

**GENERAL AVIATION STRATEGIC PLAN** 

# YUMA INTERNATIONAL AIRPORT Yuma, Arizona

## GENERAL AVIATION STRATEGIC PLAN FINAL TECHNICAL REPORT

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Approved by the Yuma County Airport Authority

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Chapter One

FACILITY ANALYSIS



# FACILITY ANALYSIS

The General Aviation Strategic Plan was commissioned by the Yuma County Airport Authority (YCAA) to provide updated guidance for future general aviation development at Yuma International Airport that will satisfy general aviation demand. This includes refining general aviation facility planning from the 1999 *Yuma International Airport Master Plan*.

Specific objectives of the planning process include:

- Determining projected general aviation needs through the year 2025.
- Recommending improvements which will enhance the general aviation facilities' capacity to the maximum extent possible.

- Producing a current and accurate General Aviation Facilities Plan.
- Establishing a schedule of development priorities and a phased program for the improvements proposed in the plan.
- Prioritizing the capital improvement program.
- Developing active and productive tenant/user involvement throughout the planning process.

The General Aviation Strategic Plan will provide recommendations from which the YCAA may take action to improve the general aviation facilities at the airport and all associated services important to public needs, convenience, and economic growth.



## BACKGROUND

The existing airport site was originally known as Fly Field when opened in 1928. It was named for Col. Benjamin Franklin Fly. He negotiated (on behalf of Yuma County) the original lease for the majority of the present site with the U.S. Department of Interior.

In 1942, shortly after World War II began, the War Department took control of the facility. Known as Yuma Army Air Base during the war, it served as a training facility for many combat aviators. The field was deactivated at the end of the war and its control reverted to Yuma County.

During the Korean War, the Air Force reactivated the airport as a military airfield, and it later became known as Vincent Air Force Base. In 1956, the land was divided into two areas. A joint-use patent was deeded to Yuma County for the area that is currently the civil portion of Yuma International The balance, including all Airport. runways and taxiways, remained under military control. January 1, 1959, marked the standup of Marine Corps Auxiliarv Air Station. Yuma (MCAAS). It remained MCAAS until July 30, 1962, when the designation was changed to Marine Corps Air Station, Yuma (MCAS). The 1956 jointuse patent provides for the joint use of the airport. Specifically, the patent provides for unrestricted civil aviation use of the airport. The patent preserved the ability for Yuma County to collect and retain landing fees to provide for operating expenses.

The YCAA was established in 1965 to administer civil activities at Yuma International Airport. The existing Yuma MCAS site encompasses approximately 3,100 acres. The YCAA controls and operates approximately 400 acres of land, owned by Yuma County, for civilian activities at the airport. Additionally, avigation easements totaling approximately 11 acres protect the Runway 8 and Runway 17 runway protection zones.

There are four runways available for use at Yuma International Airport. Runways 3L-21R and 3R-21L lie parallel to one another and are used primarily by large civilian aircraft and military aircraft operating from MCAS Yuma. Runways 17-35 and 8-26 serve primarily civilian aircraft and military helicopter operations. The runway system is capable of serving all general aviation aircraft.

# **EXISTING GENERAL** AVIATION FACILITIES

As shown on **Exhibit 1A**, general aviation facilities are concentrated in three separate areas on the airport: west of the passenger terminal building, southeast of the intersection of Fortuna Avenue and 32<sup>nd</sup> Street, and west of Runway 17-35 along Taxiways I1, I2, and I3. The general aviation area located west of the passenger terminal building includes an 18,900-square-yard parking apron, 28 aircraft tiedown positions, and storage and maintenance hangars. This area is



Exhibit 1A EXISTING FACILITIES

primarily occupied by Sun Western Flyers. Sun Western Flyers' facilities are located along the eastern edge of the apron and include a 3,000-squarefoot hangar, 1,200 square feet of shop space, and 1,000 square feet of office space. Two 1,500-square-foot conventional hangars are located along the northeast portion of the apron and are used for individual aircraft storage.

In the general aviation area near the intersection of Fortuna Avenue and  $32^{nd}$  Street, there is a five-unit "box" hangar facility (approximately 12,600 square feet total), and two, four-unit nested T-hangars (7,400 square feet and 4,300 square feet, respectively). Each facility is owned and operated by the YCAA.

General aviation facilities located west of Runway 17-35 include conventional, shade, and T-hangar storage, and aircraft tiedown. Diamond Air Jet Center is located adjacent to a 12,000square-yard parking apron along Taxiway I1, with approximately 15 aircraft tiedown locations. Diamond Air Jet Center facilities include 2,500 square feet of hangar space and 1,600 square feet of office space.

The majority of general aviation facilities are located west of Runway 17-35, between Taxiways I2 and I3, on a 55,100-square-yard apron which provides approximately 73 aircraft tiedown positions and two helicopter parking positions. The YCAA completed the construction of 35 new hangars north of Taxiway I2 in May 2004. Hangar Complex A encompasses approximately 16,100 square feet, providing four 4,000-square-foot clear-

span (corporate) hangars. Hangar Complex B includes eight separate hangars encompassing approximately 23,300 square feet. Each clearspan (corporate) hangar provides approximately 2,900 square feet of space. Hangar Complex C is an 11-unit Thangar complex encompassing approximately 14,900 square feet. Hangar Complex D is a 12-unit T-hangar encompassing approximately 13,500 square feet. The new aircraft wash rack facility has also been placed near these new hangars, and has been enlarged to accommodate the largest of the general aviation aircraft based at the airport. An additional six-unit T-hangar facility is located north of Taxiway I2 and encompasses approximately 12,300 square feet. This facility is used by FedEx and the U.S. Border Patrol.

A Sun Western Flyers maintenance hangar, two Bet-Ko Air hangars, and two 12-unit shade hangars are located on the main apron between Taxiway I2 and Taxiway I3. The Sun Western Flyers maintenance hangar is leased from the YCAA, and provides approximately 8,000 square feet of hangar space and 2,000 square feet of office space. Bet-Ko Air facilities include a 12,900-square-foot aircraft storage hangar located along the southwest portion of the apron and a separate facility located directly south of the Sun Western Flyers maintenance hangar, providing 4,800 square feet of hangar space and 2,400 square feet of office space.

**Table 1A** summarizes general avia-tion facilities at Yuma InternationalAirport.

TABLE 1A     Summary of General Aviation Facilities	
Shade and T-Hangar Positions	61
Shade and T-Hangar Area (s.f.)	74,600
Corporate Hangar Positions	12
Corporate Hangar Area (s.f.)	52,000
Conventional Aircraft Storage and Maintenance Hangar Area (s.f.)	38,600
Office and Shop Area (s.f.)	7,300
Aircraft Tiedown Positions	128
Total Apron Area (s.y.)	86,000

## VEHICLE ACCESS AND PARKING

A number of existing roadways provide vehicular access to the general aviation facilities at Yuma International Airport. The existing Sun Western Flyers apron area west of the terminal building is accessed via  $32^{nd}$ Street. Fortuna Avenue provides access to the YCAA hangar facilities located at the intersection of 32<sup>nd</sup> Street and Fortuna Avenue, the Diamond Air Jet Center, U.S. Border Patrol flight operations, and a six-unit T-hangar facility housing FedEx and U.S. Border Patrol Aircraft. The west general aviation apron area and new hangar facilities are accessed via Birch Way from 36<sup>th</sup> Street. Arizona Avenue connects 36<sup>th</sup> Street to 32<sup>nd</sup> Street. Paved parking areas are available in several separate areas of the airport and total approximately 85 spaces. Approximately 25 spaces are located in the general aviation area west of the terminal building. An additional 60 spaces are located in the west general aviation area.

#### FUELING FACILITIES

All aircraft fuel storage facilities at the airport are privately-owned and operated. Bet-Ko Air operates two 10,000-gallon tanks of 100 low lead (LL) Avgas and one 20,000-gallon Jet-A underground fuel storage tanks. According to records maintained by the Arizona Department of Environmental Quality (ADEQ), the two 10,000-gallon 100 LL Avgas underground tanks were installed in 1988. The 20,000-gallon Jet-A underground tank was installed in 1991. Sun Western Flyers operates two 12,000-gallon 100LL Avgas and three 12,000-gallon Jet-A underground storage tanks. According to records maintained by the ADEQ, the 100LL Avgas tanks were installed in 1972, while the Jet-A tanks were installed in 1982. Fuel is dispensed through mobile fuel delivery trucks.

## POPULATION PROJECTIONS

Population growth provides an indication of the potential for sustaining growth in aviation activity over the planning period. **Table 1B** summarizes historical and forecast population numbers for the City of Yuma and Yuma County.

Historical and Forecast Popul	ation					
Year	City of Yuma	Yuma County				
Historical						
1990	54,923	106,895				
1991	56,105	110,225				
1992	56,925	112,825				
1993	57,730	116,450				
1994	60,150	119,650				
1995	60,475	121,097				
1996	63,150	124,950				
1997	65,130	129,295				
1998	68,160	135,200				
1999	69,055	139,650				
2000	77,515	160,026				
2001	79,530	165,280				
2002	81,380	169,760				
2003	83,330	175,045				
2004	84,092	180,495				
Avg. Annual Growth Rate	3.1%	3.9%				
	Forecasts					
2010	98,953	215,520				
2015	111,956	249,847				
2020	126,668	289,641				
2025	143,313	335,773				
Avg. Annual Growth Rate	2.6%	3.2%				

Between 1990 and 2004, the City population grew by more than 29,000, while the County population grew by more than 73,000. The Yuma Department of Community Development projects the City population to grow by more than 59,000 new residents by 2025, while the County's population is expected to grow by more than 155,000 during the same period.

# PILOT SURVEYS

Surveys were sent to all registered aircraft owners in Yuma County, all Yuma International Airport based aircraft owners, and all Yuma International Airport tenants in August 2004 to gather local users' perspectives on Yuma International Airport and to gather specific input into the planning process. The list of registered aircraft owners was compiled from FAA records. Airport records were used for the based aircraft owners and tenants. Copies of the survey forms are included as Appendix A to this report.

As shown in **Table 1C**, there were 37 responses to the surveys. Of the total responses, 34 were from aircraft owners who kept their aircraft at Yuma International Airport. The remaining

aircraft owners based their aircraft at other airports. The survey asked these aircraft owners if they were considering purchasing or upgrading their aircraft. This was done to gauge the continued growth in aircraft ownership and confirm changes to the regional fleet mix. Of the pilots basing at Yuma International Airport, 35 percent indicated that they would be purchasing a replacement aircraft. Three aircraft owners indicated that they would be purchasing business jet aircraft, such as a Cessna Citation.

TABLE 1C	
Aircraft Owner Survey Results	
Total Surveys Sent	137
Total Survey Responses	37
Response Rate	27.0%
Respondents Based at Yuma International Airport	34
Total Based Aircraft of Respondents	100
Respondents Based Considering Upgrade or Purchase	
of Another Aircraft in Next 5 Years.	13 (35% of respondents)
Source: Coffman Associates Analysis	

## AIRCRAFT USE

The survey also collected information on aircraft use. As shown in **Table 1D**, the survey respondents indicated that the primary use of their aircraft was for business purposes, followed by pleasure/recreation, and flight instruction. (Please note that these survey results are only indicative of those surveys and may not reflect the actual use of aircraft at Yuma International Airport.)

TABLE 1D Aircraft Owner Survey Results Primary Use of Aircraft				
Based Aircraft				
Туре	Percentage			
Business	59			
Pleasure/Recreation	40			
Flight Instruction	1			
<b>Total</b> 100				
Source: Coffman Associates Analysis				

#### **BASING PRIORITIES**

The survey respondents were asked the primary reason for choosing to base at their home airport, and rank on a scale of one to ten, with one being the highest priority, several criterions. **Table 1E** summarizes the responses by the actual number of responses in each category. The number one response of aircraft owners was convenience. That is, these aircraft owners preferred to base at the airport located closest to their home or office. The availability of suitable hangar facilities was the second highest rated category, followed by the availability of Fixed Base Operator (FBO) services. The aircraft owners ranked runway length, navigational aids, and hangar costs lower.

TABLE 1E						
Aircraft Owner Survey Results						
<b>Basing P</b> 1	riorities					
		Hangar	FBO	Runway		Hangar
Rank	Convenience	Facilities	Services	Length	Navaids	Costs
1	25	5	0	1	2	1
2	2	14	7	1	1	2
3	1	1	10	5	2	3
4	3	2	1	5	1	0
5	0	1	1	2	3	3
6	1	2	1	1	3	1
7	4	11	16	21	24	26
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
Average	2.1	3.8	4.7	5.5	5.9	6.0
Source: Coffman Associates Analysis						

These survey responses were not unexpected. It is often found that aircraft owners choose an airport first for its proximity to their home and second for the type of shelter available for their aircraft. These are important confirmations for the forecasting effort, as it can be reasoned that the area from which Yuma International Airport would draw future/potential based aircraft is most likely confined to the communities closest to the airport.

#### **NEEDED IMPROVEMENTS**

The survey respondents also ranked the type of facility improvements needed at Yuma International Airport. The survey respondents ranked the need for improved FBO services, a general aviation terminal building, and aircraft hangars as the top three needed improvements at the airport. Expanded apron, runway/taxiways, and navigational aids were ranked lowered. **Table 1F** summarizes the survey results.

TABLE 1F						
Aircraft O	Aircraft Owner Survey Results					
Needed In	nprovements a	t Yuma Inter	rnational Air	port		
	FBO	Term.	Hangar		Runway/	
Rank	Services	Building	Facilities	Apron	Taxiways	Navaids
1	16	6	6	1	1	1
2	3	7	1	3	1	0
3	3	2	2	3	1	0
4	1	2	0	1	2	2
5	0	1	4	1	0	2
6	9	14	19	23	27	27
7	0	0	0	0	0	0
8	0	0	0	0	0	0
9	0	0	0	0	0	0
10	0	0	0	0	0	0
Mean	2.8	3.8	4.6	5.1	5.5	5.7
Source: Coffman Associates Analysis						

## AIRCRAFT OWNER SURVEY SUMMARY

The aircraft owner survey summary provides a profile of general aviation activity in the Yuma metropolitan area. It also provided an indication of the priorities and improvements of the general aviation community using Yuma International Airport.

It was evident from the survey that general aviation aircraft were used more for business purposes than recreational purposes. The highest ranked factor for considering where to base an aircraft was convenience. The survey respondents indicated that they preferred to have their aircraft located as close to their home or business as practical. The availability of suitable hangar facilities and FBO services were ranked second and third. This clearly demonstrates that the aircraft prefer wellowners а developed airport that provides the services they desire to keep their aircraft operational. Interestingly, hangar costs ranked the lowest of all factors in choosing where to base their aircraft.

Improved FBO services were identified as the highest ranked improvement needed at Yuma International Airport. Survey respondents indicated a desire for added services such as upholstery repair and additional avionics services. A deficiency at Yuma International Airport is the lack of suitable hangar facilities to conduct these activities. A general aviation terminal building was the second highest rated improvement. There is no specific general aviation terminal building at Yuma International Airport. General aviation passenger needs are met at the various FBO facilities.

While the availability of suitable hangar facilities was the second highest rated priority for where an aircraft owner would choose to base their aircraft, it was the third highest rated improvement needed at Yuma International Airport. This suggests that the recent hangar development at Yuma International Airport has met many of the demands of the local aircraft owners. This is further supported by the fact that there are nearly a dozen vacant hangars at Yuma International Airport. This suggests that hangar demands have been met, at least for the short term.

The aircraft owners also indicated a need for additional apron space (most likely needed to position transient aircraft) and taxiway improvements (an extension of the parallel taxiway to the Runway 35 end to eliminate the need to back taxi to this runway end).

## FORECAST GENERAL AVIATION ACTIVITY

General aviation activity at an airport is measured by the number of based aircraft and annual operations. General aviation is the second highest user of the Yuma MCAS airfield, ranked only lower than the military users. General aviation activity accounts for more airfield operations than commercial airline and all-cargo operations combined.

The 1999 Yuma International Airport Master Plan projected general aviation based aircraft to increase by 73 aircraft between 1995 and 2020. By 2003, (only eight years later) the number of based aircraft had grown by 31, which is 42 percent of the total projected for the 25-year planning period of the Master Plan. The 2003 total of 143 based aircraft was reached two years earlier than predicted in the 1999 Airport Master Plan. The 1999 Airport Master Plan projected 140 based aircraft in 2005. Therefore, based aircraft have been growing faster than projected in the 1999 Airport Master Plan. While some of the growth in based aircraft can be attributed to increases in individual aircraft ownership, much of the based aircraft growth can be attributed to growth in aviation services at the airport, including air ambulance services.

Annual operations have only recently grown. With the exception of 1997, when general aviation operations exceeded 33,000, general aviation operations remained near 25,000 each year, from 1998 to 2002. In 2003, general aviation operations increased to over 40,000. The 1999 Airport Master Plan projected that the airport would not reach 40,000 annual general aviation operations until 2010. Again, this shows that general aviation activity is growing faster than projected by the 1999 Airport Master Plan. The following subsections first discuss recent national trends and the outlook for general aviation, then further examine general aviation forecasts for Yuma International Airport.

## NATIONAL GENERAL AVIATION TRENDS

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

According to the General Aviation Manufacturers Association (GAMA), between 1994 and 2000, general aviation aircraft shipments increased at an average annual rate of more than 20 percent, increasing from 928 shipments in 1994, to 3,140 shipments in 2000. However, the growth in the general aviation industry has slowed considerably since 2000, negatively impacted by the national economic recession and the events surrounding 9/11. In 2001, aircraft shipments were down 4.7 percent to 2,994. The 2002 shipments were down an additional 10.2 percent to 2,687. Aircraft shipments in 2003 were down less than 1.0 percent from 2002, declining only to 2,686. However, 2003 billings were down 15.5 percent, declining for the third straight year.

Most notable about 2003 shipments was that single-engine piston deliveries were the only category to increase. Single-engine piston deliveries increased to 1,825 from 1,601, or 14.0 percent. This is most likely the result of new product offerings and the age of the single-engine piston aircraft fleet. Turboprop and turbojet deliveries declined. Business jets were down 23.4 percent, the second year of decline. This is the result of slowing demand by fractional jet companies, and a large used market for turboprop and turbojet aircraft. Table 1G summarizes aircraft shipments and billings since 2000.

TABLE 1G Annual General Aviation Airplane Shipments Manufactured Worldwide and Factory Not Billings							
Year Total SEP MEP TP J Net Billings (\$millions)							
2000	3,140	1,896	103	415	760	13,497.0	
2001	2,994	1,644	147	421	782	13,866.6	
2002	2,687	1,601	130	280	676	11,823.1	
2003	2,686	1,825	71	272	518	9,994.8	
Source: GAMA SEP – Single-Engine Piston; MEP – Multi-Engine Piston; TP – Turboprop; J – Turbofan/Turbojet							

The decline in aircraft shipments is not expected to last long. According to the National Business Aviation Association (NBAA), there are more than 2,700 aircraft still on order. NBAA cites a study by Honeywell that aircraft shipments will recover to record levels by 2004, and that 8,400 business aircraft will be delivered over the next 10 years. On July 21, 2004, the FAA published the final rule for sport aircraft. The Certification of Aircraft and Airmen for the Operation of Light-Sport Aircraft rules went into effect on September 1, 2004. This final rule establishes new light-sport aircraft categories and allows aircraft manufacturers to build and sell completed aircraft without obtaining type and production certificates. Instead, aircraft manufacturers will build to industry consensus stan-This reduces development dards. costs and subsequent aircraft acquisition costs. This new category places specific conditions on the design of the aircraft, to limit them to "slow (less than 120 knots maximum) and simple" performance aircraft. New pilot training times are reduced and offer more flexibility in the type of aircraft which the pilot would be allowed to operate. Viewed by many within the general aviation industry as a revolutionary change in the regulation of recreational aircraft, this new rule is anticipated to significantly increase access to general aviation by reducing the time required to earn a pilot's license and the cost of owning and operating an aircraft. These regulations are aimed primarily at the recreational aircraft owner/operator. This new rule is expected to add between 300 and 500 new aircraft each year to the national fleet, beginning in 2006. Bv 2015, there is expected to be 20,915 of these aircraft in the national fleet (including approximately 15,300 existing aircraft which will now be included in the active fleet beginning in 2004).

At the end of 2003, the total pilot population, including student, private, commercial, and airline transport, was estimated by the FAA to decline to 625,011 from the 625,358 pilots in 2002. However, the total pilot population is expected to grow 1.6 percent annually over the next 12 years. A large portion of this growth is from the expected certification of approximately 16,100 currently unrated pilots, between 2004 and 2005, as sport-rated pilots. Excluding this influx of pilots due to new regulations (many of these are existing ultralight pilots which now are not certificated), the annual growth rate for pilots is 1.4 percent. Student pilots increased 1.5 percent in 2003. The number of student pilots is projected to increase by 1.9 percent annually through 2015.

While impacting aircraft production and delivery, the events of 9/11 and the following economic downturn have not had the same negative impact on the business/corporate side of general The increased security aviation. measures placed on commercial flights have increased interest in fractional and corporate aircraft ownership, as well as on-demand charter flights. According to GAMA, the total number of corporate operators increased by 471 in 2003. Corporate operators are defined as those companies that have their own flight departments and utilize general aviation airplanes to enhance productivity. Table 1H summarizes the number of U.S. companies operating fixed-wing turbine aircraft since 1991.

TABLE 1H	TABLE 1H					
U.S. Comp	anies Operating	g				
Fixed-Win	g Turbine Busi	ness				
Aircraft ar	nd Number of A	ircraft,				
1991-2003						
	Number of	Number of				
Year	Operators	Aircraft				
1991	$6,\!584$	9,504				
1992	6,492	9,504				
1993	6,747	9,594				
1994	6,869	10,044				
1995	7,126	10,321				
1996	7,406	11,285				
1997	7,805	11,774				
1998	8,236	$12,\!425$				
1999	8,778	13,148				
2000	9,317	14,079				
2001	9,709	14,837				
2002	10,191	15,569				
2003	10,661	15,870				
Source: GA	MA/NBAA					

The growth in corporate operators comes at a time when fractional aircraft programs are experiencing significant growth. Fractional ownership programs sell 1/8 or greater shares in an aircraft at a fixed cost. This cost, plus monthly maintenance fees, allows the shareholder a set number of hours of use per year and provides for the management and pilot services associated with the aircraft's operation. These programs guarantee the aircraft is available at any time, with short notice. Fractional ownership programs offer the shareholder a more efficient use of time (when compared with commercial air service) by providing faster point-to-point travel times and the ability to conduct business confidentially while flying. The lower initial startup costs (when compared with acquiring and establishing a flight department) and easier exiting options are also positive benefits.

Since beginning in 1986, fractional jet programs have flourished. **Table 1J** summarizes the growth in fractional shares since 1986. The number of aircraft in fractional jet programs has grown rapidly. In 2001, there were 696 aircraft in fractional jet programs. This grew to 776 aircraft in fractional jet programs at the end of 2002, and 823 in 2003.

TABLE 1J						
Fractional Shares						
1986-2003 Voor	Number of Shores					
1000	Number of Shares					
1986	3					
1987	5					
1988	26					
1989	51					
1990	57					
1991	71					
1992	84					
1993	110					
1994	158					
1995	285					
1996	548					
1997	957					
1998	1,551					
1999	2,607					
2000	3,834					
2001	4,071					
2002	4,232					
2003	4,515					
Source: GAMA/NBA	A					

Manufacturer and industry programs and initiatives continue to revitalize the general aviation industry with a variety of programs. For example, Piper Aircraft Company has the Piper Financial Services (PFS) to offer competitive interest rates and/or leasing of Piper aircraft. Manufacturer and industry programs include the "No Plane, No Gain," program promoted jointly by the GAMA and the NBAA.

This program was designed to promote the use of general aviation aircraft as an essential, cost-effective tool for businesses. Other programs are intended to promote growth in new pilot starts and to introduce people to general aviation. These include "Project Pilot," sponsored by the Aircraft Owners and Pilots Association (AOPA), "Flying Start," sponsored by the Experimental Aircraft Association (EAA), "Be a Pilot," jointly sponsored and supported by more than 100 industry organizations, and "Av Kids," sponsored by the NBAA. Over the years, programs such as these have played an important role in the success of general aviation, and will continue to be vital to its growth in the future.

In 2002, there were an estimated 211,244 active general aviation aircraft, representing a decrease of 203 active aircraft from the previous year and the third straight decline following five years of increases. Exhibit 1B depicts the FAA's forecast for active general aviation aircraft in the United States. The FAA predicts the number of active general aviation aircraft to increase at an average annual rate of 1.3 percent over the 12-year forecast period. Piston-powered aircraft are expected to grow at an average annual rate of 0.2 percent. This is due, in part, to declining numbers of multi-engine piston aircraft, while single-engine and rotorcraft increased at rates of 0.3 and 1.0 percent, respectively.

Turbine-powered fixed-wing aircraft (turboprop and turbojet) are expected to grow at an average annual rate of 3.6 percent over the forecast period. The jet portion of this fleet is expected to grow at an average annual growth rate of 5.1 percent. This growth rate for jet aircraft can be attributed to growth in the fractional-ownership industry, new product offerings (which include new entry-level aircraft and long-range global jets), and a shift away from commercial travel by many travelers and corporations.

Industry estimates for the new microjets suggest that the market could be as high as 5,000 new aircraft by 2010. The microjets are very light jets (less than 12,500 pounds) with low acquisition costs (around \$1.0 million) and are believed to have the potential to redefine business jet flying. Their low operating costs (between \$0.50 and \$1.00 per mile) have the capability to support a true air taxi business service. Current microjet projects include the Eclipse, Cessna Mustang, Ravtheon Premier, and Adams A700. The current FAA forecast assumes the entry of a microjet in 2006, reaching 4,600 new aircraft by 2015.

## AIRPORT SERVICE AREA

The service area of an airport is defined by its proximity to other airports providing similar services. Yuma International Airport accommodates general aviation activity in addition to commercial airline and air cargo activities. The general aviation service area is normally impacted by other airports providing similar levels of ser-There is only one public-use vice. airport and one private-use general aviation airport (Somerton Airport) in the Yuma metropolitan area. Rolle

Airfield does not provide any general aviation services. Somerton Airport is located southwest of the airport along the Runway 3L-21R extended centerline. The Somerton Airport airspace is impacted by the military activities by the Yuma MCAS. Taking into account the limitations of these airports, Yuma International Airport can be considered the most capable airport providing general aviation services in the Yuma metropolitan area and even southwestern Arizona and portions of southeastern California.

#### AIRCRAFT OWNERSHIP

The number of aircraft based at an airport is, to some degree, dependent upon the nature and magnitude of aircraft ownership in the local service area. The process of developing forecasts of based aircraft for Yuma International Airport begins with a review of historical aircraft registrations in the area.

Historical records of aircraft ownership in Yuma County were obtained from the FAA-maintained database of aircraft ownership. Table 1K summarizes total aircraft registrations from 1993 to 2003 for Yuma County. As shown in the table, registered aircraft increased by 33 between 1993 and 2003, an average annual growth rate of 1.5%. Multi-engine piston aircraft have shown the largest growth, growing by 20 new aircraft during this period. There were no registered turbojets in 2003, although one turbojet aircraft was registered in 2000, 2001, Single-engine piston airand 2002. craft grew by seven percent and 12 aircraft. Rotorcraft declined by two.

TABLE 1K								
Historical Yuma (	County Regis	stered Aircra Multi-	ft					
	Engine	Engine						
Year	Piston	Piston	Turboprop	Turbojet	Rotorcraft	Other	Total	
1993	171	17	6	0	11	4	209	
1994	187	23	6	0	11	5	232	
1995	183	24	6	0	12	4	229	
1996	191	23	7	0	15	5	241	
1997	188	25	8	0	15	5	241	
1998	180	31	8	0	14	6	239	
1999	170	35	7	0	13	5	230	
2000	196	39	5	1	14	5	260	
2001	191	33	11	1	12	5	253	
2002	191	32	11	1	12	5	252	
2003	183	37	9	0	9	4	242	
Increase/Decrease	12	20	3	0	-2	0	33	
% Change	7.0%	117.6%	50.0%	0.0%	-18.2%	0.0%	15.8%	
Average Annual Growth	0.7%	8.1%	4.1%	0.0%	-2.0%	0.0%	1.5%	
Source: FAA Record	Source: FAA Records							





# **U.S. ACTIVE GENERAL AVIATION AIRCRAFT (in thousands)**

STATES.		FIXED WING									
NUMBER OF		PIS	STON	TU	RBINE	ROT	ORCRAFT				
INTERVIEW IN	Year	Single Engine	Multi- Engine	Turboprop	Turbojet	Piston	Turbine	Experimental	Sport Aircraft	Other	Total
NAN NANY JARA MAN	2003 (Est.)	143.4	17.5	6.9	8.5	2.4	4.3	22.0	N/A	6.4	211.2
ALC: NO DE CONTRACTOR	2005	143.5	17.3	7.0	9.0	2.4	4.3	22.1	15.5	6.4	227.6
NAME OF A DESCRIPTION O	2010	146.2	16.9	7.6	12.0	2.6	4.4	22.7	18.1	6.5	236.9
COMPACTOR OF STREET	2015	148.5	16.5	8.1	15.5	2.7	4.5	23.1	20.9	6.6	246.4

Source: FAA Aerospace Forecasts, Fiscal Years 2004-2015.

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



Exhibit 1B U.S. ACTIVE GENERAL AVIATION AIRCRAFT FORECASTS

#### FORECAST BASED AIRCRAFT

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft, the growth of aviation activities at the airport can be projected.

As shown in **Table 1L**, total based aircraft grew by 31 aircraft between 1995 and 2003, growing from approximately 112 aircraft in 1995, to 143 aircraft in 2003. This equates to an average annual growth rate of 3.1 percent. Because annual based airport totals are not available for Yuma International Airport between 1995 and 2002, traditional statistical methods of projecting based aircraft (such as time-series and regression analyses) could not be performed. Instead, market share forecasts were used to forecast general aviation based aircraft at Yuma International Airport.

The first market share analysis examined based aircraft at Yuma International Airport as a share of U.S. active general aviation aircraft. As shown in Table 1L based aircraft at Yuma International Airport represented 0.065 percent of U.S. active general aviation aircraft in 1995. The airport's market share increased to 0.067 percent in 2003, as based aircraft at Yuma International Airport grew at a faster rate than U.S. active general aviation aircraft. A projection of based aircraft was developed by maintaining the airport's share of U.S. general aviation aircraft constant at 0.067 percent through the planning period. This vields 180 based aircraft by the year 2025, with based aircraft growing at an average annual growth rate of 1.1 percent.

hare of U.S. Ac	etive Aircraft		
uma Internati	onal Airport		
		U.S. Active	
	Yuma	General Aviation	Yuma Share of U.S.
Year	Based Aircraft	Aircraft	Active Aircraft
		Historical	
1995	112	170,600	0.065%
2003	143	211,190	0.067%
	Constan	t Share Projection	
2010	159	236,915	0.067%
2015	165	246,415	0.067%
2020	173	258,400	0.067%
2025	180	269,300	0.067%
ource for histori 2003 (Yuma Co	cal based aircraft: 1995 (Yu ounty Airport Authority)	ima International Airport Ma	ster Plan),

Source for historical and forecast U.S. active general aviation aircraft: FAA Aviation Forecasts, selected years, 2020 and 2025 extrapolated by Coffman Associates Based aircraft forecasts: Coffman Associates Analysis Based aircraft were also examined as a ratio of Yuma County residents. As shown in **Table 1M** the ratio of aircraft to residents has remained below one aircraft per 1,000 residents since 1995. Maintaining the 2003 ratio constant through the planning period yields 275 based aircraft by 2025. This represents an average annual growth rate of 3.0 percent.

	Yuma Airport	Yuma County	Based Aircraft				
Year	Based Aircraft	Population	per 1,000 residents				
Historical							
1995	112	121,875	0.92				
2003	143	175,045	0.82				
Constant Share Projection							
2010	177	$215{,}520$	0.82				
2015	205	249,847	0.82				
2020	237	289,641	0.82				
2025	275	335,773	0.82				
ource for historical b	ased aircraft: 1995 (Yuma Int	ternational Airport Ma	ster Plan),				
2003 (Yuma County	y Airport Authority)	······································	//				
ource for historical a	nd forecast population: City of	of Yuma Department of	Community Development				
2003							

Based aircraft forecasts: Coffman Associates Analysis

For comparative purposes, projections for the 2004 FAA *Terminal Area Forecast* (TAF) and 2000 *Arizona State Aviation Needs Study* (SANS) have also been examined. The FAA TAF uses a 2002 base year total of 194 based aircraft and projects this total remaining constant through 2020. Using 1995 base year data, the SANS projected based aircraft growing from 95 aircraft in 1995 to 137 by 2020. As is evident, the 2020 forecast is below current based aircraft levels and clearly does not provide comparative value for assessing future demand.

**Table 1N** and **Exhibit 1C** provide asummary of all general aviation basedaircraft forecasts.The 2000 SANSunderestimates future based aircraftpotential.The FAA TAF overesti-

mates current based aircraft totals and projects static based aircraft levels through 2020. Based aircraft have historically grown. Therefore, the FAA TAF is most likely not representative of future based aircraft potential. The Constant Share of U.S. Active General Aviation Aircraft forecast only provides for 37 new aircraft by 2025. The airport has averaged approximately four new based aircraft per vear since 1995. This forecast may underestimate future based aircraft potential as well. The Constant Ratio of Based Aircraft to 1,000 Residents forecast provides for 137 new aircraft by 2025. This is approximately six new aircraft per year, or an average annual growth rate of 3.0 percent annually. This level of growth may be difficult to maintain over the





Exhibit 1C BASED AIRCRAFT FORECASTS

next 22 years and may overstate based aircraft growth potential.

The selected planning forecast was developed and lies slightly below the Constant Ratio of Based Aircraft to Aircraft per 1,000 Residents forecast. This planning forecast anticipates 102 new based aircraft by 2025, and based aircraft growing at an average annual rate 2.5 percent.

TABLE 1N   Based Aircraft Forecast Summary							
Forecast	2003	2010	2015	2020	2025		
Constant Share of U.S. Active GA Aircraft		159	165	173	180		
Constant Ratio of Aircraft Per 1,000 Residents		177	205	237	275		
FAA Terminal Area Forecast (TAF)		194	194	194	N/A		
Arizona State Aviation Needs Study (SANS) 2000		114	125	137	N/A		
1999 Yuma International Airport Master Plan Forecasts		155	170	185	N/A		
Preferred Planning Forecast	143	170	190	210	245		

#### **Based Aircraft Fleet Mix**

Knowing the aircraft fleet mix expected to utilize the airport is necessary to properly plan facilities that will best serve the level of activity and the type of activities occurring at the airport. **Table 1P** indicates that the 2003 based aircraft fleet mix is comprised mainly of single-engine piston aircraft. The based aircraft fleet mix has been examined as a share of total based aircraft.

TABLE 1P	TABLE 1P						
General Av Year	viation Bas Total	sed Aircraft Fleet . Single-Engine Piston	Mix Multi-Engine Piston	Turboprop	Helicopter	Jet	
2003	143	102	20	13	8	0	
Percentag	e Share						
2003	100.0%	71.3%	14.0%	9.1%	5.6%	0.0%	
Forecast							
2010	170	122	22	15	8	3	
2015	190	135	24	17	8	6	
2020	210	148	26	19	8	9	
2025	245	174	28	22	9	12	
Percentag	e Share						
2010	100.0%	71.8%	12.9%	8.8%	4.7%	1.8%	
2015	100.0%	71.1%	12.6%	8.9%	4.2%	3.2%	
2020	100.0%	70.5%	12.4%	9.0%	3.8%	4.3%	
2025	100.0%	70.2%	12.2%	9.0%	3.7%	4.9%	
Increase	102	70	8	12	1	12	
Source for l	nistorical da	ta: Yuma County Ai	rport Authority				

While the single-engine piston category decreases as a percentage of total based aircraft, the total number of single-engine piston aircraft is expected to grow by 70, the highest numerical change of all aircraft categories. Local economic and population growth will add new private aircraft The new regulations for ownership. sport aircraft should increase singleengine based aircraft levels as well. This new rulemaking is expected to result in 300 to 500 new aircraft nationally each year, beginning in 2006. By 2015, this results in between 2,700 and 4,500 new single-engine piston aircraft. The traditional single-engine piston fleet is expected to grow by an additional 5,100 aircraft in the next 12 years as well.

Multi-engine piston aircraft are expected to add only 8 new aircraft through the planning period. Nationally, the number of multi-engine piston aircraft is expected to decline. The cost of a new multi-engine piston aircraft is comparable to many used turboprops, which has led to their decline in use. The operational costs are also too high for widespread recreational aircraft ownership and use. For perspective, GAMA reports that only 71 new multi-engine piston aircraft were built and delivered worldwide in 2003. This compares with over 1,800 new single-engine piston aircraft and 500 business jets.

The number of helicopters increases only slightly through the planning period. Nationally, the number of helicopters is declining. The FAA projects very little change in the helicopter fleet over the next 12 years. The FAA projects only 300 new piston-engine helicopters and 260 new turbinepowered helicopters by 2015. This indicates that the supply of new helicopters will only barely keep pace with helicopter retirements and that there is not an expected significant expansion of current helicopter activities nationwide.

Considering that three of the survey respondents indicated that they would be purchasing a business jet within the next two years, and that business and corporate use is the fastest growing segment of the general aviation industry, the turbojet category is expected to grow at the fastest rate of all aircraft types at Yuma International Airport through the planning period. The introduction of the new microjets will also contribute to turbojet growth. Turboprops are expected to grow as the number of single-engine turbinepowered aircraft grows and business and corporate uses increase. Turbinepowered aircraft are now becoming available in the airplane kit market and there are a number of turbine conversions for existing pistonpowered aircraft.

## ANNUAL OPERATIONS

The MCAS airport traffic control tower (ATCT) counts the number of aircraft operations (takeoffs and landings) at Yuma International Airport. **Table 1P** summarizes historical general aviation operations as recorded by the ATCT and operations per based aircraft.

The most current FAA 5010-1, Airport Master Record Form, and the FAA TAF both report 43,252 annual general aviation operations for Yuma International Airport. The FAA TAF shows this same level of operations each year since 1989. The 2000 SANS predicted 38,400 annual general aviation operations at Yuma International Airport in 2005. Given that the 2003 actual ATCT count was 40,490 general aviation operations, the operational estimates provided by the FAA appear to slightly overstate the activity at Yuma International Airport, while the SANS underestimates activity levels. Projections of annual operations were examined by the number of operations per based aircraft. Two annual operations forecasts utilizing operations per based aircraft have been developed. First, a constant, or static, level of operations is applied to forecast based aircraft. Applying the 2003 ratio of 283 operations per based aircraft yields 69,300 annual operations at Yuma International Airport by 2025. Increasing this share through the planning periods yields 88,200 annual operations in 2025. These forecasts are summarized in **Table 1Q**.

TABLE 1Q			
<b>Annual Operations</b>			
	Based	Annual	Operations
Year	Aircraft	Operations	Per Based Aircraft
	Histo	prical	
1995	112	27,091	242
1996	108	25,485	235
1997	118	33,185	281
1998	N/A	24,380	N/A
1999	N/A	$23,\!652$	N/A
2000	N/A	$24,\!544$	N/A
2001	N/A	22,004	N/A
2002	N/A	26,863	N/A
2003	143	40,490	283
	Constant Ra	tio Forecast	
2010	170	48,100	283
2015	190	53,800	283
2020	210	59,400	283
2025	245	69,300	283
	Increasing R	atio Forecast	
2010	170	49,300	300
2015	190	60,800	320
2020	210	71,400	340
2025	245	88,200	360
	Planning	Forecast	
2010	170	48,700	286
2015	190	57,300	302
2020	210	65,400	311
2025	245	78,800	322
Source for historical annu	ual operations: MCAS		

The FAA projects an increase in aircraft utilization and the number of general aviation hours flown nationally. This trend, along with projected growth in based aircraft, supports future growth in annual operations at Yuma International Airport. Considering these factors, the selected planning forecast for the airport projects the number of operations per based aircraft to gradually increase through the planning period. The selected planning forecast is a mid-range forecast, which results in general aviation operations growing to 78,800 by 2025. This is an average annual growth rate of 3.1 percent. Exhibit 1D depicts the general aviation operational forecast.

## PEAKING CHARACTERISTICS

Most facility planning relates to levels of peak activity. The following planning definitions apply to the peak periods:

• Peak Month – The calendar month when peak aircraft operations occur.

- Design Day The average day in the peak month.
- Busy Day The busy day of a typical week in the peak month.
- Design Hour The peak hour within the design day.

It is important to note that only the peak month is an absolute peak within a given year. All other peak periods will be exceeded at various times during the year. However, they do represent reasonable planning standards that can be applied without overbuilding or being too restrictive.

The peak month was estimated at 12 percent of total annual operations. The forecast of busy day operations was calculated as 1.25 times design day activity. Design hour operations were estimated at 15 percent of design day operations. **Table 1R** summarizes peak operations forecasts for the airport.

TABLE 1R				
Peak Period Forecasts				
	2010	2015	2020	2025
Annual	48,700	57,300	65,400	78,800
Peak Month (12%)	5,800	6,800	7,800	9,400
Design Day	189	222	253	305
Busy Day	236	277	316	381
Design Hour (15%)	35	42	47	57



Exhibit 1D ANNUAL OPERATIONS FORECAST

# FACILITY REQUIREMENTS

Based upon the existing and forecast activity demand levels, as well as the information regarding preferences and airport needs from the aircraft owner surveys, the general aviation facility requirement for Yuma International Airport were evaluated. The purpose of this section is to determine the space requirements during the planning period for the following types of facilities normally associated with general aviation activity:

- General Aviation Terminal Building
- Aircraft Hangars
- Aircraft Parking Aprons
- Auto Parking
- Support Facilities

## GENERAL AVIATION TERMINAL BUILDING

commercial airline service While needs a terminal building to provide space for passenger ticketing, baggage claim, and aircraft boarding, general aviation users do not specifically require a public terminal building. While space is needed for general aviation pilots and passengers to meet and greet waiting passengers, flight planning, concessions, management, storage, and various other needs, these functions oftentimes are provided in private FBO buildings, as is currently done at Yuma International Airport.

The need for a public terminal building at a general aviation airport is declining with greater emphasis placed on suitable FBO facilities by fractional aircraft operators and corporate aircraft owners. Each of the major fractional aircraft operators has developed a set of minimum FBO standards which set forth safety, security, catering, cleaning, aircraft handling, ground transportation, and hangar and office space standards for each FBO wishing to serve the fractional aircraft owner. Since the fractional aircraft owner relies on the FBO for all these services, they also rely on the FBO to provide well-kept, professional-in-appearance terminal facilities. Since many fractional jet customers travel anonymously, private business offices are requested. These types of services cannot be provided in a public terminal building. Corporate operators are just as discerning in their operational requirements, although they do not generally publish FBO standards.

While there are many public terminal buildings serving general aviation, these facilities typically provide space for airport administration in addition to the services described above. In fact, the very reason the building was constructed was to provide the airport administrative functions. Since airport management offices require public access, providing space for public terminal functions in the same building is commonly considered. In these instances, the cost to build and maintain terminal facilities is often considered part of the normal cost of operating the airport, as space is needed for airport administration. At Yuma International Airport, airport administrative offices are located in the commercial terminal building, with no similar requirement for space in the public terminal building.

Ultimately, the decision to construct and operate a terminal building needs to be built on a solid business case. As with all facility development at an airport, the projected revenues from the terminal building must exceed development and operational costs. As noted above, the need for a public terminal building is diminishing as aircraft owners are relying more and more on private FBO operators to meet those needs. This provides significant competition to the successful and profitable operation of a public terminal building.

For planning purposes, a projection of the size of a potential terminal building at Yuma International Airport has been made. The methodology is based on the number of airport users expected to utilize general aviation facilities during the design hour. Space requirements were based upon providing 90 square feet per design hour itinerant passenger. Exhibit 1E outlines the general space requirements for general aviation terminal services at Yuma International Airport through the planning period.

#### AIRCRAFT HANGARS

The demand for aircraft storage hangars typically depends upon the number and type of aircraft expected to be based at Yuma International Airport. For planning purposes, it is necessary to estimate hangar requirements based upon forecast operational activity. However, hangar development should be based on actual demand trends and financial investment conditions.

Hangar facilities are classified as Thangars, shade hangars, or conventional (clearspan) hangars. Some conventional hangars are devoted to FBO activities such as aircraft maintenance, while other conventional hangars serve private/corporate uses where one single aircraft (such as a business jet) or multiple aircraft are stored by their owner. The different types of hangars offer varying levels of privacy, cost, security, and protection from elements.

Typically, utilization of hangar space varies across the country as a function of local climate conditions, airport security, and owner preferences. The hangar storage requirements were reviewed after considering the existing storage patterns at the airport and the airport user surveys. Approximately 57 percent of all based aircraft are stored in a hangar at Yuma International Airport. The remaining 43 per-

	EXISTING	SHORT TERM NEED	INTERMEDIATE TERM NEED	LONG TERM NEED
STORAGE HANGAR REQUIREMENTS				
Total Aircraft to be Hangared	87	111	133	196
T-hangar/Shade Hangar Positions	49	67	79	124
HANGAR AREA REQUIREMENTS				
T-hangar Area (s.f.)	87,200	100,700	118,400	186,500
Corporate Hangar Area (s.f.)	39,400	54,000	68,900	91,300
Fixed Base Operator (FBO) Hangar Area (s.f.)	54,600	103,200	122,400	166,600
Total Hangar Area (s.f.)	181,200	257,900	309,700	444,400
AIRCRAFT PARKING APRON REQUIRE	EMENTS			
Single, Multi-Engine - Transient Aircraft Positions Apron Area (s.y.)		14 11,200	19 15,000	29 23,000
Transient Business Jet Positions Apron Area (s.y.)		2 3,200	4 6,400	6 9,600
Locally-Based Aircraft Positions Apron Area (s.y.)		80 40,000	80 40,000	80 40,000
Total Positions	128	96	103	115
Total Apron Area (s.y.)	86,000	54,400	61,400	72,600
TERMINAL BUILDING REQUIREMENTS	;			
Square-feet	N/A	2,300	3,300	5,700
AUTOMOBILE PARKING REQUIREMEN	ITS			
Total Spaces	85	85	95	123
OTHER REQUIREMENTS				
	Aircraft Wash Rack	Same	Same	Same
		Expand Taxiway I Holding Apron	Extend Taxiway I to Runway 35 End	Same
	Compass Rose	Same	Same	Same
	IF			

cent are stored on the apron. Twothirds of the airport users responding to the questions of the type of storage they prefer indicated a preference for enclosed aircraft storage.

The trend in general aviation aircraft, whether single or multi-engine, is in more sophisticated (and consequently more expensive) aircraft. Therefore. many hangar owners prefer hangar space to outside tiedowns. Vintage aircraft owners and many recreational aircraft owners prefer hangar space to protect their aircraft, which many times are constructed with fabric wing The intense and fuselage covers. summer weather conditions in the region place a premium on sheltered parking.

Future hangar requirements for Yuma International Airport are summarized on **Exhibit 1E**. Future hangar requirements were developed with the assumption that a majority of aircraft owners would continue to prefer enclosed storage through the planning period, growing to 80 percent of all based aircraft by the end of the planning period.

Currently, only 49 aircraft are stored in the 61 available T-hangar spaces. Therefore, there are 11 vacant hangars. The availability of hangar space indicates that the recent hangar construction met the local demand for storage facilities. Overtime, it is expected that these hangars will fill as new aircraft owners will prefer hangar space. Current facility planning includes the development of dedicated all-cargo facilities on the airport. It is expected that FedEx will relocate once a dedicated all-cargo building is constructed. This will provide one additional T-hangar space. It is expected that new T-hangar development may not be needed for some time as demand grows to accommodate these available spaces.

The need for corporate hangar space is expected throughout the planning period. These types of hangars are preferred by business aircraft owners for privacy and security. Many recreational aircraft owners prefer this space as several owners can share one hangar and reduce storage costs.

T-hangar requirements were determined by providing approximately 1,500 square feet of space for each T-On average, approxihangar unit. mately 2,200 square feet are currently provided for each existing based aircraft located in a corporate hangar at Yuma International Airport. This ratio was used to determine future corporate hangar area requirements. On average, approximately 3,600 square feet are provided for each existing based aircraft stored in an FBO hangar at Yuma International Airport. This ratio was used to calculate future FBO hangar area requirements. The existing conventional hangar space total includes two 8,000-square-feet hangars to be constructed by Sun Western Flyers.

Total hangar space was increased by 15 percent to account for future FBO needs. The airport user surveys indicated a need for expanded FBO services at the airport. The airport has a lack of available hangar space to accommodate expanded FBO services, which may be the primary reason for the lack of these types of facilities at the airport. The alternatives analysis will specifically focus on identifying areas for new hangar development to support new FBO services such as avionics repair, aircraft interior services, aircraft painting, etc.

Similar to existing conditions, it is expected that the aircraft storage hangar requirements will continue to be met through a combination of hangar types. The alternatives analysis will examine several possible options for hangar development at Yuma International Airport and determine the best location for each type of hangar facility.

## AIRCRAFT PARKING APRONS

An aircraft parking apron should be provided for at least the number of locally-based aircraft that are not stored in hangars, as well as transient aircraft. There are approximately 128 tiedowns available for based and transient aircraft at Yuma International The majority of these tie-Airport. downs (approximately 100) are located in the west general aviation area. The remaining tiedowns will be lost once Sun Western Flyers is relocated to the west general aviation area. This relocation is necessary to segregate general aviation uses from the commercial general aviation uses located along  $32^{nd}$  Street. These tiedowns and the apron area need to be replaced in the west general aviation area.

Total apron area requirements were determined by applying a planning criterion of 500 square yards for each based aircraft parking position and 800 square yards for each singleengine piston and multi-engine piston itinerant parking position. Transient business jet positions were determined by applying a planning criterion of 1,600 square yards for each transient business jet position. Local based aircraft requirements also assumed that 50 percent of aircraft stored in FBO hangars would need to tie down outside during periods when aircraft maintenance or other activities were occurring in the hangar.

The results of this analysis are presented on Exhibit 1E. Based upon the planning criteria above and trends assumed for transient and based aircraft users, the existing number of tiedowns and area devoted to aircraft parking should be sufficient through the planning period, assuming the existing Sun Western Flyer's apron area is replaced in the west general aviation area. However, additional apron area in excess of these needs will be needed as new hangar areas are developed on the airport which are not contiguous with existing apron areas, and to accommodate increased FBO activities.

## SECURITY

## Transportation Security Administration (TSA) Security Guidelines

In cooperation with representatives of the general aviation community, the TSA published security guidelines for general aviation airports in May 2004.
While these guidelines are directed at general aviation airports, they do give an indication of security measures that need to be considered for general aviation activity at a commercial service airport. These guidelines are contained in the TSA publication, Security Guidelines for General Aviation Airports. Within this publication, the TSA recognized that general aviation is not a specific threat to national security. However, the TSA does believe that general aviation may be vulnerable to misuse by terrorists as security is enhanced in the commercial portions of aviation and at other transportation links.

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

- 1. Airport Location An airport's proximity to areas with over 100,000 residents or sensitive sites can affect its security posture. Greater security emphasis should be given to airports within 30 miles of mass population centers (areas with over 100,000 residents) or sensitive areas such as military installations, nuclear and chemical plants, centers of government, national monuments, and/or international ports.
- 2. Based Aircraft A smaller number of based aircraft increases the likelihood that illegal activities will be identified more quickly. Airports with based aircraft over

12,500 pounds warrant greater security.

- 3. Runways Airports with longer paved runways are able to serve larger aircraft. Shorter runways are less attractive as they cannot accommodate the larger aircraft which have more potential for damage.
- 4. **Operations** The number and type of operations should be considered in the security assessment.

**Table 1S** summarizes TSA-recommended airport characteristics and ranking criterion. The TSA suggests that an airport rank its security posture according to this scale to determine appropriate security enhancements.

Table 1S also ranks Yuma International Airport according to this scale. As shown in the table, the Yuma International Airport ranking on this scale is 45. Points are assessed for the airport being located contiguous to the Marine Corps Air Station, which is a military installation. The airport is also assessed for having more than 101 based aircraft, based aircraft over 12.500 pounds, having a runway greater than 5,001 feet in length, having a paved runway surface, conducting more than 50,000 annual operations, accommodating FAR Part 135 charter activities. accommodating FAR Part 125 operations with aircraft seating more than 20 people or having a maximum payload of 6.000 pounds or more, having rental aircraft, and providing maintenance for aircraft over 12,500 pounds.

TABLE 1S				
Airport Characteristics Measurement Tool				
	Assessm	ent Scale		
	TSA	Yuma		
	Established	International		
Security Characteristic	Factors	Airport		
Location				
Within 20 nm of mass population areas <sup>1</sup>	5	5		
Within 30 nm of a sensitive site <sup>2</sup>	4	4		
Falls within outer perimeter of Class B airspace	3	0		
Falls within boundaries of restricted airspace	3	3		
Based Aircraft				
Greater than 101 based aircraft	3	3		
26-100 based aircraft	2	0		
11-25 based aircraft	1	0		
10 or fewer based aircraft	0	0		
Based aircraft over 12,500 pounds	3	3		
Runways				
Runway length greater than 5,001 feet	5	5		
Runway length less than 5,000 feet, greater than 2,001 feet	4	0		
Runway length 2,000 feet or less	2	0		
Asphalt or concrete runway	1	1		
Operations				
Over 50,000 annual operations	4	4		
Part 135 operations (Small Charter Operations)	3	3		
Part 137 operations (Agricultural Operations)	3	0		
Part 125 operations (Large Aircraft Charter Operations)	3	3		
Flight training	3	3		
Flight training in aircraft over 12,500 pounds	4	0		
Rental aircraft	4	4		
Maintenance, repair, and overhaul facilities conducting				
long-term storage of aircraft over 12,500 pounds	4	4		
Totals		45		
Source: Security Guidelines for General Aviation Airports				
<sup>1</sup> An area with a total population over 100,000				
<sup>2</sup> Sensitive sites include military installations, nuclear and cher	mical plants, cente	rs of government,		
national monuments, and/or international ports				

Based upon the results of the security assessment, the TSA recommends the highest levels of security methods for Yuma International Airport. These security methods are shown in **Table 1T**. In general, it is found that the TSA recommendations mirror the existing security procedures at the airport which are needed for commercial airline security. In other words, if Yuma International Airport only supported general aviation activity, it would be expected that similar security measures would be in place due to the location of the airport on an active military base and the types of activity at the airport.

TABLE 1T				
Recommended Security Enhancements				
<b>Based on Airport Characteristics Assessment Result</b>	S			
	Points	Determine	d Through	Airport
	Ch	aracteristic	es Assessm	ent
Security Enhancements	> 45	25-44	15-24	0-14
Fencing				
Hangars				
Closed Circuit Television (CCTV)				
Intrusion Detection System				
Access Controls				
Lighting System				
Personal ID System				
Vehicle ID System				
Challenge Procedures				
Law Enforcement Support				
Security Committee				
Transient Pilot Sign-in/Sign-Out Procedures				
Signs				
Documented Security Procedures				
Positive/Passenger/Cargo/Baggage ID				
Aircraft Security				
Community Watch Program				
Contact List				
Source: Security Guidelines for General Aviation Airports				

## Fractional Jet Operator Security Requirements

The major fractional jet operators have established minimum standards for FBOs serving their aircraft. These minimum standard documents specify the following general security requirements:

**Identification**: The FBO should issue unique identification badges for employees who have access to the aircraft operations areas. Unescorted passenger access to the ramp is prohibited.

**Employees**: The FBO must conduct FAA-compliant background checks on each employee. The FBO must have pre-employment drug screening.

Aircraft Security: Aircraft cannot be left unattended when the ground power unit or auxiliary power unit is operating. Aircraft must be locked when unattended. Aircraft must be parked in well-lit, highly-visible areas with a minimum of six-foot chain link fencing. Security cameras are preferred. Sightseers or visitors are not allowed access aboard or near aircraft.

**Facility Security**: Visual surveillance of all aircraft operational areas belonging to the FBO is required. FBOs shall establish controlled access to the aircraft operational areas. The FBO should maintain at least six feet between safety fence and parked ground equipment. Bushes and shrubs must be less than four feet in height.

# **OTHER REQUIREMENTS**

#### AIRCRAFT WASH RACK

Yuma International Airport currently has an aircraft wash rack located along Taxiway I2 near hangar Complex A. This wash facility currently meets the needs of the airport users and should be maintained through the planning period.

#### AIRFIELD TAXIWAYS

Runway 17-35 is utilized for a majority of general aviation aircraft operations at Yuma International Airport. Presently, Taxiway I does not extend to the Runway 35 end. The 1999 Airport Master Plan recommended that this taxiway be extended to the Runway 35 end to eliminate the practice of back-taxiing along the runway to reach the Runway 35 end. This increases airfield safety by clearing the runway for landing and departure operations only. This also increases airfield capacity as more operations can be conducted on the runway.

#### **COMPASS CALIBRATION PAD**

A compass calibration pad is marked on the west general aviation apron. A compass calibration pad is used by pilots and/or maintenance personnel to align an aircraft on known magnetic headings, for the purpose of determining and correcting the degree of error in the magnetic compass caused by equipment installed in the aircraft. A compass calibration pad should be maintained through the planning period.

# **SUMMARY**

The following chapter will formulate and analyze alternatives that can accommodate and identify demand and requirements summarized in this chapter. These will be reviewed by the general aviation users and YCAA and used to define the recommended general aviation development program for Yuma International Airport.



Chapter Two

ALTERNATIVES



# **ALTERNATIVES**

Prior to defining the recommended general aviation development program for Yuma International Airport, it is important to consider development potential and constraints to general aviation development at the airport. The purpose of this chapter is to consider the actual physical facilities which are needed to accommodate projected general aviation demand and meet the general aviation program requirements as defined in Chapter One.

In this chapter, a series of development scenarios are considered for accommodating general aviation activity at the airport. In each of these scenarios, different physical facility layouts are presented for the purposes of evaluation. The ultimate goal is to develop the underlying rationale which supports the final general aviation recommendations.

Any proposed development evolves from an analysis of projected needs.



Though the needs were determined by the best methodology available, it can be assumed that future events will change these needs. Through coordination with tenants, airport users, the public, and the County Airport Authority Yuma (YCAA), the alternatives (or combination thereof) will be refined and modified as necessary to define the recommended development program. Therefore, the alternatives presented in this chapter can be considered a beginning point in the development of the recommended general aviation development program, and input will be necessary to define the resultant development program.



# DEVELOPMENT CONSIDERATIONS

The general aviation functions to be considered in the development program at Yuma International Airport include public terminal facilities, aircraft storage hangars, aircraft parking aprons, fixed base operator (FBO) aviation hangars, and automobile parking and access. The interrelationship of these functions is important in defining a long-range landside layout for general aviation uses at the airport. Runway frontage should be reserved for those uses with a high level of airfield interface, or need of exposure. Other uses with lower levels of aircraft movements or little need for runway exposure can be planned in more isolated locations. The following discussion briefly describes landside facility requirements.

## PUBLIC TERMINAL FACILITIES

While a general aviation public terminal building is not specifically required at commercial service airports which have a terminal serving the scheduled airlines, a public terminal for general aviation can provide some benefits. It provides a central gathering point for air travelers. A terminal building can provide a pilots' lounge and flight planning area. A terminal building commonly houses a restaurant, which is an attractive quality for the airport. Terminal buildings can provide leaseable space for aviationrelated businesses desiring to be located on an airport. There is presently no general aviation terminal building at the Yuma International Airport. Space for those functioning is provided by the FBOs.

## FIXED BASE OPERATOR ACTIVITIES

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

Planning for commercial general aviation activities is important for this The mix of aircraft using study. Yuma International Airport has changed recently to include business aircraft which have larger wingspans than the mix of aircraft using the airport in the past. These larger aircraft, which have wingspans up to 100 feet, require greater separation distance between facilities, larger apron areas for parking and circulation, and larger hangar facilities.

An additional consideration for the alternatives analysis is the planned relocation of Sun Western Flyers from an area west of the commercial terminal building to the west general aviation area. Planning must consider the need for the immediate development of two 80-foot by 100-foot hangars and replacement of the tiedown area used by Sun Western Flyers. Additional development parcels must be designated to allow for the development of additional commercial general aviation services on the airport

#### LARGE AIRCRAFT STORAGE HANGARS

Large aircraft storage hangars are used for the storage of business jets or turboprop aircraft. Many times these hangars are used to store multiple aircraft. Commonly referred to as corporate hangars, the YCAA recently completed the construction of 10 corporate hangars in the west general aviation area. A combination of hangars and parcels are typically planned to accommodate this type of development. Corporate hangar areas require all utilities and segregated roadway access.

#### SMALL AIRCRAFT STORAGE HANGARS

The facility requirements analysis indicated a need for the development of small general aviation aircraft storage hangars. This primarily involves additional T-hangars and/or shade hangars. Since small aircraft storage hangars often have lower levels of activity, these types of facilities should be located off the primary apron areas, which are reserved for commercial general aviation activity and can be located in more remote locations of the airport. Since most of the aircraft owners want to access their aircraft directly and park their vehicles in their hangars when they are gone, these facilities do not have a requirement for large parking areas. Limited utility services are needed for these areas. Typically, this involves water, sanitary sewer, and electricity.

#### VEHICLE ACCESS AND PARKING

Public vehicle access and parking at the airport is a primary concern in the planning process. The lack of available automobile parking is a concern for many areas of the airport. Increasing paved automobile parking areas will be a goal of the planning process. Fortuna Avenue presently presents an obstruction to the Runway 8 Federal Aviation Administration (FAA) approach surface. A goal of the planning process will be to close that portion of Fortuna Avenue that obstructs the approach surface. Alternate access will be considered from Bonanza Ave-Public roadway access will be nue. considered for all future commercial general aviation areas.

## RUNWAY 8 APPROACH PROTECTION

Military design standards, FAA design standards, and local land use codes place various restrictions on development west of the Runway 8 end. **Exhibit 2A** presents the various imaginary surfaces and land use areas defined for Yuma International Airport.

Since Marine Corps Air Station (MCAS) Yuma has jurisdiction over the airfield, military standards must be considered for the runways and surrounding airspace. The military imaginary surfaces are set forth in NAVFAC P-80.3, Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations and Federal Aviation Regulation (FAR) Part 77, **Objects** Affecting Navigable Airspace. These standards were developed to protect the airspace around the airport and the approaches to each runway end from hazards that could affect the safe and efficient operation of aircraft arriving and departing the airport.

The military imaginary surfaces emanate from the runway centerline and are dimensioned according to the runway classification. Runway classification is dependent upon the type of aircraft which operate from the runway. NAVFAC P-80.3 defines Class A runways as runways primarily used by small light aircraft, which do not have the potential for development for use by heavier aircraft, are less than 8,000 feet long, and have operations by aircraft within Class B less than 10 percent of the time. Class B covers all other runways and aircraft. Presently, a Class B criterion is applied to all runways at Yuma International Airport by MCAS Yuma. The 1999 Airport Master Plan recommended reclassifying Runways 17-35 and 8-26 to Class A from Class B. Class A is more

representative of the civilian and military use of these runways.

**Exhibit 2A** depicts the Class A and Class B approach departure surface (ADS). The ADS defines obstruction clearance for approach and departure protection. Near the airport, the Class A ADS slopes upward and outward at 40 to 1. The Class B ADS slopes upward and outward at 50 to 1. The Class B ADS is 500 feet wider than the Class A ADS at its beginning (which starts 200 feet from the Runway 8 threshold).

The FAA requires a runway protection zone (RPZ). The RPZ is a twodimensional trapezoidal area off the end of the runway intended to protect people and property on the ground. The RPZ is required to be under the control of the airport sponsor and clear of incompatible objects. The Runway 8 RPZ is presently clear of any objects.

The FAA approach surface extends upward and outward at a slope of 34 to 1. This surface is only 500 feet at its beginning (which is similar to the military ADS and starts 200 feet from the Runway 8 threshold). Since the FAA surface is not as wide as the military surface, the military ADS is the controlling surface for obstruction clearance standards.

The Yuma County Zoning Ordinance (November 20, 2003) defines the Runway Approach Departure Safety Areas (RADSA) and Airport Industrial Overlay District-2 (AIOD-2). The RADSA includes "all property located within 1/8 of a mile (nominal) north and



Exhibit 2A ALTERNATIVE A

south of the extended centerline of Runway 8-26 following existing property lines between the west property line of the airport and the west rightof-way line of 4<sup>th</sup> Avenue." The AIOD-2 includes property located within an area bounded by the future alignment of 36<sup>th</sup> Street (east-west mid-section line) on the south, the west right-ofway line of 4<sup>th</sup> Avenue on the west, the west airport property line on the east, and that area which is more than 1/8 of a mile (nominal) south of the extended centerline of Runway 8-26 following existing property lines. Essentially overlapping, the RADSA and AIOD-2 define certain land uses and densities for development west of Runway 8.

For this analysis, future general aviation development will remain outside the limits of the RADSA and AIOD-2. Since military Class A criterion is more representative of the aircraft using Runway 8-26, future general aviation development will remain outside the Class A ADS.

# DEVELOPMENT ALTERNATIVES

The purpose of this section is to identify and evaluate various viable general aviation development alternatives at Yuma International Airport and to meet the program requirements set forth in Chapter One.

#### ALTERNATIVE A

Alternative A is depicted on **Exhibit 2A**. This alternative proposes to purchase large sections of land to meet long-term general aviation needs. Essentially, all property west of Burch Way to Arizona Avenue and all property south of 36<sup>th</sup> Street to 39<sup>th</sup> Street (with the exception of the land occupied by the MCAS Yuma airport traffic control tower [ATCT]) would be purchased and reserved for future general aviation development.

A new roadway would bisect this acquisition area to provide public roadway access to the MCAS Yuma Presently, the MCAS Yuma ATCT. ATCT is accessed via Pico Avenue. The Pico Avenue access would be eliminated to provide taxiway access to a series of large aircraft storage (corporate) hangars and T-hangars along Arizona Avenue. Aircraft storage is proposed for this area, as this section of property is located behind the MCAS Yuma ATCT and may not have good visibility and recognition for transient users. The area between the MCAS Yuma ATCT and 36<sup>th</sup> Street would be developed with FBO hangars and apron areas. Burch Way would be closed where the apron makes the connection with the existing west general aviation apron. The southern portion of the west general aviation apron would be accessed via the new public roadway extending east from Arizona Avenue. 36<sup>th</sup> Street would continue to provide access to the facilities located on the northern edge of the apron.

The existing apron area would be expanded to the southwestern airport boundary in this alternative. FBO development is shown along Burch Way east of the MCAS Yuma ATCT. This alternative provides for separate general aviation terminals owned and operated by the FBOs on each side of Automobile parking is the apron. provided near each terminal. The existing shade hangars would be and relocated the YCAA-owned conventional hangar removed to allow for FBO hangar development on the northern section of the west general aviation apron. This locates service hangars near the northern FBO terminal.

Aircraft storage would be expanded in the hangar area north of Taxiwav I2. A T-hangar would be developed north of Hangar Complex D. A series of aircraft storage parcels are reserved west of these existing hangars. These parcels would allow for the private development of aircraft storage hangars. Access to these parcels would be via a new public roadway extending south from Bonanza Avenue and connecting to  $36^{th}$  Street. This roadway would also extend to the east connecting to the southern terminus of Fortuna Avenue. Fortuna Avenue would be closed where it obstructs the approach surface. Runway 8 Corporate hangars and T-hangars are planned north of the J-Mar hangar. A large vehicle parking area would serve these hangar areas, as well as Diamond Air.

# ALTERNATIVE B

Alternative B is depicted on **Exhibit 2B**. This alternative proposes much of the same property acquisition as Alternative A; however, the property is utilized differently. In contrast with

Alternative A, all FBO development would be located along Arizona Avenue. Arizona Avenue is planned as a major arterial roadway which would provide good visibility for the commercial general aviation businesses. The commercial general aviation areas would be separated by the public roadway extending to the east to provide access to the MCAS Yuma ATCT and existing west general aviation apron. This alternative includes a single terminal building located along Arizona Avenue.

This alternative proposes land acquisition north of 36<sup>th</sup> Street for aircraft storage hangar development. Development to the north is limited by the Class A ADS, the RADSA, and AIOD-2 land use designations.

Expansion of the new hangar complex north of Taxiway I2 to the limits of the RADSA and AIOD-2 is proposed in this alternative. FBO development is proposed for the area south of Hangar Complex A. The parking area for the FBO hangars is also planned to serve Diamond Air. This FBO area would be accessed via an extension of Bonanza Avenue. Similar to Alternative A, Fortuna Avenue would be closed where it obstructs the Runway 8 approach surfaces.

Similar to Alternative A, the existing west general aviation apron is expanded to the southwestern boundary to replace the pavement lost when Sun Western Flyers relocates from near the terminal building. FBO development is shown in an existing undeveloped area along the west general aviation apron.



Exhibit 2B ALTERNATIVE B

#### ALTERNATIVE C

Alternative C is depicted on **Exhibit 2C**. This alternative does not consider the property acquisition depicted in both Alternatives A and B. Instead, this alternative assumes the relocation of the Navy Transceiver site. The relocation of the transceiver site would allow for considerable apron expansion. This apron expansion can similarly achieved only be in Alternatives A and B with the land acquisitions.

In this alternative, FBO development is proposed along the western airport boundary with the MCAS Yuma ATCT. A terminal building is planned in this area. FBO development is also considered east of Pico Avenue along an extended apron area.

Similar to Alternative B, the existing hangar complex located north of Taxiway I2 is expanded to the limits of the RADSA and AIOD-2. FBO development is proposed south of Hangar Complex A. In contrast with Alternative B, the FBO parcels face to the east for visibility from Taxiway I. A parking area is reserved near Diamond Air. A roadway system extends from the southern terminus of Fortuna Avenue to 36<sup>th</sup> Street and connects with Bonanza Avenue to provide access to the proposed FBO and hangar areas. The portion of obstructing Fortuna Avenue the Runway 8 approach surfaces would be closed.

To meet long-term aircraft storage hangar needs, this alternative proposes land acquisition north of Burch Way. Aircraft storage hangar parcels, T-hangars, and corporate hangars are proposed for this area.

# SUMMARY

The process utilized in assessing the general aviation development alternatives involved a detailed analysis of short and long-term requirements, as well as future growth potential. Current airport design standards were considered at each stage of development.

These alternatives presented an ultimate configuration of the airport that would need to be able to be developed over a long period of time. The next phase of this study will define a reasonable phasing program to implement the ultimate plan over time.

Upon review of this chapter by the YCAA, airport tenants, airport users, and the public, a final general aviation development program can be formed. The resultant plan will represent a general aviation complex that can be developed as demand dictates.

The proposed general aviation development plan for the airport must represent a means by which the airport can grow in a balanced manner to accommodate forecast demand. In addition, it must provide (as all good development plans should) for flexibility in the plan to meet activity growth beyond the 20-year planning period.

The remaining chapters will be dedicated to refining the basic concept into a final plan with recommendations to ensure proper implementation and timing for a demand-based program.





Exhibit 2C ALTERNATIVE C



Chapter Three

GENERAL AVIATION DEVELOPMENT PLAN

# GENERAL AVIATION DEVELOPMENT PLAN



The planning process for the General Aviation Strategic Plan has evolved through several analytic efforts in the previous chapters intended to analyze future aviation demand, establish facility needs, and evaluate options for the future development of the general aviation facilities at Yuma International The planning process has Airport. included the presentation of a draft phase report to the Yuma County Airport Authority (YCAA) and airport tenants, summarizing the analysis of future demand, facility needs, and development opportunities and constraints. The purpose of this chapter is to describe, in narrative and graphic form, the recommended development direction for general aviation activity at Yuma International Airport and the capital improvements necessary to implement the program. Funding sources are also identified in this chapter.



#### DESIGN STANDARDS

3-1

The proper placement of future general aviation facilities will need to consider the size of general aviation aircraft expected to use the airport through the planning period. The Federal Aviation Administration (FAA) provides guidance in the proper placement of facilities through design standards specified in *Advisory Circular 150/5300-13, Airport Design.* FAA design standards focus on the wingspan of the critical design aircraft expected to use the general aviation facilities when designing those facilities. The Airplane Design Group (ADG) is

used by the FAA to define appropriate design standards. The three ADGs applicable to general aviation activity at Yuma International Airport include the following:

Airplane Design Group (ADG) I: Wingspans up to but not including 49 feet.

Airplane Design Group (ADG) II: Wingspans 49 feet up to but not including 79 feet.

Airplane Design Group (ADG) III: Wingspans 79 feet up to but not including 118 feet.

ADG I covers most single and multiengine piston-powered aircraft, but also includes many business jets such as the Cessna Citation and Learjet models. ADG II includes larger business jets and turboprops. ADG III covers the largest business jets such as the Gulfstream IV and V and Bombardier Global Express.

Table 3A summarizes the planning standards for the various ADGs anticipated at Yuma International Airport. These standards should be considered when facilities are actually constructed to ensure the areas can properly accommodate the type of aircraft expected to use that particular facility. In general, ADG I is sufficient for T-hangar areas. ADG II should be considered for the corporate hangar areas, while the main transient apron areas should consider ADG III for taxilanes and movement areas in and out of Fixed Base Operator (FBO) hangars.

TABLE 3A			
General Aviation Design Standards			
Yuma International Airport			
	ADG I	ADG II	ADG III
<u>Taxiways</u>			
Width (feet)	25	35	50
Shoulder Width (feet)	10	10	20
Safety Area Width (feet) 49 79 118			
Object Free Area Width (feet)89131186			
Taxiway Centerline to Parallel Taxiway/Taxilane Centerline (feet)69105152			
Taxiway Centerline to Fixed or Moveable Object (feet)44.565.593			
Wingtip Clearance (feet)	20	26	34
<u>Taxilanes</u>			
Taxilane Centerline to Parallel Taxilane Centerline (feet)	64	97	140
Taxilane Centerline to Fixed or Moveable Object (feet)	39.5	57.5	81
Taxilane Object Free Area (feet)	79	115	162
Wingtip Clearance (feet)	15	18	22
Source: FAA Airport Design Software Version 4.2D			

# DEVELOPMENT PLAN

The general aviation development plan for Yuma International Airport has been devised to efficiently accommodate potential general aviation demand. The development plan provides for land acquisition specifically for general aviation, expansion of general aviation apron space, expanded FBO areas, new general aviation terminal buildings, and expanded aircraft storage facilities. The recommended general aviation development plan is shown in detail on **Exhibit 3A**.

The plan considers the expansion of general aviation facilities to the west as needed for demand. The recommended development plan incorporates portions of all three alternatives considered in Chapter Two, but most closely follows Alternative B. This alternative allows for future general aviation facilities to be located along Arizona Avenue, a primary regional road, for ease of access. Locating the facilities along Arizona Avenue is a component of an overall theme of this plan, which is to improve the look of facilities at the airport and increase visibility for the general aviation portions of the airport. It is expected that future general aviation facilities would be of high-quality construction and match in style commercial facilities in other areas of the City.

This plan does not include the relocation of the Navy transceiver site. A definitive plan for the relocation of the Navy transceiver site had not been completed when this report was prepared. Additionally, the Navy has a lease on this property through 2020. Several steps must be taken before the Navy transceiver site is available for general aviation development. This includes finding a new site for the transceiver equipment, funding the acquisition of that property and equipment relocation, and the Navy With the relinquishing their lease. many uncertainties related to when the Navy transceiver site could be moved, the recommended general aviation plan needed to consider another development program to ensure maximum flexibility in development planning. While the plan does not depict the relocation of the Navy transceiver site, this plan does recommend that the YCAA continue to negotiate with the Marine Corps Air Station (MCAS) Yuma for the relocation of the Navy transceiver site.

The general aviation development plan includes the acquisition of approximately 66 acres of land west of the existing general aviation area for future general aviation development. The existing general aviation area is constrained for growth opportunities due to existing land use restrictions to the north to protect the approach to Runway 8, the Navy transceiver site, and the MCAS Yuma property to the east and south. The property acquisition plan includes all property west of Burch Way to Arizona Avenue, from 36<sup>th</sup> Street south to 39<sup>th</sup> Street (excluding the existing MCAS Yuma airport traffic control tower [ATCT] site), and property north of 36<sup>th</sup> Street between Arizona Avenue and Burch Way, as shown on the exhibit.

The general aviation development plan includes the construction of two separate terminal buildings. These buildings would be located along existing public access roads and parking areas along the west general aviation apron. These terminal facilities would be gathering points for air travelers and pilots, providing areas for pilots to complete flight planning and weather briefings, restrooms, and other office space as needed. The terminal buildings would be used by a particular FBO to conduct their services. Therefore, these buildings are generally considered to be developed privately by a particular FBO to meet their needs and customer base.

Access to the terminal facilities would initially be via Burch Way, which connects to 36<sup>th</sup> Street, then Arizona Avenue. Following expansion of the apron to the west, a new access point would be needed for the southern terminal building, as the portion of Burch Way south of the northern terminal building would need to be closed to provide proper security between the apron and public access roadways. The development plan includes the construction of a new access road extending between Arizona Avenue and the southern terminal facility, following the expansion of the apron area to the west. This new roadway would also serve the MCAS Yuma ATCT. Their existing entrance road along Pico Avenue will be closed in the future to allow access to future general aviation facilities west of the MCAS Yuma ATCT.

Approximately 190,000 square vards of additional apron (excluding hangar access taxilanes) is included in the recommended General Aviation Development Plan. The total apron addition would be divided into several The existing west separate areas. general aviation apron would be expanded by approximately 18.700square vards north of Taxiway I2, and 43,900 square yards to the south, for a total of 62,600 square yards. The apron west of Burch Way extending north of the MCAS Yuma ATCT would encompass approximately 82,800 square yards. The apron west of the MCAS Yuma ATCT would encompass approximately 44,500 square yards. These new aprons would support several new FBO parcels as shown on **Exhibit 3A**.

Three parcels have been established along the existing general aviation The first is a 45,500apron area. square-foot parcel at the southern end of the apron, adjacent to the MCAS Yuma ATCT site. This is the first parcel expected to be developed at the The second parcel encomairport. passes approximately 30,000 square feet between an existing FBO hangar and Burch Way. A third FBO parcel is reserved on the corner of 36<sup>th</sup> Street and Burch Way. This 27,000-squarefoot parcel would be created by removing and replacing the existing shade hangars to the north. An existing FBO hangar owned by the YCAA would also be removed. An additional FBO parcel would be located along the apron expansion north of Taxiway I2. This parcel has an area of 46,000 square feet and would be accessed across the existing apron near Taxiway I and around the east end of the J-Mar hangar. This FBO parcel would be accessed via an extension of Bonanza Avenue. The Bonanza Avenue extension would replace the existing Fortuna Avenue access point to the south. Fortuna Avenue is an obstruction to the Runway 8 approach. The portion of the road below the Runway 8 approach would be closed once Bonanza Avenue is extended to the new



Exhibit 3A RECOMMENDED GENERAL AVIATION DEVELOPMENT PLAN

FBO area. The FBO parcels along Arizona Avenue encompass approximately 275,000 square feet.

The addition of 90 new T-hangars is included in the recommended General Aviation Development Plan. All Thangars would be consolidated north of Taxiway I2 and 36<sup>th</sup> Street to segregate aircraft storage and transient activities.

Several new corporate hangar parcels are included in the recommended General Aviation Plan. A total of 293,500 square feet of corporate hangar space has been provided within This includes four 40,000the plan. square-foot corporate hangar parcels and one 57,500-square-foot hangar parcel north of 36<sup>th</sup> Street, east of Arizona Avenue. A 49,000-square-foot corporate hangar parcel is located along the southwest corner of Burch Way and 36<sup>th</sup> Street. This corporate hangar parcel would have its own parking lot to the north of the building. An additional 27,000-square-foot corporate hangar parcel is located to the east of the existing T-hangar buildings. Each of these corporate hangar parcels would be able to house multiple aircraft.

# CAPITAL IMPROVEMENT PROGRAM

The presentation of the capital improvement program has been organized into two sections. First, the airport development schedule is presented in narrative and graphic form. Second, airport improvement funding sources on the federal, state, and local levels are identified and discussed.

## DEMAND-BASED PLAN

The General Aviation Strategic Plan for Yuma International Airport has been developed according to a demand-based schedule. Demand-based planning refers to the intention to develop planning guidelines for the airport based upon airport activity levels instead of guidelines based on points in time. By doing so, the levels of activity derived from the demand forecasts can be related to the actual capital investments needed to safely and efficiently accommodate the level of demand being experienced at the airport. More specifically, the intention of the General Aviation Strategic Plan is that the facility improvements needed to serve new levels of demand should only be implemented when the levels of demand experienced at the airport justify their implementation.

For example, the aviation demand forecasts projected that based aircraft could be expected to grow through the year 2025. This forecast was supported by the local community's growing economy and population and historical trends showing growing based aircraft levels.

The forecasts noted, however, that future based aircraft levels will be dependent upon a number of economic factors. These factors could slow or accelerate based aircraft levels differently than projected in the aviation demand forecasts. Since changes in these factors cannot be realistically predicted for the entire forecast period, it is difficult to predict with the level of accuracy needed to justify a capital investment exactly when an improvement will be needed to satisfy demand level.

For these reasons, the Yuma International Airport General Aviation Strategic Plan has been developed as a demand-based plan. The General Aviation Strategic Plan projects various activity levels for Short, Intermediate, and Long Term Planning Hori-When activity levels begin to zons. reach or exceed the level of one of the planning horizons, the General Aviation Strategic Plan suggests planning begin to consider the next planning horizon level of demand. This provides a level of flexibility in the Master Plan, as the development program can be accelerated or slowed to meet demand.

A demand-based plan does not specifically require implementation of any of the demand-based improvements. Instead, it is envisioned that implementation of any General Aviation Strategic Plan improvements would be examined against demand levels, prior to implementation. The General Aviation Strategic Plan establishes a plan for the use of the airport facilities, consistent with potential aviation needs and the capital needs required to support that use. However, individual projects in the plan are not implemented until the need is demonstrated and the project is approved by the YCAA.

#### AIRPORT DEVELOPMENT SCHEDULE AND COST SUMMARIES

The airport development schedule presented in this section outlines the costs for each recommended project and estimates when development should take place. The program outlined on the following pages has been evaluated from a variety of perspectives and represents the culmination of a comparative analysis of basic budget factors, demand, and priority assignments.

Since forecast demand and operational changes can change, frequently on short notice, the airport development schedule has been divided into planning horizons reflecting short term (0-5 years), intermediate (6-10 years), and long term (11-20 years) goals and Planning horizons are inneeds. tended to reflect the fact that many future improvements for the airport are demand-based rather than timebased, and that the actual need to improve facilities will be linked to specific and verifiable activity. The airport development schedule should be viewed as a fluid document which can be modified to reflect actual growth in airport activity. The short-term planning period covers items of highest priority. Because of their priority, these are the only items scheduled vear-by-year, so as to be easily incorporated into YCAA, state, and FAA programming.

Exhibit 3B summarizes the General Aviation Strategic Plan development schedule. In addition to the listing of actual improvement projects, an estimate has been made of the timing for implementation and federal and state funding eligibility for each airport improvement project, as well as the local share costs for completing the recommended improvements. Due to the conceptual nature of the General Aviation Strategic Plan, implementation of capital improvement projects should occur only after further refinement of their design and costs through engineering and/or architectural analyses. Capital costs in this chapter should be viewed only as estimates subject to further refinement during design. Nevertheless, these estimates are considered sufficient for performing the feasibility analyses in this chapter.

## Short Term Planning Horizon Improvements

The Short Term Planning Horizon outlines the anticipated capital needs of the airport over the next five fiscal years (FY 2006-2010). Short Term Planning Horizon improvements are estimated to cost approximately \$8.3 million and include the following:

Land Acquisition: This is the purchase of the 66 acres of land identified in the plan for future general aviation needs. This includes all property west of Burch Way to Arizona Avenue, from 36<sup>th</sup> Street south to 39<sup>th</sup> Street (excluding the existing MCAS Yuma ATCT site), and property north of 36<sup>th</sup> Street between Arizona Avenue and Burch Way.

**Apron Expansion:** This is the expansion of the west general aviation apron to the southern airport boundary with MCAS Yuma.

**Hangar Construction:** This is the construction of 18 new T-hangars and 14,600 square feet of corporate hangar space anticipated to be needed for projected demand. This also includes the replacement of the existing shade hangars in the T-hangar area and removal of the exiting YCAA-owned maintenance hangar to provide for a future FBO parcel at the corner of 36<sup>th</sup> Street and Burch Way.

Automobile Parking Expansion: This is the completion of the unpaved parking areas on the west apron.

**Terminal Building Construction:** This is the construction of one of the terminal buildings shown for the west general aviation area.

#### Intermediate and Long Term Planning Horizon Improvements

The Intermediate and Long Term Planning Horizon focuses on programming improvements to meet projected demands. The following projects are included in the Intermediate Term Planning Horizon:

- Apron expansion north of Taxiway I2
- Bonanza Avenue extension and closure of Fortuna Avenue

- Construction of parking at the terminus of Bonanza Avenue
- Construction of hangar access taxiways
- Construction of 12 T-hangars
- Construction of 14,900 square feet of corporate hangar space
- Extension of Taxiway I to the Runway 35 end

Long Term Planning Horizon improvements include:

- Construction of hangar access taxiways
- Construction of 45 T-hangars
- Construction of 22,400 square feet of corporate hangar space

**Exhibit 3C** depicts the development staging through the planning period.

#### **Full Build-Out Projects**

The cost for a number of projects identified in the General Aviation Development Plan are included in the capital program shown on Exhibit 3B, but have not been specifically programmed for implementation. This is because these projects are in excess of the projection of demand summarized in Chapter One. Specifically, this includes the apron expansion west of Burch Way to Arizona Avenue and the corporate hangar development north of 36<sup>th</sup> Street. Depending upon general aviation growth at Yuma International Airport, these projects may be needed sooner than projected in this document. Therefore, the cost to implement these projects and their funding eligibility are defined for maximum development flexibility for the YCAA in the future.

## AIRPORT DEVELOPMENT FUNDING SOURCES

Financing future airport improvements will not rely exclusively upon the financial resources of the YCAA. Airport improvement funding assistance is available through various grants-in-aid programs on both the state and federal levels. The following discussion outlines the key sources for airport improvement funding and how they can contribute to the successful implementation of the General Aviation Strategic Plan.

#### FEDERAL AID TO AIRPORTS

Through federal legislation over the years, various grants-in-aid programs have been established to develop and maintain a system of public airports throughout the United States. The purpose of this system and its federally-based funding is to maintain national defense and promote interstate commerce. The most recent legislation is the Vision 100 – Century of Aviation Reauthorization Act, Vision 100, which was signed into law on December 13, 2003.

*Vision 100* is a four-year bill covering FAA fiscal years 2004, 2005, 2006, and 2007. *Vision 100* provides national funding levels of \$3.4 billion in 2004, increasing \$1 million annually, until reaching \$3.7 billion in 2007.

2.2		and the second		G	rant Eligible			
				Federally	ADOT	YCAA		Other
No.	Description	TOTAL		Eligible	Eligible	Match	Fı	inding *
	SHORT TERI	M PLANNING HOR	ZO	N				
1.	Expand Apron South - Phase I	\$ 450,000	\$	427,500	\$ 11,250	\$ 11,250		-
2.	Environmental Assessment - Land Acquisition	100,000		95,000	2,500	2,500		-
3.	Construct Taxiway I Holding Apron	150,000		-	135,000	15,000		-
4.	Land Acquisition (66 acres)	2,409,200		2,288,740	60,230	60,230		-
5.	Expand Apron South - Phase II	2,780,700		2,641,665	69,518	69,518		-
6.	Construct Automobile Parking	129,200		122,740	3,230	3,230		
7.	Construct Terminal Building	386,900		-				386,900
8.	Construct Hangar Access Taxiways	736,400		699,580	18,410	18,410		2.2.2
9.	Construct Corporate Hangars	364,400		-				364,400
10.	Construct 18 T-hangars	453,600			-	-		453,600
11.	Replace Shade Hangars	379,600						379,600
12.	Remove Hangar	38,400		36,480	960	960		-
Sub	total Short Term Planning Horizon	\$ 8,378,400	\$	6,311,705	\$ 301,098	\$ 181,098	\$	1,584,500
	INTERMEDIATE	TERM PLANNING	HOF	RIZON				
1.	Extend Taxiway I to Runway 35 End	\$ 470,900	\$	447,355	\$ 11,773	\$ 11,773	\$	
2.	Construct Apron North of Taxiway I2	1,372,100		1,303,495	34,303	34,303		-
3.	Extend Bonanza Avenue	171,700		163,115	4,293	4,293	-	-
4.	Construct Automobile Parking	64,600		61,370	1,615	1,615		-
5.	Construct Terminal Building	386,900		-		-		386,900
6.	Construct Hangar Access Taxiways	646,500		614,175	16,163	16,163		-
7.	Construct Corporate Hangars	369,500		_		-		369,500
8.	Construct 12 T-hangars	302,400		_	-			302,400
Sub	total Intermediate Term Planning Horizon	\$ 3,784,600	\$	2,589,510	\$ 68,145	\$ 68,145	\$	1,058,800
	LONG TERN	I PLANNING HORI	ZON	]		· · · ·		
1.	Construct Hangar Access Taxiways	\$ 1,394,000	\$	1,324,300	\$ 34,850	\$ 34,850	\$	
2.	Construct Corporate Hangars	489,500					1	489,500
3.	Construct 45 T-hangars	1,134,000						1,134,000
Subtotal Long Term Planning Horizon		3,017,500	- 24	1,324,300	34,850	34,850		1,623,500
Tota	al Programmed Development	\$ 15,180,500	\$	10,225,515	\$ 404,093	\$ 284,093	\$ 4	4,266,800
	FULL BUI	LD-OUT PROJECT	3					
1.	Relocate Fuel Farm	\$ 250,000	\$	-	\$ -	\$ -	\$	250,000
2.	Construct Access Road	324,300		308,085	8,108	8,108		-
3.	Construct West Apron	4,791,000		4,551,450	119,775	119,775		
4.	Construct West Automobile Parking	625,600		594,320	15,640	15,640		-
5.	Construct Southwest Apron	3,265,000		3,101,750	81,625	81,625		
6.	Construct Southwest Automobile Parking	826,400		785,080	20,660	20,660		-
7.	Construct West Corporate Hangar Apron	1,284,000		1,219,800	32,100	32,100		-
8.	Construct West Corporate Hangar Automobile Parking	154,100		146,395	3,853	3,853		-
9.	Construct West Corporate Hangars	975,000			-			975,000
10.	Construct Corporate Hangars	802,500			111111111111	-		802,500
11.	Construct Hangar Access Taxilanes	557,600		529,720	13,940	13,940		
12.	Construct Corporate Hangars	802,500				2		802,500
13.	Construct Hangar Access Taxilanes	557,600		529,720	13,940	13,940		-
14.	Construct Corporate Hangars	1,095,800				-		1,095,800
Sub	total Full Build-Out Projects	\$ 16,311,400	\$	11,766,320	\$ 309,640	\$ 309,640	\$ :	3,925,800
Tota	al Programmed Development and Full Build-Out Projects	\$ 31,491,900	\$	21,991,835	\$ 713,733	\$ 593,733	\$	8,192,600
* T	* These projects will need to be funded through the private sector as they are not grant eligible.							
No	te: FBO Hangars are assumed to be developed by the FBO own	ners.		S.S.	10			
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Exhibit 3B CAPITAL IMPROVEMENT PROGRAM

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HORIZON	LONG TERM PLANNING HORIZON	
hasa l		1
nase I	Construct Hangar Access Taxiways	
Acquisition	Construct 45 T-bangars	1
	Construct Access Road	1
	Construct West Apron	1
	Construct West Automobile Parking	
	5 Construct Southwest Apron	
	6 Construct Southwest Automobile Parking	
	Construct West Corporate Hangar Apron	
	8 Construct West Corporate Hangar Automobile Parking	
ANNING	Oonstruct West Corporate Hangars	
5)	10 Construct Corporate Hangars	I,
	Construct Hangar Access Taxilanes	
2	Construct Corporate Hangars	8
	13 Construct Hangar Access Taxilanes	1
	Construct Corporate Hangars	
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Exhibit 3C DEVELOPMENT PLAN STAGING

The source for federal funding of airports is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities and equipment, and research and development). The Trust Fund also finances the operation of the FAA. It is funded by user fees, taxes on airline tickets, aviation fuel, and various aircraft parts.

Proceeds from the Aviation Trust Fund are distributed each year by the FAA from appropriations by Congress. A portion of the annual distribution is to primary commercial service airports, such as Yuma International Airport, based upon enplanement levels. Since Yuma International Airport enplanes more than 10,000 passengers annually, the airport is provided a \$1,000,000 annual entitlement.

After meeting entitlement obligations, the remaining Airport Improvement Program (AIP) funds are distributed by the FAA, based upon the priority of the project for which they have requested federal assistance through discretionary apportionments. A national priority ranking system is used to evaluate and rank each airport project. Those projects with the highest priority are given preference in funding. Each project for Yuma International Airport is required to follow this procedure and compete with other airport projects in the state for AIP State apportionment dollars, and across the country for other federal AIP funds. An important point to consider is that funding for projects in excess of \$1 million annually is not guaranteed for Yuma International Airport.

Airport development that meets the FAA's eligibility requirements can receive 95 percent federal funding. This is a five percent increase from past funding, which only provided 90 percent funding for eligible projects. The 95 percent funding level is currently only provided by law until 2007. After 2007, the funding level would revert back to 90 percent unless extended by Congress. Funding at 95 percent for AIP eligible projects has been assumed to extend through the planning period, as it is expected that subsequent legislation would make permanent the 95 percent funding level. Property acquisition, airfield improvements, aprons, perimeter service roads, and access road improvements are examples of eligible items.

While Vision 100 does provide for the Secretary of Transportation to fund revenue-generating developments such as hangars and fuel facilities (which have historically not been eligible for federal funding), Vision 100 limits this funding eligibility to nonprimary airports. Since Yuma International Airport is a primary airport receiving an annual entitlement, general aviation terminal buildings, hangar buildings, and fuel facilities are not eligible for grant funding.

#### STATE AID TO AIRPORTS

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

Under the State of Arizona grant program, an airport can receive funding for one-half (2.5 percent) of the local share of projects receiving federal AIP funding. The state also provides 90 percent funding for projects, such as pavement maintenance, which are not eligible for AIP funding.

## State Airport Loan Program

The Arizona Department of Transportation - Aeronautics Division (ADOT) recently established the Airport Loan This program was estab-Program. lished to enhance the utilization of State funds and provide a flexible funding mechanism to assist airports in funding improvement projects. Eligible projects include runway, taxiway, and apron improvements; land acquisition, planning studies, and the preparation of plans and specifications for airport construction projects; as well as revenue-generating improvements such as hangars and fuel storage facilities. Projects which are not currently eligible for the State Airport Loan Program are considered if the project would enhance the airport's ability to be financially self-sufficient.

There are three ways in which the loan funds can be used: Grant Advance, Matching Funds, or Revenue-Generating Projects. The Grant Advance loan funds are provided when

the airport can demonstrate the ability to accelerate the development and construction of a multi-phase project. The project(s) must be compatible with the Airport Master Plan and be included in the ADOT 5-year Airport Development Program. The Matching Funds are provided to meet the local matching fund requirement for securing federal airport improvement grants or other federal or state grants. The Revenue-Generating funds are provided for airport-related construction projects that are not eligible for funding under another program.

## LOCAL FUNDING

The balance of project costs, after consideration has been given to grants, must be funded through local resources. There are several alternatives for local finance options for future development at the airport. The YCAA can fund some developments through airport revenues or issuing bonds. Other options rely on private funding mechanisms, such as bank loans or private capital investments.

The development of general aviation facilities at Yuma International Airport has relied on a combination of public and private investments in the past. The YCAA has funded many of the grant-eligible items for general aviation at the airport including the taxiways, apron, access roads, and automobile parking. Private individuals or businesses have financed the construction of some of the FBO hangars. With local bank financing, the YCAA constructed the new T-hangars and corporate hangars in the west general aviation area.

A continuation of public and private investments will be necessary to implement the proposed General Aviation Development Plan. The capital improvement program shown above included the YCAA fully pursuing all the grant-eligible improvements to accommodate general aviation growth in the future. This includes apron development, hangar access taxiways, public roadways and automobile parking, and land acquisition. Under this scenario, the YCAA (with grant assistance) would fund over \$22 million of the proposed capital program shown above, or over 73 percent of the future development costs. It is important to recognize that while many of the projects shown above are grant eligible, their funding is uncertain. The YCAA is only entitled to \$1 million annually, which needs to be directed towards all civil aviation needs at the airport including airfield safety and certification, air cargo, and commercial air service.

The T-hangar, FBO hangar, corporate hangar, and terminal building construction is not grant eligible, therefore some type of private funding must be pursued to implement these improvements. These improvements are demand-based; therefore, these projects should only be pursued when the need for these facilities can be determined. Furthermore, these facilities should only be constructed when it is found that the development costs can be fully recovered through lease and rental fees.

The YCAA has funded some T-hangar and corporate hangars in the past, al-

though future hangars and the terminal building could be developed by private contractors through long-term ground leases. The obvious advantage of such an arrangement is that it relieves the YCAA of all responsibility for raising the capital funds for improvements. Master ground leases offer a substantial financial advantage to a private developer, as there are not up-front land acquisition costs and lease payments are fully deductible for tax purposes, whereas owned land cannot be depreciated. Under a straight ground lease to a developer, the YCAA would not be involved in the construction, financing, sale, or lease of buildings for tenants.

# **SUMMARY**

The General Aviation Strategic Plan for Yuma International Airport has been developed in cooperation with interested citizens and the YCAA. It is designed to assist the YCAA in making decisions relative to the future use of general aviation facilities at Yuma International Airport. Flexibility will be a key to the plan, since activity may not occur exactly as forecast.

The best means of beginning the implementation of recommendations of the General Aviation Strategic Plan is to first recognize that planning is a continuous process that does not end with completion of the General Aviation Strategic Plan. Rather, the ability to continuously monitor the existing and forecast status of general aviation activity must be provided and maintained. In this General Aviation Strategic Plan, focusing on the timing of airport improvements was necessary. However, the actual need for facilities is more appropriately established by airport activity levels rather than a specified date.

For example, projections have been made as to when additional T-hangar facilities would be needed to accommodate based aircraft growth. However, in reality, the time frame in which additional facilities are needed may be substantially different. Actual demand may be slow in reaching forecast activity levels. On the other hand, increased based aircraft totals may establish the need for new facilities much sooner. Although every effort has been made in this planning process to conservatively estimate when facility development may be needed, aviation demand will dictate when facility improvements need to be accelerated or delayed.

In summary, the planning process requires the YCAA to consistently monitor the progress of general aviation activity in terms of total and type of aircraft operations, and total and type of based aircraft. Analysis of aircraft demand is critical to the exact timing and need for new airport facilities. The information obtained from continually monitoring airport activity will provide the data necessary to determine if the development schedule should be accelerated or decelerated.



Appendix A SURVEYS

# YUMA INTERNATIONAL AIRPORT



# **GENERAL AVIATION TENANT/USER SURVEY**

The Yuma County Airport Authority (YCAA) is initiating work on a plan for the future development of General Aviation facilities at Yuma International Airport. The study will identify specific airport facilities and services that will be required to meet future general aviation demands. As the Airport Consultants conducting the study, Coffman Associates is interested in the specific needs of those who presently use the airport and those who may use it in the future. This questionnaire has been designed to assist in the collection of specific information which will aid in assessing the need for airport improvements and general aviation facilities. It is advantageous for you to complete and return this form no later than August 15, 2004. Your cooperation is greatly appreciated.

1.	What is the zip code of the primary location you travel from to get to your aircraft?			
2.	What type(s) of aircraft do you, your company, or organization currently operate at Yuma International Airport?			
	Own       Lease       Aircraft Make       Model         Please attach a listing of any additional aircraft.       Model       Model			
3.	In percentage, indicate what types of flying you normally conduct at Yuma International Airport.			
	Business% + Pleasure% + Flight Instruction% + Other% = 100%			
	(Please specify Other Types of Flying)			
4.	Are you or your company contemplating purchasing any additional or upgrading your current aircraft?			
	Yes No			
	If yes, please indicate how many, what type, approximately when:			
5.	Approximately how many operations (takeoffs and landings) per month does your aircraft average at Yuma International Airport?			
6.	As a percentage of your total Yuma International Airport operations, indicate the amount of touch-and-go training operations performed by your aircraft at Yuma International Airport.			
	%			
7.	Rank your reasons for electing to base at Yuma International Airport by priority (1= highest priority).			
	Convenience (closer to where I live or work)			
	Aircraft Hangar Facilities FBO/Executive Terminal Services			
	Lower Aircraft Storage Costs			
	Navigational Aids			
	Other (please list)			

8. Which provider do you currently use for the following services?

Fuel	·
Maintenance	
Parking/Hangar	
Washing/Cleaning	

9. Please indicate the type of parking or hangar space that you:

Currently use for each aircraft:	Would prefer to use, if available:
Tie-down Shade Hangar T-Hangar Individual Hang Multi-Aircraft H	gar Tie-down Tie-down Shade Hangar T-Hangar Individual Hangar Multi-Aircraft Hangar

10. Overall, what types of improvements do you consider most necessary at Yuma International Airport (1=highest priority).

Airport/FBO Services	Aircraft Hangars Executive Terminal Building Navigational Aids
Other (please list)	
Please list any specific improvements that you	u feel are needed.

11. Do you have any comments regarding the future development of Yuma International Airport? (Please feel free to attach additional comments.)

12. What customer service improvements are needed at Yuma International Airport?

Thank you for your time and participation. Please return your survey in the enclosed stamped, self-addressed envelope. If the return envelope has been lost or misplaced, please mail survey to:

COFFMAN ASSOCIATES 4835 E. Cactus Road, Suite 235 Phoenix, Arizona 85254 Or FAX to: (602) 993-7196

# YUMA COUNTY



## AIRCRAFT OWNERS SURVEY

The Yuma County Airport Authority (YCAA) is initiating work on a plan for the future development of General Aviation facilities at Yuma International Airport. The study will identify specific airport facilities and services that will be required to meet future general aviation demands. As the Airport Consultants conducting the study, Coffman Associates is interested in the specific needs of those who presently use the airport and those who may use it in the future. This questionnaire has been designed to assist in the collection of specific information which will aid in assessing the need for airport improvements and general aviation facilities. It is advantageous for you to complete and return this form no later than July 31, 2004. Your cooperation is greatly appreciated.

1.	At which airport do you currently base (or rent) aircraft (identifier)				
	What is the zip code of the primary location you travel from to get to your aircraft?				
2.	What type(s) of aircraft do you, your company, or organization currently own?				
	Aircraft Make Model Mode				
3.	In percentage, indicate what types of flying you normally conduct at Yuma International Airport.				
	Business% + Pleasure% + Flight Instruction% + Other% = 100%				
	(Please specify other types of flying)				
5.	Are you or your company contemplating purchasing any additional or upgrading your current aircraft?				
	Yes No				
	If yes, please indicate how many, what type, and approximately when:				
6.	Approximately how many operations per month does your aircraft average at Yuma International Airport				
7.	Rank your reasons for electing to base at your airport by priority (1 = highest priority).				
	Convenience (closer to where I live or work)				
	Aircraft Hangar Facilities FBO/Executive Terminal Services				
	Lower Aircraft Storage Costs Available Runway Length				
	Navigational Aids				

<ol><li>Do you have an interest in basing your aircraft at Yuma Interest</li></ol>	ernational Airport?
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	Yes No	
	If no, why not?	
9.	Please indicate the type of parking or har	ngar space that you:
	Currently use for each aircraft:	Would prefer to use, if available:
	Tie-down Shade Hangar T-Hangar	Tie-down Shade Hangar T-Hangar

10.	Overall,	what types	of	improvements	do	you	consider	most	necessary	at	Yuma	International	Airport
	(1=highest priority).												

 Runway/Taxiway Airport/FBO Services Aircraft Apron Area	Aircraft Hangars Executive Terminal Building Navigational Aids
Other (please list)	

Individual Hangar

Multi-Aircraft Hangar

Please list any specific improvements that you feel are needed.

Individual Hangar

Multi-Aircraft Hangar

11. Do you have any comments regarding the future development of Yuma International Airport? (Please feel free to attach additional comments.)

12. What customer service improvements are needed at Yuma International Airport?

Thank you for your time and participation. Please return your survey in the enclosed stamped, self-addressed envelope. If the return envelope has been lost or misplaced, please mail survey to:

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## KANSAS CITY (816) 524-3500

237 N.W. Blue Parkway Suite 100 Lee's Summit, MO 64063

## PHOENIX (602) 993-6999

4835 E. Cactus Road Suite 235 Scottsdale, AZ 85254