



Yuma International Airport

MASTER PLAN UPDATE

December 2008

Prepared by:
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In association with:
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September 30, 2008

To the Master Planning Advisory Committee

First, thanks for the time you've taken to come to the meetings, review the documents and provide your input to our colleagues at Ricondo and Associates. It is only with your advice and counsel that this Master Plan will be successful.

Much of the initial research has been done and the work is going to proceed much more quickly from here through the end of the year. Now we need your time more than ever. All the work that has been accomplished is going to rapidly go down in written form and from that it becomes concrete....literally. You can see that we really want your help at this important time.

So here are the first three chapters. This is the background: our introduction, inventory and the forecast of what is to come. Remember, this is the draft. It's in rough form, but please take some time and review these pages. If you find grammar errors, mistakes in descriptions or if you think the conclusions or forecasts are wrong, this is the time to say so. We've included a "Comment Form" for you to use on the next page. Any inputs you have, any at all, please fill in the comment form and submit it by fax to the Airport Administration Office, 928-344-4677, or just bring it to the next PAC meeting on October 15.

Thanks again for all your help.

Sincerely,

Craig Williams
Airport Director



Airport Master Plan Proposed Change Form FAX to 344-4677

Instructions:

1. Fill out this form as completely as possible. Your contact information is important in case we have questions.
2. Fax this form to Minnie Samaniego at (928) 344-4677

A) Your Name (Optional but Helpful): _____

B) Your Phone Number: _____

C) Page and Paragraph Number to change: _____

D) New Wording that you propose

E) Reason or justification for your proposed change (Optional)
i.e. include related FAA rules to justify your proposal

CHAPTER ONE
INTRODUCTION

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I. Introduction

Yuma International Airport (the Airport) is located in the far southwest corner of the State of Arizona. The City of Yuma is 15 miles north of the Mexican border and 4 miles east of the Arizona-California border, and serves as the County seat for Yuma County. The general vicinity of Yuma and the Airport is shown on **Exhibit I-1**. The Colorado River, which runs along the border of Arizona and California, converges with the Gila River just north of Yuma. The Airport was incorporated into the city limits between 1970 and 1979,¹ at an elevation of 216 feet above mean sea level (MSL). The Airport is co-located with Marine Corps Air Station Yuma (MCAS Yuma), as shown on **Exhibit I-2**. The Airport site is adjacent to 32nd Street, also known as Business Route 8, which is a major route into and out of Yuma. The Airport operates under a patent with the United States of America, Secretary of the Interior, and occupies approximately 600 acres of land, while MCAS Yuma occupies approximately 2,800 acres.² For the purposes of the Airport Master Plan documentation, “Airport” will refer to the land owned by the Yuma County Airport Authority (YCAA) for the primary purpose of civil aviation activity. “MCAS Yuma” will refer to the remaining property of the military base and the airfield, which is owned, operated, and maintained by the United States Marine Corps (USMC). The Airport is one of 11 commercial service airports in Arizona, according to the Federal Aviation Administration’s (FAA’s) 2007-2011 National Plan of Integrated Airport Systems (NPIAS) report.³ The commercial service airports in Arizona are depicted on **Exhibit I-3**.

This document describes the analyses and assessments conducted during the preparation of this Airport Master Plan and provides the results of those efforts. The remainder of this chapter provides a discussion of the previous Master Plan Update, a brief history of the Airport, and a general discussion of the goals underlying the current Airport Master Plan. The following chapters of this report provide an inventory of Airport facilities, document the aviation demand forecasts, discuss the demand/capacity analyses and facility requirements, present the alternatives considered and the resulting Airport development plan, define an implementation plan and financing plan for the recommended Airport development plan, and present an overview of potential environmental effects associated with the recommended Airport development plan, as follows:

- Chapter II – Airport Inventory
- Chapter III – Aviation Demand Forecasts
- Chapter IV – Demand/Capacity Analyses and Facility Requirements
- Chapter V – Alternatives and Airport Development Plan
- Chapter VI – Implementation and Financial Plan
- Chapter VII – Environmental Overview

¹ City of Yuma, Department of Community Development, *City of Yuma Annexation Map*, Revised November 2007.

² Digitized approximations from GoogleEarth Pro, 2007, Yuma County Airport Authority, March 2008.

³ Federal Aviation Administration, National Plan of Integrated Airport Systems (NPIAS) Report, 2007-2011 *NPIAS Report*, http://www.faa.gov/airports_airtraffic/airports/planning_capacity/npias/reports/, (accessed March 25, 2008.)

Exhibit I-1

Vicinity of Yuma, Arizona; Airport Location

Exhibit I-2

Yuma International Airport/MCAS Yuma

Exhibit I-3

Commercial Service Airports in Arizona

1.1 1999 Master Plan Update

A Master Plan Update completed in 1999 examined and identified options for future Airport development.⁴ Short-term improvements were programmed for completion between 1999 and 2003 at an estimated cost of \$11.5 million. Intermediate-term projects were scheduled for completion between 2004 and 2009 at an estimated cost of \$8.8 million. Many of the short- and intermediate-term projects, such as improvements to the passenger terminal, aircraft parking areas around the terminal, airfield lighting improvements, expansion of the cargo apron, and acquisition of nearly 100 acres of land to accommodate GA growth have been completed. Long-term projects (2010-2019) with an estimated total of over \$23 million were identified to provide additional passenger, cargo, and GA facilities as demand warrants. The need for recommended improvements that have not been implemented will be re-assessed as part of this Airport Master Plan.

1.2 History of Yuma International Airport

Yuma's history of flight dates to 1911 when Robert Fowler took off from Yuma to set a world's record for endurance and distance. He entered a Transcontinental Air competition sponsored by William Randolph Hearst. Originating in Los Angeles, he arrived in Yuma on October 25th. Over 2,000 breathless spectators watched the incredible aircraft circle and make a graceful landing. The next day he succeeded in setting a world's record.

In 1925, the Yuma Chamber of Commerce went to work to secure an airport for Yuma. After two years of negotiations, 40 acres of land was secured from the federal government. The land was cleared, leveled, and the first hangar constructed. The 40 acres of land was officially designated as an active airport and named Fly Field after Colonel Ben Franklin Fly. In the beginning, Fly Field had limitations, including loose sand and a lack of facilities. In 1925, the Chamber's Aviation Committee decided another 160 acres was needed to create a first-class landing field in Yuma. Intense negotiations resulted in a public/private land trade, along with a promise by the government to provide Fly Field a steel frame hangar capable of housing 12 airplanes. Congressman Douglas of Arizona introduced a bill asking for the lease of 640 acres of government land to Yuma County for 20 years at a cost of \$1 per year, with the privilege of renewal for another 20 years at the same rate. President Calvin Coolidge signed the Yuma Aviation Bill on February 27, 1928. Almost immediately, the aviation committee started lining up activities for the airport. Yuma was selected to be a night stop for three transcontinental air races from New York to Los Angeles, and an international air race from Mexico to Los Angeles. The Chamber agreed to provide free gas and oil to the racers, at an estimated cost of \$2,000. Yuma was also selected to be a stop-over for the first All American Tour of 25 Airplanes. In June of that year, the military announced that a United States Meteorological and Aerological station would be constructed at Fly Field at a cost of \$30,000 and would be manned by four Army personnel, marking the first military presence at Yuma's airport.

In 1929, Yuma was selected as the first stop for the Women's Transcontinental Air Race. Amelia Earhart experienced landing problems nosed her aircraft in the soft sand, destroying her propeller. A new propeller and mechanics were flown in from Los Angeles to make repairs she could continue in the race. Fly Field experienced a downturn during the depression; but in the late 1930's it became clear that the United States faced a threat of conflict with the German Reich. The War Department needed facilities to train combat pilots and crews. Planning for the Yuma area, including a potential bombing range located between Yuma and Gila Bend, started in 1939 when a group of aeronautical

⁴ Coffman Associates, *Airport Master Plan Final Technical Report*, September 14, 1999.

experts toured the area. The Yuma County Board of Supervisors recommended Fly Field as a base for the Army Air Corps. Initially, Yuma County assumed the burden of airfield maintenance and limited the use exclusively to Army and Navy aircraft.

Money for the Fly Field expansion arrived early in 1941. Three separate government agencies pooled a total of \$781,000 to initiate construction. By mid-year another \$635,000 became available for repaving the north-south runway. Between 1941 and 1942 two paved runways, each measuring 4,200 feet x 150 feet, were completed under the command of the 403rd Army Air Force Base Unit, Army Air Forces West Coast Training Center. In June 1942, the War Department authorized an additional three million dollars. The first class of cadets arrived in January 1943 when the field was used for advanced pilot and gunnery training.

In September 1946, Yuma Army Air Field was scaled back and declared a surplus. The civilian portion of the field was returned to County, who again referred to it as Fly Field. The Chamber of Commerce promoted the City of Yuma airplane's famous endurance flights, which highlighted the region's weather which was very conducive to flying. This was a topic of particular importance to the military. The Airport became very active as a military facility during the Korean War, and was used extensively by the U.S. Air Force. In early 1951 the County Supervisors received a Department of Defense proposal to lease the airfield as a civilian-operated military training base with specific military and civilian sides. The Yuma County Board of Supervisors gave the U.S. Air Force a right of entry and in 1956 the field was named Vincent Air Force Base.

At the same time, the United States of America issued a U.S. Government Patent from the Department of the Interior which conveyed specific airport land to Yuma County. The conveyed land was the general footprint within today's current Airport boundary. In addition to the conveyance of land, the patent granted rights to unrestricted civil aviation use of the airfield's facilities, including all runways and taxiways, or as it is worded in the patent:

There is also granted an easement for public airport purposes in and to the land area and facilities of the Yuma County Airport, granting to the County of Yuma, State of Arizona, its successors in functions or interest and assigns, the right to use for the landing, takeoff, and parking of civil aircraft, in common with aircraft ; owned and controlled by the Government, the runways now located on the airport, those taxiways connecting the runways with the lands granted above, such runways as may be located on the airport as now constituted or as 'altered or expanded, and such future taxiways as are necessary for ingress and egress to the future runways...⁵

In 1959, control of the base was given to the United States Navy and then, nine days later, to the Marine Corps. The base was renamed Marine Corps Air Station Yuma on July 20, 1962. In 1965, the Yuma County Board of Supervisors created the Yuma County Airport Authority in accordance with the provisions of section 10-451, of the Arizona Revised Statutes, to take over the airport and all associated activity. A Board of Directors was elected from the community to oversee the Airport Authority and all airport functions. In 2007, the Board of Directors passed resolution 01-07 declaring that Yuma International Airport was an "Aviation Partner" with MCAS Yuma. That

⁵ Yuma International Airport, *Patent*, <http://www.yumairport.com/yumahome.nsf/49d7c1e341244853072573ba00732d18/4d1886b1b764201807257375001f3a6b?OpenDocument> (accessed August 2008).

partnership continues today and allows for unrestricted civil aviation use of the airfield facilities, including all runways and taxiways. The patent also preserves the ability of Yuma County to collect and retain landing fees to provide for Airport operating expenses.⁶ Exhibit I-2 depicts the boundaries for the Airport and MCAS Yuma.

1.3 Airport Operations

The Airport, classified as a public use airport, served over 143,000 passengers in 2007. Two commercial passenger airlines, United Airlines through United Express, and US Airways through US Airways Express, operate at Yuma International Airport. United provides service to Los Angeles, and US Airways provides service to Phoenix and Las Vegas. Four rental car companies operate at the Airport: Avis, Budget, Hertz, and Thrifty.

Yuma International Airport also has three fixed base operators (FBOs) that provide aircraft fueling, maintenance, storage, and other services to aircraft operators, such as light aircraft maintenance, rental car arrangements, and catering services. The FBOs currently operating at the Airport are CareFlight Aviation Center, Yuma Jet Center, and Sun Western Flyers. Additional aircraft hangars, T-hangars, and sunshades are available for rental, and a wash rack is available for use by based aircraft owners.

1.4 Airport Organization

Yuma International Airport is owned by Yuma County and operated by the YCAA through a long-term lease with the County. The YCAA was established in 1964, was incorporated in 1965, and is composed of five Officers and nine Directors—consisting of elected officials representing the business community and Airport interests—who provide guidance and direction to Airport staff through six committees. As the Airport is co-located with MCAS Yuma, coordination and cooperation between the YCAA and the USMC is critical to the long-term success of the facility.

On June 12, 2007, the following mission statement was adopted by and for the YCAA.⁷ “The Yuma County Airport Authority’s mission is to provide a safe, efficient and customer focused airport to serve Greater Yuma.”

The YCAA has defined key charters and strategies to ensure that the intent of the mission is met.⁸ These strategies include:

- Provide full service FBO by either partnering with existing businesses or attracting new businesses.
- Expand aviation-related business (e.g., MCAS, general aviation, government, and the like).
- Promote international Airport status and seek scheduled international flights, if feasible.
- Market the Airport.
- Develop a strategic plan for growth through prudent use of resources (fiscal responsibility) while focusing on customer service. Stay abreast of community growth and needs by partnering with and/or leading with our community for economic development.

⁶ Yuma International Airport, August 2008.

⁷ Yuma International Airport, <http://www.yumainternationalairport.com/yumahome> (accessed: March 2008).

⁸ Yuma International Airport, <http://www.yumainternationalairport.com/yumahome> (accessed: March 2008).

- Develop cargo business through providers such as FedEx, DHL, UPS, etc.

To further ensure implementation of these strategies, goals and objectives were developed through the Airport's Strategic Plan.⁹ Specific performance measures are used to track the progress toward the achievement of each goal and objective toward ensuring that the mission of the YCAA is accomplished.

1.5 Goals and Objectives of This Airport Master Plan

The purpose of this Airport Master Plan is to provide a roadmap for the planned and logical future development of the Airport in accordance with YCAA's mission. The following goals and objectives were identified for this master planning effort and were discussed at the first Project Advisory Committee (PAC) meeting that was held on April 1, 2008.

- Develop a plan to ensure a workable agreement between the YCAA and USMC. MCAS Yuma has an important role in the City's economy, and the collective resources offered by the Airport and MCAS should be managed collaboratively.
- Develop a plan that identifies the best long-term facilities for civil aviation activity, including reasonably-priced general aviation facilities, economic development, and passenger amenities within the terminal building.
- Enhance the relationship and partnership between the YCAA and USMC; considering global and specific issues such as airfield inspections and hours of operation for the Airport Traffic Control Tower.
- Develop a plan to identify pavement conditions and necessary improvements.
- Develop a plan that resolves vehicular parking limitations for general aviation aircraft operators.
- Provide strategies for accommodating future terminal needs, including expansion of passenger holding areas and public parking needs during peak activity or heightened levels of threat to security.
- The Airport Master Plan should:
 - be coordinated with related and regional development projects,
 - be able to be implemented without disrupting the efficient operation of the Airport,
 - be sensitive to the surrounding environments, and
 - ensure that the YCAA uses resources wisely.

⁹ Yuma International Airport, <http://www.yumainternationalairport.com/yumahome> (accessed: March 2008).

CHAPTER TWO

INVENTORY

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II. Airport Inventory

The Airport is co-located with MCAS Yuma, with the airfield operated under a patent established in 1956 that provides for unrestricted civil aviation use. The YCAA operates under a patent from and the United States of America to the County of Yuma. The Airport occupies approximately 600 acres of land, while MCAS Yuma occupies approximately 2,800 acres.¹ The YCAA is responsible for managing the civil aircraft operations at the Airport, including planning, development, administration, security, and maintenance of the commercial, fixed base operators (FBO), general aviation (GA), and air cargo facilities.

The existing facilities and other areas critical to the operation of the Airport are described in this chapter, with particular attention focused on the YCAA-owned facilities. The following are discussed in this chapter:

- Aviation Facilities and Land Use
 - Airfield
 - Passenger Terminal
 - FBO/GA
 - Ancillary Facilities
 - Security Systems
 - Utility Infrastructure
 - Off-Airport Land Use and Zoning
- Airport Access and Parking
- Airport Financial Data
- Air Traffic Activity
- Airspace Environment
 - Airspace
 - Air Traffic Control
 - Meteorological Conditions
- Socioeconomic Data
- Environmental

Exhibit II-1 presents the areas utilized by the Airport and MCAS Yuma.

2.1 Airfield

The airfield consists of runways, taxiways, apron areas, and lighting systems. The U.S. Department of Transportation (DOT) *Airport/Facility Directory, Southwest U.S.*, effective February 14, 2008, lists the Airport Reference Point (ARP), or the midpoint of the airfield, as latitude N32°39.40' and longitude W114°36.36'. The Airport elevation at the highest point on the airfield pavement is 216 feet above MSL.

2.1.1 Airport Reference Code and Critical Aircraft

The FAA classifies airports by the size of aircraft that the airport is designed to accommodate. A coding system, referred to as an Airport Reference Code (ARC) is outlined in FAA Advisory

¹ Arizona Department of Transportation, *Yuma International Airport Master Record 5010*, <http://gcr1.com/5010web/airport.cfm?Site=YUM>, (accessed: March 25, 2008).

Exhibit II-1

Airport Overview

Circular (AC) 150/5300-13, Change 12, *Airport Design*, dated January 3, 2008. The ARC is based on an aircraft's wingspan or tail height, and approach speed, and relates the operational and physical characteristics of the most demanding aircraft expected to operate at, or make substantial use of the airport, to airport design criteria (such as the size of runway safety areas and runway and taxiway/taxilane length, width, and separation distances). The most demanding aircraft is often referred to as the critical aircraft or the design aircraft and must account for at least 500 or more annual itinerant (does not include local operations) or scheduled commercial service operations at the airport. Itinerant operations are defined as all operations (takeoffs and landings) of aircraft going from one airport to another. Likewise, local operations are defined as operations of aircraft that remain within sight of the airport or within 20 nautical miles for the entire flight and are typically training operations.²

The ARC, consists of a letter designator (A through E) identifying the Aircraft Approach Category based on aircraft approach speeds followed by a Roman numeral (I through VI) identifying the Airplane Design Group (ADG) in terms of the aircraft wingspan or tail height, for example C-IV. The aircraft approach speed affects runway length and runway-related facilities, such as navigational aids, while aircraft wingspan primarily affects separation criteria between runways, taxiways, and taxilanes. **Table II-1** summarizes the aircraft classifications as presented in FAA AC 150/5300-13 and lists typical aircraft by Aircraft Approach Category and ADG.

Aircraft Approach Categories A and B typically include small piston engine aircraft and a limited number of smaller business jets with approach speeds of less than 121 knots. Categories C, D, and E consist of the larger jet and propeller aircraft with approach speeds of 121 knots or greater, generally associated with commercial and/or military use. ADGs I and II primarily include small piston engine aircraft, light and midsize business jets, and a variety of single and twin-engine turboprop aircraft. ADGs III, IV, and V include a limited number of large business jet models that have entered the fleet over the last 5 to 7 years, as well as the majority of the commercial jet aircraft fleet, and military aircraft such as the KC-10, KC-135, C-17, and KC-135R. ADG VI includes very large jets, such as the new Airbus A380, the Antonov 124 Condor transport aircraft, and large military aircraft, such as the C-5 transport.

The critical aircraft will be reviewed as the projected fleet mix and number of operations are assessed and presented in Chapter III, Aviation Activity Forecasts. The current *Airport Layout Plan (ALP)* dated August 14, 2000, identifies the existing ARC as E-VI for Runways 3R-21L and 3L-21R, which are used predominately for military aircraft operations, and as B-II for Runways 8-25 and 17-35, which are used predominately for civil aircraft operations. It should be noted that the CRJ-200 aircraft that operate at the Airport are C-II aircraft. The existing ARC E-VI standards allow the full range of air carrier, cargo, and military aircraft, expected to operate at the Airport or at MCAS Yuma, to be accommodated.

2.1.2 Runway System

The runway system consists of four runways: parallel Runways 3L-21R and 3R-21L, which are used primarily by military aircraft operating at MCAS Yuma, and perpendicular intersecting Runways 8-26 and 17-35, which are used primarily by civil aircraft. Although civil aircraft typically operate on Runways 8-26 and 17-35, all four runways are available for civil use. The USMC is responsible

² Federal Aviation Administration, Pilot/Controller Glossary, February 14, 2008, http://www.faa.gov/airports_airtraffic/air_traffic/publications/media/pcg.pdf, (accessed April 30, 2008).

for maintaining the runways, and the majority of the taxiways. **Exhibit II-2** depicts the runway and taxiway system, and the aircraft parking aprons.

Table II-1

FAA Aircraft Characteristics

Aircraft Approach Category		
Category	Approach Speed (knots)	Typical Aircraft by Aircraft Approach Category
A	< 91	C-172, Beech Bonanza, Cirrus SR-22, Diamond DA-42
B	91 - < 121	C-441, Beech 1900C, King Air 200, Citations II, III & V, Falcon 2000
C	121 - < 141	Astra Galaxy, Challenger 604, CRJ, Global Express, Citations VI, VII, X, A320, Boeing Business Jet, B-737-100/200/300/400/500/700/900ERW, B757, B767, B787-8, C-5
D	141 - < 166	Gulfstream II & IV, A310-300, A330-300, A340, B-737-800/900/900ER /900W/900ER, B-747, B-777-300, DC-10, MD 11, KC-10, KC-135, F-18
E	166 or greater	Military aircraft (F-16, F-22, T-38)

Airplane Design Group (ADG)			
Design Group	Wingspan (feet)	Tail Height (feet)	Typical Aircraft by ADG
I	< 49	< 20	C-172, C-402, Beech 400A, Cirrus SR-22, Diamond DA-42, F-16, F-22
II	49 - < 79	20 - < 30	Beech 1900C, King Air 200, CRJ-200, Citations V & X, Falcon 2000, Gulfstream G350, G450,
III	79 - < 118	30 - < 45	CRJ-700, A318, A319, A320, A321, B-727, B-737, MD 80, DC-9, Gulfstream G550, G650
IV	118 - < 171	45- < 60	A300, A310, B-757, B-767, DC-8, MD 11, B-787-8, KC-10, KC-135
V	171 - < 214	60 - < 66	A330, A340, A350, B-747, B-777, B-787-8
VI	214 - < 262	66 - < 80	A380, Antonov 124 Condor, C-5

Sources: Federal Aviation Administration, FAA AC 150/5300-13, Change 12, *Airport Design*, January 3, 2008; Burns & McDonnell, *Aircraft Characteristics*, 9th edition, *Airport Reference Code and Approach Speeds for Boeing Airplanes*, August 2, 2007, <http://www.boeing.com/commercial/airports/faqs/arcandapproachspeeds.pdf>, (accessed April 28, 2008).

Prepared by: Ricondo & Associates, Inc., March 2008.

2.1.2.1 Runway 3L-21R

Runway 3L-21R, the longest runway, is 13,300 feet long and 200 feet wide and is oriented northeast-southwest. The pavement is constructed of concrete and has a load bearing capacity of 103,000 pounds for aircraft with single-wheel landing gear, 200,000 pounds for aircraft with dual-wheel landing gear, and 400,000 pounds for aircraft with dual-tandem landing gear. The approach end of Runway 3L (the southwest end) has a 1,000-foot paved undershoot/overrun area. The approach end of Runway 21R has a 650-foot paved undershoot/overrun area. The safety area for Runway 3L-21R is 200 feet wide, and extends 1,000 feet beyond each end. Runway 3L-21R intersects Runway 17-35 approximately 2,100 feet from the approach end of Runway 21R.

Exhibit II-2

Runways, Taxiways, and Aprons

2.1.2.2 Runway 3R-21L

Runway 3R-21L is parallel to and 700 feet southeast of Runway 3L-21R, measured runway centerline to runway centerline. Runway 3R-21L is 9,241 feet long and 150 feet wide. The pavement is constructed of asphaltic-concrete and has a load bearing capacity of 162,000 pounds for aircraft with single-wheel landing gear, 200,000 pounds for aircraft with dual-wheel landing gear, and 400,000 pounds for aircraft with dual-tandem landing gear. The approach end of Runway 3R (the southwest end) has a 1,000-foot paved undershoot/overrun area. The approach end of Runway 21L has a 976-foot paved undershoot/overrun area. The safety area for Runway 3R-21L is 150 feet wide, and extends 1,000 feet beyond each end. Runway 3R-21L intersects Runway 17-35 approximately 4,000 feet from the approach end of Runway 3R and intersects Runway 8-26 approximately 500 feet from the approach end of Runway 21L.

2.1.2.3 Runway 8-26

Runway 8-26 is oriented east-west, is south of the passenger terminal apron, and is 6,146 feet long and 150 feet wide. The runway is used primarily for civil commercial operations, because of its close proximity to the passenger terminal. The pavement is constructed of asphaltic-concrete and has a load bearing capacity of 63,000 pounds for aircraft with single-wheel landing gear, 137,000 pounds for aircraft with dual-wheel landing gear, and 206,000 pounds for aircraft with dual-tandem landing gear. The approach end of Runway 8 (the west end) has a 251-foot paved undershoot/overrun area. The approach end of Runway 26 has a 1,000-foot paved undershoot/overrun area. The safety area for Runway 8-26 is 150 feet wide, and extends 251 feet beyond the end of Runway 8 and 300 feet beyond the end of Runway 26. Runway 8-26 intersects Runway 3R-21L approximately 2,200 feet from the approach end of Runway 26 and intersects Runway 17-35 approximately 500 feet from the approach end of Runway 8.

2.1.2.4 Runway 17-35

Runway 17-35 is oriented perpendicular to Runway 8-26 and is west of the passenger terminal apron. The runway is 5,711 feet long and 150 feet wide and is used primarily for civil operations. The pavement is constructed of asphaltic-concrete and has a load bearing capacity of 72,000 pounds for aircraft with single-wheel landing gear, 171,000 pounds for aircraft with dual-tandem landing gear, and 255,000 pounds for aircraft with dual-tandem landing gear. The approach end of Runway 17 (the north end) has a 262-foot paved undershoot/overrun area. The approach end of Runway 35 has an 800-foot paved undershoot/overrun area. The safety area for Runway 17-35 is 150 feet wide, and extends 262 feet beyond the end of Runway 17 and 800 feet beyond the end of Runway 35. Runway 17-35 intersects all three of the other runways as follows: Runway 8-26 approximately 700 feet from the approach end of Runway 17, Runway 3L-21R approximately 2,600 feet from the approach end of Runway 35, and Runway 3R-21L approximately 1,600 feet from the approach end of Runway 35. **Table II-2** summarizes the existing runway data.

2.1.3 Taxiway System

The taxiway system, including taxiways that are parallel to runways, runway exit/entrance taxiways, and connecting taxiways, are presented in Exhibit II-2. On-site inspection of taxiways, owned and operated by YCAA, concluded that the pavement conditions appear to be adequate given the level of review. To fully access the strength, condition, and safety of the pavement an engineered pavement maintenance management system (PMMS) should be considered and will be further evaluated as part of the recommendations of this Master Plan.

Table II-2

Existing Runway Data

	Runways			
	3L-21R	3R-21L	8-26	17-35
Length (feet)	13,300	9,241	6,146	5,711
Width (feet)	200	150	150	150
Runway End Elevation (feet)	3L-194.6 21R-194.8	3R-190.1 21L-209.6	8-196.8 26-215.4	17-198.3 35-184.6
Effective Runway Gradient	0.1%	0.3%	0.3%	0.2%
Runway Surface Type	Concrete	Asphaltic Concrete	Asphaltic Concrete	Asphaltic Concrete
Runway Condition ^{1/}	Good	Good to Fair	Good to Satis.	Good to Fair
Runway Rehabilitation (Year) ^{2/}				
Load Bearing Capacity (pounds)				
Type of Aircraft Landing Gear				
Single Wheel	103,000	162,000	63,000	72,000
Dual Wheel	200,000	200,000	137,000	171,000
Dual Tandem	400,000	400,000	206,000	255,000
Aircraft Approach Category	E	D	B	B
Airplane Design Group	VI	V	II	II
Electronic Navigational Aids	21R - ILS	None	None	None
Runway Lighting	3L – HIRL, PAPI 21R – HIRL, PAPI, MALSR	HIRL, PAPI	HIRL	17 – HIRL, VASI, 5 – HIRL, REIL
Runway Markings	Precision	Non-precision	Visual	Non-precision
Runway Safety Areas				
Length Beyond Runway End	3L – 1,000' 21R – 1,000'	3R – 1,000' 21L – 1,000'	8 – 251' 26 – 300'	17 – 262' 35 – 800'
Width	200	150	150	150

Notes:

1/ As presented in *Airfield Pavement Condition Survey: Marine Corps Air Station Yuma, Arizona*, June 2005.

Satis. = Satisfactory

Sources: U.S. Department of Transportation, Airport/Facility Directory, Southwest U.S., Effective February 14, 2008; AirNav, LLC, <http://www.airnav.com/airport/KYUM>, (accessed March 26, 2008); Yuma International Airport, Yuma County Airport Authority, Airport Master Plan, September 14, 1999.

Prepared by: Ricondo & Associates, Inc., March 2008.

2.1.3.1 Taxiways A, A1, and A2

Taxiways A, A1 and A2 together provide a full-length parallel taxiway for Runway 8-26. Taxiway A is 75 feet wide and extends north from the MCAS Yuma apron to the approach end of Runway 26. Located north of the runway, Taxiway A1 is 50 feet wide and begins approximately 125 feet west of the approach of Runway 26, extends north approximately 425 feet, then turns 90 degrees to an east-west orientation and extends west to the approach end of Runway 21L.

Taxiway A2 is 50 feet wide and extends from the approach end of Runway 21L to a point approximately 125 feet beyond the approach end of Runway 17 and then intersects with Taxiway I on the west side of Runway 17-35. Taxiways A1 and A2 are parallel to and separated 500 feet from Runway 8-26, measured runway centerline to taxiway centerline. Taxiways A and A1 are maintained by the USMC. Taxiway A2 is maintained by the YCAA.

2.1.3.2 Taxiway B

Taxiway B is 75 feet wide and connects Runway 8-26 and the MCAS Yuma apron. Taxiway B extends from Taxiway C at the north edge of the MCAS Yuma apron to Runway 8-26, intersecting the runway at a point approximately 1,700 feet west of the approach end of Runway 26. Two run-up pads are adjacent to the taxiway. Taxiway B is maintained by the USMC.

2.1.3.3 Taxiway C

Taxiway C is 150 feet wide and is an apron taxiway located along the edge of the MCAS Yuma apron. Taxiway C is maintained by the USMC.

2.1.3.4 Taxiway D

Taxiway D is 150 feet wide and connects Runways 3L-21R and 3R-21L to the MCAS Yuma apron. Taxiway D extends from the northwest edge of the MCAS apron from Taxiway C, crossing Runway 3R-21L and then extends to the approach end of Runway 21R. Taxiway D is maintained by the USMC.

2.1.3.5 Taxiway E

Taxiway E is 75 feet wide and is parallel to and southeast of Runways 3L-21R and 3R-21L. Taxiway E extends from Taxiway D to the approach end of Runway 3L, providing a full-length parallel taxiway for Runway 3L-21R. Taxiway E is maintained by the USMC.

2.1.3.6 Taxiways F, F1, and F3

Taxiway F is 75 feet wide, is a runway exit/entrance taxiway, and connects with the MCAS Yuma apron. Taxiway F extends from Taxiway C in the southwest portion of the MCAS Yuma apron to the approach end of Runway 35, continues to and crosses Runway 3R-21L at a point approximately 1,800 feet northeast of the approach end of Runway 3R, and then extends to Runway 3L-21R, intersecting that runway at a point approximately 4,100 feet northeast of the approach end of Runway 21R. Taxiway F is maintained by the USMC.

Taxiway F1 is 75 feet wide and connects the 40th Street Air Cargo apron and the South Air Cargo apron to the south, and intersects Taxiway F3 west of the Defense Contractor Complex (DCC). Taxiway F1 is maintained by the YCAA.

Taxiway F3 is 75 feet wide and is the continuation of Taxiway F on the west side of Runway 3L-21R. The taxiway provides a runway exit to the DCC from Runway 3L-21R, and together with Taxiway F provides access from the DCC to Runways 3R-21L and 17-35. Taxiway F3 intersects Taxiway F1 west of the DCC. The portion of Taxiway F3 west of the DCC is maintained by the YCAA. The portion of Taxiway F3 that traverses through the DCC and extends east to Runway 3L-21R is maintained by the USMC. Taxiway F3 is currently being rehabilitated, and will provide direct access to the air cargo aprons, and the DCC, from Runway 3L/21R.

2.1.3.7 Taxiway G

Taxiway G is 75 feet wide and extends from Taxiway F west of Runway 17-35 to the approach end of Runway 3R. Taxiway G serves as a bypass taxiway for Taxiway E and provides access to MCAS Yuma aircraft run-up aprons. Taxiway G is maintained by the USMC.

2.1.3.8 Taxiways H and H1

Taxiway H is 75 feet wide and extends from Taxiway E to Runway 3L-21R, intersecting the runway at a point approximately 4,350 feet northeast of the approach end of Runway 3L. West of Runway 3L-21R, Taxiway H becomes Taxiway H1 and extends north to the South Air Cargo apron. Taxiways H and H1 are maintained by the USMC. Taxiway H1 is used for civil aircraft operations through an easement to the YCAA.

2.1.3.9 Taxiways K and L

Taxiways K and L are 50 feet wide and are runway exit/entrance taxiways connecting Runway 8-26 and Taxiway A2. Taxiways K and L are maintained by the YCAA.

2.1.3.10 Taxiway M

Taxiway M is 75 feet wide and is a partial-length parallel taxiway to Runway 17-35, extending between Taxiways E and F east of the runway. Taxiway M is maintained by the USMC.

2.1.3.11 Taxiway N

Taxiway N is 75 feet wide and extends from the intersection of Taxiways M and F to the MCAS Yuma North Combat Aircraft Loading Area. Taxiway N is maintained by the USMC.

2.1.3.12 Taxiway O

Taxiway O is 75 feet wide and extends from the MCAS Yuma apron to the MCAS Yuma North Combat Aircraft Loading Area. Taxiway O is maintained by the USMC.

2.1.3.13 Taxiway R

Taxiway R is 75 feet wide and extends from Taxiway E to the MCAS South Combat Aircraft Loading Area. Taxiway R is maintained by the USMC.

2.1.3.14 Taxiway S

Taxiway S is 75 feet wide and extends from Taxiway E to the MCAS South Combat Aircraft Loading Area. Taxiway S is maintained by the USMC.

2.1.3.15 Taxiways Z, Z1, Z2, and Z3

Taxiway Z, Z1, Z2 and Z3 were formerly designated Taxiway I (India). Due to confusion between the letter I and the number 1, the letter designation for these taxiways have been changed to the letter Z to mitigate confusion and increase safety.

Taxiway Z is 40 feet wide and is a partial-length parallel taxiway to Runway 17-35. Taxiway Z extends south from the Northwest GA facility, west of Runway 17-35, intersects Taxiway A2, continues to and crosses the approach end of Runway 8, and then continues south to Taxiway Z3,

which connects to the GA facilities west of Runway 3L-21R.. Taxiway Z is maintained by the YCAA.

Taxiway Z1 is 40 feet wide, intersects Taxiway Z, and provides access to the CareFlight Aviation Center. Taxiways Z2 and Z3 together are also known as the “loop taxiway”. Taxiway Z2 is 40 feet wide and extends west from Taxiway I along the north side of the Navy transceiver site, turns south and terminates at the west GA parking apron. Taxiway Z3 is 40 feet wide and is a runway exit/entrance taxiway that extends west from approximately the midpoint of Runway 17-35, intersects with Taxiway Z, continues west along the south side of the Navy transceiver site, and terminates at the GA parking apron. YCAA has an easement for the portion of Taxiway Z3 located on MCAS Yuma property. Taxiways Z1, Z2 and Z3 are maintained by the YCAA.

2.1.4 Ramp and Apron Areas

Aircraft parking aprons, also referred to as ramp areas, include space for aircraft parking and circulation for aircraft transitioning between the apron and other facilities. The apron areas are summarized in **Table II-3**, and are depicted on Exhibit II-2. Discussions for individual ramps areas leased by tenants are included in Section 2.4 Fixed Base Operators and General Aviation.

The passenger terminal aircraft parking apron is located on MCAS Yuma property south of the terminal building. Partially reconstructed in 1991, the concrete apron was expanded to the east to accommodate additional aircraft parking positions associated with development of the new terminal building. An easement has been granted to the YCAA for aircraft operations along the terminal apron. The terminal apron encompasses approximately 154,800 square feet.

2.1.5 Navigational Aids and Airfield Lighting

The MCAS Yuma/USMC is responsible for maintaining the navigational aids and airfield lighting at the Airport and MCAS Yuma. High intensity runway lights (HIRL) outline the runway edges and threshold lights identify all runway ends. The taxiways are equipped with medium intensity taxiway lights (MITL). Runway 21R is equipped with a medium-intensity approach lighting system with runway alignment indicator lights (MALSR) that provide a visual guide to the runway threshold. Runways 3L-21R and 3R-21L have precision approach path indicators (PAPI) that provide a visual indication of an aircraft’s position on the glide path for the associated runway. The airfield has a single lighted wind tee located midfield, as well as windsocks located near the touchdown zones of the runway ends. The airfield is also equipped with a rotating beacon, located approximately 1,800 feet east of the southwest corner of MCAS Yuma apron, that provides general identification of the airfield location to pilots at night and during periods of reduced visibility. A summary of the approach aids and lighting systems is presented in **Table II-4**.

Table II-3

Existing Aircraft Parking Aprons

Apron Name or Current Tenant	Location	Use	Apron Maintenance Responsibility	Apron Area (sf) ^{1/}	Pavement Type
<u>Northwest Airfield</u>					
Passenger Terminal	North of Runway 8-26 adjacent to the passenger terminal	Airlines	USMC	154,800	Concrete
Lux Air Jet Center (formerly Sun Western Flyers)	West and southwest of the passenger terminal	GA/FBO	YCAA	202,975 ^{2/}	Asphalt
Northwest GA Facility	Northwest corner of Airport	GA Aircraft Storage	YCAA	81,800	Asphalt
<u>West Airfield</u>					
CareFlight Aviation Center	Between Taxiways I1 and I2 and S. Fortuna Avenue	GA/FBO	YCAA	121,741	Asphalt
Fortuna Hangar	North of Navy transceiver	GA	YCAA	38,350	Asphalt
FedEx / Fortuna Hangar	North of Navy transceiver	Air Cargo	YCAA	26,068	Asphalt
Border Patrol	North of Fortuna Hangar	Government	YCAA	104,348	
West GA Facility	Northwest of Navy transceiver	GA Aircraft Storage	YCAA	128,870	Asphalt
Lux Air Jet Center (formerly Sun Western Flyers)	Northwest of Navy transceiver	GA/FBO	YCAA	47,760	Asphalt
Yuma Jet Center (formerly Bet-Ko Air)	West of Navy transceiver	GA/FBO	YCAA	316,080	Asphalt
Lux Air Jet Center (formerly Sun Western Flyers)	Southwest of Navy transceiver	GA/FBO	YCAA	518,795	Asphalt
DCC	Adjacent to Taxiway F	Unassigned	YCAA	n/a	Asph/Conc
40 th Street Air Cargo	Northwest of Taxiway F	Air Cargo	YCAA	78,750	Concrete
South Air Cargo	Adjacent to Taxiway H1	Air Cargo	YCAA	160,000	Concrete
MCAS Yuma Main	East airfield	Military	USMC	2,100,000	Concrete
MCAS Yuma North Combat Aircraft Loading	Southwest of MCAS main apron	Military	USMC	700,000	Concrete
MCAS Yuma South Combat Aircraft Loading	Southwest of MCAS main apron	Military	USMC	1,100,000	Concrete

Note:

- 1/ Apron area quantities taken from lease documents and aerial photos. Does not include square footage associated with buildings or undeveloped land.
- 2/ Lux Air Jet Center (formerly Sun Western Flyers) to vacate this apron in September 2008.

Sources: Yuma International Airport, Yuma County Airport Authority, *Airport Master Plan*, September 14, 1999; Yuma International Airport, Yuma County Airport Authority (lease documents), <http://www.yumaairport.com/Yuma/Leases2.nsf?OpenDatabase>, (accessed March 27, 2008).

Prepared by: Ricondo & Associates, Inc., March 2008.

Table II-4

Navigational Aids and Airfield Lighting

Runway	Runway Markings	Runway Lighting	Approach Visibility Minimums		Navigational Aids
			Ceiling (ft) / Visibility	Approach Type	
3L	Precision	HIRL, PAPI	100 / ½ mile	PAR	
21R	Precision	HIRL, PAPI, MALSR	100 / ½ mile	PAR	ILS, LOC, GPS, VOR/DME
3R	Non-precision	HIRL, PAPI	400 / 1 mile ^{1/}	ASR	
21L	Non-precision	HIRL, PAPI	400 / 1 mile ^{1/}	ASR	
8	Visual	HIRL	1,000 / 3 miles	VFR	
26	Visual	HIRL	1,000 / 3 miles	VFR	
17	Non-precision	HIRL, VASI	481 / 1 mile	GPS, VOR	GPS, VOR/DME
35	Non-precision	HIRL, REIL	484 / 1 mile	GPS, VOR ^{2/}	

Notes:

ASR = Airport Surveillance Radar

CIR = Circling approach

GPS = Global positioning system

ILS = Instrument landing system

LOC = Localizer

n/a = Not applicable

PAR = Precision Approach Radar

REIL = Runway end identifier lights

RNAV = Runway area navigation

VASI = Visual approach slope indicator

VFR = Visual Flight Rules

VOR/DME = Very high frequency omnidirectional range with distance measuring equipment

1/ For Approach Category A, B, and C aircraft.

2/ Circling approach from Runway 17 GPS or VOR published approaches.

Sources: U.S. Department of Transportation, *Airport/Facility Directory, Southwest U.S.*, Effective February 14, 2008; AirNav, LLC., <http://www.airnav.com/airport/KYUM>, (accessed March 26, 2008); Federal Aviation Administration, *Digital Terminal Procedures*, Effective April 10, 2008, http://naco.faa.gov/index.asp?xml=naco/online/d_tpp, (accessed May 7, 2008); Yuma International Airport, Yuma County Airport Authority, *Airport Master Plan*, September 14, 1999.

Prepared by: Ricondo & Associates, Inc., March 2008.

2.2 Passenger Terminal Area

The existing passenger terminal building at the Airport is located south of 32nd Street just north of Runway 8-26. The original terminal was constructed in 1968 and expanded in 1980 and 1986 to encompass approximately 14,000 square feet. The original terminal building was demolished in 1999, and replaced by a new passenger terminal building adjacent to the original terminal site. The current terminal layout plan is depicted on **Exhibits II-3** and **II-4**. The new terminal is rectangular, with its north face facing 32nd Street, and is shown in **Exhibit II-5**.

The two-level terminal is approximately 47,000 square feet and includes the service areas listed in **Table II-5**. Passenger amenities such as concessions, vending machines, wireless Internet, an ATM, telephones, a conference room, and flight information display monitors are located on the terminal's lower level, with YCAA administrative offices and meeting space located on the upper level.

Exhibit II-3

Terminal Building – Existing Layout, Lower Level

Exhibit II-4

Terminal Building – Existing Layout, Upper Level

Exhibit II-5

Terminal Building – North Face



Source: Ricondo & Associates, Inc., February 2008.
 Prepared by: Ricondo & Associates, Inc., March 2008.

Table II-5

Terminal Building Space Allocation

	Area (Square Feet)
Lower Level	
Public Circulation	13,635
Boarding Areas	2,250
Airline Space	3,685
Baggage Claim	1,920
Baggage Handling	1,110
Secure Passenger Waiting Area/Outdoor Atrium	5,920
Rental Car Offices	1,060
Concessions	4,515
TSA Screening and Offices	1,545
Restrooms	1,750
Mechanical/Airport Storage	760
Total Lower Level	38,150
Upper Level	
Public Circulation	3,900
Concessions	1,140
YCAA Administrative Offices	3,235
Restrooms	500
Total Upper Level	8,775
Total Terminal	46,925

Note: TSA = Transportation Security Administration

Source: Steven R. Fischer Architect, April 2008 (base map for square footage calculations); Ricondo & Associates, Inc., February 2008.
 Prepared by: Ricondo & Associates, Inc., March 2008.

2.2.1 Airline and Ticket Counter Space

Airline ticket counters and offices are located in the western portion of the lower level of the terminal building. Three passenger airlines serve the Airport: Delta Air Lines through Delta Connection, United Airlines through United Express, and US Airways through US Airways Express. All three occupy ticket counter space and have offices for administrative and operations functions. With the current level of operations, the ticket counters are sufficient to accommodate the needs of the airlines serving the Airport. A typical airline ticket counter is shown in **Exhibit II-6**.

Exhibit II-6

Terminal Building – Ticket Counters



Source: Ricondo & Associates, Inc., May 2008.
Prepared by: Ricondo & Associates, Inc., July 2008.

2.2.2 Security Screening and Boarding Area

The boarding area is centrally located on the south side of the lower level of the terminal building. Ticketed passengers clear TSA security screening before entering the secure boarding area. Five gates currently serve the commercial flights offered by the three airlines serving the Airport. Because the terminal was constructed prior to September 11, 2001, the security screening arrangement and boarding area space are limited. Originally, an outdoor area adjacent to the indoor boarding area space was constructed for use as a secure passenger waiting area/outdoor atrium. Because of its close proximity to the aircraft parking apron, this space cannot be used for its originally intended purpose. The boarding area and outdoor atrium are shown in **Exhibits II-7** and **II-8**.

Exhibit II-7

Terminal Building – Boarding Area



Source: Yuma International Airport, August 2008.
Prepared by: Ricondo & Associates, Inc., March 2008.

Exhibit II-8

Terminal Building – Outdoor Atrium



Source: Yuma International Airport, August 2008.
Prepared by: Ricondo & Associates, Inc., March 2008.

2.2.3 Concessions/Sales and Restrooms

The main concessions area is centrally located on the lower level, across from the passenger boarding area, in the non-secure landside portion of the terminal. The concessions/sales space includes a cafeteria, seating area, . On the upper level of the terminal building, space previously used as a restaurant area has been converted to a meeting space/conference center. A vending machine is provided in the secure boarding area. Landside restrooms are located east and west of the restaurant. There are no restrooms in the secure airside area. The concessions areas is shown in **Exhibit II-9**.

Exhibit II-9

Concessions Area in Passenger Terminal



Source: Ricondo & Associates, Inc., May 2008.
Prepared by: Ricondo & Associates, Inc., July 2008.

2.2.4 Baggage Claim

A single bag belt is provided, with an adjacent baggage handling area in the southeastern portion of the lower level. This device, currently used by all three airlines, is shown on **Exhibit II-10**.

2.2.5 Rental Car Facilities

Counters and administrative office space are provided for the rental car companies across from the baggage claim area. The rental car companies currently operating at the Airport include Avis, Budget, Hertz and Thrifty. A portion of the rental car counter area is shown on **Exhibit II-11**.

2.2.6 Administrative Offices

The YCAA administrative offices are located on the upper level of the terminal building. An office reception area, conference room and other administrative functions are accommodated in this area. Two stairways and an elevator provide access between the upper and lower levels. Additional public restrooms are also located on the upper level. Other space currently not allocated or leased consists of open space at the top of each stairway on the upper level, available as additional waiting area for passengers or meeters/greeters, and reserved seating area for military personnel (as shown in **Exhibit II-12**)

Exhibit II-10

Terminal Building – Baggage Claim Area



Source: Ricondo & Associates, Inc., May 2008.
Prepared by: Ricondo & Associates, Inc., July 2008.

Exhibit II-11

Terminal Building – Rental Car Counters



Source: Ricondo & Associates, Inc., May 2008.
Prepared by: Ricondo & Associates, Inc., July 2008.

Exhibit II-12**Terminal Building – Upper Level Reserved Military Seating Area**



Source: Ricondo & Associates, Inc., May 2008.
Prepared by: Ricondo & Associates, Inc., July 2008.

2.2.7 Airport Access and Parking

Access to the passenger terminal is provided via on-Airport roadways that connect with the terminal curbside, various parking areas and connect with the local roadway system. The terminal loop roadway, named South Pacific Avenue, passes in front of the terminal building and encircles the entire public parking area, for both short and long term parking.

2.2.8 Airport Roadways

Interstate 8 is the east-west corridor from Yuma toward San Diego to the west and toward Phoenix to the northeast. The Airport is located in the southern portion of the City of Yuma and is accessible via Highway 95 or Interstate 8 from the downtown area. The Airport is bordered by:

- East 32nd Street / County Highway 11 Street East to the north,
- South Avenue 3 East to the east,
- East County 14th Street South to the south, and
- various roads, including South Fortuna Avenue, South 4th Avenue, South Avenue 1 East (South Arizona Avenue), and East 40th Street to the west.

Landside access to the passenger terminal building is via 32nd Street at South Pacific Avenue from the north. South Pacific Avenue continues to provide a terminal loops roadway in front of the terminal building that serves as the link between the regional highway system and the terminal area.

2.2.9 Terminal Curbside

When construction of the current terminal building was completed, the public parking, access, and curbside areas were also improved. The terminal curbside is single-level, with drop-off and pickup

locations near the ticket counters and baggage claim areas, respectively. Under typical circumstances, there are no congestion concerns at the curbside or on-Airport roadways.

2.2.10 Vehicle Parking

Various vehicle parking areas are provided near the terminal building, as summarized in **Table II-6** and depicted on **Exhibit II-13**.

Table II-6

Terminal Area Parking Allocation

Parking Area	Location	Number of Spaces
Customs & FAA	North of Customs and FAA facilities	22
Employee (YCAA)	Adjacent to west side of terminal	9
Employee (Non-YCAA)	Shares Lot with Airport Maintenance facility	23
Employee (YCAA Airport Maintenance)	Northeast of Passenger Terminal	34
Long-Term Public	North of Passenger Terminal and Short Term parking	211
Short-Term Public	North of Passenger Terminal	92
Rental Car	West (Returns) / East (Ready) of Passenger Terminal	107

Source: Yuma International Airport, Yuma County Airport Authority, 2008 (as-built drawing); Ricondo & Associates, Inc., February 2008.
Prepared by: Ricondo & Associates, Inc., March 2008.

Public parking is provided directly across South Pacific Avenue from the terminal building, with 92 short-term parking stalls and 211 long-term parking stalls. Rental car parking is provided in two locations. The return lot is located to the west of the terminal, and the ready lot is located east of the terminal. There are 142 parking stalls – 49 in the return lot and 93 in the ready lot.

Employee parking is currently accommodated in two locations. Nine parking stalls are provided for YCAA employees adjacent to the west side of the terminal and 23 parking stalls are provided for non-YCAA employees in a shared parking lot near the Airport Maintenance Facility. 34 parking stalls have been provided for the Airport maintenance facility employees. There are 22 parking stalls for the U.S. Customs and FAA facilities, located north of their respective facilities.

2.3 Fixed Base Operators and General Aviation

Three FBOs and numerous other tenants are located within two GA areas at the Airport – one GA area is adjacent to and west of the passenger terminal in the northwest airfield, and the second is west of Runway 3L-21R and Taxiway I in the west airfield area. The GA tenants at the Airport and their associated leaseholds are discussed below. The approximate areas presented were obtained from the leasehold documents provided by the YCAA. The overall GA facilities are presented in **Exhibit II-14** and **Exhibit II-15**.

2.3.1 Lux Air Jet Center

Lux Air Jet Center, formerly Sun Western Flyers, provides FBO services including full-service 100LL and Jet-A fueling. Lux Air Jet Center currently leases facilities space in three different locations.

Exhibit II-13

Terminal Area – Vehicle Parking Facilities

Exhibit II-14

GA Facilities Northwest Airfield

Exhibit II-15

GA Facilities West Airfield

The first area leased by Lux Air Jet Center is west of the Navy transceiver site, adjacent to the West GA Hangar facility. This 55,760-square-foot site includes 47,760 square feet of apron and an 8,000-square-foot aircraft maintenance hangar. Landside access is provided via Burch Way.

The second area is southwest of the Navy transceiver site, and south of the Yuma Jet Center. The 518,795-square foot site includes 426,815 square feet of apron, 91,980 square feet of unimproved land, and two temporary office trailers used by aircrews and for maintenance. Landside access is provided via Burch Way. Lux Air Jet Center's new GA facility, consisting of a FBO/Terminal, and three hangars, will be developed in this area. **Exhibit II-16** shows a rendering of Lux Air's new FBO/Terminal.

Exhibit II-16

Lux Air Jet Center (formerly Sun Western Flyers)

Need a site plan or rendering from Lux Air

Source: Yuma International Airport, August 2008.
Prepared by: Ricondo & Associates, Inc., August 2008.

The third facility is located west of the passenger terminal and encompasses 211,175 square feet, comprising approximately: 190,475 square feet of apron space, 3,000 square feet of storage and maintenance hangar space, 1,200 square feet of shop space, 1,500 square feet of office space, two 1,500-square foot conventional hangars, and 12,000 square feet of vehicle parking (25 parking stalls). The apron is currently configured to accommodate 27 aircraft tie-down positions. Landside access is via 32nd Street (Business Route 8). Lux Air Jet Center will vacate this area in the near term, and the facilities will be utilized by the Airport for FAA Airways Facility Office and Airport Maintenance.

2.3.2 Yuma Jet Center

Yuma Jet Center, formerly Bet Ko Air Jet Center, is located west of the Navy transceiver site. The Yuma Jet Center leases a total of 333,100 square feet, which includes: 316,080 square feet of apron, a hangar consisting of 2,460 square feet of office space and 6,560 square feet of hangar space, and a second 6,560-square foot hangar. Yuma Jet Center provides FBO services, including full-service 100LL and Jet-A fueling. Landside access is provided via Burch Way. Yuma Jet Center is shown in **Exhibit II-17**.

2.3.3 CareFlight Aviation Center

CareFlight Aviation Center, formerly Diamond Air Jet Center, provides FBO services and is located west of Taxiway I1. CareFlight's 129,683-square foot leasehold includes 113,856 square feet of apron (including approximately 20 aircraft tie-down positions), 1,600 square feet of hangar space, 700 square feet of office area, 7,885 square feet of landside access and parking, 5,450 square feet of unimproved land, and a 192-square foot storage building. CareFlight also provides self-serve 100LL and Jet-A fueling. Landside access is via Fortuna Avenue. **Exhibit II-18** shows CareFlight Aviation Center.

Exhibit II-17

Yuma Jet Center (Formerly Bet-Ko Air Jet Center)_



Source: Ricondo & Associates, Inc., February 2008.
Prepared by: Ricondo & Associates, Inc., August 2008.

Exhibit II-18

CareFlight Aviation Center



Source: Yuma International Airport, August 2008.
Prepared by: Ricondo & Associates, Inc., August 2008.

2.3.4 YCAA-owned General Aviation Facilities

YCAA provides two GA facilities that include aircraft storage hangars and tie-down parking for aircraft based at the Airport. YCAA owns and maintains the hangars and aprons.

2.3.4.1 Northwest GA Hangar Facility

The Northwest GA Hangar facility is located at the northwest corner of the Airport near the intersection of East 32nd Street and Fortuna Avenue, and was shown previously on Exhibit II-14. . Airside access is via Taxiway I. The facilities include three hangars. Building One is an 11,150-square foot hangar that comprises five square, 2,310-square foot aircraft storage units. Building Two is a 3,600-square foot hangar that comprises four nested 900-square foot T-hangars. Building Three is a 6,400-square foot hangar that comprises four nested 1,600-square foot T-hangars. The aircraft parking apron is approximately 81,800 square feet. Landside access is provided through Gate 3N from Fortuna Avenue. Approximately 55 vehicle stalls are provided for the Northwest GA facility in the parking lot south of the apron. The Northwest GA hangars are owned and maintained by the YCAA, and are shown in **Exhibit II-19**.

Exhibit II-19

Northwest GA Hangar Facility



Source: Yuma International Airport, August 2008.
Prepared by: Ricondo & Associates, Inc., August 2008.

2.3.4.2 West GA Hangar Facility

The West GA Hangar facility is located on the west side of the airfield, with airside access via Taxiway I2, and was shown previously on Exhibit II-15. The facility includes the following aircraft storage hangars: two sets of rectangular hangars, two sets of T-hangars, and 4 rows of T-shades (24 units). Building A comprises four rectangular hangar units, approximately 4,225 square feet each, totaling approximately 17,000 square feet. Building B comprises eight 2,136-square foot box-shaped hangar units, totaling approximately 25,000 square feet. Building C comprises 11 1,400-square foot nested T-hangars, totaling approximately 16,850 square feet. Building D comprises 12 1,200-square

foot nested T-hangers, totaling 15,500 square feet. The West GA apron is approximately 128,870 square feet. The West GA facility also includes restrooms and an aircraft wash rack. Landside access is through Gate 7W from Burch Way. Approximately 60 vehicle parking stalls are provided for the West GA facility. The West GA hangars are owned and maintained by the YCAA. T-shades are shown in **Exhibit II-20**.

Exhibit II-20

West GA Hangar Facility – T-Shades



Source: Ricondo & Associates, Inc., February 2008.
Prepared by: Ricondo & Associates, Inc., August 2008.

2.3.4.3 Fortuna Hangar

The Fortuna Hangar (formerly J-Mar) is a six-unit hangar facility located north of the Navy Transceiver Site, was shown previously in Exhibit II-15Exhibit II-10. Each unit is approximately 2,000 square feet, totaling 12,500 square feet. The Fortuna hangar is owned by the YCAA, and maintained by the Federal government.

2.3.4.4 Other Tenants

FedEx

FedEx leases 28,462 square feet on the east end of the Fortuna Hangar, and was shown previously in Exhibit II-15. The lease area includes a 2,394-square foot hangar and 26,068 square feet of apron, and is shown in **Exhibit II-21**.

Exhibit II-21

FedEx Operations from Fortuna Hangar Location



Source: Yuma International Airport, August 2008.
Prepared by: Ricondo & Associates, Inc., August 2008.

U.S. Customs and Border Protection

The U.S. Customs and Border Protection is responsible for the inspection of all passengers and aircraft entering United States at the Airport and is available on a scheduled basis. They lease two areas on the Airport. The first is located within the passenger terminal and occupies approximately 2,000 square feet, and is shown in **Exhibit II-22**. The second area is located within the GA area, located north of the Fortuna Hangar, with airside access via Taxiway I2. The site encompasses 114,098 square feet, comprised of a 9,750-square foot maintenance hangar and 104,348 square feet of apron, from which the U.S. Customs and Border Protection bases its local helicopter operations. Two temporary structures are also located on this site; a trailer and a shade tent. Landside access is through Gate 7W from Burch Way. The U.S. Customs and Border Protection's helicopter pads located in the GA area are shown in **Exhibit II-23**.

Exhibit II-22

U.S. Customs and Border Protection at Passenger Terminal



Source: Yuma International Airport, August 2008.
Prepared by: Ricondo & Associates, Inc., August 2008.

Exhibit II-23

U.S. Customs and Border Protection Helicopter Operations



Source: Yuma International Airport, August 2008.
Prepared by: Ricondo & Associates, Inc., August 2008.

FAA

The FAA's Airways Facilities Office facility is currently located in an FAA-owned, 780-square foot trailer located west of the passenger terminal apron, and maintains a 220-square foot maintenance building to the west of the office building.. The FAA will relocate their office to the vacated Lux Air/Sun Western Flyer's hangar, to the west of the passenger terminal, sometime in the Fall of 2008, and will occupy 1,547 square feet of office space. Ancillary Facilities

Airport support facilities that accommodate both aviation-related and non-aviation related services are discussed below, including:

- Air Cargo
- West Visiting Aircraft Line
- Airport Maintenance
- YCAA Unassigned Facilities
- Aircraft Rescue and Fire Fighting (ARFF)
- Aviation Fuel
- Military Facilities

2.3.5 Air Cargo

As of April 2008, no buildings at the Airport were dedicated solely to air cargo. As discussed in Section 2.1.3.5, FedEx leases space at the Fortuna Hangar facility. Airborne Express and United Parcel Service (UPS) facilities are located off-airport. Currently, these operators transfer freight directly from the aircraft to vehicles on the apron.

2.3.6 West Visiting Aircraft Line

Two apron areas west of Runway 3L-21R have been designated as the West Visiting Aircraft Line. The south apron is constructed of concrete, encompasses approximately 160,000 square feet, and is accessible via 4th Avenue or the Airport Loop. The 40th Street apron is located northwest of the DCC and encompasses approximately 78,750 square feet. Landside access is via East 40th Street and Arizona Avenue. The West Visiting Aircraft Line, intended to accommodate large itinerant aircraft such as the B737, B757 and B777, is depicted on **Exhibit II-24**.

2.3.7 Airport Maintenance

The Airport maintenance facility operates from a building approximately 2,000 square feet located to the northeast of the passenger terminal. Landside access is via South Pacific Avenue. The location of this facility was previously depicted on Exhibit II-14. The Airport maintenance building is shown on **Exhibit II-25**. Airport maintenance will also occupy part of the Lux Air/Sun Western Flyers' hangar located to the west of the passenger terminal, when it is vacated in September 2008. They will share the building with the FAA Airways Facility Office, who will occupy the office space. Airport maintenance will occupy the 3,000 square feet of storage and maintenance hangar space, and 1,200 square feet of shop space.

Exhibit II-24

West Visiting Aircraft Line



Source: Yuma International Airport, August 2008.
Prepared by: Ricondo & Associates, Inc., August 2008.

Exhibit II-25

Airport Maintenance Facility



Source: Yuma International Airport, August 2008.
Prepared by: Ricondo & Associates, Inc., August 2008.

2.3.8 YCAA Unassigned Facilities

The Defense Contractor Complex (DCC) is currently not leased. Airside access is via Taxiway F3 and landside access is of 40th Street and Arizona Avenue as shown in Exhibit II-24. The DCC consists of various paved and concrete pads, and a 9,900 square foot aircraft maintenance hangar. The DCC site is owned and maintained by the YCAA, and is shown in **Exhibit II-26**.

Exhibit II-26

Defense Contractor Complex



Source: Yuma International Airport, August 2008.
Prepared by: Ricondo & Associates, Inc., August 2008.

2.3.9 Aircraft Rescue and Firefighting

Aircraft rescue and fire fighting (ARFF) services are provided by the MCAS. The ARFF station is located in the east airfield, on the MCAS Yuma main apron, and is shown on Exhibit II-2. Airports with daily scheduled air carrier service are required to provide ARFF services. The index determination and equipment requirements are determined by the standards in Federal Aviation Regulations (FAR) Part 139, *Certification of Airport*.

As stated in FAR Part 139.315, the ARFF index is determined by the length of the air carrier aircraft, and the number of average daily departures of air carrier aircraft. For the purpose of determining the ARFF index, the lengths of the air carrier aircraft are categorized into 5 groups, A through E. Index A includes aircraft less than 90 feet in length. Index B includes aircraft at least 90 feet but less than 126 feet in length. Index C includes aircraft at least 126 feet but less than 159 feet in length. Index D includes aircraft at least 159 feet but less than 200 feet in length. Index E includes aircraft at least 200 feet in length. Except as provided in FAR Part 139.319(c), if there are five or more average daily departures of air carrier aircraft in a single Index group serving the airport, the longest aircraft with an average of five or more daily departures determines the Index required for the Airport. When there are fewer than five average daily departures of the longest air carrier aircraft serving the airport, the Index required for the airport will be the next lower Index group than the Index group prescribed for the longest aircraft, unless further. The minimum designated index requirement shall be Index A.

Table II-7 presents the current average daily air carrier departures, as of July 2008, by aircraft make, aircraft length, and ARFF Index. The number of daily departures and the specific fleet mix varies within the calendar year, depending on peak travel seasons. Aircraft utilized by air carriers include, CRJ-100/200, Embraer 120 and DeHavilland Dash 8-300. which are all Index A aircraft. Based on the current scheduled air carrier aircraft operating at the Airport, the Airport is categorized as ARFF Index A.

Table II-7

Average Daily Air Carrier Departures

Type Aircraft	Average Number of Daily Departures ^{1/}	Aircraft Length	ARFF Index
CRJ – 100/200	2	87' 10"	A
EMB 120	4	65' 7"	A
DeHavilland Dash 8 - 300	5	84' 3"	A
Total Departures	11		

Notes:

1/ The number of daily departures and the specific fleet mix varies within the calendar year, depending on peak travel seasons. The number of departures presented is an estimated average of annual of operations.

Sources: Delta, *Canadair Regional Jet 100 (CRJ), Aircraft Specifications*, http://www.delta.com/planning_reservations/plan_flight/aircraft_types_layout/crj-100/index.jsp (accessed July 15, 2008); SkyWest Airlines, *EMB120 Fact Sheet*, <http://www.skywest.com/about/emb.php> (accessed July 15, 2008); Bombardier, Inc., Q300 Specifications, <http://www.bombardier.com/en/aerospace/products/commercial-aircraft/q-series> (accessed July 15 2008); FAA, *Aircraft Characteristics, AC 150/5300-13, Change 12, Airport Design*, January 2008.

Prepared by: Ricondo & Associates, Inc., July 2008.

As stated in FAR Part 139.317, Index A airports require the following minimum ARFF equipment and agents: and firefighting equipment and agents: one vehicle carrying at least 500 pounds of sodium-based dry chemical, halon 1211, or clean agent; or 450 pounds of potassium-based dry chemical and water with a commensurate quantity of AFFF to total 100 gallons for simultaneous dry chemical and AFFF application. Further more, ARFF vehicles that are required to carry dry chemical, halon 1211, or clean agent for compliance with the Index requirements, must meet one of the following minimum discharge rates for the equipment installed: dry chemical, halon 1211, or clean agent through a hand line at 5 pounds per second; dry chemical, halon 1211, or clean agent through a turret at 16 pounds per second. Other extinguishing agent substitutions authorized by the Administrator may be made in amounts that provide equivalent firefighting capability. In addition to the quantity of water required, each vehicle required to carry AFFF must carry an appropriate amount of AFFF to mix with twice the water required to be carried by the vehicle.

Table II-8 presents a current inventory of MCAS Yuma ARFF equipment and quantities of agents capable of being carried by that equipment. The YCAA does not own, operate, maintain or provide manpower for this equipment. ARFF services are provided entirely by MCAS Yuma, which operates and provides ARFF services for their military operations, as well as civilian operations at the Airport. The current MCAS Yuma ARFF equipment surpasses the requirements for the Airport's FAR Part 139, ARFF Index A, air carrier operations.

Table II-8

MCAS Yuma ARFF Vehicles and Capabilities

Type of Vehicle	Manufacturer	Model	Qty.	Water (gals)	AFFF Foam (gals)	Dry Chem (lbs)	Halon 1211 (lbs)	Roof Turret Discharge Rate	Handline Discharge Rate
Truck, Fire Fighting, ARFF and Structure	Oshkosh	A/S 32P-19A	10	1,000	130	n/a	500	500 gpm	Water 60 gpm Halon 5 lbs/sec
Water Tanker	West Mark / International	P-26	1	5,000	n/a	n/a	n/a	n/a	n/a

Notes:

AFFF = Aqueous Film Forming Foam
 ARFF = Aircraft Rescue and Fire Fighting
 gals = gallons
 gpm = gallon per minute
 lbs = pounds
 lbs/sec = pounds per second
 n/a = not applicable

Source: MCAS Yuma (ARFF vehicle inventory list), August 2008.
 Prepared by: Ricondo & Associates, Inc., August 2008.

Exhibit II-27 presents a photo of a representative A/S 32P-19A fire fighting truck, as operated at MCAS Yuma.

Exhibit II-27

MCAS Yuma ARFF Vehicles and Capabilities



Source: MCAS, Tactical Wheeled Vehicles Conference, Marine Corps Systems Command Briefing, January 2002, <http://www.dtic.mil/ndia/2002tactical/feigley.pdf> (accessed July 23, 2008).
 Prepared by: Ricondo & Associates, Inc., August 2008.

2.3.10 Aviation Fuel

All civil aviation fuel storage and dispensing facilities at the Airport are privately owned and operated. The current fuel storage and years of tank installation are as follows: Yuma Jet Center operates two 10,000 gallon 100 LL Avgas underground tanks, installed in 1988, and a 20,000 gallon Jet A underground tank, installed in 1991; Sun Western Flyers operates two 100 LL Avgas tanks, installed in 1972, and three Jet A tanks, which were installed in 1982; CareFlight operates two above-ground tanks, one 12,000 gallon 100LL, and one 12,000 gallon Jet-A, both installed in 2002.³ Fuel is dispensed through both self-serve pumps and mobile fuel delivery trucks. **Exhibit II-28** presents CareFlight’s two above ground tanks.

Exhibit II-28

CareFlight Above-Ground Fuel Tanks



Source: Ricondo & Associates, Inc., May 2008.
 Prepared by: Ricondo & Associates, Inc., July 2008.

A summary of the civil aviation fuel facilities at the Airport is presented in **Table II-9**.

Table II-9

Civil Aviation Fuel Facilities Summary

Provider	Storage Capacity (# of tanks, quantity in gals.)		Tank Location	Above or Below Ground Tanks	Full or Self-Serve
	100LL	Jet-A			
Sun Western Flyers	(2) 12,000	(3) 12,000	Ramp	Under	Full
Yuma Jet Center	(2) 10,000	(1) 20,000	Ramp	Under	Full
CareFlight	(1) 12,000	(1) 12,000	Ramp	Above	Full & Self-Serve

Sources: Yuma International Airport, Yuma County Airport Authority, *Airport Master Plan*, September 14, 1999. CareFlight (tenant interview), July 22, 2008.

Prepared By: Ricondo & Associates, Inc., March 2008.

³ Yuma International Airport, Yuma County Airport Authority, *Airport Master Plan*, September 14, 1999 (Yuma Jet Center and Sun Western Flyers data); CareFlight (tenant interview), July 22, 2008.

2.4 Military Facilities

The MCAS Yuma supports 80 percent of the Marine Corps' air to ground aviation training.⁴ Four squadrons of Harriers are stationed at the facility. The base is owned by the MCAS through the United States Government, and is approximately 5 square miles in size, including the "Airport" property owned by Yuma County. Through a patent, property was conveyed to Yuma County for civil aviation use, including general aviation and passenger operations. The boundaries of the Airport area are presented in **Exhibit II-29**. The MCAS Yuma provides air traffic control and aircraft rescue and firefighting services for both military and civil aircraft that operate at the Airport.

2.5 Security Systems

The Airport maintains a modern security system, including video surveillance, controlled access through pedestrian and vehicular access points, and a sophisticated badging and background check and identification process. The Airport is currently not compliant with federal regulations regarding security and badging of personnel.

2.6 Utility Infrastructure

Yuma International Airport is served by the same public and municipal utilities that provide service to the City of Yuma. Sanitary sewer, water, and storm drainage services are provided by the City of Yuma. Electrical power is provided by Arizona Public Service (APS). Natural gas service is provided by Southwest Gas Corporation. Telephone communication lines are provided by Qwest Communications and cable television and Internet services in the passenger terminal are provided by Time Warner.

2.7 Off-Airport Land Use and Zoning

Off-Airport land uses in the vicinity of the Airport are predominantly residential, agricultural and commercial. The Airport lies within the city limits of the City of Yuma, and has planning areas within its immediate environs. The South Mesa Sub-Regional Planning Area has a goal to preserve and promote agricultural lands and activities, as well as low-density housing. The North Gila Valley and Yuma Valley Sub-Regional Planning Area is predominately agricultural.

Certain airport/airfield planning legislation applies to the preservation of military airports. Senate Bill 1525 Chapter 23: "Military Airports Preservation", ensures that cities and counties consider military airports when they undertake comprehensive general development planning studies. Senate Bill 1514 sets forth regulations for planning and zoning relative to military airport compatibility; and House Bill 2523 governs public airport disclosure. In coordination with these legislative bills, several mandates must be met in regard to land use and development in the vicinity of military airports. In the vicinity of the Airport/MCAS Yuma, rezoning proposals, development proposals, and special use permits must also be in compliance with the regulations provided in the legislation.

Specific requirements are to be addressed in coordination with Senate Bill 1525.⁵ One requirement is a 30-day minimum notification period must be given to the military airport authorities before any hearing on construction of a new school adjacent to or in the vicinity of a military airport. Noise levels for properties around the airport must also be disclosed. Additionally, sound attenuation standards must be met for residential buildings that have been developed prior to 2001.

⁴ MCAS Yuma Mission, <http://192.156.9.102/info/mission.html> (accessed March 2008).

⁵ Yuma International Airport, Yuma County Airport Authority, Planning and Engineering, *Senate Bill 1525*, [http://www.yumaairport.com/yuma/engineering.nsf/e7fa71a438fa7eba072573aa001b12ec/a4cd469a7fce3077072573e700793df4/\\$FILE/Senate%20Bill%201525.pdf](http://www.yumaairport.com/yuma/engineering.nsf/e7fa71a438fa7eba072573aa001b12ec/a4cd469a7fce3077072573e700793df4/$FILE/Senate%20Bill%201525.pdf), (accessed March 2008).

Exhibit II-29

Airport's Shared-Use Leasehold

2.8 Airspace Environment

The airspace environment that affects aircraft operating at the Airport includes the airspace itself and air traffic control.

2.8.1 Airspace

The airspace surrounding the Airport is predominantly designed to accommodate military activity in the region. The Airport is located within Class D airspace, which is generally defined as airspace from the surface to 2,500 feet above the airport elevation surrounding the airport with an operational airport traffic control tower. Each person must establish two-way radio communication with the Airport Traffic Control Tower (ATCT) controller providing air traffic services prior to entering the airspace and thereafter maintain those communications while in the airspace.⁶ The ATCT is operated by MCAS Yuma and generally operates from 7:00 a.m. to midnight daily, but changes frequently due to military operations. The ATCT does not observe daylight savings time. When the ATCT is closed, this airspace reverts to Class E airspace (un-controlled). **Exhibit II-30** presents the YUM airspace.

The majority of the airfield itself is included within an area of special-use airspace designated as a Military Operations Area (MOA). The MOA, specifically known as the Dome MOA, begins south of Runway 8-26 and extends both west and south to the U.S.-Mexico border and east to where it abuts restricted airspace area R-2301W. Civil operations within an MOA are not prohibited. However, pilots of private aircraft are cautioned to remain alert for military aircraft while operating in the MOA. Military operations within the Dome MOA are intermittent and the schedules for military activity may be obtained via a Notice to Airmen (NOTAM), where reserved blocks of time prohibit, restrict or otherwise dictate civil aircraft operations. Military operations within the Dome MOA are conducted at altitudes above 6,000 feet above MSL. Numerous restricted areas for flight activity are in place around the Airport to protect and more closely monitor the flight activity in the area.

The Imperial National and Cibola Wildlife Refuges, as well as the Muggins and Trigo Mountains Wilderness Areas, are located in the vicinity of the Airport. While aircraft operations are not restricted over these areas, pilots are requested to maintain a minimum altitude of 2,000 feet above the surface. For aircraft en route to or departing from the area using VOR navigational facilities, a system of federal airways, referred to as Victor Airways, has been established by the FAA. Victor Airways are corridors of airspace 8 miles wide that extend upward from 1,200 feet above MSL to 18,000 feet above MSL and extend between VOR navigational facilities.

2.8.2 Airport Traffic Control Tower

Aircraft operating within the Class D airspace surrounding the Airport are controlled by USMC Air Traffic Control personnel, provided by the MCAS Yuma. The Control Tower Branch is responsible for aircraft operating both on the airfield, and within MCAS Yuma's Class D airspace. The site is a combined Center and Approach Control facility responsible for 8,107 square miles of airspace, outside of the Class D airspace. This is generally within a 60 nautical mile radius of the air station from the surface to 23,000 feet MSL and within designated Special Use Airspace up to 80,000 feet MSL.⁷

⁶ Federal Aviation Administration, *Pilot/Controller Glossary*, February 14, 2008, http://www.faa.gov/airports_airtraffic/air_traffic/publications/media/pcg.pdf, (accessed April 30, 2008).

⁷ Yuma Marine Corp Air Station, Air Traffic Control Division, <http://192.156.9.102/services/atc/default.htm>, (accessed March 31, 2008).

Exhibit II-30
YUM Airspace

The ATCT is located west of the West GA facility, and was previously depicted on Exhibit II-15.. The site includes: a maintenance building, approximately 8,000 square feet located to the northeast of the ATCT, an office building, approximately 4,750 square feet, located to the south of the ATCT, and vehicle parking. Landside access is via East 39th Street and South Pico Way. The ATCT is shown in **Exhibit II-31**.

Exhibit II-31

Airport Traffic Control Tower



Source: Ricondo & Associates, Inc., May 2008.
Prepared by: Ricondo & Associates, Inc., July 2008.

2.9 Meteorological Conditions

The climate of Yuma is typical for the low desert region of southwestern Arizona. The National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service (NWS) collected data from 1971 through 2000. The Airport averages 3.17 inches annual precipitation, peaking in January, August, September, and December. The normal daily mean temperatures for Yuma range from an annual high of 93.7 degrees Fahrenheit in July to an annual low of 56.4 degrees Fahrenheit in December. July has the highest daily mean maximum temperature, averaging 106.6 degrees Fahrenheit. On average 52 days per year are considered cloudy, with 242 days on average perceived as clear, and 71 days on average noted as partly cloudy. In addition to the mild change in visibility, wind speeds are normally light, averaging 7.8 miles per hour.

CHAPTER THREE
FORECAST

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III. Aviation Activity Forecasts

Aviation activity forecasts are an important element of the Master Plan Update in that they provide the basis for future planning considerations. The forecasts are essential for:

- Determining the future role of the Airport in both the type of aircraft to be accommodated and the type of aviation demand to be served;
- Evaluating the capacity of Airport facilities and their ability to accommodate the forecast aviation demand;
- Identifying a reasonable range of activity to plan for over the Master Plan horizon; and
- Estimating the extent to which airside and landside facilities should be provided at the Airport.

Forecasting aviation activity is both an analytical and subjective process. Many of the factors influencing aviation demand cannot be readily quantified. Consequently, actual activity realized in future years may differ from the forecasts presented herein as a result of unforeseen events or changes in the operational characteristics of the Airport or economic or political uncertainties in the region served by the Airport or the nation.

This chapter presents the assumptions and historical data underlying the forecasts; outlines the socioeconomic conditions within the Airport service region; and presents forecasts of aviation activity for the planning period through 2027. The following are discussed in the remainder of this chapter:

- Historical Aviation Activity and Trends
- Factors Affecting Aviation Activity
- Enplaned Passenger Forecasts
- Aircraft Operations Forecasts and Fleet Mix Forecasts
- Design-Hour Activity and Planning Activity Levels

3.1 Historical Aviation Activity and Trends

Historical aviation activity at the Airport, and the key factors influencing this activity, are discussed in the following sections.

3.1.1 Airlines Serving the Airport

The airlines currently operating at the Airport provide service to short- and medium-haul markets (less than 1,800 miles). As of May 2008 and shown in **Table III-1** and on **Exhibit III-1**, the Airport was served by three passenger airlines providing daily nonstop scheduled service to Phoenix Sky Harbor International Airport (PHX), McCarran International Airport (LAS), Los Angeles International Airport (LAX), and Salt Lake City International Airport (SLC)¹.

¹ Delta Air Lines discontinued service to/from the Airport during the completion of this study.

Table III-1

Nonstop Markets^{1/}

Market	Daily Nonstop Departures	Number of Airlines	Airline
Las Vegas	1	1	U.S. Airways (Mesa Airlines)
Los Angeles	4	1	United Airlines (United Express)
Phoenix	5	1	U.S. Airways (Mesa Airlines)
Salt Lake City	1	1	Delta ^{2/}
Total Daily Departures	11	5	

Notes:

1/ As of May 2008.

2/ Delta Air Lines discontinued service to/from the Airport during the completion of this study.

Source: Official Airline Guide (February 2007/2008, May 2007/2008, August 2007, November 2007).

Prepared by: Ricondo & Associates, Inc.

These markets represent an average stage length of 264 miles, which reflects the demand for flights to major western markets.

3.1.2 Enplaned Passengers

The FAA classifies the Airport as a non-hub facility based on the percentage of national annual enplanements. In 2007 the Airport ranked as number 165 in total passengers enplaned and deplaned nationally, representing 0.011 percent of the market share according to the Airports Council International Traffic Data, *2007 Passenger Traffic*.

Table III-2 and **Exhibit III-2** present historical data on enplaned passengers at the Airport and the nation between 2002 and 2007.

Table III-2

Historical Enplaned Passengers (2002-2007)

Year	Airport		United States		Airport Share of U.S. Enplanements
	Total Enplanements	Annual Growth	Domestic Enplanements	Annual Growth	
2002	52,680	--	575,087,499	--	0.009%
2003	54,872	4.2%	587,829,547	2.2%	0.009%
2004	59,825	9.0%	628,493,362	6.9%	0.010%
2005	61,160	2.2%	669,427,839	6.5%	0.009%
2006	64,574	5.6%	668,418,019	-0.2%	0.010%
2007	73,487	13.8%	689,442,583	3.1%	0.011%
Compounded Annual Growth Rate					
2002-2007	6.9%		3.7%		

Source: Yuma County Airport Authority; Airports Council International Traffic Data, *2007 Passenger Traffic*.

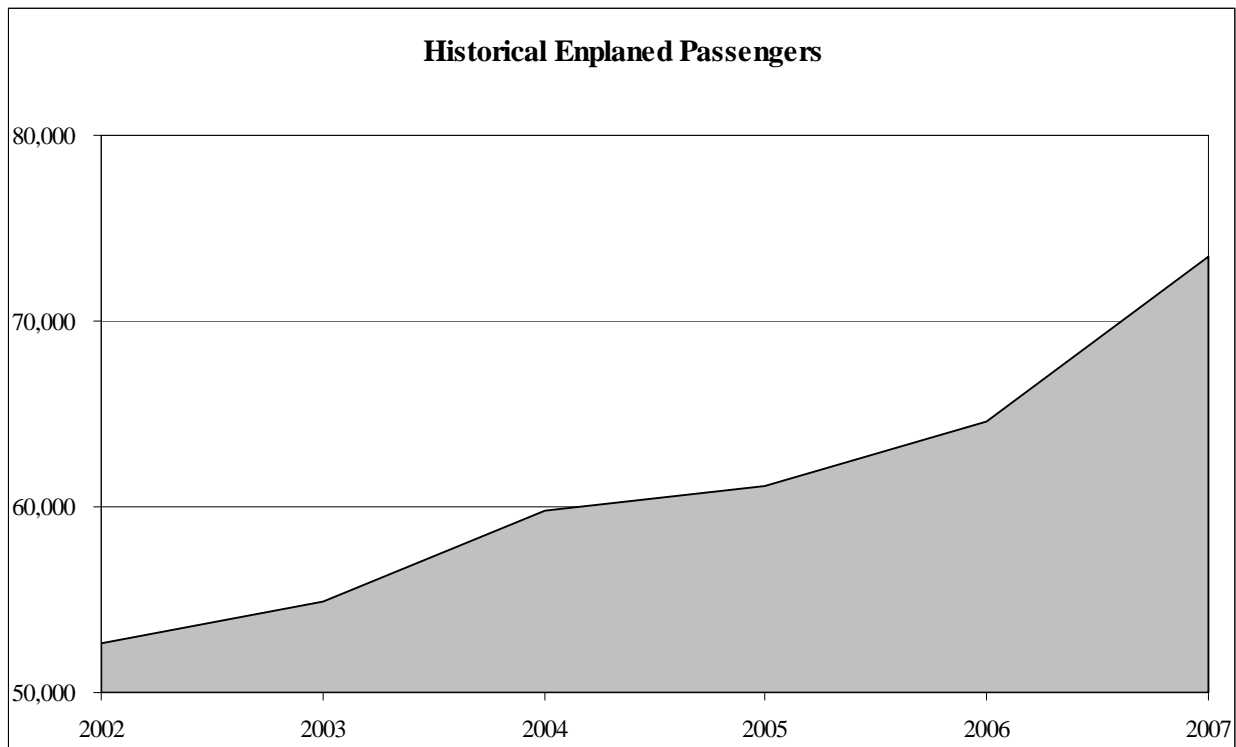
Prepared by: Ricondo & Associates, Inc., April 2008.

Exhibit III-1

Need title

Exhibit III-2

Historical Enplaned Passengers



Source: Yuma County Airport Authority.
 Prepared by: Ricondo & Associates, Inc., April 2008

The number of annual enplaned passengers has increased every year over the period from 52,680 in 2002 to 73,487 in 2007, representing a compounded annual growth rate of 6.9 percent. During the same period, enplaned passengers at the national level increased at a compounded annual growth rate of 3.7 percent. **Table III-3** and **Exhibit III-3** present the enplanement data on a monthly basis.

Exhibit III-3 shows a trend line for each year (2002-2007) of the number of monthly passenger enplanements, with established consistency in each year except 2002. In all other years, passenger enplanements were higher late in the fall season through early spring, attributable to seasonal residents and visitors.

3.1.3 Aircraft Operations

Table III-4 and **Exhibit III-4** present the historical operations and activity levels at the Airport by category from 1998 through 2007. A discussion of operations by each category is provided in the following paragraphs.

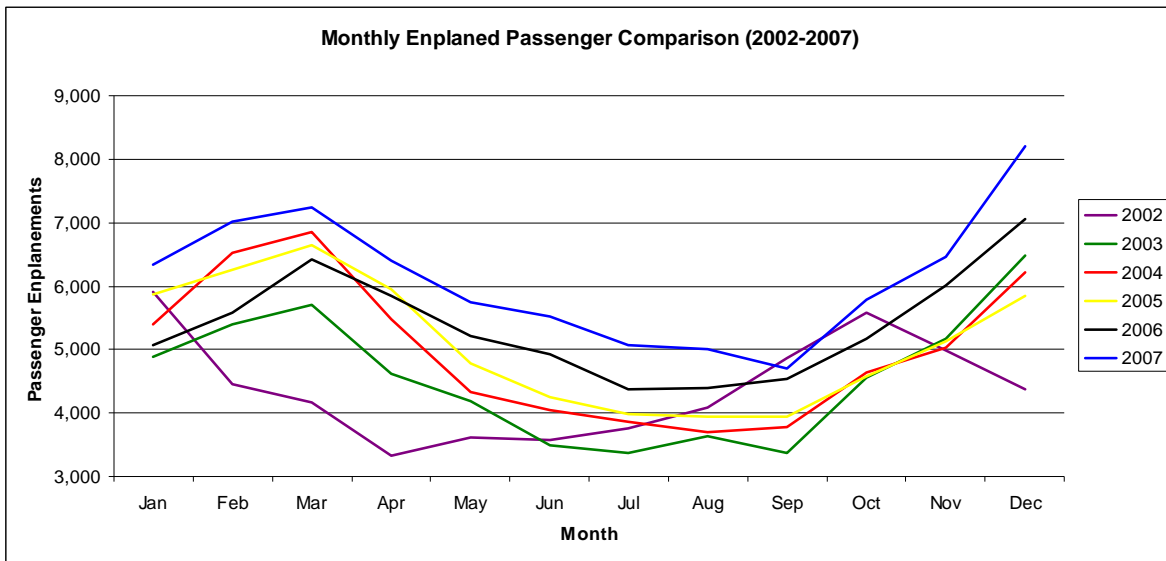
Table III-3
 Monthly Enplaned Passenger Comparison at the Airport (2002-Present)

Month	Airport Enplanements						Percent Difference					Percent of Annual Total					
	2002	2003	2004	2005	2006	2007	(03 vs. 02)	(04 vs. 02)	(05 vs. 02)	(06 vs. 02)	(07 vs. 02)	2002	2003	2004	2005	2006	2007
January	5,918	4,889	5,393	5,876	5,076	6,339	(17.4%)	(8.9%)	(0.7%)	(14.2%)	7.1%	11.2%	8.9%	9.0%	9.6%	7.9%	8.6%
February	4,448	5,397	6,529	6,256	5,574	7,012	21.3%	46.8%	40.6%	25.3%	57.6%	8.4%	9.8%	10.9%	10.2%	8.6%	9.5%
March	4,162	5,705	6,843	6,650	6,410	7,246	37.1%	64.4%	59.8%	54.0%	74.1%	7.9%	10.4%	11.4%	10.9%	9.9%	9.9%
April	3,330	4,627	5,474	5,946	5,852	6,405	38.9%	64.4%	78.6%	75.7%	92.3%	6.3%	8.4%	9.2%	9.7%	9.1%	8.7%
May	3,608	4,181	4,335	4,773	5,203	5,742	15.9%	20.1%	32.3%	44.2%	59.1%	6.8%	7.6%	7.2%	7.8%	8.1%	7.8%
June	3,567	3,489	4,052	4,249	4,929	5,513	(2.2%)	13.6%	19.1%	38.2%	54.6%	6.8%	6.4%	6.8%	6.9%	7.6%	7.5%
July	3,767	3,363	3,862	3,976	4,370	5,076	(10.7%)	2.5%	5.5%	16.0%	34.7%	7.2%	6.1%	6.5%	6.5%	6.8%	6.9%
August	4,083	3,638	3,705	3,949	4,389	5,013	(10.9%)	(9.3%)	(3.3%)	7.5%	22.8%	7.8%	6.6%	6.2%	6.5%	6.8%	6.8%
September	4,857	3,363	3,774	3,937	4,541	4,697	(30.8%)	(22.3%)	(18.9%)	(6.5%)	(3.3%)	9.2%	6.1%	6.3%	6.4%	7.0%	6.4%
October	5,582	4,557	4,630	4,574	5,168	5,782	(18.4%)	(17.1%)	(18.1%)	(7.4%)	3.6%	10.6%	8.3%	7.7%	7.5%	8.0%	7.9%
November	4,988	5,176	5,023	5,125	6,005	6,469	3.8%	0.7%	2.7%	20.4%	29.7%	9.5%	9.4%	8.4%	8.4%	9.3%	8.8%
December	4,370	6,487	6,205	5,849	7,057	8,193	48.4%	42.0%	33.8%	61.5%	87.5%	8.3%	11.8%	10.4%	9.6%	10.9%	11.1%
Annual Total	52,680	54,872	59,825	61,160	64,574	73,487	4.2%	13.6%	16.1%	22.6%	39.5%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Yuma County Airport Authority.
 Prepared by: Ricondo & Associates, Inc., April 2008.

Exhibit III-3

Monthly Enplaned Passenger Comparison (2002-2007)



Source: Yuma County Airport Authority.
 Prepared by: Ricondo & Associates, Inc., April 2008.

Table III-4

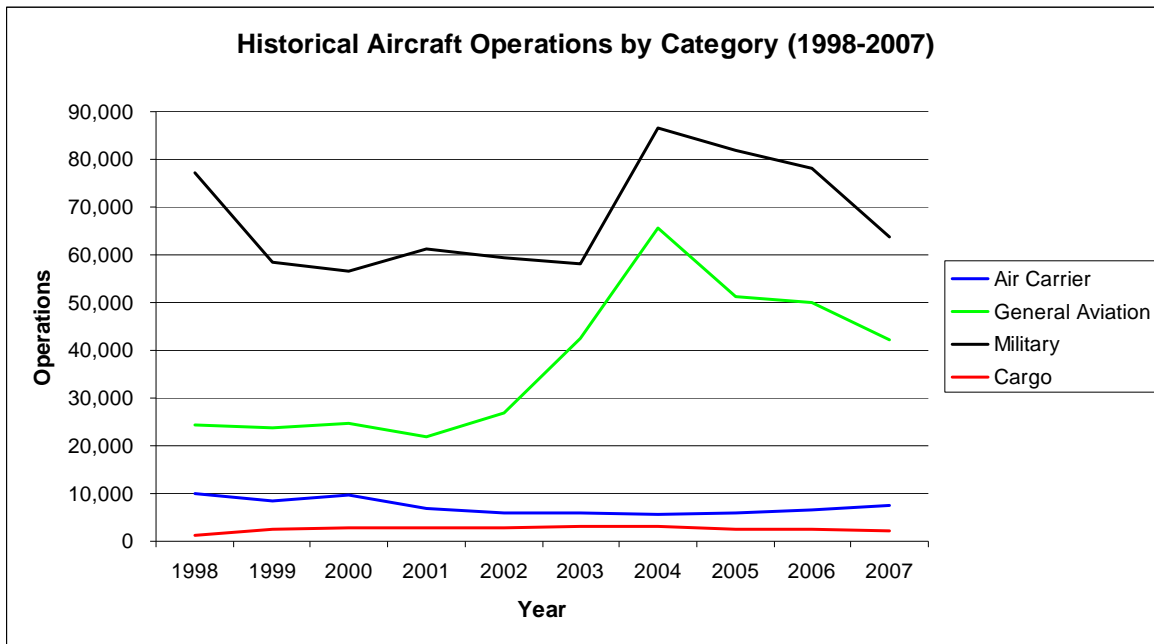
Historical Aircraft Operations (1998-2007)

Year	Air Carrier	General Aviation	Military	Cargo	Airport Total
1998	10,096	24,357	77,115	1,202	112,770
1999	8,422	23,650	58,540	2,639	93,251
2000	9,602	24,544	56,605	2,792	93,543
2001	6,831	22,004	61,324	2,716	92,875
2002	5,898	26,857	59,237	2,733	94,725
2003	5,906	42,581	58,224	3,180	109,891
2004	5,592	65,621	86,564	3,179	160,956
2005	5,870	51,178	81,781	2,450	141,279
2006	6,548	50,108	78,147	2,351	137,154
2007	7,426	42,047	63,657	2,315	115,445
Compounded Annual Growth Rate					
1998-2002	-12.6%	2.5%	-6.4%	22.8%	-4.3%
2002-2007	4.7%	9.4%	1.4%	-3.3%	4.0%
1998-2007	-3.4%	6.3%	-2.1%	7.6%	0.3%

Source: Yuma County Airport Authority.
 Prepared by: Ricondo & Associates, Inc., April 2008.

Exhibit III-4

Historical Aircraft Operations by Category (1998-2007)



Source: Yuma County Airport Authority.
Prepared by: Ricondo & Associates, Inc., April 2008.

Military: As shown by Table III-4 and Exhibit III-4, the United States Marine Corps Air Station (MCAS) has had a significant presence at the Airport, with operations exceeding all other categories. Military operations increased rapidly in 2004 as a result of overseas deployments, but have declined each year since 2004.

General Aviation: Between 1998 and 2002, general aviation activity at the Airport remained relatively constant, followed by a rapid increase in operations in 2003 and 2004. General aviation operations have declined each year since 2004.

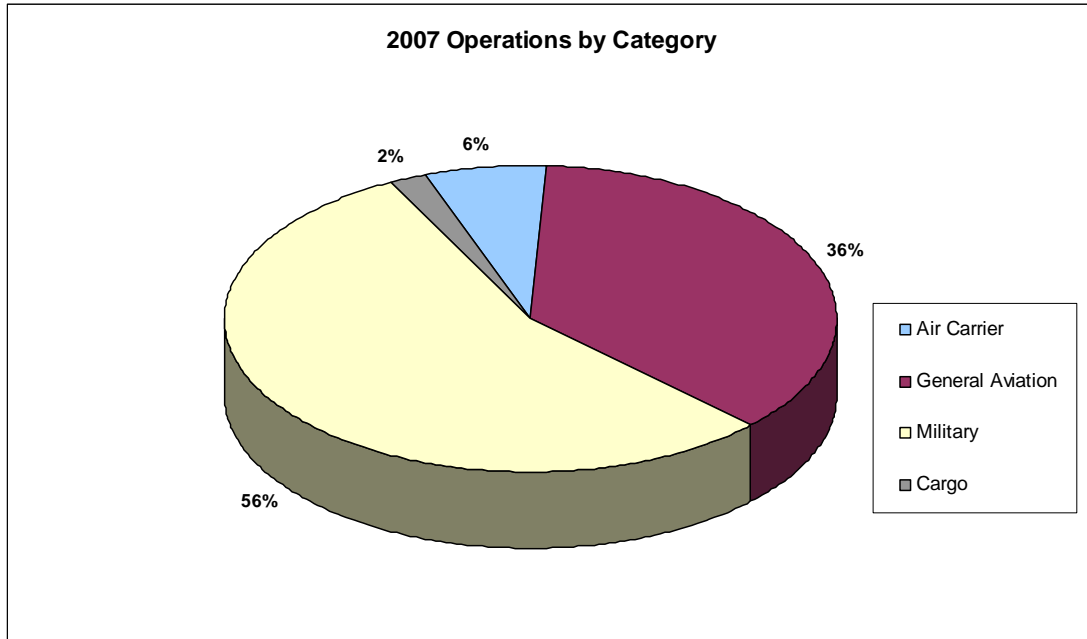
Air Cargo: Aside from 1998-1999 when air cargo activity more than doubled, operations in this category have remained relatively stable in recent years. Operations increased at a slight to moderate rate from 1999 to 2003, followed by a period of decline through 2007.

Air Carrier: From 2000 to 2001, air carrier operations at the Airport decreased substantially and then remained fairly stable for the next four years. Since 2006, the number of air carrier operations has increased moderately each year.

Exhibit III-5 shows the 2007 operations split for the Airport.

Exhibit III-5

2007 Airport Operations



Source: Yuma County Airport Authority; Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.

As shown in the exhibit, military operations represented more than half of the total operations at the Airport in 2007, while general aviation accounted for about 36 percent of total Airport operations. Air carrier operations and air cargo operations made up the remaining 8 percent of total operations in 2007.

Exhibit III-6 shows the historical trend of total Airport operations from 1998 through 2007. As shown, total operations at the Airport increased significantly from 2002 to 2004, and have since decreased each year. As previously discussed, and shown in Table III-4 and Exhibit III-4, the increase in activity from 2002 to 2004 and the subsequent decrease in operations are attributable to the fluctuations in the military and general aviation segments, which account for the majority of operations at the Airport.

Exhibit III-6

Historical Airport Operations (1998-2007)



Source: Yuma County Airport Authority; Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc.

3.2 Factors Affecting Aviation Activity

3.2.1 Airport Service Region

The Airport's service region includes the area consisting primarily of Yuma County, with a larger secondary area extending into southeastern California and portions of Mexico. The primary service area is defined as the region immediately surrounding the Airport whose population and economic activity generate the bulk of the passenger activity. The air carrier airports surrounding this service region include those in San Diego (185 miles west), Phoenix (187 miles east/northeast), and Tucson (243 miles east).

3.2.2 Socioeconomic and Demographic Trends

The conditions of the economic and demographic base within the primary service area are important considerations in determining future aviation demand at an airport. Economic and demographic variables such as population, employment, and personal income are analyzed in determining the size and strength of the base. **Table III-5** presents a summary of historical and forecast growth of these factors in Yuma County compared to the State of Arizona and the United States.

Table III-5
Socioeconomic and Demographic Trends^{1/}

Year	Yuma County	Arizona	United States
Population			
2000-2007	2.4%	2.9%	1.0%
2007-2027	2.0%	2.3%	1.0%
Employment			
2000-2007	3.8%	2.6%	1.2%
2007-2027	1.9%	2.6%	1.4%
Per Capita Income			
2000-2007	3.5%	2.1%	2.0%
2007-2027	1.1%	1.4%	1.7%

Note:
1/ Compounded Annual Growth Rate

Source: National Planning Association Data Service, Inc., 2007.
Prepared by: Ricondo & Associates, Inc.

As shown in Table III-5, the population in Yuma County has increased at a level fairly consistent with that of the State and outpacing the national average – a trend that is expected to continue into the future. Employment (total jobs) growth in the County was strong between 2000 and 2007, increasing by a compounded annual growth rate of 3.8 percent; however, employment levels in Yuma County are forecast to grow at a lower rate (1.9 percent) beyond 2007. The table also shows that per capita income (PCI) in Yuma County has historically increased at a higher rate than the State and national averages, but in recent years the rate of growth in PCI in Yuma County slowed to more closely reflect State and national trends and is forecast to grow at a slower rate than that of the State and the United States beyond 2007.

Table III-6 presents the historical and projected residential population of Yuma County, the State of Arizona, and the United States as a whole.

Table III-6
Historical and Projected Resident Population

Area	Historical		Projected 2027	Compounded Annual Growth Rate	
	2000	2007		2000-2007	2007-2027
Yuma County	161,110	190,260	281,280	2.4%	2.0%
State of Arizona	5,165,250	6,290,090	9,963,600	2.9%	2.3%
United States	282,128,140	302,510,760	369,085,360	1.0%	1.0%

Source: National Planning Association Data Services, Inc., 2007; Ricondo & Associates, Inc., April 2008 (extrapolated forecast).
Prepared by: Ricondo & Associates, Inc., April 2008.

As shown in the table, the County population increased from 161,110 to 190,260 between 2000 and 2007, representing a compounded annual growth rate of 2.4 percent. During the same period, the population increased at the State and national levels by compounded annual growth rates of 2.9 percent and 2.3 percent, respectively. The data also show that the County population is expected to increase to 281,280 by 2027, representing a compounded annual growth rate of 2.0 percent

Comparatively, population growth at the State and national levels is expected to occur at compounded annual growth rates of 2.3 percent and 1.0 percent, respectively.

A comparative summary of the employment base at the County, State, and national levels is presented in **Table III-7**.

Table III-7

Historical and Projected Employment

Area	Historical		Projected 2027	Compounded Annual Growth Rate	
	2000	2007		2000-2007	2007-2027
Yuma County	67,840	87,980	127,710	3.8%	1.9%
State of Arizona	2,825,840	3,385,570	5,627,490	2.6%	2.6%
United States	167,241,580	181,561,210	237,550,420	1.2%	1.4%

Source: National Planning Association Data Services, Inc., 2007; Ricondo & Associates, Inc., April 2008 (extrapolated forecast).
Prepared by: Ricondo & Associates, Inc., April 2008.

As shown, between 2000 and 2007 the County employment base increased from 67,840 to 87,980, representing a compounded annual growth rate of 3.8 percent. During the same period, the State and national employment levels increased at compounded annual growth rates of 2.6 percent and 1.2 percent, respectively. County employment is projected to increase to 127,710 by 2027; a compounded annual growth rate of 1.9 percent compared to the State and national rates of 2.6 percent and 1.4 percent, respectively.

Table III-8 presents the historical and projected PCI in Yuma County. The data in the table show an increase from \$15,747 in 2000 to \$20,088 in 2007, representing a compounded annual growth rate of 3.5 percent. During the same period, PCI increased at a compounded annual growth rate of 2.1 percent at the State level and 2.0 percent at the national level. The table also shows that the Yuma County PCI is expected to increase to \$25,118 by 2027, representing a compounded annual growth rate of 1.1 percent. During this same period, PCI at the State and national levels is projected to increase at compounded annual growth rates of 1.4 percent and 1.7 percent, respectively.

Table III-8

Historical and Projected Per Capita Income

Area	Historical		Projected 2027	Compounded Annual Growth Rate	
	2000	2007		2000-2007	2007-2027
Yuma County	\$15,747	\$20,088	\$25,118	3.5%	1.1%
State of Arizona	\$25,245	\$29,156	\$38,795	2.1%	1.4%
United States	\$29,628	\$33,944	\$47,351	2.0%	1.7%

Source: National Planning Association Data Services, Inc., 2007; Ricondo & Associates, Inc., April 2008 (extrapolated forecast).
Prepared by: Ricondo & Associates, Inc., April 2008.

3.3 Enplaned Passenger Forecasts

This section presents forecasts of enplaned passengers at the Airport, which were developed with consideration to a number of factors and methodologies, including local socioeconomic and demographic factors, the Airport's historical market share of U.S. enplaned passengers, and known industry trends.

3.3.1 Market Share Analysis

The market share methodology included an examination of the Airport's historical and forecast share of total U.S. enplaned passengers. The relationship between historical enplanements at the Airport and at the national level was used to derive the anticipated enplaned passenger forecast for the Airport. The U.S. forecast generally reflects the way in which industry traffic is expected to grow in the future and is based on factors such as national economic conditions, industry trends, and airline fuel and fare pricing. The national activity forecast (*FAA Aerospace Forecasts, Fiscal Years 2008-2025*) were used as the basis for the market share analysis.²

In the absence of significant local issues, the activity at an airport could reasonably be assumed to increase at a rate consistent with national growth. A market share analysis, which is a common methodology for master plans and facilities studies at commercial service airports, considers local factors that may influence growth. This analysis incorporated an increasing market share over the forecast period to correspondingly reflect the historical increase in recent years in the Airport's share of the national market.

Table III-9 displays historical and forecast enplaned passengers at the Airport using the increasing market share approach.

As shown in Table III-9, passenger enplanements at the Airport have grown historically at a much higher rate of growth than at the national level, increasing at an average annual rate of 7.6 percent. Using the market share methodology, this trend of strong growth is predicted to continue throughout the planning period, although at a lower rate (5.2 percent over the planning period).

3.3.2 Regression Analysis

A regression analysis compares the relationships between the various socioeconomic characteristics of an airport's market area to the aviation activity. A mathematical regression analysis model was developed to correlate the historical relationship of these variables at the Airport, and to forecast this relationship using independent forecasts of the socioeconomic and demographic trends in the market area. A simple line trend was used to test the resulting enplanement forecasts.

The demand for airline service is typically driven by the demographic and economic conditions of an airport's market area. The socioeconomic variables used as the independent variables in this analysis include those that were discussed previously: population, employment, and PCI. Additionally, a linear trend analysis was used to evaluate the historical growth in enplaned passengers in order to produce a result that best captures the Airport's historical activity by a straight line, which is extended into the future to represent the forecast of enplaned passengers. The results of the various regression analyses are subsequently described.

² The most recent update to the *FAA Aerospace Forecasts* includes forecasts through 2025. For the purposes of this analysis, these data were extrapolated to 2027 using applicable growth rates.

Table III-9**Domestic Enplaned Passenger Forecast – Market Share Methodology**

Year	Airport	Annual Growth	United States	Annual Growth	Market Share
Historical					
2003	54,872	--	587,829,547	--	0.009%
2004	59,825	9.0%	628,493,362	6.9%	0.010%
2005	61,160	2.2%	669,427,839	6.5%	0.009%
2006	64,574	5.6%	668,418,019	-0.2%	0.010%
2007	73,487	13.8%	689,442,583	3.1%	0.011%
Forecast					
2008	76,517	4.1%	696,244,124	1.0%	0.011%
2009	81,582	6.6%	720,620,297	3.5%	0.011%
2010	86,944	6.6%	746,167,337	3.5%	0.012%
2011	91,907	5.7%	766,974,100	2.8%	0.012%
2012	97,207	5.8%	789,394,211	2.9%	0.012%
2013	102,751	5.7%	812,564,488	2.9%	0.013%
2014	108,301	5.4%	834,603,972	2.7%	0.013%
2015	114,314	5.6%	859,026,843	2.9%	0.013%
2016	120,342	5.3%	882,376,569	2.7%	0.014%
2017	126,808	5.4%	907,753,413	2.9%	0.014%
2018	133,490	5.3%	933,465,781	2.8%	0.014%
2019	140,253	5.1%	958,566,754	2.7%	0.015%
2020	147,237	5.0%	984,030,865	2.7%	0.015%
2021	154,298	4.8%	1,008,902,662	2.5%	0.015%
2022	161,713	4.8%	1,034,981,052	2.6%	0.016%
2023	169,423	4.8%	1,061,827,849	2.6%	0.016%
2024	177,420	4.7%	1,089,346,728	2.6%	0.016%
2025	185,826	4.7%	1,118,228,463	2.7%	0.017%
2026	194,456	4.6%	1,147,302,403	2.6%	0.017%
2027	203,409	4.6%	1,177,132,266	2.6%	0.017%
Compounded Annual Growth Rate					
2003-2007	7.6%		4.1%		
2007-2012	5.8%		2.7%		
2012-2017	5.5%		2.8%		
2017-2022	5.0%		2.7%		
2022-2027	4.7%		2.6%		
2007-2027	5.2%		2.7%		

Source: Yuma County Airport Authority (historical Airport activity); FAA (historical and forecast US activity, 2003-2025); Ricondo & Associates, Inc. (forecast Airport activity; forecast national activity 2026 and 2027).
 Prepared by: Ricondo & Associates, Inc., April 2008.

- **Population Regression** – **Table III-10** displays the results of the population regression analysis. Using the Yuma County population as the basis for the regression, total enplaned passengers at the Airport are forecast to increase from 73,487 in 2007 to 159,163 in 2027, representing a compounded annual growth rate of 3.9 percent.
- **Employment Regression** – **Table III-11** presents the results of the employment regression analysis. Using Yuma County employment as the basis for the regression, total enplaned passengers at the Airport are forecast to increase from 73,487 in 2007 to 127,026 in 2027, representing a compounded annual growth rate of 2.8 percent.
- **Per Capita Income Regression** – **Table III-12** shows the results of the PCI regression analysis. Using Yuma County PCI as the basis for the regression, total enplaned passengers at the Airport are forecast to increase from 73,487 in 2007 to 104,814 in 2027, resulting in a compounded annual growth rate of 1.8 percent.
- **Linear Trend Analysis** – **Table III-13** displays the results of the linear trend analysis. As shown in the table, total enplaned passengers at the Airport are forecast to increase from 73,487 in 2007 to approximately 155,100 in 2027, resulting in a compounded annual growth rate of 3.8 percent.

The regression methodology generally resulted in high correlations between the independent variables and the dependent enplaned passenger variable. The coefficient of determination (r^2) is a statistical measure to show the relationship changes in the values of the independent variables with the changes in the values of the dependent variables. A perfect correlation of 1.0 would mean that each change in the value of the independent variable would translate into a change of equal scale in the dependent variable. Statistically, the closer the r^2 value is to a correlation of 1.0, the higher the confidence that movements in independent variables will be reflected in the dependent variable. The r^2 values of the three independent variables used in this analysis (population, employment, and PCI), as well as the linear trend analysis, were each above 0.95.

3.3.3 Comparison of Enplaned Passenger Forecasts

The key findings of each enplaned passenger forecast methodology are summarized below. The results of each methodology are presented comparatively in **Table III-14** and are shown graphically as **Exhibit III-7**. For comparative purposes, data reported in the FAA *Terminal Area Forecast* (TAF) and the previous Airport Master Plan Update (1999) are also included in the table. Following is a summarization of the key points of the various enplaned passenger forecasts:

- The regression analyses resulted in enplaned passenger forecast ranging from 104,814 to 159,163 in 2027.
- The market share methodology resulted in an enplaned passenger forecast of 203,409 in 2027.
- The most recent FAA TAF prepared for the Airport resulted in a forecast of 68,842 enplaned passengers in 2025. For comparative purposes in this forecast analysis, this trend was extended to 2027. It is important to note that the FAA TAF currently shows a static number (68,842) of enplaned passengers for 2007-2025; however, Airport records indicate that the actual number of enplaned passengers in 2007 was 73,487, as shown in Table 3-2.
- The previous Master Plan Update forecast prepared for the Airport was completed prior to the events of September 11, 2001 and the follow-on economic downturn; therefore, the results of that analysis may no longer be reliable.

Table III-10

Enplaned Passenger Forecast – Population Regression Methodology

Year	Yuma County Population	Annual Growth	Passenger Enplanements	Annual Growth
Historical				
2003	173,498	--	54,872	--
2004	177,835	2.5%	59,825	9.0%
2005	182,281	2.5%	61,160	2.2%
2006	186,838	2.5%	64,574	5.6%
2007	190,260	1.8%	73,487	13.8%
Forecast				
2008	194,826	2.4%	75,115	2.2%
2009	199,502	2.4%	79,660	6.1%
2010	204,260	2.4%	84,286	5.8%
2011	208,141	1.9%	88,059	4.5%
2012	212,096	1.9%	91,904	4.4%
2013	216,125	1.9%	95,821	4.3%
2014	220,232	1.9%	99,813	4.2%
2015	224,416	1.9%	103,881	4.1%
2016	228,680	1.9%	108,027	4.0%
2017	233,025	1.9%	112,251	3.9%
2018	237,453	1.9%	116,555	3.8%
2019	241,964	1.9%	120,941	3.8%
2020	246,561	1.9%	125,411	3.7%
2021	251,246	1.9%	129,965	3.6%
2022	256,020	1.9%	134,606	3.6%
2023	260,884	1.9%	139,335	3.5%
2024	265,841	1.9%	144,154	3.5%
2025	270,892	1.9%	149,064	3.4%
2026	276,039	1.9%	154,068	3.4%
2027	281,280	1.9%	159,163	3.3%
Compounded Annual Growth Rate				
2003-2007	2.3%		7.6%	
2007-2012	2.2%		4.6%	
2012-2017	1.9%		4.1%	
2017-2022	1.9%		3.7%	
2022-2027	1.9%		3.4%	
2007-2027	2.0%		3.9%	

Source: Yuma County Airport Authority (historical Airport activity); National Planning Association Data Services, Inc. (Yuma County Population); Ricondo and Associates, Inc. (forecast Airport activity)
 Prepared by: Ricondo & Associates, Inc., April 2008.

Table III-11

Enplaned Passenger Forecast – Employment Regression Methodology

Year	Yuma County Employment	Annual Growth	Passenger Enplanements	Annual Growth
Historical				
2003	75,324	--	54,872	--
2004	77,999	3.6%	59,825	9.0%
2005	80,767	3.5%	61,160	2.2%
2006	83,635	3.6%	64,574	5.6%
2007	87,980	5.2%	73,487	13.8%
Forecast				
2008	90,531	2.9%	75,738	3.1%
2009	93,157	2.9%	79,359	4.8%
2010	96,160	3.2%	83,502	5.2%
2011	97,602	1.5%	85,492	2.4%
2012	99,066	1.5%	87,512	2.4%
2013	100,552	1.5%	89,562	2.3%
2014	102,061	1.5%	91,642	2.3%
2015	103,592	1.5%	93,754	2.3%
2016	105,146	1.5%	95,898	2.3%
2017	106,723	1.5%	98,074	2.3%
2018	108,324	1.5%	100,282	2.3%
2019	109,948	1.5%	102,523	2.2%
2020	115,070	4.7%	109,589	6.9%
2021	116,796	1.5%	111,970	2.2%
2022	118,548	1.5%	114,387	2.2%
2023	120,326	1.5%	116,840	2.1%
2024	122,131	1.5%	119,330	2.1%
2025	123,963	1.5%	121,857	2.1%
2026	125,203	1.0%	123,567	1.4%
2027	127,710	2.0%	127,026	2.8%
Compounded Annual Growth Rate				
2003-2007	4.0%		7.6%	
2007-2012	2.4%		3.6%	
2012-2017	1.5%		2.3%	
2017-2022	2.1%		3.1%	
2022-2027	1.5%		2.1%	
2007-2027	1.9%		2.8%	

Source: Yuma County Airport Authority (historical Airport activity); National Planning Association Data Services, Inc. (Yuma County Employment); Ricondo and Associates, Inc. (forecast Airport activity).
 Prepared by: Ricondo & Associates, Inc., April 2008.

Table III-12

Enplaned Passenger Forecast – Per Capita Income Regression Methodology

Year	Yuma County Per Capita Income	Annual Growth	Passenger Enplanements	Annual Growth
Historical				
2003	17,291	--	54,872	--
2004	17,896	3.5%	59,825	9.0%
2005	18,522	3.5%	61,160	2.2%
2006	18,967	2.4%	64,574	5.6%
2007	20,088	5.9%	73,487	13.8%
Forecast				
2008	20,570	2.4%	75,699	3.0%
2009	21,064	2.4%	78,859	4.2%
2010	21,609	2.6%	82,350	4.4%
2011	21,803	0.9%	83,595	1.5%
2012	22,000	0.9%	84,851	1.5%
2013	22,198	0.9%	86,118	1.5%
2014	22,397	0.9%	87,397	1.5%
2015	22,599	0.9%	88,688	1.5%
2016	22,802	0.9%	89,990	1.5%
2017	23,008	0.9%	91,304	1.5%
2018	23,215	0.9%	92,629	1.5%
2019	23,424	0.9%	93,967	1.4%
2020	23,962	2.3%	97,413	3.7%
2021	24,154	0.8%	98,640	1.3%
2022	24,323	0.7%	99,723	1.1%
2023	24,493	0.7%	100,813	1.1%
2024	24,664	0.7%	101,910	1.1%
2025	24,837	0.7%	103,016	1.1%
2026	25,011	0.7%	104,129	1.1%
2027	25,118	0.4%	104,814	0.7%
Compounded Annual Growth Rate				
2003-2007	3.8%		7.6%	
2007-2012	1.8%		2.9%	
2012-2017	0.9%		1.5%	
2017-2022	1.1%		1.8%	
2022-2027	0.6%		1.0%	
2007-2027	1.1%		1.8%	

Source: Yuma County Airport Authority (historical Airport activity).; National Planning Association Data Services, Inc. (Yuma County Per Capita Income).; Ricondo and Associates, Inc. (forecast Airport activity).
 Prepared by: Ricondo & Associates, Inc., April 2008.

Table III-13

Domestic Enplaned Passenger Forecast – Trend Analysis Regression Methodology

Year	Airport	Annual Growth
Historical		
2003	54,872	--
2004	59,825	9.0%
2005	61,160	2.2%
2006	64,574	5.6%
2007	73,487	13.8%
Forecast		
2008	75,400	2.6%
2009	79,600	5.6%
2010	83,800	5.3%
2011	88,000	5.0%
2012	92,200	4.8%
2013	96,400	4.6%
2014	100,600	4.4%
2015	104,800	4.2%
2016	109,000	4.0%
2017	113,200	3.9%
2018	117,400	3.7%
2019	121,600	3.6%
2020	125,800	3.5%
2021	129,900	3.3%
2022	134,100	3.2%
2023	138,300	3.1%
2024	142,500	3.0%
2025	146,700	2.9%
2026	150,900	2.9%
2027	155,100	2.8%
Compounded Annual Growth Rate		
2003-2007	7.6%	
2007-2012	4.6%	
2012-2017	4.2%	
2017-2022	3.4%	
2022-2027	3.0%	
2007-2027	3.8%	

Source: Yuma County Airport Authority (historical Airport activity). ; National Planning Association Data Services, Inc. (Yuma County Per Capita Income). ; Ricondo & Associates, Inc. (forecast Airport activity).
 Prepared by: Ricondo & Associates, Inc., April 2008.

Table III-14

Comparison of Enplaned Passenger Forecasts

Year	Market Share	Socioeconomic Regression Analysis				Trend Analysis	1999 Master Plan Update ^{1/}	FAA Terminal Area Forecast ^{2/}
		Population	Employment	PCI				
Historical								
2003	54,872	54,872	54,872	54,872	54,872	N/A	53,669	
2004	59,825	59,825	59,825	59,825	59,825	N/A	61,685	
2005	61,160	61,160	61,160	61,160	61,160	112,000	62,641	
2006	64,574	64,574	64,574	64,574	64,574	N/A	61,290	
2007	73,487	73,487	73,487	73,487	73,487	N/A	68,842	
Forecast								
2008	76,517	75,115	75,738	75,699	75,400	N/A	68,842	
2009	81,582	79,660	79,359	78,859	79,600	N/A	68,842	
2010	86,944	84,286	83,502	82,350	83,800	133,000	68,842	
2011	91,907	88,059	85,492	83,595	88,000	N/A	68,842	
2012	97,207	91,904	87,512	84,851	92,200	N/A	68,842	
2013	102,751	95,821	89,562	86,118	96,400	N/A	68,842	
2014	108,301	99,813	91,642	87,397	100,600	N/A	68,842	
2015	114,314	103,881	93,754	88,688	104,800	154,000	68,842	
2016	120,342	108,027	95,898	89,990	109,000	N/A	68,842	
2017	126,808	112,251	98,074	91,304	113,200	N/A	68,842	
2018	133,490	116,555	100,282	92,629	117,400	N/A	68,842	
2019	140,253	120,941	102,523	93,967	121,600	N/A	68,842	
2020	147,237	125,411	109,589	97,413	125,800	175,000	68,842	
2021	154,298	129,965	111,970	98,640	129,900	N/A	68,842	
2022	161,713	134,606	114,387	99,723	134,100	N/A	68,842	
2023	169,423	139,335	116,840	100,813	138,300	N/A	68,842	
2024	177,420	144,154	119,330	101,910	142,500	N/A	68,842	
2025	185,826	149,064	121,857	103,016	146,700	N/A	68,842	
2026	194,456	154,068	123,567	104,129	150,900	N/A	68,842	
2027	203,409	159,163	127,026	104,814	155,100	N/A	68,842	
Compounded Annual Growth Rate								
2003-2007	7.6%	7.6%	7.6%	7.6%	7.6%	N/A	6.4%	
2007-2012	5.8%	4.6%	3.6%	2.9%	4.6%	3.5% ^{3/}	0.0%	
2012-2017	5.5%	4.1%	2.3%	1.5%	4.2%	3.0% ^{3/}	0.0%	
2017-2022	5.0%	3.7%	3.1%	1.8%	3.4%	2.6% ^{3/}	0.0%	
2022-2027	4.7%	3.4%	2.1%	1.0%	3.0%	N/A	0.0%	
2007-2027	5.2%	3.9%	2.8%	1.8%	3.8%	3.0% ^{3/}	0.0%	

Notes:

1/ Base year for 1999 Master Plan Study was 2000, with data available only on a quinquennial basis.

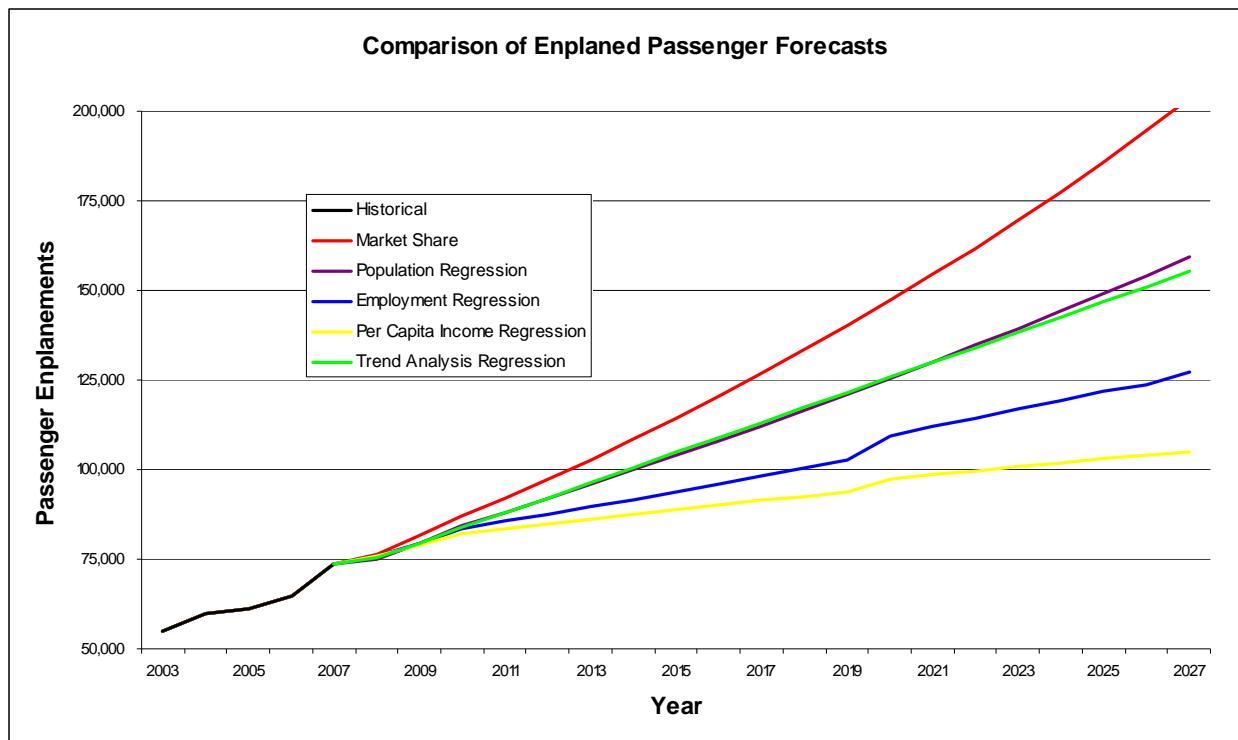
2/ The FAA TAF is based on the federal fiscal year (12-month period ending September 30) and was calculated through 2025. The TAF was extended to 2027 for comparative purposes.

3/ Compounded annual growth rates for the 1999 Master Plan Update were available on a quinquennial basis for 2005-2020.

Source: Yuma County Airport Authority; FAA Terminal Forecast, February, 2008; 1999 Master Plan Update by Coffman Associates; Ricondo & Associates, Inc. (forecast Airport activity).
Prepared by: Ricondo & Associates, Inc., April 2008.

Exhibit III-7

Comparison of Enplaned Passenger Forecasts



Source: Yuma County Airport Authority; FAA Terminal Forecast, February, 2008; 1999 Master Plan Update by Coffman Associates; Ricondo & Associates, Inc. (forecast Airport activity).
 Prepared by: Ricondo & Associates, Inc., April 2008.

Exhibit III-7 shows the results of each passenger enplanement forecasts comparatively. For the purposes of this Master Plan Update, the forecast derived from the linear trend analysis methodology is considered to be the preferred enplaned passenger forecast for the Airport. This statistically-defensible methodology, which represents the approximate midpoint of the forecast range, produces reasonable results compared to the national forecast and is also consistent with the population regression analysis, another commonly-accepted approach.

3.4 Aircraft Operations and Fleet Mix Forecasts

Operations data for this analysis were obtained from the Airport’s ATCT daily activity log. Operations are categorized as air carrier, military, general aviation, and cargo, which are discussed in the following sections. The air carrier aircraft operations forecast was developed using the passenger enplanements trend analysis methodology previously described. Similarly, the cargo and military segments were also developed using the linear trend methodology; therefore, historical trends in general aviation operations at the Airport were the primary basis for the analysis. The methodology used to forecast general aviation activity at the Airport, including the associated fleet mix and peak-period demand activity levels, is described later in this chapter.

3.4.1 Air Carrier Aircraft Operations and Fleet Mix

The total air carrier category consists of both passenger air carrier (scheduled commercial passenger aircraft) operations and military air carrier operations. It is important to note that military air carrier operations are not double-counted in the military category presented in section 3.4.2 of this chapter. The discussion and analysis of Airport passenger enplanements considers only passenger air carrier (i.e., commercial airline) statistics.

Table III-15 presents the historical and forecast passenger air carrier operations at the Airport, as well as the average number of seats per departure. As shown in the table, passenger air carrier operations are forecast to increase from 3,460 operations in 2007 to approximately 6,400 operations in 2027, representing a compounded annual growth rate of 3.1 percent. Load factors on departing flights are expected to increase from an average of approximately 43 passengers per departure in 2007 to approximately 49 passengers per departure in 2027, representing a compounded annual growth rate of 0.7 percent.

3.4.2 Military Operations

Military operations at the Airport are conducted primarily by the MCAS, but also include transient military operations. Although the trend analysis regression methodology was used for this analysis, future military activity at the Airport will be influenced by U.S. Department of Defense policy, which largely dictates the level of military activity at an airport.

As shown in **Table III-16**, military operations are forecast to increase at a low rate of growth over the planning period, from 42,047 operations in 2007 to approximately 57,200 operations in 2027. This equates to a compounded annual growth rate of 1.1 percent. Military operations were further analyzed according to those that are local operations and those that are transient. Local operations are those that stay within an airport traffic pattern or simulated instrument approaches, while all other operations are classified as itinerant.

It is important to note that the composition of the Yuma MCAS based aircraft fleet is expected to change with the arrival of the F-35 Lightning II Joint Strike Fighter (JSF). The first JSF squadron is expected to arrive at the Airport early in the planning horizon. While the immediate and long-term changes in the number of military operations conducted at the Airport are at this time unknown, discussions with MCAS staff indicate that no significant changes in the number of annual military operations are anticipated.

3.4.3 General Aviation Based Aircraft, Fleet Mix, and Operations

This section presents the forecast of the general aviation based aircraft operations, fleet mix, and operations. General aviation represents all facets of civil aviation except activity by certificated route carriers and air commuters. Therefore, general aviation at the Airport, which accounts for a substantial amount of the total operations, is inclusive of all private, not-for-hire civilian aircraft and flight training activity.

Table III-15

Passenger Air Carrier Operations and Passenger Forecast

Year	Passenger Enplanements	Total Air Carrier Operations	Passenger Air Carrier Operations	Passenger Air Carrier Departures	Average Number of Passengers per Departure
Historical					
2003	54,872	5,898	2,958	1,479	37.1
2004	59,825	5,906	2,796	1,398	42.8
2005	61,160	5,592	2,935	1,468	41.7
2006	64,574	5,870	3,284	1,642	39.3
2007	73,487	6,548	3,460	1,730	42.5
Forecast					
2008	75,400	6,568	3,534	1,767	42.7
2009	79,600	6,663	3,683	1,842	43.2
2010	83,800	6,757	3,833	1,916	43.7
2011	88,000	6,852	3,982	1,991	44.2
2012	92,200	6,946	4,131	2,065	44.6
2013	96,400	7,041	4,280	2,140	45.0
2014	100,600	7,135	4,429	2,215	45.4
2015	104,800	7,230	4,579	2,289	45.8
2016	109,000	7,325	4,728	2,364	46.1
2017	113,200	7,419	4,877	2,438	46.4
2018	117,400	7,514	5,026	2,513	46.7
2019	121,600	7,608	5,175	2,588	47.0
2020	125,800	7,703	5,325	2,662	47.2
2021	129,900	7,797	5,474	2,737	47.5
2022	134,100	7,892	5,623	2,811	47.7
2023	138,300	7,986	5,772	2,886	47.9
2024	142,500	8,081	5,921	2,961	48.1
2025	146,700	8,175	6,071	3,035	48.3
2026	150,900	8,270	6,220	3,110	48.5
2027	155,100	8,365	6,369	3,184	48.7
Compounded Annual Growth Rate					
2003-2007	4.2%	2.1%	2.6%	2.6%	1.5%
2007-2012	4.6%	1.2%	3.6%	3.6%	1.0%
2012-2017	4.2%	1.3%	3.4%	3.4%	0.8%
2017-2022	3.5%	1.2%	2.9%	2.9%	0.6%
2022-2027	3.0%	1.2%	2.5%	2.5%	0.4%
2007-2027	3.8%	1.2%	3.1%	3.1%	0.7%

Source: Yuma County Airport Authority (historical Airport activity); Ricondo & Associates, Inc. (forecast Airport activity).
Prepared by: Ricondo & Associates, Inc., April 2008.

Table III-16

Military Operations Forecast

Year	Based Military	Transient Military	Total Military
Historical			
2002	51,543	7,694	59,237
2003	50,660	7,564	58,224
2004	75,317	11,247	86,564
2005	71,158	10,623	81,781
2006	67,996	10,151	78,147
2007	55,386	8,271	63,657
Forecast			
2008	64,743	9,667	74,409
2009	64,956	9,698	74,654
2010	65,169	9,730	74,899
2011	65,382	9,762	75,144
2012	65,595	9,794	75,389
2013	65,808	9,826	75,634
2014	66,021	9,857	75,879
2015	66,234	9,889	76,124
2016	66,448	9,921	76,369
2017	66,661	9,953	76,613
2018	66,874	9,985	76,858
2019	67,087	10,016	77,103
2020	67,300	10,048	77,348
2021	67,513	10,080	77,593
2022	67,726	10,112	77,838
2023	67,939	10,144	78,083
2024	68,152	10,175	78,328
2025	68,365	10,207	78,573
2026	68,579	10,239	78,818
2027	68,792	10,271	79,062
Compounded Annual Growth Rate			
2002-2007	1.4%	1.5%	1.4%
2007-2012	3.4%	3.4%	3.4%
2012-2017	0.3%	0.3%	0.3%
2017-2022	0.3%	0.3%	0.3%
2022-2027	0.3%	0.3%	0.3%
2007-2027	1.1%	1.1%	1.1%

Source: Yuma County Airport Authority (historical Airport activity); Ricondo & Associates, Inc. (forecast Airport activity).
 Prepared by: Ricondo & Associates, Inc., April 2008.

Typically, the number of based aircraft at an airport is dependent on the local demand for aircraft storage facilities, the amenities provided by the airport, and the capacity of other airports in the service area with comparable facilities. The following three growth scenarios were used to forecast based aircraft at the Airport:

- **Population growth methodology:** based aircraft at the Airport were forecast to increase at a rate consistent with that of the Yuma County population;
- **Market Share methodology:** based aircraft at the Airport were forecast to maintain a consistent share (percentage) of the national general aviation fleet, based on the numbers presented in the 2008 FAA TAF; and
- **National Trends methodology:** based aircraft at the Airport were forecast to increase at a rate consistent with the forecast growth in the national fleet, as presented in the FAA TAF.

Table III-17 presents the results of each based aircraft forecast methodology. For comparative purposes, Table 3-17 also shows the results of the previous Master Plan Update and the FAA TAF. These data are shown graphically in **Exhibit III-8**.

Table III-17 and Exhibit III-8 show a static number of based aircraft from 2002 until 2004, the loss of 18 based aircraft in 2005, and then a static number of based aircraft until 2007. It is important to note that although the data show a decrease, accurate based aircraft counts were not maintained until recent years. Discussions with Airport personnel indicate that there have been approximately 176 based aircraft at the Airport since 2005. It should also be noted that the FAA TAF has not been updated to accurately reflect actual based aircraft at the Airport, and have been forecast to show no growth beyond 2005. As a result, these data show an anomalous increase in based aircraft in 2005, similar to the anomalous decrease that year shown by Airport records. As a result of these facts, and based on discussions with Airport management in this regard, the National Trends methodology was selected as the preferred based aircraft forecast, because of its consistency with reasonable expectations at the national level. Of the three forecast scenarios evaluated, the National Trends methodology represents the lowest rate of growth in based aircraft. According to this methodology, based aircraft are expected to increase from 176 in 2007 to 227 in 2027, representing a compounded annual growth rate of 1.3 percent.

The based aircraft forecast was further evaluated according to aircraft type. According to Airport management, the based aircraft fleet mix is expected to remain fairly homogeneous throughout the forecast period. Therefore, the current fleet mix, slightly tempered to reflect the anticipated changes in the general aviation fleet at the national level, was applied to the based aircraft forecast. **Table III-18** presents the general aviation based aircraft fleet mix forecast for the Airport.

Table III-17

Comparison of Based Aircraft Forecasts

Year	Population Growth	Market Share	National Trends	1999 Master Plan Update ^{1/}	FAA Terminal Area Forecast ^{2/}
Historical					
2002	194	194	194	N/A	194
2003	194	194	194	N/A	194
2004	194	194	194	N/A	194
2005	176	176	176	140	221
2006	176	176	176	N/A	221
2007	176	176	176	N/A	221
Forecast					
2008	176	176	176	N/A	221
2009	206	207	178	N/A	221
2010	210	210	181	155	221
2011	214	212	183	N/A	221
2012	218	216	186	N/A	221
2013	223	219	189	N/A	221
2014	227	222	192	N/A	221
2015	231	225	195	170	221
2016	236	228	197	N/A	221
2017	240	231	200	N/A	221
2018	245	235	203	N/A	221
2019	249	238	205	N/A	221
2020	254	242	208	185	221
2021	259	245	210	N/A	221
2022	264	249	213	N/A	221
2023	269	252	216	N/A	221
2024	274	256	218	N/A	221
2025	279	260	221	N/A	221
2026	284	264	224	N/A	221
2027	290	268	227	N/A	221
Compounded Annual Growth Rate					
2002-2007	-1.9%	-1.9%	-1.9%	N/A	2.6%
2007-2012	4.4%	4.2%	1.1%	2.1%	0.0%
2012-2017	1.9%	1.4%	1.5%	1.9%	0.0%
2017-2022	1.9%	1.4%	1.2%	1.7%	0.0%
2022-2027	1.9%	1.5%	1.3%	N/A	0.0%
2007-2027	2.5%	2.1%	1.3%	1.9%	0.0%

Notes:

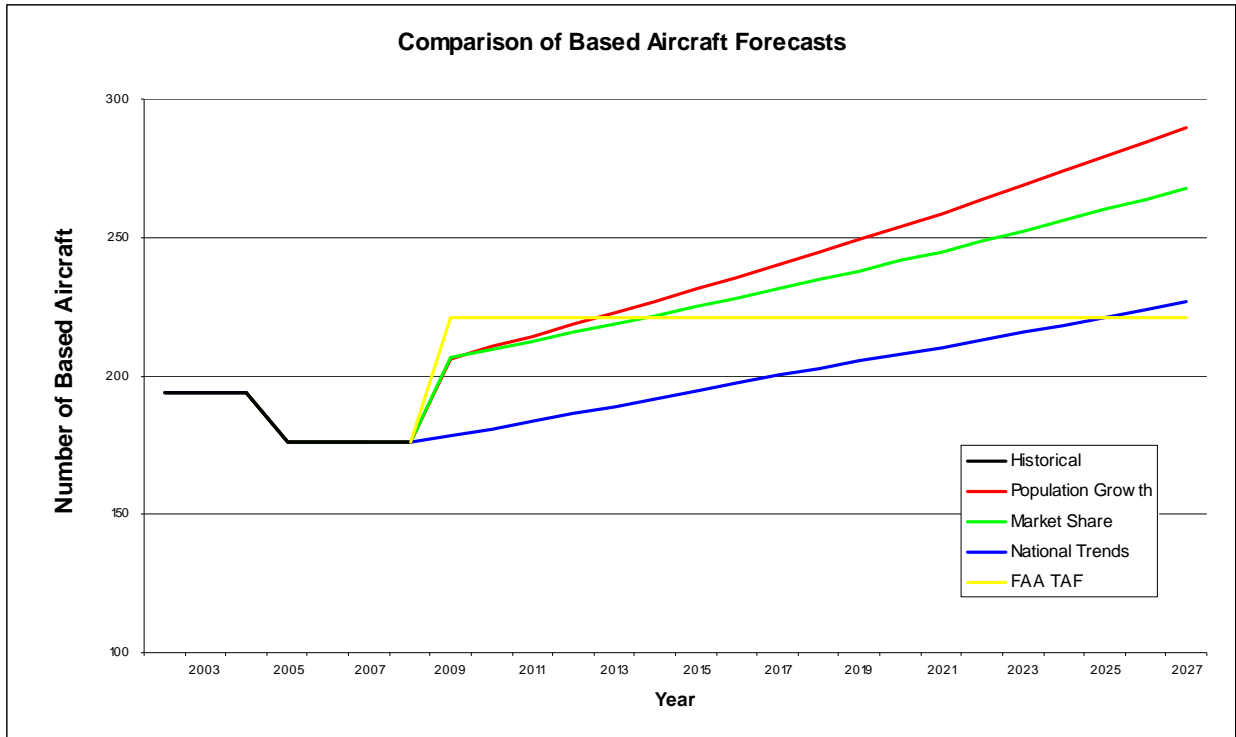
1/ Base year for 1999 Master Plan Study was 2000, with data available only on a quinquennial basis.

2/ The FAA TAF is based on the federal fiscal year (12-month period ending September 30) and was calculated through 2025. The TAF was extended to 2027 for comparative purposes.

Source: Yuma County Airport Authority; FAA Terminal Forecast, February, 2008; 1999 Master Plan Update by Coffman Associates
Prepared by: Ricondo & Associates, Inc., April 2008.

Exhibit III-8

Comparison of Based Aircraft Forecasts



Source: Yuma County Airport Authority; FAA Terminal Forecast, February, 2008; 1999 Master Plan Update by Coffman Associates
 Prepared by: Ricondo & Associates, Inc., April 2008.

Table III-18

General Aviation Based Aircraft Fleet Mix Projections

Year	Single-Engine Piston	%	Multi- Engine Piston	%	Turbine (Turboprop and Jet)	%	Rotorcraft	%	Total
2007	117	66.5%	35	19.9%	12	6.8%	12	6.8%	176
2008	117	66.5%	35	19.9%	12	6.8%	12	6.8%	176
2009	118	66.3%	34	19.1%	13	7.5%	12	7.0%	178
2010	120	66.4%	34	19.0%	14	7.5%	13	7.0%	181
2011	122	66.5%	34	18.5%	15	8.0%	13	7.0%	183
2012	124	66.5%	34	18.5%	15	8.0%	13	7.0%	186
2013	126	66.5%	35	18.5%	15	8.0%	13	7.0%	189
2014	127	66.5%	35	18.5%	15	8.0%	13	7.0%	192
2015	130	66.7%	35	17.9%	16	8.2%	14	7.2%	195
2016	131	66.7%	36	18.1%	16	8.1%	14	7.1%	197
2017	133	66.5%	36	18.0%	17	8.5%	14	7.0%	200
2018	134	66.0%	36	18.0%	17	8.5%	15	7.5%	203
2019	135	65.9%	37	18.0%	17	8.5%	15	7.5%	205
2020	137	66.0%	37	18.0%	18	8.5%	16	7.5%	208
2021	139	66.3%	37	17.6%	18	8.5%	16	7.5%	210
2022	141	66.1%	38	18.0%	18	8.5%	16	7.5%	213
2023	143	66.1%	39	17.9%	18	8.5%	16	7.5%	216
2024	144	66.0%	39	18.0%	19	8.5%	16	7.5%	218
2025	146	66.0%	40	18.0%	19	8.5%	17	7.5%	221
2026	148	66.0%	40	18.0%	19	8.5%	17	7.5%	224
2027	150	66.0%	41	18.0%	19	8.5%	17	7.5%	227

Source: Yuma County Airport Authority (historical Airport activity); Ricondo & Associates, Inc. (forecast Airport activity).
Prepared by: Ricondo & Associates, Inc., April 2008

As shown in Table III-18, the percentage of piston-engine aircraft in the based fleet at the Airport is expected to slightly decrease during the forecast period, with a corresponding increase in turbine aircraft and rotorcraft. These trends are consistent with those that are anticipated by the FAA to occur at the national level.

General aviation operations were developed using the operations per based aircraft (OPBA) methodology, a commonly accepted planning statistic. The OPBA is calculated by dividing the annual number of general aviation operations at an airport by the number of based general aviation aircraft in that same year. For this analysis, the historical average OPBA was used to forecast future operations. The OPBA statistic does not indicate which based aircraft will actually conduct a certain number of operations, but instead generally relates the total number of operations to the total number of based aircraft. **Table III-19** presents the general aviation operations forecast for the Airport using this methodology.

Table III-19
General Aviation Operations Forecast

Year	General Aviation Operations	Based Aircraft	Operations Per Based Aircraft
Historical			
2002	26,857	194	138
2003	42,581	194	219
2004	65,621	194	338
2005	51,178	176	291
2006	50,108	176	285
2007	42,047	176	239
Forecast			
2008	44,352	176	252
2009	44,972	178	252
2010	45,578	181	252
2011	46,233	183	252
2012	46,928	186	252
2013	47,628	189	252
2014	48,311	192	252
2015	49,016	195	252
2016	49,729	197	252
2017	50,446	200	252
2018	51,084	203	252
2019	51,734	205	252
2020	52,375	208	252
2021	53,012	210	252
2022	53,663	213	252
2023	54,334	216	252
2024	55,025	218	252
2025	55,740	221	252
2026	56,473	224	252
2027	57,207	227	252
Compounded Annual Growth Rate			
2002-2007	9.4%	-1.9%	
2007-2012	2.2%	1.1%	
2012-2017	1.5%	1.5%	
2017-2022	1.2%	1.2%	
2022-2027	1.3%	1.3%	
2007-2027	1.6%	1.3%	

Source: Yuma County Airport Authority (historical Airport activity); Ricondo & Associates, Inc. (forecast Airport activity).
Prepared by: Ricondo & Associates, Inc., April 2008.

As shown in Table III-19, general aviation operations increased from 26,857 in 2002 to 65,621 in 2004, but have decreased each year since. Using the OPBA methodology, and validated by first quarter 2008 data provided by the Airport, general aviation operations are forecast to increase at a low to moderate level throughout the planning period, increasing from 42,047 in 2007 to

approximately 57,200 in 2027, representing a compounded annual growth rate of 1.6 percent during this period.

3.4.4 Cargo Operations

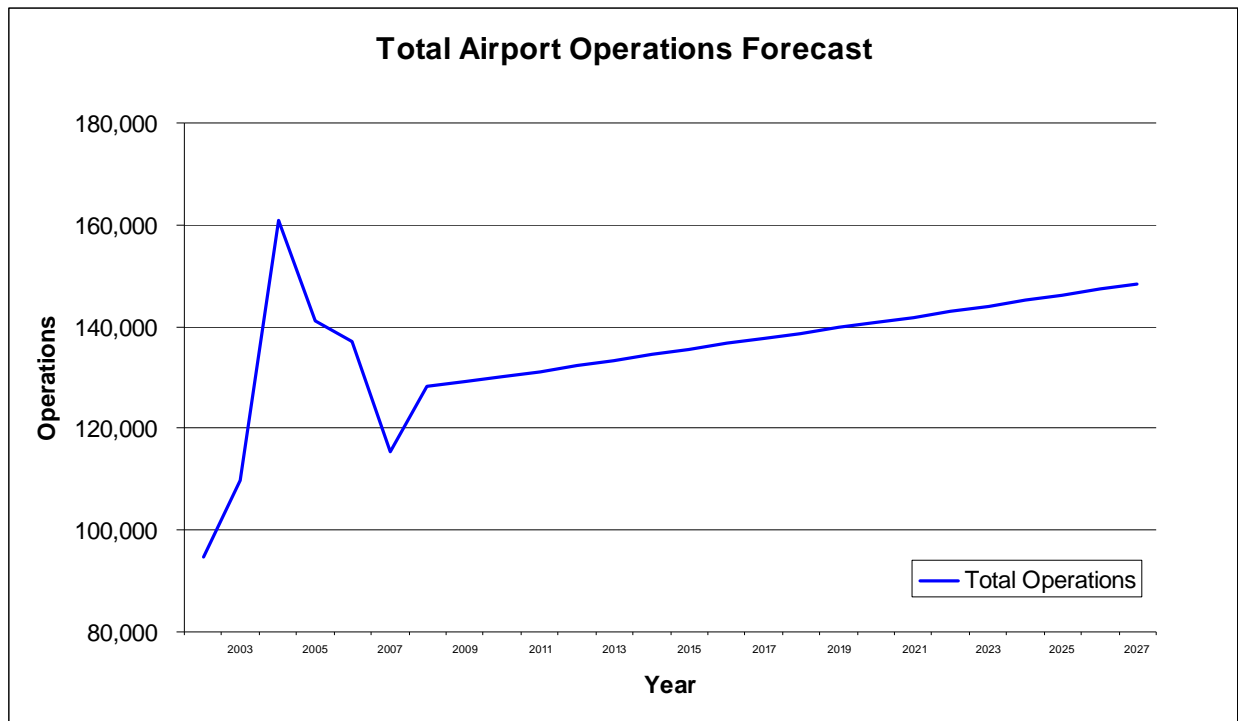
Cargo operations at the Airport consist of the air mail and air freight/air express activities conducted by the all-cargo operators who use the Airport. Air cargo operations at the Airport remained fairly constant between 2002 and 2007, with a slight decreasing trend after 2004. Using the trend analysis regression, operations are forecast to increase from 2,315 in 2007 to approximately 3,800 operations in 2027, representing a compounded annual growth rate of 2.5 percent. These data are shown in **Table III-20** in the following subsection.

3.4.5 Operations Summary

Exhibit III-9 depicts the forecast increase in total Airport operations during the planning period, while **Table III-20** presents the operations forecast for each segment at the Airport.

Exhibit III-9

Total Airport Operations



Source: Yuma County Airport Authority (historical Airport activity); Ricondo & Associates, Inc. (forecast Airport activity).
 Prepared by: Ricondo & Associates, Inc., April 2008.

As shown in Exhibit III-9, total operations at the Airport are forecast to increase from 115,445 in 2007 to approximately 148,400 in 2027, representing a compounded annual growth rate of 1.3 percent during this period. Yearly operational data is presented on a segment-by-segment basis in Table III-15.

Table III-20

Airport Operations Forecasts

Year	Passenger Air Carrier	Total Air Carrier	Cargo	General Aviation	Total Military	Airport Total
Historical						
2002	2,949	5,898	2,733	26,857	59,237	94,725
2003	2,958	5,906	3,180	42,581	58,224	109,891
2004	2,796	5,592	3,179	65,621	86,564	160,956
2005	2,935	5,870	2,450	51,178	81,781	141,279
2006	3,284	6,548	2,351	50,108	78,147	137,154
2007	3,460	7,426	2,315	42,047	63,657	115,445
Forecast						
2008	3,431	6,568	2,827	44,352	74,409	128,156
2009	3,536	6,663	2,876	44,972	74,654	129,165
2010	3,641	6,757	2,925	45,578	74,899	130,159
2011	3,746	6,852	2,974	46,233	75,144	131,203
2012	3,851	6,946	3,024	46,928	75,389	132,287
2013	3,955	7,041	3,073	47,628	75,634	133,375
2014	4,060	7,135	3,122	48,311	75,879	134,447
2015	4,165	7,230	3,171	49,016	76,124	135,541
2016	4,270	7,325	3,221	49,729	76,369	136,642
2017	4,375	7,419	3,270	50,446	76,613	137,749
2018	4,480	7,514	3,319	51,084	76,858	138,775
2019	4,585	7,608	3,368	51,734	77,103	139,814
2020	4,690	7,703	3,418	52,375	77,348	140,844
2021	4,795	7,797	3,467	53,012	77,593	141,869
2022	4,900	7,892	3,516	53,663	77,838	142,909
2023	5,005	7,986	3,565	54,334	78,083	143,969
2024	5,109	8,081	3,615	55,025	78,328	145,049
2025	5,214	8,175	3,664	55,740	78,573	146,152
2026	5,319	8,270	3,713	56,473	78,818	147,274
2027	5,424	8,365	3,762	57,207	79,062	148,397
Compounded Annual Growth Rate						
2002-2007	3.2%	4.7%	-3.3%	9.4%	1.4%	4.0%
2007-2012	2.2%	-1.3%	5.5%	2.2%	3.4%	2.8%
2012-2017	2.6%	1.3%	1.6%	1.5%	0.3%	0.8%
2017-2022	2.3%	1.2%	1.5%	1.2%	0.3%	0.7%
2022-2027	2.1%	1.2%	1.4%	1.3%	0.3%	0.8%
2007-2027	2.3%	0.6%	2.5%	1.6%	1.1%	1.3%

Source: Yuma County Airport Authority (historical Airport activity); Ricondo & Associates, Inc. (forecast Airport activity).
Prepared by: Ricondo & Associates, Inc., April 2008.

3.5 Design-Day Activity

In addition to forecasting annual activity levels at the Airport, it was necessary to forecast design level activity, defined in this study as activity that occurs during the average day in the peak month (peak month average day, or PMAD). PMAD are used statistics illustrate the demand for airport facilities based on specific use patterns. PMAD passenger enplanements reflect the number of enplaned passengers on a typical day during the peak month, while PMAD aircraft operations

represent the average number of aircraft operations for each segment on a typical day during the peak month.

Table III-21 presents the demand level forecast for the Airport. As shown in the table, PMAD enplaned passengers are forecast to increase from an estimated 264 in 2007 to 555 in 2027. The table also presents the forecast PMAD operations data. Total Airport operations on the average day in the peak month are expected to increase from 436 in 2007 to 558 in 2027.

3.6 Summary

The historical and forecast Airport activity levels are presented in Table III-21. For the purpose of the analyses of this Master Plan Update, references to specific years will be minimized in the subsequent chapters. Rather, Planning Activity Levels (PALs) will be emphasized. The purpose of the PALs is to guide Airport officials in determining when, according to activity levels instead of calendar years, Airport facilities will need to be expanded or upgraded. By referencing improvement decisions to activity levels and not specific dates, an airport operator can be flexible and responsive with regard to facility development needs. The PALs represent the preferred forecast levels of activity at the 5-, 10-, 15-, and 20-year planning horizons for PALs 1, 2, 3, and 4, respectively (estimated to occur 2012, 2017, 2022, and 2027). When utilizing these data for determining the timing of Airport improvements throughout the following chapters, the PALs are not correlated to a specific calendar year.

Table III-21

Demand Level Forecast

	Historical					Forecast																
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	
Passenger Enplanements																						
Peak Month (11.1% of Annual)	8,193	8,369	8,836	9,302	9,768	10,234	10,700	11,167	11,633	12,099	12,565	13,031	13,498	13,964	14,419	14,885	15,351	15,818	16,284	16,750	17,216	
Average Day (31 Days)	264	270	285	300	315	330	345	360	375	390	405	420	435	450	465	480	495	510	525	540	555	
Aircraft Operations																						
Passenger Air Carrier																						
Annual	3,460	3,431	3,536	3,641	3,746	3,851	3,955	4,060	4,165	4,270	4375.095	4,480	4,585	4,690	4,795	4,900	5,005	5,109	5,214	5,319	5,424	
Peak Month (9.1 % of Annual)	298	315	312	322	331	341	350	360	369	379	389	408	417	427	436	446	455	465	475	484	494	
Average Day (Peak Month/31 Days)	10	10	10	10	11	11	11	12	12	12	13	13	13	14	14	14	15	15	15	16	16	
Total Air Carrier																						
Annual	9,741	9,395	9,539	9,682	9,826	9,970	10,114	10,258	10,401	10,545	10,689	10,833	10,977	11,120	11,264	11,408	11,552	11,696	11,839	11,983	12,127	
Peak Month (11.9% of Annual)	1,155	1,118	1,135	1,152	1,169	1,186	1,204	1,221	1,238	1,255	1,272	1,289	1,306	1,323	1,340	1,358	1,375	1,392	1,409	1,426	1,443	
Average Day (Peak Month/31Days)	37	36	37	37	38	38	39	39	40	40	41	42	42	43	43	44	44	45	45	46	47	
Cargo																						
Annual	2,315	2,827	2,876	2,925	2,974	3,024	3,073	3,122	3,171	3,221	3,270	3,319	3,368	3,418	3,467	3,516	3,565	3,615	3,664	3,713	3,762	
Peak Month (11.6 % of Annual)	268	328	334	339	345	351	356	362	368	374	379	385	391	396	402	408	414	419	425	431	436	
Average Day (Peak Month/31 Days)	9	11	11	11	11	11	11	12	12	12	12	12	13	13	13	13	13	14	14	14	14	
General Aviation																						
Annual	42,047	44,352	44,972	45,578	46,233	46,928	47,628	48,311	49,016	49,729	50,446	51,084	51,734	52,375	53,012	53,663	54,334	55,025	55,740	56,473	57,207	
Peak Month (11.6 % of Annual)	4,898	5,145	5,217	5,287	5,363	5,444	5,525	5,604	5,686	5,769	5,852	5,926	6,001	6,076	6,149	6,225	6,303	6,383	6,466	6,551	6,636	
Average Day (Peak Month/30 Days)	163	171	174	176	179	181	184	187	190	192	195	198	200	203	205	207	210	213	216	218	221	
Total Military																						
Annual	63,657	74,409	74,654	74,899	75,144	75,389	75,634	75,879	76,124	76,369	76,613	76,858	77,103	77,348	77,593	77,838	78,083	78,328	78,573	78,818	79,062	
Peak Month (11.4 % of Annual)	7,288	8,483	8,511	8,538	8,566	8,594	8,622	8,650	8,678	8,706	8,734	8,762	8,790	8,818	8,846	8,874	8,901	8,929	8,957	8,985	9,013	
Average Day (Peak Month/31 Days)	235	274	275	275	276	277	278	279	280	281	282	283	284	284	285	286	287	288	289	290	291	
Total Airport Operations																						
Annual	115,445	128,156	129,165	130,159	131,203	132,287	133,375	134,447	135,541	136,642	136,642	137,749	138,775	139,814	140,844	141,869	142,909	143,969	145,049	146,152	147,274	
Peak Month	13,341	14,745	14,862	14,978	15,099	15,224	15,351	15,475	15,602	15,729	15,858	15,977	16,097	16,217	16,335	16,456	16,579	16,704	16,832	16,962	17,092	
Average Day	436	481	485	489	493	497	501	505	509	514	518	522	526	530	534	538	542	546	550	554	558	

Source: Yuma County Airport Authority (historical Airport activity); Ricondo & Associates, Inc. (forecast Airport activity).
Prepared by: Ricondo & Associates, Inc., April 2008.