CHAPTER ONE: INVENTORY

INTRODUCTION

The *2007 Chandler Municipal Airport Master Plan Update* defines a concept for development at Chandler Municipal (CHD) over the course of a 20-year planning period and is prepared in collaboration with Federal and State agencies, local officials, and interested Airport users. A goal of the study is to identify facility needs and evaluate development alternatives in order to provide guidance for the future development of the Airport based on conditions existing in late 2005 and 2006. The plan recommends improvements in accordance with specific Federal Aviation Administration (FAA) criteria, taking into consideration anticipated changes in aviation activity and trends at the local, regional, state, and national levels.

The primary objective of this Airport Master Plan for Chandler Municipal Airport is to produce a comprehensive planning guide for the continued development of a safe, efficient, and environmentally compatible aviation facility that meets the goals of the Chandler Municipal Airport Commission, Maricopa County, Airport users and tenants, and the surrounding Airport service area. The study focuses on aeronautical forecasts, the need for and justification of development, and a staged plan for recommended enhancements. Proposed airport development must adhere to standards that provide for safe aviation facilities while accommodating future demand. The staged plan typically looks at planning horizons of 0 to 5 years (short-term), 6 to 10 years (intermediate-term), and 11 to 20 years (long-term). The first phase generally addresses existing facility deficiencies or non-compliance to the FAA's airport design standards. The subsequent phases address the facilities and resources needed to accommodate predicted growth based on reasonable assumptions. Additional goals and objectives related to the Airport and the plan are described in a subsequent section of this chapter.

The initial step in the planning process is to develop a thorough inventory of existing conditions at the Airport, and in and around the Airport's market area. This chapter presents the data pertinent to the Airport and its service area necessary for subsequent phases of analysis.

The inventory process incorporates a broad spectrum of information including goals and objectives, data on landside and airside facilities, surrounding land uses, weather conditions, area airspace, historical activity levels, and socioeconomic factors. Data collected as part of the inventory effort establishes the foundation for the remainder of the Master Plan. The information summarized in this chapter was obtained through on-site visits, discussions with Airport staff, review of previous Airport planning documents, review of FAA records, and review of various local and regional planning documents. Inventory data is presented in the following sections:

- Goals and Objectives
- Airport History
- Airport Location and Access
- Airport Role
- Airport Activity
- Existing Airport Facilities
- Airspace and Approaches
- Climatic and Meteorological Conditions
- Area Land Use Patterns and Zoning
- Area Socioeconomic Data
- Other Area Airports
- Summary

This inventory data serves as a foundation for analyses conducted throughout the planning process.

GOALS AND OBJECTIVES

The *2007 Chandler Municipal Airport Master Plan Update* was initiated in late 2005 to update the last Airport Master Plan which was prepared in 1998. The earlier planning effort identified several improvements for the Airport, many of which have been completed since that time. The 2007 study is intended to update the analysis from the previous plan, ensuring the Airport is developed to meet FAA and Arizona Department of Transportation, Aeronautics Division (ADOT) requirements as well as the needs of Chandler residents and businesses.

This Airport Master Plan Update process and all of its elements were conducted consistent with the requirements of FAA and ADOT. Furthermore, the plan addresses the goals, key issues, and objectives of the City of Chandler, the official Airport sponsor. Specific goals established by the City and with input from the public and the study's established Planning Advisory Committee (PAC) related to the Airport included the following:

- Manage and develop the Airport to provide maximum levels of aviation safety on the ground
- Work to develop airspace usage around the Airport to maximize aviation safety
- Plan and develop Airport facilities to meet the needs of Airport users with an emphasis on smaller general aviation aircraft users
- Work to cultivate development potential on the Airport to achieve self sufficiency
- Seek to maximize economic development potential for the community around the Airport
- Minimize environmental impacts to Chandler residents through the planning and development of the Airport

The goal of the Airport Master Plan Update is to ensure that the plan provides guidance on developing the Airport to meet these goals.

Specific issues to be considered in the planning process include:

- Demand for aviation in and around Chandler region
- Ability of Airport to accommodate projected demand
- Alternative methods for meeting the needs of existing and future users
- Funding and financing capability of Airport and ability to meet development needs

Working with the City, Chandler residents and businesses, and the PAC established for the Airport Master Plan Update, the master planning process will provide reasonable recommendations for improvements to Chandler Municipal Airport so that the City of Chandler can consider these in their decision-making efforts.

AIRPORT HISTORY

Chandler Municipal Airport was opened in 1948 with federal aid. The original site consisted of a single runway (Runway 18/36). In 1960 the City constructed a new runway with a northeast-southwest orientation (existing Runway 4L/22R). The entire development at the Airport has been constructed and funded under the auspices of the City of Chandler.

Key dates in the Airport's on-going development include the following:

- In **1948**, the airport site was purchased from Roosevelt Water Conservation District for $8,000.
- In **1950**, the City completed its first airport improvement project (Runway 18/36 and the drilling of a well).
- In **1960**, a new runway (existing Runway 4L/22R) and full parallel taxiway measuring 2,610 feet in length were constructed. In addition to the new runway and taxiway system, an apron area was constructed.
- In **1961**, Runway 4L/22R was equipped with lighting.
- During the **1970s** Runway 4L/22R and its parallel taxiway were extended 1,200 feet to the south. Additional runway lighting was installed on the runway extension, visual approach slope indicators (VASI) were installed on both runway ends, perimeter fencing was installed, and a new apron area was constructed.
- During the mid **1980s**, 116 t-hangars were constructed.
- In **1982**, a new Airport Master Plan was completed for the Airport.
- In **1983**, Runway 4L/22R and its taxiway were extended 600 feet to the northeast and a new apron was constructed.
- In **1984**, an Environmental Impact Statement (EIS) was conducted for the future development of a new runway system.

- In **1985**, the City purchased 55 acres of property for future expansion at the Airport for $1.8 million. The expansion would be for a four-lane access road, internal service roads on airport property, the relocation of the terminal building and fuel farm, the realignment of the apron, vehicle parking lot, relocation of shade hangars, the design of a drainage system, and the design of an apron and taxiways to the new hangar area.
- Between **1986** and **1988**, the Airport acquired 175 acres of land for the new runway system for over $9 million.
- During the **1990s**, an additional 137 acres of land were acquired for development.
- In **1994**, the new runway (Runway 4R/22L) was constructed to 4,850 feet in length. A new heliport was also opened for use.
- In **1996**, a new 5,500-square foot terminal building completed construction and was opened.
- In **1998**, an air traffic control tower completed construction and was opened. Additionally, the Airport's master plan was updated.
- In **2000**, 86 privately developed t-hangars and 7 acres of new apron completed construction and were opened.
- In **2001**, an additional 28 acres of land was purchased for hangar and apron development.

Source: *A History of the Chandler Municipal Airport*, Renee Menard; *Chandler Municipal Airport – Property Acquisition* Summary; and Airport Management Records.

Since the late 1980s, the City of Chandler has received in excess of $5 million from ADOT-Aeronautics Division to improve the Airport. Over that same period, FAA airport improvement program (AIP) monies account for over $18 million for airport improvement projects at the Airport. Development projects funded within the past five years include the construction of 86 privately developed t-hangars, a new apron area, an update to the Airport's master plan, relocation of the heliport, and the first phase of new executive hangars.

The Airport's historic and continuing development has allowed it to evolve to meet the changing needs of its tenants, aviation users, and market area. Recent development projects at the Airport include the relocation of the heliport area and construction of three executive hangars. These facilities will be examined in more detail in the inventory of existing airport facilities.

AIRPORT LOCATION AND ACCESS

As shown in **Exhibit 1.1**, Chandler Municipal serves the southeastern side of the Phoenix metropolitan area. The City of Chandler is the sixth largest city in Arizona and as of the 2000 U.S. Census, the City was one of the fastest growing cities in the United States. The Phoenix metropolitan area encompasses approximately 23 cities and towns. The Metro area elevation is approximately 1,117 feet and is located in the heart of the Sonoran Desert and extends from Scottsdale in the northeast, to Glendale and

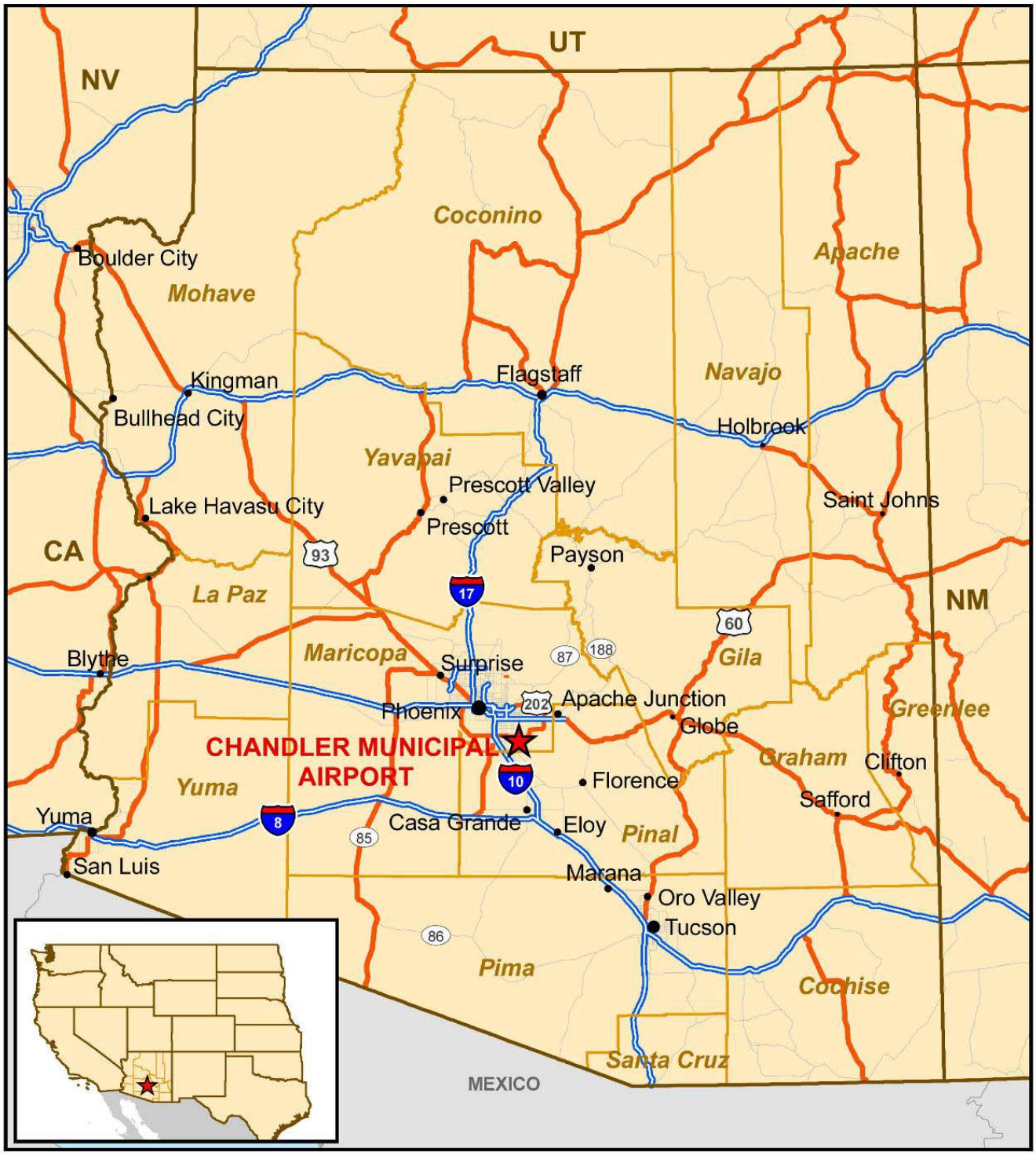
numerous expanding towns in the west. In the heart of the Greater Phoenix area is Tempe and to the east lies the City of Mesa. Desert mountains surround the area, creating “The Valley of the Sun."

Communities surrounding the Airport and the local surface transportation network are depicted in **Exhibit 1.2**. Interstates 10 and 17 provide major regional and national ground transportation access to the Phoenix metropolitan area. Easy access to Interstates 10 and 17 from the Airport is provided via either State Highway 101 or 202. It should be noted that State Highway 202 is in the process of being extended to the east, thus creating better accessibility to the Airport.

Chandler Municipal is located approximately 20 miles southeast of downtown Phoenix in Maricopa County. The Airport is located within the City of Chandler’s corporate limits. Airport property is bounded by several roadways. The general boundaries of the Airport site are as follows:

- **North Boundary** – East Germann Road
- **South Boundary** – East Queen Creek Road and South Cooper Road
- **East Boundary –** South Gilbert Road
- **West Boundary** – South McQueen Road and Airport Boulevard

Existing characteristics and planned future improvements of the local surface transportation network and internal Airport circulation roads are examined in more detail in a subsequent section.



Legend

- Chandler Municipal Airport
- Populated Places
- States
- Arizona Counties
- Limited Access Highways
- Highways
- Major Roads

Source: NTAD 2004, ESRI ArcMap 9 Data

EXHIBIT 1.1
National & Regional Location

Wilbur Smith Associates

Legend

- Arizona Counties
- US Census Bureau Urbanized Areas
- Parks
- Airport Property
- Airside Facilites
- Major Roads
- Minor Roads
- 202 Loop
- Under Construction
- Water

Source: NTAD 2004, ESRI AcrMap 9 Data, US Census TIGER 2000
Prepared: December 2005

EXHIBIT 1.2
Airport Area

AIRPORT ROLE

From the outset of the planning process, it is important to understand the role of Chandler Municipal in the national aviation system, as well as the State of Arizona and Phoenix metropolitan area. One goal of the master plan is to ensure that the Airport has the necessary facilities to adequately accomplish the various roles that it may play in the local, regional, and national transportation system.

At the national level, the National Plan of Integrated Airport Systems (NPIAS) identifies airports that are significant to the national air transportation system. The NPIAS is used by the FAA in managing and administering the Airport Improvement Program (AIP) and supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility.

Airports included in the NPIAS are classified as having one of the following roles within the national system:

- **Primary Commercial Service Airports** – Publicly owned commercial service airports that have more than 10,000 passenger boardings or enplanements each calendar year and receive scheduled passenger service. Phoenix Sky Harbor International Airport is the only primary commercial service airport in the area. Other primary commercial service airports in Arizona include: Laughlin/Bullhead International in Bullhead City, Flagstaff Pulliam in Flagstaff, Grand Canyon National Park in Grand Canyon, Page Municipal in Page, Grand Canyon West in Peach Springs, Tucson International in Tucson, and Yuma International in Yuma.
- **Nonprimary Commercial Service Airports** – Publicly owned commercial service airports that have at least 2,500 and not more than 10,000 passenger boardings each year. Arizona has four nonprimary commercial service airports: Kingman, Ernest A. Love Field, Show Low Regional, and Lake Havasu City.
- **Reliever Airports** – Airports designated by the FAA to relieve congestion at commercial service airports and to provide improved general aviation access to the overall community. These may be publicly or privately-owned. Reliever airports in the Phoenix region include: Chandler Municipal, Glendale Municipal, Phoenix Goodyear, Falcon Field, Phoenix Deer Valley, Williams Gateway, and Scottsdale.
- **General Aviation Airports** – Airports included in the national system that are not categorized as commercial service or reliever airports. General aviation airports can be publicly or privately-owned. There are 38 NPIAS general aviation airports in Arizona.

Chandler Municipal Airport is currently classified as a reliever airport to Phoenix Sky Harbor International. Chandler Municipal plays an important role in supporting general aviation for the Phoenix metropolitan area and the region by supporting local businesses and residents as well as transient users. Historic airport activity statistics for each component of overall airport activity are summarized in the following section.

AIRPORT ACTIVITY

In addition to providing an understanding of the levels and types of aviation activity that occur at Chandler Municipal, historic Airport activity can be used to identify recent trends that may impact future activity levels. Historic data for the aircraft operations and based aircraft components of Airport activity are summarized in the following sections. These two components of Airport activity will be examined in greater detail in *Chapter Two, Projections of Aviation Demand*.

Aircraft Operations

A common measure of airport activity is the number of aircraft operations occurring on an annual basis. An aircraft operation is defined as either a landing or a departure. For example, a touch-and-go operation, where an aircraft lands and takes off without leaving the active runway, counts as two operations. Aircraft operations are categorized in several ways, one of which is whether the operation is itinerant or local in nature. Itinerant operations are those conducted by aircraft coming from outside the Airport's traffic pattern. Local operations are conducted by aircraft remaining in the local traffic pattern, conducting simulated instrument approaches at the Airport, or by aircraft going to or from the Airport and a practice area within a 20-mile radius of the tower. Touch-and-go training activity is an example of local activity. Once categorized as itinerant or local operations, aircraft activity is further categorized by the nature of the operator. Transient aircraft operations are categorized into one of the following groups: air carrier, air taxi, general aviation, or military. Local operations are categorized as either general aviation or military.

A summary of total aircraft operations for Chandler Municipal for the period 2000 to 2005 is presented in **Table 1.1**.

Table 1.1
HISTORIC AIRCRAFT ACTIVITY

	ITINERANT OPERATIONS				LOCAL OPERATIONS		
Year	Air Carrier	Air Taxi	General Aviation	Military	General Aviation	Military	Total
2000	0	1,771	75,713	25	172,281	21	**249,811**
2001	0	2,237	64,675	20	165,472	45	**232,449**
2002	0	1,828	67,302	12	161,377	19	**230,538**
2003	0	1,939	64,780	10	152,929	13	**219,671**
2004	0	2,530	61,626	41	168,850	32	**233,079**
2005	0	2,739	62,816	34	169,489	17	**235,095**

SOURCE: Airport Management records
PREPARED: January 2006

As shown in Table 1.1, total aircraft operations at Chandler Municipal Airport have fluctuated between 2000 and 2005. Much of this can be attributed to the events of September 11th. Aircraft operation trends presented in Table 1.1 illustrate recent trends in general aviation that are affecting Chandler Municipal Airport and many other airports across the nation. *Chapter Two, Projections of Aviation Demand*, develops projections

of future aircraft activity at the Airport and examines the recent and anticipated future trends regarding general aviation which are also used to develop forecasts for each of the components of Chandler Municipal's aircraft activity.

Based Aircraft

A based aircraft is defined as an aircraft that is permanently stored at an airport, typically in a hangar building or tied down on an airport apron area. Historic based aircraft counts for the Airport taken from the FAA's Form 5010 and Airport Management records for the years 1998 through 2005 are presented in **Table 1.2**.

Table 1.2
HISTORIC BASED AIRCRAFT

Year	Single Engine	Multi Engine	Jet	Military	Helicopter	Other	Total
1998	323	21	0	0	10	0	**354**
1999	316	23	0	0	11	0	**350**
2000	358	24	0	0	10	0	**392**
2001	352	26	0	0	10	0	**388**
2002	379	19	0	0	13	0	**411**
2003	387	31	0	0	15	0	**433**
2004	399	31	0	0	15	0	**445**
2005	407	33	1	0	16	0	**457**

SOURCE: FAA Form 5010 and Airport Management records
PREPARED: January 2006

The number and types of based aircraft at an airport typically fluctuate as aircraft owners relocate and/or change the type of aircraft they own. In addition, on-airport flight schools and charter services that may be provided by fixed base operators (FBOs) frequently adjust their aircraft operating fleet to match the demand for their services. Projections of the based aircraft operating at Chandler Municipal are developed in a following task of the master planning process and facility developments required to support future based aircraft are also identified.

EXISTING AIRPORT FACILITIES

An essential element of the master planning process at Chandler Municipal is identifying the location and characteristics of existing facilities and ultimately determining their ability to meet the future needs of the Airport and its users. The inventory of existing facilities at Chandler Municipal Airport was completed through physical inspection, discussions with Airport management and staff, and review of existing Airport studies, airport layout plans, and related studies.

To facilitate the inventory process, existing airport facilities at Chandler Municipal are categorized and examined in the following sections:

- Airport Property
- Airfield Facilities
- Landside Facilities

- Support Facilities and Equipment
- Utilities
- Surface Access and Parking System

These inventory categories comprise important components of the Airport's infrastructure. For the Airport to efficiently accommodate future demand, each component must provide sufficient capacity while at the same time seamlessly integrate with other infrastructure components to support general aviation, limited military operations, and tenant needs.

Airport Property

Existing facilities at Chandler Municipal are located on approximately 542 acres currently owned by the City of Chandler. Current Airport property is identified in **Exhibit 1.3**.

Airfield Facilities

Airfield facilities are those facilities that accommodate aircraft operations and support the transitioning of aircraft from the air to the ground, and vice versa. At Chandler Municipal, airfield facilities currently include the following: runways and taxiways, lighting and signage, and aprons and tie-downs. Existing airfield facilities are summarized in the following sections and other factors impacting the airfield are also presented.

Runways and Taxiways

Chandler Municipal is currently served by parallel runways, Runway 4R/22L and Runway 4L/22R, 4,850 feet in length and 4,401 feet in length, respectively. The runways' geodetic bearings and the magnetic variation of the area determine the runway orientations and location of the runways relative to one another. The dimensions, conditions, and weight bearing capacity of the two runways are summarized in **Table 1.3**.

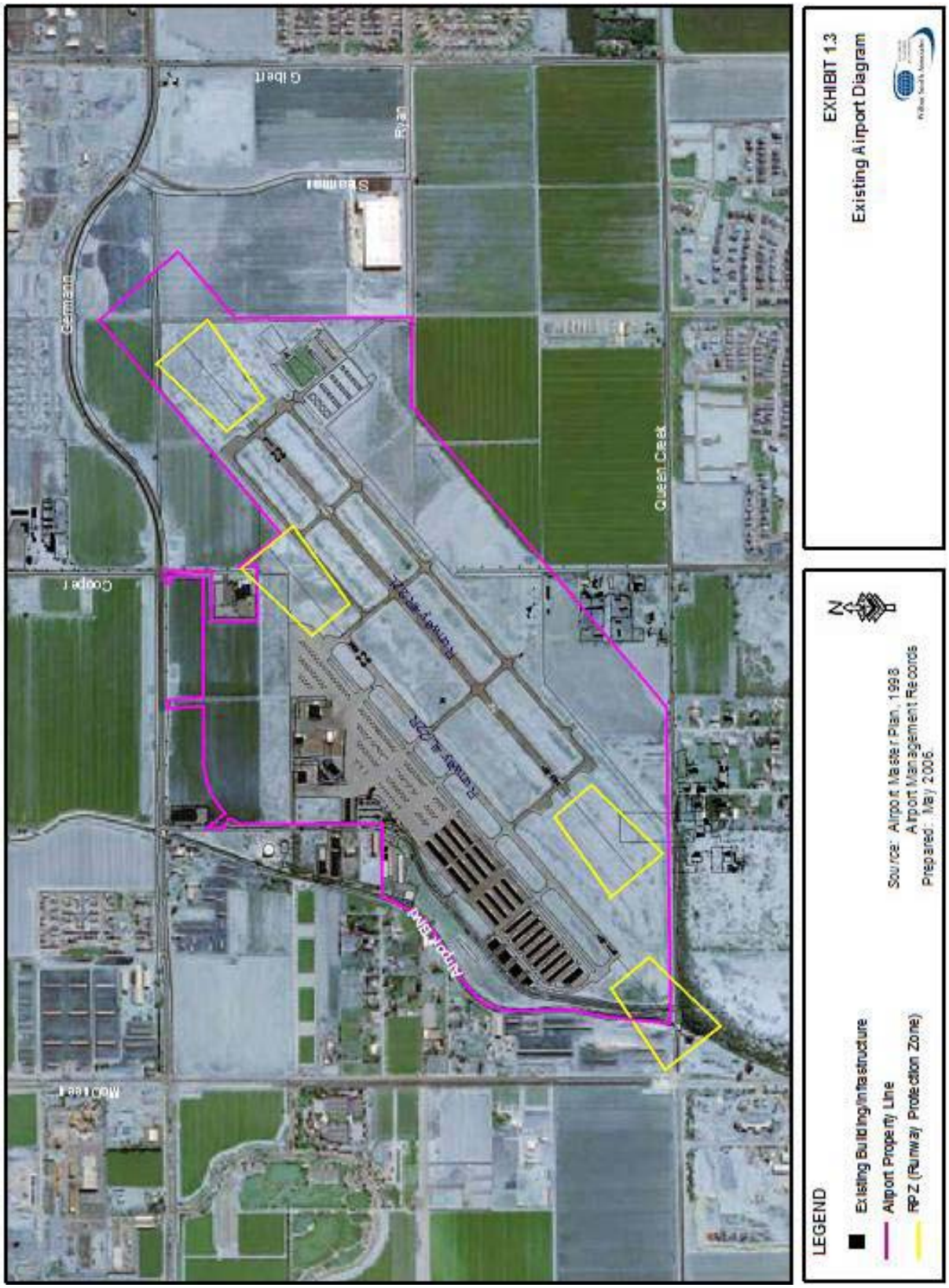


EXHIBIT 1.3
Existing Airport Diagram
LEGEND
Existing Building/Infrastructure
Airport Property Line
RPZ (Runway Protection Zone)
Source: Airport Master Plan, 1998
Airport Management Records
Prepared: May 2006
Gilbert
Ryan
Germann
Queen Creek
Cooper
Runway 4-22
Runway 4-22R
Airport Blvd
Mc Kellips

Table 1.3
EXISTING RUNWAY FACILITIES

	Runway 4R/22L	Runway 4L/22R
Length	4,850'	4,401'
Width	75'	75'
Surface/Condition	Asphalt/Good	Asphalt/Good
Weight Limitations	30,000 SWL*	30,000 SWL*

*SWL = Single Wheel Loading
SOURCE: 1998 Airport Master Plan, Airport Management records, www.airnav.com
PREPARED: January 2006

The runway system at Chandler Municipal is supported by a network of taxiways. The taxiways facilitate safe and efficient aircraft operations by allowing taxiing aircraft to remain clear of the active runway. Each runway is supported by a full-length parallel taxiway of comparable weight bearing capacity. A number of connector taxiways provide access to and from the runway and other airport areas including the terminal apron area, FBO apron areas, and transient apron areas.

Runway and taxiway system requirements at an airport are determined by a variety of factors including the number of aircraft operations occurring at the airport, the types of aircraft conducting those operations, the elevation of the airport, and the meteorological conditions in the airport area. The capacity of the existing runway system and its ability to accommodate the anticipated fleet mix at Chandler Municipal over the planning period are examined in a later chapter.

Runway wind coverage for aircraft is defined in terms of allowable rated crosswind by type of aircraft using the airfield. If the airfield is utilized solely by small aircraft the critical crosswind component would be 12 mph. Where types of aircraft classified as larger than utility (generally those aircraft weighing in excess of 12,500 lbs) are using the facility, a crosswind component of 15 mph is used. Chandler Municipal Airport is projected to continue to serve aircraft in excess of 12,500 pounds. Therefore, a crosswind component of 15 mph is used for the wind analysis.

Exhibit 1.4 shows runway wind coverage based upon historical weather observations at Williams Gateway Airport, which is the closest available long-term historical data source. It is recognized that local variations in wind patterns do occur. However, this reporting station is reasonably representative of the wind patterns present.

The analysis indicates that, under all weather conditions, crosswind velocities will not exceed 15 mph 99 percent of the time for both runways.

Heliport

The Airport adopted a Federal Aviation Regulation (FAR) Part 150 Noise Compatibility Study (Part 150 Study) in 1999. The objective of this study was to improve the compatibility between aircraft operations and noise-sensitive land uses in the area. One of the recommendations of this study was to relocate the heliport away from the

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13.5 Knots	16.0 Knots
4R/22L	98.75%	99.44%	99.84%
4L/22R	98.75%	99.44%	99.84%

Source: Williams AFB, Mesa, AZ
Observations from 1983 to 1992

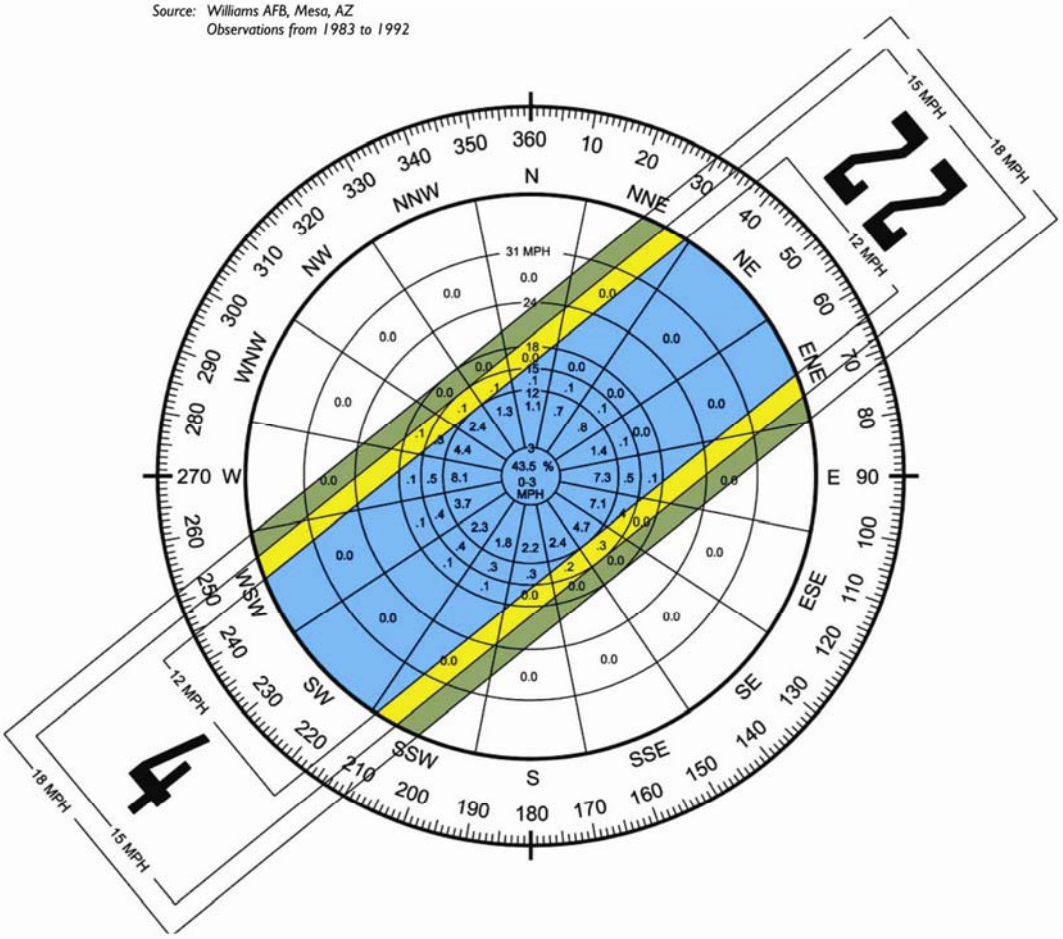


EXHIBIT 1.4
Chandler Municipal Wind Coverage

ENGINEERS PLANNERS ECONOMISTS
Wilbur Smith Associates

southwest side of the airfield. In 2005 the Airport relocated its heliport to the northeast side of the airfield as a result of the noise abatement recommendations in the 1999 Part 150 Study. The helipad facility's Final Approach and Takeoff Area (FATO) is 120 feet long by 100 feet wide. Additionally, it is supported by a taxiway and a helicopter parking apron.

Lighting, Signage, and Navigational Aids

Airport lighting and signage is important to supporting the control and movement of aircraft in the airfield area. It also helps pilots visually identify their location relative to the airport and the airfield area. Navigational aids, or NAVAIDS, are electronic or visual devices that provide guidance to pilots during the landing or takeoff of an aircraft.

Existing airfield lighting and NAVAID equipment at Chandler Municipal is summarized in **Table 1.4**.

Table 1.4
EXISTING AIRFIELD LIGHTING AND NAVAIDS

	Runway 4R/22L		Runway 4L/22R	
	4R	**22L**	**4L**	**22R**
Runway Edge Lighting	MIRL		MIRL	
Taxiway Lighting	MITL		MITL	
Runway Marking	Non-Precision		Basic	
PAPI	4-light PAPI	4-light PAPI	4-light PAPI	4-light PAPI
Approach Lights	No, REILs	No, REILs	No	No
Touchdown Point	Yes, no lights	Yes, no lights	Yes, no lights	Yes, no lights
Approach	Non-Precision	Visual	Visual	Visual
NAVAIDS	Non-Directional Beacon, Global Positioning System, LORAN-C, VORTAC			
Weather Aids	AWOS-3			

SOURCE: www.airnav.com; Airport Management records
PREPARED: January 2006

As shown in Table 1.4, both runways are equipped with medium intensity runway lighting (MIRL). Runway 4R/22L has non-precision markings and Runway 4L/22R has basic markings. The taxiways have medium intensity taxiway lighting (MITL). Other airfield lighting and NAVAID equipment identified in Table 1.4, and their respective functions, include the following:

- **PAPI** – There are 4-light precision approach path indicators (PAPIs) on both ends of Runways 4R/22L and 4L/22R. PAPIs provide visual guidance to pilots during their approach.
- **REILs** – Runway end identifier lights (REILs) are located on both ends of Runway 4R/22L.
- **NDB** – Non-directional beacons (NDBs) transmit non-directional radio signals to assist pilots in determining bearings.
- **GPS** – Global positioning system (GPS) uses satellites placed in orbit to determine altitude, speed, and navigational information for pilots.

- **LORAN-C** – A LORAN-C is a ground-based navigational aid utilizing transmitters located across the United States. A LORAN-C can allow pilots to navigate to any airport in the U.S.
- **VORTAC** – Very high frequency omnidirectional range with TACAN capability (VORTAC) provides distance and direction information to pilots.
- **AWOS-3** – An Area Weather Observation System (AWOS) is a system that allows pilots to have the most accurate account of weather at an airport that is available. This equipment transmits Airport-specific weather information and is transmitted at frequency 128.325 MHZ or by calling (480) 814-9952.

The ability of existing airfield lighting and NAVAID equipment to efficiently accommodate existing and future demand at Chandler Municipal is determined in a subsequent chapter.

Aprons and Tie-Downs

Airport apron areas serve a variety of purposes and are generally classified based on the users they are intended to support, the activities conducted on the apron area and/or their location on the airport. Existing apron areas at Chandler Municipal, their location, size, and function, are listed below:

- Terminal Area Apron Area
- FBO Apron Areas
- Heliport Apron Area

These apron areas account for approximately 90,000 square yards of aircraft parking which provide 251 aircraft tie-down spaces. The tie-down spaces are for based aircraft, transient aircraft, and aircraft utilizing FBO facilities. The majority of aircraft parking apron area is located in the terminal area on the main ramp. The ability of these apron areas to accommodate anticipated future Airport tenant needs is examined in a subsequent chapter.

Aircraft tie-down positions are located on each of the apron areas mentioned above. These tie-down positions accommodate the parking of general aviation aircraft, both based and transient, and are managed either by the City or the FBOs.

Landside Facilities

Landside facilities at airports consist of a wide variety of buildings and equipment that support airport operations. For the purposes of this analysis, the following facilities at Chandler Municipal Airport are categorized and examined as landside facilities:

- General Aviation Terminal
- Fixed Base Operators
- Aircraft Hangars

- Other Landside Facilities

General Aviation Terminal

The general aviation terminal has a total area of approximately 5,500 square feet and houses administration, and pilot and passenger areas; the terminal was constructed in 1996. The terminal building consists of a pilot's lounge, flight planning area, restrooms, lobby, conference room, office space, and Airport administration offices. The old terminal building is now occupied by Tailwind Flight Centre.

Fixed Base Operators

Fixed Base Operators (FBOs) support a variety of aviation activity at Chandler and are the primary providers of services and facilities for general aviation operators at the Airport. The majority of facilities at the Airport, including FBO facilities, is located to the northeast of the general aviation terminal and apron areas. There is currently only one FBO operating on the Airport, Chandler Air Service. Chandler Air Service provides hangar and tie-down storage space, fueling services, aircraft maintenance, aircraft rental, and flight training.

The FBO leases approximately four acres of land from the City of Chandler. The FBO owns and operates two hangar buildings, an apron, and other various facilities that are located on the leased ground.

Airport Rescue and Firefighting

There are no airport rescue and firefighting (ARFF) facilities in place at the airport. Chandler Fire Station 1 is the closest fire station to the Airport. It is located 1 ¼ miles from the Airport at the crossroads of Hamilton and Pecos. If for some reason Fire Station 1 is unable to respond an emergency at the Airport, any of the other engine and ladder stations are capable of responding to an emergency on the airfield. All of the City's engine and ladder fire stations conduct annual drills at the Airport to ensure they are familiar with the facilities.

Aircraft Hangars

Aircraft hangar structures at the Airport currently include facilities that support the activities of the FBO and general aviation operators. Two recently constructed corporate (condo) hangar developments on the Airport are located southwest of the terminal area and a third condo hangar development is under construction as of January 2006. Hangar facilities at the Airport consist of conventional hangars, t-hangars, shade hangars, and condo hangars. All of the conventional hangars are occupied by either the FBO or other specialized aviation service operators (SASO). These facilities provide for 238 covered storage spaces for aircraft (see **Table 1.5**).

Table 1.5
AIRCRAFT HANGAR STORAGE

Name	Building Label	Type	No. Hangar Units	Typical Inside Dimension	Total Square Feet
City Owned	Alpha	Lg. T-hgr	8	54' x 45'	14,674
City Owned	Bravo	Sm. T-hgr	10	42' x 36'	11,628
City Owned	Charlie	Sm. T-hgr	10	42' x 36'	11,628
City Owned	Delta	Sm. T-hgr	10	42' x 36'	11,628
City Owned	Echo	Lg. T-hgr	8	54' x 45'	14,674
City Owned	Fox	Sm. T-hgr	10	42' x 36'	11,628
City Owned	Golf	Sm. T-hgr	10	42' x 36'	11,628
City Owned	Hotel	Sm. T-hgr	10	42' x 36'	11,628
City Owned	India	Sm. T-hgr	10	42' x 36'	11,628
City Owned	Juliet	Sm. T-hgr	10	42' x 36'	11,628
City Owned	Kilo	Sm. T-hgr	10	42' x 36'	11,628
City Owned	Lima	Sm. T-hgr	10	42' x 36'	11,628
Sub-totals			*116*		*145,628*
Hangars Unlimited	Mike	Sm. T-hgr	10	44' x 38'	12,920
Hangars Unlimited	November	Sm. T-hgr	11	40' x 36'	12,240
Hangars Unlimited	Oscar	Sm. T-hgr	11	40' x 36'	12,240
Hangars Unlimited	Papa	Sm. T-hgr	11	40' x 36'	12,240
Hangars Unlimited	Quebec	Sm. T-hgr	10	44' x 42'	14,280
Hangars Unlimited	Romeo	Sm. T-hgr	11	40' x 36'	12,240
Hangars Unlimited	Sierra	Sm. T-hgr	11	40' x 36'	12,240
Hangars Unlimited	Tango	Lg. T-hgr	6	55' x 44'	12,007
Sub-totals			*81*		*100,407*
Hangars Unlimited*	Uniform	Conventional	2	86' x 44'	6,578
Hangars Unlimited	Victor	Conventional	4	56' x 50	10,200
Hangars Unlimited	Whiskey	Conventional	4	56' x 42	8,500
Hangars Unlimited	X-ray	Conventional	4	50' x 44	8,360
Hangars Unlimited*	Yankee	Conventional	4	49' x 40'	7,840
Hangars Unlimited*	Zulu	Conventional	4	49' x 40'	7,840
Hangars Unlimited*	Alpha-Alpha	Conventional	4	49' x 40'	7,840
Hangars Unlimited*	Alpha-Bravo	Conventional	2	45' x 42	3,780
Sub-totals			*28*		*60,938*
F & G Hangars*	Alpha-Charlie	Conventional	8	60' x 60'	14,400
F & G Hangars*	Alpha-Charlie	Conventional	8	50' x 40'	8,000
Sub-totals			*8*		*22,400*

Table 1.5, Continued
AIRCRAFT HANGAR STORAGE

Name	Building Label	Type	No. Hangar Units	Typical Inside Dimension	Total Square Feet
Venture Aviation	N/A	Conventional	1	80' x 80'	6,400
Chandler Aviation	N/A	Conventional	1	120' x 80'	9,600
Chandler Air Service	1	Conventional	1	50' x 40'	2,000
Chandler Air Service	2	Conventional	1	120' x 100'	12,000
Quantum Helicopters**	N/A	Conventional	1	60' x 60'	3,600
Sub-totals			*5*		*33,600*
Total			***238***		***362,973***

*In design or construction at time data (August 2005) was compiled.
** Owned by City of Chandler, leased to Quantum Helicopters
SOURCE: Airport Management records
PREPARED: January 2006

It should be noted that the Airport maintains a 10-year waiting list for hangar storage that requires a paid deposit. Additionally, the City is currently working with developers to lease ground for the design, construction, and operation of additional hangars.

Other Landside Facilities

Chandler Municipal is home to a diverse array of tenants that utilize Airport facilities and lease land and/or buildings from the City. The ability of the Airport to meet the current and future needs of these tenants is an important consideration in the master planning process. As of August 2005, there were 10 contractual agreements in place between the Airport and entities wishing to conduct business on the Airport and/or provide services to those using the Airport. A summary of existing Airport tenants located at Chandler Municipal, both on Airport property and adjacent, is presented in the following sections.

Chandler Air Service

Chandler Air Service is the Airport's only full-service FBO and is located on the northeast side of the terminal building. Chandler Air Service offers flight school training that is FAA approved, general aircraft maintenance, aircraft fueling, aircraft rental, and fuel sales. The FBO operates from two buildings. The first is a 12,000-square foot maintenance/hangar storage building with 5,000 feet of office space and an additional 800 square feet for Hangar Café, the Airport's only restaurant. It should be noted that Hangar Café subleases its space from Chandler Air Service. The second building is a conventional hangar that is approximately 2,000 square feet and is used for maintenance and hangar space as well as office space.

Chandler Air Service also provides both AvGas (10,000 gallon above ground tank) and Jet A fuels (12,000 gallon above ground tank). In addition to the storage tanks,

Chandler Air Service also operates fuel trucks for both fuel types as well as provides self-service AvGas. Chandler Air Service maintains 36 tie-down spaces.

Airport Business Center of Chandler, Inc

Airport Business Center of Chandler, Inc. is a real estate business and leases office and warehouse space to aviation businesses. Current tenants include Varga Enterprises, Inc., SoftComm Products, Inc., Aguila Aerospace Services LLC, Curtis Superior Valve Co., Inc., and Aircraft Engine Specialist LLC.

Aircraft Engine Specialist LLC

Aircraft Engine Specialist LLC specializes in overhaul and repair of Lycoming and Continental aircraft engines and engine accessories. Aircraft Engine Specialist is located adjacent to airport property.

Aguila Aerospace Services LLC

Aguila Aerospace Services LLC specializes in non-destructive testing. It should be noted that Aquila Aerospace Services is located adjacent to airport property.

Chandler Aviation

Chandler Aviation provides a complete line of maintenance services, annual aircraft inspections, sheet metal repairs, fabric repairs, and engine overhauls in a 120-foot by 80-foot conventional hangar (a total of 9,600 square feet). Chandler Aviation's operation is located just east of the terminal and is also located on the northeast apron area. Additionally, Chandler Aviation maintains 16 tie-down spaces.

Curtis Superior Valve Co.

Curtis Superior Valve Co., Inc. is located adjacent to airport property. Curtis Superior Valve is a manufacture of aircraft fuel and oil drain valves primarily for general aviation and military aircraft.

Exec Avionics

Exec Avionics occupies 2,500 square feet of hangar space through a lease agreement. They also maintain 600 square feet of office space. Exec Avionics provides full-service avionics sales and repairs at the Airport.

Hangar Café

Hangar Café is the only restaurant at the Airport. The Café is open for breakfast and lunch with outdoor seating available. As previously mentioned, Hangar Café sublets approximately 800 square feet of space in Chandler Air Service's larger hangar.

Hangars Unlimited

Hangars Unlimited, a division of HU Inc., a Washington corporation, is a land leasehold development system which builds and sells aviation storage hangars. The hangars are built in blocks and a Condominium Association is formed which simplifies ownership for the buyer. Currently, Hangars Unlimited leases 109 hangars in various stages of development. The hangars are a combination of t-hangars and conventional hangars. It should be noted that Hangars Unlimited offices are not located on Airport property.

Holmes Aviation

Holmes Aviation specializes in engine overhauls, repairs, and accessories. The company also occupies space within the larger Chandler Air Service conventional hangar through a sublease agreement.

Quantum Helicopters

As of January 2006, Quantum Helicopters is located on the western portion of the airfield adjacent to the old heliport area, however, the company is in the process of building new facilities on the eastern side of the airfield adjacent to the new heliport area. Quantum Helicopters currently leases a 3,600-square foot hangar from the City of Chandler. Quantum has 2,000 square feet of office space as well. Quantum provides helicopter flight training and charter service.

SoftComm Products, Inc

SoftComm Products is manufacturer of general aviation headsets, intercoms, and flight computers. The company currently sublets space from Varga Enterprises, Inc. It should be noted that SoftComm Products is located adjacent to Airport property.

Tailwind Flight Centre

Tailwind Flight Centre provides the Airport with flight training and aircraft rental and is located south of the existing general aviation terminal in the old terminal building.

Varga Enterprises, Inc.

Varga Enterprises is a mail order retail and wholesale aircraft parts distributor. Varga Enterprises has a full-line instrument and hose shop. It should be noted that Varga Enterprises is located adjacent to Airport property.

Support Facilities and Equipment

In addition to airside and landside facilities at the Airport, there are a variety of support facilities and equipment that facilitate the operations of Airport users and tenants. Depending on function, some specific facilities are owned by the City of Chandler while others are owned and operated by individual tenants. In some cases, tenant-owned equipment is stored on or within Airport-owned facilities. The specific support facilities inventoried in this chapter include fuel storage and distribution.

The Airport's fuel storage facility is located adjacent to the old heliport area. On this site, the Airport maintains fuel storage tanks to support the fueling of AvGas fuel. The fuel farm includes four underground storage tanks: two 8,000 gallon tanks, one 10,000 gallon tank, and one 12,000 gallon tank storing AvGas. As previously mentioned, Chandler Air Service provides both AvGas and Jet A fuels. The City receives a fuel flowage fee from Chandler Air Service in the amount of $0.10 per gallon of fuel pumped. The City also operates a self-service AvGas fuel island located adjacent to Tailwind Flight Centre. The fuel facilities provided by the City and Chandler Air Service comply with Arizona Department of Environmental Quality (ADEQ) requirements. Further, the City and Chandler Air Service are the only fuel providers at the airport.

Utilities

Utility services are provided to the Airport and its tenants by several local companies and the City of Chandler. The existing utility infrastructure at Chandler Municipal Airport is summarized as follows:

- **Water Service** – Water Service is provided by the City of Chandler.
- **Sanitary Sewer Service** – The City of Chandler provides sanitary sewer service to the general aviation terminal building, the old terminal building, old heliport, and condo hangars. Sanitary sewer for all other facilities at the airport is accommodated through septic systems.
- **Electrical Power** – Salt River Project (SRP) provides all electrical power to the Airport. It should be noted that all power lines located on Airport property have been buried underground except at the t-shade hangars and north of the Airport's property.
- **Gas Service** – Natural gas is not currently available at the Airport.
- **Telecommunications** – Qwest Communications provides telecommunication services to the Airport. The terminal building is equipped with digital telephone/data lines.

Surface Access and Parking System

The ability of Airport users to efficiently access the Airport via the Chandler area's surface transportation infrastructure is an important consideration in the master planning process. Furthermore, Airport users require convenient access to parking facilities once

at the Airport. An inventory of the Airport's surface access and parking system is presented in the following sections:

- Airport Access Roads
- Airport Parking Facilities

Airport Access Roads

Arizona State Highway 202 is the primary regional access roadway serving the Airport. The highway is classified as an expressway and is a divided, six-lane highway connecting the City of Chandler with Maricopa County and other suburban areas. State Highway 202 serves as a primary route for traffic destined for Phoenix and other parts of the eastern metropolitan area. As previously mentioned, State Highway 202 is currently being extended to the east and was opened to Gilbert Road in December 2005. Once complete, State Highway 202 will be a "loop" road that will provide east-west access to the area, including access to Interstate 10 to the west. Vehicular traffic accessing the Airport can use State Highway 202, U.S. Highway 60, or a number of secondary roads such as Gilbert Road, Germann Road, Queen Creek Road, and McQueen Road.

Suburban development in the Airport area has helped to stress the ability of highway structures to efficiently accommodate growing traffic demand. Increasing congestion of these roadways has not impacted access to the Airport dramatically.

Airport Parking Facilities

The vast majority of Airport parking facilities support the terminal area and adjacent FBO and tenant areas. The designated parking area in the terminal area can accommodate 30 vehicles. The FBO and tenant areas account for approximately 200 additional spaces that are paved.

Airport Fencing and Security

The airport is surrounded by a commercial and residential real estate. Additionally, major roadways are in the immediate vicinity of the Airport. Wildlife are often seen on and adjacent to Airport property. These types of encroachment, especially on the runways and taxiways, are a serious safety concern to aircraft. To protect the safety of aircraft operations and provide security environment, a six-foot chain link fence topped with barbed wire was installed around the airfield. There are several automatic vehicle entry gates, manually operated swing gates, and pedestrian access gates installed along the fence. In addition to the perimeter fencing and security gates, the Chandler Police Department performs a facility check on a regular basis throughout the day.

Pavement Condition

A report entitled, "Chandler Municipal Airport – Pavement Management Report," dated October 2003 prepared by Applied Pavement Technologies, Inc. was obtained by the Arizona Department of Transportation. This information provided the construction history for airside pavements at the Airport and presented the detailed results of a visual pavement condition survey conducted in January 2003.

For inspection purposes, each section was divided into sample units. Representative sample units were then randomly chosen at the network level frequency within each section for actual survey and data recordation.

The PCI (pavement condition index) is based on a number of distinct distress types, quantities and severities commonly found on airport pavements. After all distresses for each sample unit are measured and catalogued, the PCI is computed as a numerical rating index between 0 and 100, with a PCI of 100 being a pavement in "Excellent" condition.

The pavements at Chandler Municipal range from 57 to 95 upon inspection in November 2003. It should be noted that the Airport is currently updating its Pavement Management Report. The findings should be available by the end of 2006.

AIRSPACE AND APPROACHES

Free and unencumbered use of the airspace above and around Chandler Municipal Airport is crucial to the safe and efficient operation of aircraft at the Airport. An important consideration in the master planning process is the protection and maintenance of navigable airspace. The following sections summarize existing airspace characteristics on and around Chandler Municipal as well as the instrument approach procedures at the Airport. Various aspects of the Airport's navigable airspace are summarized in the following sections:

- Airport Traffic Pattern and Procedures
- Air Traffic Control Facilities and Procedures
- Aeronautical Radio Communications
- Instrument Approaches and Equipment
- Regional Airspace Considerations
- Avoidance of Noise Sensitive Areas

These sections provide an understanding of the existing airspace characteristics of the Airport and regional factors that impact aviation activity at Chandler Municipal Airport.

Airport Traffic Pattern and Procedures

The approach, departure, and taxiing of aircraft on the parallel runway system and taxiways at Chandler Municipal is managed by the Airport's Air Traffic Control Tower (ATCT). Runway usage is determined based on the weather conditions at the Airport, including wind direction and speed, and the amount of aviation activity occurring at the Airport at any given time. When conditions and activity levels allow, Airport users are typically directed to use the closest runway environment to minimize taxiing requirements which during calm winds and ideal conditions is Runway 4L/22R.

As a result of prevailing winds and atmospheric conditions at the Airport, on an average annual basis, the majority of aircraft operations occur to the northeast, with approaches to and departures from Runway 4R and Runway 4L. The remaining annual activity operates in a southwesterly flow with approaches to and departures from Runway 22R and Runway 22L.

The centerlines of the parallel runways at Chandler Municipal Airport are separated by approximately 1,750 feet. There are no adverse effects to aircraft operating simultaneously due to the separation between Runways 4R/22L and 4L/22R during visual flight rules (VFR).

In VFR conditions, periods when there is at least 1,000 foot cloud base and 3 miles visibility, general aviation traffic is typically assigned to Runway 4L/22R. Runway 4R/22L is also used to accommodate general aviation activity during peak periods of activity.

During periods of instrument flight rule (IFR) conditions, those periods when weather conditions do not meet VFR requirements, arriving IFR aircraft use NDB, VOR or GPS approaches to Runway 4R.

Air Traffic Control Facilities and Procedures

The Air Traffic Control Tower (ATCT) at Chandler Municipal is in operation 15 hours a day and is charged with controlling the movements of all aircraft within a four nautical mile radius of the Airport up to an altitude of 3,000 feet MSL. In addition to the Chandler Municipal ATCT, there are other entities that share responsibility in managing the movement of aircraft during fight to and from the Airport as well as during approach and departure procedures. The specific roles that each of the following has in managing aviation traffic at Chandler Municipal are summarized in the following sections:

- Albuquerque Air Route Traffic Control Center (ARTCC)
- Phoenix Terminal Radar Approach Control (TRACON)

Albuquerque Air Route Traffic Control Center

The Albuquerque Air Route Traffic Control Center (Albuquerque ARTCC) controls all IFR aircraft and some VFR operations within controlled airspace across a multi-state area, including the Phoenix metropolitan area. The Albuquerque ARTCC controls aircraft movements at altitudes greater than 10,000 feet above ground level (AGL) and is responsible for establishing the initial approach sequencing of aircraft and providing adequate separation from all other known traffic. As enroute aircraft approach Chandler Municipal Airport and get within approximately 25 to 40 mile radius of the Volunteer VORTAC, they become the responsibility of the Phoenix Terminal Radar Approach Control (TRACON). Typically, once an aircraft departing from Chandler Municipal reaches 10,000 feet AGL they become the responsibility of the Albuquerque ARTCC.

Phoenix Terminal Radar Approach Control

The Phoenix TRACON controls aircraft under 10,000 feet AGL during their approach to and departures from Chandler Municipal. It is the responsibility of the Phoenix TRACON to provide separation for participating aircraft in the vicinity of the TRACON boundary area and direct them to the Airport by instructing pilots to fly specific altitudes and headings called radar vectors. This process is used for all IFR arriving traffic regardless of its destination airport in the TRACON boundary. As aircraft approach the Chandler Municipal airspace area, the TRACON "hands-off" or transfers control responsibility to the Chandler Municipal Air Traffic Control Tower (ATCT). This process is reversed for aircraft departing Chandler Municipal Airport.

Aeronautical Radio Communications

Communications between pilots, controllers, and other FAA personnel in the environs of Chandler Municipal Airport are facilitated by aeronautical radio communication equipment. These pieces of communication equipment operate on assigned radio frequencies and provide unique Airport-specific information related to air traffic guidance and Airport-area weather conditions. Important radio communication facilities at Chandler Municipal Airport are described below and their frequencies are on the following page.

- **ATIS** – The Air Traffic Information System (ATIS) equipment transmits a continuous broadcast of recorded non-control information for certain terminal areas. At Chandler Municipal this information is transmitted at 128.325 MHZ.
- **UNICOM** – The UNICOM (Uniform Communications) frequency at Chandler Municipal operates at 122.95 MHZ.
- **Phoenix Radar Approach/Departure Control** – The Terminal Radar Approach/Departure Control (TRACON) manages the arrival and departure of aircraft in Chandler Municipal airspace on the 123.7 frequency.
- **Chandler Municipal ATCT** – The takeoff and landing of aircraft at Chandler Municipal is managed by Chandler Municipal ATCT personnel via communication

with aircraft on several frequencies depending on heading/location of aircraft and the amount of activity in the Airport area. The primary frequencies used are 126.1 MHZ for aircraft north and west of the Airport, and 133.1 MHZ for aircraft south and east of the Airport.

- **Ground Control** – Chandler Municipal ATCT personnel also control the movement of pilots and aircraft once they are on the ground at Chandler Municipal with radio communications at 124.2 MHZ.
- **WX AWOS** – This equipment transmits Airport-specific weather information and is transmitted at frequency 128.325 MHZ or by calling (480) 814-9952.

Radio communication facilitated by these Airport facilities promotes safe and efficient aircraft operations.

Instrument Approaches and Equipment

An instrument approach procedure is defined as a series of predetermined maneuvers for guiding an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or a point from which a landing may be made visually. Instrument approaches rely on navigational aid (NAVAID) equipment to provide the necessary guidance to pilots in flight. Available NAVAIDs at Chandler Municipal are summarized in the previous Airfield Facilities section of this chapter.

Instrument approach procedures are classified as precision approaches or non-precision approaches based on the guidance provided to pilots. Precision approaches are procedures that provide both vertical guidance, typically via a glide slope, and horizontal guidance, typically with a localizer, to aircraft. Non-precision approach procedures and equipment provide only horizontal guidance to pilots. Instrument approach equipment and available non-precision approaches at Chandler Municipal include the following:

- **Area Navigation with Global Positioning System (RNAV (GPS))** – A non-precision approach type utilizing radio signals from Area Navigation equipment and/or radio signals from a network of navigational satellites.
- **Very-High Frequency Omnidirectional Radio (VOR)** – A non-precision approach that utilizes a radio signal from an on or off airport facility to aid in an instrument approach.
- **Non-Directional Beacon (NDB)** – A radio signal from an on or off airport facility used for non-precision approach procedures. An NDB is considered an older and less accurate system than a VOR.

It should be noted that the 1994 and 2001 *Federal Radionavigation Plan* outlines the phase out of ground-based NAVAIDS, including NDBs. It is anticipated that their primary importance will be replaced by Global Positioning Systems (GPS). The NDB approach to Runway 4R is planned to be phased out by the FAA.

Instrument approaches at Chandler Municipal and their respective current decision height and site distance minima are summarized in **Table 1.6**.

Table 1.6
CURRENT INSTRUMENT APPROACHES

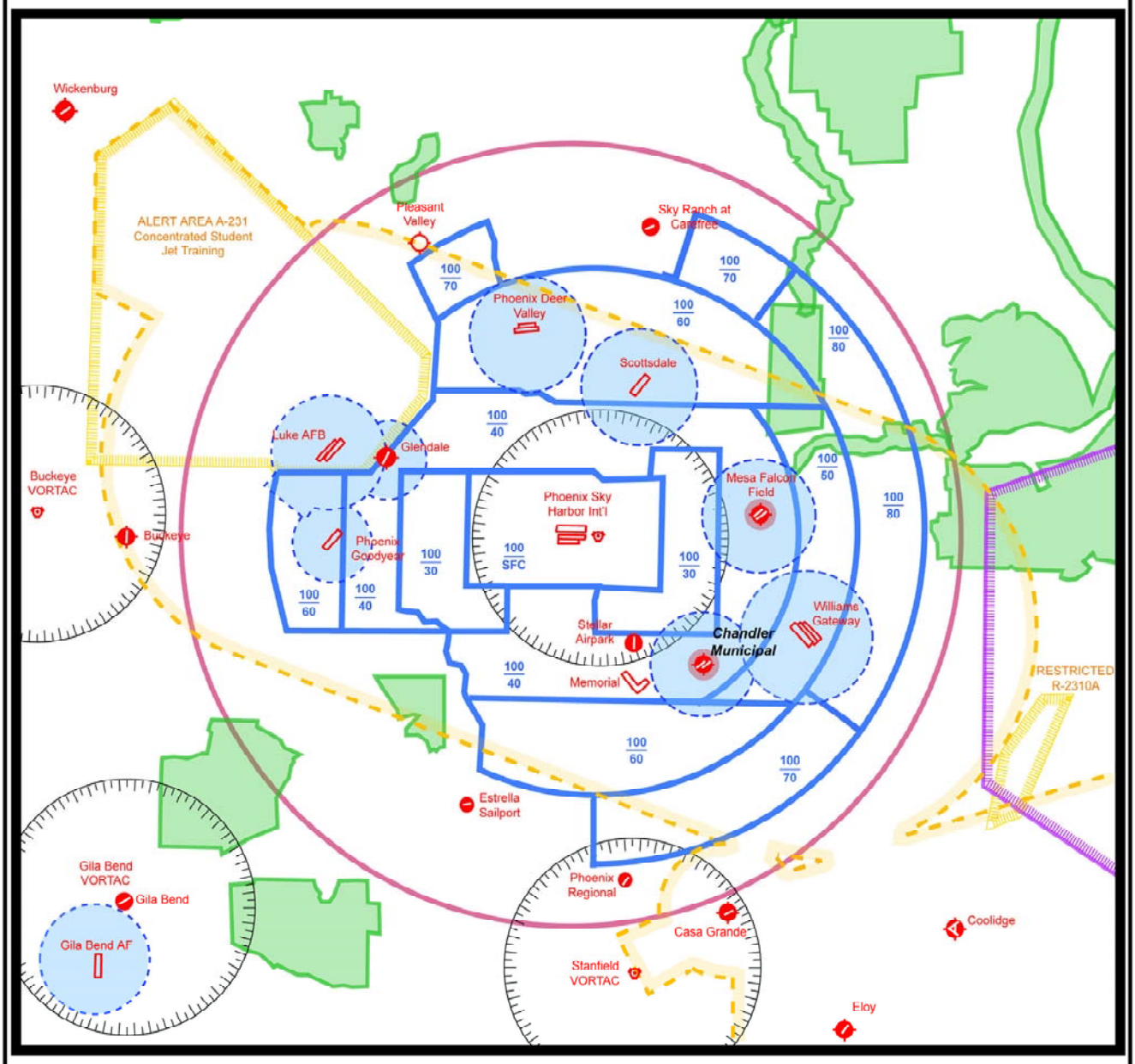
Runway End	Approach Type	Decision Height (MSL)	AGL	Site Distance
4R	RNAV (GPS)	1,680'	437'	1 mile
4R	NDB	1,780'	537'	1 mile
4R	VOR	1,680'	437'	1 mile

SOURCE: U.S. Terminal Procedures, August 4, 2005
PRESENTED: January 2006
Note: Minimums represented are for Category A and B aircraft only.

The decision height minimum (depicted in terms of mean sea level) denotes the height above ground level (AGL) at which the pilot must be able to visually identify the runway environment. If the pilot reaches this altitude and cannot visually identify the runway environment, a missed approach procedure must be conducted and the aircraft may re-initiate the approach procedure or proceed to an alternative destination. The site distance minimum represents the minimum visibility in statute miles, prescribed for landing while using an instrument approach procedure. The ability of these approach procedures to safely and efficiently accommodate current and future activity levels at the Airport is determined in a following task in the master planning process.

Regional Airspace Considerations

General airspace characteristics and classifications in the environs of Chandler Municipal Airport are examined in the following sections and factors that impact, or could potentially impact, aircraft operations at and around the Airport are identified. The current airspace characteristics of the region, as depicted on the Phoenix Sectional Aeronautical Chart, are presented in **Exhibit 1.5**.



Legend

- Wilderness Preserves
- Other than hard-surfaced runway
- Hard-surfaced runways 1500 ft. to 8,069 ft. in length
- Hard-surfaced runways > than 8,069 ft. in length or some multiple runways less than 8,069 ft.
- VORTAC
- Compass Rose
- Prohibited, Restricted, Warning and Alert Areas
- Military Operations Area (MOA)
- Class B Airspace
- Class D Airspace
- Class E Airspace
- 30 Nautical Mile Mode C Veil
- Non-Directional Beacon (NDB)

Source: Phoenix Sectional Aeronautical Chart 73rd Edition * Include Airspace Amendments Effective May 12, 2005
Prepared: October 2005

EXHIBIT 1.5
Regional Airspace

Through Federal Aviation Regulations (FARs), airspace classifications have been developed to promote the safe and efficient movement and control of aircraft during flight and approach/departure procedures. Airspace classifications are identified on sectional aeronautical charts published by the FAA's National Aeronautical Charting Office. FAR Part 71 and FAR Part 73 establish classifications of airspace with the following characteristics:

- **Class A Airspace** – Class A airspace is not shown on aeronautical charts. It begins at 18,000 feet above mean sea level (MSL) and extends to higher altitudes. Only pilots flying IFR can enter this airspace and prior permission is required. Class A airspace does not significantly impact the operation of Chandler Municipal.
- **Class B Airspace** – Class B airspace is found around major airports. Pilots must get permission to enter this airspace from the controlling agency, typically the Terminal Radar Approach Control (TRACON) facility associated with the airport and region. The Class B airspace located in the region surrounds Phoenix Sky Harbor International and provides controlled airspace along some primary arrival routes to Chandler Municipal.
- **Class C Airspace** – Class C airspace is the airspace from the surface to 4,000 feet above the airport elevation. Although the configuration of each Class C airspace area is individually tailored, the airspace usually consists of a surface area with a 5 mile radius, and an outer circle with a 1 mile radius that extends from 1,200 feet to 4,000 feet above the airport elevation. An aircraft must establish two-way radio communication with the controlling agency providing air traffic services prior to entering the airspace and thereafter maintain those communications while within the airspace. VFR aircraft are only separated from IFR aircraft within the airspace. Class C airspace does not exist in the Chandler Municipal area.
- **Class D Airspace** – Class D airspace exists at any airport with an operating air traffic control tower where Class B or Class C airspace does not exist. Class D airspace typically extends 5 miles from the airport to an altitude of 2,500 feet AGL. Pilots must establish two-way radio communication with the controlling agency, usually the air traffic control tower, before entering this classification of airspace. Because there is Class B airspace surrounding Chandler Municipal, Class D airspace and its associated restrictions do impact aircraft operations at Chandler Municipal. It should be noted that when the Chandler Municipal ATCT is inactive, the Class D airspace surrounding the Airport reverts to Class E airspace.
- **Class E Airspace (with floor 700 feet above surface)** – Class E airspace typically surrounds airports having instrument approaches and encompasses portions of the instrument approach paths. The flight requirements within Class E airspace result in increased aircraft separation requirements thereby promoting safety and minimizing potential incidents between IFR and VFR aircraft in this airspace. Class E airspace protects portions of instrument approach paths associated with the Phoenix metropolitan area and Chandler Municipal Airport.

- **Class G Airspace** – Class G airspace is referred to as uncontrolled airspace and is not depicted on aeronautical charts. This classification of airspace comprises all airspace not identified as another class. IFR flights typically do not operate in Class G airspace, as no ATC services are provided. VFR flights are permitted as long as visibility and cloud clearance minimums are met. Class G airspace does not significantly impact operations at Chandler Municipal.
- **Restricted Areas** – Restricted areas contain airspace identified by an area on the surface of the earth within which the flight of aircraft, while not wholly prohibited, is subject to restrictions. Restricted areas denote the existence of unusual, often invisible, hazards to aircraft; examples include artillery firing, aerial gunnery, or guided missiles. Penetration of restricted areas without authorization from the using or controlling agency may be extremely hazardous to the aircraft and its occupants. An area located approximately 25 miles southeast of Chandler Municipal Airport is designated as restricted airspace. Restricted Areas R-2310 A, B, and C operate at various times and altitudes ranging from 10,000 to 35,000 feet.
- **Prohibited Areas** – Prohibited areas contain airspace within which the flight of unauthorized aircraft is prohibited. Such areas are established for security or other reasons associated with the national welfare. Prohibited areas are published in the National Register and are depicted on aeronautical charts. There are no areas of prohibited airspace proximate to Chandler Municipal Airport.
- **Military Operations Areas (MOAs)** – MOAs consist of airspace of defined vertical and lateral limits established for the purpose of separating certain military training activities from IFR traffic. Whenever a MOA is being used, nonparticipating IFR traffic maybe be cleared through a MOA if IFR separation can be provided by air traffic control. Otherwise, air traffic control will reroute or restrict nonparticipating IFR traffic. Pilots operating under VFR should exercise caution while flying within a MOA when military activity is being conducted. Prior to entering an active MOA, pilots should contact the controlling agency for traffic advisories. The Outlaw MOA is located approximately 22 miles east of Chandler Municipal Airport. The operations conducted within the Outlaw MOA are typically conducted Monday through Friday between the hours of 7:00 am and 8:00 pm, and between the altitudes of 3,000 and 8,000 feet AGL. The Outlaw MOA does not significantly impact aircraft operations at the Airport.
- **Alert Areas** – Alert areas are depicted on aeronautical charts to inform nonparticipating pilots of areas that may contain a high volume of pilot training or an unusual type of aerial activity. Pilots should be particularly alert when flying in these areas. All activity within an alert area shall be conducted in accordance with the Code of Federal Regulations (CFRs), without waiver, and pilots of participating aircraft as well as pilots transiting the areas shall be equally responsible for collision avoidance. There are no area alerts near Chandler Municipal.
- **Military Training Route (MTR) –** Several military training routes are located south of Chandler Municipal Airport. These routes are used by military training

aircraft which operate at speeds in excess of 250 knots and altitudes to 10,000 feet MSL. Pilots are strongly cautioned to be alert for high-speed military jet training aircraft.

As the summary descriptions of airspace classifications indicate and **Exhibit 1.6** shows, different classes of airspace have different characteristics, dimensions, altitudes, and requirements based on the types of activity that they are intended to support. Existing airspace classifications in the vicinity of Chandler Municipal and those that could have the potential to impact aircraft operations at the Airport have been identified. Any potential impacts that these airspace classifications and areas may have on the Airport will be examined prior to identifying the recommended development plan for the Airport.

Avoidance of Noise Sensitive Areas

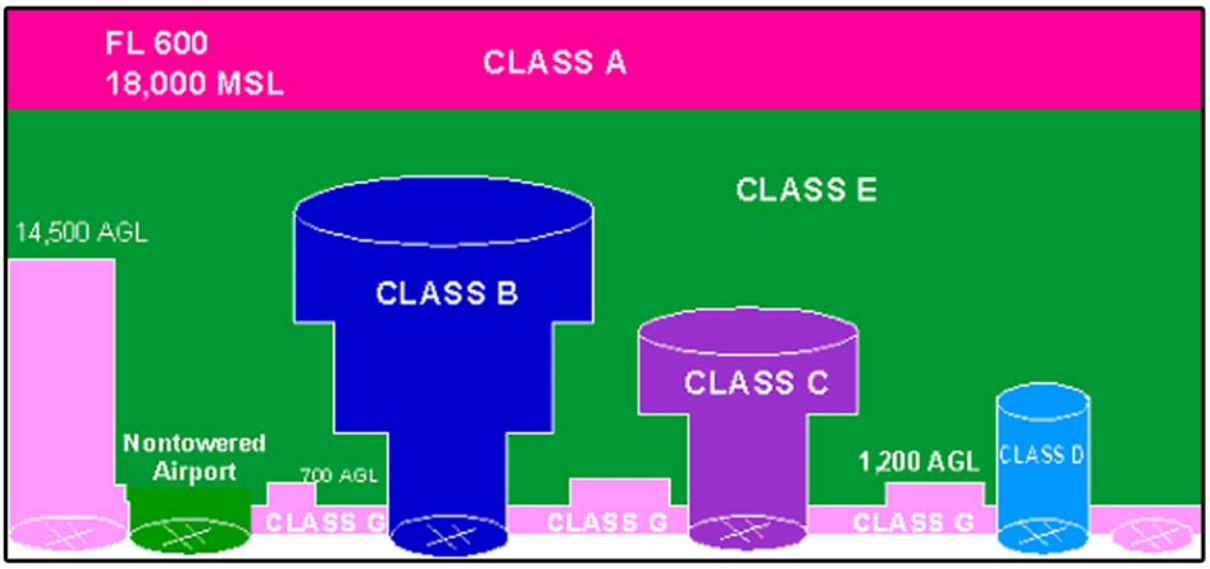
The Airport conducted a FAR Part 150 Noise Compatibility Study (Part 150 Study) that was adopted in 1999. The objective of the noise compatibility planning process was to improve the compatibility between aircraft operations and noise-sensitive land uses in the area, while allowing the Airport to continue to serve its role in the community, State, and nation. The Part 150 Study included measures to abate aircraft noise, control land development, mitigate the impact of noise on non-compatible land uses, and implement and update the program. Many of the recommendations from the Part 150 Study were related to the noise generated by helicopters operating at the Airport and relocating the heliport. Where possible, this and other Part 150 Study recommendations were implemented over the last several years.

CLIMATIC AND METEOROLOGICAL CONDITIONS

Climatic and meteorological conditions are important considerations in the analysis and development of aviation-related facilities. Considerations related to temperature, wind speed, wind orientation, and visibility help to identify facility requirements at specific airports. Effective airport planning and development can minimize the impacts that climatic and meteorological conditions have on aircraft operations and can promote the maximum utilization of airport facilities.

Data related to weather conditions at Chandler Municipal is available from nearby Williams Gateway Airport through the National Oceanic and Atmospheric Administration (NOAA). Climatic and meteorological data relevant to the master planning process at Chandler Municipal can be summarized as follows:

- The predominant wind direction at Chandler Municipal is from the southwest and over 90 percent of the recorded wind speed at the Airport is under 10 knots.
- Normal daily mean temperatures at the Airport range from 54.2 degrees Fahrenheit in January to 92.8 degrees Fahrenheit in July.
- The average daily mean temperature at the Airport is 72.8 degrees Fahrenheit.



Airspace Classes	Communications	Entry Requirements	Separation	Special VFR in Surface Area
A	Required	ATC clearance	All	N/A
B	Required	ATC clearance	All	Yes
C	Required	Two-way communications prior to entry	VFR/IFR	Yes
D	Required	Two-way communications prior to entry	Runway operations	Yes
E	Not required for VFR	None for VFR	None for VFR	Yes
G	Not required	None	None	N/A

Legend

AGL - Above Ground Level
FL - Flight Level
MSL - Mean Sea Level

Source: USDOT and FAA; Effective: September 16,1993
Prepared: December 2005

EXHIBIT 1.6
U.S. Airspace Classifications

- The absolute maximum average temperature at the Airport is 104.2 degrees Fahrenheit in June and the absolute minimum average temperature is 43.4 degrees Fahrenheit in January.
- Average annual precipitation in Chandler and the Phoenix metropolitan area is 8.29 inches and includes trace amounts of snow/ice per year.
- Rain is fairly evenly distributed throughout the year with summer months being relatively wetter and referred to as "monsoon season."

The impacts that these climatic and meteorological conditions have on Chandler Municipal and the operation of aircraft at the Airport are examined in detail in the facility requirements task of the master planning process.

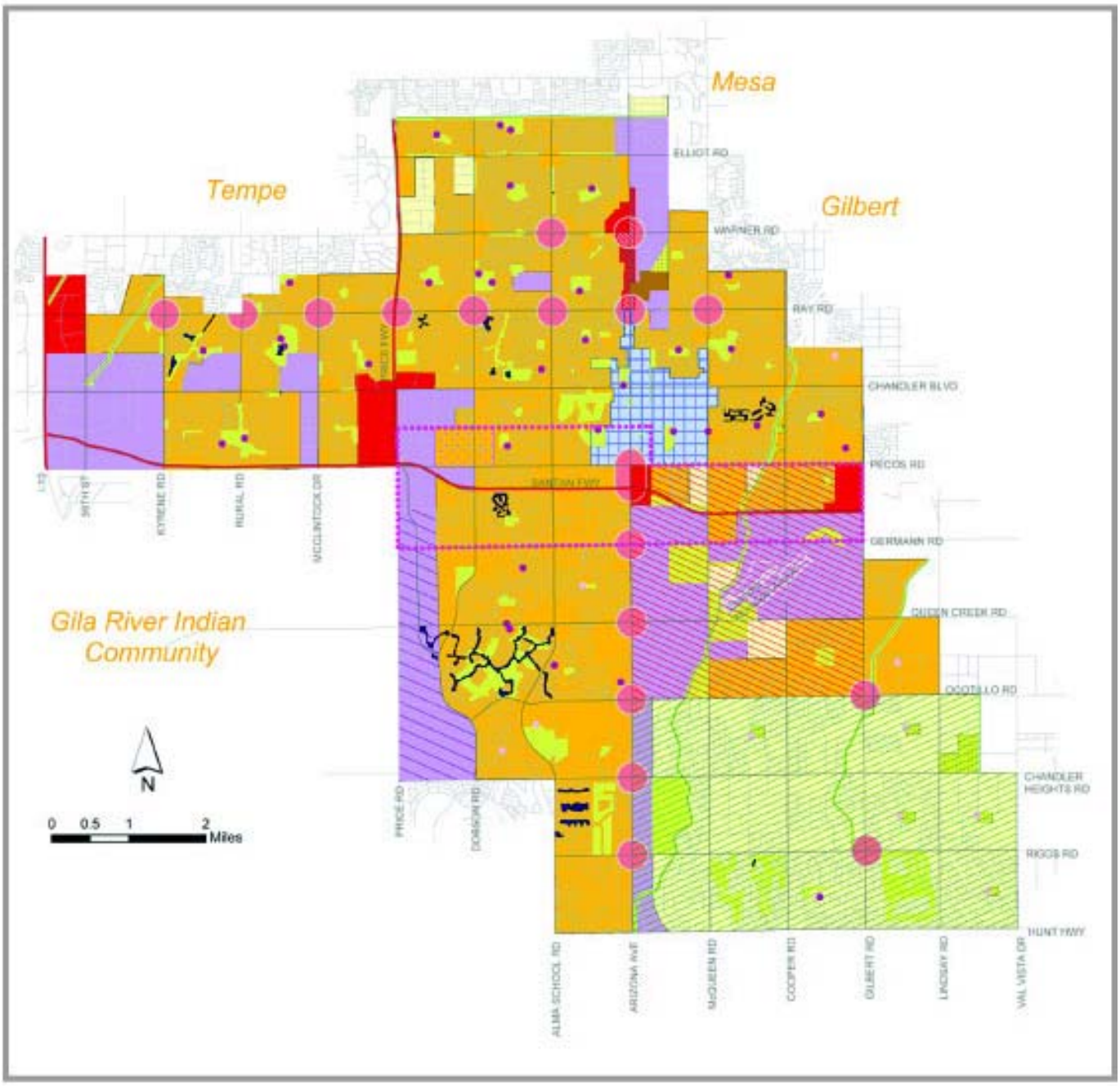
AREA LAND USE PATTERNS AND ZONING

Identifying land use and zoning characteristics in the environs of airports is an important task in the master planning process because of significant impacts that incompatible development in the airport area can have on the facility's continued operation and development. Working with the relevant planning commissions, counties, municipalities, or other entities to promote compatible land uses and zoning in the environs of Chandler Municipal can allow the Airport to continue to operate and develop in a manner that minimizes the impacts of the Airport on non-compatible land uses.

The City of Chandler has adopted a specific zoning district, AP-1-Airport District, to regulate the development of land owned or leased by the City of Chandler as well as height restricts as they apply to FAA Part 77 requirements. These regulations specify allowed uses or uses that can be considered under a Use Permit process to verify compatibility with the Airport. Additionally, these regulations specify development standards in the interest of the safety and compatibility with airport operations and to ensure the development quality of a public land use.

Current land uses of lands south of Queen Creek and east of McQueen Road primarily include industrial/support uses, transitional/mixed uses, and commercial uses along the immediate borders of the Airport's property. Residential areas are located primarily to the south and east of the Airport.

In November 1998, the City of Chandler adopted the *Chandler Airpark Area Plan*. This plan was developed to guide future development in and around the airport area. The airpark area encompasses approximately nine square miles surrounding the Airport. The goal of plan is to protect the Chandler Municipal Airport from residential encroachment and economic development within the area. The City of Chandler later adopted (March 2002) the *Chandler General Plan* which updated its land use plan, as shown in **Exhibit 1.7**. In this plan, Chandler Municipal Airport and the Chandler Airpark are identified and have the appropriate land use zoning adjacent to both entities. The surrounding areas serve as a "buffer" to the residential areas located to the north and



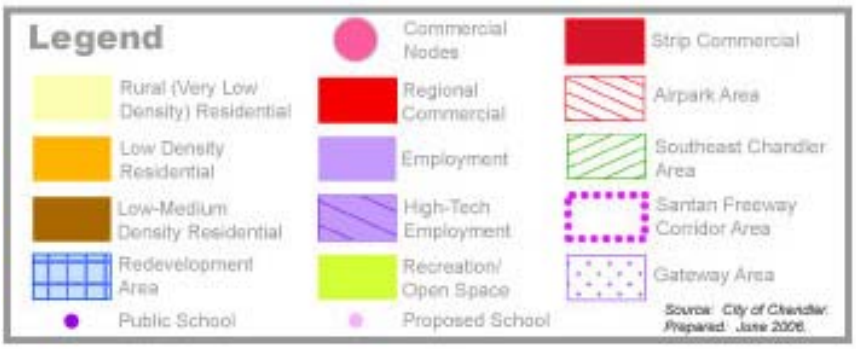


EXHIBIT 1.7
Chandler Land Use Map

Wilbur Smith Associates

southeast. It should be noted that the *Airpark Area Plan* follows the overall goals and policies of the *General Plan* and is compatible with surrounding uses which are planned.

Arizona has several statutes in place that were developed to reflect the importance of addressing airport noise. The first, Airport Influence Area (ARS: 28-8485), was implemented in 1997. At this same time, to encourage the preservation of military airports in Arizona, Military Airport Registry was also implemented (ARS: 28-8483 and 28-8484), which was later amended to Military Airport Disclosure. The Public Airport Disclosure (ARS: 28-8486) was implemented in 2000.

The Airport Influence Area statute allows the development of an airport influence area to serve as a notification that properties are located in the vicinity of an airport that may be impacted by noise levels or aircraft overflights. If an airport influence area is established, a record must be filed in each county that contains property in the area such that notification of homeowners within the area occurs. The airport influence area is not restricted in size to noise contours, but can be established to address issues such as overflights from training or significant activity levels that occur as a result of aircraft operating patterns. At this time Chandler Municipal Airport has not adopted this statute.

The City of Chandler has however adopted an Airport Impact Overlay District that encompasses the nine square miles covered by the Airpark Area Plan. This zoning district is marked on the City's zoning maps as an overlay zoning district establishing rules and regulations in addition to any other rules and regulations otherwise established by a property's zoning district. The zoning district's purpose is to establish four airport overlay areas to distinguish between the severity of the levels of noise impact and accident potential so that appropriate uses and acoustical performance standards can be established to mitigate the adverse impacts of aircraft noise, and hazards to protect the public's health, safety, and welfare. Further, prior to the issuance of any building or development permit for property within the Airport Impact Overlay District, the City requires the recordation of an avigational easement and release from liability for airport related damage claims.

The Public Airport Disclosure statute requires that the public airports work with the Arizona Department of Real Estate to develop a map "showing the exterior boundaries of each territory in the vicinity of a public airport." The territory is defined as property that is within the traffic pattern airspace, including property that is within a certain DNL, determined based on county population. For counties with a population of less than 500,000, 65 DNL is the standard; for counties with more than 500,000 in population such as Maricopa County, 60 DNL is the standard. It is important to note that the FAA uses 65 DNL as its basis for determining incompatible land use compared to the State's use of 60 DNL for large counties such as Maricopa. The map is then recorded with the applicable county recorder(s) and made available to the public – there is no requirement for distribution. Chandler Municipal Airport currently has a disclosure map on file with the Arizona Department of Real Estate. This map will be updated as part of the master planning process.

AREA SOCIOECONOMIC DATA

The relationship between socioeconomic factors and an airport's role and activity levels is an important consideration in the master planning process. In addition to providing a general understanding of the existing conditions in an airport area, socioeconomic data is instrumental in developing future projections of aviation activity. Summary socioeconomic data for the City of Chandler, Maricopa County, and Chandler Municipal Airport's market area are presented in the following sections.

Table 1.7 presents historic population data for the City of Chandler and Maricopa County and provides a comparison to comparable data for the State of Arizona and the United States.

Table 1.7
HISTORIC REGIONAL POPULATION DATA

Year	City of Chandler	Maricopa County	Arizona	United States
1990	90,533	2,132,249	3,684,097	249,622,814
2000	176,581	2,954,157	5,165,765	282,177,838
2001	190,091	3,029,150	5,297,684	285,093,870
2002	201,262	3,104,077	5,441,125	287,974,001
2003	211,984	3,179,155	5,580,811	290,810,789
2004	224,644	3,254,363	5,707,121	293,545,244
1990 -2004 CAGR	6.71%	3.07%	3.18%	1.16%

CAGR: Compound Annual Growth Rate
SOURCE: Woods & Poole, Inc. City of Chandler Long Range Planning Division April, 2005, U.S. Bureau of Labor Statistics
PREPARED: January 2006

Table 1.8 summarizes historic data related to employment and unemployment in the City of Chandler, Maricopa County, the State of Arizona, and the United States from 1990 to 2004.

Table 1.8
HISTORIC EMPLOYMENT DATA

Year	City of Chandler	Maricopa County	Arizona	United States
		Employment		
1990	50,222	1,068,480	1,909,879	139,380,891
2000	100,442	1,543,315	2,819,304	166,758,782
2001	102,865	1,580,553	2,844,359	166,908,258
2002	102,876	1,612,455	2,873,564	167,033,565
2003	105,516	1,653,834	2,953,036	169,545,983
2004	110,262	1,694,213	3,032,571	172,058,819
1990 -2004 CAGR	5.78%	3.35%	3.36%	1.52%
		Unemployment Rate		
1990	3.2%	4.3%	5.3%	5.6%
2000	2.5%	3.3%	4.0%	4.0%
2001	3.2%	4.1%	4.7%	4.7%
2002	4.1%	5.5%	6.0%	5.8%
2003	3.8%	5.0%	5.7%	6.0%
2004	3.4%	4.4%	5.0%	5.5%

CAGR: Compound Annual Growth Rate
SOURCE: Woods & Poole, Inc. City of Chandler Long Range Planning Division April, 2005, U.S. Bureau of Labor Statistics
PREPARED: January 2006

Tables 1.9 and 1.10 summarize historic data related to employment by industry for the City of Chandler and Maricopa County for 2000.

Table 1.9
EMPLOYMENT BY INDUSTRY (2000)
CHANDLER MUNICIPAL AIRPORT MARKET AREA

Sector	City of Chandler	Maricopa County
Agriculture, forestry, fishing and hunting, and mining	618	9,151
Construction	6,288	123,255
Manufacturing	17,488	165,409
Wholesale trade	3,811	53,869
Retail trade	11,012	172,636
Transportation and warehousing, and utilities	4,957	72,752
Information	3,213	45,209
Finance, insurance, real estate, and rental and leasing	8,260	135,494
Professional, scientific, management, administrative, and waste management services	9,086	164,602
Educational, health and social services	14,477	229,895
Arts, entertainment, recreation, accommodation and food services	6,594	127,600
Other services (except public administration)	3,359	64,336
Public administration	3,483	63,084

SOURCE: US Census Bureau, 2000 Census
PREPARED: January 2006

Table 1.10
EMPLOYMENT BY INDUSTRY (1970-2000)
MARICOPA COUNTY

Changes from 1970 to 2000	1970	% of Total	2000	% of Total	New Employment	% of New Employment
Total Employment	430,567		1,896,035		1,465,468	
Wage and Salary Employment	376,509	87.4%	1,613,418	85.1%	1,236,909	84.4%
Proprietor's Employment	54,058	12.6%	282,617	14.9%	228,559	15.6%
Farm and Agricultural Services	14,302	3.3%	32,095	1.7%	17,793	1.2%
Farm	9,391	2.2%	7,515	0.4%	-1,876	NA
Ag. Services	4,911	1.1%	24,580	1.3%	19,669	1.3%
Mining	464	0.1%	2,899	0.2%	2,435	0.2%
Manufacturing (incl. forest products)	73,272	17.0%	168,487	8.9%	95,215	6.5%
Services and Professional	244,820	56.9%	1,361,536	71.8%	1,116,716	76.2%
Transportation & Public Utilities	20,522	4.8%	93,636	4.9%	73,114	5.0%
Wholesale Trade	21,915	5.1%	97,247	5.1%	75,332	5.1%
Retail Trade	75,926	17.6%	319,943	16.9%	244,017	16.7%
Finance, Insurance & Real Estate	39,159	9.1%	216,805	11.4%	177,646	12.1%
Services (Health, Legal, Business, Others)	87,298	20.3%	633,905	33.4%	546,607	37.3%
Construction	26,603	6.2%	142,288	7.5%	115,685	7.9%
Government	71,106	16.5%	188,730	10.0%	117,624	8.0%

SOURCE: Sonoran Institute, *Population, Employment, Earnings, & Personal Income Trends – Maricopa County, AZ,* 12/2003
PREPARED: January 2006

The summary data presented in Tables 1.7, 1.8, 1.9, and 1.10 reflects the continuous growth experienced by the City of Chandler and its market area for the socioeconomic factors examined in this analysis. It is also important to note that the unemployment rate for the market area has been significantly lower than the national and state averages for the past five years. Job growth in the market of the services sector and retail trade services has contributed to the overall employment growth in the county.

These socioeconomic factors and on-going economic development associated with the Maricopa County and the Phoenix metropolitan area are important considerations in the development of projections of aviation demand in the market area. The following chapter examines historic socioeconomic data in more detail, presents socioeconomic projections for the market area, and uses this data in the process of developing aviation activity projections for Chandler Municipal Airport.

OTHER AREA AIRPORTS

In addition to examining market area demographic and socioeconomic characteristics, it is also important to understand the dynamics of aviation activity in the Chandler Municipal area and the impacts that other nearby airports may have on aviation demand. The location of other airports and the level of service and activity that they support is an important consideration in developing a long-range development plan for Chandler Municipal Airport. The nearest commercial service airport, Phoenix Sky Harbor International, is less than 15 nautical miles from Chandler Municipal. Nearby general aviation airports and their relevant characteristics are summarized in **Table 1.11**.

Table 1.11
OTHER AREA AIRPORTS

Airport	FAA ID	Distance from Chandler Municipal	RWY Length	Approach Type	Based Aircraft (2005)
Casa Grande Municipal	CGZ	19 NM	5,200'	Precision	98
Coolidge	P08	28 NM	5,528'	Non-Precision	2
Eloy Municipal	E60	30 NM	3,900'	Visual	41
Estrella Sailport	E68	21 NM	3,740'	Visual	3
Falcon Field	FFZ	12 NM	5,102'	Non-Precision	891
Glendale Municipal	GEU	27 NM	7,150'	Non-Precision	259
Phoenix Deer Valley	DVT	28 NM	8,208'	Non-Precision	890
Phoenix Goodyear	GYR	29 NM	8,500'	Non-Precision	197
Phoenix Sky Harbor Int'l	PHX	14NM	11,489'	Precision	237
Memorial Airfield	34AZ	5 NM	8,577'	Visual	61
Scottsdale	SDL	20 NM	8,249'	Non-Precision	429
Stellar Airpark	P19	5 NM	3,913'	Non-Precision	144
Williams Gateway	IWA	8 NM	10,401'	Precision	93

SOURCE: FAA Form 5010, www.airnav.com
PREPARED: January 2006

The locations of these airports are illustrated in **Exhibit 1.8.**

SUMMARY

The inventory data presented in this chapter provides a framework from which analysis in the Chandler Municipal Airport Master Plan will proceed. Some inventory data, such as airport role, historic activity, area socioeconomic trends, and existing airport facilities are used to develop forecasts of future activity levels at the Airport and to determine future facility requirements. Much of the data presented in this chapter is used to conduct numerous analyses as the master planning process works towards identifying a recommended development plan for Chandler Municipal Airport.

Legend

- Chandler Municipal Airport
- General Aviation Airport
- Commercial Airport
- Arizona Counties
- Urbanized Areas
- Roads

Source: NTAD 2004, ESRI ArcMap 9 Data
Prepared: October 2005

N

EXHIBIT 1.8
Other Area Airports