer and a radio transmitter to provide real-time weather data. There are four types of AWOS. An AWOS-A only reports altimeter setting while an AWOS-I also measures and reports wind speed, direction, gusts, temperature and dew point. AWOS-II provides visibility information in addition to everything reported by an AWOS-I. The most capable system, the AWOS-III also includes cloud and ceiling data. The AWOS transmits over a VHF frequency or the voice portion of a navigational aid. The transmission can be received within 25 nautical miles of the site or above 3,000 feet above ground level (AGL). The frequency for the AWOS is published on Aeronautical charts as well as in the airport facilities directory. The installation of an AWOS-III is recommended for the Ak-Chin Regional Airport. The AWOS will enhance safety at the airport by increasing situational awareness for pilots as well as provide an altimeter setting for future instrument approach procedures. The AWOS should be connected to the telephone service allowing pilots to check current weather conditions at the airport.

It is recommended that when Ak-Chin Regional Airport obtains an AWOS that it be connected to the National Airspace Data Interchange Network (NADIN). This will allow national dissemination of the AWOS observations and allow the National Oceanic and Atmospheric Administration (NOAA) to digitally record the hourly observations and disseminate real-time weather information to Flight Service Stations and other sources. The installation of an AWOS was approved by the Planning and Zoning Department and Tribal Council in 2014.

3.7 AIRSPACE REQUIREMENTS

14 CFR Part 77 establishes several imaginary surfaces that are used as a guide to provide a safe, unobstructed operating environment for aviation. These surfaces, which are typical for civilian airports, are shown in **Figure 3-6**. The Primary, Approach, Transitional, Horizontal and Conical Surfaces identified in 14 CFR Part 77 are applied to each runway. For the purpose of this section, a visual/utility runway is a runway that is intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight or less. A non-precision instrument/utility runway is a runway that is intended to be used by aircraft of 12,500 pounds maximum gross weight or less with a straight-in instrument approach procedure and instrument designation indicated on an FAA approved ALP, a military service approved military ALP by any planning document submitted to the FAA by a competent authority. A non-precision instrument/larger-than-utility is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure. The recommended instrument approaches described in Section 3.3.7, would result in a non-precision/larger than utility runway. The resulting Part 77 surfaces are described below.

3.7.1 PRIMARY SURFACE

The Primary Surface is an imaginary surface of specific width longitudinally centered on a runway. Primary Surfaces extend 200 feet beyond each end of the paved surface of runways, but do not extend past the end of non-paved runways. The elevation of any point on the Primary Surface is the same as the elevation of the nearest point on the runway centerline. The width of the Primary Surface varies from 250, 500 or 1,000 feet depending on the type of approach and approach visibility minimums. The current Primary Surface width for Runway 4/22 is 250 feet. The primary surface width would increase to 500 feet if and when the airport develops an LPV instrument approach with 1-mile visibility and the runway pavement strength increased to more than 12,500 pounds.

3.7.2 APPROACH SURFACE

The Approach Surface is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the Primary Surface. An Approach Surface slope is applied to each end of the runway based upon the type of approach available or planned for that runway, either 20:1, 34:1 or 50:1. The inner edge of the surface is the same width as the Primary Surface. It expands uniformly to a width corresponding to the Part 77 runway classification criteria. The current Approach Surface is 20:1 and the approach surface dimensions are 250' x 1,250' x 5,000' for Runway 4/22. This would change to 34:1 and 500' x 3,500' x 10,000' if the airport increases the pavement strength and develops a non-precision, instrument approach with 1-mile visibility minimums. Marking and lighting of all Part 77 obstructions is recommended.

3.7.3 TRANSITIONAL SURFACES

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

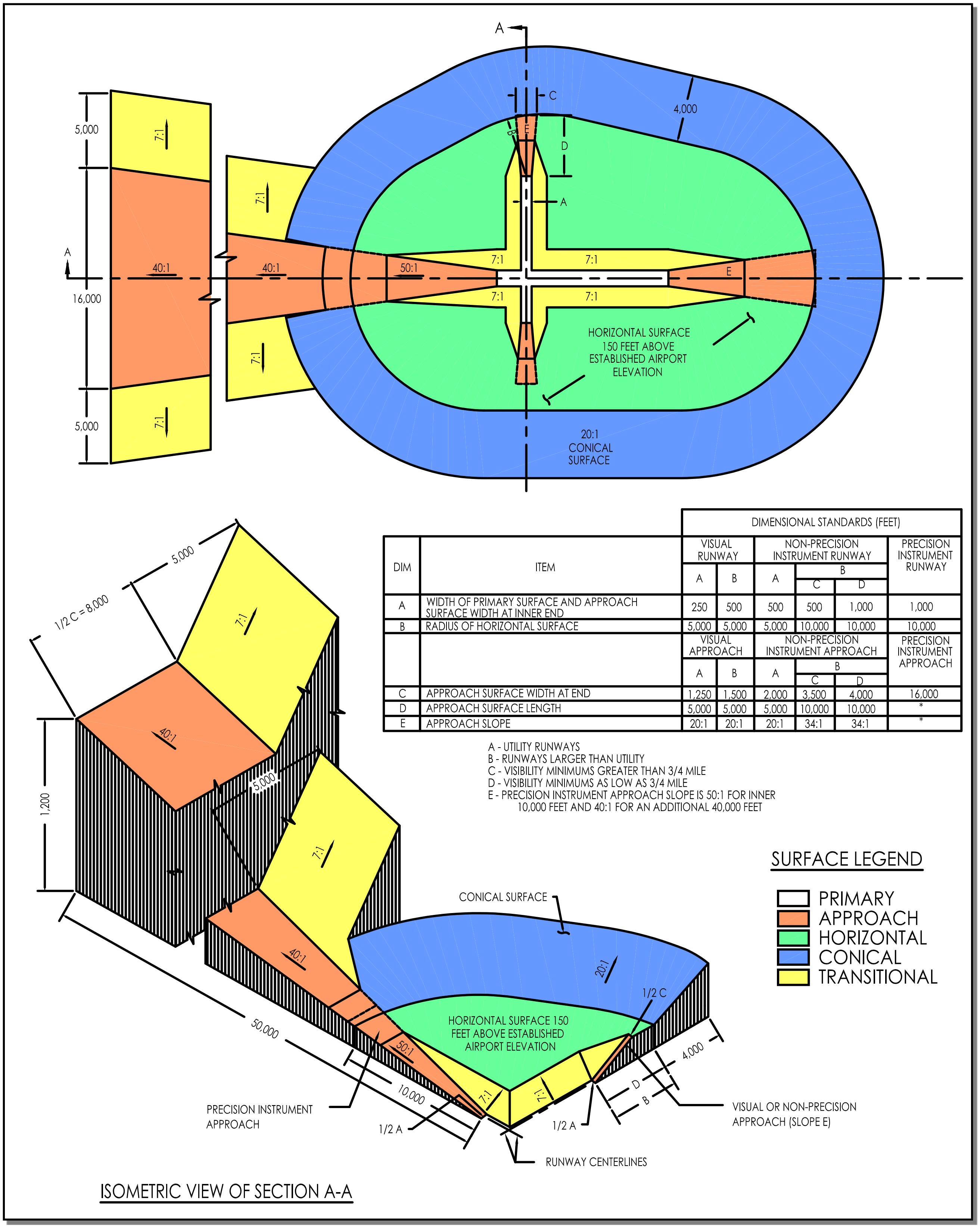
3.7.4 HORIZONTAL SURFACE

The Horizontal Surface is considered necessary for the safe and efficient operation of aircraft in the vicinity of an airport. As specified in Part 77, the Horizontal Surface is a horizontal plane

150 feet above the established airport elevation. The airport elevation is defined as the highest point of an airport's useable runways, measured in feet above mean sea level. The perimeter is constructed by arcs of specified radius from the center of each end of the Primary Surface of each runway. The radius of the existing arcs is 5,000 feet. The future arcs will increase to 10,000 feet if the airport increases the pavement strength and develops a non-precision instrument approach.

3.7.5 CONICAL SURFACE

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



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

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

SURFACE LEGEND

☐	PRIMARY
🟧	APPROACH
🟩	HORIZONTAL
🟦	CONICAL
🟨	TRANSITIONAL

FIGURE 3-6 FAR PART 77 SURFACES

3.8 LAND USE COMPATIBILITY AND CONTROL

3.8.1 AIRPORT PROPERTY

Ak-Chin Indian Community property encompasses approximately 450 acres including the airport and adjacent property. Land located within RPZs should be controlled either fee simple or through avigation easements in the future. The airport currently only controls a portion of the existing ARC B-I (small) RPZs located at both ends of the runway. The existing RPZs dimension is 250' x 450' x 1,000'. The future RPZs dimensions will be 500' x 700' x 1,000'. It is recommended that the Community acquire control of the RPZs through fee simple purchase of the land or through avigation easements.

Based on this AMP the Ak-Chin Indian Community will be designating approximately 244 acres of existing land as airport property. Designating this area as airport property will allow the airport to be eligible for future FAA funding. The remaining 206 acres will be reserved for an industrial park and will not be eligible for FAA funding and will not render it subject to FAA grant assurances. The development of a TTF for Saddleback Industrial Park is recommended along with any future development occurring adjacent to but not within the airport boundary. Compliance with FAA regulations is strongly encouraged for the development of a TTF agreement.

3.8.2 THROUGH THE FENCE (TTF) OPERATIONS

There are times when a sponsor will enter into an agreement that permits access to the airfield by aircraft based on land adjacent to, but not a part of, the airport property. This type of an arrangement has frequently been referred to as a through-the-fence (TTF) operation, even though a perimeter fence may not be visible. Guidance on TTF operations can be found in FAA Order 5190.6B Chapter 12 and in FAA Compliance Letter 2009-1 (see Appendix C). TTF arrangements can place an encumbrance upon the airport property and reduce the airport’s ability to meet its federal obligations.

Historically the FAA has distinguished between commercial and residential TTF activities. The FAA has strongly discouraged or in some cases prohibited residential TTF while stipulating strict requirements for commercial TTF.

TERMS AND CONDITIONS FOR TTF

The FAA Modernization and Reform Act of 2012 (the FAA reauthorization legislation) signed into law includes the following provisions for residential TTF activity.

"In general, a sponsor of a general aviation airport shall not be considered to be in violation of this subtitle, or to be in violation of a grant assurance made under this section or under any other provision of law as a condition for the receipt of Federal financial assistance for airport development, solely because the sponsor enters into an agreement that grants a person that owns residential real property adjacent to or near the airport access to the airfield of the airport for the following: aircraft of the person and aircraft authorized by the person."

TTF AGREEMENTS

TTF between the airport sponsor and a property owner (or an association representing such property owner) shall be a written agreement that prescribes the rights, responsibilities, charges, duration, and other terms the airport sponsor determines are necessary to establish and manage the airport sponsor's relationship with the property owner.

TERMS AND CONDITIONS FOR COMMERCIAL TTF - FAA

- **Right of Access**
  The explicit right of access will be described, i.e. the right to taxi aircraft to and from the airfield. Access points and authorized taxi routes will be identified. Procedures for access control devices (remote control openers, etc.) will be established. This Article will also identify the responsibilities for maintenance of various improvements, such as access roads, taxiways, gates, fences, signage, etc. This Article will also describe the authorizations, limitations or restrictions of the use of TTF access rights by guests or customers of the TTF Operator.

- **Authorized Uses**
  The agreement shall specify the authorized aviation-related activities that may be conducted from TTF properties.

- **Authority for Granting or Selling Access**
  This Article shall prohibit the TTF operator from granting or selling access to the airport through its property. Only the Sponsor may grant access to the airfield.

- **Subordination to Grant Assurances and Federal Obligations**
  This Article will establish that the TTF Agreement is subordinate to the Sponsor’s grant assurances and federal obligations; and that if any provisions of the access agreement violate the sponsor’s grant assurances or federal obligations, the sponsor shall have the unilateral right to amend or terminate the access agreement to remain in compliance with its grant assurances and federal obligations.

- **Right-of-Assignment or Transfer**
  This Article shall describe the procedures required approvals and potential adjustments for assigning or transferring the TTF Agreement to successors or assigns of the TTF Operator.

- **Access Fees**
  This Article will develop and describe the fees for through-the-fence users comparable to those charged to airport tenants so that through-the-fence operators bear a fair proportion of airport operation and access costs. The method of calculating access fees, such as a square footage basis or number/type of aircraft basis, will be determined and included in the agreement. The method for periodically adjusting the rates or fees, such as annual CPI, shall be described. This effort will review the rates and charges for the airport to ensure the TTF activity does not provide an unfair economic advantage over those located on airport property, including the assessment of concession fees for TTF Operators conducting a commercial business catering to aeronautical users. An approach to assigning and prorating TTF-specific development, operations and maintenance costs (such as fencing, access gates, roadways and taxiways) will be developed.

- **Term of Agreement and Renewal**
  This Article will stipulate the term of the agreement and procedures for renewing the agreement at the end of the term. Typical terms should not exceed 25 years as a maximum.

- **Amendments**
  This Article will describe the methods and situations in which amendments to the Agreement may be made.

- **Enforcement and Termination**
  This Article will describe the procedures for enforcement of the agreement, notifications and penalties for violations, and causes and procedures for termination of the Agreement, including nonpayment of access fees.
- **Insurance Requirements**
  This Article will stipulate minimum insurance requirements for TTF Operators.
- **Operations Safety and Security**
  This Article will explain how the agreement will address minimum standards and rules and regulations for the airport, including operational procedures for dual use aircraft and vehicle roadways/taxiways. This Article will also include information on how aircraft will access the runway from the through-the-fence parcel, and required measures or procedures for maintaining security of the airport.
- **Land Use Compatibility**
  This Article will describe the types of land uses that are considered compatible with the airport and will describe the approval process for land use proposals on TTF parcels to avoid the introduction or development of incompatible land uses on TTF parcels. This Article will also describe those activities that would be considered competitive with on-airport businesses, which would in turn be prohibited. Residential TTF activities are considered an incompatible land use by FAA and shall be prohibited in accordance with FAA regulations and policy.
- **Protection of Airport Airspace**
  This Article will stipulate height restrictions to conform to 14 CFR Part 77 Airspace surfaces and provide guidance on the requirements for submission of FAA Form 7460-1, Notice of Proposed Construction to the FAA for airspace evaluation. This task will ensure the development located on through-the-fence parcels will not have an adverse impact on the airspace surrounding the airport.

TERMS AND CONDITIONS FOR RESIDENTIAL TTF

An agreement describe between an airport sponsor and a property owner (or an association representing such property owner) shall require the property owner, at minimum

- to pay airport access charges that, as determined by the airport sponsor, are comparable to those charged to tenants and operators on-airport making similar use of the airport
- to bear the cost of building and maintaining the infrastructure that, as determined by the airport sponsor, is necessary to provide aircraft located on the property adjacent to or near the airport access to the airfield of the airport
- to maintain the property for residential, noncommercial use for the duration of the agreement
- to prohibit access to the airport from other properties through the property of the property owner
- to prohibit any aircraft refueling from occurring on the property

APPLICABILITY

The amendment made shall apply to an agreement between the airport sponsor and a property owner (or an association representing such property owner) entered into before, on, or after the date of enactment of the Act.

In the past, poorly written TTF agreements and activities without any written agreements have resulted in safety and security problems and unfair economic advantages. However, the FAA recently released guidance on how TTF should be structured and how TTF activities can be conducted so that the airport can meet safety and security standards and comply with AIP Grant Assurances.

The federal obligation to make an airport available for the use and benefit of the public does not impose any requirement to permit access by aircraft from adjacent property. In order to be in compliance with the FAA in any TTF agreement, Ak-Chin Regional Airport must retain the ability to take action should a safety or security concern require fencing around the airport. In some cases, airport sponsors have been unable to install actual fencing to mitigate wildlife hazards due to pre-existing TTF agreements.

The existing TTF activity at Ak-Chin Regional Airport allows Saddleback Industrial Park to freely access the airport. There is no existing written recorded access between the airport and Saddleback Industrial Park and the access could be terminated at any time.

3.8.3 COMPATIBILITY WITH STATE/REGIONAL PLANS

All future state and regional transportation plans should be coordinated with the AMP and ALP drawing set included in Chapter 5 to ensure conformance.

3.8.4 ZONING

Development around airports can pose certain hazards to air navigation if appropriate steps are not taken to ensure that buildings and other structures do not penetrate the 14 CFR Part 77 Airspace Surfaces (described in the previous sections). The FAA, therefore, recommends that all airport sponsors implement height restrictions in the vicinity of the airport to protect these Part 77 Surfaces, as well as assuring compatible land uses as discussed in the next section.

3.8.5 COMPATIBLE LAND USE

In addition to ensuring that obstructions to Part 77 surfaces are avoided or appropriately marked and lighted, it is recommended that the airport sponsor make reasonable efforts to prevent incompatible land uses from the immediate area of the airport. For example, the FAA states in FAA AC 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*, that landfills, transfer stations are incompatible land uses with airports. Therefore, these types of facilities should be located at least 5,000 feet from any point on a runway that serves piston type aircraft and 10,000 feet from any point on a runway that serves turbine type aircraft. Furthermore, any facility which may attract wildlife (especially birds) such as sewage treatment ponds and wastewater treatment plants should also be located this same distance from any point on the runway. Development proposals should also be reviewed to ensure compatibility in the vicinity of the airport.

An off-airport land use drawing along with a 14 CFR Part 77 airspace drawing will be developed as part of this AMP. The drawing will be included in the ALP drawing set included in Chapter 5. Adoption of an airport overlay zone by surrounding jurisdictions including Pinal County is recommended to ensure incompatible development surrounding the airport is avoided in the future.

3.9 SUMMARY OF FACILITY REQUIREMENTS

In summary, the facility requirements for Ak-Chin Regional Airport are based on the types and volume of aircraft expected to use the airport in the short and long-term timeframes. These facilities will enable the airport to serve its users in a safe and efficient manner. The recommended airside and landside facilities are summarized in **Table 3-11**.

TABLE 3-11 SUMMARY OF AIRPORT FACILITY REQUIREMENTS

		EXISTING	**FUTURE**	**ULTIMATE**
RUNWAY 4/22				
	Length (feet)	4,751’	5,000’	5,000'
	Width (feet)	50’	75'	75'
	Displaced Threshold	290	None	None
	Strength (pounds)	12,500 SWG	12,500 SWG	30,000 SWG
MARKINGS	Runway 4	Visual	Nonprecision	Nonprecision
	Runway 22	Visual	Nonprecision	Nonprecision
TAXIWAYS	Parallel	Yes	Yes	Yes
	Bypass Taxiways/Turnarounds	No	No	Yes
	Width (feet)	30'	35'	35'
	Strength (pounds)	12,500 SWG	12,500 SWG	30,000 SWG
APRON	Tie Downs	12	41*	89*
NAVAID	Approaches	Visual	GPS/LPV	GPS/LPV
	Minimums	N/A	1-mile	1-mile
LIGHTING & VISUAL AIDS	Signs	None	Lighted	Lighted
	Runway Edge	None	MIRL	MIRL
	Taxiway/Apron Edge	None	MITL	MITL
	Threshold Lights	None	Yes	Yes
	REILs	None	Yes	Yes
	Approach Slope Indicator (PAPI)	None	PAPI-4	PAPI-4
	Segmented Circle/Wind Cone	Yes	Yes	Yes
	Rotating Beacon	Yes	Yes	Yes
	Approach Lighting System	No	No	No
ACCESS & PARKING	Automobile	50	50*	100*
HANGAR FACILITIES	Hangars	None	122	264
FUEL STORAGE	100 AvGas	20,000 Gallon Tank	20,000 Gallon Tank	20,000 Gallon Tank
	Jet-A	None	12,000 Gallon Tank	12,000 Gallon Tank
	Jet-A Mobile Fuel Truck	None	2,000 Gallon Truck	2,000 Gallon Truck
OTHER	AWOS	No	Yes	Yes
	Unicom	No	Yes	Yes
	Terminal Building	Yes	Yes	Yes

*As required based on demand

3.10 SUMMARY OF DESIGN STANDARDS

Table 3-12 summarizes the FAA design standards, described in Chapter 1, for the recommended airport facilities.

TABLE 3-12 SUMMARY OF DIMENSIONAL CRITERIA

	EXISTING B-I (SMALL) VISUAL RUNWAY	**FUTURE/ULTIMATE B-II 1-MILE VISIBILITY MINIMUMS**
Runway centerline to parallel taxiway centerline	150 (185' actual)	240' (400' Recommended)
Runway width	60’ (50’ actual)	75'
Runway shoulder width	10’	10'
Runway Safety Area width	120’	150'
Runway Safety Area length beyond runway end	240’	300
Runway Object Free Area width	250’	500'
Runway Object Free Area length beyond runway end	240’	300'
Runway Obstacle Free Zone width	250’	400'
Runway Obstacle Free Zone length beyond runway end	200’	200'
Runway Protection Zone RW 4	250’ x 450’ x 1,000’	500' x700' x1,000'
Runway Protection Zone RW 22	250’ x 450’ x 1,000’	500' x700' x1,000'
Taxiway width	25’ (30’ actual)	35'
Taxiway Safety Area width	49’	79'
Taxiway Object Free Area width	89’	131'
Taxilane Object Free Area width	79’	115'
Runway centerline to aircraft hold lines	125’	200'
AIRSPACE SURFACES (PART 77)	**VISUAL RUNWAY UTILITY**	**NON-PRECISION INSTRUMENT RUNWAY > THAN UTILITY**
Primary Surface width	250’	500'
Primary Surface length beyond runway ends	200’	200’
Approach Surface dimensions RW 4	250’ x 1,250’ x 5,000’	500’ x 3,500’ x 10,000’
Approach Surface dimensions RW 22	250’ x 1,250’ x 5,000’	500’ x 3,500’ x 10,000’
Approach Slope RW 4	20:1	34:1
Approach Slope RW 22	20:1	34:1
Transitional Surface slope	7:1	7:1
Horizontal Surface radius from runway	5,000’	10,000’
Conical Surface width	4,000’	4,000’

Source: FAA AC 150/5300-13A, *Airport Design* & 14 CFR Part 77

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CHAPTER

4

DEVELOPMENT ALTERNATIVES

AK-CHIN REGIONAL AIRPORT
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER FOUR
DEVELOPMENT ALTERNATIVES

4.1 INTRODUCTION

Airports have a wide variety of development options, so an organized approach to identifying and evaluating alternatives for the recommended development is essential for effective planning. The purpose of this Chapter is to identify and evaluate various methods for providing the facilities identified Chapter 3 for the 20-year planning horizon. While there are theoretically a wide range of options and variations for each aspect of airport development, this study will only address those alternatives that reasonably meet demand and community objectives. The future airport development will also consider physical, political, financial and environmental constraints. Primary consideration will be given to needs for of operational safety, airfield standards, efficiency of aeronautical operations and meeting the identified aeronautical demand.

For some airport elements, one alternative may maintain the existing condition, while for other elements various alternatives that satisfy the facility requirements may exist. Usually, the selection of a favored project can result from a straightforward and logical evaluation of the options at hand. The discussion of facility requirements presented in this report provides the basis for the airport development concepts described in this section. The improvements evaluated in this Chapter are developed from an analysis of projected needs. Though the needs were determined by the best methodology available, it should not be assumed that future trends will not change these needs.

The preceding discussion of facility requirements provides the basis for formulating project development concepts. Chapter 3 provided recommended development for the majority of needs at the airport. This Chapter will focus on the projects the sponsor should consider for the existing and future configuration of the airport.

4.2 DEVELOPMENT CONCEPTS

The overall objective of the alternatives analysis is to (1) Review the facility requirements that have been determined necessary to safely and efficiently accommodate aviation demand over the 20-year planning period; and (2) through investigation of available projects and options (where applicable) to determine the best way to implement the facility requirements as determined in Chapter 3 of this report.

The following objectives discussed in FAA AC 150/5070-6B, *Airport Master Plans*, generally apply to the evaluation of master plan development alternatives; and serve the planner, airport owner and community well:

- Conforms to best practices for safety and security.
- Conforms to the intent of FAA and other appropriate design standards.
- Satisfies user needs.
- Is technically and financially feasible.
- Allows for forecast growth throughout the planning period.
- Provides for the “highest and best” land use on and off airport.
- Provides balance between development elements.
- Provides flexibility to adjust to unforeseen changes.
- Conforms to the airport owner’s strategic vision.

- Conforms to relevant local, regional and state transportation plans.
- Is socially and politically feasible.

A combination of effective airside and landside planning is essential to the successful development of the airport. Airside facilities are those used during takeoff or landing of aircraft. Landside facilities generally support aircraft after they exit the taxiway and consist of a system of taxilanes, apron area, fuel systems and parking areas. **Figures 4-7** and **4-8** provide a graphical depiction of the future development discussed within this Chapter.

4.3 AIRSIDE DEVELOPMENT

Airside development is typically the most critical and physically dominant feature of airport development and is therefore a focal point of an airport's planning process. This section discusses the airside development alternatives and addresses the needs of the existing and future aviation demand identified in Chapter 3. Chapter 6 will provide the projected scheduling and budgeting.

4.3.1 RUNWAY DEVELOPMENT

The recommended runway length analysis from the Chapter 3 identified that the existing runway length of 4,751 feet accommodates 100 percent of the small aircraft fleet mix. Chapter 3 recommended that as activity increases and the fleet mix changes, the recommended runway length should be increased to 5,000 feet.

In order to accommodate the future recommended runway at the airport, several options were evaluated. The options evaluated included upgrading the existing runway, constructing a new shifted runway and potential extensions in one or both directions. The existing runway is located along the southeastern side of the airport property. Upgrading the existing runway to meet future ARC of B-II would require the parallel taxiway to be relocated to the southeast, into the apron and hangar development area. The existing runway is also constrained and cannot be lengthened on the southwest end. Constructing a new runway parallel to and offset to the northwest of the existing runway end would allow the new runway to be shifted toward the southwest in order to maximize the length available on the property as well as provide the recommended set backs from existing and future hangar and apron development located on the southeastern side of the airport. The recommended development plan is to convert the existing runway into future parallel taxiway and construct a replacement runway to ARC B-II standards. This will also allow the airport to remain open during the construction of the new runway. The recommended location for the future Runway 4/22 is 400 feet northwest of the existing runway centerline. The 400 foot separation is recommended in order to protect for the possibility for upgrade beyond B-II sometime in the future. The width of the new runway will meet the standards per FAA, to where the existing runway width is below the standards by 10 feet.

Options for siting the runway ends were also reviewed to satisfy the 5,000 foot goal. The runway siting analysis determined that moving the approach end of the new Runway 4 toward the southwest by approximately 371 feet was possible without impacting the existing water tanks, West Trading Post Road or West Maricopa-Casa Grande Highway. Extending Runway 4 to the southwest beyond 371 feet would impact West Maricopa-Casa Grande Highway and adjacent two track railroad; therefore, a runway extension to the southwest is considered impractical do to the physical, financial and political constraints surrounding the relocation of the existing infrastructure. The development of a 5,000 foot runway within the existing property boundary results in the RPZ crossing North Russell Road. North Russell Road is a County owned road which serves development to the north and east of the airport. Several options exist for mitigating the impacts to North Russell Road which include re-routing of North Russell Road around the future RPZ, or closure of the road where the future RPZ crosses the road and installing turn a rounds, improving North Anderson Road and re-routing traffic onto North Anderson Road to accommodate the traffic currently using North Russell Road. Additionally a runway a length of 5,000 feet would require land acquisition for the new RPZ. The additional property required for the runway RPZ is currently owned by the BLM. As a result of discussions with the Ak-Chin Community, a runway extension beyond the existing airport property line was considered to be impractical at this time due to political, environmental and financial constraints. During the runway relocation project to meet B-II design standards, the runway should be constructed to a length of 4,815 feet, which is the maximum length that would result in no significant impact to off airport property.

4.3.2 TAXIWAY DEVELOPMENT

The existing Runway 4/22 is served by a full length parallel taxiway along the eastern side of the runway. The parallel taxiway is 30 feet wide and located 185 feet from the runway centerline. This distance exceeds the current required separation of 150 feet based on the current ARC of B-I (Small). However, this distance does not meet the separation required for the future ARC of B-II. Therefore the future parallel taxiway separation of 400 feet is recommended in order to protect for a future ARC of B-II or above as described in Chapter 3. Converting the existing Runway 4/22 into a parallel taxiway is recommended. This will allow the existing parallel taxiway to be converted into taxilane to serve future apron and hangar expansion along the eastern side of the airport property thus maximizing the use of existing infrastructure and property.

FIGURE 4-1 EXISTING RUNWAY 4/22

The development of a parallel taxiway along the west side of the future Runway 4/22 is also recommended. The parallel taxiway development on the west side of the future runway will serve airport development on the western side of the property as well as future development within the airpark development parcels. The taxiway will help prevent runway incursions by allowing aircraft based on the west side of the airport access to both ends of the future runway and minimize aircraft crossing the runway and aircraft back taxiing on the runway. It is recommended that the future west parallel taxiway be constructed 400 feet from the runway centerline in order to protect for a future ARC of B-II or above. The future west side parallel taxiway development will require the acquisition of approximately one acre of land.

The development of holding bays and bypass taxiways is also recommended for each phase of taxiway development. The holding bays and bypass taxiways provide an area for aircraft to conduct pre-flight checks as well as enhance circulation for aircraft entering and departing the runway.

4.3.3 AIRCRAFT APRON

Aircraft apron development is considered essential airfield development. As described in Chapter 3, the apron expansion should be developed to accommodate Group I and Group II aircraft wingspans with a total of 89 parking spaces throughout the 20 year planning period. Initial general aviation apron expansion should occur adjacent to the existing apron and when the runway is shifted toward the west the apron should be expanded toward the west. Individual apron development is anticipated to occur concurrently with the development of large corporate hangars. Corporate hangar developers and owners typically desire an apron to be constructed of adequate size to allow them to pull their aircraft out of the hangar and park in front of the hangar while the aircraft is loaded or cleaned. The existing aircraft parking apron is shown in **Figure 4-2**.

FIGURE 4-2 EXISTING AIRCRAFT APRON

4.3.4 INSTRUMENT APPROACH DEVELOPMENT

Because instrument approach visibility minimums influence the airfield design standards, it is important to first consider the effects of developing an instrument approach at the airport. Generally the weather conditions in southern Arizona are sunny and clear, low visibility minimums are rare and are usually associated with dust storms and the Monsoon flow during late summer. Historical weather conditions from the Casa Grande Municipal Airport AWOS report that instrument weather conditions occur less than four percent of the time. Therefore, low instrument approach visibility minimums are not as critical at Ak-Chin as they may be other parts of the country. Even though weather conditions may be visual most of the time the majority of the turbo-prop and turbo-jet aircraft operations occur under the IFR regulations, since these types of aircraft typically fly above FL 180 while enroute to and from the airport, therefore the development of an instrument approach procedure at the airport is recommended to allow aircraft the opportunity to operate under IFR to and from the airport. The development of a GPS approach with vertical guidance, such as a LPV approach with 1-mile visibility minimums is recommended for the future. The approach development would require an aeronautical survey of the airport and surroundings to verify the height and location of any obstructions. Implementing a precision approach or lower minimums would not be cost effective, would require an additional 250 foot building setback from the runway would consume valuable development property and would not be utilized on a regular basis given the local weather conditions.

4.3.5 AIRPORT VISUAL AIDS AND LIGHTING

The installation of Medium Intensity Runway Lights, (MIRLs), Medium Intensity Taxiway Lights (MITLs) and PAPIs are recommended with all phases of future development. The installation of lighting and visual aids will enhance airport safety and increase the utility of the airport allowing operations to occur during hours of darkness.

4.3.6 AUTOMATED WEATHER OBSERVATIONS SYSTEM

The installation of an AWOS-III was recommended in Chapter 3. The AWOS should be located in a location which prevents future incompatibility with future airfield development. The location would meet the FAA/NOAA sitting criteria, of a 500 foot minimum clearance from buildings and 500 foot minimum lateral separation to the runway. The proposed location is shown near the approach end of Runway 4.

4.4 LANDSIDE DEVELOPMENT

Landside development consists of all portions of the airport designed to serve passengers, users, operators and maintenance facilities. These areas consist of the terminal building, vehicle roads, parking facilities, general aviation development areas, and airport support facilities. The following facilities were evaluated in order to meet future forecast of aviation growth for landside development.

4.4.1 HANGAR FACILITIES

The development of new box and T-hangars is recommended. Large corporate box hangar development is anticipated to occur on the west side of the runway adjacent to the proposed airport industrial park. Phased large corporate hangar development in this location will provide convenient access to the future primary airport access, air industrial park, executive terminal and FBO. The development of small box hangars, T-hangars and shade hangars is planned for the eastern side of the runway. The hangars have been configured to accommodate Group I wingtip clearance for small hangars and Group II for the large corporate style hangars. The development of an executive-style terminal is recommended for the northwest side of the airport. The executive terminal should be setup to accommodate corporate aircraft storage, maintenance and fueling facilities. A sample corporate hangar is shown in **Figure 4-3**.

FIGURE 4-3 CORPORATE HANGAR

4.4.2 AIRPORT ACCESS AND AUTOMOBILE PARKING

Future automobile parking would also be incorporated into future hangar development areas to provide parking for airport users in close proximity to their hangars and aircraft. A new airport access road is recommended for the initial term to the southeast side of the airport. The recommended location for the southeast side access road is entering from the north side of West Trading Post Road and running north along the west side of the industrial park development parcels located on the southeast corner of Ak-Chin property. This will avoid having airport traffic enter through West Bud Road which is also used by aircraft based in Saddleback Industrial Park. A small piece of right-of-way is needed to cross the corner of the adjacent property. It is also recommended that the taxilane serving Bud Road be reconfigured including the construction of a new taxilane running north south to connect Bud Road with the existing parallel taxiway. This reconfigured access from Bud Road to the airport will help to alleviate the mixing of automobile and aircraft traffic.

A future primary airport access road serving the west side is recommended as west side airport and airpark development occurs. The access road on the west side of the airport is envisioned to be the main access to the airport in the future with landscaped medians, curb and gutter and upscale signage and lighting. The west side access road would enter the airport from North Anderson Road connecting to points west including the Bunger Property and the Santa Cruz Commerce Center.

4.4.3 AIRCRAFT RESCUE AND FIRE FIGHTING

As discussed in Chapter 3, ARFF facilities are not required at general aviation airports; however should the airport become 14 CFR Part 139 certificated for commercial passenger service, then ARFF services will be required. Furthermore the Ak-Chin Community expressed a desire to construct a multi-use ARFF/structural fire station adjacent to the airport boundary to effectively provide fire protection services to the airport as well as other surrounding lands. The proposed location is on the west side of the airport with direct access to the runway and to North Anderson Road. Other locations were considered and were found to be less desirable for access and response. **Figure 4-5** provides a sample floor plan and conceptual ARFF Building sketch.

FIGURE 4-4 CONCEPTUAL ARFF FACILITY

4.4.4 INDUSTRIAL AIRPARK DEVELOPMENT

Future industrial airpark development has been planned for the west side of the property beyond the future airport boundary line. Taxilanes are proposed to access the future airpark development areas beyond the proposed airport hangar development area. The taxilanes would provide TTF access from airpark parcels to airport facilities. Each of the proposed parcels is provided airfield access by taxilane for aircraft access and roadway access for vehicle traffic. The sizes of the parcels are flexible so that they can be expanded or contracted based on actual demand. Development within these adjacent parcels would need to be consistent with airport operations, providing for the safety and security of aircraft movement in the area.

4.4.5 AIRPORT SUPPORT, MAINTENANCE AND UTILITIES

As the airport continues to develop, the need for airport support equipment will be required. This includes the acquisition of a tractor to perform routine maintenance at the airport. Routine maintenance will include mowing, grading and sweeping of airfield pavements. An equipment storage building is also recommended for the airport. This will help keep the airport equipment in usable condition as well as provide for security for the equipment. **Figure 4-6** shows a sample airport equipment storage building.

FIGURE 4-5 EQUIPMENT STORAGE BUILDING

The airport is in the process of conducting a utility study which will provide recommendations for the future development of water, sewer, power, gas and telephone on the airport and within the industrial airpark.

4.4.6 AIRCRAFT FUELING

To meet the fueling demand of Ak-Chin Regional Airport users, a future self service fuel farm with a Jet-A fuel, AvGas fuel and MoGas fuel tanks is recommended to be placed on existing aircraft parking apron. The self service fuel farm would include a credit card reader to enable fuel to be purchased 24 hours a day. Lighting would be included to provide increased security and to support fueling operations during hours of darkness.

4.5 RECOMMENDED PHASED DEVELOPMENT PLAN

The development of the airport should be based on actual demand for facilities rather than a plan based on a relative timeframe. The demand-based plan will allow the airport flexibility to accelerate or decelerate development based on current conditions. The proposed phasing plan listed below is intended to provide the Community with a realistic phased development plan for the airport over the 20 year planning period. It allows the appropriate sequencing of development, while at the same time accommodating each respective type of airport user.

4.5.1 PHASE I

The initial phase of development proposed for the Ak-Chin Regional Airport includes establishing the Building Restriction Line (BRL) on the northwest side of the property to provide adequate land to accommodate the development of the parallel taxiway and proposed hangar development on the northwest side of the airport. Acquisition of land for Taxiway B (0.2 acres) and the southeast airport access road (0.1 acres) will be required during Phase I.

Should demand for hangars on the northwest side occur during Phase I, the hangar development should be done so that if would not hinder the future runway and taxiway development or require any facilities to be relocated. The phase I airpark development would include the development of an access road and utilities to the site this should also include upgrades to Anderson Road. Construction of connector taxiway and partial parallel taxiway will accommodate initial corporate hangar development and access to the industrial airpark.

Apron expansion on the southeast side of the airport in the first phase of development will provide the required parking area for the increase in based and transient aircraft until such time that hangar development can occur. Construction of a taxilane will accommodate the initial demand for small to medium hangars for small general aviation aircraft at the airport. **Figure 4-7** shows the recommended development for Phase I.

4.5.2 PHASE II

The second development phase for the Ak-Chin Regional Airport includes shifting and constructing a new B-II runway (4,815 feet by 75 feet), which keeps the runway within the existing airport property boundary. The old runway will then be converted into a full length parallel taxiway.

Additional corporate hangar development on the west side of the new runway is shown. As the west side corporate hangar development continues the development of the west side parallel taxiway is recommended. The development of a large commercial FBO is anticipated to occur during Phase II development. Access and parking for the FBO will be an essential component of the development. Additional airpark development is also expected as part of Phase II which will include additional taxilanes serving the airpark.

Apron expansion is shown in Phase II along the east side of the runway. Hangar development along the east side of the runway is also anticipated to continue growing and taxilanes will be developed as required.

The development of an instrument approach is recommended as part of the Phase II development. As previously described the only cost associated with the instrument approach development is related to the aeronautical survey required to identify any obstructions surrounding the airport and airspace. **Figure 4-8** shows the recommended development for Phase II.

4.6 ACCOMMODATION OF AVIATION DEMAND LEVELS

Each development project would meet FAA safety and design standards for an ARC of B-II and protect for an ARC of C-III. This will allow the airport to accommodate the current and projected types of aircraft that are expected to use the airport, while not creating constraints for any post-planning period development.

4.7 AIRSPACE IMPACTS

As discussed in previous sections the development of an instrument approach procedure to the airport is anticipated. The approach visibility minimums throughout the 20 year planning period are not planned to be lower than 1-mile. All future development has been placed to accommodate the future instrument approach procedure. The actual development and approach visibility minimums will depend upon the results of a completed aeronautical survey and coordination with the FAA. No significant airspace impacts are anticipated as a result of the proposed development.

4.8 ENVIRONMENTAL IMPACTS

The environmental impacts associated with the recommended development will be evaluated in detail as part of Chapter 7. No significant environmental impacts are anticipated as a result of the proposed development.

4.9 DEVELOPMENT COSTS

The costs associated with the recommended development are included as part of the Financial Development Plan for the Airport in Chapter 6. The detailed analysis provided in Chapter 6 will include the potential funding sources and percentages for local and federal budgeting purposes.

4.10 OTHER ALTERNATIVES CONSIDERED

4.10.1 NO ACTION ALTERNATIVE

The no action alternative would include leaving the airport in its current condition including the runway and apron area. This alternative does not meet the objectives of the Community in providing an airport that meets the demands of the existing and projected airport users. Therefore, the no action alternative has not been carried forward for further discussion.

4.11 CONCLUSIONS AND RECOMMENDATIONS

The recommended development items shown in each phase of development have been discussed and agreed upon with the Ak-Chin Community. The recommended development will be carried forward into the ALP drawing set in Chapter 5.

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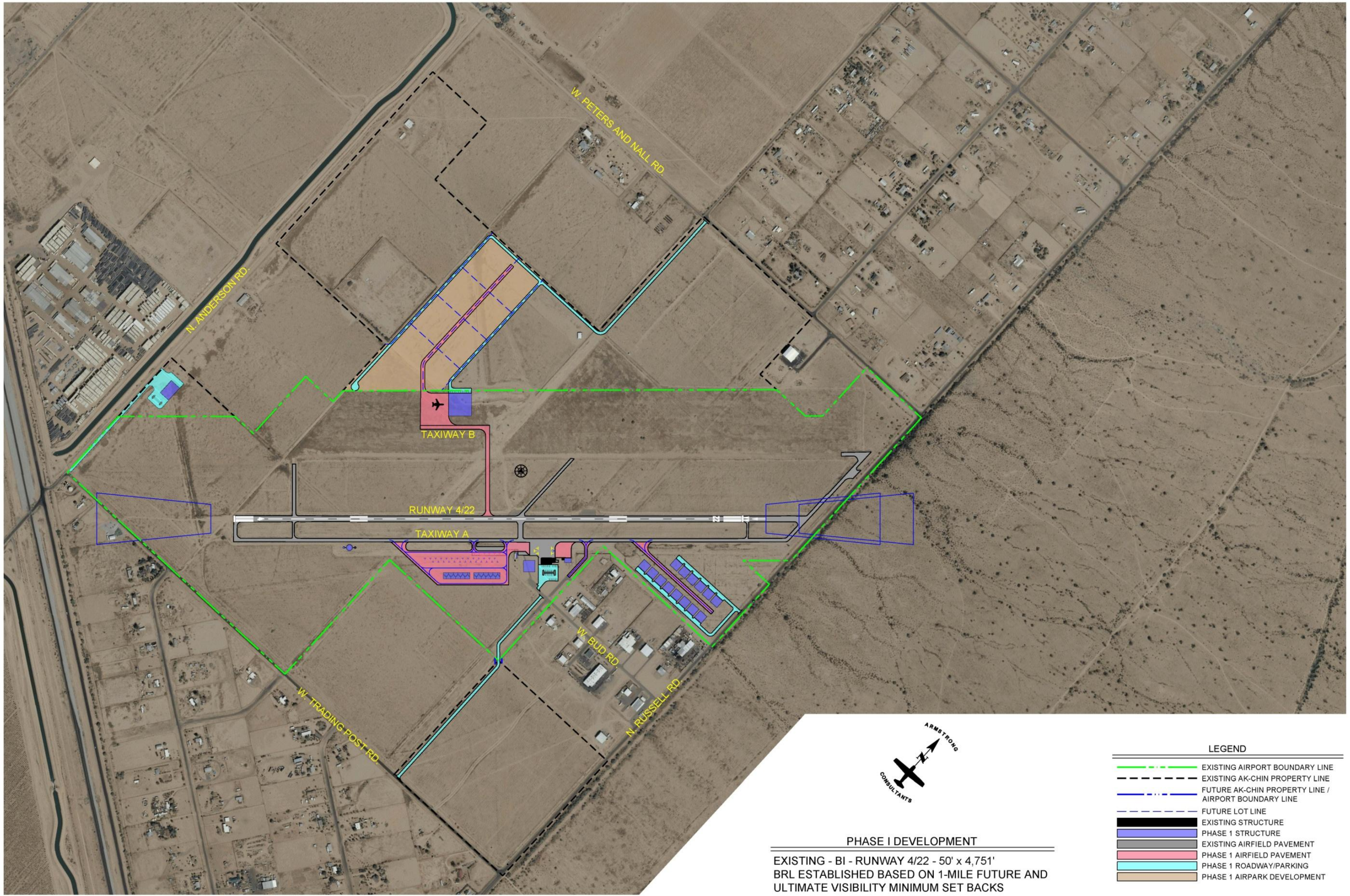


FIGURE 4-7 PHASE I RECOMMENDED DEVELOPMENT

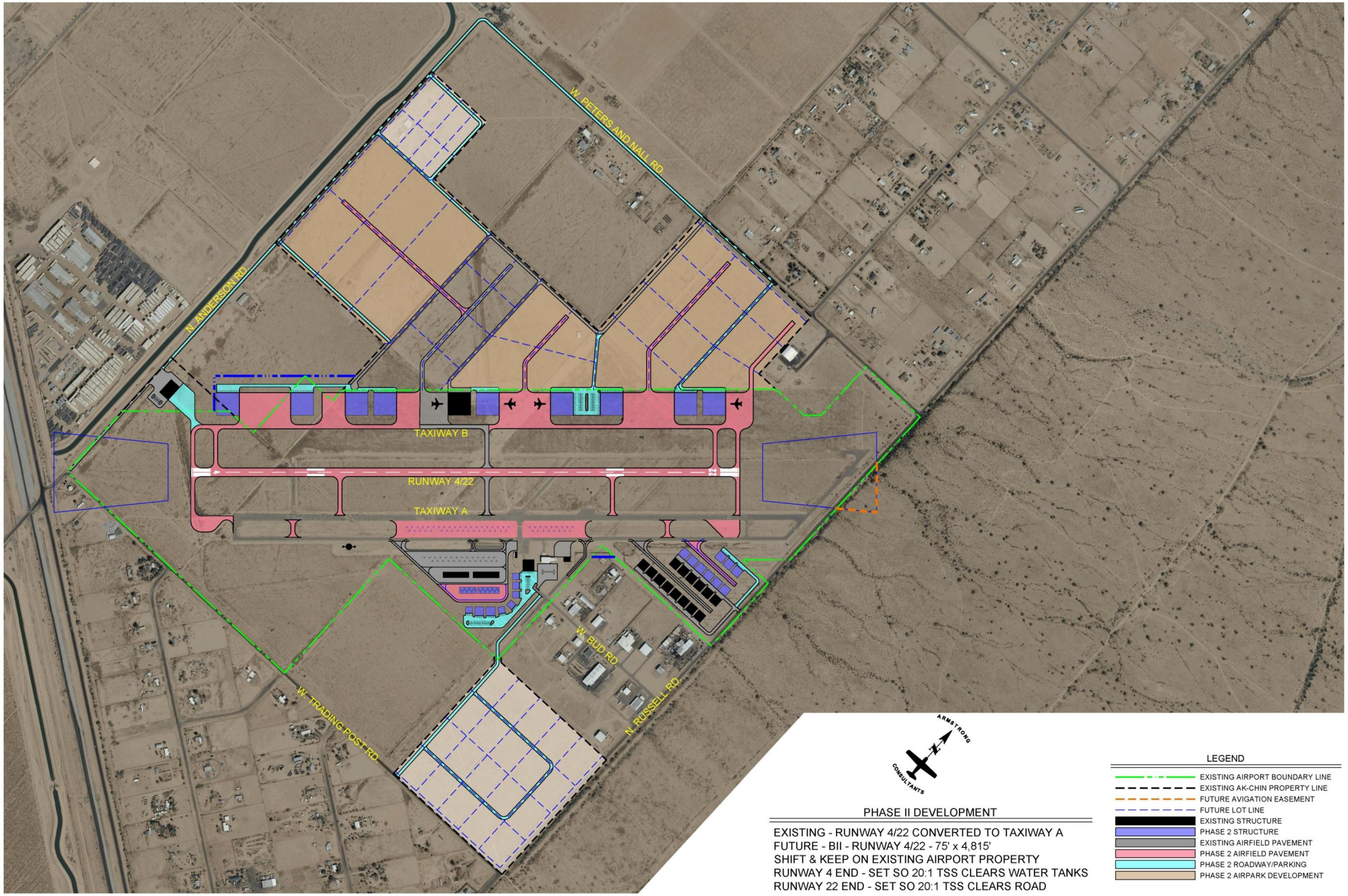


FIGURE 4-8 PHASE II RECOMMENDED DEVELOPMENT

CHAPTER

5

AIRPORT LAYOUT PLANS

AK-CHIN REGIONAL AIRPORT
AIRPORT MASTER PLAN

ARMSTRONG

AK-CHIN REGIONAL AIRPORT
AK-CHIN INDIAN COMMUNITY
MARICOPA, ARIZONA

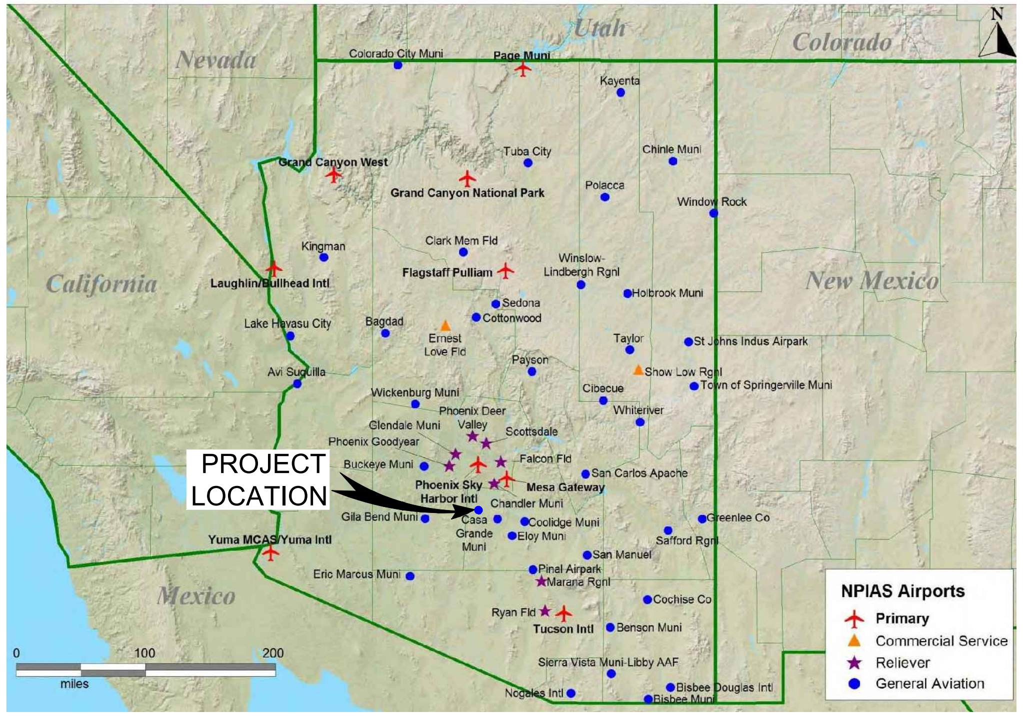
AIRPORT LAYOUT PLANS

PREPARED BY:

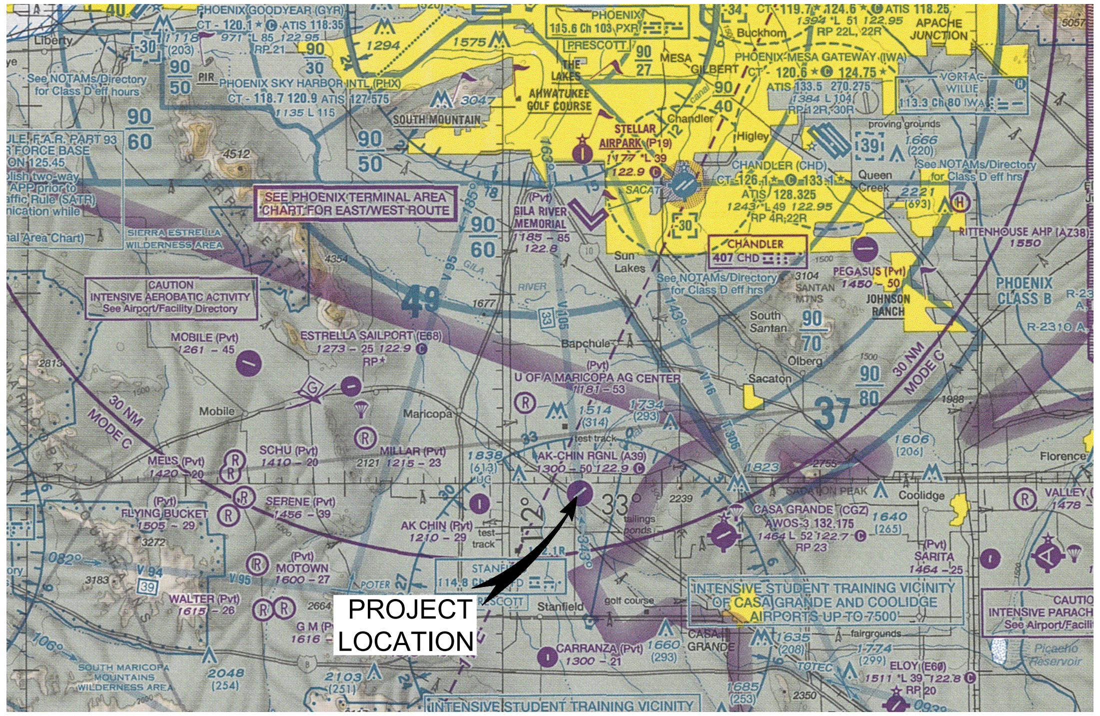
ARMSTRONG CONSULTANTS, INC.

A.C.I. PROJECT NO.126082
DATE: APRIL, 2015

Arizona



LOCATION MAP



VICINITY MAP

INDEX TO SHEETS

(E = EXISTING, F = FUTURE)

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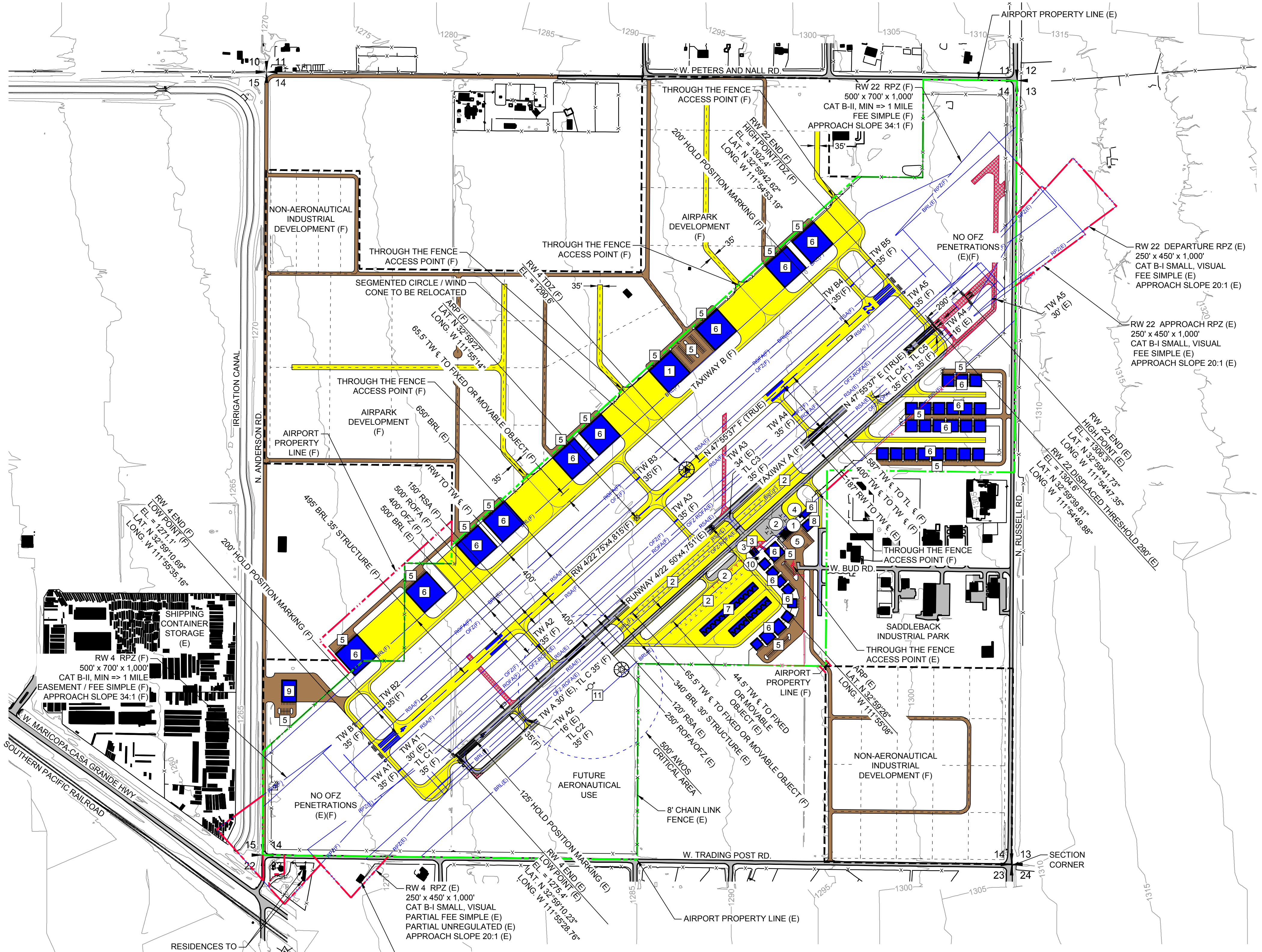
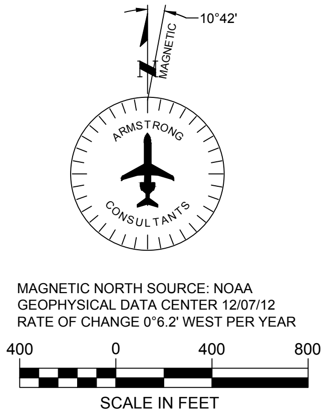
6082501





MAGNETIC NORTH SOURCE: NOAA
GEOPHYSICAL DATA CENTER 12/07/12
RATE OF CHANGE 0°6.2' WEST PER YEAR

SCALE IN FEET

NOTES

1. BUILDING RESTRICTION LINE (BRL) DEPICTS REQUIRED SETBACKS FOR A TYPICAL 35' STRUCTURE. HEIGHTS OF EXISTING AND FUTURE BUILDINGS WITHIN THE BRL REMAIN CLEAR OF THE OFA'S AND AREA BELOW THE 7:1 TRANSITIONAL SURFACE (OR ARE OBSTRUCTION MARKED AND LIGHTED ACCORDINGLY).
1. NO PACS/SACS AT THE AIRPORT, NGS MONUMENT Z421 IS A STAINLESS STEEL ROD IN A SLEEVE. OTHER NGS MONUMENTS ARE NOT IN VICINITY OF AIRPORT.
2. TOPOGRAPHY FROM AN AERIAL SURVEY BY DIBBLE, 2012 AND A CONSTRUCTION SURVEY BY NEW HORIZON SURVEYING, 9/2011
3. NO OFZ OBJECT PENETRATIONS.
4. NO APPROACH OR THRESHOLD SITING SURFACE PENETRATIONS.
5. NO THRESHOLD SITING SURFACE PENETRATIONS.

AIRPORT FACILITIES LIST

EXISTING	FUTURE	FACILITY DESCRIPTION	TOP ELEVATION ESTIMATED (MSL)
①	1	FBO/TERMINAL BLDG.	1329'
②	2	TIEDOWNS	-
③	3	FUEL STORAGE	1304'
④		ELECTRICAL VAULT	1307'
⑤	5	VEHICLE PARKING	-
	6	BOX HANGARS	1316' - 1354'
	7	T-HANGARS	1306' - 1345'
	8	MAINTENANCE EQUIP. BLDG.	1320'
	9	FIRE STATION	1303'
⑩		BEACON	1337'
	11	AWOS	1314'

SPONSOR APPROVAL

LOUIS J. MANUEL, JR., CHAIRMAN
AK-CHIN INDIAN COMMUNITY

DATE

FAA APPROVAL

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
▭	🟨	AIRFIELD DEVELOPMENT (PAVEMENT)	●●●● ●●●●	0000 0000	THRESHOLD LIGHTS
⬛	🟦	STRUCTURE/FACILITIES (BUILDING)			REIL
🟩	🟥	AIRPORT PROPERTY LINE (APL)	■	□	VASI/PAPI
- - - -	N/A	EXISTING AK-CHIN PROPERTY LINE			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)	●	○	AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)	▶	▷	LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)	1 2 12 11	N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
⊕	⊕	AIRPORT REFERENCE POINT			MARKINGS
△		NGS SURVEY MONUMENT	X	XX	FENCING
	- - - -	PARCEL LINE		▨	TO BE REMOVED

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AK-CHIN REGIONAL AIRPORT
AK-CHIN INDIAN COMMUNITY
MARICOPA, ARIZONA

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	126082	04/2015	ORIGINAL ISSUE	6082502	LKB	TMB	JZP

AIRPORT
LAYOUT
PLAN

Sheet: 2 of: 16

RUNWAY DATA

ITEM		RW 4/22 EXISTING (E)	RW 4/22 FUTURE (F)
RUNWAY DESIGN CODE (RDC) / RUNWAY VISUAL RANGE (RVR)		B-I SMALL / VIS	B-II / 5,000
DEPARTURE REFERENCE CODE (DPRC)		B-I SMALL / VIS	B-II / 5,000
APPROACH MINIMUMS		VISUAL	1-MILE
APPROACH TYPE	RW 4	VISUAL UTILITY	NPI >UTILITY
	RW 22	VISUAL UTILITY	NPI >UTILITY
FAR PART 77 APPROACH SLOPE	RW 4	20:1	34:1
	RW 22	20:1	34:1
RUNWAY LENGTH		4,751'	4,815'
RUNWAY WIDTH		50'	75'
RUNWAY & TAXIWAY PAVEMENT		ASPHALT	SAME
PAVEMENT STRENGTH (LBS)		12,500 SWG	30,000 SWG
PCN (FOR BEARING STRENGTH OF 12,500 LBS OR GREATER)		0	0
RUNWAY LIGHTING		NONE	MIRL
RUNWAY MARKING	RW 4	NPI	SAME
	RW 22	NPI	SAME
% EFFECTIVE GRADIENT		0.65%	0.65%
% MAXIMUM GRADE		0.92%	0.65%
LINE OF SIGHT REQUIREMENTS MET		YES	SAME
VISUAL APPROACH AIDS		BEACON	BEACON/PAPI'S/REIL'S
INSTRUMENT APPROACH AIDS		VISUAL	GPS/LPV
DESIGN AIRCRAFT	CRITICAL AIRCRAFT	CESSNA 421 GOLDEN EAGLE	BEECH SUPER KING AIR B200
	APPROACH SPEED (KNOTS)	96	103
	WINGSPAN (FEET)	41.7	54.5
	MAX. CERTIFIED TAKEOFF WT. (LBS)	7,450	12,500
	UNDERCARRIAGE WIDTH (FEET)	14.7	17.2
RUNWAY SAFETY AREA (RSA)	WIDTH	120'	150'
	LENGTH BEYOND RW END	240'	300'
RUNWAY OBJECT FREE AREA (ROFA)	WIDTH	250'	500'
	LENGTH BEYOND RW END	240'	300'
OBSTACLE FREE ZONE (OFZ)	WIDTH	250'	400'
	LENGTH BEYOND RW END	200'	SAME
RUNWAY ELEVATIONS (NAVD 88)			
RUNWAY END	RW 4	1275.4'	1271.1'
	RW 22	1306.3'	1302.4'
DISPLACED THRESHOLD	RW 4	-	-
	RW 22	1304.6'	-
TOUCHDOWN ZONE (TDZ)	RW 4	-	1290.6'
	RW 22	-	1302.4'
HIGH POINT		1306.3'	1302.4'
LOW POINT		1275.4'	1271.1'
RUNWAY PROTECTION ZONE DIMENSIONS	RW 4	250' x 450' x 1,000'	500' x 700' x 1,000'
	RW 22	250' x 450' x 1,000'	500' x 700' x 1,000'
APPROACH SURFACE DIMENSIONS	RW 4	250' x 1,250' x 5,000'	500' x 3,500' x 10,000'
	RW 22	250' x 1,250' x 5,000'	500' x 3,500' x 10,000'
RUNWAY C/L TO HOLD BARS AND SIGNS		125'	200'
RUNWAY / PARALLEL TAXIWAY C/L SEPARATION		150'	240' (400' RECOMMENDED)
RUNWAY TO AIRCRAFT PARKING		125'	250'
TAXIWAY DESIGN GROUP (TDG)		TDG-1	TDG-2
TAXIWAY OBJECT FREE AREA WIDTH		89'	131'
TAXIWAY SAFETY AREA WIDTH		49'	79'
TAXIWAY WING TIP CLEARANCE		20'	26'
TAXIWAY C/L TO FIXED OR MOVABLE OBJECT		44.5'	65.5'
TAXIWAY WIDTH		25' (15' - 44' ACTUAL)	35'
TAXIWAY SURFACE TYPE		ASPHALT	SAME

DECLARED DISTANCES

ITEM	EXISTING		FUTURE		FAA APPROVAL DATE
	RW 4	RW 22	RW 4	RW 22	
TAKEOFF RUN AVAILABLE (TORA)	4,751'	4,751'	-	-	
TAKEOFF DISTANCE AVAILABLE (TODA)	4,751'	4,751'	-	-	
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	4,751'	4,751'	-	-	
LANDING DISTANCE AVAILABLE (LDA)	4,751'	4,461'	-	-	

AIRPORT DATA

ITEM		EXISTING (E)	FUTURE (F)
AIRPORT ELEVATION (NAVD 88)*		1306.3'	1302.4'
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	LATITUDE	N 32°59'26"	N 32°59'27"
	LONGITUDE	W 111°55'08"	W 111°55'14"
MEAN MAX. TEMP: HOTTEST MONTH (JULY)		106.6° F	SAME
RUNWAY WIND COVERAGE	12 MPH / 10.5 kts	97.53%	SAME
	15 MPH / 13 kts	98.97%	SAME
	18 MPH / 16 kts	99.79%	SAME
AIRPORT REFERENCE CODE		B-I SMALL	B-II
NPIAS ROLE		GENERAL AVIATION	SAME
MAGNETIC VARIATION		10°42' E	TBD
TAXIWAY LIGHTING		NONE	MITL
TAXIWAY MARKING		CENTERLINE	SAME
AIRPORT & TERMINAL NAVAIDS		BEACON	BEACON, GPS, LPV

* NAVD 88 ELEVATIONS FROM SURVEY BY NEW HORIZON SURVEYING, 9/4/2011

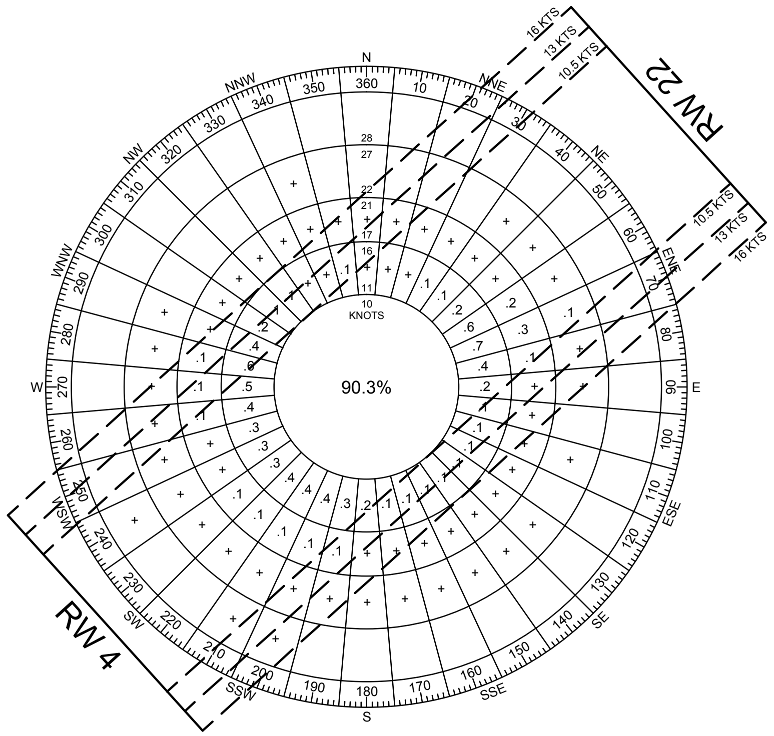
RUNWAY END COORDINATES (NAD 83)

	EXISTING			FUTURE	
	RW 4 END	RW 22 DISPLACED	RW 22 END	RW 4 END	RW 22 END
LATITUDE	N 32°59'10.23"	N 32°59'39.81"	N 32°59'41.73"	N 32°59'10.69"	N 32°59'42.62"
LONGITUDE	W 111°55'28.76"	W 111°54'49.88"	W 111°54'47.35"	W 111°55'35.16"	W 111°54'53.19"

COORDINATES BASED ON SURVEY BY NEW HORIZON SURVEYING, 9/4/2011, USING NGS SURVEY MONUMENTS.

NON-STANDARD CONDITIONS

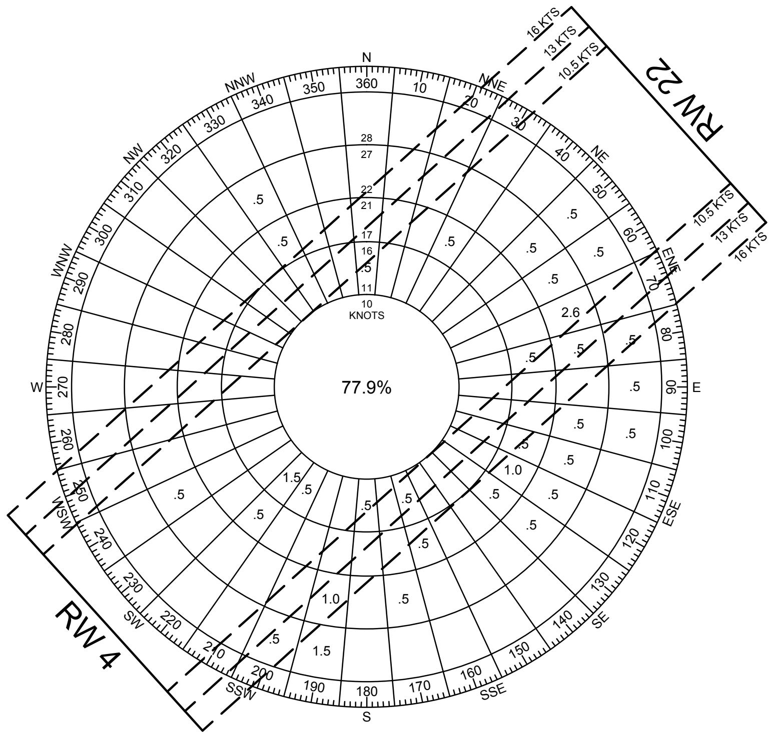
ITEM	RUNWAY DESIGN CODE	STANDARD	NON-STD CONDITION	PROPOSED ACTION
RUNWAY 4/22 WIDTH	B-I SMALL	60'	50'	RELOCATE RUNWAY, CONVERT RUNWAY TO TAXIWAY A
TAXIWAYS A2 & A4 WIDTH	B-I SMALL	25'	<25'	WIDEN TW A2, REMOVE TW A4
RUNWAY 4 RPZ (E)	B-I SMALL	CONTROLLED	2 ACRES UNREGULATED	ACQUIRE AVIGATION ESEMENT OR FEE SIMPLE
RUNWAY 22 RPZ (E)	B-I SMALL	CONTROLLED	7 ACRES UNREGULATED	ACQUIRE AVIGATION ESEMENT OR FEE SIMPLE



RUNWAY	10.5 KNOTS 13 MPH	13 KNOTS 16 MPG	16 KNOTS 20 MPH
4/22	97.53%	98.97%	99.79%

ALL WEATHER WIND ROSE

WIND DATA SOURCE: CASA GRANDE MUNICIPAL AIRPORT AWOS-3
8 NM E OF A39 AT 1,464' MSL, 2012 (COLLECTION BETWEEN 01/2001
TO 12/2009). NUMBER OF OBSERVATIONS: 81,269



RUNWAY	10.5 KNOTS 13 MPH	13 KNOTS 16 MPG	16 KNOTS 20 MPH
4/22	86.63%	88.42%	90.43%

IFR-WEATHER WIND ROSE

WIND DATA SOURCE: CASA GRANDE MUNICIPAL AIRPORT AWOS-3
8 NM E OF A39 AT 1,464' MSL, 2012 (COLLECTION BETWEEN 01/2001
TO 12/2009). NUMBER OF OBSERVATIONS: 29,986

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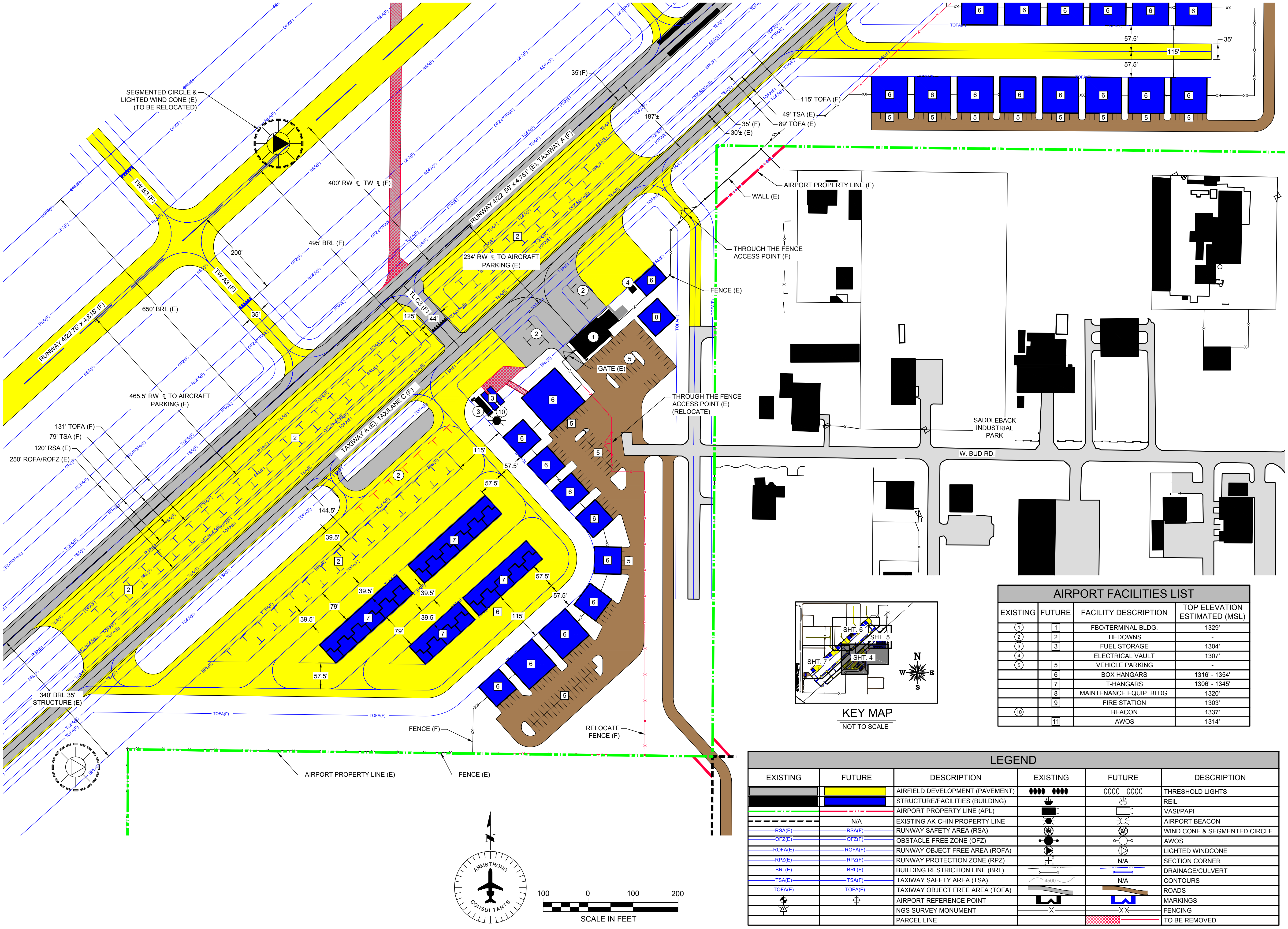
AK-CHIN INDIAN COMMUNITY
MARICOPA, ARIZONA

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	126082	04/2015	ORIGINAL ISSUE	6082502	LKB	TMB	JZP

AIRPORT
DATA
SHEET

Sheet: 3 of: 16



KEY MAP

NOT TO SCALE

AIRPORT FACILITIES LIST

EXISTING	FUTURE	FACILITY DESCRIPTION	TOP ELEVATION ESTIMATED (MSL)
①	1	FBO/TERMINAL BLDG.	1329'
②	2	TIEDOWNS	-
③	3	FUEL STORAGE	1304'
④		ELECTRICAL VAULT	1307'
⑤	5	VEHICLE PARKING	-
	6	BOX HANGARS	1316' - 1354'
	7	T-HANGARS	1306' - 1345'
	8	MAINTENANCE EQUIP. BLDG.	1320'
	9	FIRE STATION	1303'
⑩		BEACON	1337'
	11	AWOS	1314'

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
▬	▬	AIRFIELD DEVELOPMENT (PAVEMENT)	●●●● ●●●●	0000 0000	THRESHOLD LIGHTS
■	■	STRUCTURE/FACILITIES (BUILDING)			REIL
— - —	— - —	AIRPORT PROPERTY LINE (APL)	■	☐	VASI/PAPI
– – –	N/A	EXISTING AK-CHIN PROPERTY LINE			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)	●	○	AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)	▶	▷	LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)	1 2 12 11	N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
⊕	⊕	AIRPORT REFERENCE POINT			MARKINGS
△		NGS SURVEY MONUMENT	—X—	—XX—	FENCING
	- - - - -	PARCEL LINE		▨	TO BE REMOVED

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MARICOPA, ARIZONA

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TERMINAL AREA DRAWING

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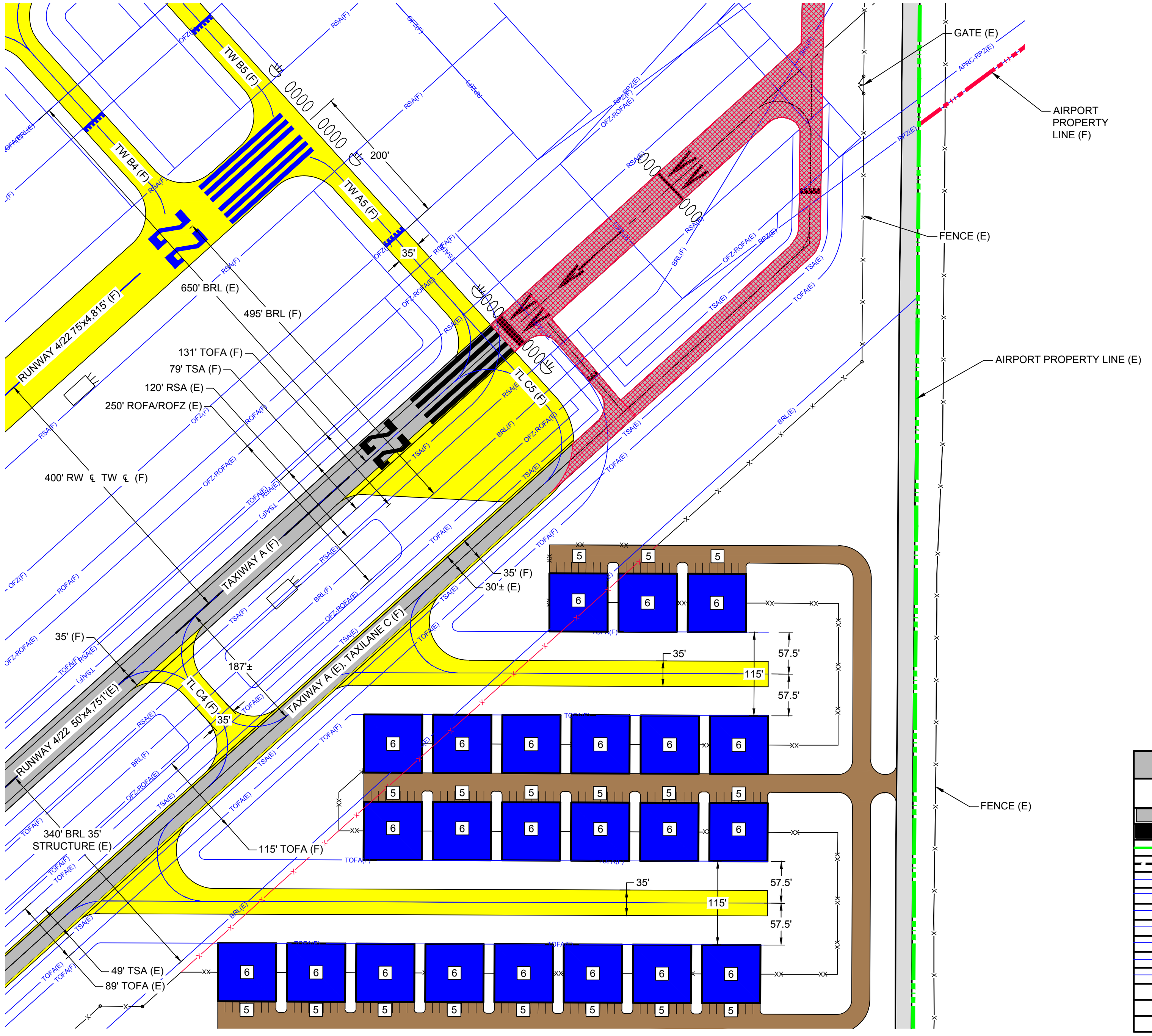
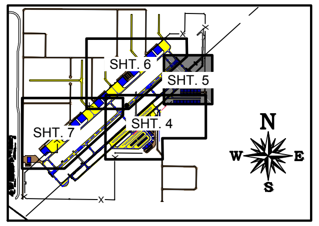
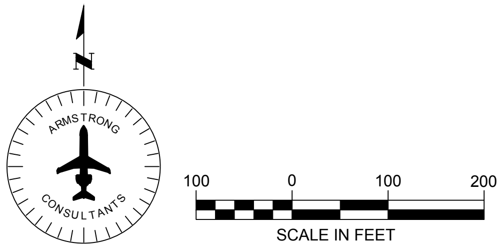




KEY MAP

NOT TO SCALE



AIRPORT FACILITIES LIST

EXISTING	FUTURE	FACILITY DESCRIPTION	TOP ELEVATION ESTIMATED (MSL)
①	1	FBO/TERMINAL BLDG.	1329'
②	2	TIEDOWNS	-
③	3	FUEL STORAGE	1304'
④		ELECTRICAL VAULT	1307'
⑤	5	VEHICLE PARKING	-
	6	BOX HANGARS	1316' - 1354'
	7	T-HANGARS	1306' - 1345'
	8	MAINTENANCE EQUIP. BLDG.	1320'
	9	FIRE STATION	1303'
⑩		BEACON	1337'
	11	AWOS	1314'

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
▨	🟨	AIRFIELD DEVELOPMENT (PAVEMENT)	●●●● ●●●●	0000 0000	THRESHOLD LIGHTS
⬛	🟦	STRUCTURE/FACILITIES (BUILDING)			REIL
— - - —	— - - —	AIRPORT PROPERTY LINE (APL)	■	□	VASI/PAPI
— — — —	N/A	EXISTING AK-CHIN PROPERTY LINE	✹	✳	AIRPORT BEACON
—RSA(E)—	—RSA(F)—	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
—OFZ(E)—	—OFZ(F)—	OBSTACLE FREE ZONE (OFZ)	●—●—●	○—○—○	AWOS
—ROFA(E)—	—ROFA(F)—	RUNWAY OBJECT FREE AREA (ROFA)	▶	▷	LIGHTED WINDCONE
—RPZ(E)—	—RPZ(F)—	RUNWAY PROTECTION ZONE (RPZ)	1 2 + 12 11	N/A	SECTION CORNER
—BRL(E)—	—BRL(F)—	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
—TSA(E)—	—TSA(F)—	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
—TOFA(E)—	—TOFA(F)—	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
⊕	⊕	AIRPORT REFERENCE POINT			MARKINGS
△		NGS SURVEY MONUMENT	—X—	—XX—	FENCING
	- - - - - - -	PARCEL LINE		▨ ——	TO BE REMOVED

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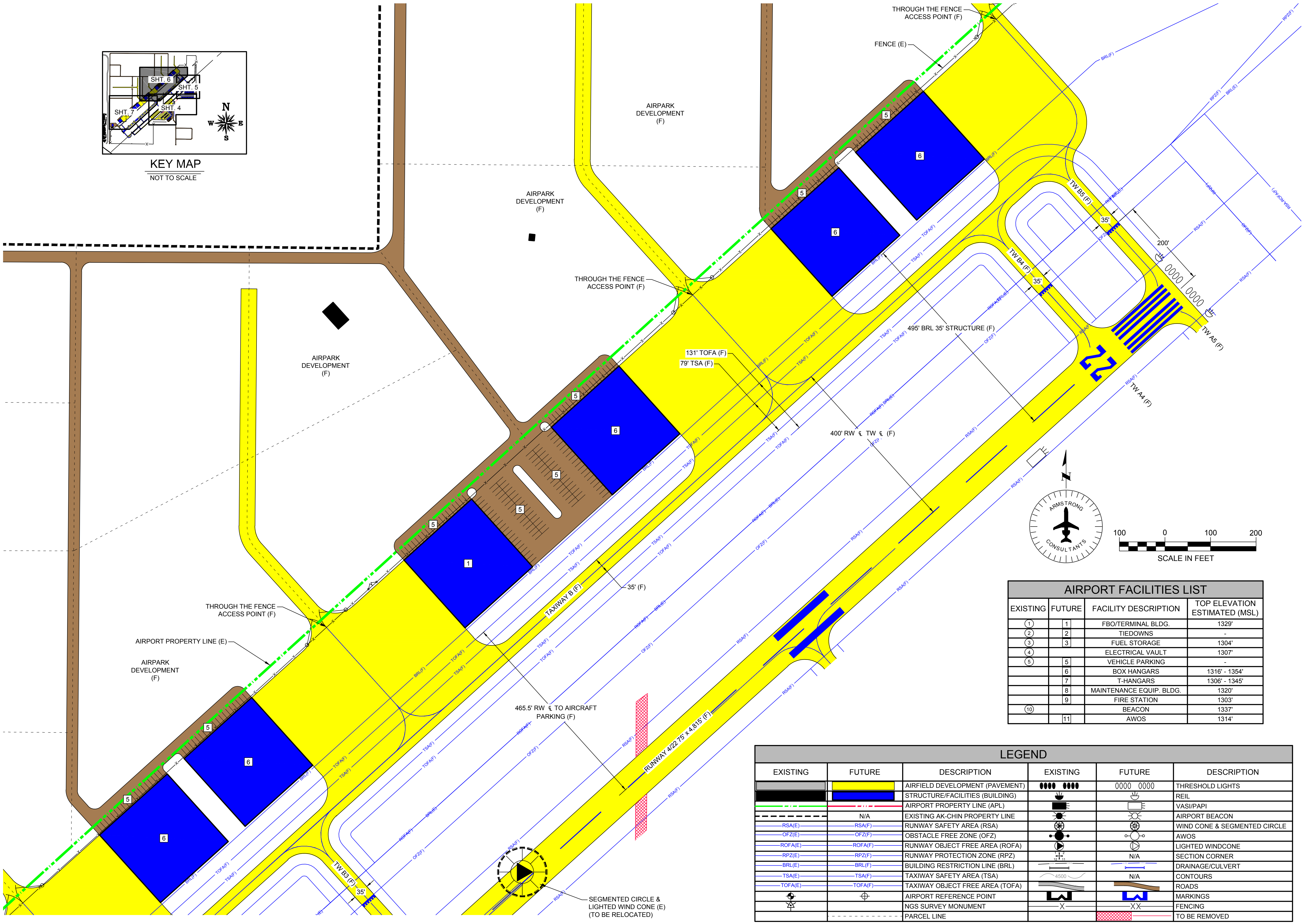
TERMINAL
AREA
DRAWING

Sheet: 5 of: 16



AIRPORT FACILITIES LIST

EXISTING	FUTURE	FACILITY DESCRIPTION	TOP ELEVATION ESTIMATED (MSL)
①	1	FBO/TERMINAL BLDG.	1329'
②	2	TIEDOWNS	-
③	3	FUEL STORAGE	1304'
④		ELECTRICAL VAULT	1307'
⑤	5	VEHICLE PARKING	-
	6	BOX HANGARS	1316' - 1354'
	7	T-HANGARS	1306' - 1345'
	8	MAINTENANCE EQUIP. BLDG.	1320'
	9	FIRE STATION	1303'
⑩		BEACON	1337'
	11	AWOS	1314'

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
⬜	🟨	AIRFIELD DEVELOPMENT (PAVEMENT)	●●●● ●●●●	0000 0000	THRESHOLD LIGHTS
⬛	🟦	STRUCTURE/FACILITIES (BUILDING)			REIL
🟩	🟥	AIRPORT PROPERTY LINE (APL)	■	□	VASI/PAPI
— — — —	N/A	EXISTING AK-CHIN PROPERTY LINE			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)	●	○	AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)	▶	▷	LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)	1 2 12 11	N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
	⌖	AIRPORT REFERENCE POINT			MARKINGS
		NGS SURVEY MONUMENT	X	XX	FENCING
	- - - - - - - -	PARCEL LINE		▨	TO BE REMOVED

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TERMINAL
AREA
DRAWING

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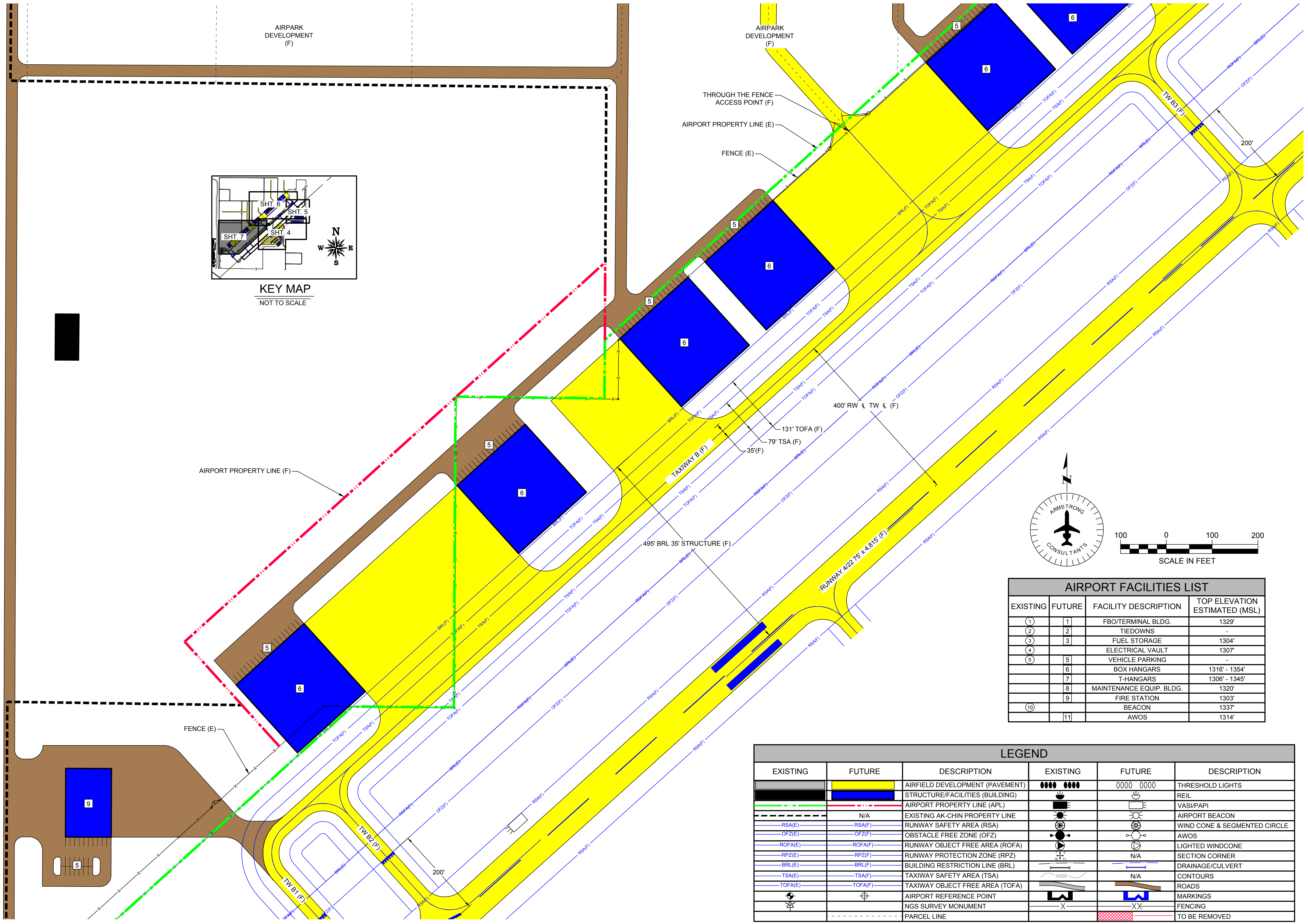

AIRPORT FACILITIES LIST

EXISTING	FUTURE	FACILITY DESCRIPTION	TOP ELEVATION ESTIMATED (MSL)
①	1	FBO/TERMINAL BLDG.	1329'
②	2	TIEDOWNS	-
③	3	FUEL STORAGE	1304'
④		ELECTRICAL VAULT	1307'
⑤	5	VEHICLE PARKING	-
	6	BOX HANGARS	1316' - 1354'
	7	T-HANGARS	1306' - 1345'
	8	MAINTENANCE EQUIP. BLDG.	1320'
	9	FIRE STATION	1303'
⑩		BEACON	1337'
	11	AWOS	1314'

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
▨	🟨	AIRFIELD DEVELOPMENT (PAVEMENT)	●●●● ●●●●	0000 0000	THRESHOLD LIGHTS
■	🟦	STRUCTURE/FACILITIES (BUILDING)			REIL
— - —	— - —	AIRPORT PROPERTY LINE (APL)	■	□	VASI/PAPI
– – – –	N/A	EXISTING AK-CHIN PROPERTY LINE	✹	✹	AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)	●	○	AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)	▶	▷	LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)	1 2 12 11	N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
⊕	⊕	AIRPORT REFERENCE POINT			MARKINGS
△		NGS SURVEY MONUMENT	X	XX	FENCING
	- - - - - -	PARCEL LINE		▨	TO BE REMOVED

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AIRPORT LAYOUT PLAN

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TERMINAL
AREA
DRAWING

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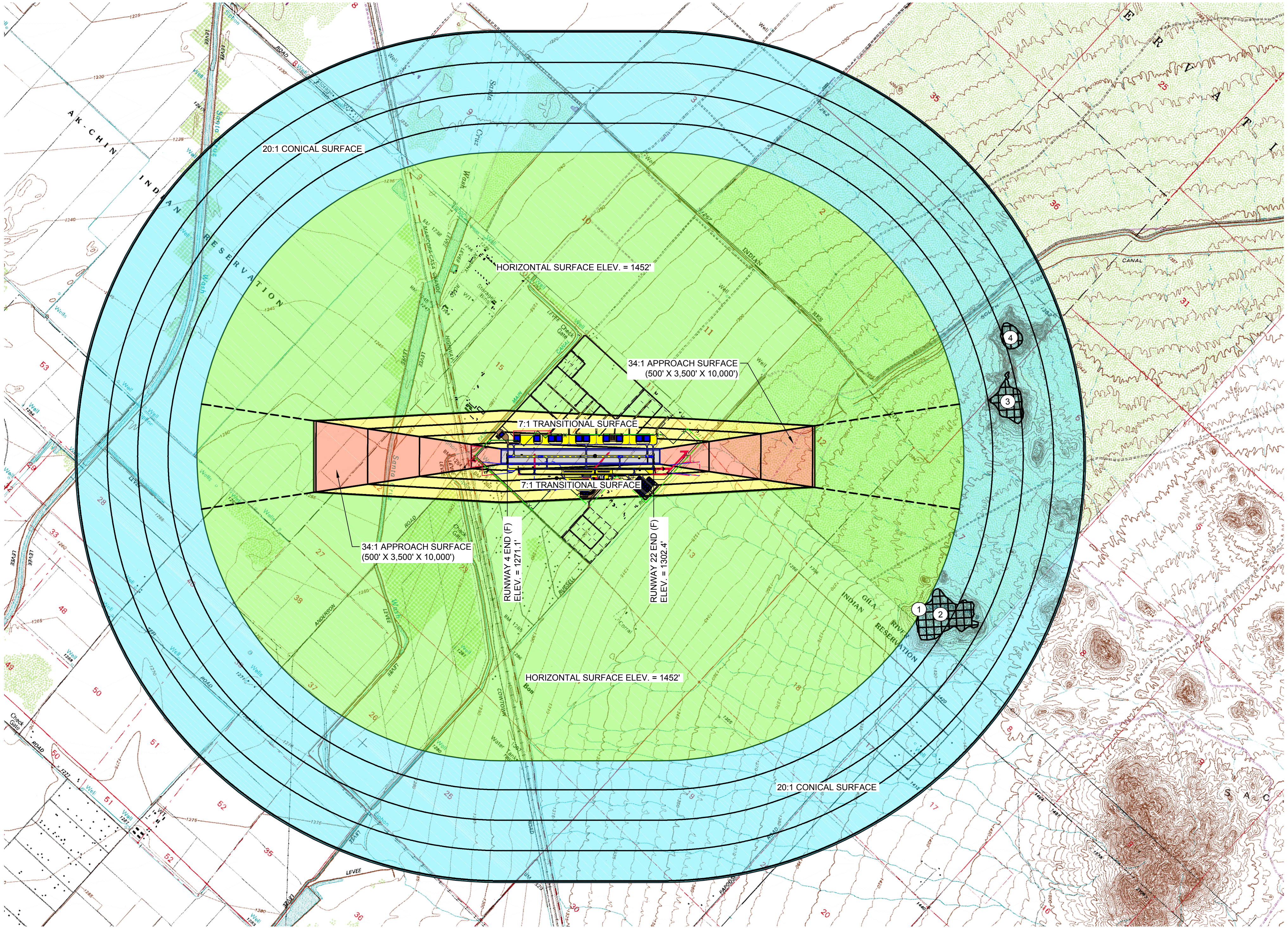


OBSTRUCTION CHART

SURFACE	DESCRIPTION	TOP ELEVATION	PENETRATION	REMARKS
PRIMARY	NONE	----	----	----
APPROACH	SEE NOTE 2	----	----	----
TRANSITIONAL	NONE	----	----	----
HORIZONTAL	① TERRAIN	1480'	+27'	----
CONICAL	② TERRAIN	1725'	+243'	----
CONICAL	③ TERRAIN	1714'	+182'	----
CONICAL	④ TERRAIN	1735'	+173'	----

NOTES

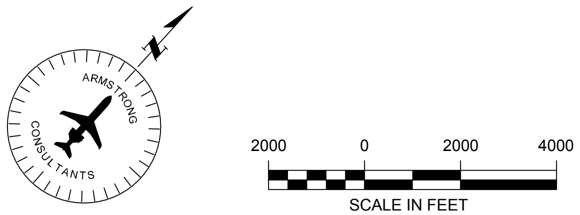
1) NO CURRENT HEIGHT RESTRICTION ZONING IN EFFECT.

2) REFER TO "INNER PORTION OF THE APPROACH SURFACE" DRAWING FOR DETAILS ON CLOSE-IN APPROACH OBSTRUCTIONS.

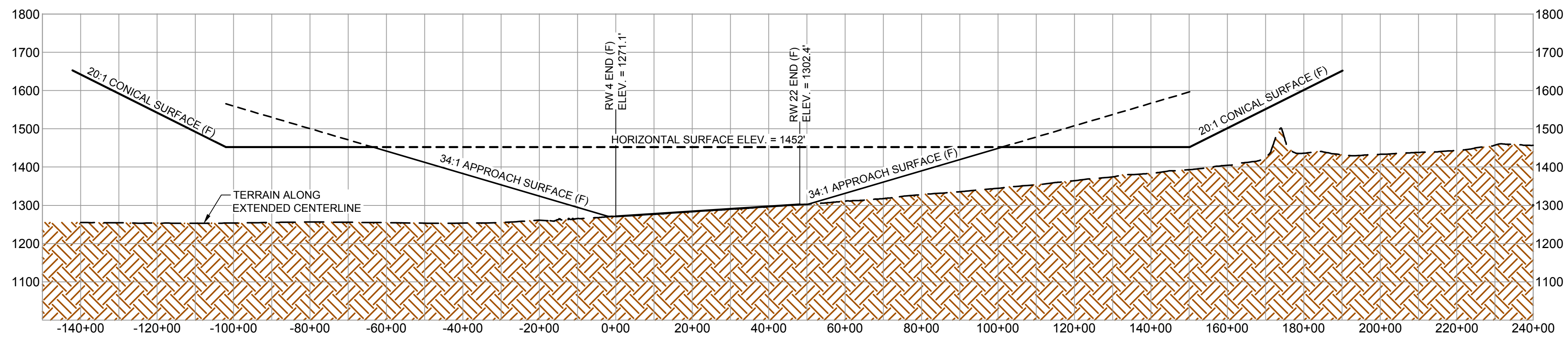
3) APPROACH SURFACES BASED ON ULTIMATE CONDITION.

4) THE FAR PART 77 AIRSPACE DRAWING WAS BASED ON ESTIMATED TERRAIN ELEVATIONS AND ESTIMATED DEVELOPMENT HEIGHTS ALONG WITH THE USE OF AIRSPACE EVALUATION CASES THAT HAVE BEEN SUBMITTED THROUGH THE FAA OBSTRUCTION EVALUATION/AIRPORT AIRSPACE ANALYSIS (OE/AAA) PROCESS. NO SURVEYS OF THE FAR PART 77 SURFACES HAVE BEEN CONDUCTED.

🟨	TRANSITIONAL SURFACE	🟩	HORIZONTAL SURFACE
🟥	APPROACH SURFACE	🟦	CONICAL SURFACE
⬜	PRIMARY SURFACE	▨	PENETRATION

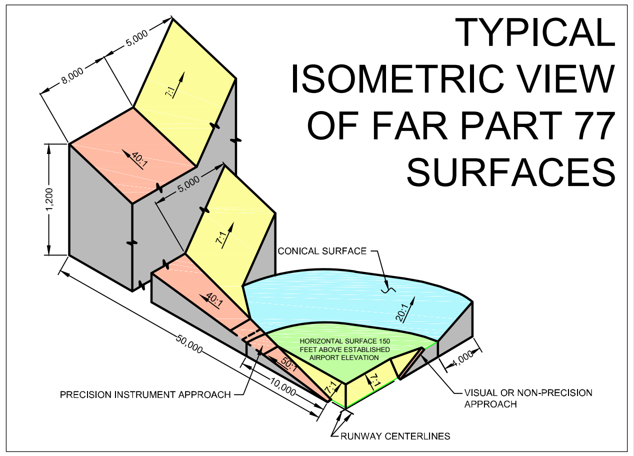


SCALE IN FEET



RUNWAY 4/22 (F)

TYPICAL ISOMETRIC VIEW OF FAR PART 77 SURFACES



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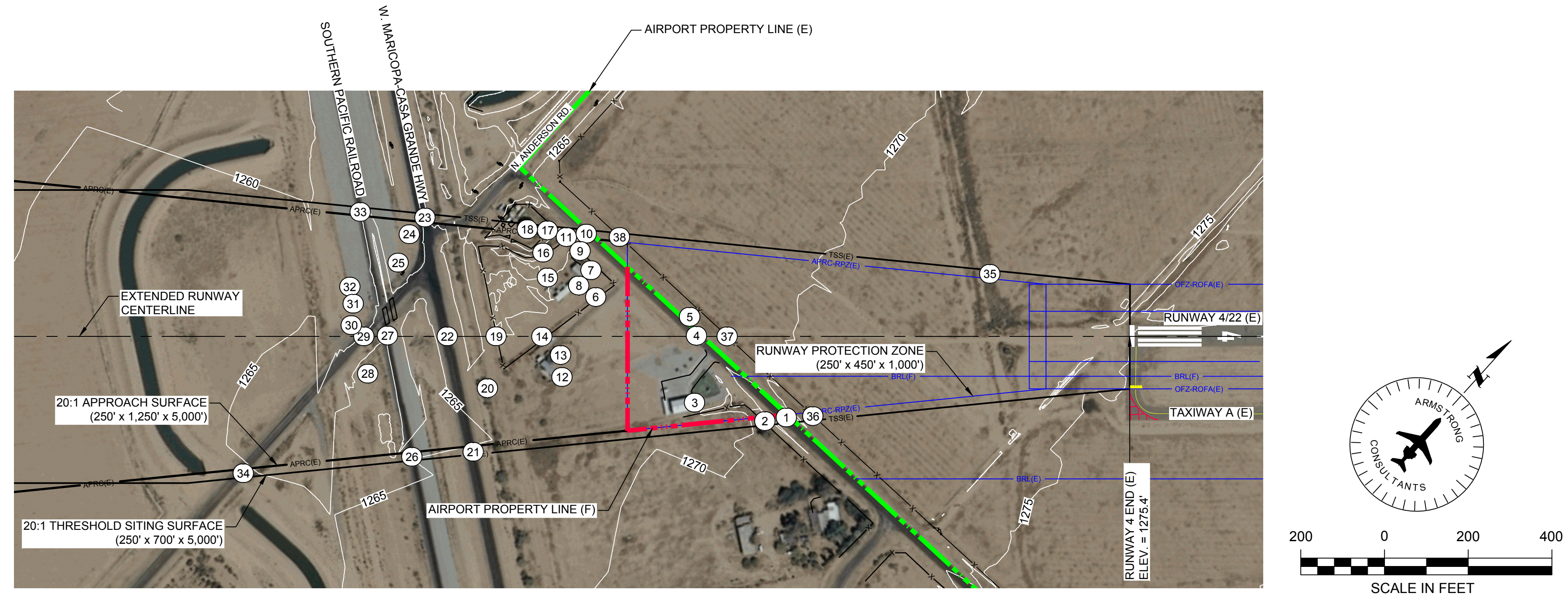
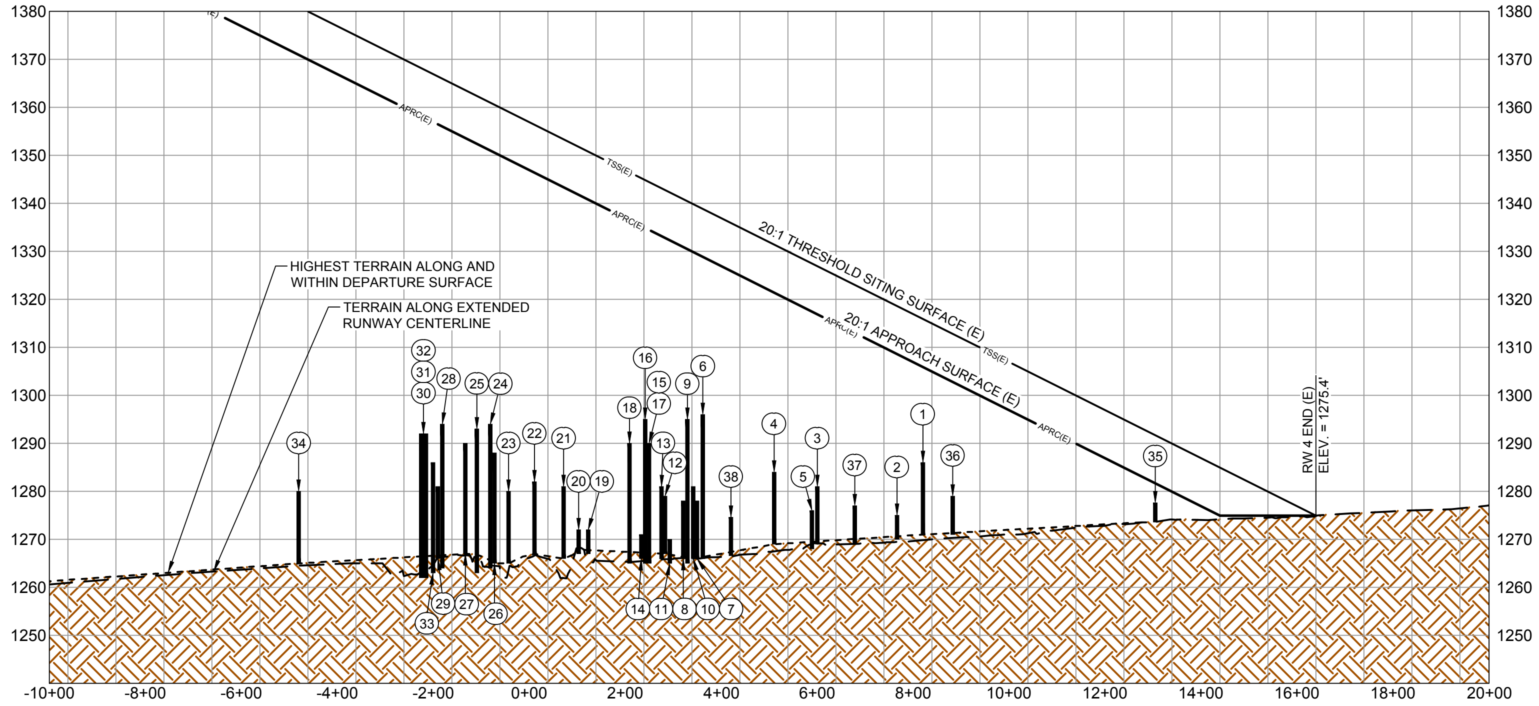
FAR
PART 77
AIRSPACE

Sheet: 8 of: 16



PLAN

SCALE: PER BAR SCALE



PROFILE

SCALE: PER GRID

OBJECTS WITHIN RUNWAY 4 APRC AND TSS SURFACES (E)

No.	OBJECT	EST. OBJECT HT. (AGL)	TOP ELEV. (MSL)	20:1 TSS PEN.	20:1 APRC SURFACE PEN.	REMARKS
①	ROAD	15'	1289'	NONE	NONE	N/A
②	FENCE	5'	1275'	NONE	NONE	N/A
③	BUILDING	12'	1281'	NONE	NONE	N/A
④	ROAD	15'	1284'	NONE	NONE	N/A
⑤	SIGN	8'	1276'	NONE	NONE	N/A
⑥	POWER POLE	30'	1296'	NONE	NONE	N/A
⑦	BUILDING	12'	1278'	NONE	NONE	N/A
⑧	BUILDING	12'	1278'	NONE	NONE	N/A
⑨	POWER POLE	30'	1295'	NONE	NONE	N/A
⑩	ROAD	15'	1281'	NONE	NONE	N/A
⑪	FENCE	5'	1270'	NONE	NONE	N/A
⑫	BUILDING	12'	1279'	NONE	NONE	N/A
⑬	TREE	15'	1281'	NONE	NONE	N/A
⑭	FENCE	5'	1271'	NONE	NONE	N/A
⑮	TREE	25'	1290'	NONE	NONE	N/A
⑯	POWER POLE	30'	1295'	NONE	NONE	N/A
⑰	FENCE	8'	1274'	NONE	NONE	N/A
⑱	TANK	25'	1277'	NONE	NONE	N/A
⑲	FENCE	5'	1272'	NONE	NONE	N/A
⑳	TREE	5'	1272'	NONE	NONE	N/A
㉑	ROAD	15'	1281'	NONE	NONE	N/A
㉒	ROAD	15'	1282'	NONE	NONE	N/A
㉓	ROAD	15'	1280'	NONE	NONE	N/A
㉔	POWER POLE	30'	1294'	NONE	NONE	N/A
㉕	POWER POLES	30'	1293'	NONE	NONE	N/A
㉖	RAILROAD	23'	1288'	NONE	NONE	N/A
㉗	RAILROAD	23'	1290'	NONE	NONE	N/A
㉘	POWER POLE	30'	1294'	NONE	NONE	N/A
㉙	ROAD	15'	1281'	NONE	NONE	N/A
㉚	POWER POLE	30'	1292'	NONE	NONE	N/A
㉛	POWER POLE	30'	1292'	NONE	NONE	N/A
㉜	POWER POLE	30'	1292'	NONE	NONE	N/A
㉝	RAILROAD	23'	1286'	NONE	NONE	N/A
㉞	ROAD	15'	1280'	NONE	NONE	N/A
㉟	BRUSH	4'	1278'	NONE	NONE	N/A
㊱	FENCE	8'	1271'	NONE	NONE	N/A
㊲	FENCE	8'	1269'	NONE	NONE	N/A
㊳	FENCE	8'	1266'	NONE	NONE	N/A

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY. TOPOGRAPHY FROM AN AERIAL SURVEY BY DIBBLE, 2012.
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
● = OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
▒	🟨	AIRFIELD DEVELOPMENT (PAVEMENT)	APRC(E)	APRC(F)	APPROACH SURFACE
⬛	🟦	STRUCTURE/FACILITIES (BUILDING)	TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
—	—	AIRPORT PROPERTY LINE (APL)	N/A	DPRT(F)	DEPARTURE SURFACE
- - -	N/A	EXISTING AK-CHIN PROPERTY LINE	N/A	GQS(F)	GLIDESLOPE QUALIFICATION SURFACE
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)	●●●● ●●●●	0000 0000	THRESHOLD LIGHTS
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			REIL
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)	4500	N/A	CONTOURS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			ROADS
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			MARKINGS
	▨	TO BE REMOVED	X	XX	FENCING
	- - -	PARCEL LINE		▨ ▨	CUT / FILL

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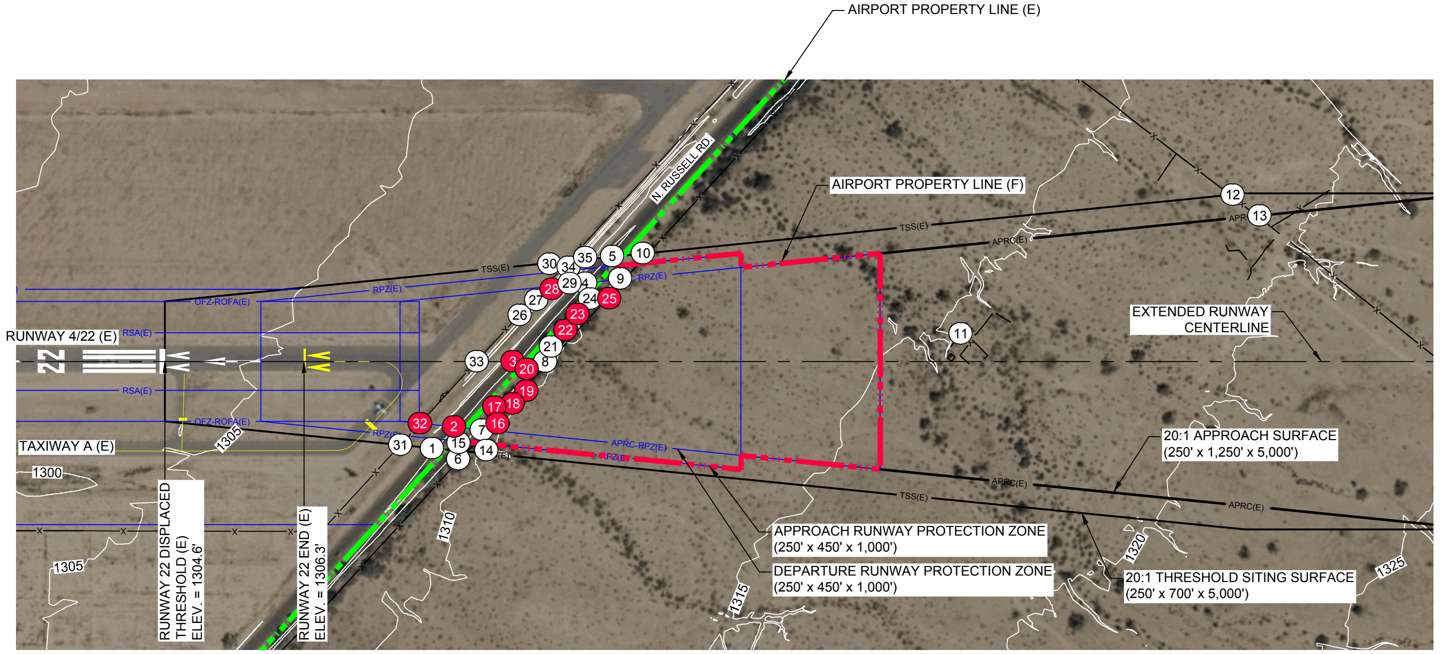
AK-CHIN REGIONAL AIRPORT
AK-CHIN INDIAN COMMUNITY
MARICOPA, ARIZONA

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	126082	04/2015	ORIGINAL ISSUE	6082505	LKB	TMB	JZP

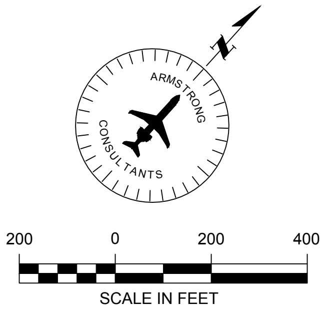
RUNWAY 4
INNER
APPROACH
(E)

Sheet: 9 of: 16



PLAN

SCALE: PER BAR SCALE



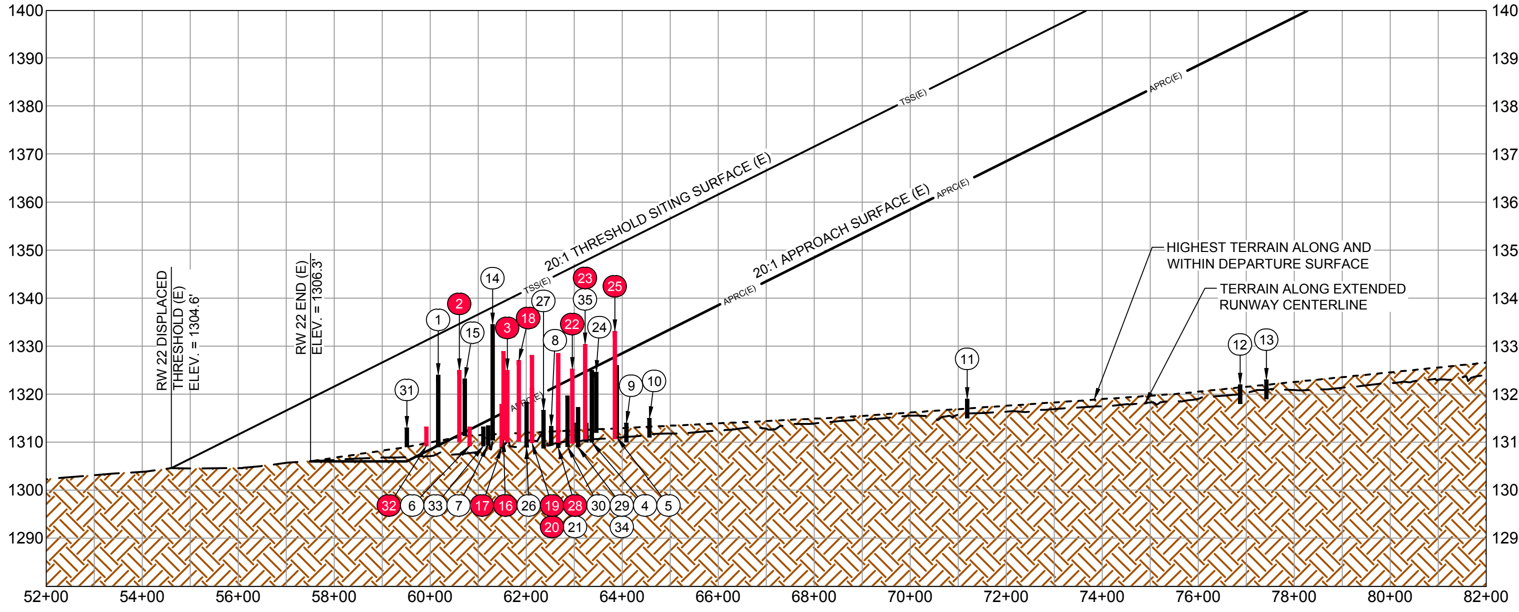
OBJECTS WITHIN RUNWAY 22 APRC AND TSS SURFACES (E)

No.	OBJECT	EST. OBJECT HT. (AGL)	TOP ELEV. (MSL)	20:1 TSS PEN.	20:1 APRC SURFACE PEN.	REMARKS
①	ROAD	15'	1324'	NONE	-	N/A
● 2	ROAD	15'	1325'	NONE	+14'	SEE NOTE 1
● 3	ROAD	15'	1325'	NONE	+9'	SEE NOTE 1
④	ROAD	15'	1325'	NONE	NONE	N/A
⑤	ROAD	15'	1326'	NONE	-	N/A
⑥	FENCE	4'	1313'	NONE	-	N/A
⑦	FENCE	4'	1313'	NONE	NONE	N/A
⑧	FENCE	4'	1314'	NONE	NONE	N/A
⑨	FENCE	4'	1314'	NONE	NONE	N/A
⑩	FENCE	4'	1315'	NONE	-	N/A
⑪	FENCE	4'	1319'	NONE	NONE	N/A
⑫	FENCE	4'	1322'	NONE	-	N/A
⑬	FENCE	4'	1323'	NONE	NONE	N/A
⑭	TREE	24'	1334'	NONE	-	N/A
⑮	TREE	12'	1323'	NONE	-	N/A
● 16	TREE	19'	1329'	NONE	+13'	SEE NOTE 1
● 17	TREE	9'	1320'	NONE	+2'	SEE NOTE 1
● 18	TREE	17'	1327'	NONE	+9'	SEE NOTE 1
● 19	TREE	18'	1328'	NONE	+9'	SEE NOTE 1
● 20	TREE	11'	1322'	NONE	+2'	SEE NOTE 1
㉑	TREE	10'	1321'	NONE	NONE	N/A
● 22	TREE	16'	1328'	NONE	+2'	SEE NOTE 1
● 23	TREE	20'	1330'	NONE	+6'	SEE NOTE 1
㉔	TREE	13'	1325'	NONE	NONE	N/A
● 25	TREE	22'	1332'	NONE	+6'	SEE NOTE 1
㉖	TREE	9'	1317'	NONE	NONE	N/A
㉗	TREE	8'	1318'	NONE	NONE	N/A
● 28	TREE	19'	1329'	NONE	+7'	SEE NOTE 1
㉙	TREE	8'	1317'	NONE	-	N/A
㉚	TREE	11'	1320'	NONE	-	N/A
㉛	FENCE	4'	1313'	NONE	-	N/A
● 32	FENCE	4'	1313'	NONE	+4'	SEE NOTE 1
㉝	FENCE	4'	1313'	NONE	NONE	N/A
㉞	FENCE	4'	1314'	NONE	NONE	N/A
㉟	FENCE	4'	1314'	NONE	-	N/A

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY. TOPOGRAPHY FROM AN AERIAL SURVEY BY DIBBLE, 2012.
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
● = OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE

NOTE:

1. APPROACH SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.



PROFILE

SCALE: PER GRID

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
▒	🟨	AIRFIELD DEVELOPMENT (PAVEMENT)	—APRC(E)—	—APRC(F)—	APPROACH SURFACE
■	🟦	STRUCTURE/FACILITIES (BUILDING)	—TSS(E)—	—TSS(F)—	THRESHOLD SITING SURFACE
— · —	— · —	AIRPORT PROPERTY LINE (APL)	N/A	—DPRT(F)—	DEPARTURE SURFACE
— — —	N/A	EXISTING AK-CHIN PROPERTY LINE	N/A	—GQS(F)—	GLIDESLOPE QUALIFICATION SURFACE
—RSA(E)—	—RSA(F)—	RUNWAY SAFETY AREA (RSA)	●●●● ●●●●	0000 0000	THRESHOLD LIGHTS
—OFZ(E)—	—OFZ(F)—	OBSTACLE FREE ZONE (OFZ)	⏚	⏚	REIL
—ROFA(E)—	—ROFA(F)—	RUNWAY OBJECT FREE AREA (ROFA)	4500	N/A	CONTOURS
—RPZ(E)—	—RPZ(F)—	RUNWAY PROTECTION ZONE (RPZ)	▬	▬	ROADS
—BRL(E)—	—BRL(F)—	BUILDING RESTRICTION LINE (BRL)	▙	▙	MARKINGS
	▩ ——	TO BE REMOVED	—X—	—X X—	FENCING
	- - - - - -	PARCEL LINE		▨ ▨	CUT / FILL

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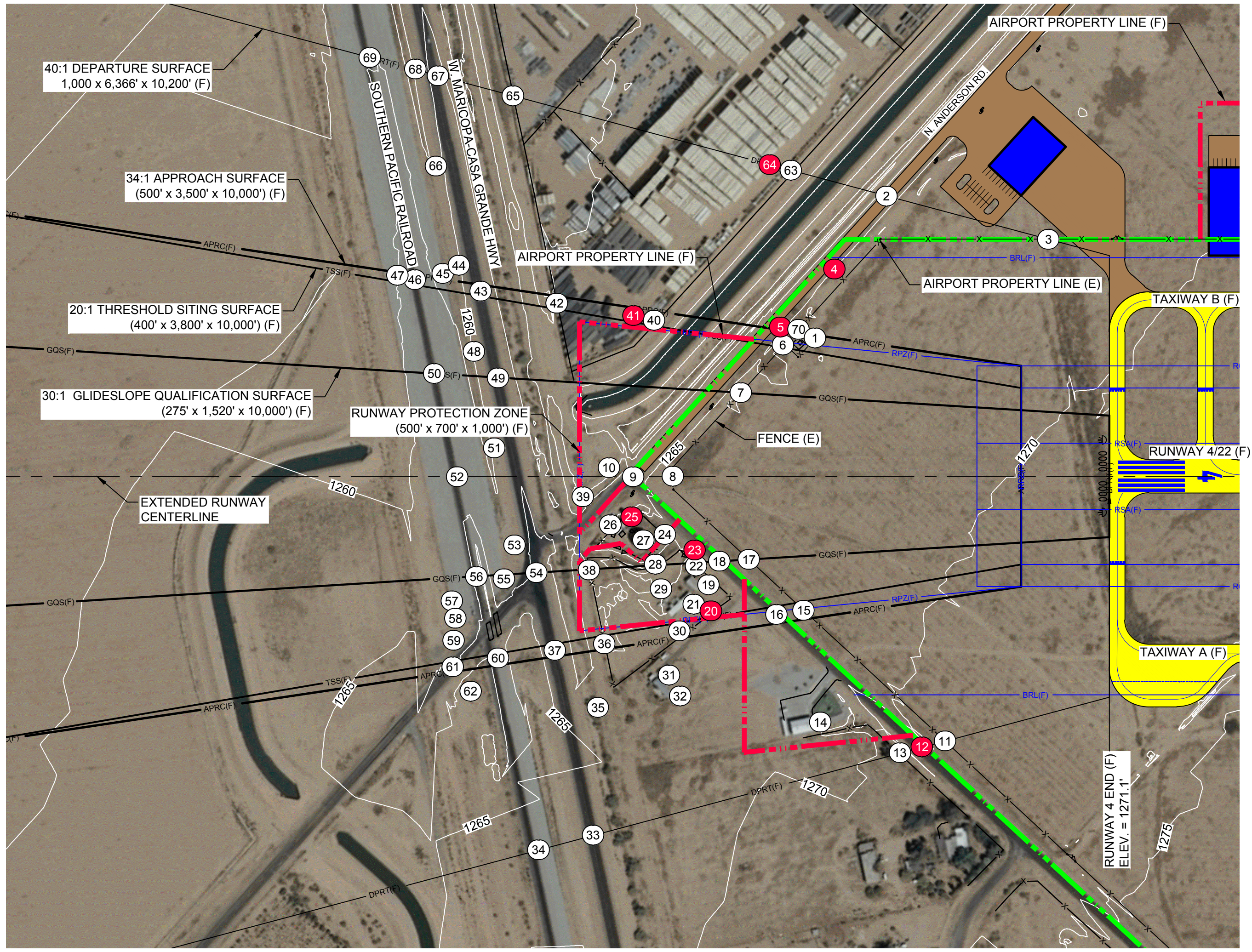
0	126082	04/2015	ORIGINAL ISSUE	6082505	LKB	TMB	JZP

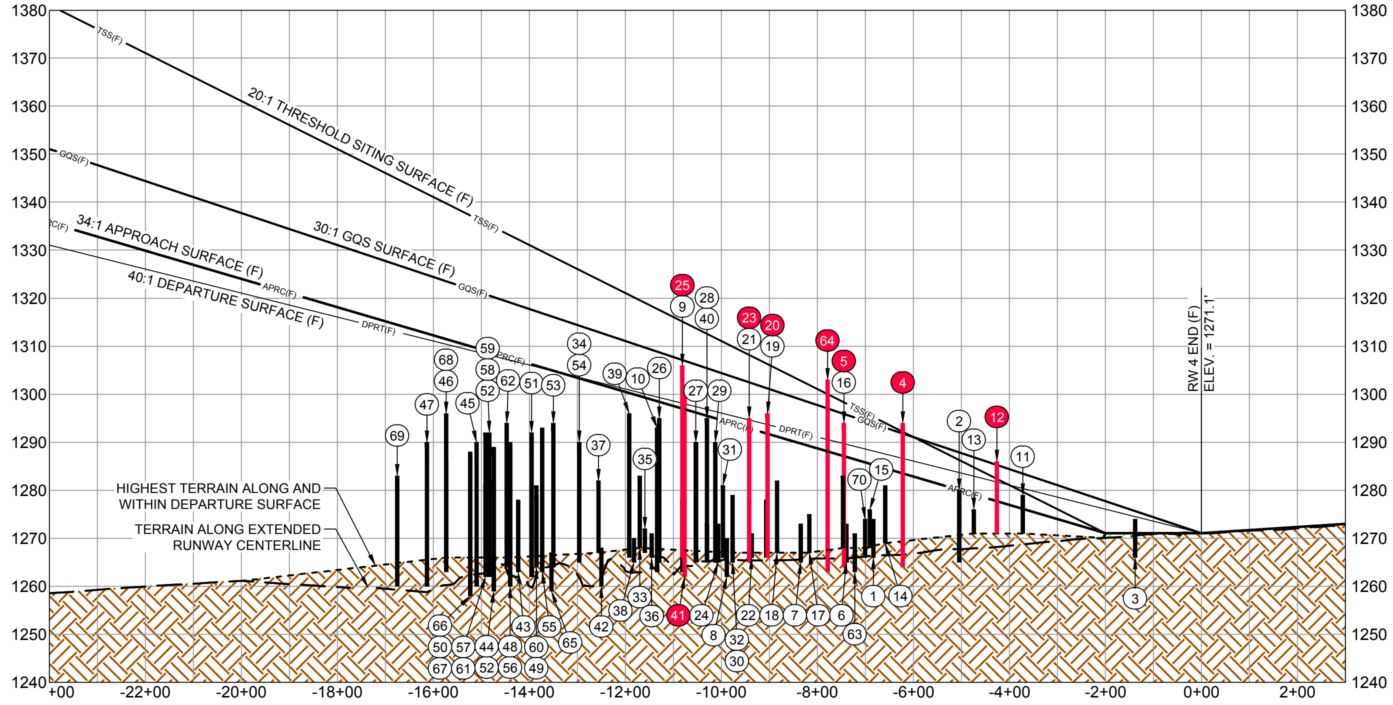
RUNWAY 22
INNER
APPROACH
(E)

Sheet: 10 of: 16



PLAN

SCALE: PER BAR SCALE



PROFILE

SCALE: PER GRID

OBJECTS WITHIN RUNWAY 4 GQS, APRC, TSS AND DEPARTURE SURFACES (F)

No.	OBJECT	EST. OBJECT HT. (AGL)	TOP ELEV. (MSL)	30:1 GQS PEN.	20:1 TSS PEN.	20:1 APRC SURFACE PEN.	40:1 DPRT PEN.	REMARKS
①	FENCE (E)	8'	1274'	-	-	NONE	NONE	N/A
②	ROAD (E)	15'	1280'	-	-	-	NONE	N/A
③	FENCE (E)	8'	1274'	-	-	-	NONE	N/A
④	POWER POLE	30'	1294'	-	-	-	+7'	SEE NOTE 2
⑤	POWER POLE	30'	1294'	-	-	+7'	+4'	SEE NOTES 1 & 2
⑥	FENCE (E)	8'	1273'	-	NONE	NONE	NONE	N/A
⑦	FENCE (E)	8'	1273'	NONE	NONE	NONE	NONE	N/A
⑧	FENCE (E)	8'	1273'	NONE	NONE	NONE	NONE	N/A
⑨	ROAD (E)	15'	1278'	NONE	NONE	NONE	NONE	N/A
⑩	POWER POLE	30'	1293'	NONE	-	-	NONE	N/A
⑪	FENCE (E)	8'	1279'	-	-	-	NONE	N/A
⑫	ROAD (E)	15'	1286'	-	-	-	+4'	SEE NOTE 2
⑬	FENCE (E)	5'	1276'	-	-	-	NONE	N/A
⑭	BUILDING (E)	12'	1281'	-	-	-	NONE	N/A
⑮	FENCE (E)	8'	1276'	-	NONE	NONE	NONE	N/A
⑯	ROAD (E)	15'	1283'	-	NONE	NONE	NONE	N/A
⑰	FENCE (E)	8'	1275'	NONE	NONE	NONE	NONE	N/A
⑱	ROAD (E)	15'	1282'	NONE	NONE	NONE	NONE	N/A
⑲	BUILDING (E)	12'	1278'	-	NONE	NONE	NONE	N/A
⑳	POWER POLE	30'	1296'	-	NONE	+4'	+2'	SEE NOTE 1 & 2
㉑	BUILDING (E)	12'	1278'	-	NONE	NONE	NONE	N/A
㉒	FENCE (E)	5'	1271'	NONE	NONE	NONE	NONE	N/A
㉓	POWER POLE	30'	1295'	NONE	NONE	+2'	+1'	SEE NOTE 1 & 2
㉔	FENCE (E)	8'	1273'	NONE	NONE	NONE	NONE	N/A
㉕	TANKS	40'	1266'	NONE	NONE	+9'	+8'	SEE NOTE 1 & 2
㉖	POWER POLE	30'	1295'	NONE	NONE	NONE	NONE	N/A
㉗	TANK	25'	1277'	NONE	NONE	NONE	NONE	N/A
㉘	POWER POLE	30'	1295'	NONE	NONE	NONE	NONE	N/A
㉙	TREE	25'	1290'	-	NONE	NONE	NONE	N/A
㉚	FENCE (E)	5'	1270'	-	NONE	NONE	NONE	N/A
㉛	TREE	15'	1281'	-	-	-	NONE	N/A
㉜	BUILDING (E)	12'	1279'	-	-	-	NONE	N/A
㉝	ROAD (E)	15'	1283'	-	-	-	NONE	N/A
㉞	RAILROAD	23'	1290'	-	-	-	NONE	N/A

OBJECTS WITHIN RUNWAY 4 GQS, APRC, TSS AND DEPARTURE SURFACES (F)

No.	OBJECT	EST. OBJECT HT. (AGL)	TOP ELEV. (MSL)	30:1 GQS PEN.	20:1 TSS PEN.	20:1 APRC SURFACE PEN.	40:1 DPRT PEN.	REMARKS
㉟	TREE	5'	1272'	-	-	-	NONE	N/A
㊱	FENCE (E)	5'	1271'	-	NONE	NONE	NONE	N/A
㊲	ROAD (E)	15'	1282'	-	NONE	NONE	NONE	N/A
㊳	FENCE (E)	5'	1270'	NONE	NONE	NONE	NONE	N/A
㊴	POWER POLE	30'	1296'	NONE	NONE	NONE	NONE	N/A
㊵	WALL	8'	1270'	-	NONE	NONE	NONE	N/A
㊶	CONTAINERS	16'	1302'	-	NONE	+5	+4	SEE NOTES 1 & 2
㊷	WALL	8'	1268'	-	NONE	NONE	NONE	N/A
㊸	ROAD (E)	15'	1278'	-	NONE	NONE	NONE	N/A
㊹	POWER POLE	30'	1289'	-	-	-	NONE	N/A
㊺	POWER POLE	30'	1290'	-	-	-	NONE	N/A
㊻	RAILROAD	23'	1286'	-	NONE	NONE	NONE	N/A
㊼	POWER POLE	30'	1290'	-	-	NONE	NONE	N/A
㊽	POWER POLE	30'	1290'	-	NONE	NONE	NONE	N/A
㊾	ROAD (E)	15'	1279'	NONE	NONE	NONE	NONE	N/A
㊿	RAILROAD	23'	1287'	NONE	NONE	NONE	NONE	N/A
(51)	POWER POLE	30'	1292'	NONE	NONE	NONE	NONE	N/A
(52)	RAILROAD	23'	1288'	NONE	NONE	NONE	NONE	N/A
(53)	POWER POLE	30'	1294'	NONE	NONE	NONE	NONE	N/A
(54)	ROAD (E)	15'	1280'	NONE	NONE	NONE	NONE	N/A
(55)	POWER POLES	30'	1293'	NONE	NONE	NONE	NONE	N/A
(56)	RAILROAD	23'	1289'	NONE	NONE	NONE	NONE	N/A
(57)	POWER POLE	30'	1292'	-	NONE	NONE	NONE	N/A
(58)	POWER POLE	30'	1292'	-	NONE	NONE	NONE	N/A
(59)	POWER POLE	30'	1292'	-	NONE	NONE	NONE	N/A
(60)	RAILROAD	23'	1290'	-	NONE	NONE	NONE	N/A
(61)	ROAD (E)	15'	1281'	-	NONE	NONE	NONE	N/A
(62)	POWER POLE	30'	1294'	-	-	-	NONE	N/A
(63)	WALL	8'	1271'	-	-	-	NONE	N/A
(64)	CONTAINERS	40'	1303'	-	-	-	+12'	SEE NOTE 2
(65)	WALL	8'	1267'	-	-	-	NONE	N/A
(66)	POWER POLE	30'	1288'	-	-	-	NONE	N/A
(67)	ROAD (E)	15'	1276'	-	-	-	NONE	N/A
(68)	POWER POLE	30'	1286'	-	-	-	NONE	N/A
(69)	RAILROAD	23'	1283'	-	-	-	NONE	N/A
(70)	WELL HOUSE	12'	1278'	-	-	NONE	NONE	N/A

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY. TOPOGRAPHY FROM AN AERIAL SURVEY BY DIBBLE, 2012.
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
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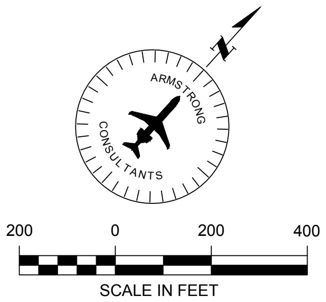
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE



SCALE IN FEET

NOTES:

1. APPROACH SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.
2. LESS THAN 35' LOW, CLOSE-IN DEPARTURE SURFACE PENETRATIONS: ADD NOTE TO DEPARTURE PROCEDURE OR LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
▭	▭	AIRFIELD DEVELOPMENT (PAVEMENT)	—APRC(E)—	—APRC(F)—	APPROACH SURFACE
■	■	STRUCTURE/FACILITIES (BUILDING)	—TSS(E)—	—TSS(F)—	THRESHOLD SITING SURFACE
— · —	— · —	AIRPORT PROPERTY LINE (APL)	N/A	—DPRT(F)—	DEPARTURE SURFACE
— — —	N/A	EXISTING AK-CHIN PROPERTY LINE	N/A	—GQS(F)—	GLIDESLOPE QUALIFICATION SURFACE
—RSA(E)—	—RSA(F)—	RUNWAY SAFETY AREA (RSA)	●●●● ●●●●	0000 0000	THRESHOLD LIGHTS
—OFZ(E)—	—OFZ(F)—	OBSTACLE FREE ZONE (OFZ)			REIL
—ROFA(E)—	—ROFA(F)—	RUNWAY OBJECT FREE AREA (ROFA)	4500	N/A	CONTOURS
—RPZ(E)—	—RPZ(F)—	RUNWAY PROTECTION ZONE (RPZ)			ROADS
—BRL(E)—	—BRL(F)—	BUILDING RESTRICTION LINE (BRL)			MARKINGS
	▩	TO BE REMOVED	—X—	—XX—	FENCING
	- - - - - -	PARCEL LINE		▨ ▨	CUT / FILL

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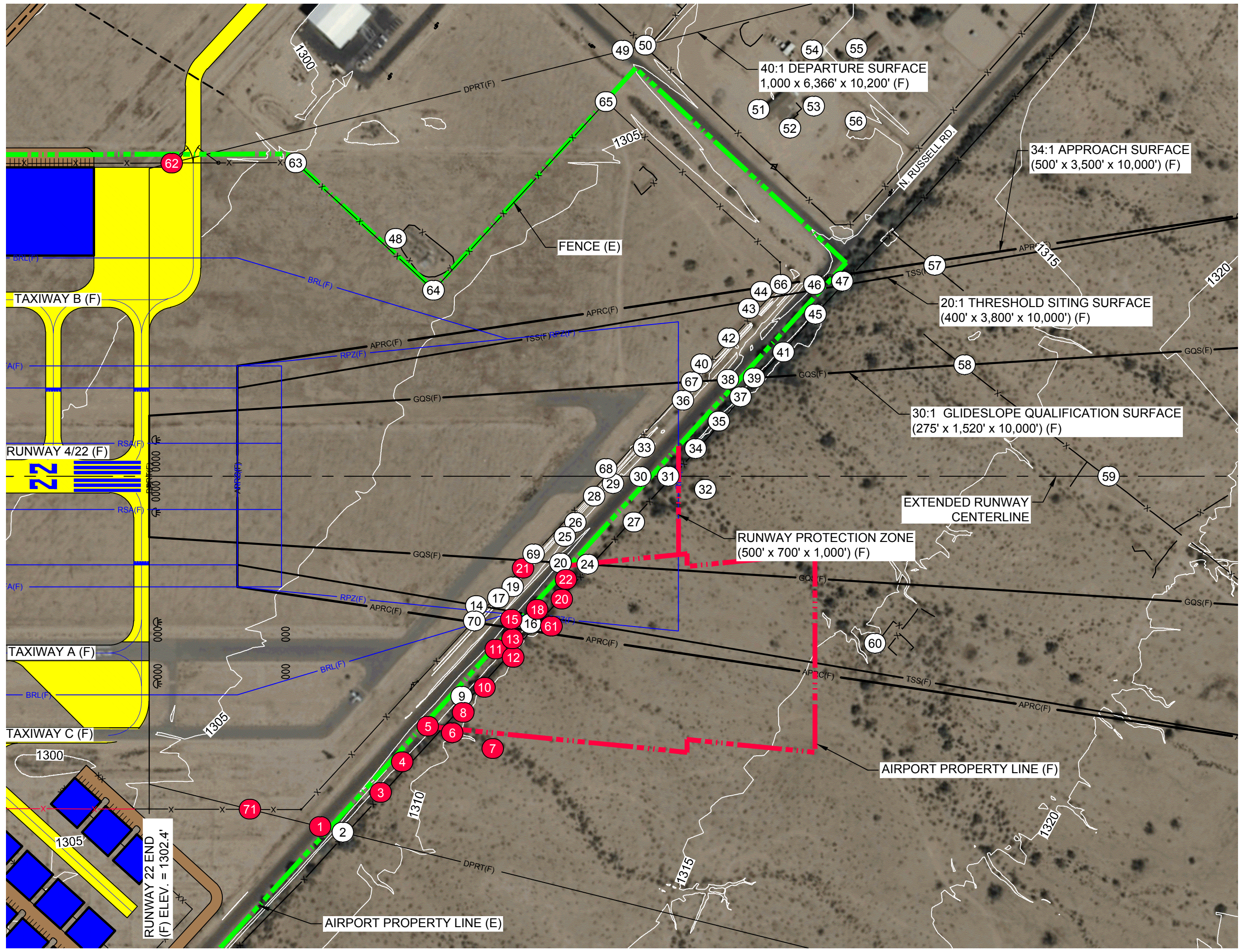
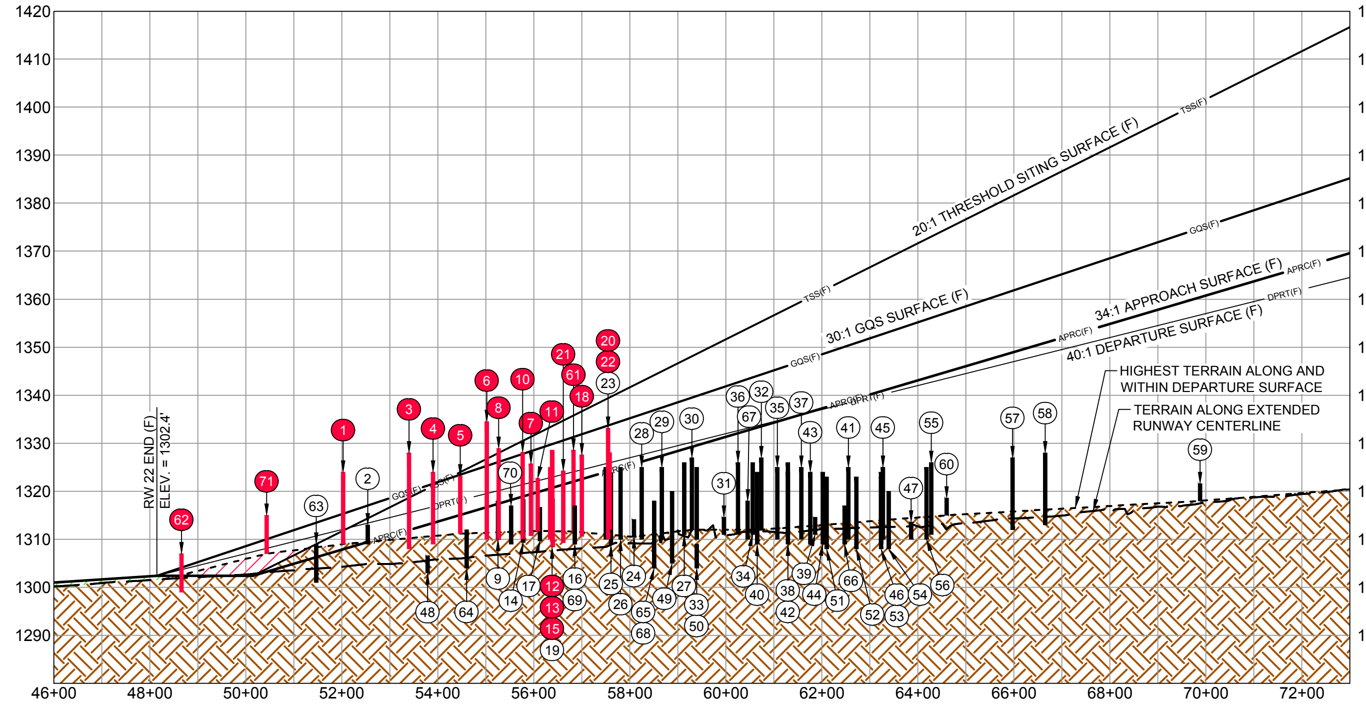
RUNWAY 4
INNER
APPROACH
(F)

Sheet: 11 of: 16



PLAN

SCALE: PER BAR SCALE



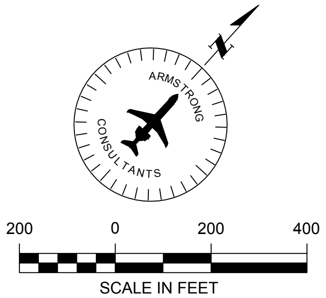
PROFILE

SCALE: PER GRID

OBJECTS WITHIN RUNWAY 22 GQS, APRC, TSS AND DEPARTURE SURFACES (F)

No.	OBJECT	EST. OBJECT HT. (AGL)	TOP ELEV. (MSL)	30:1 GQS PEN.	20:1 TSS PEN.	20:1 APRC SURFACE PEN.	40:1 DPRT PEN.	REMARKS
1	ROAD	15'	1324'	-	-	-	+12'	SEE NOTE 2
2	FENCE (E)	4'	1313'	-	-	-	NONE	N/A
3	TREE	20'	1328'	-	-	-	+13'	SEE NOTE 2
4	TREE	22'	1331'	-	-	-	+14'	SEE NOTE 2
5	TREE	12'	1323'	-	-	-	+5'	SEE NOTE 2
6	TREE	25'	1335'	-	-	-	+15'	SEE NOTE 2
7	TREE	15'	1326'	-	-	-	+4'	SEE NOTE 2
8	TREE	19'	1329'	-	-	-	+9'	SEE NOTE 2
9	TREE	8'	1318'	-	-	-	NONE	N/A
10	TREE	18'	1328'	-	-	-	+7'	SEE NOTE 2
11	TREE	11'	1323'	-	-	-	+1'	SEE NOTE 2
12	TREE	19'	1329'	-	-	-	+6'	SEE NOTE 2
13	TREE	16'	1328'	-	-	-	+5'	SEE NOTE 2
14	TREE	9'	1318'	-	NONE	NONE	NONE	N/A
15	ROAD	15'	1325'	-	NONE	+4'	+2'	SEE NOTE 1 & 2
16	TREE	4'	1314'	-	NONE	NONE	NONE	N/A
17	TREE	7'	1317'	-	NONE	NONE	NONE	N/A
18	TREE	17'	1328'	-	NONE	+5'	+3'	SEE NOTE 1 & 2
19	TREE	10'	1319'	-	NONE	NONE	NONE	N/A
20	TREE	23'	1333'	-	NONE	+9'	+7'	SEE NOTE 1 & 2
21	TREE	15'	1324'	-	NONE	+3'	+1'	SEE NOTE 1 & 2
22	TREE	16'	1328'	-	NONE	+4'	+2'	SEE NOTE 1 & 2
23	ROAD	15'	1325'	NONE	NONE	NONE	NONE	N/A
24	FENCE (E)	4'	1314'	NONE	NONE	NONE	NONE	N/A
25	TREE	15'	1324'	NONE	NONE	NONE	NONE	N/A
26	TREE	15'	1325'	NONE	NONE	NONE	NONE	N/A
27	TREE	15'	1326'	NONE	NONE	NONE	NONE	N/A
28	TREE	15'	1325'	NONE	NONE	NONE	NONE	N/A
29	TREE	15'	1325'	NONE	NONE	NONE	NONE	N/A
30	ROAD	15'	1327'	NONE	NONE	NONE	NONE	N/A
31	FENCE (E)	4'	1315'	NONE	NONE	NONE	NONE	N/A
32	TREE	15'	1327'	NONE	NONE	NONE	NONE	N/A
33	TREE	15'	1325'	NONE	NONE	NONE	NONE	N/A
34	TREE	15'	1326'	NONE	NONE	NONE	NONE	N/A
35	TREE	15'	1325'	NONE	NONE	NONE	NONE	N/A
36	TREE	15'	1326'	NONE	NONE	NONE	NONE	N/A
37	TREE	15'	1325'	NONE	NONE	NONE	NONE	N/A
38	ROAD	15'	1326'	NONE	NONE	NONE	NONE	N/A
39	FENCE (E)	4'	1315'	NONE	NONE	NONE	NONE	N/A
40	TREE	15'	1324'	-	NONE	NONE	NONE	N/A
41	TREE	15'	1325'	-	NONE	NONE	NONE	N/A
42	TREE	15'	1324'	-	NONE	NONE	NONE	N/A
43	TREE	15'	1324'	-	NONE	NONE	NONE	N/A
44	TREE	15'	1324'	-	NONE	NONE	NONE	N/A
45	TREE	15'	1325'	-	NONE	NONE	NONE	N/A
46	ROAD	15'	1324'	-	NONE	NONE	NONE	N/A
47	FENCE (E)	4'	1314'	-	NONE	NONE	NONE	N/A
48	FENCE (E)	4'	1307'	-	-	-	NONE	N/A
49	ROAD	15'	1320'	-	-	-	NONE	N/A
50	FENCE (E)	5'	1309'	-	-	-	NONE	N/A
51	BUILDING	15'	1323'	-	-	-	NONE	N/A
52	TREE	15'	1323'	-	-	-	NONE	N/A
53	TREE	15'	1323'	-	-	-	NONE	N/A
54	BUILDING	12'	1320'	-	-	-	NONE	N/A
55	BUILDING	15'	1326'	-	-	-	NONE	N/A
56	TREE	4'	1325'	-	-	-	NONE	N/A
57	FENCE (E)	4'	1316'	-	NONE	NONE	NONE	N/A
58	FENCE (E)	4'	1317'	NONE	NONE	NONE	NONE	N/A
59	FENCE (E)	4'	1322'	NONE	NONE	NONE	NONE	N/A
60	FENCE (E)	4'	1319'	-	NONE	NONE	NONE	N/A
61	TREE	17'	1329'	-	-	+7'	+5'	SEE NOTE 1 & 2
62	FENCE (E)	8'	1307'	-	-	-	+7'	SEE NOTE 2
63	FENCE (E)	8'	1309'	-	-	-	NONE	N/A
64	FENCE (E)	8'	1312'	-	-	-	NONE	N/A
65	FENCE (E)	8'	1312'	-	-	-	NONE	N/A
66	FENCE (E)	8'	1317'	-	-	-	NONE	N/A
67	FENCE (E)	8'	1318'	-	-	-	NONE	N/A
68	FENCE (E)	8'	1318'	-	-	-	NONE	N/A
69	FENCE (E)	8'	1317'	-	-	-	NONE	N/A
70	FENCE (E)	8'	1317'	-	-	-	NONE	N/A
71	FENCE (E)	8'	1315'	-	-	-	+7'	SEE NOTE 2

NOTE: OBJECT ELEVATIONS IN FEET MSL (VERTICAL DATUM NAVD88).
OBJECT ELEVATIONS ARE ESTIMATED AND NOT BASED ON A SURVEY. TOPOGRAPHY FROM AN AERIAL SURVEY BY DIBBLE, 2012.
- = OBJECT IS NOT LOCATED WITHIN THIS SURFACE.
● = OBJECT PENETRATION LOCATION
EST. = ESTIMATED; ELEV. = ELEVATION; HT. = HEIGHT; PEN. = PENETRATION; N/A = NOT APPLICABLE; O.L. = OBSTRUCTION LIGHT; GQS = GLIDESLOPE QUALIFICATION SURFACE; APRC = APPROACH SURFACE; TSS = THRESHOLD SITING SURFACE; DPRT = DEPARTURE SURFACE



SCALE IN FEET

NOTES:

1. APPROACH SURFACE PENETRATIONS: LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.
2. LESS THAN 35' LOW, CLOSE-IN DEPARTURE SURFACE PENETRATIONS: ADD NOTE TO DEPARTURE PROCEDURE OR LOWER, MARK AND LIGHT, OR REMOVE PER FAA FLIGHT PROCEDURES OFFICE DETERMINATION.

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
▨	🟨	AIRFIELD DEVELOPMENT (PAVEMENT)	APRC(E)	APRC(F)	APPROACH SURFACE
■	🟦	STRUCTURE/FACILITIES (BUILDING)	TSS(E)	TSS(F)	THRESHOLD SITING SURFACE
🟩	🟥	AIRPORT PROPERTY LINE (APL)	N/A	DPRT(F)	DEPARTURE SURFACE
- - - -	N/A	EXISTING AK-CHIN PROPERTY LINE	N/A	GQS(F)	GLIDESLOPE QUALIFICATION SURFACE
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)	●●●● ●●●●	0000 0000	THRESHOLD LIGHTS
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)			REIL
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)	4500	N/A	CONTOURS
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)			ROADS
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			MARKINGS
	▨	TO BE REMOVED	X	XX	FENCING
	- - - -	PARCEL LINE		▨ ▨	CUT / FILL

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AK-CHIN REGIONAL AIRPORT
AK-CHIN INDIAN COMMUNITY
MARICOPA, ARIZONA

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
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RUNWAY 22
INNER
APPROACH
(F)

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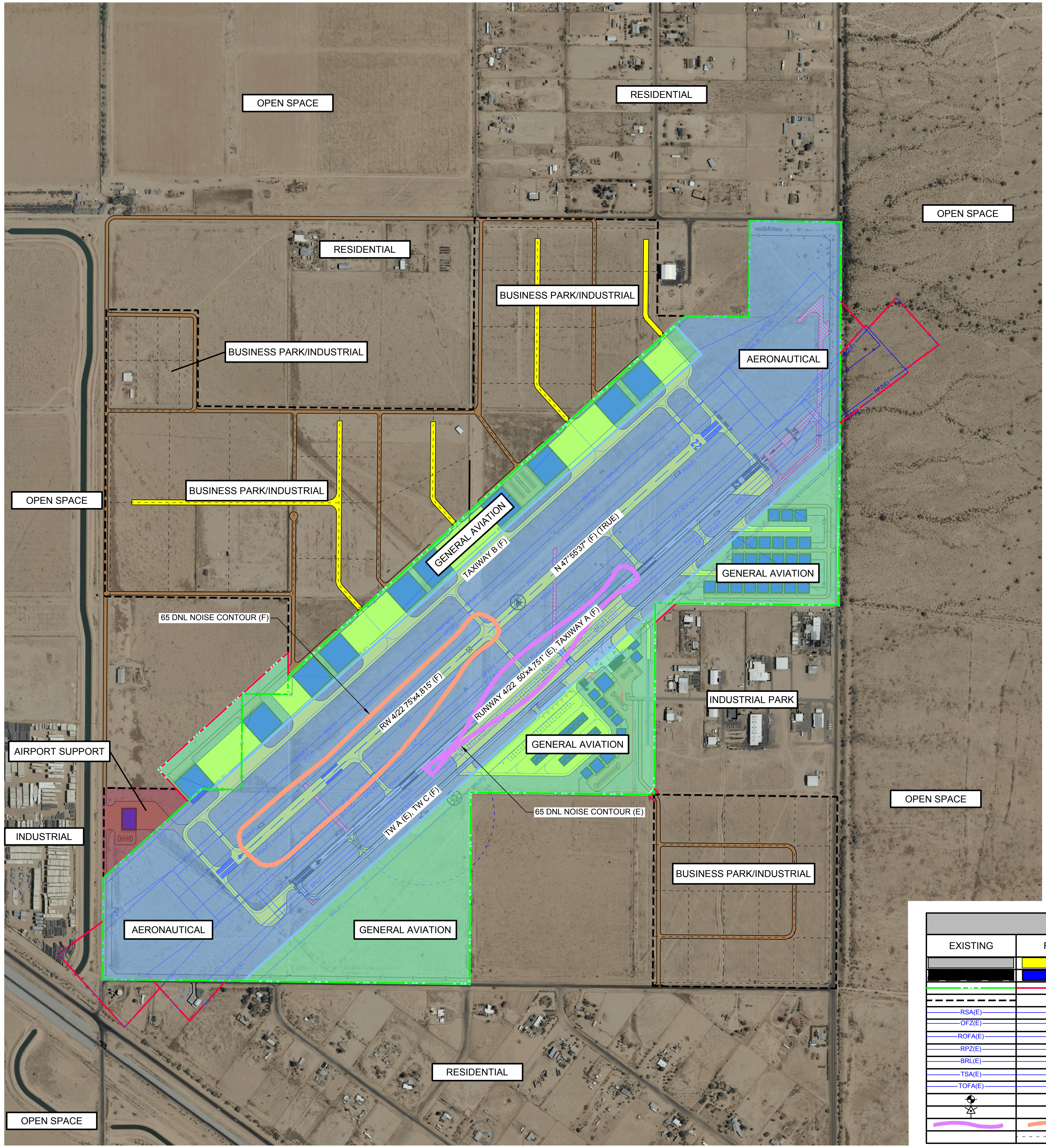
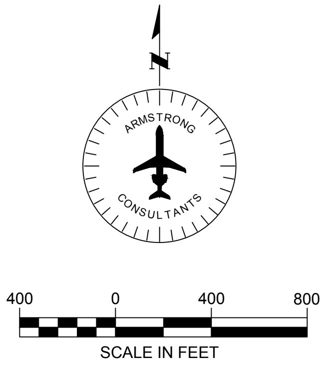


LEGEND

🟦	AERONAUTICAL
🟩	GENERAL AVIATION
🟥	AIRPORT SUPPORT



LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
▭	🟨	AIRFIELD DEVELOPMENT (PAVEMENT)	●●●● ●●●●	0000 0000	THRESHOLD LIGHTS
■	🟦	STRUCTURE/FACILITIES (BUILDING)			REIL
		AIRPORT PROPERTY LINE (APL)	■	▭	VASI/PAPI
- - - -	N/A	EXISTING AK-CHIN PROPERTY LINE			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)	●	○	AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)	▶	▷	LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)	1 2 12 11	N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
⊕	⊕	AIRPORT REFERENCE POINT			MARKINGS
△		NGS SURVEY MONUMENT	X	XX	FENCING
		DNL NOISE CONTOUR		▨	TO BE REMOVED
	- - - -	PARCEL LINE			

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MARICOPA, ARIZONA

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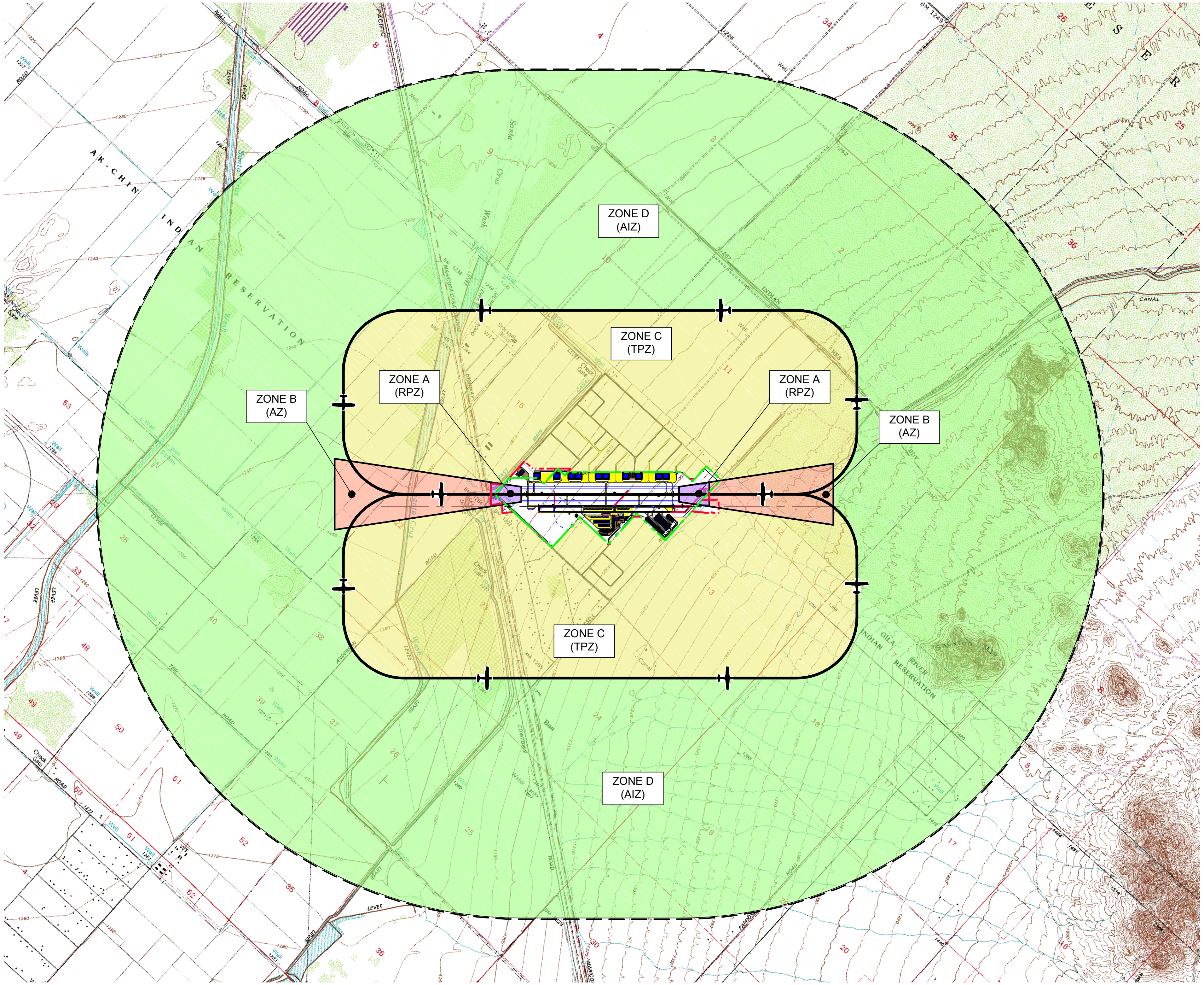
ON-AIRPORT
LAND USE



LAND USE COMPATIBILITY GUIDELINES

Land Use Category	ZONE D Airport Influence (AIZ)	ZONE C Traffic Pattern (TPZ)	ZONE B Approach (AZ)	ZONE A Runway Protection (RPZ)
Residential				
single-family, nursing homes, mobile homes, multi-family, apartments, condominiums	+	o (3)	- (1,3)	- -
transient lodging, hotel, motel	+	o (3)	- (1,3)	- -
Public				
schools, libraries, hospitals	+	o (3)	- (3)	- -
churches, auditoriums, concert halls	+	o (3)	- (3)	- -
transportation, parking, cemeteries	++	++	++	- (2,5)
Commercial and Industrial				
offices, retail trade, service commercial, wholesale trade, warehousing, light industrial, general manufacturing, utilities, extractive industry	++	+	o (3)	- -
Agricultural and Recreational				
cropland	++	++	++	++
livestock breeding	++	++	++	- (2)
parks, playgrounds, zoos, golf courses, riding stables, water recreation	++	++	++	- (2)
outdoor spectator sports	++	+	- (3)	- -
amphitheaters	o	- (4)	- -	- -
open space	++	++	++	++

NOTE: DEVELOPMENT PROJECTS WHICH ARE WILDLIFE ATTRACTANT, INCLUDING SEWERAGE PONDS AND LANDFILLS, WITHIN 10,000 FEET OF THE AIRPORT ARE UNACCEPTABLE. (REF.: FAA AC 150/5200-33)

(1) If allowed, avigation easements and disclosure must be required as a condition of development.

(2) Any structures associated with uses allowed in the RPZ must be located outside the RPZ.

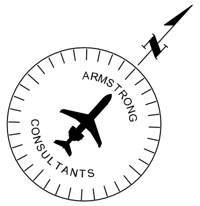
(3) If no reasonable alternative exists, use should be located as far from extended centerline as possible.

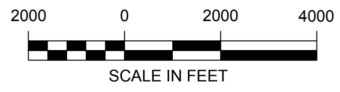
(4) If no reasonable alternative exists, use should be located as far from extended runway centerline and traffic patterns as possible.

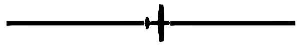
(5) Transportation facilities in the RPZ (i.e. roads, railroads, waterways) must be configured to comply with Part 77 requirements.

CRITERIA

Land Use Availability	Interpretation/Comments
++ Clearly Acceptable	The activities associated with the specified land use will experience little or no impact due to airport operations. Disclosure of airport proximity should be required as a condition of development.
+ Normally Acceptable	The specified land use is acceptable in this zone or area. Impact may be perceived by some residents. Disclosure of airport proximity should be required as a condition of development. Dedication of avigation easements may also be advisable.
o Conditionally Acceptable	If appropriate disclosure avigation easements and density limitations are put in place, residential uses and uses involving indoor public assemblies are acceptable.
- Normally Unacceptable	Specified use should be allowed only if no reasonable alternative exists. Disclosure of airport proximity and avigation easements must be required as a condition of development.
- - Clearly Unacceptable	Specified use must not be allowed. Potential safety or overflight nuisance impacts are likely in this area.







TYPICAL TRAFFIC PATTERN DIRECTION AND FLIGHT TRACK AREA.

🟪	RUNWAY PROTECTION ZONE (RPZ) AS DIMENSIONED ON SHEET 2 OF AIRPORT LAYOUT PLAN.
🟧	APPROACH SURFACE AS DESCRIBED ON THE FAR PART 77 DRAWING OF THE AIRPORT LAYOUT PLAN.
—·—	EXISTING AIRPORT PROPERTY LINE
— — —	NO HAZARDOUS WILDLIFE ATTRACTANT RING
—··—	FUTURE AIRPORT PROPERTY LINE

ORDINANCES IN EFFECT

NONE

NOTICE OF PROPOSED CONSTRUCTION

An FAA Form 7460-1, "Notice of Proposed Construction or Alteration" must be submitted for any construction or alteration (including hangars and other on-airport and off-airport structures, towers, etc.) within 20,000 horizontal feet of the airport greater in height than an imaginary surface extending outward and upward from the runway at a slope of 100 to 1 or greater in height than 200 feet above ground level.

NOTES

No land fills within 5 miles of the airport.

No section 4f land affected by the airport.

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AK-CHIN REGIONAL AIRPORT
AK-CHIN INDIAN COMMUNITY
MARICOPA, ARIZONA

AIRPORT LAYOUT PLAN

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OFF AIRPORT
LAND USE

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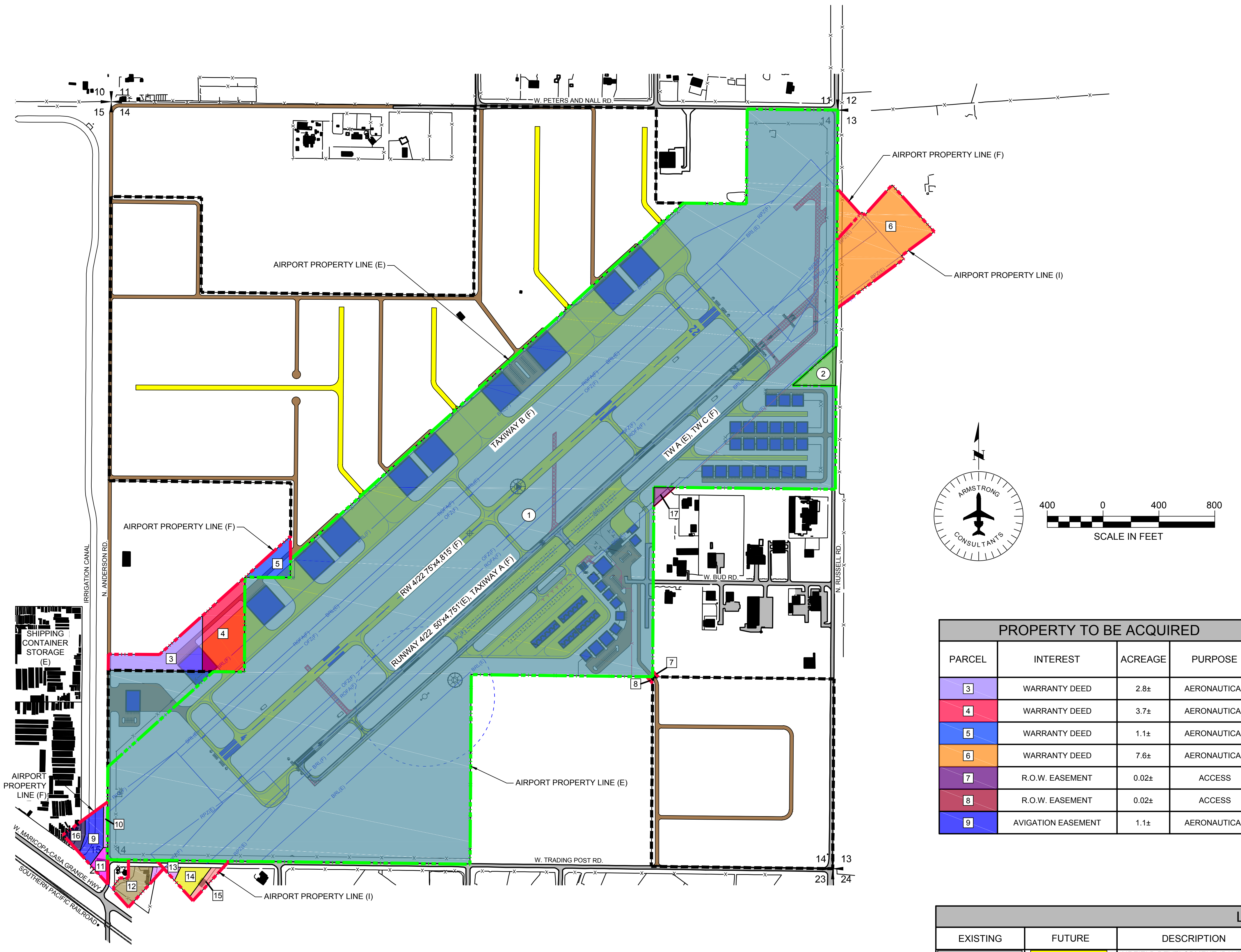

PROPERTY TO BE ACQUIRED

PARCEL	INTEREST	ACREAGE	PURPOSE
3	WARRANTY DEED	2.8±	AERONAUTICAL
4	WARRANTY DEED	3.7±	AERONAUTICAL
5	WARRANTY DEED	1.1±	AERONAUTICAL
6	WARRANTY DEED	7.6±	AERONAUTICAL
7	R.O.W. EASEMENT	0.02±	ACCESS
8	R.O.W. EASEMENT	0.02±	ACCESS
9	AVIGATION EASEMENT	1.1±	AERONAUTICAL

PROPERTY TO BE ACQUIRED

PARCEL	INTEREST	ACREAGE	PURPOSE
10	AVIGATION EASEMENT	0.2±	AERONAUTICAL
11	AVIGATION EASEMENT	0.4±	AERONAUTICAL
12	WARRANTY DEED	1.1±	AERONAUTICAL
13	WARRANTY DEED	0.3±	AERONAUTICAL
14	WARRANTY DEED	0.7±	AERONAUTICAL
15	WARRANTY DEED	0.3±	AERONAUTICAL
16	AVIGATION EASEMENT	0.5±	AERONAUTICAL
17	WARRANTY DEED	0.3±	AERONAUTICAL

EXISTING AIRPORT PROPERTY

PARCEL	CURRENT OWNER	GRANTOR	INTEREST	LOCATION	BOOK/PAGE	DATE	ACREAGE	PURPOSE	FEDERAL PARTICIPATION
①	AK-CHIN INDIAN COMMUNITY	GRAND VALLEY AIRPORT, LLC	WARRANTY DEED	SEC. 14 T05S R04E	502/47	8/11/06	275±	AERONAUTICAL	NONE
②	AK-CHIN INDIAN COMMUNITY	GRAND VALLEY AIRPORT, LLC	WARRANTY DEED	SEC. 14 T05S R04E		8/11/14	0.84±	AERONAUTICAL	NONE

LEGEND

EXISTING	FUTURE	DESCRIPTION	EXISTING	FUTURE	DESCRIPTION
▭	🟨	AIRFIELD DEVELOPMENT (PAVEMENT)	●●●● ●●●●	0000 0000	THRESHOLD LIGHTS
■	🟦	STRUCTURE/FACILITIES (BUILDING)			REIL
🟩	🟥	AIRPORT PROPERTY LINE (APL)	■	▭	VASI/PAPI
- - - -	N/A	EXISTING AK-CHIN PROPERTY LINE			AIRPORT BEACON
RSA(E)	RSA(F)	RUNWAY SAFETY AREA (RSA)			WIND CONE & SEGMENTED CIRCLE
OFZ(E)	OFZ(F)	OBSTACLE FREE ZONE (OFZ)	●	○	AWOS
ROFA(E)	ROFA(F)	RUNWAY OBJECT FREE AREA (ROFA)	▶	▷	LIGHTED WINDCONE
RPZ(E)	RPZ(F)	RUNWAY PROTECTION ZONE (RPZ)	1 2 12 11	N/A	SECTION CORNER
BRL(E)	BRL(F)	BUILDING RESTRICTION LINE (BRL)			DRAINAGE/CULVERT
TSA(E)	TSA(F)	TAXIWAY SAFETY AREA (TSA)	4500	N/A	CONTOURS
TOFA(E)	TOFA(F)	TAXIWAY OBJECT FREE AREA (TOFA)			ROADS
⊕	⊕	AIRPORT REFERENCE POINT			MARKINGS
		NGS SURVEY MONUMENT	X	XX	FENCING
				▨	TO BE REMOVED

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AIRPORT LAYOUT PLAN

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EXHIBIT "A"
PROPERTY
MAP

NAIP AERIAL PHOTOGRAPH OBTAINED FROM USGS THE NATIONAL MAP VIEWER, TAKEN IN 2010.

RUNWAY MARKINGS AND AIRPORT PAVEMENT NOT PART OF PHOTO. THEY ARE FROM 2012 CONSTRUCTION PROJECT.

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AK-CHIN REGIONAL AIRPORT
AK-CHIN INDIAN COMMUNITY
MARICOPA, ARIZONA

AIRPORT LAYOUT PLAN

No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.
0	126082	04/2015	ORIGINAL ISSUE	6082509	LKB	TMB	JZP

AERIAL PHOTOGRAPH

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CHAPTER

6

AIRPORT DEVELOPMENT AND FINANCIAL PLAN

AK-CHIN REGIONAL AIRPORT AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER SIX
FINANCIAL PLAN

6.1 INTRODUCTION

A program of recommended development for the Ak-Chin Regional Airport has been formulated to guide the sponsor in the systematic development of the airport and to aid the FAA, Arizona Department of Transportation Multimodal Planning Division (ADOT-MPD) Aeronautics Group and the Ak-Chin Indian Community in allocating funding over the planning period. Eligible capital improvement projects at NPIAS airports in Arizona are currently funded at 91.06 percent by the FAA with Airport Improvement (AIP) Funds. Grant eligible items typically include airfield and aeronautical related facilities such as runways, taxiways, aprons, lighting and visual aids as well as land acquisition and environmental tasks needed to accomplish the improvements. The public use (non-revenue generating) portions of passenger and general aviation terminal buildings are also grant eligible. In addition, fuel systems and hangars are also grant eligible; however, these items are considered a low priority for FAA funding and require all airside development needs to be met first.

6.2 AIRPORT DEVELOPMENT PLAN

Future airport development at the Ak-Chin Regional Airport, as included in this study, covers a twenty-year period. Development items are grouped into two phases. Each phase is based on the demand at Ak-Chin Regional Airport. Within each phase, development items could take place in any particular order to satisfy future demand or airport need. If the initial demand in the phase is met at the airport, the continued developments of each phase will begin as soon as the previous phase is complete. Estimated development costs are based on the proposed improvements (as shown on the ALP) and are included for each item in the financial development plan. Proposed improvements are based on the recommended facility requirements discussed in Chapter 3 and the selected alternatives in Chapter 4. The phasing of projects assists the airport sponsor in budgetary planning for construction improvements that are needed to provide safe and functional facilities for aviation demands. **Table 6-1** shows the development in both phases for Ak-Chin Regional Airport and assumes the FAA will participate with funding from AIP of 91.06 percent of eligible items. Historically, the Community would have been responsible for the remaining 8.94 percent local match; however, Arizona State Senate Bill 1317 revised the language to include Native American airports in state aeronautics grant funding programs. Senate Bill 1370 results in state matching funds of 4.47 percent would be provided towards AIP projects. A drawing showing the project phasing is included at the end of this Chapter in **Figure 6-2**.

Table 6-1 20 Year Financial Development Plan

Phase I Development		**Total**	**FAA[1]** **91.06%**	**State** **4.47%**	**Local** **4.47%**
A1	Partial Taxiway B and Bypass Taxiway Development	$913,000	$831,378	$40,811	$40,811
A2	Install Perimeter Fencing	$258,000	$234,935	$11,533	$11,533
A3	Install AWOS	$240,000	$218,544	$10,728	$10,728
A4	Northeast Taxilane Development	$276,000	$251,326	$12,337	$12,337
A5	Southeast Apron Expansion	$2,668,000	$2,429,481	$119,260	$119,260
A6	Southwest Apron Expansion	$537,000	$488,992	$24,004	$24,004
A7	Northeast Roadway Development	$374,000	$340,564	$16,718	$16,718
A9	Airport Access Road	$201,000	$183,031	$8,985	$8,985
A10	Pavement Preservation	$164,000	$149,338	$7,331	$7,331
	Total Phase I Development Cost	**$5,631,000**	**$5,127,588**	**$251,706**	**$251,706**
Phase II Development		**Total**	**FAA[1]** **91.06%**	**State** **4.47%**	**Local** **4.47%**
B1	Land Acquisition	$150,000	$136,590	$6,705	$6,705
B2	Replacement Runway 4/22	$5,503,000	$5,011,032	$245,984	$245,984
B3	Southwest Parallel Taxiway B, Bypass Taxiway and Holding Bay	$2,714,000	$2,471,368	$121,316	$121,316
B4	Southeast Holding Bay	$212,000	$193,047	$9,476	$9,476
B5	Northeast Connector Taxiway	$125,000	$113,825	$5,588	$5,588
B6	Southeast Connector Taxiway	$125,000	$113,825	$5,588	$5,588
B7	Northwest Parallel Taxiway B and Connector Taxiway	$1,711,000	$1,558,037	$76,482	$76,482
B8	Northeast Taxilane Development	$276,000	$251,326	$12,337	$12,337
B9	Northwest Apron Expansion	$720,000	$655,632	$32,184	$32,184
B10	Southeast Apron Expansion	$2,263,000	$2,060,688	$101,156	$101,156
B11	ARFF Parking and Roadway Development	$593,000	$539,986	$26,507	$26,507
B14	Pavement Preservation	$164,000	$149,338	$7,331	$7,331
B15	Connector Taxiway	$271,000	$246,773	$12,114	$12,114
B16	Northwest Apron Expansion	$984,000	$896,030	$43,985	$43,985
B17	Parking and Roadway Development	$110,000	$100,166	$4,917	$4,917
B18	Pavement Preservation	$164,000	$149,338	$7,331	$7,331
B20	Southeast Apron Expansion	$1,537,000	$1,399,592	$68,704	$68,704
B21	Southwest Apron Development	$985,000	$896,941	$44,030	$44,030
B22	Southwest Apron Development	$452,000	$411,591	$20,204	$20,204
B23	Northwest Apron Development	$3,677,000	$3,348,276	$164,362	$164,362
B24	Fire Station Expansion for ARFF	$100,000	$91,060	$4,470	$4,470
B25	Southeast Parking and Roadway Development	$300,000	$273,180	$13,410	$13,410
B26	Southwest Parking and Roadway Development	$382,000	$347,849	$17,075	$17,075
B29	West Peters and Nall Road Development	$710,000	$646,526	$31,737	$31,737
B30	North Anderson Road Development	$590,000	$537,254	$26,373	$26,373
B31	Northeast Roadway Development	$100,000	$91,060	$4,470	$4,470
B32	Pavement Preservation	$164,000	$149,338	$7,331	$7,331
B33	Airport Master Plan Update	$250,000	$227,650	$11,175	$11,175
	Total Phase II Development Cost	**$25,332,000**	**$23,067,319**	**$1,132,340**	**$1,132,340**
	Total Development Costs	**$30,963,000**	**$28,194,907**	**$1,384,046**	**$1,384,046**

[1] FY 2014 Dollars for planning purposes only, depicts FAA funding eligibility. Actual development will be dependent on FAA funding availability. FAA Funding for all eligible projects may not be available. Does not include ongoing planning, environmental, maintenance or operational costs.

TABLE 6-2 20 YEAR NON-FAA AND ADOT- MPD AIRPARK DEVELOPMENT PLAN

PHASE I DEVELOPMENT		TOTAL
A8	Airpark Taxilane Development	$653,000
	TOTAL PHASE I DEVELOPMENT COST	**$653,000**
PHASE II DEVELOPMENT		**TOTAL**
B12	Fire Station	$1,200,000
B13	Airpark Taxilane Development	$377,000
B19	Airpark Taxilane Development	$371,000
B27	Airpark Taxilane Development	$676,000
B28	Airpark Taxilane Development	$658,000
	TOTAL PHASE II DEVELOPMENT COST	**$3,282,000**
	TOTAL DEVELOPMENT COST	**$3,935,000**

*Does not include site grading, utilities, landscaping, curb and gutter, storm drains or other site improvements

6.3 CAPITAL DEVELOPMENT

Federal Grant Assistance: The phasing of projects assists the airport sponsor in budgetary planning for construction improvements that are needed to provide safe and functional facilities for aviation demands. Phased development schedules also assist the airport sponsor in contingencies and construction.

The Airport and Airways Act of 1982 created and authorized the AIP to assist in the development of a nationwide system of public-use airports adequate to meet the current projected growth of civil aviation. The Act provides funding for airport planning to meet the current projected growth of civil aviation. The Act provides funding for airport planning and development projects at airports included in the NPIAS. Ak-Chin has recently entered into the NPIAS and is therefore eligible for FAA funding through AIP. However, it should be noted that eligibility to receive funding does not guarantee the availability of FAA-funding for any particular project. System-wide airport capital development needs exceed availability funding and the FAA utilizes a priority rating system to select projects and allocate funding.

State Assistance: ADOT- MPD Aeronautics Group has historically participated in funding airport development and maintenance projects in the State of Arizona. However Tribal airports have not been eligible for this funding source. As a result of the passing of Senate Bill 1370, state funding has been included in **Table 6-1** for future airport capital improvement projects. ADOT typically contributes 90 percent of funding to projects without Federal participation and contributes 4.47 percent matching funds to the FAA's 91.06 percent funding of federally eligible capital improvement projects. The resulting local share is generally 4.47 percent for FAA and State funded projects and 10 percent for State only funded projects.

Funding The Local Share: The airport sponsor has several methods available for funding the capital required to meet the local share of airport development costs. The most common methods involve cash, debt financing which amortizes the debt over the useful life of the project, force accounts, in-kind service, third-party support and donations.

Bank Financing: Some airport sponsors use bank financing as a means of funding airport development. Generally, two conditions are required. First, the sponsor must show the ability to repay the loan plus interest and second, capital improvements must be less than the value of the present facility or some other collateral used to secure the loan. These are standard conditions which are applied to almost all bank loan transactions.

General Obligation Bonds: General Obligation bonds (GO) are a common form of municipal bonds whose payment is secured by the full faith credit and taxing authority of the issuing agency. GO bonds are instruments of credit and because of the community guarantee, reduce the available debt level of the sponsoring community. This type of bond uses tax revenues to retire debt and the key element becomes the approval of the voters to a tax levy to support airport development. If approved, GO bonds are typically issued at a lower interest rate than other types of bonds.

Self-liquidating General Obligation Bonds: As with General Obligation bonds, Self-liquidating General Obligation Bonds are secured by the issuing government agency. They are retired, however, by cash flow from the operation of the facility. Providing the state court determines that the project is self-sustaining, the debt may be legally excluded from the Community debt limit. Since the credit of the local government bears the ultimate risk of default, the bond issue is still considered, for the purpose of financial analysis, as part of the debt burden of the Community. Therefore, this method of financing may mean a higher rate of interest on all bonds sold by the Community. The amount of increase in the interest rate depends, in part, upon the degree of risk of the bond. Exposure risk occurs when there is insufficient net airport operating income to cover the level of service plus coverage requirements, thus forcing the Community to absorb the residual.

Revenue Bonds: Revenue Bonds are payable solely from the revenues of a particular project or from operating income of the borrowing agency, such as an airport commission which lacks taxing power. Generally, they fall outside of constitutional and statutory limitations and in many cases do not require voter approval. Because of the limitations on the other public bonds, airport sponsors are increasingly turning to revenue bonds whenever possible. However, revenue bonds normally carry a higher rate of interest because they lack the guarantees of municipal bonds. It should also be noted that the general public would usually be wary of the risk involved with a revenue bond issue for a general aviation airport. Therefore, the sale of such bonds could be more difficult than other types of bonds.

Combined Revenue/General Obligation Bonds: These bonds, also known as "Double-Barrel Bonds", are secured by a pledge of back-up tax revenues to cover principal and interest payments in cases where airport revenues are insufficient. The combined Revenue/General Obligation Bond interest rates are usually lower than Revenue Bonds, due to their back-up tax provisions.

Force Accounts, In-kind Service and Donations: Depending on the capabilities of the Sponsor, the use of force accounts, in-kind service, or donations may be approved by the FAA and the State for the Sponsor to provide their share of the eligible project costs. An example of force accounts would be the use of heavy machinery and operators for earthmoving and site preparation of runways or taxiways; the installation of fencing; or the construction of improvements to access roads. In-kind service may include surveying, engineering or other services. Donations may include land or materials such as gravel or water needed for the project. The values of these items must be verified and approved by the FAA prior to initiation of the project.

Third-Party Support: Several types of funding fall into this category. For example, individuals or interested organizations may contribute portions of the required development funds (Pilot Associations, Economic Development Associations, Chambers of Commerce, etc.). Although not a common means of airport financing, the role of private financial contributions not only increases the financial support of the project, but also stimulates moral support to airport development from local communities. Because of the potential for hangar development, private developers may be persuaded to invest in hangar development. A suggestion would be that the sponsor authorizes long-term leases to individuals interested in constructing a hangar on airport property. This arrangement generates revenue from the airport, stimulates airport activity, and minimizes the sponsor's capital investment requirements.

6.4 PAVEMENT MAINTENANCE PLAN

Periodic maintenance is necessary to prolong the useful life of the airport pavements. The affects of weather, oxidation and usage cause the pavement to deteriorate. The accumulation of moisture in the pavement causes heaving and cracking and is one of the greatest causes of pavement distress. The sun's ultraviolet rays oxidize and break down the asphalt binder in the pavement mix. This accelerates raveling and erosion and can reduce asphalt thickness.

The appropriate pavement maintenance will minimize the effects of weather damage and oxidation. Crack sealing is accomplished to keep moisture from accumulating inside and underneath the pavement and should be accomplished at least every five years prior to fog sealing or overlaying the pavements. Fog seals and slurry seals are spread over the entire paved area to replenish the binder lost. Asphalt overlays are typically accomplished near the end of the useful life of the pavement. A layer of new asphalt is placed over the existing pavement to renew the life of the pavement and to recover lost strength due to deterioration. Unless specially designed, the overlay is not intended to increase the weight bearing capacity of the pavement. Overlays may be supplemented with a porous friction course or grooving to increase friction and minimize hydroplaning. Remarking of the pavement is required following a fog seal or overlay.

The recommended pavement maintenance cycle time frames are listed below in **Table 6-3**. It should be noted that the time frames are recommendations only. Actual pavement deterioration will be affected by use of the Airport and weather exposure. Maintenance actions should be programmed as necessary through close monitoring and inspection of the pavements.

The pavement at Ak-Chin Regional Airport appears to have severe shrinkage cracking that goes beyond normal treatments and needs further analysis.

TABLE 6-3 PAVEMENT MAINTENANCE SCHEDULE

PAVEMENT MAINTENANCE CYCLE	APPROXIMATE TIME FRAMES
Crack Seal Pavement	1 - 2 years
Crack Seal, Seal Coat and Remark Pavements	3 - 8 years
Overlay Pavements	15 - 18 years

Source: Armstrong Consultants, Inc

6.5 FINANCIAL PLAN

The ultimate goal of any airport should be the capability to support its own operation and development through airport generated revenues. Unfortunately, few airports similar in size to Ak-Chin Regional Airport are able to do this. For example, it is difficult to break even when the fees received from hangar rentals and fuel sales will not adequately amortize the cost of construction projects. Yet the effort to become self-sufficient will generate a more positive perception of the airport by the Community.

While most airports of similar size to Ak-Chin Regional Airport are not able to become self-sustaining, the intrinsic value of a well-maintained airport to the community or region typically exceeds the operational and maintenance costs of the airport.

6.6 PROJECTED REVENUES AND EXPENDITURES

Expenditures: Airport operating expenditures typically include insurance, utilities, and maintenance and personnel costs. Insurance costs include liability insurance for the airport and property insurance for any real property on the airport owned by the Community. Utility expenses primarily consist of power costs to operate airfield lighting and visual aids and water for public use areas. Pavement maintenance consists of crack sealing on an annual basis and seal coating and remarking the pavements every three to five years. Facility maintenance consists of mowing, weed control, sweeping and repair and replacement of parts and equipment such as light bulbs, light fixtures, fences, etc. Personnel costs typically include an airport manager and staff. Currently, the airport manager oversees and administers the day-to-day operations of the airport.

Revenues: Airport revenues generally consist of land and facility leases, user fees and fuel sales or fuel flowage fees. In some cases they involve through-the-fence fees and non-aeronautical ground leases.

Land Leases: Property on the airport that is not devoted to airfield use, vehicle parking or contained within areas required to be cleared of structures may be leased to individual airport users or aviation related businesses. Typically, the individual is provided a long-term lease on which to construct a hangar, business or other facility. At the termination of the lease, the lessee typically has the option to renew the lease, sell or lease the buildings or to remove the buildings.

Facility Leases: Hangars and other buildings on the airport owned by the airport sponsor can be leased to private aircraft operators or businesses. Typically, the individual or business is provided five to ten year lease. At the termination of the lease, the lessee typically has the option to renew the lease or cease use of the facility.

Hangar Rental: The fees are usually established on a nightly rate for transient aircraft or monthly rate for based aircraft.

Tie-Down Fees: A fee is typically established for the use of fixed ramp tiedowns on paved apron areas. The fees are usually established on a monthly or annual basis for based aircraft and on an overnight basis for transient aircraft and vary between single-engine, multi-engine and jet aircraft.

Through-the-Fence Fees (Airport/Airpark Access Fee): A fee is typically charged to adjacent landowners who are provided access directly from their private parcel to the public use airport facilities. This fee ensures that the level of rates and charges assessed to on-airport users is equitable to off-airport users and that there is not an unfair economic advantage to operating "through-the-fence". Additionally, through-the-fence operators are typically required to maintain a secure airport perimeter with fencing and/or gates and to construct paved access taxiways to the airport operating areas.

Fuel Sales: In some cases, such as Ak-Chin Regional Airport, the fuel concession is owned and operated by the Sponsor. In this case, the Sponsor purchases the fuel wholesale, marks up the price and sells it retail. Rather than simply receiving a fuel flowage fee, the Sponsor retains the profit; however, in this case the Sponsor is responsible for quality control, testing and inspections. In other cases, the fuel concession or FBO is a private entity and simply pays a fuel flowage fee as described below.

Fuel Flowage Fee: This fee is typically imposed on all aircraft fuels delivered to the private FBO or self-fuelers on the airport and would include all fuels used by aircraft including AvGas, Jet-A and MoGas which is an automotive fuel used in aircraft.

Airport Usage, Landing, or Ramp Fee: This fee is typically imposed on charter and commercial aircraft, or aircraft weighing more than a specified weight. The fee is often waived if the operator purchases a minimum amount of fuel.

Commercial Activity Fee: This fee is typically imposed on commercial activities operating "for profit" at the airport. Typical commercial activities may include fixed base operators, maintenance services, air taxi or charter services, automobile rental, restaurants, retail or other goods and services which may be provided at the airport. These fees are typically a flat annual rate, a percentage of gross revenue or a combination thereof.

Non-Aeronautical Revenue Generating: Leases on land that are allocated as airport property but have no access and/or by of aeronautical activities are considered for non-aeronautical uses. The leases for these areas must be established at fair market value and all revenue generated from these leases must remain within the airport fund.

TABLE 6-4 TYPICAL RATES AND CHARGES

	RECOMMENDED RATES
Airpark TTF Fees	$0.10 per sq. ft per year
Saddleback TTF Fees	$0.10 per sq ft. per year
T & Box Hangar Land Leases	$0.17 per sq. ft per month
Corporate Hangar Land Leases (Prime Locations)	$0.30 per sq. ft per month
Based Aircraft Tie-down	$34 per month
Transient Aircraft Tie-down	$10 per aircraft per night
Fuel Mark Up Fees (Jet-A)	$0.75 per gallon
Fuel Mark Up Fees (Av Gas)	$0.75 per gallon
Commercial Activity Fees	0% - 20% of revenue

An analysis of potential revenues was generated for Ak-Chin Regional Airport at various levels of development utilization. The analysis was developed utilizing the aforementioned rates and charges which the Ak-Chin Indian Community could impose on airport users applied to the potential build out of airport facilities. Additionally, the analysis also lists the net operating cash flow by considering airport expenses subtracted from revenues generated. Two scenarios were developed to evaluate the funding methods for future development projects. Scenario One incorporates Federal, State, Local and airport-generated funds for capital investment projects. Scenario Two only includes Local and airport-generated funds to cover the capital investment projects. **Table 6-5** lists the results of potential revenue analysis.

Table 6-3 Potential Revenue Analysis

Full Build Out (Phase I-III)																									
Based Aircraft	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330	330
Total Annual Operations	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500	115,500
Airpark Development (s.f.)	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035	5,140,035
Saddleback Industrial Park (s.f.)	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400	1,742,400
T & Box Hangar Land Leases (s.f.)	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000	470,000
Corporate Hangar Land Leases (s.f.)	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000	920,000
Based Aircraft Tiedown	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
Transient Tiedown	10	10	10	10	10	10	15	15	15	15	20	20	20	20	20	25	25	25	25	25	25	25	25	25	25
Jet Fuel Sales (gallons)	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800	184,800
Av Gas and MoGas Sales (gallons)	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780	318,780
Rates & Charges Basis																									
Airpark TTF Fees	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522	349,522
Saddleback TTF Fees	3,485	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924
T & Box Hangar Land Lease Rate	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Corporate Hangar Land Lease Rate	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Based Aircraft Tiedown Rate (annual)	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
Transient Aircraft Tiedown Fees	36,500	36,500	36,500	36,500	36,500	36,500	54,750	54,750	54,750	54,750	73,000	73,000	73,000	73,000	73,000	91,250	91,250	91,250	91,250	91,250	91,250	91,250	91,250	91,250	91,250
Jet Fuel Mark Up ($ per gallon)	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Av Gas Mark Up ($ per gallon)	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Percent Occupancy/Utilization					**1%**	**5%**	**10%**	**15%**	**20%**	**25%**	**30%**	**35%**	**40%**	**45%**	**50%**	**55%**	**60%**	**65%**	**70%**	**75%**	**80%**	**85%**	**90%**	**95%**	**100%**
Based Aircraft					3	17	33	50	66	83	99	116	132	149	165	182	198	215	231	248	264	281	297	314	330
Total Annual Aircraft Operations					1,155	5,775	11,550	17,325	23,100	28,875	34,650	40,425	46,200	51,975	57,750	63,525	69,300	75,075	80,850	86,625	92,400	98,175	103,950	109,725	115,500
Airport Operating Revenues																									
Airpark TTF Fees					3,495	17,476	34,952	52,428	69,904	87,381	104,857	122,333	139,809	157,285	174,761	192,237	209,713	227,190	244,666	262,142	279,618	297,094	314,570	332,046	349,522
Saddleback TTF Fees					5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924
T & Box Hangar land Leases					799	3,995	7,990	11,985	15,980	19,975	23,970	27,965	31,960	35,955	39,950	43,945	47,940	51,935	55,930	59,925	63,920	67,915	71,910	75,905	79,900
Corporate Hangar Land Leases					2,760	13,800	27,600	41,400	55,200	69,000	82,800	96,600	110,400	124,200	138,000	151,800	165,600	179,400	193,200	207,000	220,800	234,600	248,400	262,200	276,000
Based Tiedown fees					300	1,700	3,300	5,000	6,600	8,300	9,900	11,600	13,200	14,900	16,500	18,200	19,800	21,500	23,100	24,800	26,400	28,100	29,700	31,400	33,000
Transient tiedown fees					3,650	18,250	18,250	18,250	18,250	18,250	18,250	18,250	18,250	18,250	18,250	18,250	18,250	18,250	18,250	18,250	18,250	18,250	18,250	18,250	18,250
Jet Fuel Markup					1,386	6,930	13,860	20,790	27,720	34,650	41,580	48,510	55,440	62,370	69,300	76,230	83,160	90,090	97,020	103,950	110,880	117,810	124,740	131,670	138,600
Av Gas and MoGas Markup					2,391	11,954	23,909	35,863	47,817	59,771	71,726	83,680	95,634	107,588	119,543	131,497	143,451	155,405	167,360	179,314	191,268	203,222	215,177	227,131	239,085
Total Revenues					20,705	80,030	135,785	191,640	247,396	303,251	359,006	414,862	470,617	526,472	582,228	638,083	693,839	749,694	805,449	861,305	917,060	972,915	1,028,671	1,084,526	1,140,282
Airport Operating Expenses					90,000	94,500	99,225	104,186	109,396	114,865	120,609	126,639	132,971	139,620	146,601	153,931	161,627	169,708	178,194	187,104	196,459	206,282	216,596	227,426	238,797
Net Operating Cash flow					(69,295)	(14,470)	36,560	87,454	138,000	188,386	238,398	288,223	337,646	386,853	435,627	484,153	532,212	579,986	627,255	674,201	720,601	766,634	812,075	857,101	901,485
Scenario One: Federal/State/Local Funds																									
Capital Investment					(215,000)	0	0	0	0	0	(6,284,000)	0	0	0	(14,307,000)	0	0	0	(14,307,000)	0	0	0	0	0	0
FAA Funding					0	0	0	0	0	0	(5,631,000)	0	0	0	(11,533,659)	0	0	0	(11,533,659)	0	0	0	0	0	0
State Funding					0	0	0	0	0	0	(251,706)	0	0	0	(561,075)	0	0	0	(561,075)	0	0	0	0	0	0
Local Funding					(215,000)	0	0	0	0	0	(904,706)	0	0	0	(2,207,170)	0	0	0	(2,207,170)	0	0	0	0	0	0
Net Operating + Net Local Capital					(284,295)	(14,470)	36,560	87,454	138,000	188,386	(666,308)	288,223	337,646	386,853	(1,771,543)	484,153	532,212	579,986	(1,579,915)	674,201	720,601	766,634	812,075	857,101	901,485
Cummulative Net Operating + Capital					(284,295)	(298,765)	(262,205)	(174,751)	(36,751)	151,634	(514,674)	(226,451)	111,195	498,048	(1,273,495)	(789,342)	(257,131)	322,855	(1,257,060)	(582,858)	137,743	904,377	1,716,452	2,573,553	3,475,037
Scenario Two: Local Funds Only																									
Capital Investment					(215,000)	0	0	0	0	0	(6,284,000)	0	0	0	(14,307,000)	0	0	0	(14,307,000)	0	0	0	0	0	0
FAA Funding					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
State Funding					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Funding					(215,000)	0	0	0	0	0	(6,284,000)	0	0	0	(14,307,000)	0	0	0	(14,307,000)	0	0	0	0	0	0
Net Operating + Net Local Capital					(284,295)	(14,470)	36,560	87,454	138,000	188,386	(6,045,602)	288,223	337,646	386,853	(13,871,373)	484,153	532,212	579,986	(13,679,745)	674,201	720,601	766,634	812,075	857,101	901,485
Cummulative Net Operating + Capital					(284,295)	(298,765)	(262,205)	(174,751)	(36,751)	151,634	(5,893,968)	(5,605,745)	(5,268,099)	(4,881,246)	(18,752,619)	(18,268,466)	(17,736,255)	(17,156,269)	(30,836,014)	(30,161,812)	(29,441,211)	(28,674,577)	(27,862,502)	(27,005,401)	(26,103,917)

Note: Assumptions and rationale of each category described on reverse.

Assumptions for Revenue and Expenditure Projections

Based Aircraft: Based on data from Forecasts of Aviation Activity
Total Annual Operations: Based on data from Forecasts of Aviation Activity
Airpark Development: Total area of fully developed Airpark parcels (assumes 90% leasable area allowing for road right-of-ways and open space).
Saddleback Industrial Park: Total area of Saddleback Industrial Park parcels in square feet
T & Box Hangar Land Leases: Total area of developed T and Box Hangars to accommodate 75% of based aircraft with a 15 foot building footprint on each side in square feet
Based Aircraft Tiedown: Total equals 25% of based aircraft
Transient Tie Down: Estimated average number of daily overnight transient tiedown aircraft
Jet Fuel Sales: 20 gallons of jet fuel per jet/turbine operation
AvGas Sales: 3 gallons of AvGas per piston aircraft operation

Rates & Charges Basis

Airpark TTF Fees: 40% of total Airpark Development area parcel multiplied by the TTF Fee Rate of $0.17 per square foot per year
Saddleback TTF Fees: 2% of Saddleback parcels multiplied by the TTF Fee Rate of $0.17 per square foot per year
T & Box Hangar Land Lease Rate (Annual): $0.17 per square foot
Based Aircraft Tiedown Lease Rate (Annual): $400 per aircraft
Corporate Hangar Land Lease Rate (Annual): $0.30 per square foot
Jet-A Fuel Mark Up: $0.75 per gallon
AvGas Fuel Mark Up: $0.75 per gallon
Transient Aircraft Tiedown Rate (Per Night): $10 per aircraft

Annual Estimates

Percent Occupancy/Utilization: Percent of total forecasted based aircraft, total operations and hangar and Airpark build out
Based Aircraft: Forecasted based aircraft (330) multiplied by the occupancy/utilization percentage.
Total Annual Operations: Forecasted total annual operations (115,500) multiplied by the occupancy/utilization percentage
Airpark TTF Fees: 40% aeronautical use of Airpark parcel multiplied by $0.17 per square foot per year multiplied by the occupancy/utilization percentage
Saddleback TTF Fees: 2% aeronautical use of Saddleback parcel multiplied by $0.17 per square foot per year multiplied by the occupancy/utilization percentage
T & Box Hangar Land Leases: Maximum T & Box hangar area to be developed multiplied by the annual rate of $0.17 per square foot per year multiplied by the occupancy/utilization percentage
Corporate Hangar Land Leases: Maximum Corporate Hangar Development Area to be developed multiplied by the Corporate Hangar Lease Rate of $0.30 per square foot per year multiplied by the occupancy/ utilization percentage
Based Tie Down Fees: 25% of forecasted based aircraft multiplied by the occupancy/ utilization percentage multiplied by the annual rate of $400 per aircraft
Transient Tie Down Fees: Total number of transient tiedowns multiplied by the occupancy/ utilization percentage multiplied by the rate of $10.00 per aircraft per night
Jet Fuel Markup: Estimated Jet-A fuel sales (gallons) multiplied by Jet-A Fuel Markup Rate of $1 per gallon multiplied by the occupancy/utilization percentage
AvGas Markup: Estimated AvGas fuel sales (gallons) multiplied by AvGas Fuel Markup Rate of $0.75 per gallon multiplied by occupancy/utilization percentage

Airport Operating Expenses: $75,000 for airport management plus $15,000 for utilities, insurance and maintenance. Projected to increase 5% per year thereafter with increased employees and activity

Net Operating Cash Flow: Airport Operating Revenue minus Airport Operating Expenses

Net Capital Investment

Scenario One: Includes Federal, State and Local shares of all grant eligible projects listed in Phases I and II of the Airport Development Plan in **Table 6-1**. The Airpark Development Plan costs in **Table 6-2** are included with Local funding only.
Scenario Two: All Airport Development Plan and Airpark Development Plan costs are covered by Local shares only. Does not include any Federal or State funding.

6.7 FEE-TO-TRUST CONVERSION

In most cases, Native American Tribes develop and utilize land that falls within their reservation as Trust Land. This land has been provided in-trust to Native American Tribes by the federal government for their use, enjoyment and benefit. Trust land can be leased to private individuals or businesses or developed by the Tribe, but cannot be sold. Development of the land falls under the jurisdiction, standards and codes of the local Tribe. The Ak-Chin Indian Community currently consists of approximately 22,000 acres of Trust Land.

However, the Ak-Chin Regional Airport property and adjacent land was purchased by the Ak-Chin Indian Community from a private party in 2006. As such, it is considered a fee simple ownership by a public entity, the Ak-Chin Indian Community, of land falling within the jurisdiction of unincorporated Pinal County. Through this ownership, development on the property must conform to Pinal County zoning and building code standards and processes. Also, Pinal County imposes and collects property taxes on the land and improvements on the airport property.

Fee-to-Trust: In order to enhance its economic development and enterprises for long-term community development and sustainability, the Community has prepared a Fee-to-Trust application to the Department of Interior (DOI), Bureau of Indian Affairs (BIA) that includes the property boundaries of two Community-owned tracts: Bunger and PRA tract. The Fee-To-Trust applications must follow the 25 CFR Part 151, *Land Acquisitions*, process, which includes notification of state and local governments, compliance of all environmental clearances, review of property title documents, and notification for comments. The two tracts being incorporated into trust status would offer opportunity to enhance current and future economic initiatives. Currently, unlike municipalities, the Community has no property tax revenue base on this land to fund infrastructure projects such as roads, public use buildings, public service programs, police, or fire, which creates a significant challenge for any economic or community development. The tribe must diversify its tribal businesses to generate much needed non-governmental revenue to support various economic initiatives. Seeking new opportunities to diversify its economy and creating career opportunities for tribal and non-members is another benefit for the Fee-to-Trust applications. The two tracts the Community is proposing to transfer into Trust are contiguous to the reservation. The Community will not change the current land uses and does not intend to place any gaming facility on these tracts.

Benefits of the Fee-to-Trust Applications: Transferring these two tracts into Trust offers enormous economic opportunities for western Pinal County. Businesses on the reservation create job opportunities for the residents of neighboring communities and purchase goods and services that translate into a "multiplier effect" as this capital circulates throughout the region. For example, the Harrah's Casino and Resort is considered to be the largest employer in western Pinal County with 98 percent of its employees living off reservation and paying local taxes, purchasing goods and services off reservation, and paying property taxes in cities in which they reside. An economic impact analysis documented the total output of Ak-Chin Indian Community economic activity at $436,997,503 for 2010.

The fee-to-trust conversion will place the land under the jurisdiction and development control of the Ak-Chin Indian Community. Also, Pinal County will no longer impose or collect property tax revenues from the land or improvements. As such, the Ak-Chin Regional Airport may provide a competitive economic advantage over other airports in which property taxes are imposed, or if the Community desires to implement its own property tax or gross receipts tax on the land, the Community would receive tax revenues directly into the Community General Fund that would not be considered airport revenue.

6.8 COMMUNITY SUPPORT

While it would certainly be advantageous for an airport to support itself, the indirect and intangible benefits of the airport to the Community's economy and growth must be considered. People are directly or indirectly employed on the airport. As airport activity increases, it is probable that employment on the airport will also grow throughout the planning period. The local construction industry will also benefit directly from implementation of the development programs. Other Community benefits involve business growth and development that is enhanced by the availability of air transportation including corporate and private aviation. Clients and suppliers of area businesses will also benefit from the future improvements to the airfield.

The use of corporate and business aircraft is an increasing trend across the United States. The movement of American industry from large metropolitan areas to smaller communities that offer lower taxes and labor costs and a better working environment has influenced this trend. Time is money in the business environment and corporate aircraft are answering the need for quick and convenient access to and from these new locations for both executives and management personnel. The ability of a community to provide convenient access to corporate aircraft will be reflected not only in benefits to existing businesses and industries but will be a strong factor in attracting new industry.

These factors place the Ak-Chin Regional Airport in a prime position to capitalize on the trends in the general aviation industry and to maximize the benefits the airport provides to the Community.

6.9 CONTINUOUS PLANNING PROCESS

Airport planning is a continuous process that does not end with the completion of a major project. The fundamental issues upon which this AMP is based on are expected to remain valid for several years; however, several variables, such as based aircraft, annual aircraft operations, and socioeconomic conditions are likely to change over time. The continuous planning process necessitates that the Community consistently monitor the progress of the airport in terms of growth in based aircraft and annual operations, as this growth is critical to the exact timing and need for new airport facilities. The information obtained from this monitoring process will provide the data necessary to determine if the development schedule should be accelerated, decelerated or maintained as scheduled.

Periodic updates of the ALP, Capital Improvement Plan (CIP), and AMP are recommended to document physical changes to the airport, review changes in aviation activity and to update improvement plans for the airport. The primary goal of this AMP is to develop a safe and efficient airport that will meet the demands of its aviation users and stimulate economic development for the Community. The continuous airport planning process is a valuable tool in achieving that goal.

6.10 CONCLUSIONS

The most effective means of increasing revenue at Ak-Chin Regional Airport is to accommodate existing constrained demand and to continue to attract new and additional users. Increasing aircraft storage hangars at the airport would result in not only increased direct revenues generated through land leases, but would also produce indirect revenue through increased use of airport services and facilities, such as increased fuel mark-up fees. Business/corporate tenants are typically flight departments for local businesses and provide employment in the local community. They generally operate multi-engine turboprop or business jet aircraft. Their land lease parcels are usually large, the aircraft are typically operated two to three times per week and fuel purchases are typically several hundred gallons per fueling, which is larger than other general aviation user's.

Whether the improved Ak-Chin Regional Airport operates at an annual surplus or subsidy depends greatly on the amount of activity and facilities that are constructed at the airport. Existing demand is currently constrained by the lack of aircraft storage facilities and services. The most efficient way for the Community to accommodate this demand is to construct taxilanes and provide land leases for hangars. If demand for basing aircraft at the Ak-Chin Regional Airport continues in the long-term, the Community should consider constructing multi-unit T-hangars and/or box hangars.

Obtaining FAA and State grant funding for future capital improvement is recommended for the airport. The acquisition of FAA and State grant funds will significantly reduce the amount of local cost for the future development of the airport over the planning period. Should FAA and State grant funding not be available within the desired timeframe, local funding could be used for capital development projects.

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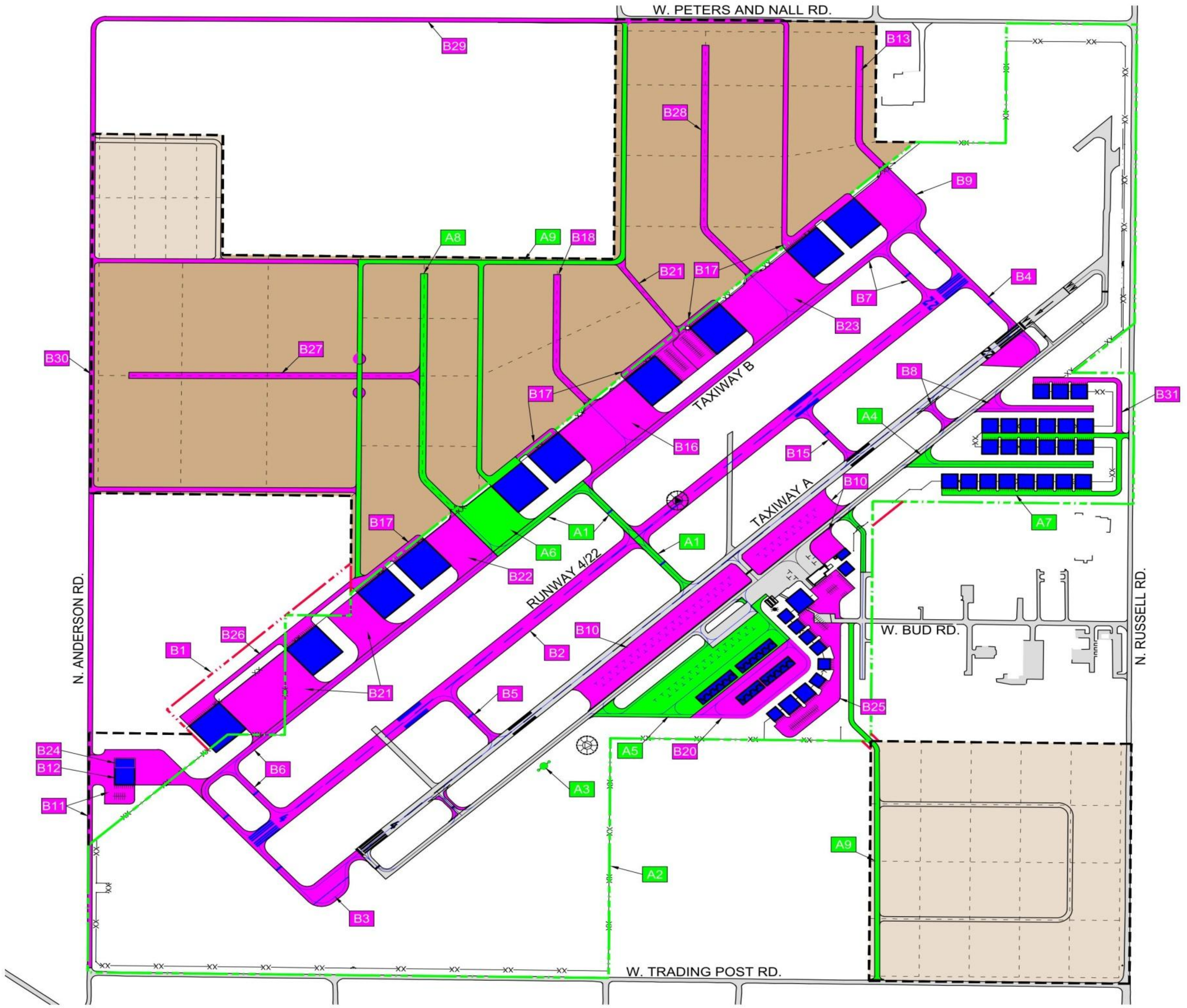

🟩 PHASE I - (1-5 YEARS) SHORT-TERM DEVELOPMENT ITEMS

A1	PARTIAL TAXIWAY B AND BYPASS TAXIWAY DEVELOPMENT
A2	INSTALL PERIMETER FENCING
A3	INSTALL AWOS
A4	NORTHEAST TAXILANE DEVELOPMENT
A5	SOUTHEAST APRON EXPANSION
A6	SOUTHWEST APRON EXPANSION
A7	NORTHEAST ROADWAY DEVELOPMENT
A8	AIRPARK TAXILANE DEVELOPMENT
A9	AIRPORT ACCESS ROAD
A10	PAVEMENT PRESERVATION (NOT SHOWN)

🟪 PHASE II - (6-20 YEARS) MEDIUM TO LONG-TERM DEVELOPMENT ITEM

B1	LAND ACQUISITION
B2	REPLACEMENT RUNWAY 4/22 *
B3	SOUTHEAST HOLDING BAY
B4	NORTHEAST CONNECTOR TAXIWAY
B5	SOUTHEAST CONNECTOR TAXIWAY
B6	SOUTHWEST PARALLEL TAXIWAY B AND BYPASS TAXIWAY
B7	NORTHWEST PARALLEL TAXIWAY B AND CONNECTOR TAXIWAY
B8	NORTHEAST TAXILANE DEVELOPMENT
B9	NORTHWEST APRON EXPANSION
B10	EAST APRON EXPANSION
B11	ARFF PARKING AND ROADWAY DEVELOPMENT
B12	FIRE STATION
B13	AIRPARK TAXILANE DEVELOPMENT
B14	PAVEMENT PRESERVATION (NOT SHOWN)
B15	CONNECTOR TAXIWAY
B16	NORTHWEST APRON EXPANSION
B17	PARKING AND ROADWAY DEVELOPMENT
B18	AIRPARK TAXILANE DEVELOPMENT
B19	PAVEMENT MAINTENANCE (NOT SHOWN)
B20	SOUTHEAST APRON EXPANSION
B21	SOUTHWEST APRON DEVELOPMENT
B22	SOUTHWEST APRON DEVELOPMENT
B23	NORTHWEST APRON DEVELOPMENT
B24	FIRE STATION EXPANSION
B25	SOUTHEAST PARKING AND ROADWAY DEVELOPMENT
B26	SOUTHWEST PARKING AND ROADWAY DEVELOPMENT
B27	AIRPARK TAXILANE DEVELOPMENT
B28	AIRPARK TAXILANE DEVELOPMENT
B29	WEST PETERS AND NALL ROAD DEVELOPMENT
B30	NORTH ANDERSON ROAD DEVELOPMENT
B31	NORTHEAST ROADWAY DEVELOPMENT
B32	PAVEMENT PRESERVATION (NOT SHOWN)
B33	AIRPORT MASTER PLAN UPDATE (NOT SHOWN)

* INCLUDING VISUAL AIDS, LIGHTING,
SIGNAGE AND MARKINGS

NOT TO SCALE

LEGEND

— · —	EXISTING AIRPORT BOUNDARY LINE
— — —	EXISTING AK-CHIN PROPERTY LINE
— · · —	FUTURE AK-CHIN PROPERTY LINE / AIRPORT BOUNDARY LINE
— · · —	FUTURE AIRPORT BOUNDARY LINE
— — —	FUTURE LOT LINE
■	EXISTING STRUCTURE
🟦	FUTURE STRUCTURE
🟫	FUTURE AIRPARK DEVELOPMENT
▨	FUTURE INDUSTRIAL DEVELOPMENT

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AK-CHIN REGIONAL AIRPORT
AK-CHIN INDIAN COMMUNITY
MARICOPA, ARIZONA

0	126082	07/2014	FINANCIAL PLAN DRAWING	6082605	LKB	TMB	JZP
No.	Project No.	Date	Revision / Description	File	Drwn.	Chkd.	Apprvd.

THE PREPARATION OF THIS DOCUMENT WAS FINANCED IN PART, THROUGH THE AIRPORT IMPROVEMENT PROGRAM FINANCIAL ASSISTANCE FROM 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 PLAN BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED THEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE OR WOULD HAVE JUSTIFICATION IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

FINANCIAL
PLAN

FIGURE 6-1

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CHAPTER

7

ENVIRONMENTAL OVERVIEW

AK-CHIN REGIONAL AIRPORT
AIRPORT MASTER PLAN

ARMSTRONG

CHAPTER SEVEN
ENVIRONMENTAL OVERVIEW

7.1 INTRODUCTION

This environmental overview examines the potential environmental impacts associated with the proposed airport improvements from the recommended alternatives selected in Chapter 4 and listed in the Capital Improvement and Financial Plans in Chapter 6. The recommended developments which would likely result in environmental impacts include the relocation of Runway 4/22 taxiway and landside development. All other improvements occur on existing Community property and are less likely to impact the natural environment. This Chapter is intended to provide an overview of the potential impacts and identify additional environmental documentation that may be required as a prerequisite to development.

7.2 AIR QUALITY

Air quality has become a major component of pollution control in the last 40 to 50 years. The passing of the Clean Air Act (CAA) in 1970 marked the beginning of government regulation to monitor and ensure pollution is controlled to the maximum extent possible.

The Clean Air Act of 1970 was enacted to reduce emissions of specific pollutants via uniform Federal standards. These standards include the National Ambient Air Quality Standards (NAAQS) which set maximum allowable ambient concentrations of ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), lead (Pb) and particulate matter 10 microns or smaller (PM_{10}). Section 176(c) of the Act, in part, states that no Federal agency shall engage in, support in any way or provide financial assistance for, license or permit or approve any activity that does not conform to the State Implementation Plan.

Federal Aviation Administration Orders 5050.4B and 1050.1E require air quality analysis for projects in areas not in compliance with the Environmental Protection Agency (EPA) approved State Implementation Plan (SIP). Because the entire area is considered to be in attainment, no further air quality analysis is required.

Construction emissions, specifically dust, are not a long-term factor. These emissions are described in the “Construction Impacts” section of this chapter. The necessary permits would be obtained before construction begins and construction projects would conform to FAA AC 150/5370-10, *Standards for Specifying Construction of Airports.*

The following Best Management Practices (BMP) are recommended to minimize construction emissions:

I. Site Preparation
    A. Minimize land disturbance;
    B. Use watering trucks to minimize dust;
    C. Cover trucks when hauling dirt or debris;
    D. Stabilize the surface of dirt piles and any disturbed areas;
    E. Use windbreaks to prevent any accidental dust pollution; and
    F. Segregate storm water drainage from construction sites and material piles.
II. Construction Phase
    A. Cover trucks when transferring materials; and
    B. Minimize unnecessary vehicular and machinery activities.

III. Completion Phase
    A. Revegetate any disturbed land not used; and
    B. Remove unused material and dirt piles;

Temporary air pollution may occur as a result of the proposed development. The design and construction of the proposed improvements would incorporate BMP to reduce air quality impacts, including minimizing land disturbance, wetting down, using water trucks, dust suppressant, covering trucks when hauling soil and the use of wind breaks. These practices would be selected based on the site's characteristics. No significant air quality impacts are anticipated as a result of the proposed development.

The airport is located within an attainment area. An attainment area is a zone within which the level of pollutant is considered to meet National Ambient Air Quality Standards (NAAQS). Air pollutants are emitted by a variety of means and sources: aircraft, ground support equipment (GSE), auxiliary power units, motor vehicle operations, and construction activities.

Figures 1-21 and **1-22** show the current air quality maps for the state and the county. No significant impacts to air quality are anticipated as a result of the recommended development projects.

7.3 COASTAL RESOURCES

There are no coastal zones associated with the proposed development. Therefore, compliance with the Coastal Zone Management Act of 1972 and the Coastal Barriers Resources Act of 1982 is not a factor.

7.4 COMPATIBLE LAND USE

Land use compatibility considerations include safety, height hazards and noise exposure. Although extremely rare, most aircraft accidents occur within 5,000 feet of a runway. Therefore, the ability of the pilot to bring the aircraft down in a manner that minimizes the severity of an accident is dependent upon the type of land uses within the vicinity of the airport. Land uses are reviewed in four zones surrounding the airport: the Runway Protection Zone (RPZ), the Approach Zone, Airport Influence Zone and the Traffic Pattern Zone. The RPZ is a trapezoidal area extending beyond the ends of the runway and is typically included within the airport property boundary. Residential and other uses that result in congregations of people are restricted from the RPZ. The Approach Zone generally falls within the 14 CFR Part 77 Approach Surface area. Within the Approach Zone, public land uses, such as schools, libraries, hospitals and churches should be avoided. New residential developments within the Approach Zone should include avigation easements and disclosure statements. The Traffic Pattern Zone is generally the area within one mile of the airport. Within the Traffic Pattern Zone, avigation easements should be considered for residential and public uses within this area and disclosure statements should be required. The Airport Influence Zone is the area where aircraft are transitioning between cruise altitude and the standard traffic pattern altitude of 800 to 1,000 feet above airport elevation.

14 CFR Part 77, *Safe, Efficient Use, and Preservation of the Navigable Airspaces*, provides imaginary surfaces surrounding an airport that should be protected from penetration by objects. These include the approach surface, horizontal surface and conical surface. These surfaces

were described in Chapter 3. Proposed structures in the vicinity of the airport should be reviewed against the Part 77 criteria to ensure hazards to air navigation are not created. Objects penetrating these surfaces could result in a hazard to air navigation.

The recommended development would not have a significant impact with respect to compatible land uses, as long as appropriate disclosure, avigation easements and density limitations are put in place. Therefore, no significant impacts to compatible land uses are anticipated as a result of the recommended development projects. A Compatible Land Use drawing and Height Restriction (FAR Part 77 airspace drawing) are included as part of this plan as a tool for the Ak-Chin Community and adjoining jurisdictions to use in reviewing and evaluating the compatibility of proposed development in the vicinity of the airport.

Arizona Revised Statutes -Title 28 Transportation-Section 28-8486 Public Airport

Section 28-8486 states, "the Arizona Department of Real Estate shall have and make available to the public on request a map showing the exterior boundaries of each territory in the vicinity of a public airport. The map shall clearly set forth the boundaries on a street map. The Arizona Department of Real Estate shall work closely with each public airport and affected local government as necessary to create a map that is visually useful in determining whether property is located in or outside of a territory in the vicinity of a public airport.

Each public airport shall record the map prepared pursuant to Subsection A in the Office of the County Recorder in each county that contains property in a territory in the vicinity of the public airport. The recorded map shall be sufficient to notify owners and potential purchasers of property that the property is located in or outside of a territory in the vicinity of a public airport."

7.5 CONSTRUCTION IMPACTS

Local, State and Federal ordinances and regulations address the impacts of construction activities, including dust and noise from heavy equipment traffic, disposal of construction debris and air and water pollution.

Construction operations for the proposed development would cause specific impacts resulting solely from and limited exclusively to the construction period. Construction impacts are distinct in that they are temporary in duration and the degree of adverse impacts decreases as work is concluded. The following construction impacts can be expected:

- A temporary increase in particulate and gaseous air pollution levels as a result of dust generated by construction activity and by vehicle emissions from equipment and worker's automobiles;
- Increases in solid and sanitary wastes from the workers at the site;
- Traffic volumes that would increase in the airport vicinity due to construction activity (workers arriving and departing, delivery of materials, etc.);
- Increase in noise levels at the airport during operation of heavy equipment; and
- Temporary erosion, scarring of land surfaces and loss of vegetation in areas that are excavated or otherwise disturbed to carry out future developments.

Construction projects would comply with guidelines set forth in FAA AC 150/5370-10, *Standards for Specifying the Construction of Airports*. The contractor would obtain the required construction permits. The contractor would also prepare SWPPP and Fugitive Dust Control

Plans for construction. These requirements would be specified in the contract documents for the construction of the proposed improvements.

No significant construction impacts are anticipated as a result of the recommended development.

7.6 DOT ACT – SECTION 4(F)

Section 303c of Title 49, U.S.C., formerly Section 4(f) of DOT Act of 1966, provides that the Secretary of Transportation shall not approve any program or project that requires the use of any publicly owned land from a public park, recreation area or wildlife or waterfowl refuge of National, State or Local significance or land from an historic site of National, State or Local significance, as determined by the officials having jurisdiction thereof, unless there is no feasible and prudent alternative to the use of such land and such project includes all possible planning to minimize impacts. The proposed improvements would not require land from any public park, recreation area or wildlife or waterfowl refuge.

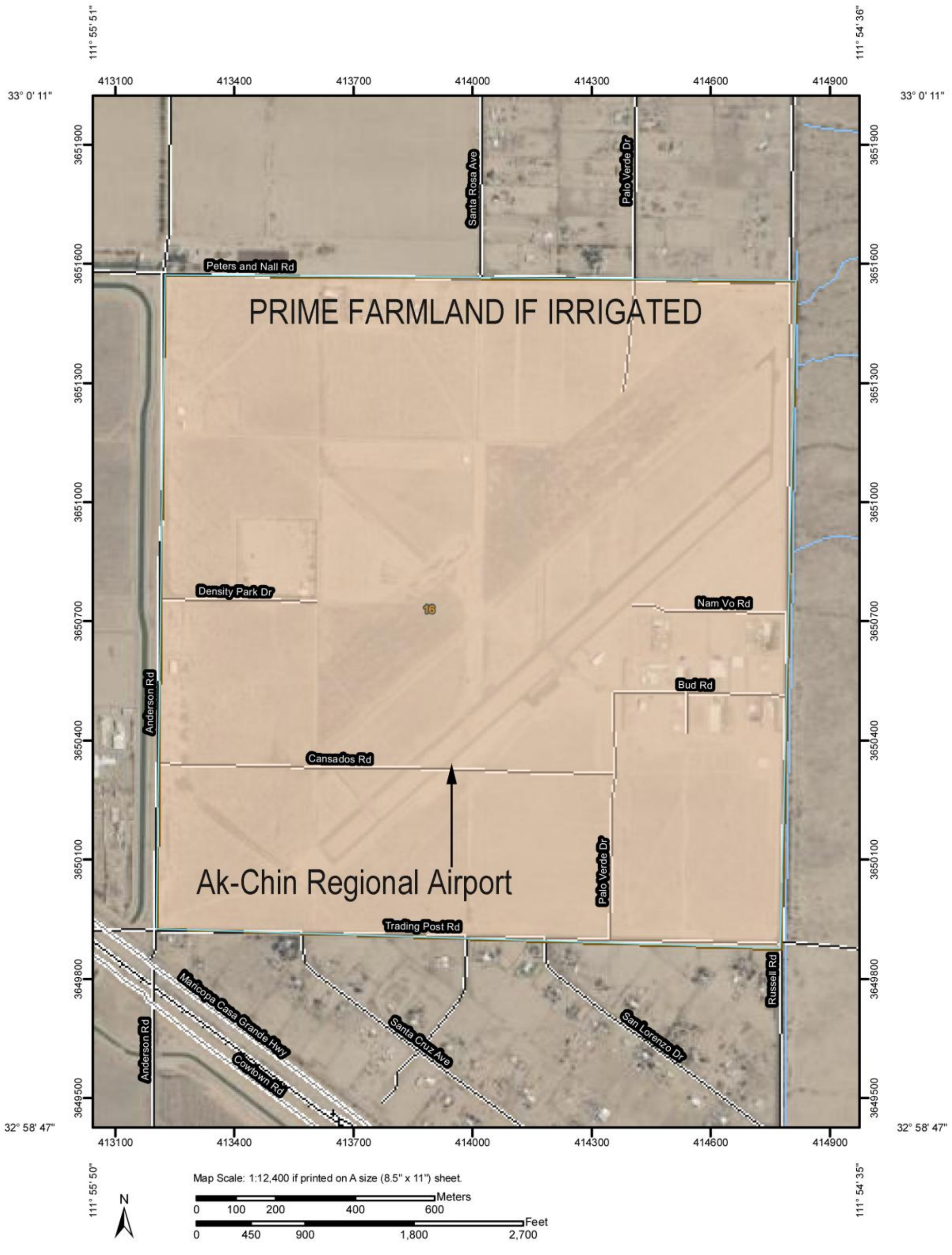
Therefore, no Section 4(F) impacts are anticipated as a result of the recommended development.

7.7 FARMLANDS

The Farmland Protection Policy Act (FPPA) authorizes the U.S. Department of Agriculture (USDA) to develop criteria for identifying the effects of Federal programs upon the conversion of farmland to uses other than agriculture. Conversion of "Prime or Unique" farmland may be considered a significant impact. Prime farmland is land that has the best combination of physical and chemical characteristics for producing good, feed or fiber without intolerable soil erosion as determined by the Secretary of Agriculture. Unique farmland is land other than prime farmland which is used to produce specific high value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits and vegetables.

Figure 7-1 shows the USDA farmland classification ratings for the airport and adjacent development area and **Figure 7-2** shows the Farmland map legend. The area is classified as Prime Farmland if Irrigated (shaded in Brown). Since the land is not used for farming activity and not currently irrigated, no impacts to prime or unique farmlands are anticipated as a result of the recommended development.

Farmland Classification—Pinal County, Arizona, Western Part

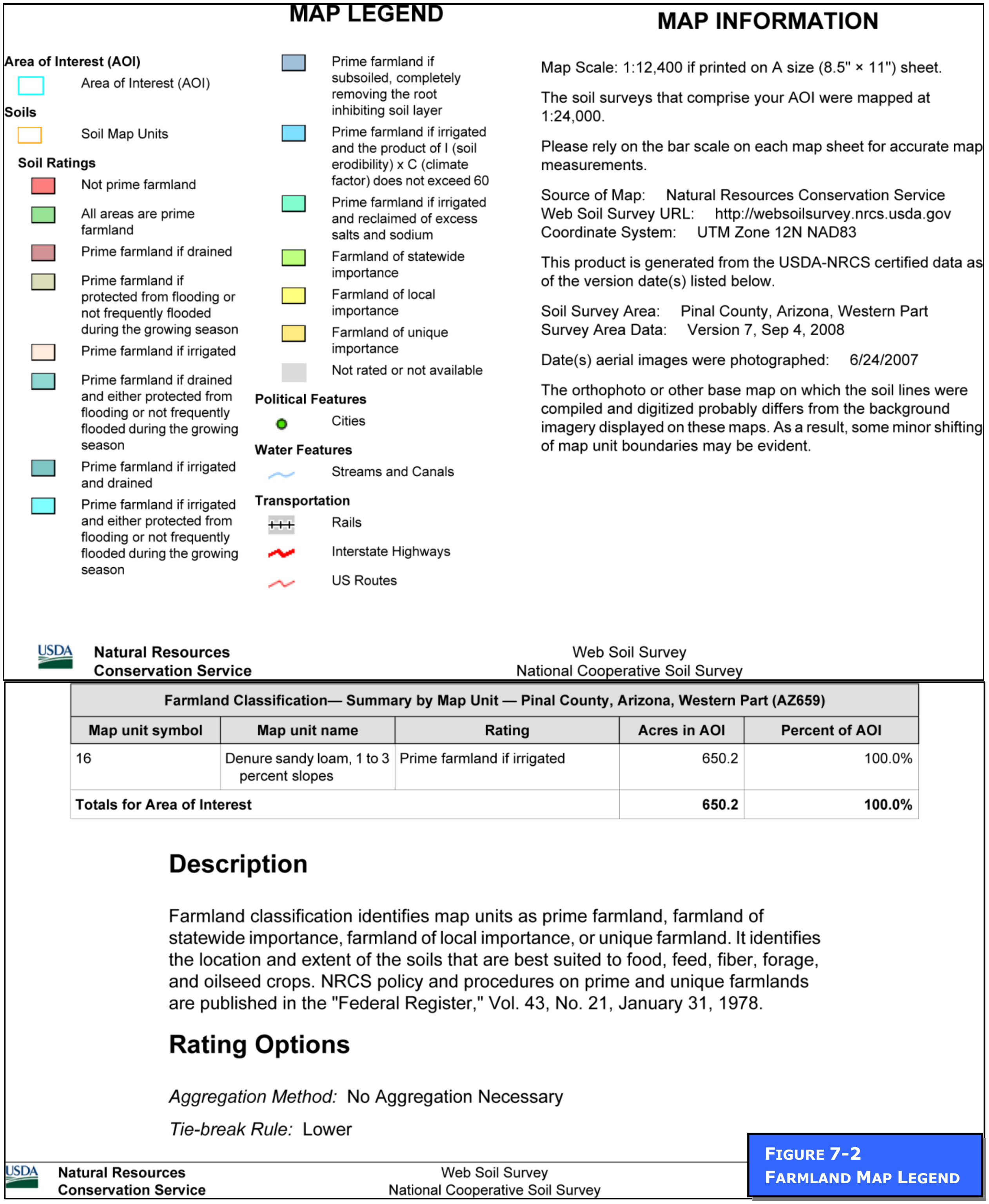


USDA Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

8/29/2012
Page 1 of 3

FIGURE 7-1
FARMLAND MAP



MAP LEGEND

Area of Interest (AOI)

- □ Area of Interest (AOI)

Soils

- □ Soil Map Units

Soil Ratings

- 🟥 Not prime farmland
- 🟩 All areas are prime farmland
- ■ Prime farmland if drained
- ■ Prime farmland if protected from flooding or not frequently flooded during the growing season
- ■ Prime farmland if irrigated
- ■ Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- ■ Prime farmland if irrigated and drained
- ■ Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- ■ Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- ■ Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- ■ Prime farmland if irrigated and reclaimed of excess salts and sodium
- ■ Farmland of statewide importance
- 🟨 Farmland of local importance
- ■ Farmland of unique importance
- ■ Not rated or not available

Political Features

- ● Cities

Water Features

- ∼ Streams and Canals

Transportation

- +++ Rails
- ∼ Interstate Highways
- ∼ US Routes

MAP INFORMATION

Map Scale: 1:12,400 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Pinal County, Arizona, Western Part
Survey Area Data: Version 7, Sep 4, 2008

Date(s) aerial images were photographed: 6/24/2007

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

Farmland Classification— Summary by Map Unit — Pinal County, Arizona, Western Part (AZ659)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
16	Denure sandy loam, 1 to 3 percent slopes	Prime farmland if irrigated	650.2	100.0%
Totals for Area of Interest			**650.2**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

Natural Resources Conservation Service

Web Soil Survey
National Cooperative Soil Survey

FIGURE 7-2
FARMLAND MAP LEGEND

7.8 FISH, WILDLIFE AND PLANTS

This category concerns potential impacts to existing wildlife habitat and threatened and endangered species. Examining both the area of land to be developed and its relationship to surrounding habitat quantify the significance of the impacts in this category. For example, removal of a few acres of habitat which represents a small percentage of the area's total similar habitat or which supports a limited variety of common species would not be considered significant. However, removal of a sizeable percentage of the area's similar habitat or habitat which is known to support rare species would be considered a significant impact. The surrounding area offers an abundance of similar habitat and the proposed improvements are not considered to be a significant habitat loss.

Section 7 of the Endangered Species Act, as amended, requires each Federal agency to insure that "any action authorized, funded or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat of such species . . .".

An Endangered Species is defined as any member of the animal or plant kingdoms determined to be in danger of extinction throughout all or a significant portion of its range. A Threatened Species is defined as any member of the plant or animal kingdoms that are likely to become endangered in the foreseeable future.

Table 7-1 shows the species that were identified as having potential critical habitat with the airport project area.

TABLE 7-1 CRITICAL HABITATS WITHIN THE PROJECT AREA

COMMON NAME	**SCIENTIFIC NAME**
ENDANGERED	
Gila chub	*Gila intermedia*
Loach minnow	*Tiaroga cobitis*
Mexican spotted owl	*Strix occidentalis lucida*
Razorback sucker	*Xyrauchen texanus*
Southwestern willow flycatcher	*Empidonax traillii extimus*
Spikedace	*Meda fulgida*

Source: U.S. Fish and Wildlife April, 2014

Further evaluation of potential impacts to all species listed under the Endangered Species Act (ESA) for Pinal County is recommended during the environmental process.

7.9 FLOODPLAINS

Floodplains are defined by Executive Order 11988, Floodplain Management, as the lowland and relatively flat areas adjoining coastal water . . . including at a minimum, that area subject to a one percent or greater chance of flooding in any given year . . . ", that is, an area which would be inundated by a 100-year flood. If a proposed action involves a 100-year floodplain, mitigating measures must be investigated in order to avoid significant changes to the drainage system.

As described in FAA Order 5050.4B, an airport development project would be a significant impact pursuant to NEPA if it results in notable adverse impacts on natural and beneficial floodplain values. Mitigation measures for base floodplain encroachments may include committing to special flood related design criteria, elevating facilities above base flood level, locating nonconforming structures and facilities out of the floodplain or minimizing fill placed in floodplains. Ak-Chin Regional Airport is located in Zone X, which is an area of minimal flood hazard, usually the area between the limits of the 100-year and 500-year floods. The recommended development for the Ak-Chin Regional Airport does not encroach upon a designated 100-year floodplain and no floodplain impacts are expected. **Figure 7-3** shows the floodplain map for the Ak-Chin Regional Airport.

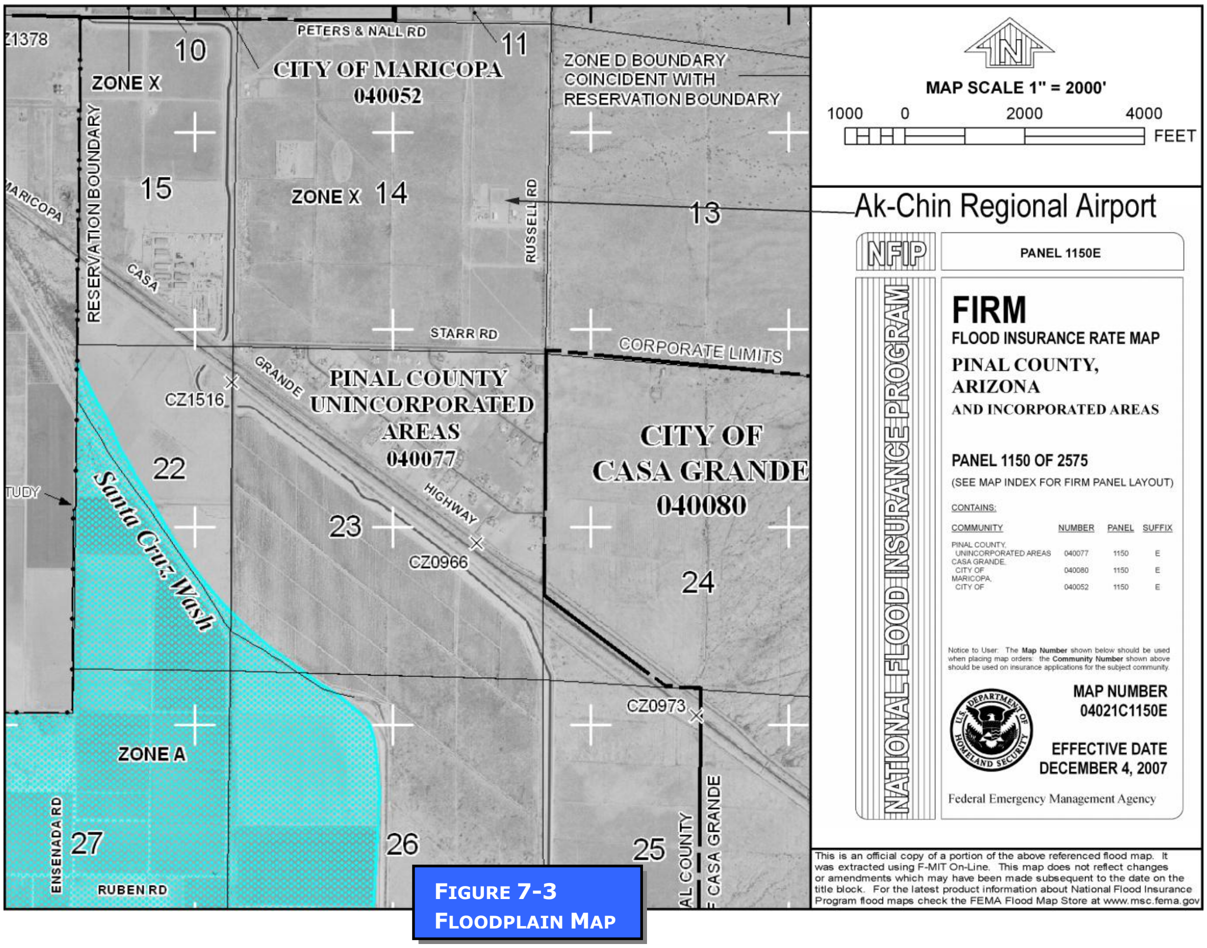


FIGURE 7-3
FLOODPLAIN MAP

7.10 HAZARDOUS MATERIALS, POLLUTION PREVENTION AND SOLID WASTE

Four primary laws have been passed governing the handling and disposal of hazardous materials, chemicals, substances and wastes. The two statutes of most importance to the FAA in proposing actions to construct and operate facilities and navigational aids are the Resource Conservation and Recovery Act (RCRA) (as amended by the Federal Facilities Compliance Act of 1992) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA or Superfund) and the Community Environmental Response Facilitation Act of 1992. RCRA governs the generation, treatment, storage and disposal of hazardous wastes. CERCLA provides for consultation with natural resources trustees and cleanup of any release of a hazardous substance (excluding petroleum) into the environment.

Airport development actions that relate only to construction or expansion of runways, taxiways and related facilities do not normally include any direct relationship to solid waste collection, control or disposal other than that associated with the construction itself. The nature of the proposed airport improvements meet these criteria and would not significantly increase net waste output.

Any existing and future solid waste disposal facility (i.e. sanitary landfill) which is located within 5,000 feet of all runways planned to be used by piston-powered aircraft or within 10,000 feet of all runways planned to be used by turbine aircraft, is considered by the FAA to be an incompatible land use because of the potential for conflicts between birds and low-flying aircraft. This determination is found in FAA AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*. There are no existing solid waste disposal facilities within 10,000 feet of the airport. Any planned solid waste disposal facilities should be located at least 10,000 feet from the runway.

7.11 HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL AND CULTURAL RESOURCES

The National Historic Preservation Act of 1966 requires that an initial review be made in order to determine if any properties in or eligible for inclusion in the National Register of Historic Places are within the area of a proposed action's potential environmental impact (the area within which direct and indirect impacts could occur and thus cause a change in historic, architectural, archaeological or cultural properties).

The Archaeological and Historic Preservation Act of 1974 provides for the survey, recovery and preservation of significant scientific, prehistorical, historical, archaeological or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally funded or federally licensed project.

The nearest National Register of Historic Place (NRHP) include the Casa Grande Stone Church and Wilson C.J. (Blinky) house within the City of Casa Grande. Future land acquisition should be evaluated and/or surveyed for historical, architectural, archaeological and cultural resources during the environmental process.

7.12 LIGHT EMISSIONS AND VISUAL IMPACTS

Airfield lighting is the main source of light emissions emanating from an airport. The purpose of evaluating the change in light emissions is to determine the extent to which lighting improvements associated with proposed airport development would create an annoyance for inhabitants of properties in the immediate vicinity of the airport. The determination of impact was based on the nature and intensity of lighting facilities at the airport and its physical characteristics and anticipated uses of adjacent properties.

Light emissions from any of the development projects are expected to be localized and should not have any impacts beyond the airport boundary. Given the nature of the projects, lighting would be confined to area illumination of runway taxiways, parking areas, aircraft apron areas, and roadway lighting as required.

The International Dark-Sky Association (IDA) is a non-profit organization fighting to preserve the night. The IDA sees quality luminare design and implementation as a critical part of putting a halt to, and inevitably reversing the scourge of light pollution. The IDA principles are; light when you need it, where you need it, and no more. One of the fundamental methods of controlling light pollution is the simple curfew. Utilizing simple timers can also make retrofitting existing installations feasible, practical and economical. The darkened exterior of a building, form of a statue, or fronds of a palm tree aren't an issue of safety. Landside lighting should use best practices through the IDA as fully cut-off fixtures that will not illuminate light towards the sky.

Significant light emission impacts are not expected as a result of the proposed improvements. Airside and landside improvements would remain consistent with existing light emissions.

7.13 NATURAL RESOURCES, ENERGY SUPPLY AND SUSTAINABLE DESIGN

Executive Order 13123, Greening the Government through Efficient Energy Management (64FR 30851, June 8, 1999), encourages each Federal agency to expand the use of renewable energy within its facilities and in its activities. E.O. 13123 also requires each Federal agency to reduce petroleum use, total energy use and associated air emissions and water consumption in its facilities.

It is also the policy of the FAA, consistent with NEPA and the Council on Environmental Quality (CEQ) regulations, to encourage the development of sustainability. All elements of the transportation system should be designed with a view to their aesthetic impact, conservation of resources such as energy, pollution prevention, harmonization with the community environment and sensitivity to the concerns of the traveling public.

Energy requirements associated with airport improvements generally fall into two categories: 1) changed demand for stationary facilities (i.e. airfield lighting and terminal building heating) and 2) those that involve the movement of air and ground vehicles (i.e. fuel consumption). The use of natural resources includes primarily construction materials and water which are in sufficient supply.

Energy requirements are not expected to significantly increase as a result of the proposed improvements. Demand for electricity and aircraft fuel is expected to increase with future development; however, the increase is not considered to be significant based on the forecasted activity levels documented in Chapter 2 for the airport. Aircraft fuel should be stored in above ground tanks at the airport that conform to U.S. EPA regulations. Significant increases in ground vehicle fuel consumption are not anticipated.

The application of Leadership in Energy and Environmental Design (LEED) certification should be considered during the development of the future airport buildings. LEED design utilizes strategies aimed at achieving high performance in key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality. LEED provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

Future development and improvement projects should take into account and apply sustainable design measures. Examples of sustainable design initiatives include, but are not limited to: adaptive shading, double skin walls, photovoltaic roof panels, induction lights on photocell, recycled flooring and carpets.

7.14 NOISE

Noise analysis considerations include: 1) whether the Federal thresholds of noise exposure are exceeded, 2) whether the 65 day-night level (DNL) noise contour extends beyond airport property and 3) if there are any residences, churches, schools or hospitals within the 65 DNL noise contour. The basic measure of noise is the sound pressure level that is recorded in decibels (dBA). The important point to understand when considering the impact of noise on communities is that equal levels of sound pressure can be measured for both high and low frequency sounds. Generally, people are less sensitive to sounds of low frequencies than they are high frequencies. An example of this might be the difference between the rumble of automobile traffic on a nearby highway and the high-pitched whine of jet aircraft passing overhead. At any location, over a period of time, sound pressure fluctuates considerably between high and low frequencies. **Figure 7-4** depicts a Sound Level Comparison of different noise sources.

The identification of airport generated noise impacts and implementation of noise abatement measures is a joint responsibility of airport operators and users. Noise contours were generated using FAA Integrated Noise Model (INM) Version 7.0c for the existing and forecasted future operations at the airport and are depicted in **Figure 7-5** and **Figure 7-6**. Existing aircraft operations generate a maximum noise contour of 55 DNL and do not impact any noise sensitive land uses. The future 65 DNL noise contour would remain within airport property and would not impact noise sensitive land uses.

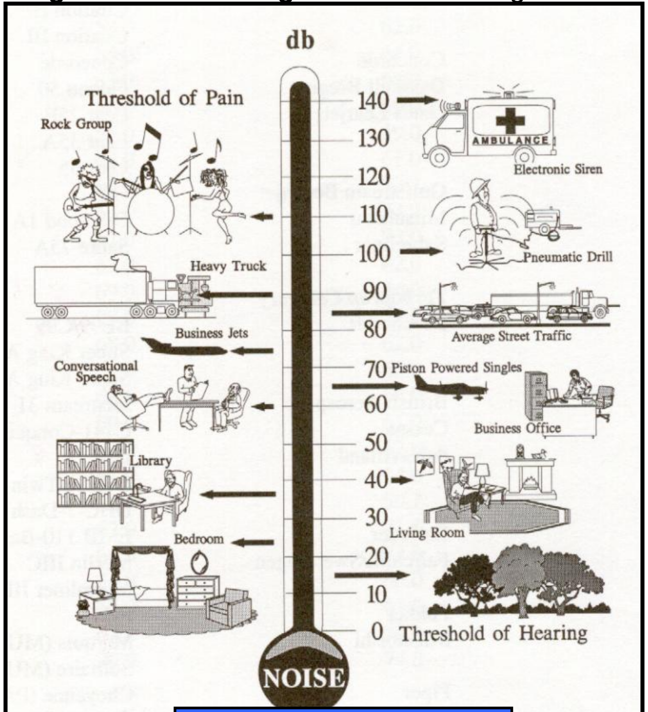


FIGURE 7-4
SOUND LEVEL COMPARISON

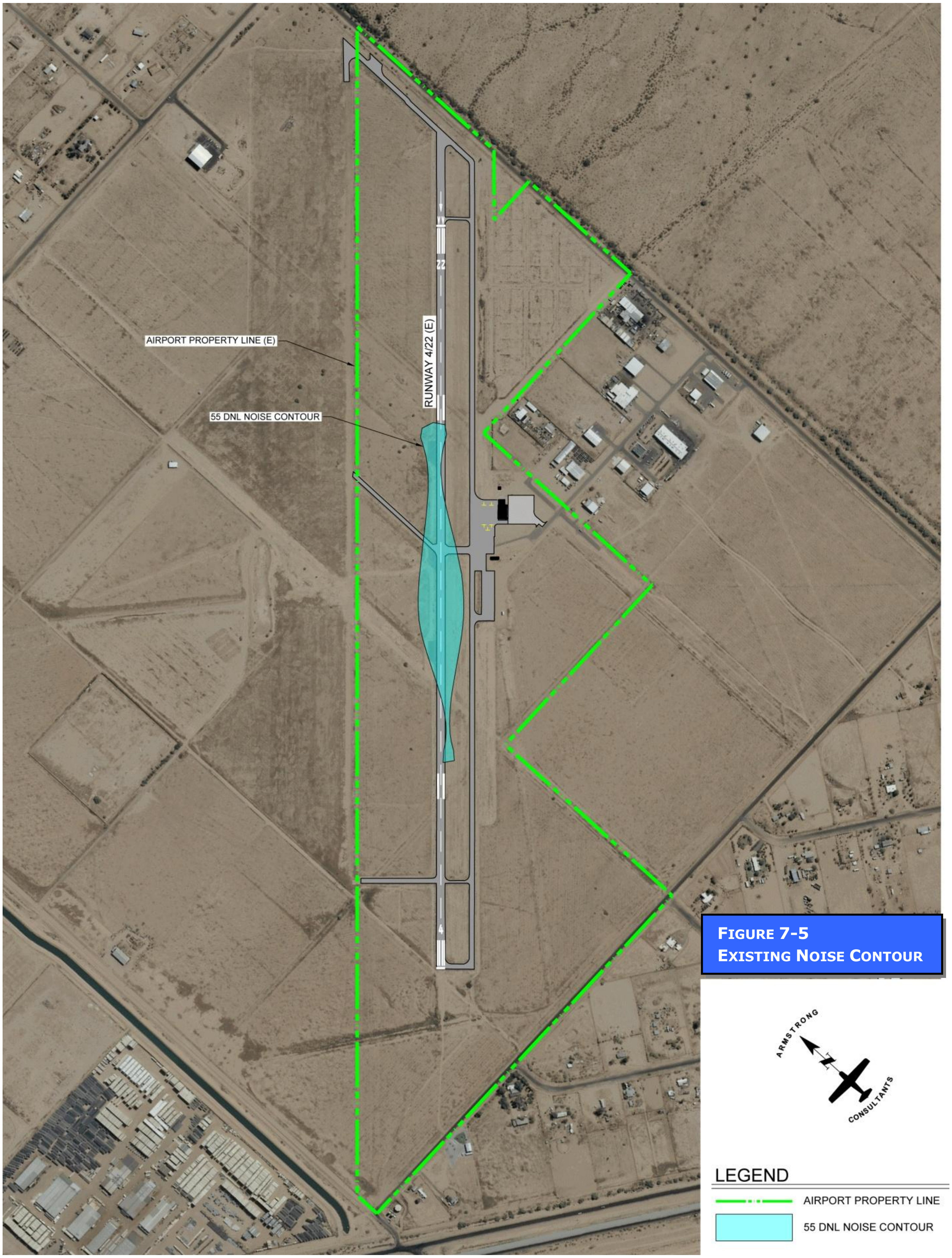


FIGURE 7-5
EXISTING NOISE CONTOUR

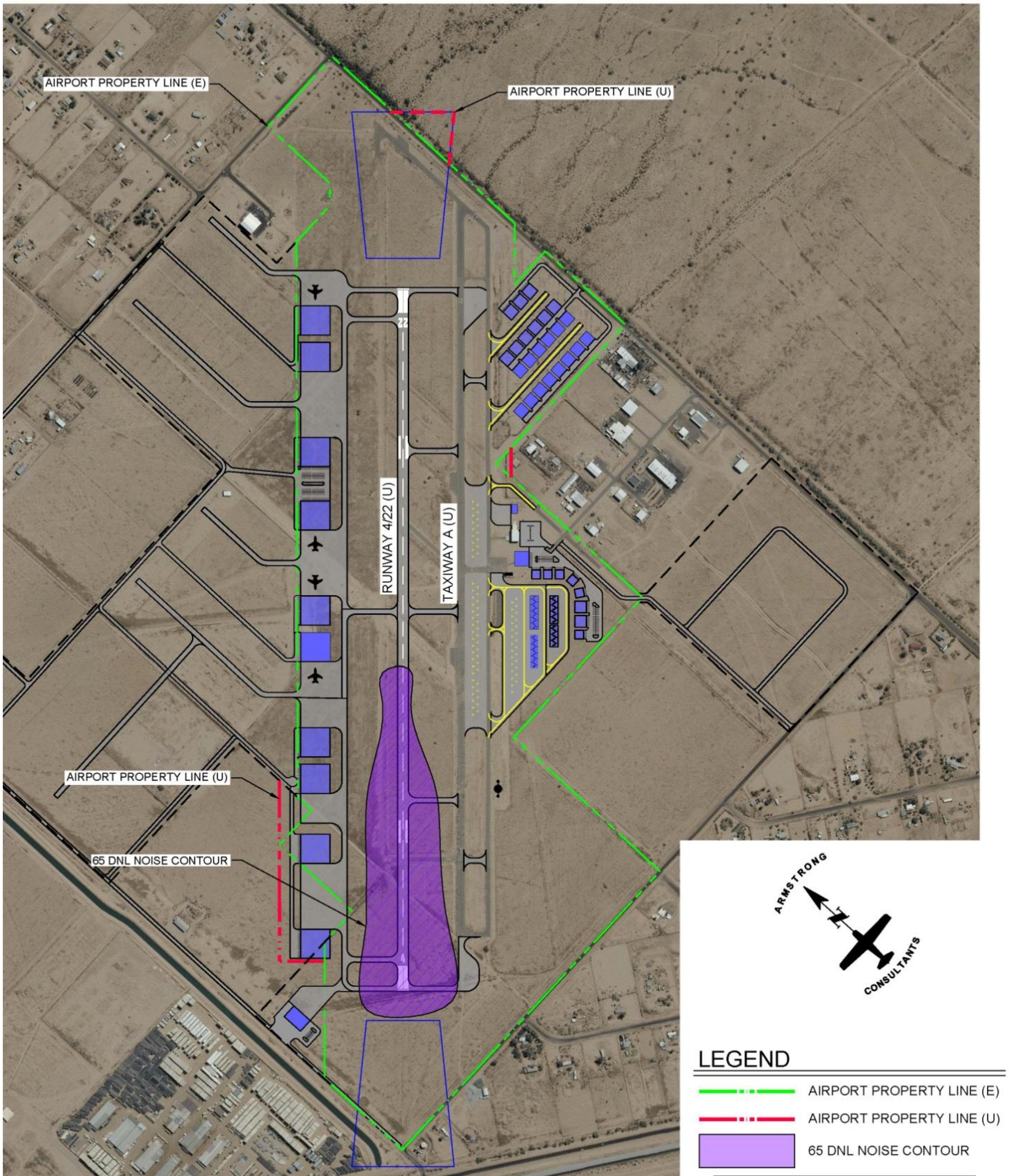


FIGURE 7-6
FUTURE NOISE CONTOUR

7.14.1 VOLUNTARY NOISE ABATEMENT PROGRAM

Although the noise exposure levels would not exceed 65 DNL over any noise sensitive area, several voluntary measures can be applied to minimize noise exposure to surrounding areas. Several of these measures are listed below. It is recommended that a voluntary noise abatement program be implemented for the airport and publicized to all based and transient pilots.

Pilots:

- Be aware of noise sensitive areas, particularly residential areas near the airport and avoid low flight over these areas.
- Fly traffic patterns tight and high, keeping the aircraft as close to the field as possible.
- In constant-speed-propeller aircraft, do not use high RPM settings in the pattern. Propeller noise from high-performance singles and twins increases drastically at high RPM settings.
- On takeoff, reduce to climb power as soon as safe and practical.
- Climb after liftoff at best-angle-of-climb speed until crossing the airport boundary, then climb at best rate.
- Depart from the start of the runway rather than intersections, for the highest possible altitude when leaving the airport vicinity.
- Avoid prolonged run-ups and do them inside the airport area, rather than at its perimeter.
- Try low-power approaches and always avoid the low, dragged-in approach.

Instructors:

- Teach noise abatement procedures to all students, including pilots you take up for flight reviews.
- Know noise-sensitive areas and point them out to students.
- Assure students fly at or above the recommended pattern altitude.
- Practice maneuvers over unpopulated areas and vary practice areas so that the same locale is not constantly subjected to aircraft operations.
- During practice of ground-reference maneuvers, be particularly aware of houses or businesses in your flight path.
- Stress that high RPM propeller settings are reserved for takeoff and for short final but not for flying in the pattern. Pushing the propeller to high RPM results in significantly higher levels of noise.

Fixed Base Operators (FBOs):

- Identify noise-sensitive areas and work with customers to create voluntary noise abatement procedures.
- Post any noise abatement procedures in a prominently visible area and remind pilots of the importance of adhering to them.
- Call for the use of the least noise sensitive runway whenever wind conditions permit.
- Initiate pilot education programs to teach and explain the rationale for noise abatement procedures and positive community relations.

Airport Owner and Surrounding Jurisdictions:

- Maintain appropriate zoning in the vicinity of the airport and see that noise sensitive land uses are not authorized within pattern, approach and departure paths.
- Disclose the existence of the airport and the airport influence area to real estate purchasers.
- Publish voluntary noise procedures on the Internet.
- Publish voluntary calm runway use procedures.

Source: Aircraft Owners and Pilots Association (AOPA)

7.15 SECONDARY (INDUCED) IMPACTS

These secondary or induced impacts involve major shifts in population, changes in economic climate or shifts in levels of public service demand. The effects are directly proportional to the scope of the project under consideration. Assessment of induced socioeconomic impacts is usually only associated with major development at large air carrier airports, which involve major terminal building development or roadway alignments and similar work.

7.16 SOCIOECONOMIC IMPACTS, ENVIRONMENTAL JUSTICE AND CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, the accompanying Presidential Memorandum and Order DOT 5610.2, Environmental Justice, require the FAA to provide for meaningful public involvement by minority and low-income populations and analysis, including demographic analysis that identifies and addresses potential impacts on these populations that may be disproportionately high and adverse. Included in this process is the disclosure of the effects on subsistence patterns of consumption of fish, vegetation or wildlife and effective public participation and access to this information. The Presidential Memorandum that accompanied E.O. 12898, as well as the CEQ and EPA Guidance, encourage consideration of environmental justice impacts in Environmental Assessments (EA) especially to determine whether a disproportionately high and adverse impact may occur. Environmental Justice is examined during evaluation of other impact categories, such as noise, air quality, water, hazardous materials and cultural resources.

7.16.1 SOCIOECONOMIC IMPACTS

The socioeconomic impacts produced as a result of the proposed improvements to the Ak-Chin Regional Airport are expected to be positive in nature and would include direct, indirect and induced economic benefits to the local area. These airport improvements are expected to attract additional users and in turn encourage tourism, industry and to enhance the future growth and expansion of the community's economic base.

If acquisition of real property or displacement of persons is involved, 49 CFR Part 24, *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended, must be met for Federal projects and projects involving Federal funding. Otherwise, the FAA, to the fullest extent possible, observes all local and State laws, regulations and ordinances concerning zoning, transportation, economic development or housing when planning, assessing or implementing the proposed action. The recommended improvements would include land acquisition to the south of the airport. The land currently has homes to be purchased southwest of Runway 4 approach end. Therefore, no significant impacts are expected as a result of the recommended development.

7.16.2 ENVIRONMENTAL JUSTICE

The focus of the Environmental Justice evaluation is to determine whether the proposed development results in an inequitable distribution of negative effects to special population groups, as compared to negative effects on other population groups. These special population groups include minority or otherwise special ethnicity or low-income neighborhoods.

The proposed action is not expected to result in any significant negative impacts to any population groups and therefore, would not result in disproportionate negative impacts to any special population group. Socioeconomic and induced economic impacts are expected to be positive in nature and are expected to benefit all population groups in the area.

7.16.3 CHILDREN'S ENVIRONMENTAL HEALTH AND SAFETY RISKS

Pursuant to Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks, Federal agencies are directed, as appropriate and consistent with the agency's mission, to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children. Agencies are encouraged to participate in implementation of the Order by ensuring that their policies, programs, activities and standards address disproportionate risks to children that result from environmental health risks or safety risks. The proposed improvements are not expected to result in any environmental health risks or safety risks on children.

7.17 WATER QUALITY

Water quality considerations related to airport development often include increased surface runoff and erosion and pollution from fuel, oil and solvents. Potential pollution could come from petroleum products spilled on the surface and carried through drainage channels off of the airport. State and Federal laws and regulations have been established to safeguard these facilities. These regulations include standards for above ground and underground storage tanks, leak detection and overflow protection. An effective SWPPP identifies storm water discharge points on the airport, describes measures and controls to minimize discharges and details spill prevention and response procedures. There is currently no SWPPP for the airport.

In July of 2002, the EPA amended the Oil Pollution Prevention Regulation at Title 40 of the Code of Federal Regulations, Part 112 (40 CFR Part 112). Subparts A through C of this regulation is often referred to as the “SPCC rule” because they describe requirements for certain facilities (including airports) to prepare and implement SPCC Plans. There is currently no SPCC plan for the airport.

In accordance with Section 402(p) of the Clean Water Act, a National Pollution Discharge Elimination System (NPDES) General Permit is required from the Environmental Protection Agency for construction projects that disturb one or more acres of land. Applicable contractors would be required to comply with the requirement and procedures of the NPDES General Permit, including the preparation of a Notice of Intent, prior to the initiation of construction activities.

Recommendations established in FAA AC 150/5370-10, *Standards for Specifying Construction of Airports*, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control, would be incorporated into the project design and specifications. The design and construction of the proposed improvements would incorporate BMP to reduce erosion, minimize sedimentation, control non-storm water discharges and to protect the quality of surface water features potentially affected. These practices would be selected based on the site’s characteristics and those factors within the contractor’s control and may include: construction scheduling, limiting exposed areas, runoff velocity reduction, sediment trapping and good housekeeping practices.

Future fuel storage and dispensing facilities should be designed, constructed, operated and maintained in accordance with Federal, State and Local regulations. Waste fluids, including oils, coolants, degreasers and aircraft wash facility wastewater would be managed and disposed of in accordance with applicable Federal, State and Local regulations.

No significant impacts to water quality are anticipated as a result of the recommended projects. However, further environmental analysis is typically required for the new of runway, upgrades to airport reference code and land acquisition of more than three acres.

7.18 WETLANDS

Wetlands are defined in Executive Order 11990, Protection of Wetlands, as “those areas that are inundated by surface or ground water with a frequency sufficient to support and under normal circumstances does or would support, a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.”

Wetlands generally include swamps, marshes, bogs and similar areas such as sloughs, potholes, wet meadows, river overflows and natural ponds. Jurisdictional Waters of the United States may also include drainage channels, washes, ditches, arroyos or other waterways that are tributaries to Navigable Water of the United States or other waters where the degradation or destruction of which could affect interstate or foreign commerce. **Figure 7-7** shows the National Wetlands Inventory Map at Ak-Chin Regional Airport.

According to the U.S. Fish and Wildlife Service’s National Wetlands Inventory, there is a wetland along the western boundaries of the airport property but are not anticipated to be impacted by future airport development.

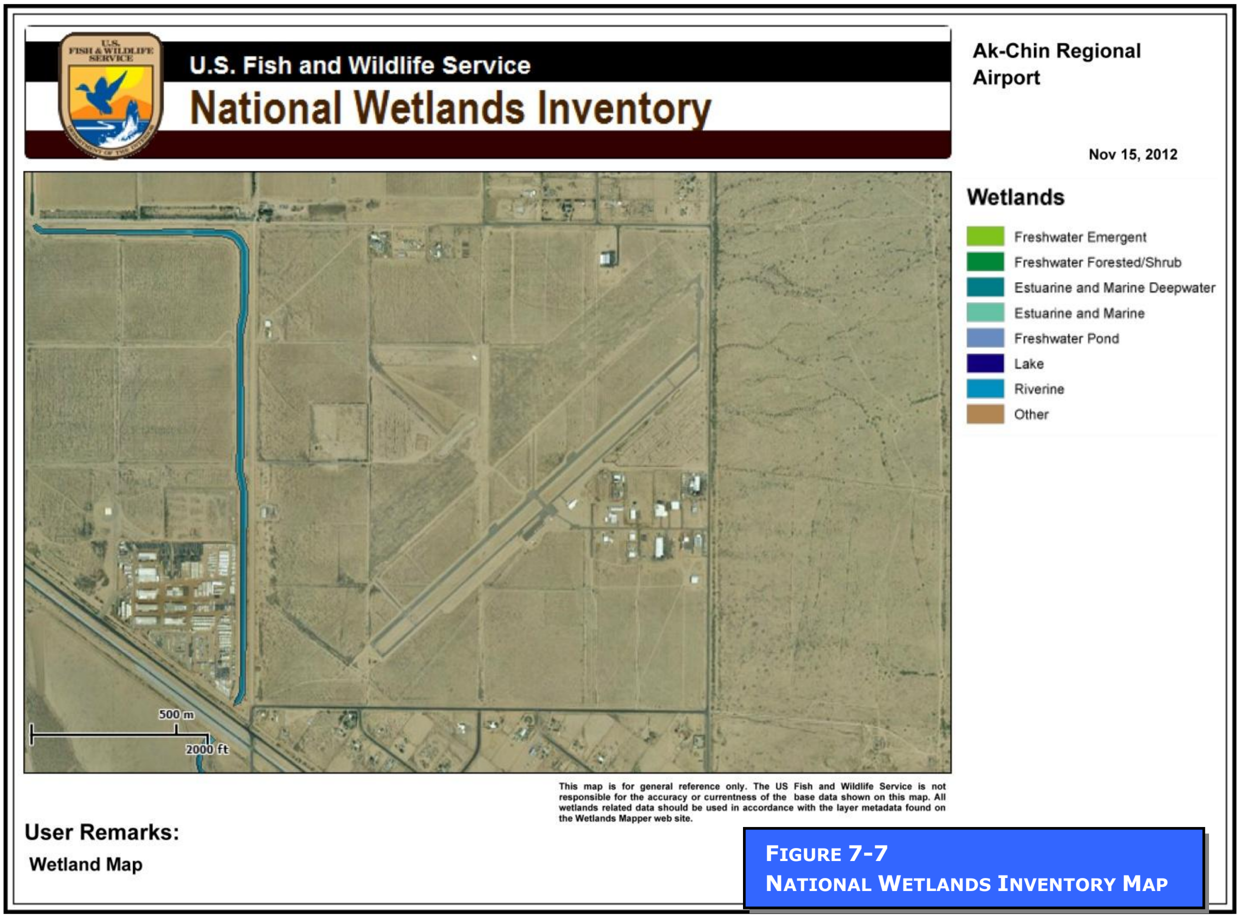


FIGURE 7-7
NATIONAL WETLANDS INVENTORY MAP

7.19 WILD AND SCENIC RIVERS

The Wild and Scenic Rivers Act (PL 90-542) describes those river areas eligible for protection from development. As a general rule, these rivers possess outstanding scenic, recreational, geological, fish and wildlife, historical, cultural or other similar value.

The National Park Service Wild and Scenic River list contains two Wild and Scenic River in Arizona. The Wild and Scenic Rivers are the Verde River and Fossil Creek, which are located in the middle of the state. The end of the Verde River is located approximately 65 miles north and Fossil Creek is approximately 160 miles north of Pinal County. Therefore, no Wild and Scenic Rivers would be affected by the proposed improvements.

7.20 MEANS TO MITIGATE AND/OR MINIMIZE ADVERSE ENVIRONMENTAL IMPACTS

Where appropriate, the mitigation or minimization of environmental impacts was noted in the discussion of impacts. These actions are summarized below:

- Maintain compatible land uses in the vicinity of the airport;
- Adhere to the land acquisition policies in Subpart B of 49 CFR Part 24 for land acquisition;

- Utilize pilot controlled lighting on all airfield lighting and visual aids. Utilize timers or motion sensors for apron and automobile parking area lights;
- Adhere to FAA AC 150/5370-10, *Standards for Specifying the Construction of Airports* and best management practices to minimize or eliminate impacts to water quality and air quality during construction.

7.21 SUMMARY AND CONCLUSIONS OF ENVIRONMENTAL IMPACTS

Table 7-2 provides a summary of the analysis ratings for each of the environmental impact categories with regard to the recommended development. While some categories indicate a minor impact, they are all estimated to be below the threshold of significance as described in FAA Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects. It is expected that most recommended development projects would be categorically excluded, with the exception of land acquisition, runway improvements and airport reference code upgrade.

TABLE 7-2 SUMMARY OF ENVIRONMENTAL IMPACTS OF AIRSIDE DEVELOPMENT

ENVIRONMENTAL CATEGORY	**RECOMMENDED DEVELOPMENT**	**DESCRIPTION**
Air Quality	⦿	Short-term dust and exhaust during construction
Coastal Resources	○	
Compatible Land Use	○	
Construction Impacts	⦿	Short-term dust, exhaust, erosion
DOT Act Section 4 (F)	○	
Farmlands	○	
Fish, Wildlife and Plants	○	
Floodplains	○	
Hazardous Materials Pollution Prevention and Solid Waste	○	
Historical, Architectural, Archaeological and Cultural Resources	○	
Light Emissions and Visual Impacts	○	
Natural Resources and Energy Supply	○	
Noise	⦿	Increased aircraft operations
Secondary (Induced) Impacts	⦿	Positive - direct/indirect economic benefits
Socioeconomic Impacts, Environmental Justice and Children's Environmental Health	⦿	Increased employment short-term
Water Quality	⦿	Storm water runoff
Wetlands	○	
Wild and Scenic Rivers	○	

Legend:
○ No Impact
⦿ Minor Impact
● Significant Impact

7.22 SELECTION OF PREFERRED ALTERNATIVE

Based on input from the Sponsor and FAA, the recommended development will be carried forward into the ALP. These projects would accommodate existing and forecasted demand by providing enhanced safety, and providing adequate landside space for future development. Post planning horizon considerations have been included in order to protect for a C-III ARC upgrade.

APPENDIX

A

ACRONYMS

AK-CHIN REGIONAL AIRPORT
AIRPORT MASTER PLAN

ARMSTRONG

COMMONLY USED ACRONYMS

AC	Advisory Circular
AD	Airport Design
ADG	Airplane Design Group
AGL	Above Ground Level
AIP	Airport Improvement Program
ALP	Airport Layout Plan
ALS	Approach Lighting System
ARC	Airport Reference Code
ARP	Airport Reference Point
ARTCC	Air Route Traffic Control Center
ASDA	Accelerate Stop Distance
ASR	Airport Surveillance Radar
ASV	Annual Service Volume
ATC	Air Traffic Control
ATCT	Airport Traffic Control Tower
AWOS	Automated Weather Observation system
BRL	Building Restriction Line
CAT	Category
CFR	Code of Federal Regulations
CWY	Clearway
CY	Calendar Year
DME	Distance Measuring Equipment
EL	Elevation
EMT	Emergency Medical Technician
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FBO	Fixed Base Operator
FSS	Flight Service System
FY	Fiscal Year
GA	General Aviation
GPS	Global Positioning System
HIRL	High Intensity Runway Lights
IEMT	Intermediate Emergency Medical Technician
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
LDA	Landing Distance Available
LOC	Localizer
MALS	Medium Intensity Approach Lighting System
MALSF	Medium Intensity Approach Lighting System with Sequenced Flashers
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
ME	Multi-Engine
MIRL	Medium Intensity Runway Lights
MITL	Medium Intensity Taxiway Lights
MLS	Microwave Landing System
MOA	Military Operating Area
MSL	Mean Sea Level
NAVAID	Navigational Aid
NDB	Nondirectional Beacon
NM	Nautical Mile
NPIAS	National Plan of Integrated Airport Systems
ODALS	Onmnidirectional Approach Lighting System
OFA	Object Free Area
OFZ	Obstacle Free Zone
PAPI	Precision Approach Path Indicator
PAR	Precision Approach Radar
RAIL	Runway Alignment Indicator Lights
RDC	Runway Design Code
REIL	Runway End Identifier Lights
ROFA	Runway Object Free Area
RPZ	Runway Protection Zone
RSA	Runway Safety Area
RVR	Runway Visual Range
RW	Runway
SWY	Stopway
TDG	Taxiway Design Group
TH	Threshold
TL	Taxilane
TODA	Takeoff Distance Available
TOFA	Taxiway Object Free Area
TORA	Takeoff Run Available
TSA	Taxiway Safety Area
TVOR	Very High Frequency Omni range on an Airport
TW	Taxiway
USGS	United States Geological Society
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VOR	Very High Frequency Omni range

APPENDIX

B

GLOSSARY OF TERMS

AK-CHIN REGIONAL AIRPORT
AIRPORT MASTER PLAN

ARMSTRONG

GLOSSARY OF TERMS

Above Ground Level (AGL)	A height above ground as opposed to MSL (height above Mean Sea Level).
Advisory Circular (AC)	Publications issued by the FAA to provide a systematic means of providing non-regulator guidance and information in a variety of subject areas.
Airport Improvement Program (AIP)	The AIP of the Airport and Airways Improvement Act of 1982 as amended. Under this program, the FAA provides funding assistance for the design and development of airports and airport facilities.
Aircraft Mix	The number of aircraft movements categorized by capacity group or operational group and specified as a percentage of the total aircraft movements.
Aircraft Operation	An aircraft takeoff or landing.
Airport	An area of land or water used or intended to be used for landing and takeoff of aircraft includes buildings and facilities, if any.
Airport Elevation	The highest point of an airport's useable runways, measured in feet above mean sea level.
Airport Land Use Regulations	Are designed to preserve existing and/or establish new compatible land uses around airports, to allow land use not associated with high population concentration, to minimize exposure of residential uses to critical aircraft noise areas, to avoid danger from aircraft crashes, to discourage traffic congestion and encourage compatibility with non-motorized traffic from development around airports, to discourage expansion of demand for governmental services beyond reasonable capacity to provide services and regulate the area around the airport to minimize danger to public health, safety, or property from the operation of the airport, to prevent obstruction to air navigation and to aid in realizing the policies of a County Comprehensive Plan and Airport Master Plan.
Airport Layout Plan (ALP)	A graphic presentation, to scale, of existing and proposed airport facilities, their location on the airport and the pertinent applicable standards. To be eligible for AIP funding assistance, an airport must have an FAA-approved ALP.
Airport Master Record, Form 5010	The official FAA document, which lists basic airport data for reference and inspection purposes.
Airport Reference Code (ARC)	The ARC is a coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport.

Airport Reference Point (ARP)	The latitude and longitude of the approximate center of the airport.
Airspace	Space above the ground in which aircraft travel; divided into corridors, routes and restricted zones.
Air Traffic	Aircraft operating in the air or on an airport surface, excluding loading ramps and parking areas.
Approach Surface	A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.
Automated Weather Observing System (AWOS)	This equipment automatically gathers weather data from various locations on the airport and transmits the information directly to pilots by means of computer generated voice messages over a discrete frequency.
Based aircraft	An aircraft permanently stationed at an airport.
Building Restriction Line (BRL)	A line, which identifies suitable building area locations on airports.
Ceiling	The height above the earth’s surface of the lowest layer of clouds or other phenomena which obscure vision.
Conical Surfaces	A surface extending outward and upward form the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.
Controlled Airspace	Airspace in which some or all aircraft may be subject to air traffic control to promote safe and expeditious flow of air traffic.
Critical/Design Aircraft	In airport design, the aircraft which controls one or more design items such as runway length, pavement strength, lateral separation, etc., for a particular airport. The same aircraft need not be critical for all design items.
Day Night Level (DNL)	24-hour average sound level, including a 10 decibel penalty for sound occurring between 10:00 PM and 7:00 AM.
Decibel	Measuring unit for sound based on the pressure level.
Design Type	The design type classification for an airport refers to the type of runway that the airport has based upon runway dimensions and pavement strength.
Federal Aviation Administration (FAA)	The federal agency responsible for the safety and efficiency of the national airspace and air transportation system.
FAR Part 77	A definition of the protected airspace required for the safe navigation of aircraft.

Fixed Base Operator (FBO)	An individual or company located at an airport and providing commercial general aviation services.
Fuel Flowage Fees	A fee charged by the airport owner based upon the gallons of fuel either delivered to the airport or pump at the airport.
General Aviation (GA)	All aviation activity in the United States, which is neither military nor conducted by major, national or regional airlines.
Glider	A heavier-than-air aircraft that is supported in flight by the dynamic reaction of the air against its lifting surfaces and whose free flight does not depend principally on an engine (FAR Part 1).
Global Positioning System (GPS)	The global positioning system is a space based navigation system, which has the capability to provide highly accurate three-dimensional position, velocity and time to an infinite number of equipped users anywhere on or near the Earth. The typical GPS integrated system will provide: position, velocity, time, altitude, groundspeed and ground track error, heading and variation. The GPS measures distance, which it uses to fix position, by timing a radio signal that starts at the satellite and ends at the GPS receiver. The signal carries with it, data that discloses satellite position and time of transmission and synchronizes the aircraft GPS system with satellite clocks.
Hazard to Air Navigation	An object which, as a result of an aeronautical study, the FAA determines will have a substantial adverse effect upon the safe and efficient use of navigable airspace by aircraft, operation of air navigation facilities or existing or potential airport capacity.
Horizontal Surface	A horizontal plane 150 feet above the established airport elevation, the perimeter which is constructed by swinging arcs of specified radii form the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs.
Imaginary Surfaces	Surfaces established in relation to the end of each runway or designated takeoff and landing areas, as defined in paragraphs 77.25, 77.28 and 77.29 of FAR Part 77, *Objects Affecting Navigable Airspace*. Such surfaces include the approach, horizontal, conical, transitional, primary and othersurfaces.
Itinerant Operations	All operations at an airport, which are not local operations.
Jet Noise	The noise generated externally to a jet engine in the turbulent jet exhaust.
Knots	Nautical miles per hour, equal 1.15 statute miles per hour.
Large Airplane	An airplane of more than 12,500 pounds maximum certified takeoff weight.

Local Operations	Operations by aircraft flying in the traffic pattern or within sight of the control tower, aircraft known to be arriving or departing from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.
Location Identifier	A three-letter or other code, suggesting where practicable, the location name that it represents.
Maneuvering Area	That part of an airport to be used for the takeoff and landing of aircraft and for the movement of aircraft associated with takeoff and landing, excluding aprons.
Master Plan	A planning document prepared for an airport, which outlines directions and developments in detail for 5 years and less specifically for 20 years. The primary component of which is the Airport Layout Plan.
Mean/Maximum Temperature	The average of all the maximum temperatures usually for a given period of time.
Mean Sea Level (MSL)	Height above sea level.
Medium Intensity Runway Lights (MIRL)	For use on VFR runways or runway showing a nonprecision instrument flight rule (IFR) procedure for either circling or straight-in approach.
Minimum Altitude	That designated altitude below which an IFR pilot is not allowed to fly unless arriving or departing an airport or for specific allowable flight operations.
National Airspace System	The common network of United States airspace, navigation aids, communications facilities and equipment, air traffic control equipment and facilities, aeronautical charts and information, rules, regulations, procedures, technical information and FAA manpower and material.
National Plan of Integrated Airport Systems (NPIAS)	A plan prepared annually by the FAA which identifies, for the public, the composition of a national system of airports together with the airport development necessary to anticipate and meet the present and future needs of civil aeronautics, to meet requirements in support of the national defense and to meet the special needs of the Postal Service. The plan includes both new and qualitative improvements to existing airports to increase their capacity, safety, technological capability, etc.
NAVAID	A ground based visual or electronic device used to provide course or altitude information to pilots.
Noise	Defined subjectively as unwanted sound. The measurement of noise involves understanding three characteristics of sound: intensity, frequency and duration.
Noise Contours	Lines drawn about a noise source indicating constant energy levels of noise exposure. DNL is the measure used to describe community exposure to noise.

Noise Exposure Level	The integrated value, over a given period of time of a number of different events of equal or different noise levels and durations.
Non-Precision Instrument	A runway having an existing instrument approach procedure utilizing air navigation facilities with only horizontal guidance for which a straight-in nonprecision instrument approach procedure has been approved.
Notice to Airmen (NOTAM)	A notice containing information (not known sufficiently in advance to publicize by other means concerning the establishment, condition or change in any component (facility, service, or procedure) of or hazard in the National Airspace System, the timely knowledge of which is essential to personnel concerned with flight operations.
Object	Includes, but is not limited to, above ground structures, NAVAIDs, people, equipment, vehicles, natural growth, terrain and parked aircraft.
Object Free Area (OFA)	A two-dimensional ground area-surrounding runways, taxiways and taxilanes which is clear of objects except for object whose location is fixed by function.
Obstacle Free Zone (OFZ)	The airspace defined by the runway OFZ and, as appropriate, the inner-approach OFZ and the inner-transitional OFZ, which is clear of object penetrations other than frangible NAVAIDs.
Obstruction	An object which penetrates an imaginary surface described in the FAA's Federal Aviation Regulations (FAR), Part 77.
Parking Apron	An apron intended to accommodate parked aircraft.
Pattern	The configuration or form of a flight path flown by an aircraft or prescribed to be flown, as in making an approach to a landing.
Precision Approach Path Indicators (PAPI)	The visual approach slope indicator system furnishes the pilot visual slope information to provide safe descent guidance. It provides vertical visual guidance to aircraft during approach and landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that they are "on path" if they see red/white, "above path" if they see white/white and "below path" if they see red/red.
Primary Surface	A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway, but when the runway has no specially prepared hard surface, or planned hard surface, the primary surface ends at each end of that runway.
Rotating Beacon	A visual navaid operated at many airports. At civil airports, alternating white and green flashes indicate the location of the airport.
Runway	A defined rectangular surface on an airport prepared or suitable for the landing or takeoff of airplanes.

Runway Design Code (RDC)	A code signifying the design standards to which the runway is to be built.
Runway End Identifier Lights (REIL)	REILs are flashing strobe lights which aid the pilot in identifying the runway end at night or in bad weather conditions.
Runway Gradient	The average gradient consisting of the difference in elevation of the two ends of the runway divided by the runway length may be used provided that no intervening point on the runway profile lies more than five feet above or below a straight line joining the two ends of the runway. In excess of five feet the runway profile will be segmented and aircraft data will be applied for each segment separately.
Runway Lighting System	A system of lights running the length of a system that may be either high intensity (HIRL), medium intensity (MIRL), or low intensity (LIRL).
Runway Orientation	The magnetic bearing of the centerline of the runway.
Runway Protection Zone (RPZ)	An area off the runway end used to enhance the protection of people and property on the ground.
Runway Safety Area (RSA)	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion form the runway.
Segmented Circle	A basic marking device used to aid pilots in locating airports and which provides a central location for such indicators and signal devices as may be required.
Small Aircraft	An airplane of 12,500 pounds or less maximum certified takeoff weight.
Taxiway	A defined path established for the taxiing of aircraft from one part of an airport to another.
Taxiway Design Group (TDG)	A classification of airplanes based on outer to outer Main Gear Width (MGW) and Cockpit to Main Gear distance (CMG).
Terminal Area	The area used or intended to be used for such facilities as terminal and cargo buildings, gates, hangars, shops and other service buildings, automobile parking, airport motels, restaurants, garages and automobile services and a specific geographical area within which control of air traffic is exercised.
Threshold	The beginning of that portion of the runway available for landing.
Touch and Go Operations	Practice flight performed by a landing touchdown and continuous takeoff without stopping.
Traffic Pattern	The traffic flow that is prescribed for aircraft landing at, taxiing on or taking off form an airport. The usual components are the departure, crosswind, downwind, and base legs; and the final approach.

Transitional Surface	These surfaces extend outward and upward at right angles to runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces.
Universal Communications (UNICOM)	A private aeronautical advisory communications facility for purpose other than air traffic control. Only one such station is authorized in any landing area. Service available are advisory in nature primarily concerning the airport services and airport utilization. Locations and frequencies of UNICOMs are listed on aeronautical charts and publications.
Visual Flight Rules (VFR)	Rules that govern flight procedures under visual conditions.
Visual Runway	A runway intended for visual approaches only with no straight- in instrument approach procedure either existing or planned for that runway.