Chapter

2

FACILITY INVENTORY

Chapter

2

FACILITY INVENTORY

for the Airport Master Plan and Environmental Assessment for the San Carlos Apache Airport

2.0 INTRODUCTION

This chapter will document the collection and evaluation of information pertaining to several aspects of the San Carlos Apache Airport. The result of assembling and preparing this basic data (including an examination of physical characteristics of the airfield, surrounding land uses, and a socioeconomic profile of the area) will be a comprehensive source of information for future tasks in the Master Plan. The information in the inventory was obtained through on-site inspections, review of existing plans and documents, and interviews with the existing fixed base operator, various city, county, and tribal officials, and economic development personnel.

2.1 EXISTING AIRPORT CHARACTERISTICS

The San Carlos Apache Airport encompasses approximately 185 acres of land located in Gila County, on the San Carlos Indian Reservation. The City of Globe and Gila County had leased the airport from the San Carlos Indian Tribe for approximately 52 years. The City of Globe and Gila County jointly financed and supported the facility through annual budget appropriations. The facility was managed on a day-to-day basis by the Globe-San Carlos Regional Air Facility Board. The Board managed, operated, maintained, and promoted the facility for Gila County and the City of Globe.

On August 1, 1997, the San Carlos Apache Tribe dissolved the lease to the City and County, assumed operations of the airport, and changed the name of the airport to the San Carlos Apache Airport. On January 5, 1998 the Tribe assumed the responsibility of existing FAA grant assurances from the City and County and became the sole airport sponsor. The Tribe currently maintains ownership of all on-airport and adjacent property. This step secured control over the land for an indefinite period of time.

2.1.1 Location

The San Carlos Apache Airport is located approximately seven miles southeast of the City of Globe, adjacent to U.S. Route 70. The Airport Reference Point coordinates for the San Carlos Apache Airport are 33°21'10" North and 110°39'45" West. San Carlos Apache Airport is recognized as FAA site number 00694.A.

The nearest commercial service airport is Sky Harbor International Airport (Phoenix) which is located approximately 65 nautical air miles west of Globe. The nearest airports to San Carlos Apache Airport are the San Carlos and Superior Airports. San Carlos is a dirt strip located approximately nine nautical miles northeast of the San Carlos Apache Airport and is a private use facility. Superior Airport is also a dirt strip located approximately twenty-one nautical miles southwest of the San Carlos Apache Airport. Figure 2-1 provides a graphic depiction of the location of San Carlos Apache Airport in relationship to other cities within the region.

2.1.2 Topography

The elevation of the San Carlos Apache Airport is 3,235 feet above mean sea level (MSL). The facility is situated in a broad valley. Hills and mountains surround the valley in which the airport is located. Area drainage occurs from numerous channels, with a primary channel occurring in close proximity to Runway 09/27. The valley slopes in an easterly direction.

The valley's prime use is range land and no incompatible land uses currently exist. A casino/resort is under development on the land adjoining the airport to the north.

2.2 FLEET MIX / AIRPORT REFERENCE CODE

2.2.1 Fleet Mix

Aircraft fleet mix is the relative percentage of operations conducted by each of the four classes of aircraft: A, B, C, and D (See Table II-1). Approximately 85 percent of the operations at San Carlos Apache Airport are by Class A and B aircraft. Based on the best available data, there are approximately 15 percent of Class C type aircraft. No Class D type aircraft operations occur at San Carlos Apache Airport.

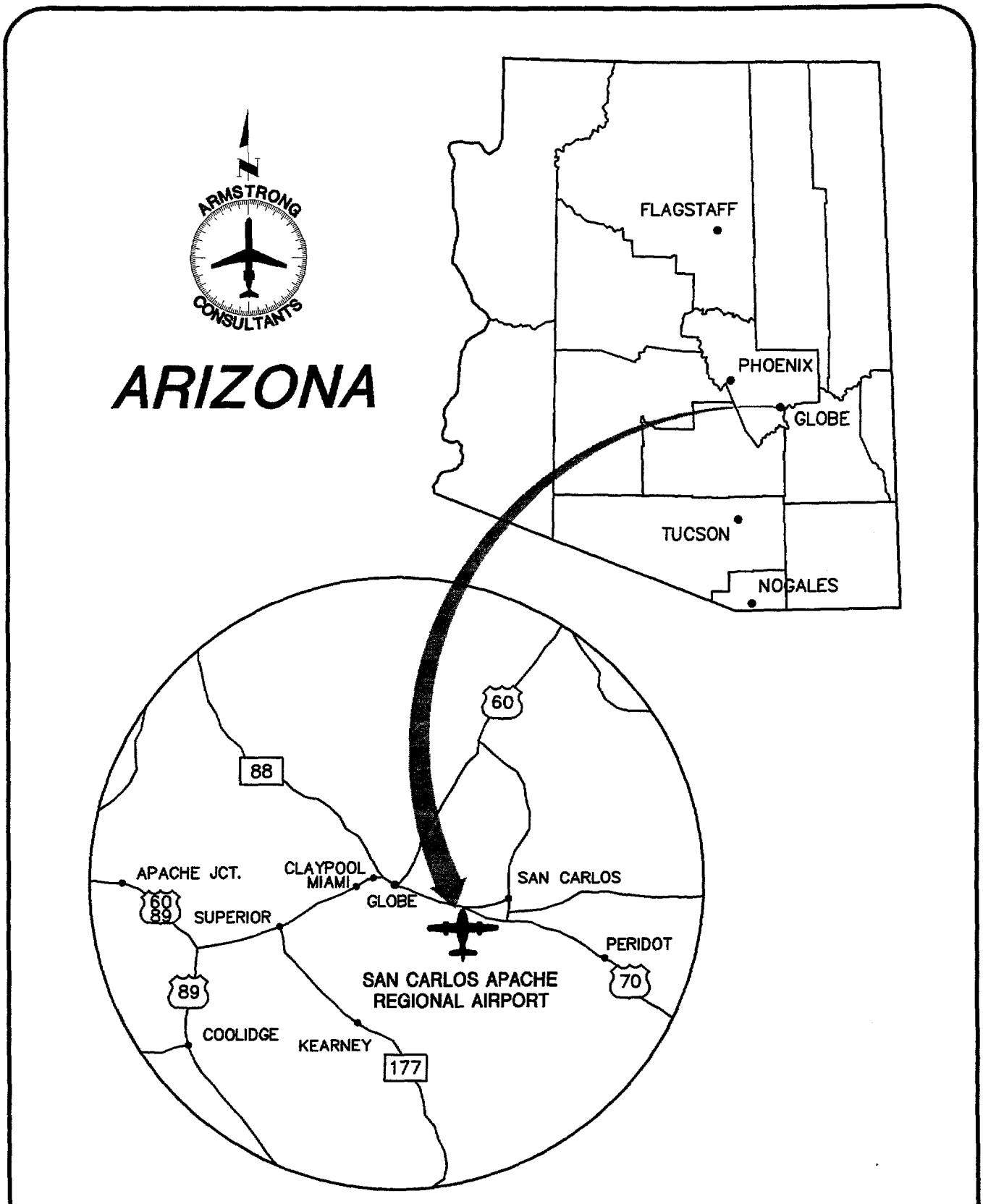


FIGURE 2-1
VICINITY MAP
SAN CARLOS APACHE REGIONAL AIRPORT

TABLE II-1
AIRCRAFT CLASSIFICATION

Aircraft Classification	Description
Class A	Single-engine - 12,500 pounds or less maximum certificated takeoff weight (MCTW).
Class B	Multi-engine - (12,500 pounds or less MCTW).
Class C	Large multi-engine - (12,500 to 300,000 pounds MCTW). Includes corporate jets.
Class D	Heavy multi-engine -(300,000 pounds MCTW or more).

Source: FAA AC 5060-5 Capacity Planning Manual.

2.2.2 Airport Reference Code (ARC)

The Airport Reference Code is a coding system used to relate airport design criteria to the operational and physical characteristics of the aircraft intended to operate at the airport. The ARC has two 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 characteristic). The second component, depicted by a Roman numeral, is the aircraft design group and relates to aircraft wingspan (physical characteristic). Generally, aircraft approach speed applies to runways and runway related facilities. Aircraft wingspan is primarily related to separation criteria involving taxiways and taxilanes. Table II-2 provides definitions for aircraft approach Categories and Aircraft Design Groups.

Tables II-3 and II-4 provide examples of aircraft which fall into the A-I & B-I, A-II & B-II, C-I & D-I, and C-II & D-II Airport Reference Codes. Tables II-3 and II-4 also provide the certificated maximum takeoff weights of each aircraft as a reference to the previously discussed aircraft classification system. Table II-5 provides a list of transient aircraft using San Carlos Apache Airport, and Table II-6 lists those aircraft based at the airport. The current design aircraft for Runway 09/27 are those aircraft weighing less than 60,000 pounds and having an ARC of B-II. Criteria for this ARC have been used in the inventory section of this study as a guideline.

TABLE II-2
AIRCRAFT APPROACH CATEGORIES & DESIGN GROUPS

AIRCRAFT APPROACH CATEGORY: An aircraft approach category is a grouping of aircraft based on an approach speed of 1.3 times the stall speed of the aircraft at the maximum certification landing weight.

Aircraft Category	Approach Speed
Category A	Speed less than 91 knots
Category B	91 knots or more but less than 121 knots
Category C	121 knots or more but less than 141 knots
Category D	141 knots or more but less than 166 knots
Category E	166 knots or more

AIRCRAFT DESIGN GROUP: The aircraft design group subdivides aircraft by wingspan. The aircraft design group concept links an airport's dimensional standards to aircraft approach categories or to aircraft design groups or to runway instrumentation configurations. The aircraft design groups are:

Design Group	Aircraft Wingspan
Group I	Up to but not including 49 feet
Group II	49 feet up to but not including 79 feet
Group III	79 feet up to but not including 118 feet
Group IV	118 feet up to but not including 171 feet
Group V	171 feet up to but not including 214 feet
Group VI	214 feet up to but not including 262 feet

TABLE II-3
EXAMPLE ARC & AIRCRAFT CLASSIFICATIONS

EXAMPLE AIRCRAFT HAVING AN ARC OF A-I OR B-I			
Aircraft	**Approach Speed (Knots)**	**Wingspan (Feet)**	**MCTOW[1] (Pounds)**
Beech Baron 58P	101	37.8	6,200
Beech Bonanza V35B	70	33.5	3,400
Beech King Air B100	111	45.9	11,799
Cessna 150	55	33.3	1,670
Cessna 177	64	35.5	2,500
Cessna 421	96	41.1	7,500
Cessna Citation I	108	47.1	11,850
Gates Learjet 28/29	120	42.2	15,000
Mitsubishi MU-2	119	39.1	10,800
Mitsubishi MU-300	100	43.3	13,890
Piper Archer II	86	35.0	2,500
Piper Cheyenne	110	47.6	12,050
Piper Navajo	100	40.7	6,500
Rockwell Sabre 40	120	44.4	18,650
Swearingen Merlin	105	46.3	12,500
EXAMPLE AIRCRAFT HAVING AN ARC OF A-II OR B-II			
Aircraft	**Approach Speed (Knots)**	**Wingspan (Feet).**	**MCTOW[1] (Pounds)**
Beech E-18	87	49.2	8,750
Beech King C90-1	100	50.3	9,650
Beech Super King Air	103	54.5	12,500
Beech 1900 Airliner	120	54.5	15,245
Cessna 441	100	49.3	9,950
Cessna Citation II	108	51.6	13,300
Cessna Citation III	114	50.6	17,000
Dassault Falcon 200	114	53.5	30,650
Dassault Falcon 50	113	61.9	37,480
Dassault Falcon 900	100	63.4	45,500
Embraer Brasilia	92	64.9	23,800
Fokker F-28-1000	119	77.3	65,000
Fokker F-28-2000	119	77.3	65,000
Grumman Gulfstream I	113	78.5	35,100

TABLE II-4
EXAMPLE ARC & AIRCRAFT CLASSIFICATIONS

EXAMPLE AIRCRAFT HAVING AN ARC OF C-I OR D-I			
Aircraft	**Approach Speed (Knots)**	**Wingspan (Feet).**	**MCTOW[1] (Pounds)**
Gates Learjet 24	128	35.6	13,000
Gates Learjet 25	137	35.6	15,000
Gates Learjet 54-55-56	128	43.7	21,500
IAI-1124 Westwind	129	44.8	23,500
Rockwell Sabre 75A	137	44.5	23,300
Gates Learjet 35A/36A	143	39.5	18,300
EXAMPLE AIRCRAFT HAVING AN ARC OF C-II OR D-II			
Aircraft	**Approach Speed (Knots)**	**Wingspan (Feet)**	**MCTOW[1] (Pounds)**
Grumman Gulfstream III	136	77.8	68,700
Rockwell Sabre 80	128	50.4	24,500
Grumman Gulfstream II	141	68.8	65,300
Grumman Gulfstream IV	145	77.8	71,780

[1]*MCTOW: Maximum Certificated Take Off Weight*

TABLE II-5
TRANSIENT AIRCRAFT USING
SAN CARLOS APACHE AIRPORT

Aircraft Type	Aircraft Owner / Sponsor	ARC[1]	MCTOW[2] (Pounds)
Beech Bonanza	US Forest Service	A-I	3,850
Cessna 172	Parachute, Inc.	A-I	2,200
Cessna 210	Private	A-I	3,800
Piper Warriors	Aerobatic Team	A-I	3,600
Beech Barron	Private	B-I	6,200
C-12 (King Air)	Air National Guard	B-I	11,800
Cessna 414	Roosevelt Dam Contractor	B-I	6,785
Hamilton West Wind	Private	B-I	5,668
Piper Navajo	Private	B-I	10,800
Cessna Citation	Capin Family	B-II	13,300
Cessna Citation	Cyprus Mining	B-II	13,300
Rockwell Aero Commander	Capin Family	B-II	6,785
Rockwell Aero Commander	Private	B-II	6,500
Gates Learjet 24	Cyprus Mining	C-I	13,000
Gates Learjet 25	Roosevelt Dam Contractor	C-I	15,000
Grumman Gulfstream III	Cyprus Amax	C-II	68,700
Rockwell Sabreliner	Mexican Mining Co.	C-II	25,500
Rockwell Sabreliner	Smith's	C-II	25,500
Rockwell 690 Turbo Cmdr.	Rocky Mountain Air Amb.	B-I	10,300
BAe Jetstream 31	Native American Air Amb.	B-II	14,550
Cessna 421	Life Flight	B-I	7,450
Cessna 441	Samaritan Air Ambulance	B-II	9,925
Lear 35A	Samaritan Air Ambulance	D-I	18,300
AS 350 and AS 355	Southwest Helicopter	N/A	N/A
Cobra, Apache, OV-10	Military	N/A	N/A
Various Helicopters	USGS Survey Team	N/A	N/A

[1] *ARC: Airport Reference Code*
[2] *MCTOW: Maximum Certificated Take Off Weight*

TABLE II-6
AIRCRAFT BASED AT SAN CARLOS APACHE AIRPORT

Aircraft Type	Aircraft N-number Registration	Aircraft Condition	Airport Reference Code
Cessna 140	N3142N	flyable	A-I
Cessna 150	N11577	being repaired	A-I
Cessna 150	N3835J	flyable	A-I
Cessna 172	N86258	flyable	A-I
Cessna 172	N8549T	flyable	A-I
Cessna 175	N7244M	flyable	A-I
Cessna 182	N5014D	flyable	A-I
Cessna 182	N9286X	flyable/hangared	A-I
Cessna 182	N6077B	flyable	A-I
Cherokee	N3678K	flyable	A-I
Cherokee	N7377J	flyable	A-I
Cherokee	N4507N	flyable	A-I
Cherokee	N5361W	flyable	A-I
Cherokee	N1732J	flyable	A-I
Mooney	N1238X	flyable	A-I
Turbine Bonanza	N279WP	being repaired	A-I
Cessna 210	N61RB	flyable	A-II
Piper Apache	N2203P	flyable/hangared	B-I
Twin Beechcraft	N44602	being renovated	B-I
Grumman Albatross	N4796U	being repaired	B-III
Gates Learjet	N24WX	flyable	C-I
Helicopter	N269JM	flyable	N/A
Helicopter	N26444	flyable	N/A

2.3 AIRSIDE CHARACTERISTICS

The airside facilities of an airport are the runway configuration, the associated taxiway system, the ramp and aircraft parking area, and any visual or electronic approach navigational aids. Figure 2-2 provides a graphic depiction of facilities located on the Airport.

2.3.1 Runway 09/27

The San Carlos Apache Airport has one asphalt runway. Runway 09/27 is oriented approximately east/west and is 5,804 feet long and 75 feet wide. Design criteria taken from existing construction and renovation plans indicate the pavement strength of Runway 09/27 to be 12,500 pounds Single Wheel Gear (SWG). Runway 09/27's pavement strength should not be considered adequate for the existing design aircraft. Runway markings consist of runway end number identification, centerline, and hold-lines at each end. Runway 09/27 and its associated taxiway system are in fair condition. However, both the runway and taxiway pavements suffer from longitudinal, transverse and alligator cracking. Along with the associated cracking, vegetation has grown up within the cracks, causing an accelerated disintegration of the pavement. This natural growth is occurring mainly along the edges of the runway and connecting taxiways. Raveling of the runway pavement has also begun. Without immediate attention, these problems may require a total rehabilitation of the airside pavements.

2.3.2 Taxiways

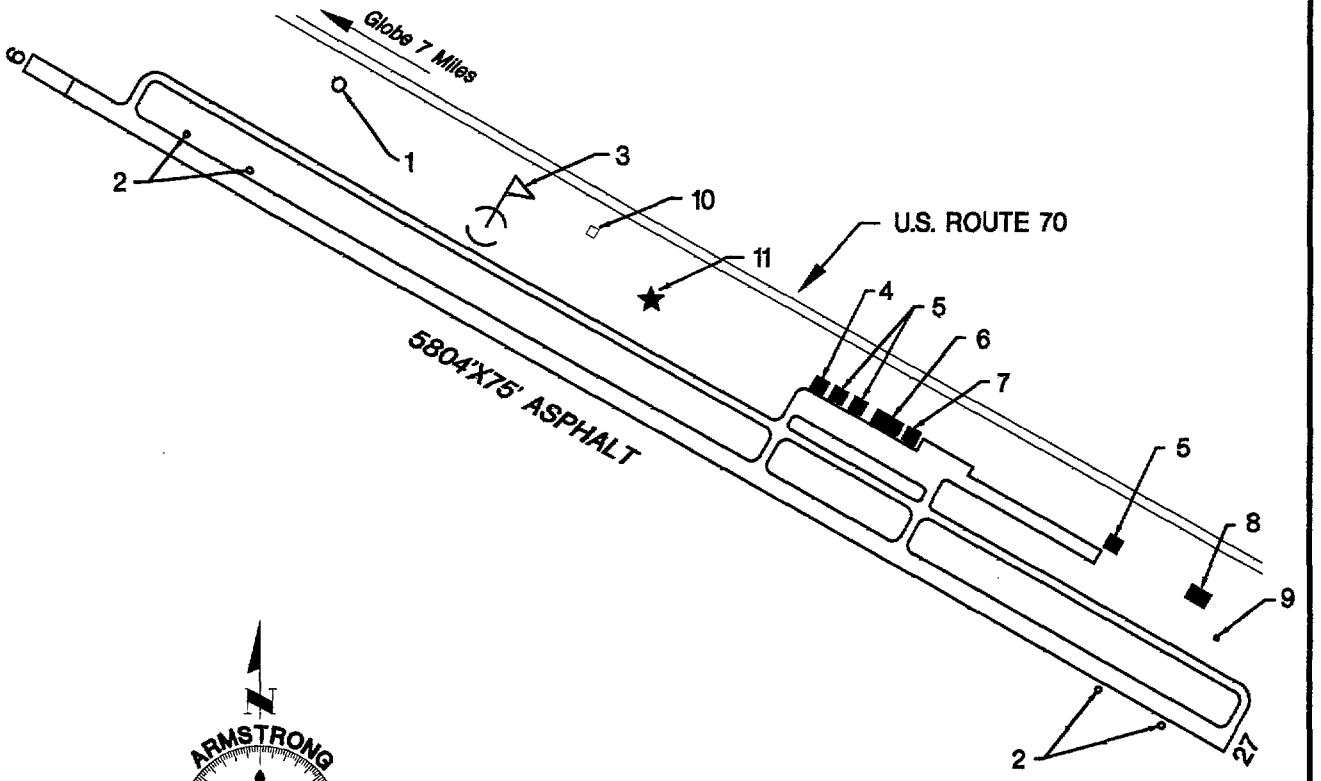
A parallel taxiway located north of Runway 09/27 is constructed of asphalt and is 35 feet wide. Its centerline is located 200 feet from the runway centerline. The parallel taxiway meets or exceeds the width criteria for the current design aircraft; however, the taxiway does not meet FAA design standards for weight bearing capacity, as discussed above, and the runway-parallel taxiway separation requirement of 300 feet, as discussed in Section 2.11.4.

2.3.3 Parking Aprons

All general aviation apron development has occurred on the north side of Runway 09/27's parallel taxiway. The aircraft parking apron is approximately 14,000 square yards with 50 tie downs. The apron's pavement does not meet the criteria for the design aircraft and is in poor condition due to repeated use by heavy aircraft.

FACILITIES LIST

1. NON-DIRECTIONAL BEACON (NDB)
2. VASI
3. SEGMENTED CIRCLE WITH LIGHTED WIND CONE
4. TRAILER HOUSE
5. HANGARS
6. T-HANGARS
7. FBO/HANGAR/PILOT LOUNGE
8. ACTIVITY BUILDING
9. WIND SOCK & SEGMENTED CIRCLE WITHOUT LIGHT
10. LIGHTED WIND TEE
11. AIRPORT BEACON LIGHT



NOT TO SCALE

FIGURE 2-2
AIRPORT FACILITIES
SAN CARLOS APACHE REGIONAL AIRPORT

2.3.4 Airfield Lighting

The airport has a standard rotating beacon, a lighted wind cone, and Medium Intensity Runway Lights (MIRLs) on Runway 09/27. At this time the taxiway system is not equipped with any type of lighting or retroreflective markers. The general aviation aircraft parking apron has flood lighting as a security aid.

2.3.5 Navigational and Visual Aids

A Nondirectional Beacon (NDB) is located near the northwest corner of the airport property. An NDB radiates a signal which can be used by pilots to provide them with directional guidance to the transmitting antenna. At Globe, the NDB has a pole-mounted antenna, approximately 35 feet in height. The Globe NDB is presently out of service. Nondirectional Beacons can be used to provide a non-precision approach to an airport. The closest operational navigational aids to the San Carlos Apache Airport are Very High Frequency Omni-Directional TACANs (VORTACs) at Willie, 55 NM west, Tucson, 73 NM south, and St. Johns, 100 NM northeast; and an NDB at Show Low, 65 NM north-northeast.

The installation of a Differential GPS (Global Positioning System) has been discussed with the FAA as an option to replace, rather than repair, the NDB. The Global Positioning System is a space based navigation system which can provide highly accurate position, velocity, time, altitude, steering information, ground speed and ground track error, heading, and variation. Civil aviation users can receive position data accurate to within 100 meters. The ground-based differential GPS system enhances the accuracy of the positioning signal to enable approaches to the runway with less than 3/4 mile visibility.

Non-precision approaches consist of either a straight-in or a circle-to-land approach. Recognized non-precision approaches are those approaches utilizing air navigation facilities with only horizontal guidance, or area type navigation equipment, for which a straight-in non-precision instrument approach procedure has been approved, or planned. The main difference between the two types of non-precision instrument approaches is: A circle to land instrument approach is commonly called an approach to the airport rather than an approach to a specific runway. A straight-in non-precision instrument approach is an approach to a specific runway.

Runways 09 and 27 have Visual Approach Slope Indicators -Two (VASI-2). Both sets of VASI-2s are located on the left side of the runway approaches. VASIs furnish the pilot with visual approach information to provide descent guidance. The system provides the pilot with a well-defined corridor of light consisting of red and white beams. Each group of lights transverse to the direction of the runway are referred to as a *bar.* A bar is made up of one, two or three light units, referred to as *boxes.* Thus

the VASI-2 system is a two bar system consisting of 2 boxes. The bar that is nearest to the runway threshold is referred to as the *downwind bar*, and the bar that is farthest from the runway threshold is referred to as the *upwind bar*. If the pilot is on the proper glide path, the downwind bar appears white and the upwind bar red. If the pilot is too low, both bars appear red. If the pilot is above the glide path, both bars appear white. The VASI-2 lights are visible in day VFR conditions at a minimum distance of three nautical miles.

2.4 LANDSIDE CHARACTERISTICS

Landside characteristics are described as those facilities not included in airside characteristics. Examples of landside facilities are any structures adjoining the airfield, the access routes to and from the facility, terminal buildings, and automobile parking areas.

2.4.1 Fixed Base Operator and Services

Fixed base operations (FBO) are provided by Mace Aviation. Mace Aviation has an office and hangar facility located near midfield. Operating hours are 8:00 AM to 6:00 PM. The FBO has a "full service" operation for airport users, including fueling (both Avgas and Jet Fuel), tie downs for single engine, twin engine, and private jet planes, helicopter tie down parking, aircraft sales/service, maintenance, flight instruction, and charter service. Automobile rental is available through Cobra Valley Motors.

2.4.2 Aircraft Fuel Facilities

Tank storage for aircraft fuel consists of two below ground tanks that hold 12,000 gallons of fuel. Each tank holds 6,000 gallons of 100 LL Avgas. Aircraft which require 100 LL Avgas are fueled from pumps located directly above the fuel tanks. The fuel tanks are sufficiently remote from the runways and taxiways to constitute very little hazard. At times, congestion on the ramp may occur due to the location of the fueling facility. The fueling of turbine aircraft requiring jet fuel is completed by using a tank truck which is owned by the FBO. This tanker is capable of holding 4,000 gallons of Jet-A fuel.

The underground fuel storage tanks (USTs) were installed in 1963, and spill and overfill prevention systems were installed on the tanks in 1995. A tracer leak detection test was performed on the tanks by Horizon Engineering & Testing on July 26, 1996. Both tanks passed the inspection and no leaks were detected. That is not to say; however, that no contamination of the surrounding soils has occurred in the past. Potential sources of contamination of the surrounding soils may include overfilling the storage tanks or aircraft, discharges or spills along delivery routes, and leakage from piping, fittings, or pumps. Sampling and testing of soils in

the area should be conducted to determine the extent of any hazardous substance or petroleum product contamination.

In accordance with regulations set forth in 40 CFR, Part 280 the underground storage tanks are required to meet Environmental Protection Agency (EPA) standards by December 22, 1998. In order to meet Environmental Protection Agency standards the tanks must have 1) spill protection, 2) overfill protection, and 3) corrosion protection. An internal structural integrity test of the tanks is necessary to determine the required action(s) to meet the corrosion protection requirements. Depending on the condition of the tanks, either lining, corrosion protection and lining, or complete removal of the tanks and replacement with new tanks would be necessary. Existing piping must also meet the same corrosion protection standards.

2.4.3 Airport Buildings

Table II-7 summarizes the existing permanent structures at the San Carlos Apache Airport which include: the FBO office/hangar and attached pilot's lounge, three conventional hangars capable of holding a total of seven aircraft, one T-Hangar capable of holding four aircraft, one special activity building, and one trailer home. All buildings are located north of Runway 09/27.

The structures which are located on the airport range from poor to good condition. Those buildings which are in poor condition include: the FBO facility, pilot lounge and the conventional hangars. The T-Hangar is in fair condition, and the trailer house and activity building are in good condition.

2.4.4 Access and Parking

The public access to the San Carlos Apache Airport is directly from U.S. Highway 70. Private automobile parking for more than 30 vehicles is conveniently located in a lot adjacent to the apron and FBO.

2.4.5 Airport Fencing

The primary purpose of airport fencing is to prevent unwanted intrusions by persons or animals onto 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 Federal Aviation Administration in Advisory Circular (AC) 150/5300-13 and Federal Aviation Regulation (FAR) Part 77.

Airport fencing at the San Carlos Apache Airport consists of five strand barbed wire surrounding the perimeter of the airport and five foot chain link fencing installed along the northern side of the aircraft parking apron, FBO office, and hangar areas.

TABLE II-7
EXISTING BUILDING CHARACTERISTICS

Facility Map List Number	Type of Building	Approximate Height	Approximate Dimensions	Construction Materials	Condition
7	FBO Office / Hanger	20 feet	100' x 70'	Wood	Poor
5	Hangar (5 aircraft)	15 feet	60' x 90'	Wood	Poor
6	T-Hangars (4 aircraft)	15 feet	32' x 126'	Metal	Fair
5	Hangar (1 aircraft)	15 feet	28' x 42'	Block & Steel	Poor
5	Hangar (1 aircraft)	15 feet	36' x 60'	Slump Block & Steel	Poor
7	Pilot Lounge	10 feet	24' x 24'	Wood	Poor
8	Activity Building	10 feet	20' x 48'	Metal	Good
4	Trailer Home	10 feet	20' x 30'	Metal	Good

2.4.6 Transportation Alternatives

The main surface transportation routes to the Globe area are via U.S. Highway 60 and state Highway 77, with direct access to the airport from U.S. Highway 70 as described previously. Bus service is provided to the area by Beeline Bus Agency, Greyhound Bus Lines, and Payson Express. Rail service is provided by Arizona Eastern Railroad and is for freight only. No passenger rail service is provided. Several freight companies provide trucking service to the region.

2.4.7 Utilities

The utilities available at the airport, and their suppliers are listed below:

Electric: Arizona Public Service
Natural Gas: Southwest Gas
Telephone: US West
Water: On-airport well (owned by the San Carlos Apache Tribe)
Sanitary: Septic System

A six inch high pressure gas line runs through the airport between the taxiway and runway on the west end of the airport, then crosses underneath the taxiway near the aircraft parking apron, and continues eastward within the landside area north of the taxiway. This gas line will likely need to be relocated to accommodate future airport development.

2.5 AIRCRAFT RESCUE AND FIREFIGHTING

2.5.1 Fire Fighting

The Globe Fire Department was previously responsible for emergency situations at the San Carlos Apache Airport. Since the dissolution of the airport lease between Gila County and the San Carlos Apache Tribe, the San Carlos Fire Department assumes responsibility for emergency situations at the airport, unless a Mutual Aid Agreement is established between the Globe and San Carlos Fire Departments. Additionally, there is no fire fighting water supply at the airport. The closest resupply point is located at the Apache Gold Casino, approximately ½ mile to the northwest.

The Globe Fire Department is located in downtown Globe, approximately seven miles from the airport. They have 16 full time fire fighters, including eight fully qualified Paramedics, one Intermediate Emergency Medical Technician (IEMT), and seven Emergency Medical Technicians (EMT's). They also have 16 volunteer fire fighters, including two Paramedics, eight EMT's, and six basic fire fighters. Their equipment consists of one multipurpose response vehicle, two pumper trucks, and one ladder truck. The multipurpose truck is foam capable and all full-time fire fighters are trained in foam application. Table II-8 depicts the capabilities of the equipment. The response time of the Globe Fire Department to the San Carlos Apache Airport is approximately seven to eight minutes.

TABLE II-8
GLOBE FIRE DEPARTMENT ASSETS

Distance from Airport: 7 miles		**Response Time:** 7-8 minutes	
Personnel	**Paramedic**	**IEMT**	**EMT**
Full-Time: 16	8	1	7
Volunteer: 16	2	0	8
Equipment	**Storage (Gal.)**	**Dispensing Capability (GPM)[1]**	**Remarks**
Multi-Purpose Trident Truck	300	---	300 Gal. Air Foam, Rescue Equipment, Patient Transport
Ladder Truck	500	1500	75' Ladder
Pumper	500	1500	
Pumper Truck	500	750	"Brush Truck"

[1]*GPM: Gallons Per Minute*

The San Carlos Fire Department operates three stations to achieve coverage of the overall San Carlos Apache Reservation; one in San Carlos, approximately 12 miles from the airport, one in Peridot, approximately 18 miles from the airport, and one in Bylas, approximately 34 miles from the airport. The San Carlos station has the fastest response time of the three stations. A total of 23 fire fighters are distributed throughout the three stations with four personnel having advanced EMT certification. One truck, along with one ambulance, are located at each of the stations. Although the trucks have foam dispensing capabilities, the San Carlos fire fighters are not yet trained in foam application.

TABLE II-9
SAN CARLOS FIRE DEPARTMENT ASSETS

Distance from Airport: San Carlos Station: 12 miles Peridot Station: 18 miles Bylas Station: 34 miles		**Response Time:** San Carlos Station: 14-17 minutes Peridot Station: 20-25 minutes Bylas Station: 35-40 minutes	
Personnel (Total all stations)	**Paramedic**	**IEMT**	**EMT**
Full-Time: 23	2	2	19
Equipment	**Storage (Gal.)**	**Dispensing Capability (GPM)[1]**	**Remarks**
Attack Truck (San Carlos)	300	1500	Foam Capable
Pumper Truck (Peridot)	1200	1500	Foam Capable
Attack Truck (Bylas)	300	1500	Foam Capable

[1]GPM: Gallons Per Minute

2.5.2 Ambulance

Ambulance service to the San Carlos Apache Airport is currently provided by Canyon State Ambulance Service. The closest dispatch station is located near downtown Globe with a response time to the airport of approximately 7-8 minutes. The station is staffed with 20 personnel, including eight Paramedics, two IEMT's, and 10 EMT's. They have a total of four ambulances. One ambulance is continuously on primary call and staffed with Paramedics, the remaining three are used as backup depending on maintenance status and crew availability. In addition, the San Carlos Fire Department has three ambulances, one positioned at each of the fire stations, on call for emergency situations. The response time of their closest ambulance is approximately 12 minutes. The closest hospital facility is the Cobra Valley Community Hospital located in Claypool, approximately 12 miles northwest of the airport.

2.5.3 Airport Security

The Gila County Sheriff's office works closely with the San Carlos Law and Order Police for the protection of the San Carlos Apache Airport. With the current airport lease agreement, the Sheriff's office has jurisdiction for security situations on the airport; however, the San Carlos Police respond to all incidents in which a tribal member is involved. The Sheriff's office patrols the airport area approximately once per week. The airport caretaker, who lives on airport property, will generally notify the Sheriff's office or San Carlos Police of any suspicious activity at the airport. The appropriate agency then responds to the situation.

2.6 AIRSPACE CHARACTERISTICS

2.6.1 Area Airports / Airport 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 which offer the same or similar services can all affect the size of a particular airport's service area. To define the service area for San Carlos Apache Airport, the airports in the area and their specific services and facilities were first reviewed. This information is displayed in Table II-10.

By examining the information in Table II-10 it is evident that the San Carlos Apache Airport offers similar services and facilities to airports located 40 to 60 NM away. To determine the service area, however, it is important to establish the furthest ground distance which pilots are willing to travel in order to operate out of San Carlos Apache Airport. A good determination of this distance can be obtained by reviewing the cities of residence of the current based aircraft owners. The cities and their distance from the airport in driving miles include Globe (9 miles), Claypool (12 miles), and Miami (15 miles). There are no registered aircraft owners between the San Carlos Apache Airport and either Safford or Whiteriver. Since these facilities offer similar facilities and services, future aircraft owners in these regions would most likely be served by the closest facility.

By examining area airport services and the distance pilots are willing to travel in order to operate out of the San Carlos Apache Airport, the service area of the San Carlos Apache Airport was determined. This service area is shown in Figure 2-3. This service area is expected to grow larger with the addition of a non-precision instrument approach. The San Carlos Apache Airport would then offer superior capabilities to those airports located 40 NM to 60 NM from San Carlos Apache Airport and would potentially draw more demand from those areas.

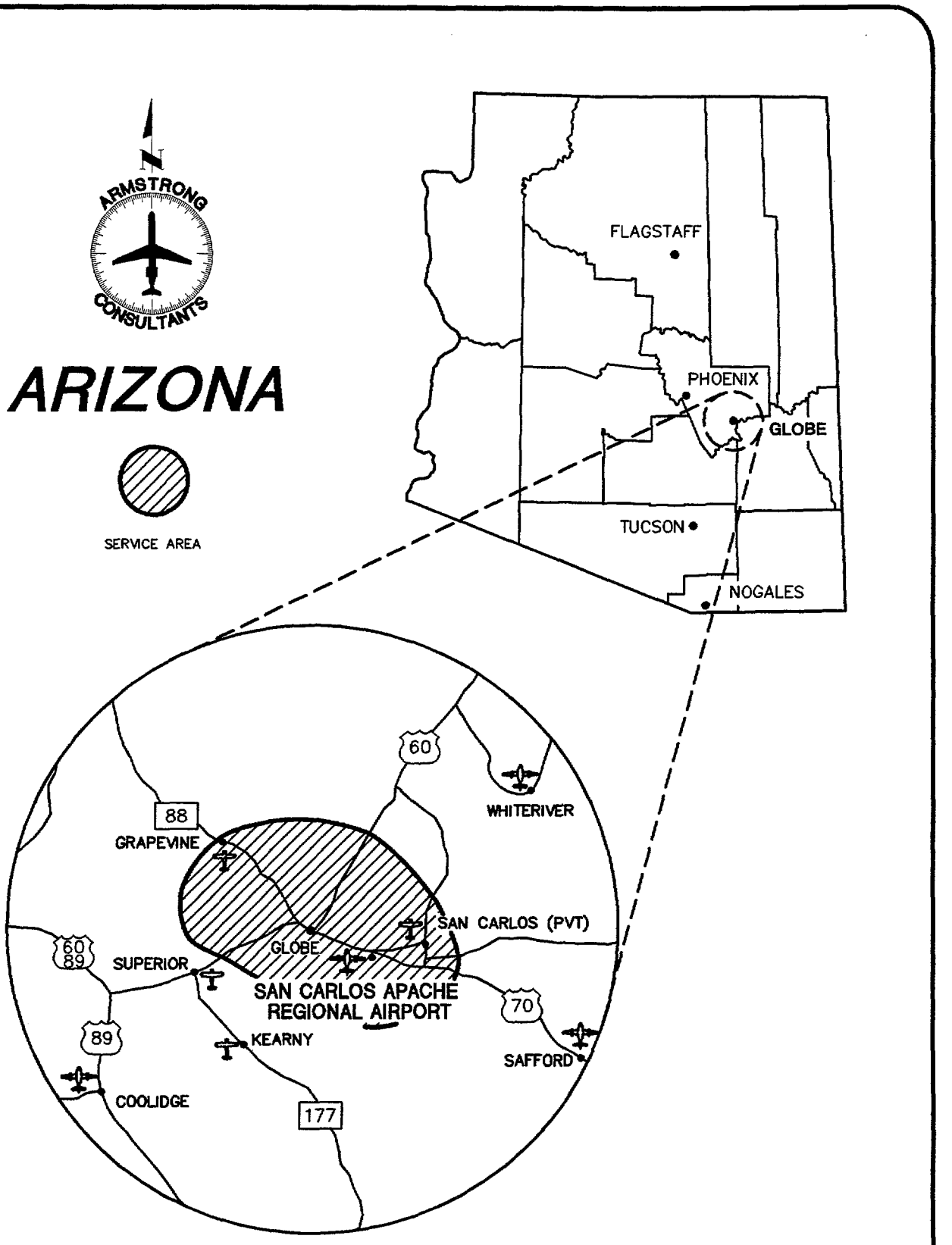


FIGURE 2-3
SERVICE AREA
SAN CARLOS APACHE REGIONAL AIRPORT

TABLE II-10
AIRPORTS SURROUNDING SAN CARLOS APACHE AIRPORT

Airport Name and Location	Distance from G-SC[1] (in NM[2])	NPIAS Status[3]	Runway Length(s)	Pavement Type	Instrument Approaches[4]	Fuel Available
San Carlos Apache Regional Globe, AZ	N/A	GA	5804 x 75	asphalt	NDB (Inop) VFR	100 LL Jet-A
San Carlos (Private) Globe, AZ	9 northwest	Not Listed	7300	dirt	VFR	None
Superior Municipal Superior, AZ	21 east	Not Listed	3500 x 110	dirt	VFR	None
Kearney Kearney, AZ	21 southwest	Not Listed	2900 x 30	asphalt	VFR	None
Grapevine (Private) Roosevelt, AZ)	30 northwest	Not Listed	3800	asphalt	VFR	None
Coolidge Municipal Coolidge, AZ	44 southwest	GA	5550 x 150 3740 x 75	asphalt asphalt	VFR	100LL Jet
Whiteriver Whiteriver, AZ	45 northeast	GA	6288 x 75	asphalt	VFR	None
Safford Municipal Safford, AZ	59 southeast	GA	6015 x 100 4800 x 75	asphalt	VFR	100LL Jet

Abbreviations included in Table II-2
[1] *G-SC = San Carlos Apache Airport*
[2] *NM = Nautical Miles*
[3] *NPIAS = National Plan of Integrated Airport Systems*
Categories included in table:
GA-General Aviation
[4] *VFR = Visual Flight Rules*

2.6.2 Surrounding Airspace

Figure 2-4 provides a depiction of the airspace surrounding the San Carlos Apache Airport. As discussed in Section 2.3.5, an NDB is located in Show Low and the nearest VOR's as shown in the figure are St Johns, Tucson, and Willie. Several Victor routes extend from each of these VOR's to other area navigational aids or airports; however, none of these lead directly towards San Carlos Apache Airport.

2.6.3 Airspace Jurisdiction

All communications pertaining to aircraft movement on the ground as well as in the air and for airport advisories are on the Unicom frequency of 122.8. At this time, the airport's Unicom is considered unmonitored.


SURROUNDING AIRSPACE SYSTEM
San Carlos Apache Airport
FOR FLIGHTS AT AND BELOW 10,000 MSL SEE PHOENIX VFR TERMINAL AREA CHART
OUTLAW MOA
8000 OR 3000' AGL WHICHEVER IS HIGHER TO BDT NOT INCL FL 180
EXCL R-2310 A, B, AND C WHEN ACTIVATED
HOURS OF USE 0700-1300 MON-FRI; 1800-2200 MON-FRI BY NOTAM
INTERMITTENT WEEKENDS BY NOTAM
CONTACT NEAREST FSS
JACKAL MOA
11,000 OR 3000' AGL WHICHEVER IS HIGHER TO BUT NOT INCL FL 180
HOURS OF USE 0700-1800 MON-FRI; 1800-2200 MON-FRI BY NOTAM
INTERMITTENT WEEKENDS BY NOTAM
CONTACT NEAREST FSS
RESERVE MOA
5000' AGL TO BUT NOT INCL FL 180
HOURS OF USE BY NOTAM
CONTACT NEAREST FSS
MORENCI MOA
1500' AGL TO BUT NOT INCL FL 180
HOURS OF USE 0600-2100 MON-FRI
OTHER TIMES BY NOTAM
CONTACT NEAREST FSS
EXCLUDES AIRSPACE BELOW 1500' AGL
EXCLUDES AIRSPACE 5600' AGL AND BELOW
JACKAL LOW MOA
100' AGL TO BUT NOT INCL 11,000'
HOURS OF USE 0700-1800 MON-FRI; 1800-2200 MON-FRI BY NOTAM
INTERMITTENT WEEKENDS BY NOTAM
CONTACT NEAREST FSS
CAUTION - UNMARKED CABLES 360° AND 935° ACROSS DAM
PHOENIX SKY HARBOR INTL
PHOENIX
SCOTTSDALE
PAPAGO AAF (INA)
FALCON FIELD
CHANDLER
WILLIAMS GATEWAY
CHANDLER
STANFIELD
COOLIDGE
CASA GRANDE
ROTTERS (Pvt)
EDS (Pvt)
PINAL
AVRA VALLEY
TWIN HAWKS
LA CHOLLA (Pvt)
BRAVE BULLS (Pvt)
SAN MANUEL
KEARNY
SUPERIOR
GLOBE
SAN CARLOS
GLOBE RCO
MOUNT LEMMON RCO
SAFFORD-RCO
PRESCOTT
ROOSEVELT DAM
RITTENHOUSE AF
Figure 2-4

The San Carlos Apache Airport is located within the jurisdiction of the Albuquerque Air Route Traffic Control Center (ARTCC) and the Prescott Flight Service Station (FSS). The current frequencies for Albuquerque ARTCC are 132.9 and 125.4. 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. Pilots can contact the Prescott FSS directly on radio frequency 122.4, or through the remote communications outlet (RCO) at Globe on 122.3.

2.6.4 Airspace Restrictions

Located approximately 30 NM southwest of San Carlos Apache Airport is restricted airspace designated R-231A/B/C. This airspace encompasses approximately 39 square nautical miles and is not authorized for overflight.

The San Carlos Apache Airport is situated within the Outlaw Military Operating Area (MOA). Use of this MOA occurs Monday through Friday from 7:00 AM to 6:00 PM. The MOA is also in use Monday through Friday 6:00 PM to 10:00 PM as indicated by Notices to Airmen (NOTAMs), and intermittent on weekends as indicated by NOTAM. The MOA airspace includes altitudes of 8,000 feet or 3,000 feet above ground level (AGL) whichever is higher but not to include 18,000 feet (FL 180) and R-231A/B/C airspace. Additional MOAs nearby the San Carlos Apache Airport include Jackal, Jackal Low, Reserve, and Morenci.

Class B airspace is located approximately 36 NM to the west, surrounding the Phoenix area.

2.7 OTHER AIRPORT CHARACTERISTICS

2.7.1 Control of Property

Under current Federal guidelines, an airport sponsor must be able to prove their ability to control that land on which airport development has occurred or is planned to occur, for a minimum of twenty-years. This is either accomplished through acquisition of the property by fee simple, or through the negotiation of a lease that has a minimum term of twenty-years.

The San Carlos Apache Airport is located on the San Carlos Apache Indian Reservation. The City of Globe and Gila County had leased the airport property from the Tribe for the past 52 years. The most recent lease for the airport and easements for the approaches to Runway 09 and Runway 27 was signed on April 10, 1987. Consequently, Gila County had less than the required twenty years of control of the property. On January 5, 1998, the San Carlos Apache Tribe dissolved the lease, assumed the existing FAA grant assurances, and became the sole airport sponsor.

In the past, it had been difficult to maintain a minimum twenty-year lease on that property on which the airport has been constructed. This was mainly attributed to the fact that there were numerous agencies and parties which were involved in the lease negotiations. Since the dissolution of the lease and assumption of the FAA grant assurances, the San Carlos Apache Tribe is the sole sponsor of the airport; thus assuring control over the airport property for an indefinite time period. The advantage of this arrangement is the eligibility for up to 91.06% Federal grant funding for specified airport development projects. The disadvantage of this arrangement is that under current State of Arizona guidelines, the airport is not eligible for state financial assistance (which would otherwise match the sponsor's remaining share) due to the fact that the airport does not fall under any political jurisdiction of the state government; it is a sovereign Indian nation.

2.8 METEOROLOGICAL CONDITIONS

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

2.8.1 Local Climatological Data

While located in a desert region of Arizona, Gila County is atypical of the desert climate associated with this region. The annual mean maximum temperature is a mild 76.2° and the mean minimum temperature is 50.2°. The mean maximum temperature of the hottest month is 97.0° (July). Annual precipitation averages approximately 18.05 inches. Table II-11 shows the monthly and annual climatic data for the Globe/Miami/San Carlos area.

TABLE II-11
LOCAL CLIMATOLOGICAL DATA
GLOBE/MIAMI/SAN CARLOS AREA, ARIZONA

Month	Mean Maximum Temperature (°F)	Mean Minimum Temperature (°F)	Average Total Precipitation
January	55.0	32.7	2.06
February	60.4	35.4	1.25
March	65.1	39.5	1.78
April	74.7	47.3	0.66
May	84.5	55.7	0.25
June	93.7	64.2	0.26
July	97.0	70.3	2.34
August	93.9	67.9	3.33
September	89.7	62.9	1.53
October	78.8	52.0	1.07
November	65.4	40.5	1.12
December	56.6	34.2	2.40
Year	76.2	50.2	18.05

Average Total Snow, Sleet and Hail is 3.9 inches. (Based on a 30-year average)
Source: Arizona Department of Commerce

2.8.2 Density Altitude

An extremely important meteorological factor to pilots is density altitude. Density altitude is not a height reference. Rather, it is used as an index of aircraft performance. Air density is determined by air pressure, temperature, and humidity. As you increase altitude, the air density decreases. However, air density also decreases with high temperatures and high humidity. This means that high altitudes or conditions of high temperature or humidity cause the air to be thinner than at lower altitudes, temperatures, or humidities. The combination of high temperatures, high humidity, and increased altitude result in an increasing high density altitude condition. High density altitude reduces performance in all types of aircraft.

The results of a high density altitude include increased takeoff and landing rolls and a reduced rate of climb. Density altitude is most dangerous when other contributing factors are involved, such as heavy loads, calm winds, short runways, unfavorable runway conditions, and obstructions near the end of the runway. Density altitude is a concern at the San Carlos Apache Airport, given its elevation, high summer temperatures, and runway length.

2.8.3 Ceiling and Visibility Conditions

Ceiling and visibility conditions are important considerations at any airport since the occurrence of low ceiling and/or poor visibility conditions limit the use of the airport. At airports with an instrument approach, during poor visibility conditions or instrument meteorological conditions (IMC), the pilot must operate under Instrument Flight Rules (IFR), rather than Visual Flight Rules (VFR). Under IMC, the pilot maneuvers the aircraft through reference to instruments in the aircraft and navigational aids on the ground. The airport must be closed for use when conditions are worse than the published IFR minimums for that airport. When flight conditions are VFR, the pilot can maneuver the aircraft by reference to the horizon and objects on the ground.

Definitions for the VFR and Below Minimum weather conditions for uncontrolled airspace from the surface up to, but not including 1,200 feet have been included as part of this Airport Master Plan Update.

- VFR - Must maintain one mile visibility and remain clear of clouds.

- Below Minimums - Unable to remain clear of clouds or visibility is less than one mile.

Since San Carlos Apache Airport is strictly a VFR airport, any conditions which result in the ceiling or visibility being less than VFR minimums requires pilots not to land at the airport until those meteorological conditions have improved. In some instances, pilots may be authorized to depart the airport by obtaining a departure reservation through the Flight Service Station (FSS) or by requesting clearance from the Air Route Traffic Control Center (ARTCC).

2.8.4 Runway Wind Coverage

Wind direction and speed determine the desired alignment and configuration of the runway system. Aircraft land and take off into the wind and therefore, can tolerate only limited crosswind components (the percentage of wind perpendicular to the runway centerline). The ability to land and take-off in crosswind conditions varies according to pilot proficiency and aircraft type.

The FAA recommends that airports have adequate runways to provide for coverage of 95 percent of all wind directions under stipulated crosswind components. 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 runway direction. Normally, these wind vector triangles are solved graphically. Table II-12 shows the allowable crosswind component for each Airport Reference Code.

TABLE II-12
ALLOWABLE 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

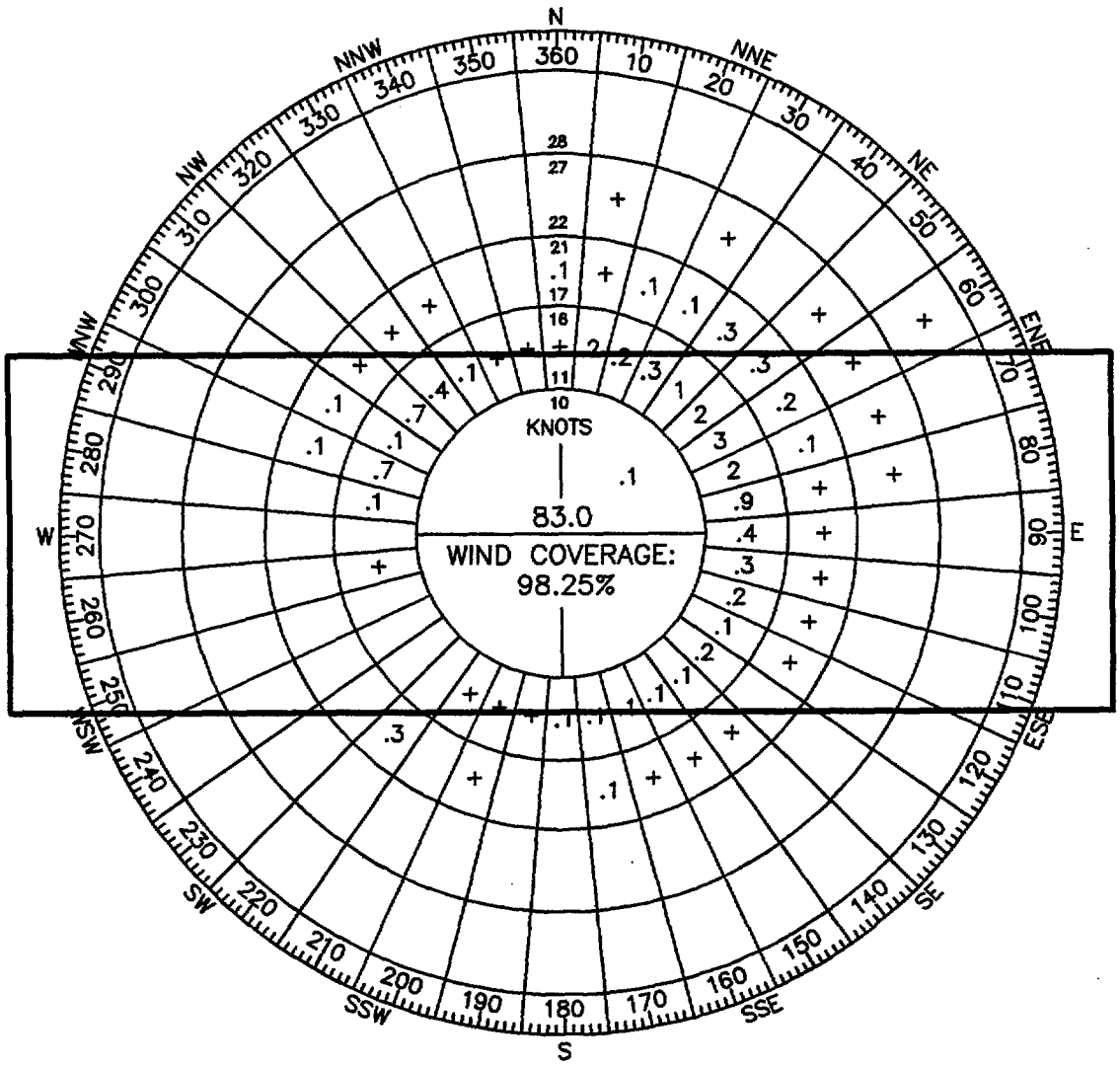
Source: FAA AC 150/5300-13.

The wind rose shown in Figure 2-5 is an All Weather Wind Rose. An All Weather Wind Rose includes all cloud ceiling conditions and visibility conditions.

Wind data collected by the Cyprus Miami Mining Company located in Miami, Arizona was used to determine the crosswind coverage at the San Carlos Apache Airport. An analysis of the existing wind conditions provides a breakdown of the annual occurrence for all weather conditions. The existing runway orientation provides an all weather wind coverage of 96.1 percent for a 10.5 knot cross wind component and 98.2 percent for a 13.0 knot crosswind component. This data concurs with the wind analysis accomplished in previous airport studies and with information reported by pilots, the local FBO, and airport management personnel.

2.9 AIRPORT IMAGINARY SURFACES

Federal Aviation Regulations (FAR) Part "77" establishes several "Imaginary Surfaces" of varying dimensions that are used as a guide to provide a safe operating environment for aviation. These surfaces, which are typical for civilian airports, are shown in Figure 2-6. The Primary, Horizontal, Transitional, Conical and Approach Surfaces identified in FAR Part 77 are applied to each runway at both existing and new airports on the basis of the type of approach procedure available or planned for that runway and the specific FAR Part 77 runway category criteria. For the purpose of this section, a "Utility Runway" means a runway that is constructed for and intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight and less. A "Visual Runway" means a runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan, or by any planning document submitted to the FAA by competent authority. A "Nonprecision Instrument Runway" means a runway having an existing instrument approach procedure utilizing air navigation facilities with only horizontal guidance, or area type navigation equipment, for which a straight-in nonprecision instrument approach procedure has been approved, or planned, and for which no precision approach facilities are planned, or indicated on an FAA



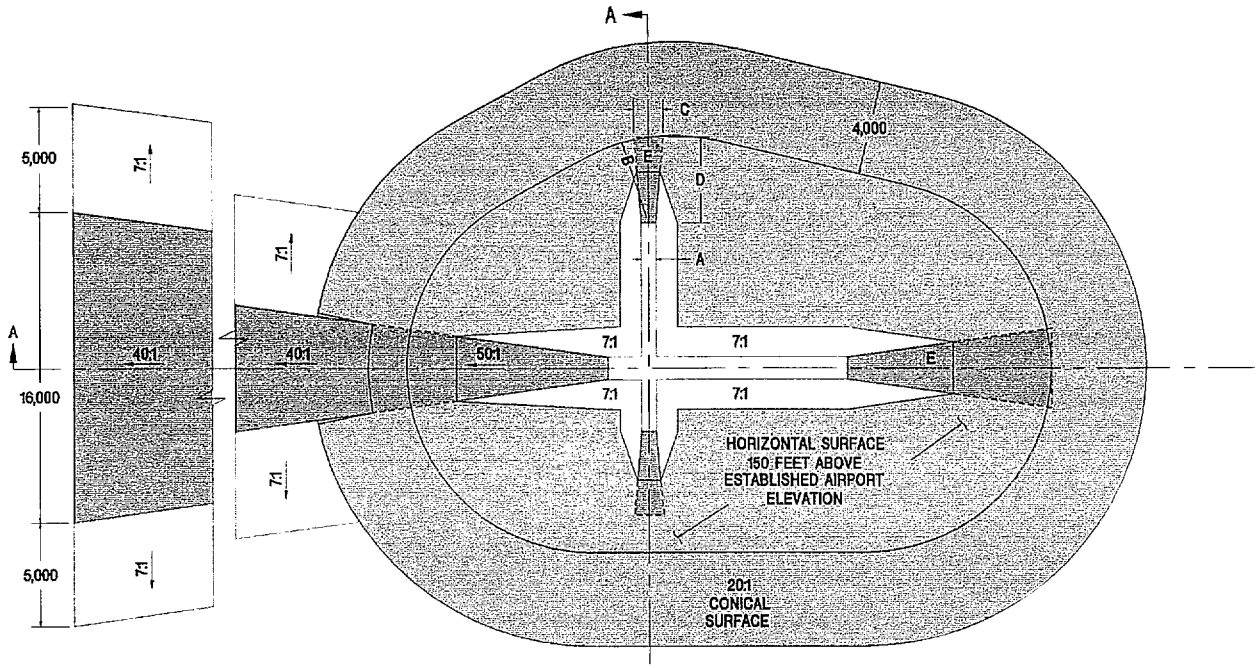
ALL WEATHER WIND ROSE

SOURCE: CYPRUS–MIAMI MINING COMPANY
MIAMI, ARIZONA
PERIOD: JANUARY – DECEMBER 1994

10.5 KNOT CROSSWIND COVERAGE RUNWAY 09/27 = 96.13%

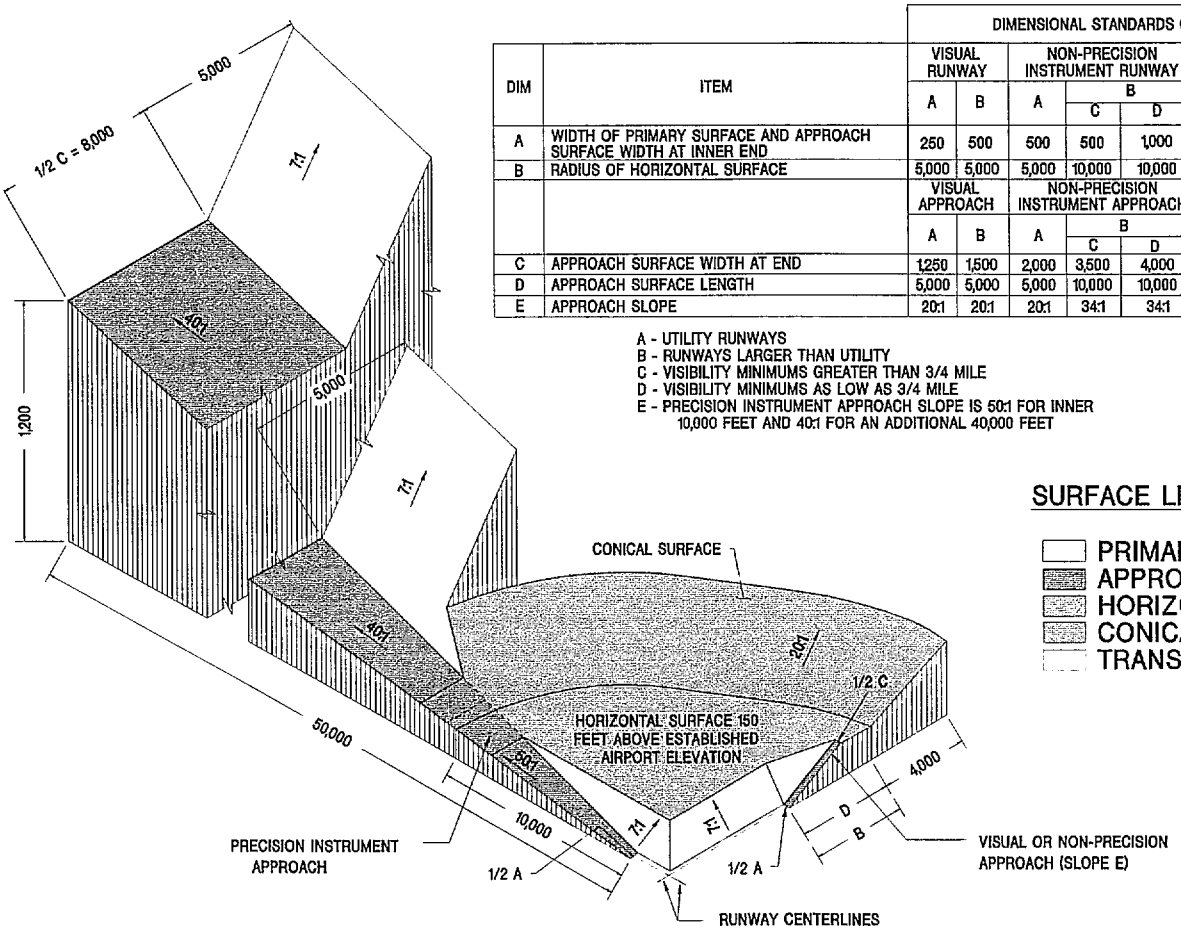
13.0 KNOT CROSSWIND COVERAGE RUNWAY 09/27 = 98.23%

FIGURE 2-5
ALL WEATHER WIND ROSE
SAN CARLOS APACHE REGIONAL AIRPORT



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		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

ISOMETRIC VIEW OF SECTION A-A

FIGURE 2-6
IMAGINARY SURFACES

planning document or military service military airport planning document. "Precision Instrument Runway" means a runway having an existing instrument approach procedure utilizing an Instrument Landing System (ILS) or a Precision Approach Radar (PAR). It may also mean a precision approach system is planned and is so indicated by an FAA approved airport planning document; a military service approved military airport layout plan; or any other FAA planning document. The dimensional application of imaginary surfaces for the existing San Carlos Apache Airport relates to the data contained in the FAR Part 77 for visual runways and the FAA Airport Master Record (Form 5010-10). Runway 09 and Runway 27 are visual runways with visual approaches only.

2.9.1 Horizontal Surface

The Horizontal Surface is normally considered necessary for the safe and efficient operation of aircraft in the vicinity of an airport. As specified in FAR Part 77, the Horizontal Surface is a horizontal plane 150 feet above the established airport elevation. The elevation for the Horizontal Surface at the San Carlos Apache Airport is 3,385 above Mean Sea Level (MSL). 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 radius of the arc at the San Carlos Apache Airport is 5,000 feet.

2.9.2 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. The Conical Surface's inner elevation is 3,385 feet MSL and extends to an outer elevation of 3,585 feet MSL.

2.9.3 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. 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 at the San Carlos Apache Airport for Runway 09/27 is 500 feet.

2.9.4 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 is applied to each end of the runway based upon the type of approach available or planned for that runway. 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 current Approach Surfaces for both ends of Runway 09/27 are classified as visual for larger aircraft. The dimensions for this type of surface measure 1,500 feet in width at their outer limit, 500 feet at their inner width and extend for a horizontal distance of 5,000 feet, with an approach slope angle of 20 to 1.

2.9.5 Transitional Surface

The Transitional Surface extends outward and upward at right angles to the runway centerline from the sides of the Primary and Approach Surfaces at a slope of 7:1. The Transitional Surface ends at the horizontal surface. Transitional Surfaces for those portions of the precision approach surface which project through and beyond the limits of the Conical Surface, extend a distance of 5,000 feet measured horizontally from the edge of the Approach Surface and at right angles to the runway centerline.

2.10 OBJECTS AFFECTING NAVIGABLE AIRSPACE

The criteria for objects affecting navigable airspace (obstructions) contained in FAR Part "77" apply to existing and proposed manmade objects, objects of natural growth and terrain. These criteria indicate the "critical" areas in the vicinity of airports which should be kept free of obstructions. "Secondary" areas may contain obstructions, if they are determined to be non-hazardous by an aeronautical study and if they are marked and lighted as specified in the aeronautical study determination.

Airfield navigational aids, lighting and visual aids by nature of their location, may constitute obstructions; but these objects do not violate FAR Part "77" requirements, as they are essential to the operation of the airport.

Presently, the Horizontal and Conical Surfaces of the FAR Part "77" are penetrated by rising terrain which is located south and southwest of Runway 09/27. Both the Primary and Approach Surfaces of Runway 09/27 are penetrated by natural growth which occurs directly south, east and west of the runway. Trees and brush that penetrate these surfaces occur approximately 125 to 200 feet south of the runway, approximately 100 to 300 feet from Runway 27's threshold, and approximately 100 to 350 feet from Runway 09's threshold. The Airport's perimeter fence located approximately fifty feet south of Runway 9's threshold also penetrates the Primary Surface.

2.11 RUNWAY & TAXIWAY SEPARATION STANDARDS

As previously discussed, the Airport Reference Coding (ARC) system is used to relate airport design criteria to the operational and physical characteristics of the critical aircraft intended to operate at the airport. The design or critical aircraft usually has the largest wingspan and the fastest approach speed. The design/critical aircraft must also

have over 500 operations per year to be considered as the design aircraft. As previously discussed, those aircraft weighing 60,000 pounds or less and having an ARC of B-II should be considered the design aircraft for Runway 09/27. Runway standards for the San Carlos Apache Airport were developed by utilizing the FAA guidelines to provide the airport operator with a selection of various widths, clearances and separations related to the critical aircraft design group and approach category for the airport.

2.11.1 Obstacle Free Zone (OFZ) and Object Free Area (OFA)

As established in FAA Advisory Circular 150/5300-13, Chapter 3, the OFZ is a three-dimensional volume of airspace that supports the transition of ground to airborne aircraft operations. The clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible NAVAIDS whose location is fixed by function.

Runway OFZs are similar to the FAR Part "77" Primary Surface insofar that it represents the volume of space longitudinally centered on the runway. It also extends 200 feet beyond each end of the runway. For the San Carlos Apache Airport, the current width of the Runway OFZ for Runway 09/27 is 400 feet.

The Runway Object Free Area (OFA) is a two dimensional ground area surrounding the runway. The Runway OFA standard precludes parked aircraft and objects, except objects whose location is fixed by function. The ROFA dimensions for Runway 09/27 are 500 feet in width and extending 300 feet beyond the runway ends. The parallel taxiway, as discussed in Section 2.8.4, penetrates the ROFA.

The natural growth and perimeter fence previously described which penetrate the Part "77" Primary and Approach Surfaces also penetrates the ROFA.

FAA Advisory Circular 150-5300-13, Chapter 4, describes the taxiway and taxilane OFA's as two dimensional ground areas adjacent to taxiways and taxilanes. The taxiway/taxilane OFA clearing standards preclude service vehicle roads, parked airplanes, and objects except those whose location is fixed by function. The existing Taxiway Object Free Area (TOFA) width for the parallel taxiways and associated connecting taxiway system for Runway 09/27 is 131 feet. The existing Taxilane OFA is 115 feet.

2.11.2 Runway Protection Zones (RPZ)

The RPZ (formerly the runway clear zone) is trapezoidal in shape and centered about the extended runway centerline. It begins 200 feet beyond the end of the area usable for takeoff or landing. Displacing the threshold does not change the beginning point of the RPZ. The RPZ dimensions are functions of the design aircraft, type of operation, and visibility minimums. Existing dimensions for the RPZs for Runway 09/27 meet the FAA criteria

as described in AC 150/5300-13.

For the San Carlos Apache Airport, Runway 09/27 has Runway Protection Zones for visual approaches and large aircraft. The current Runway Protection Zone for both ends of Runway 09/27 is a trapezoid with an inner width of 500 feet extending to an outer width of 700 feet. The length of the RPZ is 1,000 feet.

While it is desirable to clear all objects from the RPZ, uses such as agricultural operations are acceptable, provided they do not attract birds. Land uses prohibited from RPZs are residences and places of public assembly.

Presently, the San Carlos Apache Airport controls the land on which the RPZs for Runway 09/27 occur. This control is through direct ownership control of the land as discussed in Section 2.7.1.

2.11.3 Safety Areas

Runway and Taxiway Safety Areas are a defined surface surrounding the runway or 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 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
- Free of objects, except objects that need to be located in the runway or taxiway safety area because of their function

The Safety Area for Runway 09/27 is 150 feet wide and extends for 300 feet beyond the runway end. The Taxiway Safety Area associated with Runway 09/27's parallel taxiway is 79 feet in width. For the most part, the Runway and Taxiway Safety Areas meet FAA criteria for grade and slope. The Runway Safety Area (RSA) is penetrated by the airport perimeter fence, a drainage channel and numerous trees and bushes. Penetration occurs to the RSA south of Runway 09's threshold. The perimeter fence and drainage channel are located approximately fifty feet south of the runway pavement.

2.11.4 Runway/Taxiway Separation

The FAA minimum standard for runway centerline to taxiway separation is 240 feet for aircraft having an ARC of B-II and 300 feet for an ARC of C-II. The existing separation for between the runway centerline and taxiway centerline is 200 feet. Consequently, FAA recommendations for this separation are not met.

2.11.5 Summary of Dimensional Criteria

Table II-13, on the next page, summarizes the dimensional criteria for the San Carlos Apache Airport.

TABLE II-13
SUMMARY OF DIMENSIONAL CRITERIA
SAN CARLOS APACHE AIRPORT

STANDARD	EXISTING DIMENSIONS	
Horizontal Surface		
Elevation	3,385 feet MSL	
Radius of arcs	5,000 feet	
Conical Surface		
Slope	20:1	
Inner elevation	3,385 feet MSL	
Outer elevation	3,585 feet MSL	
Transitional Surface - Slope	7:1	
Primary Surface		
Width	500 feet	
Length beyond runway end	200 feet	
Approach Surface	Runway 09	Runway 27
Inner width	500 feet	500 feet
Outer width	1,500 feet	1,500 feet
Length	5,000 feet	5,000 feet
Slope	20 : 1	20 : 1
Runway Obstacle Free Zone		
Width	400 feet	
Length beyond runway end	200 feet	
Runway Object Free Area		
Width	500 feet	
Length beyond runway end	300 feet	
Runway Protection Zone	Runway 09	Runway 27
Inner Width	500 feet	500 feet
Outer Width	700 feet	700 feet
Length	1,000 feet	1,000 feet
Runway Safety Area		
Width	150 feet	
Length beyond runway end	300 feet	
Taxiway Object Free Area		
Width	131 feet	
Taxiway Safety Area		
Width	79 feet	

Source: FAR Part 77 and FAA Advisory Circular 150/5300 -13, Airport Design