BISBEE DOUGLAS
INTERNATIONAL AIRPORT

DOUGLAS, ARIZONA

AIRPORT MASTER PLAN
WORKING PAPER #1

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ARMSTRONG CONSULTANTS, INC.

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Introduction

INTRODUCTION

In 2011, Cochise County, the Airport Sponsor, published its first ever Strategic Plan in order to provide the most efficient and effective delivery of services to its community. Consequently, Cochise County continues to move forward with its progressive community-wide planning efforts with its decision to update the Airport Master Plan for Bisbee Douglas International Airport. Bisbee Douglas International Airport is located in Douglas, Arizona, and is a valuable resource to both the surrounding community and the County as a whole. The Airport Master Plan will ensure future airport development is designed to enhance air and ground operations and improve safety and airport services for the County, as well as the public users of the airport.

PURPOSE

An Airport Master Plan (AMP) describes and depicts the overall concept for the long-term development of an airport. It presents the concepts graphically in the Airport Layout Plan (ALP) drawing set and reports the data and logic upon which the concept is based in the narrative report. The goal of the plan is to provide direction for future airport development that will satisfy aviation demand in a financially feasible manner and meet the needs of Cochise County with respect to the airport. This AMP updates and replaces the 1997 Airport Master Plan.

OBJECTIVES

The primary objectives of the Airport Master Plan are to produce an attainable phased development plan that will satisfy the airport needs in a safe, efficient, economical and environmentally sound manner. The plan serves as a guide to decision makers, airport users and the general public for implementing airport development actions while considering County goals and objectives. There are a number of objectives that Cochise County would like to achieve as a result of this Airport Master Plan for Bisbee Douglas International Airport.

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

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

the integrity of the airport and its surroundings.

- Set the stage and establish the framework for a continuing planning process that will monitor key activities and permit changes to the plan recommendation as required.
- Review of existing land uses surrounding the airport for compatibility and control.

AIRPORT MASTER PLAN PROCESS AND SCHEDULE

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

TECHNICAL ADVISORY COMMITTEE

The Bisbee Douglas International Airport Technical Advisory Committee (TAC) consists of members representing varied interests in the airport. Their involvement throughout the Airport Master Plan process will help to keep interested parties informed and will foster consensus for future development actions.

<u>TAC Representatives</u>

Ann English	Chairman, Cochise County Board of Supervisors
Richard Searle	Vice-Chairman, Cochise County Board of Supervisors
Jim Vlahovich	Deputy County Administrator - Cochise County
Eddie Levins	Director of Facilities Management - Cochise County
Lisa Marra	Grants Administrator - Cochise County
Mike Turisk	Planning Manager - Cochise County
Karen Lamberton	Transportation Planner - Cochise County
Elda Orduno	Deputy County Attorney - Cochise County
Jared Raymond	Airport Planner – Federal Aviation Administration
Kenneth Potts	Airport Projects Planning Manager – Aeronautics Group, ADOT
Ruben Ojeda	Manager, Right of Way – AZ State Land Department

Lt. Col. David Stine	Airspace Manager – Arizona Air National Guard
Lauren Ortega	Public Works Director – City of Douglas
Sam Place	Landowner – Member of the public
Belinda Burnett	Director of Aviation Programs / Chief Flight Instructor - Cochise College

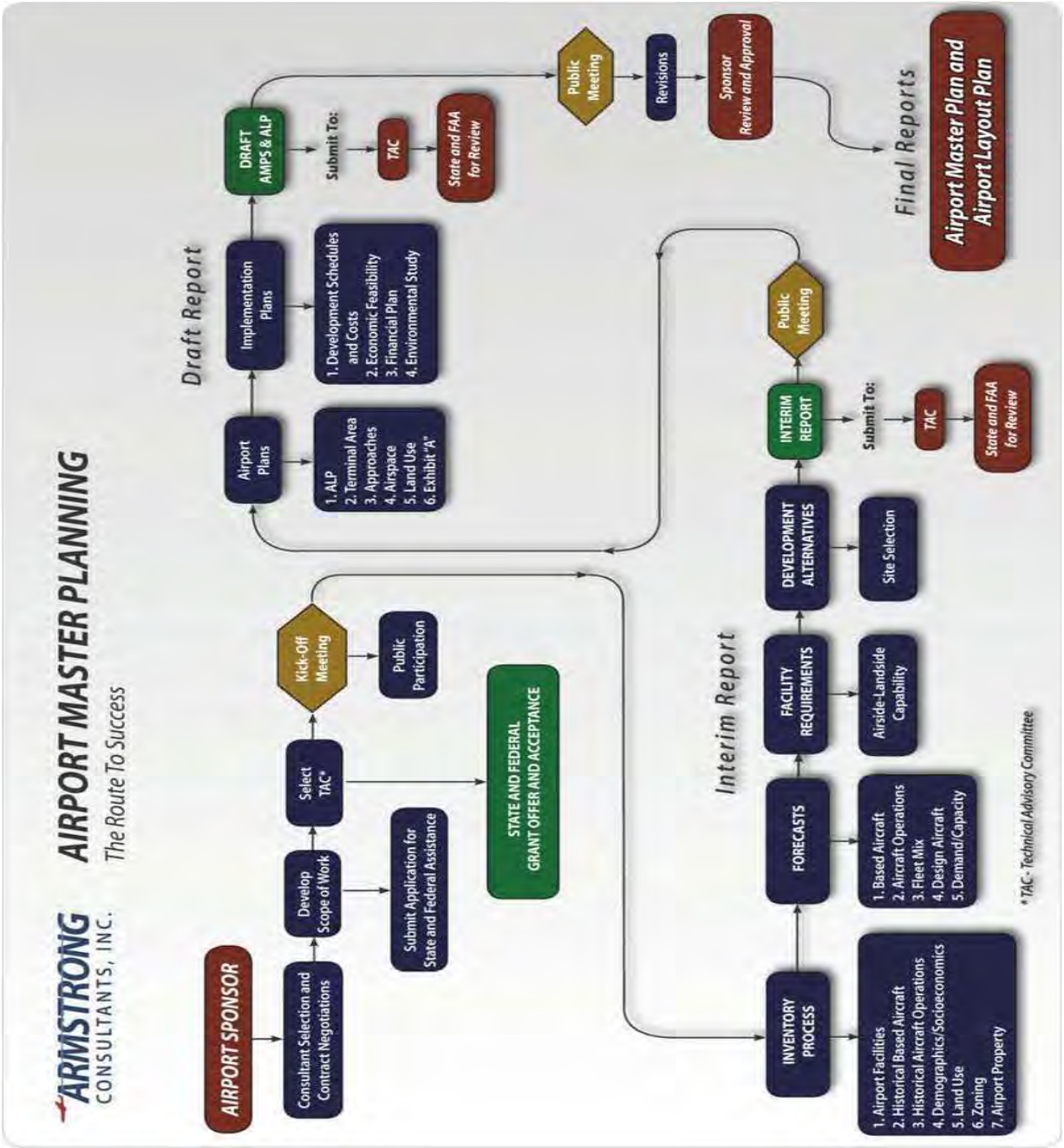

FIGURE 1 AIRPORT MASTER PLAN FLOW CHART

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Chapter One
Inventory

1.1 INTRODUCTION AND AIRPORT HISTORY

Bisbee Douglas International Airport (KDUG) is a general aviation airport located in southeastern Arizona, approximately ten miles north of the City of Douglas and 24 miles east of the City of Bisbee in Cochise County. The Airport is approximately 110 miles southeast of Tucson and approximately 224 miles southeast of the state capitol in Phoenix, Arizona.

The Bisbee Douglas International Airport was initially constructed during 1941-1943 by the U.S. Army Corps of Engineers (through the War Department) as the Douglas Army Airfield, to become a major bomber training facility. During World War II, there were about 5,500 troops stationed at Douglas at any one time.

The original Douglas Army Airfield included seven operational runways, all over 7,000 feet in length, and 141 buildings. The present airport terminal building served as the base administration building. However, most of the original buildings are no longer in existence. Five of the original hangars, the terminal building, a few small sheds, and a small training building remain. A state prison, constructed in 1987, now occupies the area which was once a large part of the landside operations area of the Airfield.

On May 13, 1949, the U.S. government, acting through the War Assets Administration deeded the Douglas Army Airfield to Cochise County. The airfield was named Bisbee Douglas International Airport. The idea was to convert the airport to serve as the major air commerce facility in the region. As such, many of the buildings were remodeled to accommodate passenger service. For example, the base administration building was remodeled to serve as an airline terminal building; the terminal building remains today, for the most part, in its vintage configuration.

During the 1960s, the Airport did have scheduled airline service, but this is no longer the case today. Several Airport Layout Plan (ALP) record drawings have been completed for the Airport over the years starting in 1956. The ALP drawings were also updated in 1967 and 1974. The original Cochise County Airport System Plan was prepared in 1982, and updated in 1994. Perhaps the most significant to note is the phasing out of the airport's numerous runways. Of the seven original runways, only two remain in use today, Runway 17-35 and Runway 8-26. The last Airport Master Plan was prepared by Gannett Fleming and Nicolas J. Pela & Associates in 1997. There has been relatively little development activity at the Airport over recent years. It is the County's desire to create a new vision for the Bisbee Douglas International Airport , which is why the County has decided to update the Airport Master Plan.

As previously mentioned, the Airport was originally deeded by the Federal government to Cochise County via a Quit Claim Deed dated May 13, 1949. According to the most current Airport Master Plan from 1997, this action was taken by the War Assets Administration under Reorganization Plan One of 1947 (12 Federal register 4534), and the provisions of the Surplus Property Act of 1944. The Quit Claim Deed conveyed the present airport property, as well as then-existing buildings and improvements. The conveyance was subject to several restrictions. If the terms, conditions, and obligations contained in the restrictions of the 1949 conveyance are not met by Cochise County, the airport at the option of the Federal Aviation Administration

(FAA) may revert to the Government with sixty days notice. Cochise County would be given the sixty days to comply with any condition which is in default.

It should be noted that the development of the state prison on the Airport property did not meet the description of a "public airport use" as the original 1949 Quit Claim conveyance demanded. However, prior to the Arizona Department of Corrections (ADOC) prison development, the County requested the Administrator of the FAA to release 72.62 acres of land for non-airport use. The FAA did issue an Instrument of Release, which approved this release.

1.2 AIRPORT SERVICE LEVEL AND ROLE

Since 1970, the FAA has classified a subset of the 5,400 public-use airports in the United States as being vital to serving the public needs for air transportation, either directly or indirectly, and therefore may be made eligible for federal funding to maintain their facilities. These airports are classified within the National Plan of Integrated Airport Systems (NPIAS), where the airport service level reflects the type of public use the airport provides. The service level also reflects the funding categories established by Congress to assist in airport development.

The categories of airports listed in the NPIAS are:

- **Commercial Service** - public airports that accommodate scheduled air carrier service provided by the world's certificated air carriers. Commercial service airports are either:
    - Primary – a public-use airport that enplanes more than 10,000 passengers annually
    - Non-primary - a public-use airport that enplanes between 2,500 and 10,000 passengers annually.
- **Reliever** - an airport designated by the FAA as having the function of relieving congestion at a commercial service airport and providing more general aviation access. These airports comprise a special category of GA airports and are generally located within a relatively short distance of primary airports. Privately owned airports may also be identified as reliever airports.
- **General Aviation** – airports used exclusively by private and business aircraft not providing scheduled air carrier passenger service. There are many GA airports that are not included in the NPIAS, however, one criterion for inclusion is that the airport has at least 10 based aircraft and is located at least 20 miles away from the nearest NPIAS airport.

Bisbee Douglas International Airport's service level is categorized in the NPAIS as general aviation. According to FAA records, as of 2012, the Airport has 12 based aircraft. The Airport is also located approximately 23 miles from Bisbee Municipal Airport, and 56 miles from Sierra Vista Municipal Airport; both airports are also included in the NPIAS as general aviation airports. The nearest NPIAS primary commercial service airport to Bisbee Douglas International Airport is Tucson International Airport, located approximately 106 miles to the northwest.

At the State level, the Arizona Department of Transportation – Aeronautics Division has long recognized the importance of planning as a proactive approach to ensuring aviation continues

its role in the statewide transportation system. They created a similar plan to the FAA's NPIAS in 1978 called the Arizona State Airports System Plan (ASASP). The purpose of the ASASP is to provide a framework for the integrated planning, operation, and development of Arizona's aviation assets. The most current version of the ASASP was published in 2008.

The ASASP also classifies airports into service roles. Bisbee Douglas International Airport is categorized as a general aviation (GA) rural airport. The ASASP defines a GA-rural airport as an airport that serves a supplemental role in local economies, primarily serving smaller business, recreational and personal flying. This classification accurately describes the role Bisbee Douglas International Airport plays in the local community. The majority of the aircraft utilizing the Airport are predominately single-engine piston, multi-engine piston, turbo prop, light turbo jet, and rotorcraft aircraft. Furthermore, the role of a general aviation rural airport lends itself to specific aeronautical activities. The types of aeronautical activities found at Bisbee Douglas International Airport include the following:

Business Transportation: Business aviation users benefit by being able to travel to or from business centers to conduct business activities in a single day, without requiring an overnight stay or extensive ground travel time. Local and other small businesses generally utilize single engine and multi-engine piston aircraft. This user category also includes state and federal agencies and travel by government officials. Bisbee Douglas International Airport is located 10 miles north of the central business district in Douglas, AZ. Additionally, the Airport is located 12 miles from Agua Prieta, Mexico. Both Douglas and Agua Prieta serve as the main business districts in the area.

Recreational and Tourism: These users include transient pilots flying into the region to visit recreational and tourist attractions. These users mostly utilize single-engine piston aircraft; however, a small percentage may operate multi-engine piston aircraft. Other types of aircraft in this category include home-built, experimental aircraft, gliders and ultralights. Bisbee Douglas International Airport is located in an area of the State that does attract a fair amount of tourists and contains multiple recreational activity areas.

Flight Training: These users conduct local and itinerant flights in order to meet flight proficiency requirements for obtaining FAA pilot certifications. These flights include touch-and-goes, day and night local and cross-country flights and simulated approaches. Bisbee Douglas International Airport is located near Cochise College and its airport, which supports one of the State's premier college Flight Training Programs. Cochise College student pilots and instructors frequently use the Airport for flight training activities.

Military: Military operations are those conducted by U.S. or Foreign military aircraft and personnel for the purposes of national security and defense. Almost all military operations are training or proficiency activities. Bisbee Douglas International Airport is located in close proximity to Fort Huachuca and Davis-Monthan Air Force Base. Thus, both the Army and Air Force use the Airport and/or its airspace during training exercises and for re-fuelling services while in the area.

Air Medevac Services: Occasionally, Arizona Lifeline and Lifenet provides essential emergency medical transportation for life threatening situations and assists in patient transfers by air to higher level care facilities using both fixed-wing and helicopters. The air medevac

services provide quick and efficient transportation in emergency situations when time is of the essence, resulting in lives being saved.

Aerial Firefighting: The Airport is utilized by aerial firefighting aircraft during the Arizona wildfire season of May through July. The airport's configuration is able to accommodate large rotary aircraft, aerial tankers and patrol aircraft. The U.S. Forest Service fire crew has a permanent base at the Airport during wildfire season, and one U.S. Forest Service firefighting-equipped helicopter is based on the airfield during these months.

Prison Transports: The Airport is adjacent to the Arizona State Prison Complex – Douglas, and is on occasion used by the State and County to transport prisoners. The type of aircraft utilized for prisoner transport most often is a small single-engine piston aircraft, but on occasion a larger twin-engine piston aircraft may be used.

1.3 AIRPORT SETTING

Bisbee Douglas International Airport (KDUG) is located in the southeast corner of Arizona in Cochise County, approximately 12 miles from the U.S./Mexico border. The Airport is located within the Sulphur Springs Valley with higher terrain bordering the valley to the west and the east. The terrain surrounding Bisbee Douglas International Airport within the 20 mile valley is generally flat. The Mule Mountains are located approximately 15 miles west of the Airport and reach as high as 7,370 feet mean sea level (MSL). The Chiricahua Mountains are located approximately 10 miles northeast of the Airport and reach as high as 9,759 feet MSL.

The Airport is designated by the FAA as Site Number 00671.*A, and is situated at a field elevation of 4,150 MSL. An airport's location is defined by its Airport Reference Point (ARP), which is the geometric center of the runway system based upon the length of the existing runways. ARPs are calculated based on future and ultimate runway lengths and locations. The existing ARP at Bisbee Douglas International Airport is located at 31° 28' 10.29"N latitude and 109° 36' 13.50"W longitude. The existing airport property encompasses approximately 3,000 acres which is owned and operated by Cochise County. The geographic location of Bisbee Douglas International Airport is depicted in **Figure 1-1**.

FIGURE 1-1 BISBEE DOUGLAS INTERNATIONAL AIRPORT LOCATIONS MAP

1.4 COMPATIBLE LAND USE

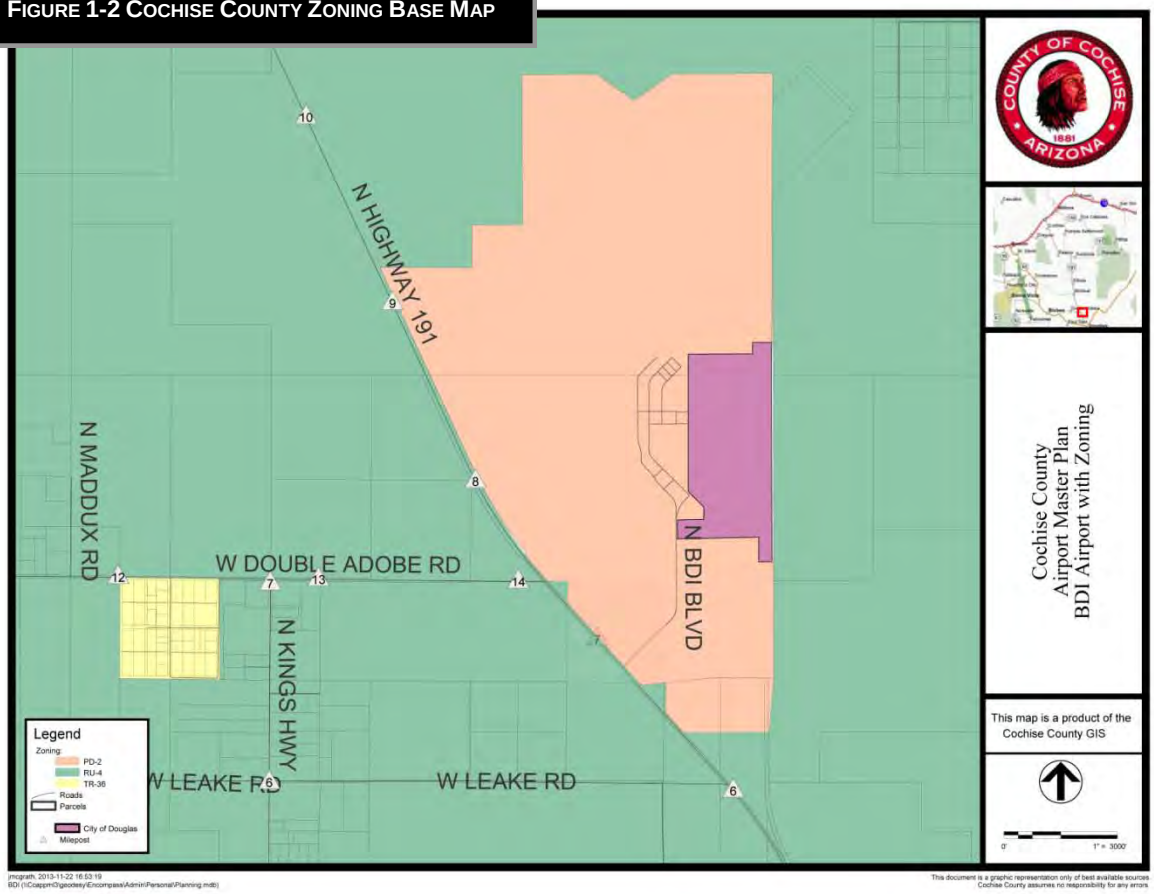
Land use compatibility conflicts are a common problem around many airports, including smaller general aviation facilities. In urban areas, as well as some rural settings, airport owners find that essential expansion to meet the demands of airport traffic is difficult to achieve due to the nearby development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

Conflicts may also exist in the protection of runway approach/departure and transition zones to ensure the safety of both the flying public and the adjacent property owners. Adequate land for this use should be either owned in fee or controlled in easements, as recommended in this and future sections of this Airport Master Plan.

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

According to the Cochise County zoning base map of the area, all of the airport property encompassing Bisbee Douglas International Airport is zoned as Planned Development (PD). Likewise, the land surrounding the airport is identified as RU-4, indicating it is zoned as rural. The closest residential developments are located over three miles to the east and southeast of the airport. The existing Cochise County land use zoning map of the land surrounding the Airport is shown in **Figure 1-2.**

FIGURE 1-2 COCHISE COUNTY ZONING BASE MAP



Source: Cochise County Planning and Zoning Department, 2013

1.5 SOCIOECONOMIC CHARACTERISTICS

The socioeconomic makeup of the community of an airport is always an important aspect to examine during the Airport Master Planning process. Examining the specific socioeconomic characteristics of Cochise County will help determine the factors influencing aviation activity in the area and the extent to which aviation facility developments are needed. Characteristics, such as employment, demographic patterns and income will help in establishing the potential growth rate of aviation within the area. In other words, by analyzing the information in this Chapter, forecasts of aviation activity can be developed. Those forecasts are provided in Chapter 2.

1.5.1 LOCAL PROFILE

Bisbee Douglas International Airport is geographically situated directly to the north of Douglas, AZ and almost directly east of Bisbee, AZ, the two largest communities in the area. The city of Douglas has experienced both residential and economic growth within the last few years. The City is located just two miles from the U.S./Mexico border; the Douglas Port of Entry serves as an entry/exit point for business travelers and tourists alike. The city of Bisbee is a quaint former mining town with a smaller population than Douglas, but sees a steady stream of tourist

activities throughout the year. Besides the rich history of the town, Bisbee relies on its eclectic artist community to draw visitors to the area.

The Airport itself is located adjacent to U.S. Highway 191, which if taken north will connect to the U.S. Interstate 10. The Airport is also within close proximity to Arizona Highways 80 and 92, which can be used to access the communities of Bisbee and Sierra Vista. A variety of attractions surround both Bisbee and Douglas. As previously mentioned, both towns have a rich mining history, and this living history is a large draw for tourism in the region. Additionally, the Leslie Canyon National Wildlife Preserve and San Pedro Riparian National Conservation Area are located in the vicinity which provides nature lovers a chance to observe over 238 species of wildlife. The Chiricahua Mountains, one of Arizona's largest mountain ranges, is also located close by.

1.5.2 POPULATION

According to 2010 U.S. Census data, there are 131,346 people residing in Cochise County. Furthermore, there are 17,378 people residing in Douglas, Arizona, the closest city to the Airport, and 79,138 people in the nearby Mexican border town of Agua Prieta. The population has increased at a double-digit rate from 2000-2010 in the State of Arizona, as well as in Cochise County. The population has also increased steadily in Douglas and Agua Prieta. The increase in population trend is illustrated in **Table 1-1.**

TABLE 1-1 CURRENT AND HISTORICAL POPULATION

	2000	2010	Annual Growth Rate 2000-2010
Douglas, Arizona[1]	14,312	17,378	2%
Agua Prieta, Mexico[2]	61,944	79,138	2.5%
Cochise County[1]	117,755	131,346	11%
Arizona[1]	5,130,632	6,392,017	22%

Source: [1]U.S. Census Bureau, 2000 and 2010 Census Briefs; [2] Instituto Nacional de Estadística Geografía e Informática, Mexico (web).

Population projections for Cochise County and Arizona were obtained from the Arizona Department of Administration, Office of Employment and Population Statistics. Based upon 2012 data, the population of Cochise County is projected to grow on average 1.2 percent annually between 2015 and 2030; the population of Arizona is projected to grow on average 1.9 percent annually between 2015 and 2030. Long-range population projections for Douglas and Agua Prieta were calculated based upon the annual growth rate from 2000-2010. These projections are shown in **Table 1-2** and **Figure 1-3**. Traditionally, population growth in an area is advantageous to airports; an increase in an area's population often means the potential for increases in an airport's user base and aviation and non-aviation related businesses.

TABLE 1-2 POPULATION PROJECTIONS

	2015	2020	2025	2030	Average Annual Growth 2015-2030
Douglas, Arizona[1]	19,186	21,183	23,388	25,822	2%
Agua Prieta, Mexico[1]	89,537	101,303	114,615	129,677	2.5%
Cochise County[2]	134,166	142,398	150,247	157,693	1.1%
Arizona[2]	6,777,534	7,485,163	8,168,354	8,852,645	1.8%

Sources: [1]Table 1-1 Annual Growth Rate 2000-2010; [2]Arizona Department of Administration, Office of Employment & Population Statistics, 2012

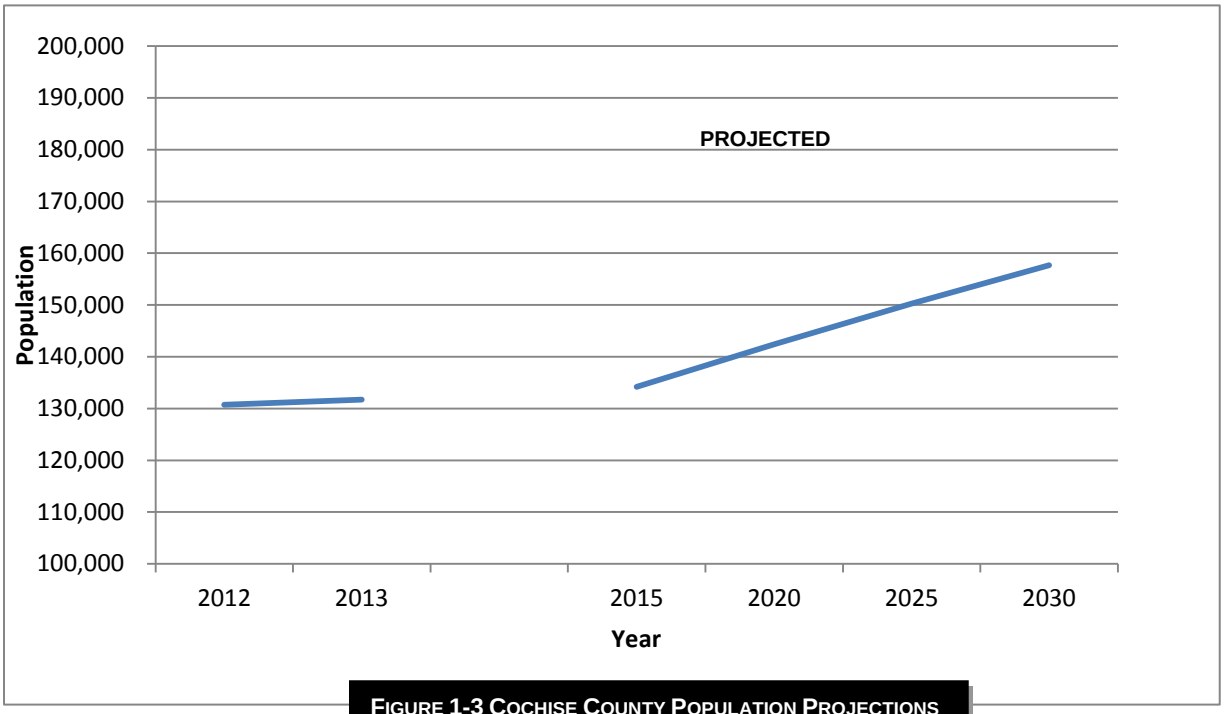


FIGURE 1-3 COCHISE COUNTY POPULATION PROJECTIONS

1.5.3 EMPLOYMENT

According to the U.S. Census Bureau 2007-2011 American Community Survey 5-year Estimates, the largest industries in Cochise County are education, health care and social services, followed by public administration; professional, scientific, management, administration and waste management services, and retail trade. Employment distribution by industry for Cochise County is shown in **Table 1-3** and **Figure 1-4**.

1.5.4 ECONOMIC IMPACT OF MEXICAN BUSINESSES AND VISITORS

Since the early 1990s, Agua Prieta has seen a considerable increase in maquiladoras (twin factories with a presence on both sides of the border that manufacture and assemble products for export). Many of the manufacturing plants in Agua Prieta operate under the maquiladoras concept in which the city of Douglas serves as the warehouse distribution center and Agua Prieta the manufacturing center. Agua Prieta has more than 20 manufacturing plants with multiple warehouse operations in Douglas.

The Douglas Port of Entry is open 24 hours a day, seven days a week to vehicle and pedestrian traffic. A 2007-2008 University of Arizona study indicated 81.6 percent of Mexican residents entering through Douglas did so for the purpose of shopping – the highest of all ports in Arizona. The same study also found that Mexican visitors to Cochise County accounted for 5.3 percent of countywide taxable sales. Mexican visitors spent an annual $186.4 million in Cochise County, with 55 percent of that occurring in retail stores, 24.1 percent in grocery stores, and 7.3 percent in restaurants. Accounting for indirect and induced impacts, Mexican visitors were responsible for $211.8 million in sales, 1,763 jobs, and $36.5 million in income countywide.

TABLE 1-3 COCHISE COUNTY EMPLOYMENT DISTRIBUTION

	Cochise County	% of Total
Agriculture, forestry, fishing, hunting and mining	1,637	3.4
Construction	3,353	6.9
Manufacturing	1,359	2.8
Wholesale trade	828	1.7
Retail trade	5,925	12.2
Transportation, warehousing and utilities	2,190	4.5
Information	693	1.4
Finance, insurance, real estate, rental and leasing	2,002	4.1
Professional, scientific, management, administrative and waste management services	6,404	13.2
Educational, health and social services	9,383	19.4
Arts, entertainment, recreation, accommodation and food services	4,971	10.3
Public Administration	7,394	15.3
Other services	2,298	4.7
Total	47,116	100%

Source: U.S. Census Bureau, American FactFinder, 2007-2011 American Community Survey 5-year Estimates

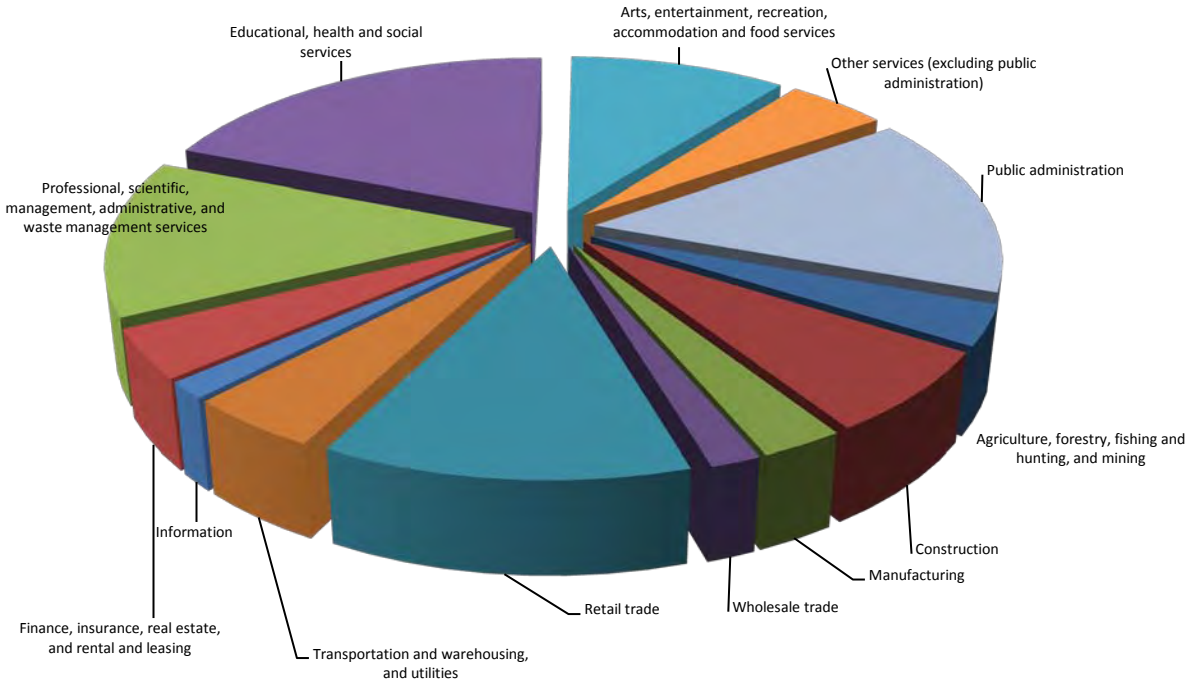


FIGURE 1- 4 COCHISE COUNTY EMPLOYMENT BY INDUSTRY

1.5.5 INCOME

According to the U.S. Census American Community Survey 5-year Estimates for 2007-2011, the median household income in Arizona is approximately $50,752. Likewise, according to the same data, the median income for a household in Cochise County is approximately $45,906. The average number of persons per household in Cochise County is 2.53, and 2.64 for Arizona as a whole. The per capita income for 2007-2011 was $23,296 for the County and $25,784 for the State of Arizona. The percentage of families living below the poverty line for 2007-2011 was 16.2 percent for the County, as well as for the State of Arizona.

1.6 CLIMATE AND METEOROLOGICAL CONDITIONS

Meteorological conditions play an important role in the planning and development of an airport. Wind direction and speed are essential in determining optimum runway orientation. Temperatures substantially affect aircraft performance and are a major factor in runway length determination. The percentage of time an airport experiences low visibility because of meteorological conditions is a key factor in determining the need for instrument approach procedures and the type of procedure and facilities needed. The type of instrument approach procedure that might be needed, in turn, determines airspace and imaginary surface requirements. The amount and type of precipitation that occurs at an airport affects visibility and runway friction, or runway braking effectiveness. It also affects the type of maintenance equipment required, for example, snow and ice removal equipment.

1.6.1 LOCAL CLIMATIC DATA

According to the Western Regional Climate Center, the monthly average maximum temperature for the hottest month (June) is 95.0 degrees Fahrenheit. July is the month with the largest amount of precipitation (3.30 inches). The total annual average precipitation is 12.52 inches. The average total snow fall is 1.3 inches and there is no snow accumulation during the winter months.

1.7 SURROUNDING AIRPORTS / SERVICE AREA

As previously discussed, Bisbee Douglas International Airport is located in the southeastern region of Arizona. The region's mild climate and terrain serve as an ideal location for an airport; In fact, there are several other airports located within the region. A comparison of several other notable airports in the vicinity of Bisbee Douglas International Airport was conducted in order to illustrate their proximity to the study airport and to give an overall picture of the types of aeronautical facilities available to the surrounding communities. This type of comparison is typically performed in order to define an airport's service area. An airport service area is defined by the communities and surrounding areas served by the airport facility. For example, factors such as the airport's surrounding topographical features (mountains, rivers, etc.), proximity to its users, quality of ground access, required driving time to the airport and the proximity of the facility to other airports that offer the same or similar services can all affect the size of a particular airport's service area. To define the service area for Bisbee Douglas International Airport, the airports in the area and their specific services and facilities were reviewed. **Table 1-4** summarizes the closest public airports and their services in relation to Bisbee Douglas International Airport. The service area includes the area within half the distance of the nearest airport with a published instrument approach procedure from Bisbee Douglas International

Airport and is depicted in **Figure 1-5**. It may be of interest to note that Bisbee Douglas International Airport (DUG), Cochise College Airport (P03), Douglas Municipal Airport (DGL), and Bisbee Municipal Airport (P04) have overlapping geographic service areas where these four airports serve the two population centers of Bisbee and Douglas. Bisbee and Douglas are not overly populous areas, and thus having four general aviation, public use airports within a relatively close proximity to one another may be a contributing factor to the lack of growth at Bisbee Douglas International Airport over the years.

TABLE 1-4 BISBEE DOUGLAS INTERNATIONAL AIRPORT AND SURROUNDING AIRPORTS

	Identifier	Distance (Nautical Miles)	Distance (Highway Miles)	NPIAS Status	Runway Length(s) Width(s)	Pavement Type	Instrument Approaches	Fuel
Bisbee Douglas International Airport, Douglas, AZ	DUG	-	-	GA	6,430'x100' 4,966'x60'	Asphalt Asphalt	VOR/DME, GPS	Yes
Cochise College Airport, Douglas, AZ	P03	7.4 SW	15	N/A	5,303'[1]x60'	Asphalt	None	Yes
Douglas Municipal Airport, Douglas, AZ	DGL	9.1 SE	13	GA	5,760'x75' 4,095'x100'	Asphalt Dirt	None	Yes
Bisbee Municipal Airport, Bisbee, AZ	P04	15.6 SW	23	GA	5,929'x60' 2,650'x110'	Asphalt Dirt	None	Yes
Sierra Vista Municipal Airport-Libby Army Airfield, Fort Huachuca/Sierra Vista, AZ	FHU	38.6 W	64	JU	12,001'x150' 5,366'x150' 4,285'x75'	Concrete Asphalt Asphalt	ILS, LOC, GPS,VOR	Yes

Source: AirNav, 2013

Source: Google Maps, 2013

FIGURE 1-5 SERVICE AREA FOR BISBEE DOUGLAS INTERNATIONAL AIRPORT

1.8 AIRPORT OWNERSHIP AND MANAGEMENT

Bisbee Douglas International Airport is owned and operated by Cochise County. The operation and maintenance of the airport is the responsibility of the County's Facilities Management Department. The County Board of Supervisors is responsible for the administrative and financial oversight of the airport.

1.9 GRANT HISTORY

The grant history for the capital improvements at Bisbee Douglas International Airport is depicted in **Table 1-5.**

TABLE 1-5 BISBEE DOUGLAS INTERNATIONAL AIRPORT GRANT HISTORY

State Fiscal Year	State Grant Number	Federal Grant Number	Project Description and Project Type	Local Amount	State Amount	Federal Amount	Total Amount
2002	2F44	Not available	Rehabilitation of Runway 17-35 Phase 1 - design only	$7,363	$7,363	$149,994	$164,720
2004	4F14	3-04-0013-02	Rehabilitation of Runway 8-26 and T/W TA/A4 - design/construct	$14,726	$14,726	$300,000	$329,453
2004	4S27	N/A	Master Plan Update	$6,300	$56,700	-	$63,000
2005	5F40	3-04-0013-003	Rehabilitation of Runway 17-35 & T/W A1, A2 and A3 - design/construct	$28,684	$28,864	$1,089,973	$1,147,342
2006	6F87	3-04-0013-004	Rehabilitate Apron	$6,875	$6,875	$261,250	$275,000
2010	10F09	3-04-0013-05	Rehabilitate main terminal apron	$18,259	$18,259	$693,852	$730,371
2011	1F03	3-04-0013-06-10	Rehabilitate T/W A1, A2 - phase 1 design only	$3,947	$3,948	$150,000	$157,895
2013	3S1A	N/A	Crack seal and rubberized asphalt seal coat R/W 17-35 & 8-25, T/W A3 & A4	$37,654	$338,891	-	$376,545
2013	3F2M	3-04-0013-007-12	Rehabilitate T/W A2 and new edge lighting system	$31,634	$31,634	$644,423	$707,691
2014	4S10	N/A	Design T/W A reconstruction	$20,000	$180,000	-	$200,000
2014	4F3D	3-04-0013-008-13	Update Airport Master Plan	$9,642	$9,642	$196,407	$215,690
			Total amount	**$185,084**	**$696,902**	**$3,485,899**	**$4,367,707**

Source: ADOT MPD - Aeronautics Group Sept. 2013

1.10 AIRPORT FINANCIAL DATA

Financial data was obtained for the Bisbee Douglas International Airport from 2009 to 2013 in order to conduct a review of the revenue and expenditures. The data provides a baseline for the financial status of the airport and allows for further evaluation in the Airport Development and Financial Plan chapters. It is important to note that Cochise County's fiscal year is from July 1st to June 30th.

Some preliminary observations of the data reveal that fuel sales were at their peak at $297,216 in fiscal year 2009/2010 and have steadily tapered off to $96,605 in fiscal year 2012/2013. Airport operations expenditures have fluctuated over recent years from a high of $418,060 in 2012/2013 to a low of $298,033 in 2010/2011. The largest source of revenue comes from the sale of water to the Arizona Department of Corrections (DOC) for the Arizona State Prison Complex – Douglas located adjacent to the Airport. The second largest source of revenue comes from the sale of aircraft fuel (Jet A and AVGAS).

The Financial Chapter of the master plan report discusses the economic benefits in more detail and provides recommendations to potentially increase revenues and help fund the County's share of future airport capital improvement projects. A breakdown of airport revenues and expenditures from 2009 to 2013 for the Airport is depicted in **Table 1-6**.

TABLE 1-6 BISBEE DOUGLAS INTERNATIONAL AIRPORT FINANCIAL DATA 2009-2013

	2009/20010	2010/2011	2011/2012	2012/2013	*2013/2014
Revenue					
Hangar Leases	$19,135	$18,840	$19,915	$18,615	$19,379
Other Leases	$46,742	$50,395	$50,037	$52,350	$51,573
Fuel (Jet A, AVGAS)	$297,216	$263,356	$166,461	$96,605	$91,601
Water Sales - DOC	$165,179	$184,042	$172,324	$150,557	$159,485
Other	$2,545	$5,798	$251,012[1]	$2,091	$142,931[2]
Total Revenue	**$530,817**	**$522,431**	**$659,749**	**$320,218**	**$464,969**
Expenditures					
Airport Operations	$366,645	$298,033	$352,584	$418,060	$351,997
Fuel (Jet A, AVGAS)	$279,113	$194,482	$149,205	$91,849	$50,371
Airport Facility Utility	$20,193	$19,076	$15,399	$14,574	$19,101
Other Utility	$32,311	$31,298	$33,407	$38,461	$42,600
Debt Service	$0	$0	$0	$0	$0
Total Expenditures	**$698,262**	**$542,889**	**$550,595**	**$562,944**	**$464,069**
Net Loss/Gain	**-$167,445**	**-$20,458**	**$109,154**	**-$242,726**	**$900**

Source: Cochise County, September 25, 2013
*Budget Amount (2013/2014)
Note: Fiscal Year=07/01 to 06/30
[1] $250,048.35 was misc. charges for services related to the water system upgrade for the DOC.
[2] $142,931 is cash carried forward in the budget.

1.11 BASED AIRCRAFT AND OPERATIONS

There are various federal, state and local sources available for determining existing activity levels at an airport. These include, but are not limited to, FAA 5010-1 Form, FAA Terminal Area Forecast (TAF), on-site inventory and airport management records.

The FAA *Airport Master Record*, Form 5010-1, is the official record kept by the FAA to document airport physical conditions and other pertinent information. The information is typically collected from the airport sponsor and includes an annual estimate of aircraft activity as well as the number of based aircraft. The accuracy of the information contained in the 5010-1 Form varies directly with the airport manager's record keeping system and the date of its last revision. The current FAA 5010-1 Form for Bisbee Douglas International Airport indicates there are 12 based aircraft. The 5010-1 also reports 19,700 annual operations; this is based upon a 12-month reporting period which ended 04/23/2012.

The TAF is a historical record and contains forecast projections of based aircraft and annual operations. The TAF is maintained and utilized by the FAA for planning and budgeting purposes. The 2014-2034 TAF data for the Airport projects 19 based aircraft and 19,650 annual operations for each year over the course of this future projection. The TAF data may not accurately reflect the based aircraft and operations numbers, as it is dependent on when it was last updated by the FAA. Furthermore, it is difficult to accurately record aircraft operations at airports that are not equipped with an air traffic control tower. Normally, operations are recorded by air traffic controllers and reported to the FAA. In this instance, Bisbee Douglas International Airport does not have an air traffic control tower.

Thus, the existing activity at the Airport was evaluated using a method for estimating general aviation operations. The FAA Statistics and Forecast Branch has developed a *Model for Estimating General Aviation Operations at Non-Towered Airports using Towered and Non-Towered Airport Data.* This model was created using data from towered and non-towered general aviation airports. A dummy variable is used to differentiate between those airports having an air traffic control tower and those that do not. The model was used to estimate the number of operations at 2,789 non-towered general aviation airports included in the FAA *Terminal Area Forecasts*. The equation they developed is Equation #15, Model for Estimating General Aviation Operations at Non-Towered Airports. Local factors such as the number of based aircraft, population, location, and the number of flight schools is applied to the equation resulting in an estimated number of annual operations. The factors pertinent to Bisbee Douglas International Airport were applied in this formula, and the results are shown below. In order to make the result as accurate as possible, the number of based aircraft used in this formula is 5, as this is the most up to date figure as reported by airport management. The formula, and the breakdown of data for Bisbee Douglas International Airport within the formula, is as follows:

Operations = 775 + 241(Based Aircraft) – 0.14(Based Aircraft)^2 + 31,478(Based Aircraft/Total Number of Based Aircraft within 100 miles of Airport) + 5,577(Number of Flight Schools at Airport) + 0.001(Population with 100 miles) – 3,736(multiply by 1 if Airport is Located in WA, CA, OR or AK; multiply by zero if not) + 12,121(Population within 25 miles/population within 100 miles) 775 + 241(5) – 0.14(5)^2 + 31,478(.05) + 0 + 131 – 0 + 12,121(.20) = 6,105 total estimated annual operations.

The estimated number of annual operations determined by Equation #15 is much closer to those that have been reported by airport management. According to discussions with airport management, there were 5 based aircraft and 1,920 annual operations in 2012. The based aircraft fleet mix includes 4 single-engine and 1 multi-engine aircraft.

Historical based aircraft and operations are shown in **Table 1-7**.

TABLE 1-7 HISTORICAL BASED AIRCRAFT AND OPERATIONS

Year	Total Operations	Based Aircraft
1996[1]	3,285	24
2007[2]	3,800	15
2011[3]	19,700	12
2012[4]	1,920	5
2013[5]	6,105	5

[1]Bisbee Douglas International Airport Master Plan – 1996 actual data
[2]Arizona State Airports System Plan – 2007 base year data
[3]Bisbee Douglas International Airport Master Record – October 2013
[4]Bisbee Douglas International Airport Manager – November 2013
[5]Estimate of Operations-Derived from *Model for Estimating General Aviation Operations at Non-Towered Airport, Equation #15, FAA Statistics and Forecast Branch (July 2001).*

1.12 CERTIFICATED PILOTS AND REGISTERED AIRCRAFT

The FAA databases of certificated airmen and registered aircraft were reviewed to determine the current distribution of pilots and registered aircraft in Cochise County. This data indicates that there are 494 certificated pilots and 251 aircraft registered in Cochise County as of November 2013. Aircraft are not always based where they are registered. Of the 251 registered aircraft in the Cochise County, 12 are based at Bisbee Douglas International Airport according to FAA records.

1.13 DESIGN STANDARDS

Airport design standards provide basic guidelines for a safe, efficient and economic airport system. The standards cover the wide range of size and performance characteristics of aircraft that are anticipated to use an airport. Various elements of airport infrastructure and their functions are also covered by these standards. Choosing the correct aircraft characteristics for which the airport will be designed needs to be done carefully so that future requirements for larger and more demanding aircraft are taken into consideration while remaining mindful that designing for large aircraft that will never serve the airport is not economical.

1.13.1 DESIGN AIRCRAFT

According to FAA AC 150/5300-13A Airport Design, planning a new airport or improvement to an existing airport requires the selection of one or more “design aircraft”. In most cases, the design aircraft (for the purpose of airport geometric design) is a composite aircraft representing a collection of aircraft classified by the parameters:

- Aircraft Approach Category (AAC)
- Airplane Design Group (ADG)
- Taxiway Design Group (TDG)

For the purpose of selecting a design aircraft, the FAA recommends that the most demanding aircraft, or family of aircraft, which makes at least 500 operations per year at the airport be chosen as the design aircraft(s). Additionally, when an airport has more than one active runway, a design aircraft is selected for each runway. According to the approved 1997 Master Plan for the Airport, the existing design aircraft for Runway 8-26 is a light, twin-engine propeller aircraft, and the existing design aircraft for Runway 17-35 is a small corporate jet. An example of a light, twin-engine propeller aircraft is the Piper Navajo. Likewise, an example of a small corporate jet is the Lear 36.

1.13.2 RUNWAY DESIGN CODE (RDC)

To arrive at the RDC, the AAC, ADG and approach visibility minimums are combined to form the RDC of a particular runway. The RDC provides the information needed to determine certain design standards that apply. The first component, depicted by a letter, is the AAC and relates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the ADG and relates to the aircraft wingspan or tail height (physical characteristics). The final component relates to the visibility minimums expressed by runway visual range (RVR) values in feet of 1,200, 1,600, 2,400 and 4,000. The FAA AC 150/5300-13A Airport Design RDC requirements are illustrated in **Table 1-8**.

As indicated in the approved 1997 Master Plan for the Airport, the existing RDC for Runway 8-26 is B-I; the existing RDC for Runway 17-35 is C-I.

TABLE 1-8 RUNWAY DESIGN CODE

Aircraft Approach Category	Approach Speed	
Category A	less than 91 knots	
Category B	91 to 120 knots	
Category C	121 knots to 140 knots	
Category D	141 knots to 165 knots	
Category E	165 knots or more	
Airplane Design Group	Wingspan	Tail Height
Group I	< 49 feet	<20 feet
Group II	49 to 78 feet	20 to 29 feet
Group III	79 to 117 feet	30 to 44 feet
Group IV	118 to 170 feet	45 to 59 feet
Group V	171 to 213 feet	60 to 65 feet
Group VI	214 to 261 feet	66 to 79 feet
Runway Visual Range (ft.)	Flight Visibility Category (statue mile)	
4000	Lower than 1 mile but not lower than 3/4 mile	

TABLE 1-8 RUNWAY DESIGN CODE CONTINUED

2400	Lower than 3/4 mile but not lower than 1/2 mile (CAT-I PA)
1600	Lower than 1/2 mile but not lower than 1/4 mile (CAT-II PA)
1200	Lower than 1/4 mile (CAT-III PA)

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

1.13.3 TAXIWAY DESIGN GROUP (TDG)

To arrive at the best TDG, the undercarriage dimensions of the aircraft are used. The TDG design standards are based on the overall Main Gear Width (MGW) and the Cockpit to Main Gear (CMG) distance. Taxiway/taxilane width and fillet standards, and in some instances, runway to taxiway and taxiway/taxilane separation requirements, are determined by the TDG. The FAA advises that it is appropriate for a series of taxiways on an airport to be built to a different TDG standards based on anticipated use.

For airports with two or more active runways, it is advisable to design all airport elements to meet the requirements of the most demanding RDC and Taxiway Design Group (TDG). However, it may be more practical and economical to design some airport elements such as a secondary runway to standards associated with a lesser demanding RDC and TDG. For example, it would not be prudent for an air carrier airport that has a separate general aviation runway, or a crosswind runway for general aviation traffic, to design that element for air carrier traffic.

The existing taxiways at the Airport vary in width from 25’ – 75’. Taxiway A is 75’ wide, categorizing it in TDG 5. Taxiway A2 is 25’ wide, thus falling within TDG 1 standards. Finally, the remaining Taxiways A1, A3, and A4 are 35’ wide, and therefore are categorized in TDG 2. Taxiway A5 has been abandoned, and therefore does not have an assigned TDG.

1.13.4 AIRPORT REFERENCE CODE (ARC)

An Airport Reference Code (ARC) is not a design standard, rather is an airport designation that signifies the Airport’s highest Runway Design Code (RDC), minus the third (visibility) component of the RDC. The ARC is used for planning purposes only, and does not limit the aircraft that may be able to operate safely on the airport. According to the approved Master Plan from 1997, the current ARC for Bisbee Douglas International Airport is C-I. Examples of the types of design aircraft and their corresponding ARC are depicted in **Figure 1-6**.

AI

Primarily Single-Engine Propeller Aircraft, some light twins

Example Type: Cessna 172 Skyhawk

BI

Primarily Light Twin-Engine Propeller Aircraft

Example Type: Piper Navajo

BII

(<12,500 lbs)
Primarily Light Turboprops

Example Type: Beechcraft King Air

BII

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

Example Type: Cessna Citation II

A/BIII

Primarily large commuter-type aircraft

Example Type: De Havilland Dash 8

CI, DI

Primarily small and fast corporate jets

Example Type: Lear Jet 36

C/DII

Large corporate jets and regional-type commuter jets

Example Type: Gulfstream IV

C/DIII

Commercial airliners (approx. 100-200 seats)

Example Type: Boeing 737

C/DIV

Large commercial airliners (approx. 200-350 seats)

Example Type: Boeing 767

DV

Jumbo commercial airliners (approx. 350+ seats)

Example Type: Boeing 747

FIGURE 1-6 TYPICAL DESIGN AIRCRAFT AND CORRESPONDING ARC

1.13.5 SAFETY AREAS

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

- Cleared and graded and have no potentially hazardous surface variations;
- Drained so as to prevent water accumulation;
- Capable, under dry conditions, of supporting snow removal equipment, ARFF equipment and the occasional passage of aircraft without causing structural damage to the aircraft;
- Free of objects, except for objects that need to be located in the runway or taxiway safety area because of their function.

Based on a recent windshield survey, the runway safety areas for Runway 17-35 and Runway 8-26 at Bisbee Douglas International Airport are in good condition and appear to meet FAA standards. No apparent violations were noted at the time of the site visit. The taxiway safety areas were also reviewed and no apparent deficiencies were noted. However, upon further review, it was discovered that the Taxiway Object Free Area (TOFA) for Taxiway A is in violation of the taxiway centerline to a fixed or movable object standard. All three hangars (one wood-framed structure and two steel-framed structures) located along Taxiway A are located approximately 100 feet from the taxiway centerline; the standard separation requirement for taxiways designated in Taxiway Design Group 5 states that 160’ feet separation is required from the taxiway centerline to a fixed or movable object. Furthermore, the small electrical building located along Taxiway A is also approximately 100 feet from the taxiway centerline, and thus does not meet the required separation standard.

1.13.6 OBSTACLE FREE ZONE (OFZ) AND OBJECT FREE AREA (OFA)

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

1.13.7 RUNWAY PROTECTION ZONE (RPZ)

The Runway Protection Zone (RPZ) is trapezoidal in shape and centered about the extended runway centerline. The RPZ dimension for a particular runway end is a function of the type of aircraft and approach visibility minimum associated with that runway end.

For Runway 17-35 the RPZ begins 200 feet from the runway threshold and extends for 1,700 feet at both ends; the RPZ is 500 feet wide at the inner end and 1,010 feet wide at the outer end. For Runway 8-26 the RPZ begins 200 feet from the runway threshold and extends for 1,000 feet at both ends; the RPZ is 500 feet wide at the inner end and 700 feet wide at the outer end.

The land uses not recommended by FAA to be within the RPZ are residences and places of public assembly (churches, schools, hospitals, office buildings, shopping centers and other uses with similar concentrations of persons typify places of public assembly). The FAA recommends the Sponsor control the entire RPZs through fee simple ownership or avigation easements. A summary of the existing design standards for the Airport's runways and taxiways is depicted in **Table 1-9** and **Table 1-10**.

TABLE 1-9 EXISTING DIMENSIONAL STANDARDS – RUNWAYS

	Runway 17-35		Runway 8-26	
	Existing Dimension	Standard	Existing Dimension	Standard
Runway Design Code (RDC)	--	C-I	--	B-I
Runway length	6,430'	--	4,966'	--
Runway width	100'	100'	60'	60'
Runway Safety Area (RSA) width	500'	500'	120'	120'
Runway Safety Area (RSA) length beyond runway end	1,000'	1,000'	240'	240'
Runway Object Free Area (ROFA) width	800'	800'	400'	250'
Runway Object Free Area (ROFA) length beyond runway end	1,000'	1,000'	240'	240'
Runway Obstacle Free Zone (ROFZ) width	400'	400'	250'	250'
Runway Obstacle Free Zone (ROFZ) length beyond runway end	200'	200'	200'	200'
Runway Protection Zone (RPZ) length	1,700'	1,700'	1,000'	1,000'
Runway Protection Zone (RPZ) inner width	500'	500'	500'	500'
Runway Protection Zone (RPZ) outer width	1,010'	1,010'	700'	700'

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

TABLE 1-10 EXISTING DIMENSIONAL STANDARDS – TAXIWAYS

Taxiway Design Group 1 (TDG) Taxiway A-2		
Taxiway Width	25’	25'
Taxiway Safety Area (TSA) width	49’	49'
Taxiway Object Free Area (TOFA) width	89’	89'
Taxiway Centerline to Fixed or Movable Object	44.5’	44.5'
Taxiway Design Group 2 (TDG) Taxiway A-1, A-3 and A-4		
Taxiway Width	35’	35'
Taxiway Safety Area (TSA) width	79’	79'
Taxiway Object Free Area (TOFA) width	89’	89'
Taxiway Centerline to Fixed or Movable Object	65.5’	65.5'
Taxiway Design Group 5 (TDG) Taxiway A		
Taxiway Width	75’	75'
Taxiway Safety Area (TSA) width	214’	214'
Taxiway Object Free Area (TOFA) width	320’	320'
Taxiway Centerline to Fixed or Movable Object	**100'**	160'

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

1.14 FEDERAL AVIATION REGULATION (FAR) PART 77 IMAGINARY SURFACES

FAR Part 77 establishes several imaginary surfaces that are used as a guide to provide a safe and unobstructed operating environment for aviation. These surfaces, which are typical for civilian airports, are shown in **Figure 1-7**. The primary, approach, transitional, horizontal and conical surfaces identified in FAR Part 77 are applied to each runway at both existing and new airports on the basis of the type of approach procedure available or planned for that runway and the specific FAR Part 77 runway category criteria. For the purpose of this section, a visual-utility runway is a runway that is constructed for and intended for use by propeller driven aircraft of a maximum gross weight of 12,500 pounds or less. A larger than utility runway is a runway constructed for an intended for the use of aircraft of a maximum gross weight of 12,500 pounds or greater. A visual runway is a runway intended for the operation of aircraft weighing greater or less than 12,500 pounds and using only visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan or by any planning document submitted to the FAA by competent authority. A non-precision instrument runway is a runway with an approved or planned straight-in instrument approach procedure.

Runway 17-35 and Runway 8-26 are the two runways currently in use at Bisbee Douglas International Airport. Runway 17 is classified as a greater than utility non-precision instrument runway and has a RNAV (GPS) and a VOR/DME non-precision instrument approach. Runway 35 is classified as a greater than utility visual runway.. Runway 8-26 is a visual-utility runway and is used for Visual Flight Rules (VFR) operations during daylight hours only. The existing FAR Part 77 surfaces at Bisbee Douglas International Airport include a non-precision approach,

greater than utility runway i.e. (>12,500 pounds) for Runway 17, a greater than utility runway visual approach for Runway 35, and a visual-utility approach for Runway 8-26. The FAR Part 77 imaginary surfaces for these classifications are further described below.

1.14.1 Primary Surface

The primary surface is an imaginary surface of specific width, longitudinally centered on a runway. The primary surface extends 200 feet beyond each end of the paved surface of runways, but does not extend past the end of soft field runways. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width is 1,000 feet for precision runways, 500 feet for visual larger than utility runways, and 250 feet for visual-utility runways.

1.14.2 Approach Surface

The approach surface is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of the runway based upon the type of approach available or planned for that runway, with approach gradients of 20:1, 34:1 or 50:1. The inner edge of the surface is the same width as the primary surface. It expands uniformly to a width corresponding to the FAR Part 77 runway classification criteria. At Bisbee Douglas International Airport, these dimensions are 500 feet by 3,500 feet by 10,000 feet, with a 34:1 approach surface gradient for Runway 17, 500 feet by 1,500 feet by 5,000 feet, with a 20:1 approach surface gradient for Runway 35, and 250 feet by 1,250 feet by 5,000 feet, with a 20:1 approach surface gradient for Runway 8-26.

1.14.3 Transitional Surface

The transitional surfaces extend outward and upward at right angles to the runway centerlines from the sides of the primary and approach surfaces at a slope of 7:1 and end at the horizontal surface.

1.14.4 Horizontal Surface

The horizontal surface is considered necessary for the safe and efficient operation of aircraft in the vicinity of an airport. As specified in FAR Part 77, the horizontal surface is a horizontal plane 150 feet above the established airport elevation. The airport elevation is defined as the highest point of an airport's useable runways, measured in feet above mean sea level. The perimeter is constructed by arcs of specified radius from the center of each end of the primary surface of each runway. The radius of each arc is 5,000 feet for runways designated as utility or visual and 10,000 feet for all other runways.

1.14.5 Conical Surface

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

1.14.6 Summary of Dimensional Criteria

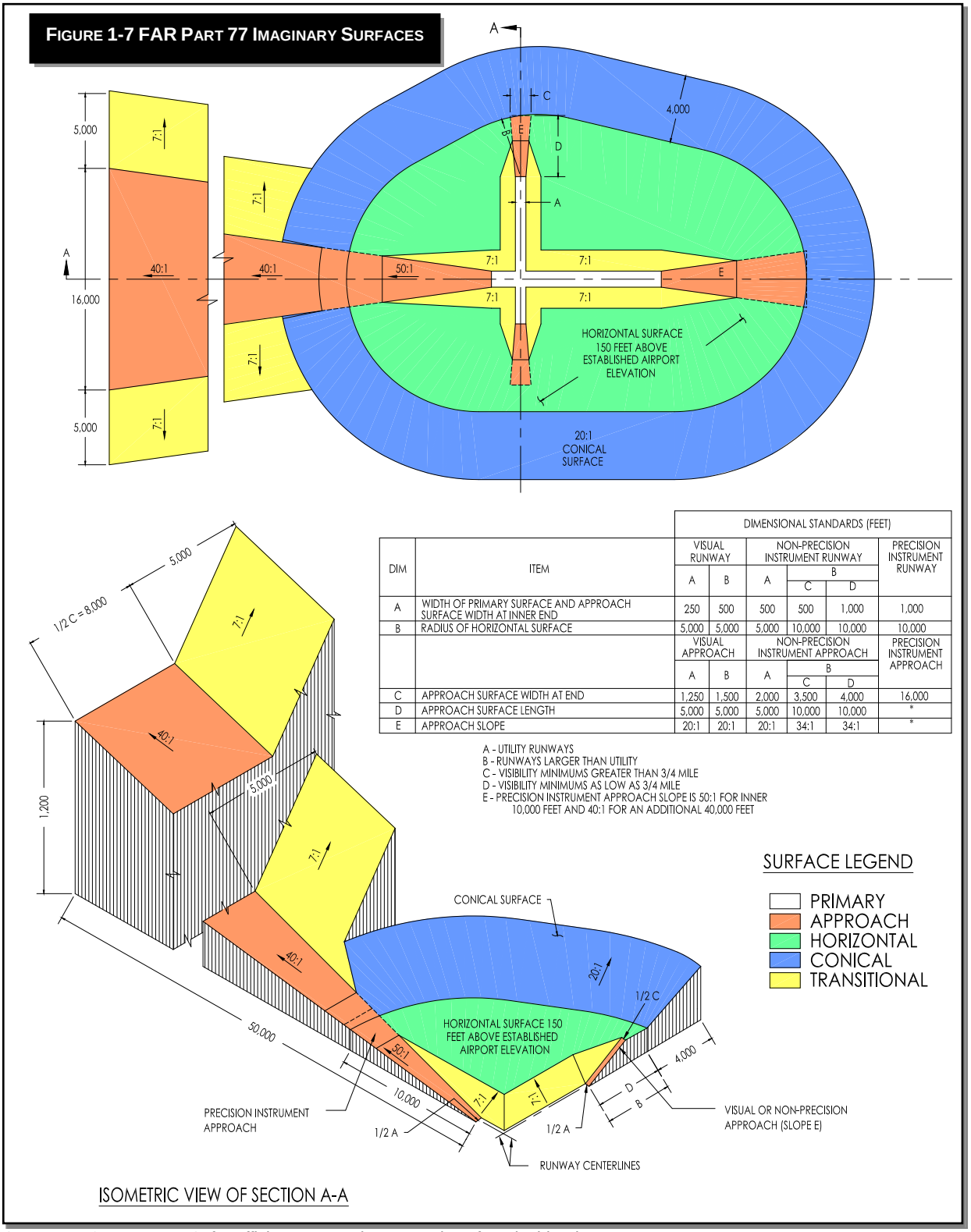
The FAR Part 77 imaginary surfaces described above for the Bisbee Douglas International Airport are summarized in **Table 1-11**.

TABLE 1-11 FAR PART 77 IMAGINARY SURFACES

	Runway 17-35	Runway 8-26
Primary Surface width	500’	250’
Primary Surface beyond RW end	200’	200’
Approach Surface dimensions	RW 17 (500’ x 3,500’ x 10,000’) RW 35 (500’ x 1,500’ x 5,000’)	250’ x 1,250’ x 5,000’
Approach Surface slope	RW 17 (34:1) RW 35 (20:1)	20:1
Transitional Surface slope	7:1	7:1

Source: 14 CFR, Part 77 Safe, Efficient Use, and Preservation of Navigable Airspace

FIGURE 1-7 FAR PART 77 IMAGINARY SURFACES



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

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

Source: 14 CFR, Part 77 Safe, Efficient Use, and Preservation of Navigable Airspace

1.15 AIRSPACE CHARACTERISTICS

The National Airspace System consists of various classifications of airspace that are regulated by the FAA. Airspace is either controlled or uncontrolled. Pilots flying in controlled airspace are subject to Air Traffic Control (ATC) and must follow either Visual Flight Rules (VFR) or Instrument Flight Rules (IFR) requirements. These requirements include combinations of operating rules, aircraft equipment and pilot certification and vary depending on the Class of airspace. These rules are described in Federal Aviation Regulations (FAR) Part 71, Designation of Class A, Class B, Class C, Class D and Class E Airspace Areas; Airways; Routes; and Reporting Points and FAR Part 91, General Operating and Flight Rules. A graphical representation of the different airspace classes is shown in **Figure 1-8**. General definitions of the classes of airspace are provided below:

- **Class A Airspace**: Airspace from 18,000 feet MSL up to and including Flight Level (FL) 600.
- **Class B Airspace**: Airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of IFR operations or passenger enplanements.
- **Class C Airspace**: Generally, airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower.
- **Class D Airspace**: Airspace from the surface up to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports with an operational control tower.
- **Class E Airspace**: Generally, controlled airspace that is not Class A, Class B, Class C or Class D.
- **Class G Airspace**: Generally, uncontrolled airspace that is not designated Class A, Class B, Class C, Class D or Class E.
- **Victor Airways:** These airways are low altitude flight paths between ground based VHF Omnidirectional Range receivers (VORs).

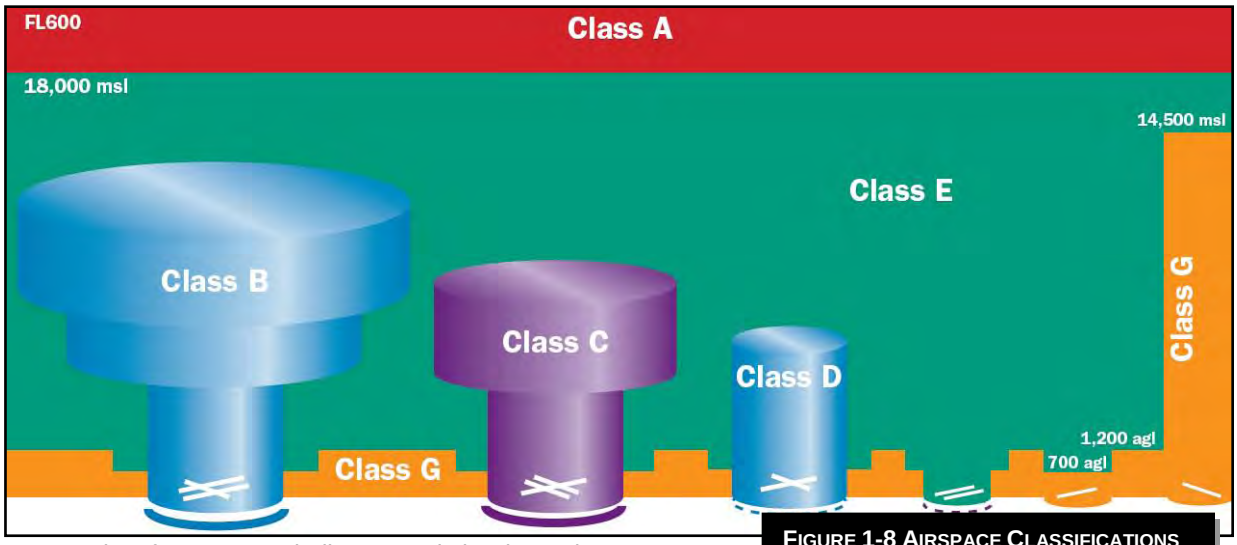


FIGURE 1-8 AIRSPACE CLASSIFICATIONS

Source: Aircraft Owners and Pilots Association (AOPA) 2009

Bisbee Douglas International Airport is situated under Class E airspace starting at the surface and continuing up to 18,000 feet MSL. Pilots should check Notices to Airmen (NOTAMs) or the Airport/Facility Directory (A/FD) for Class E (surface) effective hours.

The traffic patterns at Bisbee Douglas International Airport are standard left traffic for Runway 17-35 and Runway 8-26. Traffic Pattern Altitude (TPA) is 5,150 feet MSL (1,000 feet AGL) for all aircraft. There are currently no noise abatement procedures in place at the Airport.

A Victor Airway is a special kind of Class E airspace and is like a “highway” in the sky. Many powered aircraft follow these routes. The routes connect VOR stations that radiate a signal in all directions. These stations are usually located at or near airfields. North-South Victor Airways have odd numbers while East-West airways have even numbers. These federal or Victor Airways are used by both IFR and VFR aircraft. The airspace set aside for a Victor Airway is eight miles wide with a floor at 1,200 feet AGL and extend up to FL 180 (18,000 feet MSL).

Victor Airway 66 (V-66) is a highway in the sky that connects the Douglas (DUG) VORTAC located on the airfield with the Tucson (TUS) VORTAC located approximately 79 nautical miles (nm) northwest of the Airport at Tucson International Airport. Increased air traffic can be expected in and around Victor Airways and the originating and terminating VOR.

The location of the Airport and the various airspace classifications which surround it can be seen on the VFR Phoenix Sectional Chart in **Figure 1-9**.

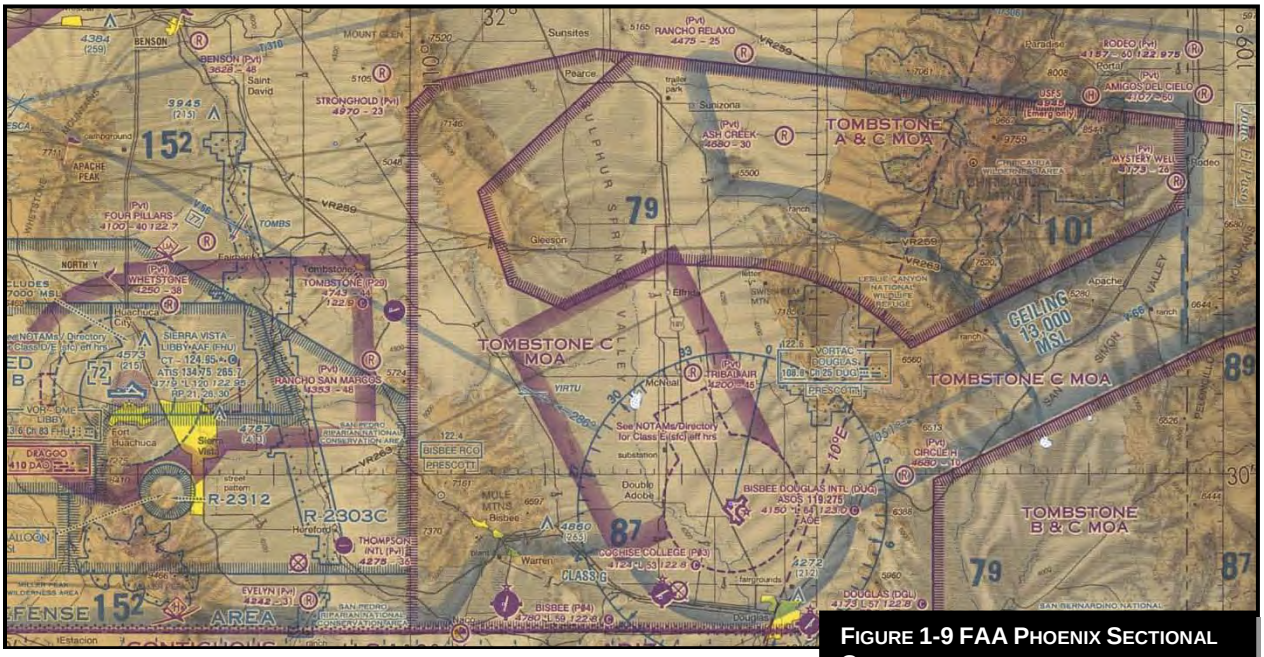


FIGURE 1-9 FAA PHOENIX SECTIONAL CHART

1.15.1 AIRSPACE JURISDICTION

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

1.15.2 AIRSPACE RESTRICTIONS

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

Bisbee Douglas International Airport is located under the Tombstone C MOA. The Tombstone C MOA covers the surrounding area and includes the airspace from 14,500 feet MSL to 18,000 feet MSL. The Tombstone C MOA is active Monday through Friday from 6:00 a.m. until 9:00 p.m. The Tombstone A and B MOAs are located north and east of the Airport and include the airspace from 500 feet AGL to 14,500 feet MSL. The Tombstone A and B MOAs are active

Monday through Friday from 6:00 a.m. until 9:00 p.m. The controlling agency for the MOAs is Albuquerque Center. The MOAs are routinely scheduled for activation on weekends. Above Tombstone MOA is an Air Traffic Control Assigned Airspace (ATCAA) which extends the Tombstone MOA up to 51,000 MSL. The Tombstone MOA/ATCAA may be scheduled active at other times by issuing a Notice to Airmen (NOTAM).

Aerial refueling (AR) occurs above Bisbee Douglas International Airport and may be scheduled independent of Tombstone MOA activation. AR-639A is authorized for refueling between 13,000 and 28,000 feet MSL and AR-639 is authorized for refueling between 16,000 and 28,000 feet MSL. Albuquerque Center is the controlling authority for both. The Airport may also be over flown by VFR or IFR military aircraft at fairly low altitudes transitioning to/from Sierra Vista Municipal Airport-Libby Army Airfield and Tombstone MOA.

The Airport is also located approximately 20 nm east of the R-2303C restricted airspace. R-2303C is part of restricted airspace that surrounds the U.S. Army Post Fort Huachuca and includes the airspace from 15,000 feet MSL to 30,000 feet MSL.

Bisbee Douglas International Airport is located approximately 8 nm from the U.S. border with Mexico. Aircraft flying into the U.S. are required to follow the procedures of the Air Defense Identification Zone (ADIZ). An ADIZ is an area of airspace defined by a nation where an aircraft must identify themselves and their location in the interest of national security. An aircraft entering an ADIZ is required to contact ATC and state their planned course, destination and any other information about their trip through the ADIZ.

In addition to MOAs and Restricted airspace, Military Training Routes (MTR) pose a potential hazard to civilian aircraft. The MTR program is a joint venture by the FAA and the Department of Defense (DOD). MTRs are mutually developed for use by the military to conduct low-altitude, high-speed training. Increased vigilance is recommended for pilots operating in the vicinity of these training routes. There are two MTRs in the vicinity of the Bisbee Douglas International Airport. Visual MTR (VR 263) is located approximately 13 nm northwest of the Airport and runs in a northeast/southwest orientation. Visual MTR (VR 259) is located approximately 16 nm north of the Airport and runs in an east/west orientation.

Special Conservation Areas are also located in the vicinity of the Airport. This type of airspace surrounds many national parks, wildlife refuges and other noise sensitive areas. Pilots are requested to avoid flight below 2,000 feet AGL in these areas. The San Pedro Riparian National Conversation Area is located approximately 25 nm west of the Airport, and the Leslie Canyon National Wildlife Refuge is located approximately 16 nm northeast of the Airport. Additionally, the Chiricahua Wilderness Area is located approximately 35 nm northeast of the Airport.

1.16 RUNWAY WIND COVERAGE

Wind direction and speed determine the desired alignment and configuration of the runway system. Aircraft land and takeoff into the wind and therefore can tolerate only limited crosswind components (the percentage of wind perpendicular to the runway centerline). The ability to land and takeoff in crosswind conditions varies according to pilot proficiency and aircraft type.
FAA Advisory Circular 150/5300-13, Airport Design, recommends that a runway should yield 95 percent wind coverage under stipulated crosswind components. If one runway does not meet this 95 percent coverage, then construction of an additional runway may be advisable. The crosswind component of wind direction and velocity is the resultant vector, which acts at a right

angle to the runway. It is equal to the wind velocity multiplied by the trigonometric sine of the angle between the wind direction and the runway direction. The allowable crosswind component for each Runway Design Code is shown in **Table 1-12**. The allowable crosswind component and corresponding wind coverage percentage for Bisbee Douglas International Airport is shown in **Table 1-13**.

TABLE 1-12 CROSSWIND COMPONENT

Allowable Crosswind in Knots	Airport Reference Code
10.5 knots	A-I & B-I
13 knots	A-II & B-II
16 knots	A-III, B-III & C-I through D-III
20 knots	A-IV through D-VI, E-I through E-VI

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

Historical wind data from the Douglas ASOS located on the airfield at Bisbee Douglas International Airport was used to create a wind rose and corresponding wind coverage data as seen in **Figure 1-10**. The existing runway configuration provides 99.0 percent crosswind coverage for 10.5 knots and 99.8 percent for 13.0 knots. This is more than the recommended 95 percent coverage for A-I and B-I aircraft and meets the recommended coverage for A-II and B-II aircraft.

TABLE 1-13 WIND COVERAGE – ALL WEATHER

Runway	Crosswind (knots)	Wind Coverage
17-35	10.5	87.6%
17-35	13.0	92.8%
8-26	10.5	91.2%
8-26	13.0	95.1%
Combined	10.5	99.0%
Combined	13.0	99.8%

Source: Bisbee Douglas International Airport ASOS
Note: KDUG ASOS
4,150' MSL
Time Period: 1999-2008
78,405 Wind Observations

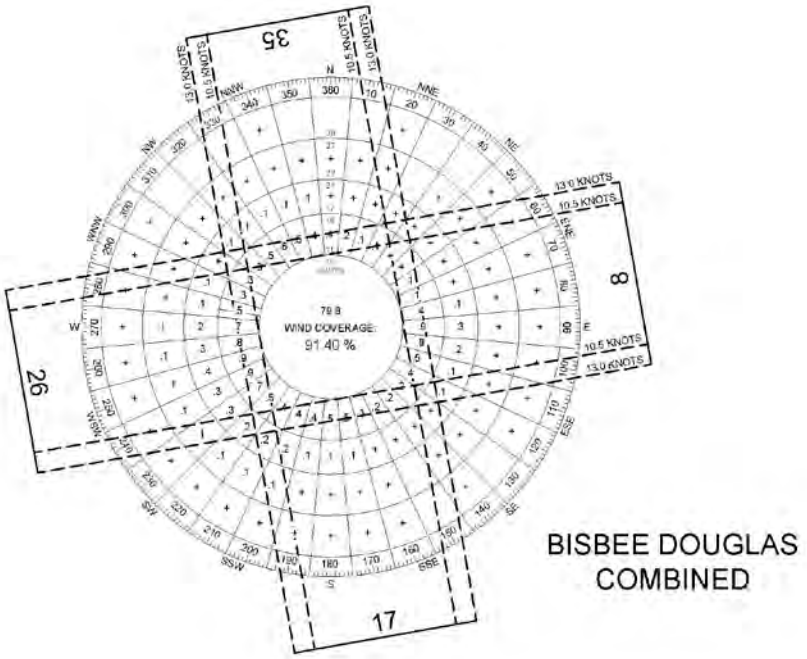


FIGURE 1-10 WIND ROSE

1.17 EXISTING AIRSIDE FACILITY INVENTORY

The definition of airside is that portion of the airport, typically within the public safety and security fenced perimeter, in which aircraft, support vehicles and equipment are located; and in which aviation-specific operational activities take place. The inventory of airside facilities provides the basis for the airfield demand/capacity analysis and the determination of any facility change requirements that might be identified. The various airside facilities are depicted on **Exhibit A** at the end of this section.

1.17.1 RUNWAYS

There are two active runways at Bisbee Douglas International Airport: Runway 17-35 and Runway 8-26. Runway 17-35 is 6,430 feet long, 100 feet wide, oriented in a north-south direction and serves as the primary runway. Runway 17-35 is constructed of asphalt; it also had a rubberized friction seal coat applied in 2013. The existing pavement strength ratings, or weight bearing capacity, for Runway 17-35 are 30,000 lbs. gross weight single-wheel landing gear, 160,000 lbs. gross weight dual-wheel landing gear, and 250,000 lbs. gross weight dual-tandem wheel landing gear. Pavement markings and lighting for Runway 17-35 are discussed in Section 1.17.5. Runway 17-35 is in good condition.

Runway 8-26 is 4,966 feet long, 60 feet wide, oriented in an east-west direction and serves as the crosswind runway. According to the FAA's *Airport Master Record,* Form 5010-1 for the

Airport, four foot high brush has been noted 200 feet from the end of Runway 8, and 100 feet from the end of Runway 26. The runway is constructed of asphalt, and has a 12,500 lbs. gross weight single-wheel pavement strength rating/weight bearing capacity. Runway 8-26 also has paved overruns that approximately 1,000 feet long on both runway ends. Pavement markings and lighting for Runway 8-26 are discussed in Section 1.17.5. Runway 8-26 is in fair condition.

An interesting design feature of the Airport is the placement of the Runways in relation to each other. The end of Runway 17 is adjacent to Runway 8-26, located nearly at the mid-point of Runway 8-26. There is threshold lighting and a hold bar pavement marking located at the end of Runway 17's threshold, thus technically the two runways do not intersect. They essentially form a "T" shape. In order to access the end of Runway 17, one must use Runway 8-26 as a taxiway. As a result of this configuration, the Runway Safety Area for Runway 17-35 crosses Runway 8-26.

1.17.2 Taxiway System

Taxiway A is the primary taxiway providing access to both ends of Runway 17-35. Taxiway A is 75 feet wide. Taxiway A begins at the far south end of the facility near the fuel service facility and terminal building and runs north the entire length of the airside/landside boundary, eventually curving to the northeast near three of the hangars. The southern portion of Taxiway A closest to the terminal building is in good condition (see **Figure 1-12**). However, the remainder of Taxiway A is in fair condition (see **Figure 1-12**). Taxiways A-1, A-2, A-3, and A-4 serve as runway entrance/exit taxiways and connect Runway 17-35 with Taxiway A. Taxiway A-5 has been abandoned. Taxiway A-2 was recently (2013) reconstructed and is in excellent condition; it is 25' wide. Taxiway A-1, A-3, and A-4 are all 35 feet wide. Taxiway A-3 is in good condition, Taxiway A-4 is in fair condition, and Taxiway A-1 is in poor condition (see **Figure 1-12**). It is important to note that currently no taxiway has access to either end of runway 8-26. There are currently two angled taxiway exits located at approximately the midpoint of Runway 8-26 that access Taxiway A-4. It was observed that the taxiway pavement markings on Taxiway A-4 were faded in some locations, and no centerline is present.

1.17.3 Aircraft Apron

The aircraft apron is constructed of asphalt and encompasses approximately 31,000 square yards. According to airport operations staff, there are 10 tiedown spaces for based and transient aircraft. The portion of the apron closest to the terminal building and fuel farm is in good condition (see **Figure 1-12**). However, the portion of the apron located further from the terminal building near Runway 35 is in poor condition; large ruts and loose aggregated were observed. A helicopter parking area is located to the southwest of the main apron and is in fair condition. The helicopter parking area is also constructed of asphalt and measures approximately 50 feet in diameter.

1.17.4 Pavement Condition Index (PCI)

According to the Arizona Department of Transportation (ADOT), the airport system in Arizona is a multimillion dollar investment of public and private funds that must be protected and preserved. State aviation fund dollars are limited, and the State Transportation Board recognizes the need to protect and extend to the maximum amount the useful life of the airport system's pavement. The Arizona Pavement Preservation Program (APPP) has been established to assist in the preservation of the Arizona airport system infrastructure. Every year ADOT's Aeronautics Group, using the Airport Pavement Management System (APMS), identifies airport pavement maintenance projects eligible for funding for the upcoming five years.

These projects will appear in the state's Five-Year Airport Development Program. Once a project has been identified and approved for funding by the State Transportation Board, the airport sponsor may elect to accept a state grant for the project and not participate in the APPP, or the airport sponsor may sign an inter-government agreement (IGA) with the Aeronautics Group to participate in the APPP.

ADOT also conducts pavement surveys using the procedure as documented in the following publications:

1 - The Federal Aviation Administration's (FAA's) Advisory Circular 150/5380-6B, Guidelines and Procedures for Maintenance of Airport Pavements.

2 - The American Society for Testing and Material's (ASTM's) standard D-5340, Standard Test Method for Airport Pavement Condition Index Surveys.

The PCI procedure is the standard used by the aviation industry to visually assess pavement condition. It was developed to provide engineers with a consistent, objective, and repeatable tool to represent the overall pavement condition. During a PCI survey, visible signs of deterioration within a selected sample area are identified, recorded, and analyzed.

According to ADOT, the results of a PCI evaluation provide an indication of the structural integrity and functional capabilities of the pavement. However, it should be recognized that during a PCI inspection only the top layer of the pavement is examined and that no direct measure is made of the structural capacity of the pavement system. Nevertheless, the PCI does provide an objective basis for determining maintenance and repair needs as well as for establishing rehabilitation priorities in the face of constrained resources. Furthermore, the results of repeated PCI monitoring over time can be used to determine the rate of deterioration and to estimate the time at which certain rehabilitation measures can be implemented.

Pavement defects are characterized in terms of type of distress, severity level of distress, and amount of distress. This information is then used to develop a composite index (PCI number) that represents the overall condition of the pavement in numerical terms, ranging from 0 (failed) to 100 (excellent). In general terms, pavements above a PCI of 85 that are not exhibiting significant load-related distress will benefit from routine maintenance actions, such as periodic crack sealing or patching. Pavements with a PCI of 56 (65 for PCC pavements) to 85 may require pavement preservation, such as a surface treatment, thin overlay, or PCC joint resealing. Often, when the PCI is 55 or less, major rehabilitation, such as a thick overlay, or reconstruction are the only viable alternatives due to the substantial damage to the pavement structure. **Figure 1-11** depicts how the appropriate repair type varies with the PCI of a pavement section.

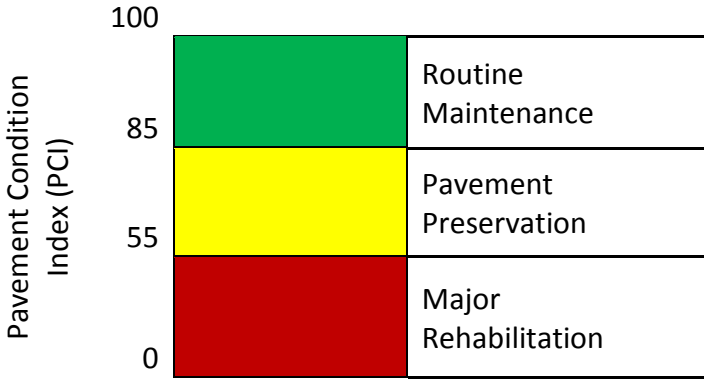


FIGURE 1-11 PCI REPAIR SCALE

For Bisbee Douglas International Airport, **Figure 1-12** depicts the most recent PCI inspection reported in the 2010 APMS. ADOT is in the process of updating the PCI for all airports in Arizona and the preliminary findings should be released in early 2014.

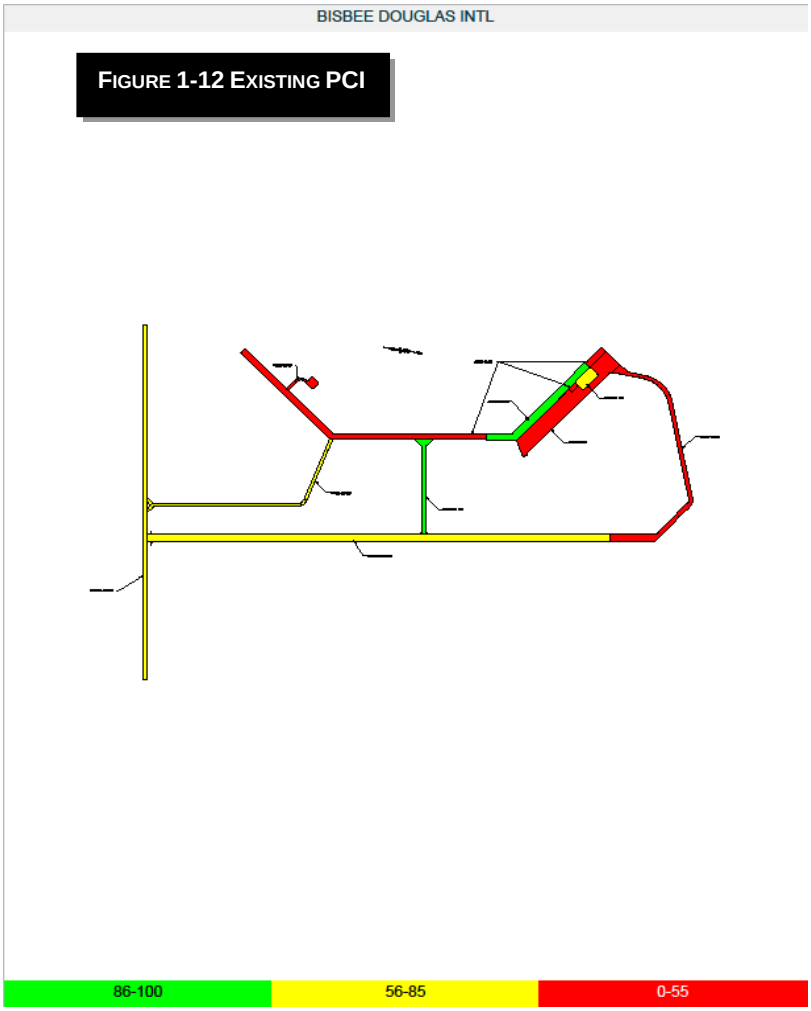


FIGURE 1-12 EXISTING PCI

1.17.5 Airfield Lighting, Signage and Visual Aids

Runway 17-35 is equipped with Medium Intensity Runway Lights (MIRL) that appear to be in good condition. A 2-box VASI (Visual Approach Slope Indicator) is located to the left of Runway 17. The unit is an older model VASI and is in fair condition. Runway 17-35 is equipped with threshold lights at the end of each runway. However, Runway 17 has four threshold lights per side of the runway, while Runway 35 only has three threshold lights per side of the runway. Both the runway edge lights and VASI can be controlled by pilots by using the Common Traffic Advisory Frequency (CTAF) for operation at night. Runway 17-35 has non-precision markings that are in good condition. Runway 8-26 is used for VFR operations only during daylight hours. As such, it was noted that the runway edge lights for Runway 8-26 have been abandoned. Runway 8-26 has basic markings that are in poor condition. The runway designation numbers and centerline are highly faded.

The majority of Taxiway A is equipped with Medium Intensity Taxiway Lights (MITL). The overall condition of the lights is good. However, it was noted that around the mid-point of Taxiway A, the MITL ceased. The remainder of Taxiway A does not have any edge lighting. Taxiway A-2 is equipped with MITL that were recently installed in 2013; these lights are in excellent condition. A representation of the MITL located on the airfield is depicted in **Figure 1-13**.

Figure 1-13 Medium Intensity Taxiway Edge Light

Taxiways A-1, A-3, and A-4 are marked using reflectors; the reflectors are in fair to good condition. All taxiway pavement edge markings and centerlines (with the exception of Taxiway A-2) are in fair to poor condition due to fading.

Lighted airfield destination signs are installed at some of the connector taxiways. These signs are in good condition as depicted in **Figure 1-14**. Other unlighted directional signs are also located near the taxiway entrances and are also in good condition as depicted in **Figure 1-15**.

FIGURE 1-14 LIGHTED DIRECTIONAL SIGN

FIGURE 1-15 RETRO-REFLECTIVE DIRECTIONAL SIGN

It was noted that there was no signage on Runway 8-26 indicating the approach to Runway 17-35. It is suggested that signage be installed for safety reasons. Furthermore, the runway hold sign for Runway 8-26 on Taxiway A-4 is faded and cracked and is in poor condition as depicted in **Figure 1-16**.

FIGURE 1-16 RETRO-REFLECTIVE RUNWAY HOLD SIGN

The rotating beacon is located on top of a wood framed hangar on the east side of the airport near the terminal building. The beacon utilizes alternating white-green lenses, indicating the Airport is a lighted land airport. The beacon appears to be in good condition, although it is outdated and should be replaced with a more energy efficient unit. The existing wind cone and segmented circle are located on the south portion of the airport property near Taxiway A-1. The wind cone is lighted and is in fair condition; the cone fabric is slightly faded. The segmented circle is in poor condition; most of it is not visible due to the overgrown vegetation and the paint was faded.

1.17.6 Weather Reporting Systems

Automated airport weather stations are automated sensor suites which are designed to serve aviation and meteorological observing needs for safe and efficient aviation operations, weather forecasting and climatology. There are several types of automated airport weather reporting stations. These include the Automated Weather Observing System (AWOS), the Automated Surface Observing System (ASOS), and the Automated Weather Sensor System (AWSS). During the inventory of Bisbee Douglas International Airport, it was observed that the airport has an Automated Surface Observing System (ASOS). These units are operated and controlled cooperatively in the United States by the National Weather Service (NWS), the FAA and the Department of Defense (DOD). These systems generally report at hourly intervals, but also report special observations if weather conditions change rapidly and cross aviation operation thresholds. They generally report all the parameters of the AWOS-III (barometric pressure, altimeter setting, wind speed and direction, temperature and dew point in degrees Celsius, density altitude, visibility, and cloud ceiling), while also having the additional capabilities of reporting temperature and dew point in degrees Fahrenheit, present weather, icing, lightning, sea level pressure and precipitation accumulation. Data dissemination is usually via an automated VHF airband radio frequency (108-137 MHz) at each airport, broadcasting the automated weather observation. This is often via the Automatic Terminal Information Service (ATIS). Most automated weather stations also have discrete phone numbers to retrieve real-time observations over the phone or through a modem. The radio frequency for the Bisbee Douglas ASOS is 119.275, and the phone number is (520) 364-7208. The ASOS is located on the south-west portion of airport property, closest to the end of Runway 35, near Highway 191. There is an access road from Highway 191 to the ASOS station that can be reached through a locked gate. The ASOS is in good working condition.

1.17.7 Navigational Aids

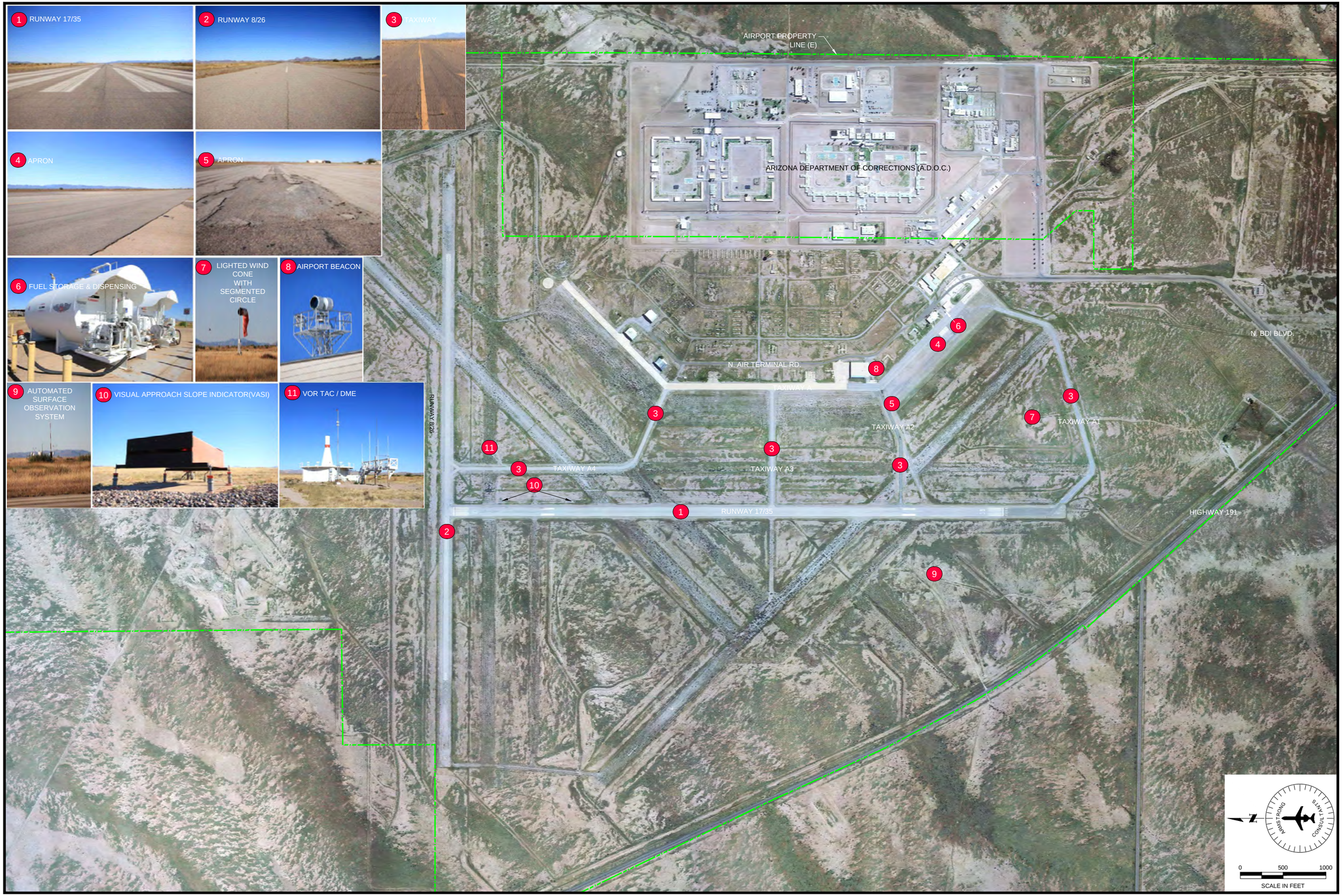
A Navigational Aid (NAVAID) is any ground based visual or electronic device used to provide course or altitude information to pilots. NAVAIDs include Very High Omnidirectional Range (VORs), Very High Frequency Omnidirectional Range with Tactical Information (VOR-TACs), Nondirectional Beacons (NDBs) and Tactical Air Navigational Aids (TACANs), as examples. The Douglas VORTAC is located on the north-central part of the airfield near the end of Runway 17. The Cochise VORTAC is located at Cochise County Airport approximately 49 nm miles north. The Libby VOR/DME is located at Sierra Vista Municipal / Libby Army Airfield approximately 39 nm west. The Dragoo NDB is also located at Sierra Vista Municipal / Libby Army Airfield.

1 RUNWAY 17/35
2 RUNWAY 8/26
3 TAXIWAY

4 APRON
5 APRON

6 FUEL STORAGE & DISPENSING
7 LIGHTED WIND CONE WITH SEGMENTED CIRCLE
8 AIRPORT BEACON

9 AUTOMATED SURFACE OBSERVATION SYSTEM
10 VISUAL APPROACH SLOPE INDICATOR(VASI)
11 VOR TAC / DME


AIRPORT PROPERTY LINE (E)
ARIZONA DEPARTMENT OF CORRECTIONS (A.D.O.C.)
N. BDI BLVD.
N. AIR TERMINAL RD.
TAXIWAY A
TAXIWAY A1
TAXIWAY A2
TAXIWAY A3
TAXIWAY A4
RUNWAY 17/35
RUNWAY 8/26
HIGHWAY 191
ARMSTRONG CONSULTANTS
0 500 1000
SCALE IN FEET

1.18 EXISTING LANDSIDE FACILITY INVENTORY

The definition of landside is that portion of the airport designed to serve passengers or other airport users typically located outside of the public safety and security fenced perimeter; landside facilities include terminal buildings, parking areas, entrance roadways, and other buildings that may not necessarily conduct aviation related activities. The inventory of landside facilities provides the basis for the airfield demand/capacity analysis and the determination of any facility change requirements that might be identified. The various landside facilities are depicted on **Exhibit B** at the end of this section.

1.18.1 TERMINAL BUILDING

A 6,250 square foot terminal building is located on the southeast portion of the airfield, along the east side of the aircraft parking apron. The terminal building was originally built in the early 1940's, and remodeled in late 1949. The space includes a large public seating area, restrooms, a pilot lounge, a space for a restaurant (although one is currently not in operation), and several offices. The airport operations staff, as well as three other airport tenants, use the building for their office space. Besides airport operations, the U.S. Forest Service, the USDA's Natural Resource Conservation Service, and the Arizona State Forestry Division are located in the building. Although dated, the building structure appears to be in good condition, but could use renovation in order to bring it up to current standards.

1.18.2 AIRPORT SERVICES / FIXED BASE OPERATOR

A Fixed Base Operator (FBO) is usually a private enterprise that leases land from the airport sponsor on which to provide services to based and transient aircraft. The extent of the services provided varies from airport to airport; however, these services frequently include aircraft fueling, minor maintenance and repair, aircraft rental and/or charter services, flight instruction, pilot lounge and flight planning facilities and aircraft tiedown and/or hangar storage. There is currently no FBO present at Bisbee Douglas International Airport; however, the following services are provided by the County: weather briefing and flight planning, pilot lounge, and restrooms. Again, these facilities are in good condition, but should be updated and/or remodeled.

1.18.3 HANGARS

There are currently four original 1940's built hangars still in use at the Airport. The first hangar is located to the east of the Taxiway A and A-2 intersection. It is approximately 40,000 square feet and is a wood frame structure. The airport rotating beacon is located on the roof of this hangar. The hangar is in fair to poor condition. A second hangar is located further north on Taxiway A near the Taxiway A-4 intersection. This hangar is approximately 12,500 square feet and is a steel frame structure. The frame of the hangar is in good condition, but the metal siding is in poor condition. A large depression in the pavement outside of the hangar doors was noted; this type of condition contributes to poor drainage during any type of heavy precipitation and could possibly overflow into the hangar. A third hangar is also located several hundred feet from the second one, towards the end of Taxiway A. It is approximately 12,500 square feet and is also a steel framed structure. Again, the steel frame appears is in good condition, but the metal siding is in poor condition. It was observed that one airport tenant is conducting routine aircraft maintenance from this hangar. Several aircraft are inside the hangar, but according to the tenant, none are actually based on the airfield. The fourth remaining hangar is located several hundred feet behind the third hangar. It is approximately 12,500 square feet and is also a steel frame structure. This hangar is overall in good condition, more so than the other two.

1.18.4 Other Miscellaneous Buildings

There are several other buildings located on the landside portion of the airport that should be noted. Most of the buildings do not serve any aeronautical type of activity or function. For example, there is a large rectangular building immediately to the east of the airport access road when approaching the terminal building. This building appears to be original to the airfield and is abandoned and boarded up. The condition of the building is poor and more than likely should be removed. Next to this building is another large rectangular shaped building. Although it also appears to be original to the airfield, it is in better condition than the aforementioned building. A large portion of the building is empty, and looks as if it had plans to be remodeled, but work was never completed. It was observed that some of the Arizona State Forestry equipment is being stored in an area where there is a covered awning attached to the building. The other half of the building is currently being occupied by Ames Diversified Services, LLC. This is a company who offers animal cremation services to the Animal Health Care Center, the local animal shelter for the city of Douglas and parts of southeastern Arizona, as well as to participating veterinary offices throughout Arizona. About 50-100 feet from the terminal building, there is an old military housing/barracks building that appears to be currently used for storage. The building is in poor condition and does not appear to be inhabitable. At approximately mid-field near Taxiway A, there is a small concrete block building that houses high-voltage equipment. It appears from the overhead power lines that this is the source of power for the nearby hangars. From the outside the building appears to be in good condition. Finally, there are two newer steel frame storage sheds located on the southeast portion of the airfield adjacent to the Ames Diversified Services building. They are in fair to poor condition.

1.18.5 Access Roads and Signage

Bisbee Douglas International Airport can be accessed from Highway 191 from either direction. The main airport access road is well marked with a large white sign with the name of the airport on it. Two other signs are also located at the main entrance road; one for the USDA Natural Resource Conservation Service and one for the Arizona Department of Corrections State Prison Complex – Douglas. A cattle guard is also present at the entrance to the main airport access road. The access road itself is well paved and in good condition. The access road terminates at the parking area for the airport terminal.

1.18.6 Automobile Parking

There are approximately six paved parking spaces located on the landside entrance to the terminal building. The asphalt pavement is in good condition.

1.18.7 Utilities

Electricity, water, sewer, refuse, telephone, and Internet services are available at the airport. Electrical service is provided by Arizona Public Service (APS). The County provides the water. The city of Douglas provides sewer service, and Waste Management Disposal provides refuse collection. Centurylink is the telephone utility provider and Transworld Network Services provides Internet service.

1.18.8 Fencing and Security

At present, there is no perimeter fencing at Bisbee Douglas International Airport separating the airside from the landside facilities. Access to the aircraft apron, and essentially all other airside locations on the airfield like the taxiways, runways and hangars is easily accessible from the main airport access road. There is a small chain link fence that surrounds the terminal building, but again, this does not prevent access to the apron. The only fencing that is apparent is a small

four-strand barbed wire fence south of the airfield encompassing the airport property line along Highway 191. The other noticeable fence is that of the State prison on the east side of the airport property. The small property fence is depicted in **Figure 1-17**.

FIGURE 1-17 AIRPORT PERIMETER FENCING

1.18.9 AVIATION FUEL FACILITIES

There are currently two fuel storage tanks on the Airport that are owned by the County and are operated by the airport operations staff. Each fuel tank has a capacity of 10,000 gallons; 100LL AvGas and Jet A are available. A self-service system is not available. The normal business hours for fueling are 7:30am to 4:00pm. After hours fueling is available, but for a fee. Two fuel trucks are available, one with 100LL AvGas and one with Jet A. Each fuel truck has a capacity of 1,200 gallons. A Spill Prevention, Control and Countermeasure (SPCC) Plan is on location with airport operations staff.

1.18.10 EMERGENCY SERVICES

Emergency response is provided by the Elfrida Fire Department; Elfrida is a small unincorporated community located 18 miles north of the Airport. The Fire Department has one full-time fire fighter and 15 volunteer firefighters, as well as three auxiliary members. Elfrida Fire is available for response to aircraft and airport facility emergencies using standard response equipment such as fire trucks, ambulatory services, and hazardous material containment equipment. The average response time is 20 minutes. Should the need arise, Elfrida Fire Department may call upon assistance from the Douglas Fire Department or the Bisbee Fire Department, which has an average response time of 30-40 minutes to the Airport. The closest facility that can provide medical emergency services is the Southeast Arizona Medical Center located approximately 10 miles south in Douglas, Arizona. The Medical Center is a fully staffed hospital with 24-hour emergency room service.

1.18.11 Airport Support and Maintenance

There is one airport support equipment building located on the Airport. It is located on the south portion of the airfield next to the fuel storage tanks and the terminal building. It mostly consists of a large covered awning and a small garage sized enclosed area. The garage has several small maintenance related equipment inside. The small fuel service trucks and a large tractor with a mower attachment are located underneath the large awning. The steel structure itself is in good condition. The large tractor and mower attachment are in fair condition. The airport support, maintenance and the required equipment is provided by Cochise County. All the equipment is operated by airport operations staff or other Facilities Management Department County employees.

Trucks:

1. 1970's vintage dual wheel Ford Jet A fuel truck
2. 1970's vintage dual wheel Ford AVGas 100LL fuel truck

Maintenance equipment:

1. 1980's vintage Ford 5610 diesel tractor used for mowing
2. 1990's vintage Ford Broce Broom

No other support or maintenance equipment that is actively being used was observed.

1.18.12 Airport Sustainability

The FAA began focusing on sustainability at airports in 2010, and has said that their objective is to make sustainability a core objective in airport planning. The FAA has provided airports across the United States with funding to develop comprehensive sustainability planning documents. These documents, called Sustainability Master Plans and Airport Sustainability Plans, include initiatives for reducing environmental impacts, achieving economic benefits, and increasing integration with local communities. To date, the FAA has funded 45 airports across the United States.

The FAA Reform and Modernization Act of 2012, Section 133 of H.R. 658, requires airport master plans to address the feasibility of solid waste recycling at an airport, minimizing the generation of waste, operation and maintenance requirements, the review of waste management contracts, and the potential for cost savings or revenue generation. The FAA is in the process of crafting guidance for airport sponsors to use in developing a recycling program at their airport as part of an airport master plan. For the purpose of this study, a review of the solid waste collection practices was performed. It was observed that solid waste is being collected from the terminal building and disposed of by a waste collection company. It was also noted that no recycling was taking place by any of the airport tenants. Recommendations for ways to implement a recycling program and other sustainability practices will be discussed in the Facility Requirements chapter.

1 TERMINAL BUILDING
2 SUPPORT EQUIPMENT STORAGE BUILDING
3 AIRPORT PARKING
4 COUNTY BUILDINGS
5 COUNTY BUILDINGS
6 COUNTY BUILDINGS
7 ELECTRICAL VAULT
8 COUNTY BUILDINGS
9 HANGAR
10 HANGAR
11 HANGAR
12 HANGAR
13 AIRPORT ENTRANCE
14 N. AIR TERMINAL RD.
ARIZONA DEPARTMENT OF CORRECTIONS (A.D.O.C.)
AIRPORT PROPERTY LINE (E)
N. BDI BLVD.
TAXIWAY A1
APRON
N. AIR TERMINAL RD.
TAXIWAY A
TAXIWAY A4
TAXIWAY A3
TAXIWAY A2
RUNWAY 17/35
ARMSTRONG CONSULTANTS
0 200 400
SCALE IN FEET

1.19 ENVIRONMENTAL INVENTORY

In the airport master planning process, planners are required to identify potential key environmental impacts of the various airport development alternatives so that those alternatives that avoid or minimize impacts on sensitive resources are considered. The evaluation of potential environmental impacts should only be done to the level necessary to evaluate and compare how each alternative would involve sensitive environmental resources. The data compiled in this section will be used in evaluating proposed airport development alternatives and to identify any required environmental permits for the recommended projects.

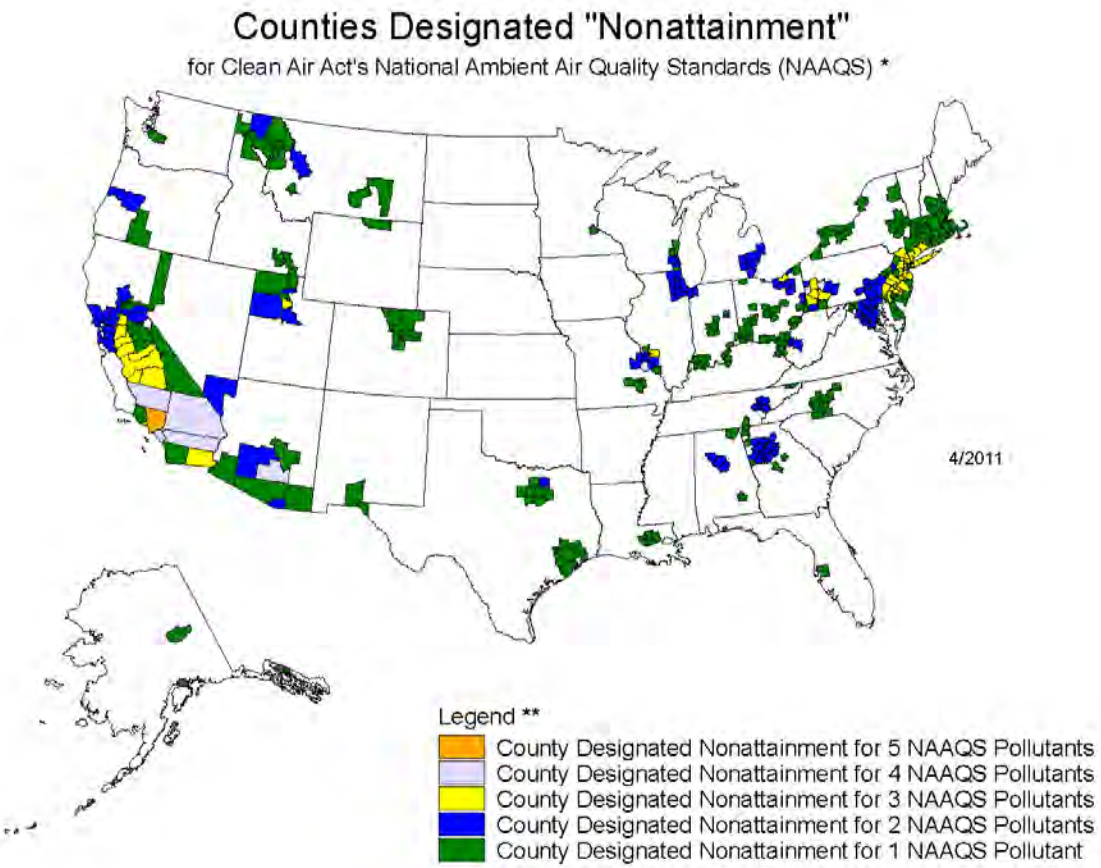
1.19.1 AIR QUALITY

The US Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) based on health risks for six pollutants: carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, ozone, and two sizes of particular matter (PM) measuring 10 micrometers or less in diameter and PM measuring 2.5 micrometers in diameters.

According to EPA, an area with ambient air concentrations exceeding the NAAQS for a criteria pollutant is said to be a nonattainment area for the pollutant's NAAQS, while an area where ambient concentrations are below the NAAQS is considered an attainment area. The EPA requires areas designated as nonattainment to demonstrate how they will attain the NAAQS by an established deadline. To accomplish this, states prepare State Implementation Plans (SIPs) which are typically a comprehensive set of reduction strategies and emissions budgets designed to bring the area into attainment. A graphical illustration of Counties designated Nonattainment for NAAQS is depicted in **Figure 1-18**.

In a 1990 clarification, the Douglas-Paul Spur Group I Area was specified to include all or part of eight contiguous townships in and around the City of Douglas and the Paul Spur unincorporated area. Consistent with EPA's PM10 grouping scheme, the Douglas-Paul Spur Group I Area was designated and classified as a moderate PM10 nonattainment area upon enactment of the 1990 Clean Air Act (CAA) amendments. Arizona Department of Environmental Quality (ADEQ) is currently developing a maintenance plan and request for re-designation for the Douglas-Paul Spur PM10 nonattainment Area. A graphical illustration of the ADEQ Nonattainment and Attainment areas is depicted in **Figure 1-19**.

It appears that the Bisbee Douglas International Airport is partially located in the Sulphur Dioxide Attainment area with a maintenance plan, and the PM 10 Attainment area with a maintenance plan, as shown in **Figure 1-20**. Further evaluation of potential air quality impacts will be discussed in the alternatives chapter of the master plan report.



Guam - Piti and Tanguisson Counties are designated nonattainment for the SO2 NAAQS

* The National Ambient Air Quality Standards (NAAQS) are health standards for Carbon Monoxide, Lead, Nitrogen Dioxide, 8-hour Ozone, Particulate Matter (PM-10 and PM-2.5), and Sulfur Dioxide.

** Included in the counts are counties designated for NAAQS and revised NAAQS pollutants. 1-hour Ozone is excluded. Partial counties, those with part of the county designated nonattainment and part attainment, are shown as full counties on the map.

The Indiana portion of the Chicago-Gary-Lake County, IL-IN 8-hr Ozone multi-state nonattainment area has been redesignated, but the area is not considered a maintenance area until both states in the area are redesignated. All of the counties for this area are displayed as being in nonattainment

FIGURE 1-18 COUNTIES DESIGNATED NONATTAINMENT (NAAQS)

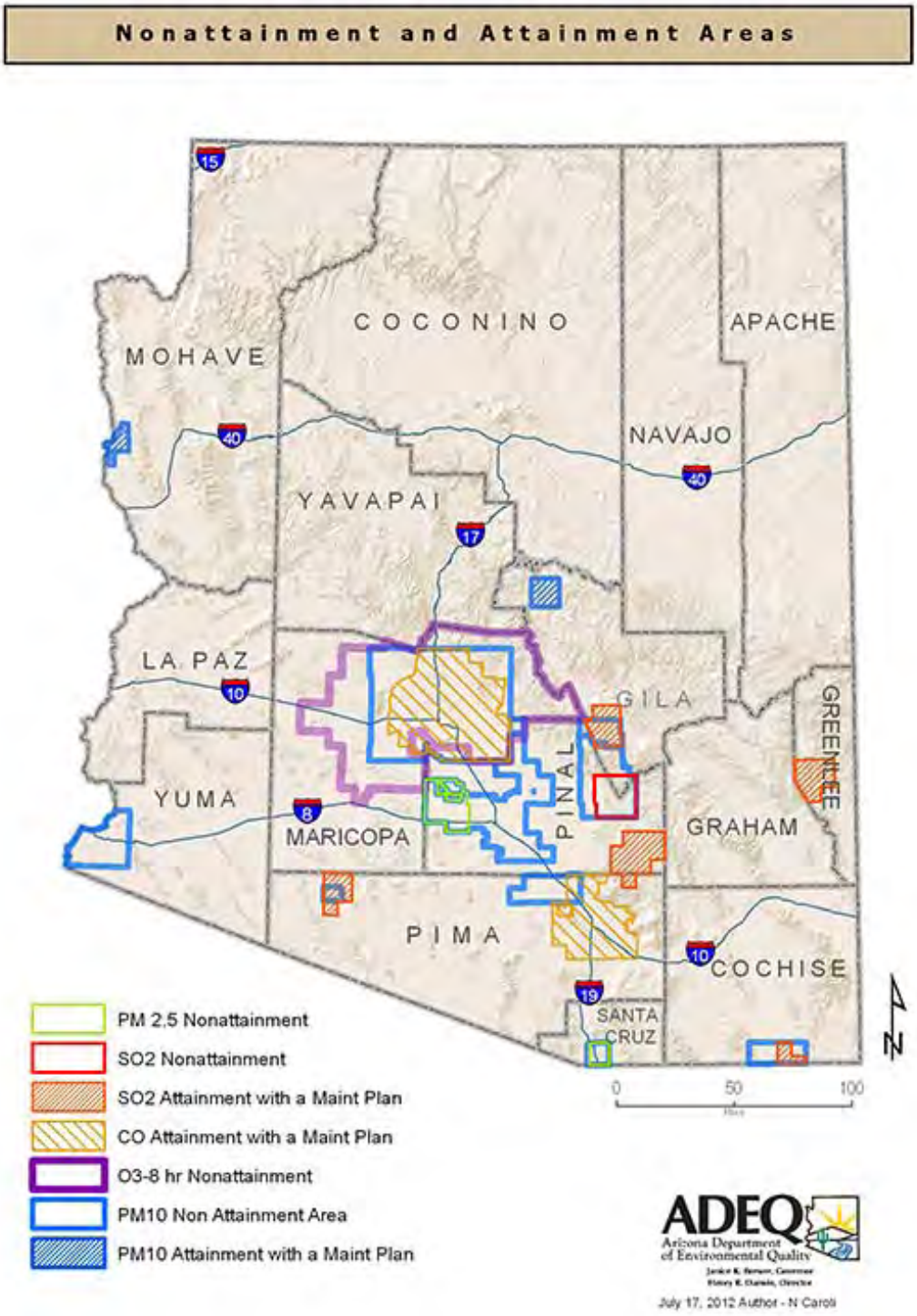


FIGURE 1-19 NONATTAINMENT AND ATTAINMENT AREAS WITH A MAINTENANCE PLAN

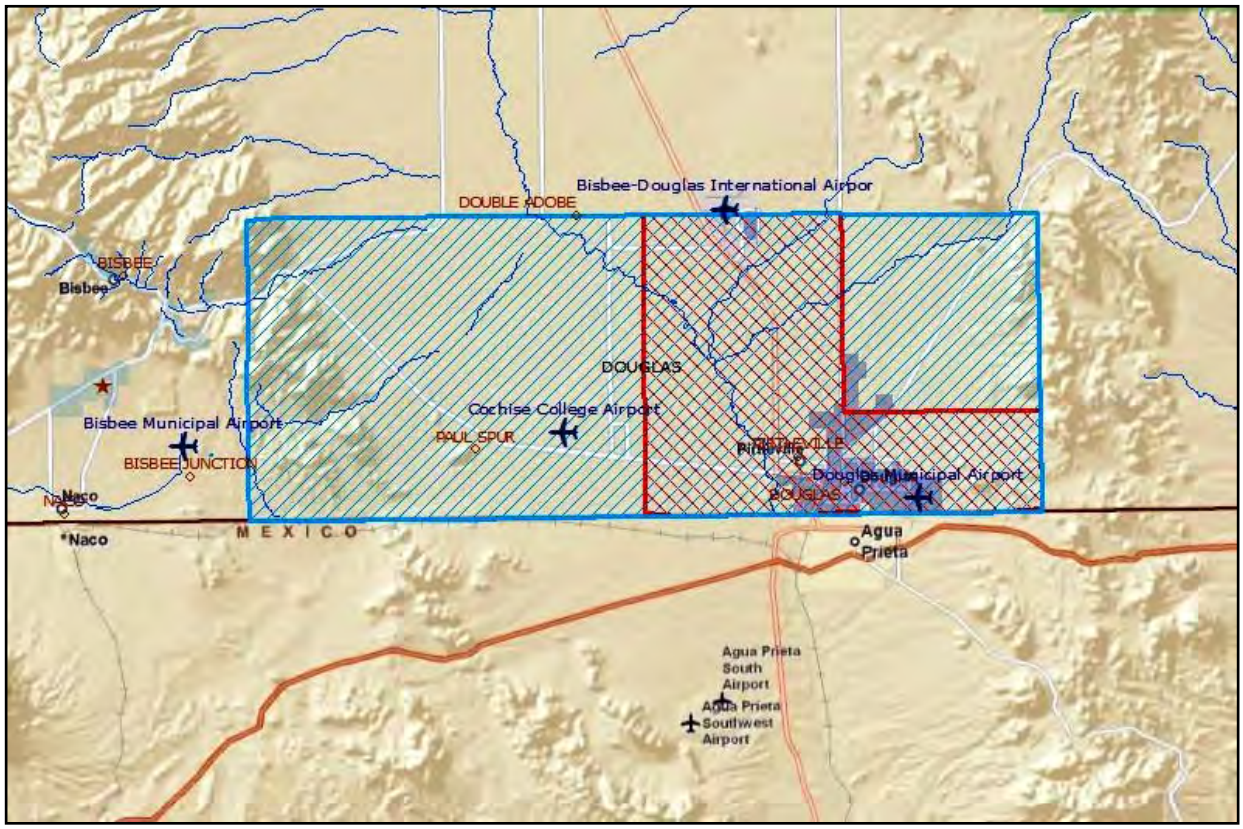


FIGURE 1-20 SULPHUR DIOXIDE ATTAINMENT AREA

1.19.2 BIOTIC COMMUNITIES/ENDANGERED AND THREATENED SPECIES OF FLORA AND FAUNA

Consideration of biotic communities and endangered and threatened species is required for all proposals under the Endangered Species Act as Amended. Section 7 of the Endangered Species Act as Amended requires each Federal agency to insure that any action the agency carries out "is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat" of critical species.

All of the federally listed threatened and endangered species within Cochise County are illustrated in **Table 1-14**. Cochise County encompasses a large area, and therefore all of the threatened and endangered species listed on Table 1-14 are not necessarily found at Bisbee Douglas International Airport.

TABLE 1-14 THREATENED, ENDANGERED AND CANDIDATE SPECIES POTENTIALLY OCCURRING WITHIN COCHISE COUNTY, ARIZONA

Common Name	Scientific Name	Status
Arizona treefrog	*Hyla wrightorum*	Candidate
Beautiful shiner	*Cyprinella formosa*	Federally Threatened
Canelo hill ladies'-tresses	*Sprianthes dielitescens*	Federally Endangered
Chiricahua leopard frog	*Rana chiricahuensis*	Federally Threatened
Cochise pincushion cactus	*Coryphantha robbinsorum*	Federally Threatened
Desert pupfish	*Cyprinodon macularius*	Federally Endangered
Gila chub	*Gila intermedia*	Federally Endangered
Gila topminnow	*Poeciliopsis*	Federally Endangered
Huachuca springsnail	*Pyrgulopsis thompsoni*	Candidate
Huachuca water-umbel	*Lilaeopsis schaffneriana var. recurva*	Federally Endangered
Jaguar	*Panthera onca*	Federally Endangered
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	Federally Endangered
Loach minnow	*Tiaroga cobitis*	Federally Endangered
Mexican spotted owl	*Strix occidentalis lucida*	Federally Threatened
New Mexico ridenose rattlesnake	*Crotalus willardi obscurus*	Federally Threatened
Northern aplomado falcon	*Falcon femoralis septenrionalis*	Federally Endangered
Northern Mexican gartersnake	*Thamnophis eques megalops*	Proposed Threatened
Ocelot	*Leopardus pardalis*	Federally Endangered
San Bernadino springsnail	*Pyrgulopsis bernadina*	Federally Threatened
Sonora tiger salamander	*Ambystoma tigrinum*	Federally Endangered
Sonoran desert tortoise	*Gopherus morafkai*	Candidate
Southwestern willow flycatcher	*Empidonax traillii*	Federally Endangered
Spikedace	*Meda fulgida*	Federally Endangered
Sprague's pipit	*Anthus spragueii*	Candidate
Yaqui catfish	*Ictalurus pricei*	Federally Threatened
Yaqui chub	*Gila purpurea*	Federally Endangered
Yaqui topminnow	*Poeciliopsis occidentalis*	Federally Endangered
Yellow-billed cuckoo	*Coccyzus americanus*	Proposed Threatened

SOURCE: US FISH AND WILDLIFE SERVICE, OCTOBER 2013

1.19.3 Coastal Zone Management Program and Coastal Barriers

Bisbee Douglas International Airport is not located within or adjacent to a coastal zone. Any proposed action and reasonable alternatives will not adversely impact the coastal zone natural resources protected by the National Oceanic and Atmospheric Administration regulations under 15 CFR Part 930.

1.19.4 Department of Transportation Act, Section 4(f)

Section 4(f) of the DOT Act places restrictions on the use of any publicly-owned recreational land, public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance. There are no Section 4(f) resources in the vicinity of the Bisbee Douglas International Airport. The nearest Section 4 (f) resource is the Douglas Golf Course which is located over 6 miles south of the Airport.

1.19.5 Farmland

The Farmland Protection Policy Act (Public Law 97-98) directs federal agencies to use criteria developed by the U.S. Department of Agriculture to identify and analyze impacts related to the conversion of farmland to nonagricultural uses. According to the U.S. Department of Agriculture, Natural Resources Conservation Services (NRCS), the airport consists of the following soils:

- 13-Bonita-Forrest complex (Farmland of unique importance)
- 56-Elgin-McAllister-Stronghold complex (Prime farmland if irrigated)
- 79-Guest silty clay loam (Non prime farmland)

It is important to note that there are currently no active farming activities taking place on the Airport property.

According to the Farmland Protection Policy Act, the regulation does not apply to land already committed to “urban development or water storage”, i.e., airport developed areas, regardless of its importance as defined by the NRCS. See **Figure 1-21** for the farmland soil classifications in the vicinity of the Bisbee Douglas International Airport.

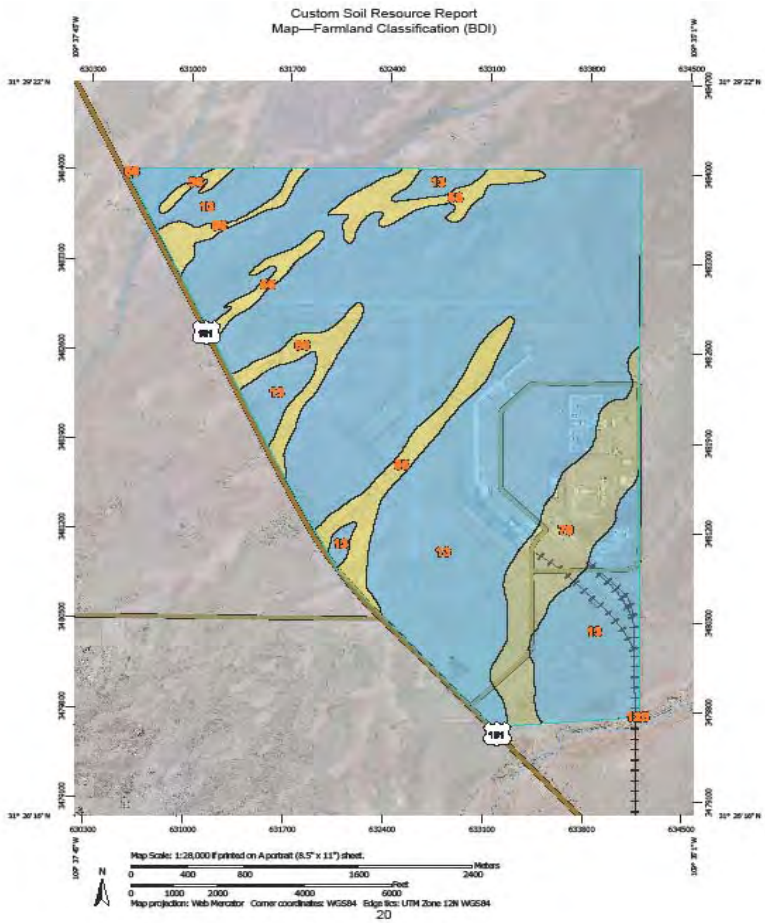
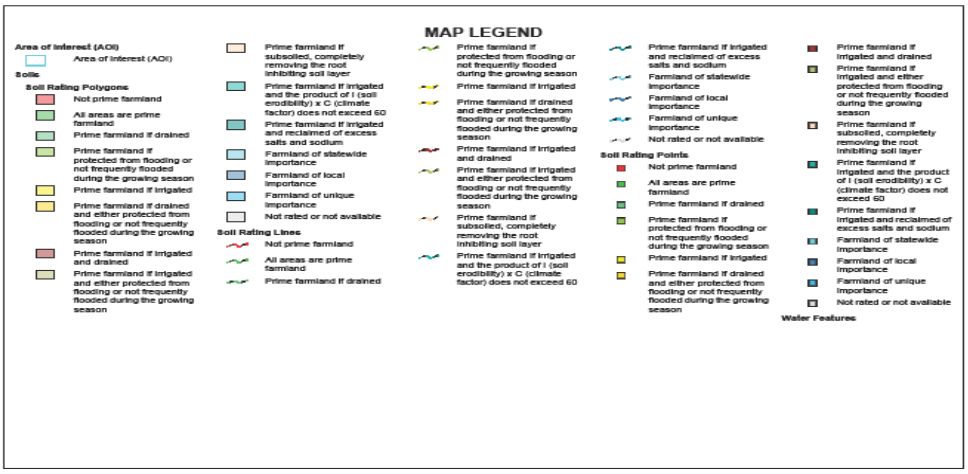


FIGURE 1-21 FARMLAND SOIL CLASSIFICATION

Custom Soil Resource Report



1.19.6 FLOODPLAINS

Flood plains are defined as "the lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year."

The Threshold of Significance (TOS) is exceeded when there is an encroachment on a base flood plain (100-year flood). An encroachment involves:

- A considerable probability of loss of life,
- Likely future damage associated with encroachment that could be substantial in cost or extent, including interruption of service or loss of vital transportation facilities, or
- A notable adverse impact on natural and beneficial flood plain values.

According to the Federal Emergency Management Agency (FEMA) National Flood Insurance Rate Map, Bisbee Douglas International Airport is not located in a floodplain. The airport is adjacent to a Special Flood Hazard Area which is located southeast of the airport property.

See **Figure 1-22** for the FEMA designated floodplains in the vicinity of the Bisbee Douglas International Airport.

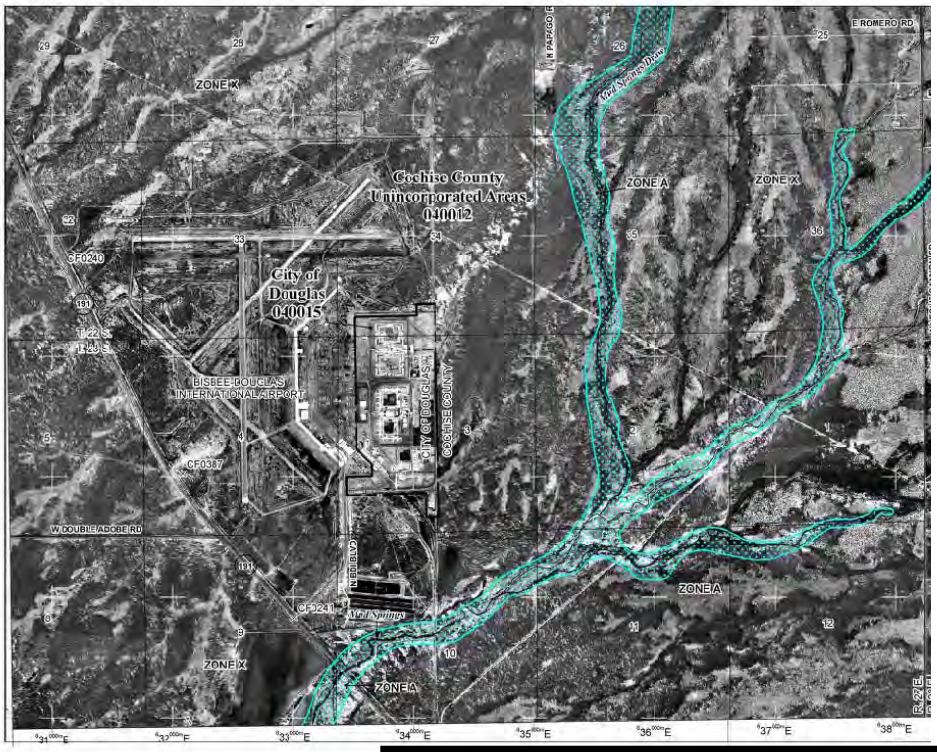


FIGURE 1-22 FEMA FLOODPLAIN VICINITY MAP

1.19.7 Historic, Architectural, Archeological, and Cultural Resources

The National Historic Preservation Act (NHPA) of 1966, as amended requires that an initial review be made to determine if any properties that are in or eligible for inclusion in, the National Register of Historic Places are within the area of a proposed action's potential environmental impact. The Archeological and Historic Preservation Act (AHPA) of 1974 provides for the survey, recovery, and preservation of significant scientific, prehistoric, historical, archeological, or paleontological data when such data may be destroyed or irreparably lost due to a Federal, federally licensed, or federally funded project.

Agency coordination letter will be sent to the agency to determine if any of the proposed projects will cause an adverse effect on a property which has been identified as having historical, architectural, archaeological, or cultural significance. To date, a Cultural Resource Survey at the Cochise County Airport has not been completed. There are several old steel frame and wood frame aircraft hangars along with other structures at the Airport that may be eligible for the National Register of Historic Places (NRHP).

1.19.8 Noise

Most land uses are considered to be compatible with airport noise that does not exceed 65 decibels (dB), although FAR Part 150 declares that "acceptable" sound levels should be subject to local conditions and community decisions. Nevertheless, 65 dB is generally identified as the threshold level of aviation noise which is "significant." The FAA has established 65 DNL as the threshold above which aircraft noise is considered to be incompatible with residential areas. In addition, the FAA has determined that a significant impact occurs if a proposed action would result in an increase of 1.5 DNL or more on any noise-sensitive area within the 65 DNL exposure justify.

The existing and forecast levels of traffic are below the current threshold of significance (90,000 annual propeller aircraft operations or 700 annual jet operations) for environmental analysis on federally-aided projects, as defined by FAA Order 1050.1E therefore, no noise analysis is required. Based on existing activity at the Airport, no 65 DNL noise contour exists for the Airport.

1.19.9 Land Use Compatibility

The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of noise impacts related to that airport. There currently are no generated noise contours for the Airport due to the low activity. Should the Airport generate enough operations to warrant contours, those will have to be addressed and compatibility will have to be reviewed.

Based on a site visit, it appears there are no existing non-compatible land uses on or near the Airport. There are a few residential houses within approximately three miles of the Airport property.

1.19.10 Light Emissions

In order to assess the potential light emissions impacts, the extent to which any proposed airport lighting will create an annoyance among people in the vicinity of the installation must be addressed. Furthermore, installation of all outdoor lighting fixtures must comply with Cochise County's Light Pollution Code, found within Article 1810 – Outdoor Lighting Standards of the County's Zoning Regulations. No impacts are known to occur based on the existing configuration of the airfield.

1.19.11 WETLANDS

Wetlands are defined in Executive Order 11990, Protection of Wetlands, as "those areas that are inundated by surface or ground water with a frequency sufficient to support...a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas..."

As depicted on **Figure 1-23**, and according to the U.S. Fish and Wildlife Services' National Wetlands Inventory, no wetlands presently exist on or adjacent to the Airport property.

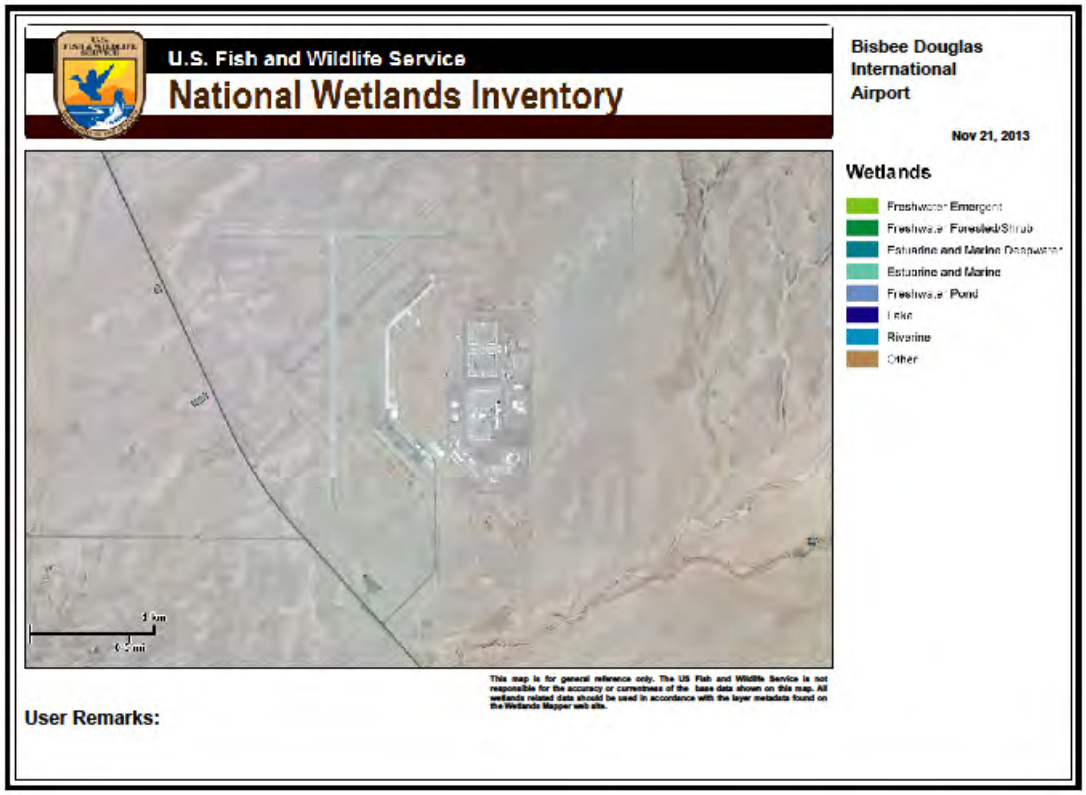


FIGURE 1-23 NATIONAL WETLANDS INVENTORY VICINITY MAP

Chapter Two
Forecasts of Aviation Activity

2.1 INTRODUCTION

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

For this reason, an ongoing program of examination of local airport needs and national and regional trends is recommended in order to promote the orderly development of aviation facilities at Bisbee Douglas International Airport.

At airports not served by air traffic control towers, approximations of existing aviation activity are necessary in order to form a basis for the development of reasonable forecasts. Unlike towered airports, non-towered general aviation airports have historically not tracked or maintained comprehensive logs of aircraft operations. Approximations of existing aviation activity are based on a review of based aircraft, available historical data, available local information and regional, state and national data that form the baseline to which forecasted aviation activity trends are applied. Arizona Department of Transportation (ADOT) requires the use of the *FAA Model for Estimating General Aviation Operations at Non Towered Airports using Towered and Non Towered Airport Data.* The model is further discussed in Section 2.5, *Existing Aviation Activity*.

Activity projections are made based on estimated growth rates, area demographics, industry trends and other indicators. Forecasts are prepared for the Initial-Term (0-5 years), the Intermediate-Term (6-10 years) and the Long-Term (11-20 years) planning period. Using forecasts within these time frames allows airport improvements to be timed to meet demand.

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

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

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

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

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

The terms transient and itinerant are sometimes erroneously used interchangeably. This study will confine analysis to local and itinerant operations.

2.2 NATIONAL AND GENERAL AVIATION TRENDS

2.2.1 NATIONAL TRENDS

From a broader perspective the U.S. civil aviation sector has its challenges to overcome, the long term future is bright according to the Federal Aviation Administration (FAA) March 2012 forecast which predicts that the U.S. aviation industry would grow steadily over the next 20 years, reaching 1.2 billion passengers flying commercial by 2024, compared with 731 million in 2011. The FAA believes that cargo traffic on U.S. airlines will more than double during the same period growing 4.9 percent annually on average. The world economy will certainly play a role in FAA's positive outlook. With fewer commercial aircraft currently in service due to the spike in fuel prices between 2008-2009, the airlines are focusing on profitability as opposed to market share, so you're not seeing as much new service added.

2.2.2 GENERAL AVIATION TRENDS

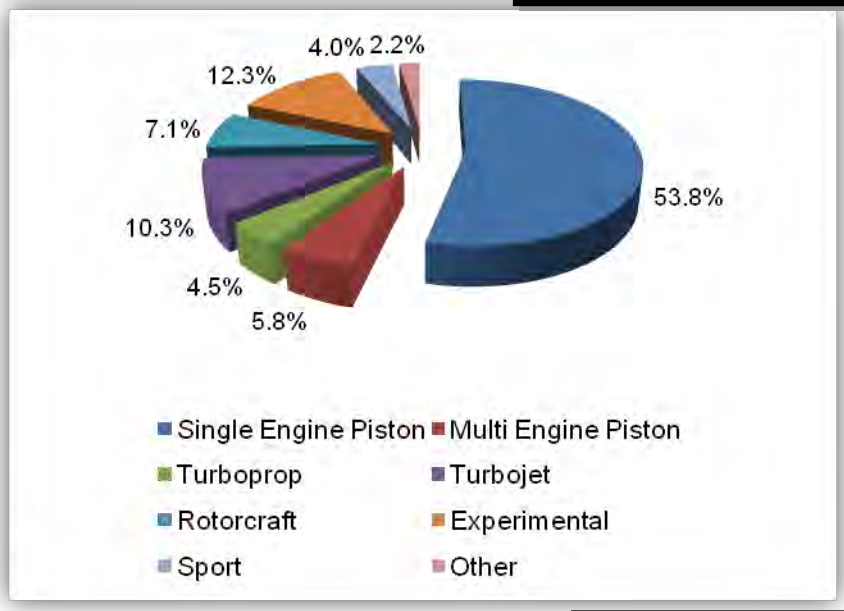
According to factors such as aircraft production, pilot activity and hours flown, general aviation reached a peak in the late 1970s. This peak was followed by a long downturn that persisted through most of the 1980s and the early 1990s and has been attributed to high manufacturing costs associated with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

The FAA convenes a panel of aviation experts annually and to develop forecasts for future activity in all areas of aviation, including general aviation. According to the *FAA Aerospace Forecast Fiscal Years 2013-2033,* in 2012 the general aviation market showed an improvement especially from the agricultural airplane segment of turboprops and strong growth in the rotorcraft sector. The total operations at FAA and contract towers decreased for the fifth consecutive year, falling 0.3 percent, as activity declines in the air taxi and military categories offset increases in air carrier and general aviation activity.

The active general aviation fleet is projected to increase at an average annual rate of 0.5 percent during the 21-year forecast period, growing from an estimated 220,670 aircraft in 2012 to 246,375 aircraft by 2033. The fleet of jet turbine aircraft is expected to grow at an average of 2.8 percent per year over the 20-year forecast period. Turbine jet aircraft are forecasted to increase at an average rate of 3.5 percent per year, reaching a total of 24,620 by 2033. **Figures 2-1** and **2-2** illustrate the existing and future general aviation fleet that is forecasted to occur over the 20-year planning period.

In 2005 the category of "light sport" aircraft was created. At the end of 2011 a total of 6,645 aircraft were included in this category. The forecast assumes about 3.2 percent growth of the fleet by 2013. Thereafter, the rate of increase in the fleet slows to about 2 percent per year. By 2033 a total of 10,245 light sport aircraft are projected to be in the fleet.

FIGURE 2-1 EXISTING GA FLEET MIX



Source: FAA

FIGURE 2-2 FUTURE GA FLEET MIX

The General Aviation Manufacturer's Association (GAMA) produces activity forecasts based on general aviation hours flown. As shown in **Table 2-1**, the greatest increase is for turbo jet and light sport aircraft at 5.3 percent and 3.5 percent growth respectively from 2013 through 2032. Both fixed wing piston aircraft categories are forecast to decline slightly through the forecast period.

TABLE 2-1 AIRCRAFT HOURS FLOWN (THOUSANDS)

	Fixed Wing				Rotorcraft					
Year	Single Engine	Multi Engine	Turbo Prop	Turbo Jet	Piston	Turbine	Experimental	Light Sport Aircraft	Other	Total General Aviation Fleet
2013	11,091	1,758	2,471	4,330	834	2,611	1,315	356	183	24,728
2014	10,820	1,744	2,523	4,605	858	2,674	1,401	372	183	25,180
2015	10,594	1,728	2,554	4,865	881	2,739	1,462	388	184	25,396
2016	10,409	1,703	2,591	5,106	903	2,819	1,525	404	185	25,645
2017	10,285	1,689	2,624	5,321	924	2,903	1,591	421	185	25,943
2018	10,205	1,678	2,657	5,558	944	2,988	1,627	438	186	26,281
2019	10,150	1,668	2,685	5,774	965	3,071	1,664	455	187	26,619
2020	10,125	1,667	2,704	6,009	986	3,156	1,702	473	188	27,009
2021	10,092	1,665	2,723	6,251	1,006	3,242	1,731	487	188	27,387
2022	10,124	1,667	2,745	6,516	1,028	3,336	1,761	501	189	27,866
2023	10,159	1,668	2,762	6,802	1,051	3,431	1,791	515	190	28,368
2024	10,247	1,673	2,782	7,102	1,075	3,531	1,821	530	190	28,951
2025	10,391	1,675	2,802	7,420	1,099	3,636	1,851	544	191	29,610
2026	10,545	1,684	2,822	7,726	1,124	3,742	1,882	559	192	30,276
2027	10,708	1,696	2,841	8,044	1,149	3,852	1,913	574	193	30,970
2028	10,866	1,709	2,859	8,381	1,174	3,963	1,944	590	193	31,678
2029	10,997	1,719	2,879	8,753	1,200	4,076	1,975	605	194	32,398
2030	11,145	1,729	2,897	9,149	1,225	4,191	2,007	621	195	33,159
2031	11,300	1,743	2,912	9,557	1,250	4,313	2,039	637	196	33,948
2032	11,467	1,760	2,930	9,987	1,275	4,438	2,071	654	197	34,779
Avg. Annual Growth	-0.20%	-0.10%	1.10%	5.30%	2.30%	2.70%	2.60%	3.50%	0.40%	1.70%

Source: FAA 2013-2033 Aerospace Forecast

The number of active general aviation pilots (excluding air transport pilots) is projected to be 510,295 in 2032, an increase of 39,335 (up 0.4 percent yearly) over the forecast period. Commercial pilots are projected to increase from 119,200 in 2012 to 130,100 in 2032, an average annual increase of 0.5 percent. The number of student pilots is forecast to decrease at an average annual rate of 0.03 percent over the forecast period, declining from 117,340 in 2012 to 116,720 in 2032. The number of private pilots is projected to grow at an average yearly rate of 0.3 percent over the forecast period from 188,001 in 2012 to a total of 199,300 in 2032.

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

2.2.3 Other Aviation Industry Trends

Next Generation Air Transportation System (NextGen) is a new era in flight that is transforming how aircraft navigate the sky and is a replacement to the World War II era technology that has until recently been the primary navigation technology. NextGen utilizes satellite technology which allows pilots to know the precise locations of other aircraft around them. This allows more planes in the sky while enhancing the safety of air travel. Satellite landing procedures also allow pilots to arrive at airports more efficiently by providing for more direct flight routes. **Figure 2-3** highlights the airports in the United States currently benefitting from NextGen.

Source: 2011 General Aviation Manufacturer's Association Statistical Databook & Industry Outlook

Figure 2-3 NextGen Precision

The FAA is also in the process of selecting sites throughout the United States to serve as research and development hubs for unmanned aerial vehicles (UAV). UAV is an aircraft with no pilot on board. The aircraft can be remote controlled aircraft or can fly autonomously based on pre-programmed flight plans on more complex dynamic automation systems. The FAA has adopted the acronym UAS (Unmanned Aircraft System) to reflect the fact that these complex systems include ground stations and other elements besides actual air vehicles. There are various types of UAVs that can be utilized at the Airport such as the Global Hawk, Predator A, Predator B, X-47A, X-47B, Mariner, Altair, Fire Scout, ER/MP UAS, Hunter, I-GNAT, Army IGNAT ER, etc. **Figure 2-4** depict just two of the many UAVs being used today.

Figure 2-4 Typical UAVs

The Arizona Department of Transportation (ADOT) has several published reports on the economic impact aviation has on the State. For example, according to ADOT's research, aviation-related job account for nearly 16.8% of all employment in Arizona. Aviation plays an important role in the economic growth of the State.

2.3 EXISTING AVIATION ACTIVITY AND PROJECTIONS

The first step in preparing aviation forecasts is to examine available historical and existing and activity levels and based aircraft. There are typically sources of aviation activity forecasts available from the FAA and State. The FAA publishes the Terminal Areas Forecast (TAF) annually which forecasts airport activity and is commonly used for long term planning.

- For the Bisbee Douglas International Airport, the FAA TAF suggests that in 2013, there were 19 based aircraft and 19,650 operations at the airport. The TAF shows no growth over the 20-year planning period, which is not uncommon at general aviation airports similar to Bisbee Douglas International Airport.

- The 2009 Arizona State Airports System Plan (SASP) indicated 18 based aircraft and 3,800 annual operations in 2007.

- The previous 1997 Airport Master Plan suggested that by 2012, the airport would have 53 based aircraft and should experience nearly 40,467 annual operations.

- Based on discussions with the County and airport personnel they indicate that there are 5 based aircraft and approximately 1,920 annual operations in 2012. The activity reported by the County was collected by the onsite County Airport employee between the hours of 8:00am and 5:00pm Monday through Friday.

2.3.1 FLEET MIX

FAA Form 5010-1, *Airport Master Record*, is the official record kept by the Federal Aviation Administration to document airport physical conditions and other pertinent information. The record normally includes an annual estimate of aircraft activity as well as the number of based aircraft. This information is normally obtained from the airport sponsor and depending on the sponsor's recording keeping system, the accuracy will vary. The current FAA Form 5010-1 for Bisbee Douglas International Airport indicates 12 based aircraft and 19,700 annual aircraft operations. An operation is defined as a takeoff or a landing. A touch-and-go is considered two operations. This form also breaks down operations to 0 Air Carrier, 0 Air Taxi, 4,000 GA Local, 10,000 GA Itinerant operations and 5,700 military operations.

Table 2-2 shows the existing fleet mix of based aircraft at the airport as reported by Cochise County.

TABLE 2-2 BASED AIRCRAFT FLEET MIX

Aircraft Type	Based Aircraft	Fleet Mix Percentage (%)
Single-Engine	4	80%
Multi-Engine	1	20%
Jet	0	0%
Light Sport Aircraft	0	0%
Gliders	0	0%
Ultra lights	0	0%
TOTAL	**5**	**100%**

Source: Cochise County (2013)

Bisbee Douglas International Airport serves a mix of single-engine piston, multi-engine, turboprop and turbojet and helicopter aircraft. These users include business and recreational transport, air medivac, aerial firefighting, flight trainers and some military operations.

The Airport Service Level and Role and the existing aviation activity are described in more detail in. Chapter 1, Section 1.2.

The growth trends for the fleet mix at Bisbee Douglas International Airport will in all likelihood mirror the national trends. For example, single-engine piston aircraft are projected to continue to account for the majority of based aircraft and at the same time decrease as a percentage of the overall total number of based aircraft. It is anticipated that other types of aircraft will grow at a moderate pace. According the SASP, in Arizona 79 percent of all based aircraft are single-engine aircraft and multi-engine follow with 11 percent. Helicopter and jet aircraft account for four percent each of the state total. Gliders and other aircraft make up the remaining two percent. It is anticipated that the fleet mix will generally remain the same as the existing fleet mix (**Table 2-2**) for the 20-year planning period.

2.3.2 HISTORICAL BASED AIRCRAFT AND OPERATIONS

The 1997 Airport Master Plan for the Bisbee Douglas International Airport estimated 3,285 annual operations and 24 based aircraft at the airport in 1996. Operations were estimated by reference to an informal record of traffic observations kept by airport management. The log included 199 days of record for a 12 month period. The survey was limited to the hours of 8:00am to 4:30pm.

2.3.3 FACTORS INFLUENCING AVIATION DEMAND

Factors influencing aviation demand at the airport are directly related to any future development on or adjacent to the airport as a result of the recently executed (September 2013) memorandum of understanding between Cochise County and the City of Douglas for non-exclusive use of the non-movement areas on the airport property.

In addition, there has been continued growth of the Cochise College Flight Training Program and the potential development of other flight testing and training program. The flight training activity may have a positive impact on future aviation demand at Bisbee Douglas International Airport with the continued use of the Airport for flight training operations.

The Bisbee Douglas International Airport is located in a unique geographical location due to the proximity to the U.S. / Mexico border. The U. S. Customs and Border Protection (CBP) have 10 Ports of Entry in Arizona. Ports of Entry are responsible for daily port specific operations. Port personnel are the face at the border for most cargo and visitors entering the United States. Ports also perform agriculture inspections to protect the USA from potential carriers of animal and plant pest or diseases that could cause damage to America's crops, livestock, pets and the environment. The Douglas Port of Entry is the closest to the Bisbee Douglas International Airport. The airport has the potential to play a role in future Port of Entry activities in Cochise County.

2.4 EXISTING FORECASTS

2.4.1 ARIZONA STATE AIRPORTS SYSTEM PLAN FORECAST

The 2009 Arizona State Airports System Plan (SASP) forecast of based aircraft at Bisbee Douglas International Airport was evaluated. Three forecasting methodologies were used to generate a low, medium and high forecast for based aircraft in Arizona. The SASP concludes that the medium forecast was selected based on historic based aircraft growth and FAA industry forecasts. The SASP projected a statewide compound average growth rate of 1.71 percent through 2030 and 0.7 percent through 2030 for the Bisbee Douglas International Airport. Using a base year of 2007, the SASP reflects 18 based aircraft and a forecast of 21 based aircraft at the Bisbee Douglas International Airport by 2030.

2.4.2 BISBEE DOUGLAS INTERNATIONAL AIRPORT MASTER PLAN

The 1997 Bisbee Douglas International Airport Master Plan forecast of based aircraft indicated that the number of based aircraft would increase from 24 to 63 based aircraft at an average rate of 5.2 percent over the 19 year planning period from 1997 to 2016. The master plan indicates that the based aircraft forecast assumed significant airport improvements would take place to enhance the aviation market share of the airport.

2.5 FORECASTS OF AVIATION ACTIVITY

2.5.1 BASED AIRCRAFT FORECASTS

It is widely accepted within the aviation industry that the number of based aircraft at a given airport is the most basic indicator of general aviation demand.

According to FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS),* when forecast data is not available, a satisfactory procedure is to forecast based aircraft using the statewide based aircraft growth rate from the January 2013 FAA TAF and develop activity statistics by estimating annual operations per based aircraft. The first forecasting method for based aircraft using the FAA's Terminal Area Forecast annual growth rate for the State of Arizona of 1.6 percent between 2013-2033. This method results in a forecast of 7 based aircraft at Bisbee Douglas International Airport in 2033. The results of the FAA TAF method are shown in **Table 2-3**.

TABLE 2-3 FAA TAF METHOD

Year	TAF for Arizona Based Aircraft	Average Growth Rate	Based Aircraft
2013	5,422	1.6%	**5**
2018	5,858	1.6%	**6**
2023	6,338	1.6%	**6**
2028	6,869	1.6%	**7**
2033	7,437	1.6%	**7**

The second forecasting method for based aircraft was developed using a market share analysis based on the number of based aircraft within the U.S. general aviation fleet mix compared to the number of based aircraft at Bisbee Douglas International Airport (**Table 2-4**). This method was then applied to the general aviation fleet mix aircraft projections provided by the 2012 General Aviation Manufacturer's Association Statistical Databook & Industry Outlook. This resulted in 6 based aircraft at Bisbee Douglas International Airport in 2033.

TABLE 2-4 MARKET SHARE METHOD

Year	Total U.S. General Aviation Fleet Mix	Market Share Aircraft
2013	222,690	**5**
2018	225,490	**5**
2023	231,145	**5**
2028	240,570	**5**
2033	253,205	**6**

The third method utilized a bottom-up per capita approach that projects the number of based aircraft in direct proportion to the projected population of Cochise County (**Table 2-5**) using the Arizona Department of Administration population statistics (medium series). This resulted in 6 based aircraft at Bisbee Douglas International Airport in 2033.

TABLE 2-5 PER CAPITA METHOD

Year	Population[1]	Aircraft
2013	130,753	**5**
2018	137,452	**5**
2023	145,592	**6**
2028	153,257	**6**
2033	160,682	**6**

It is anticipated that Bisbee Douglas International Airport based aircraft growth rate will likely trend closer to the Per Capita Method. Recognizing that all of the above methods do not vary significantly the Per Capita Method (indicating 6 based aircraft by 2032) was selected as the preferred based aircraft forecast (**Figure 2-5**).

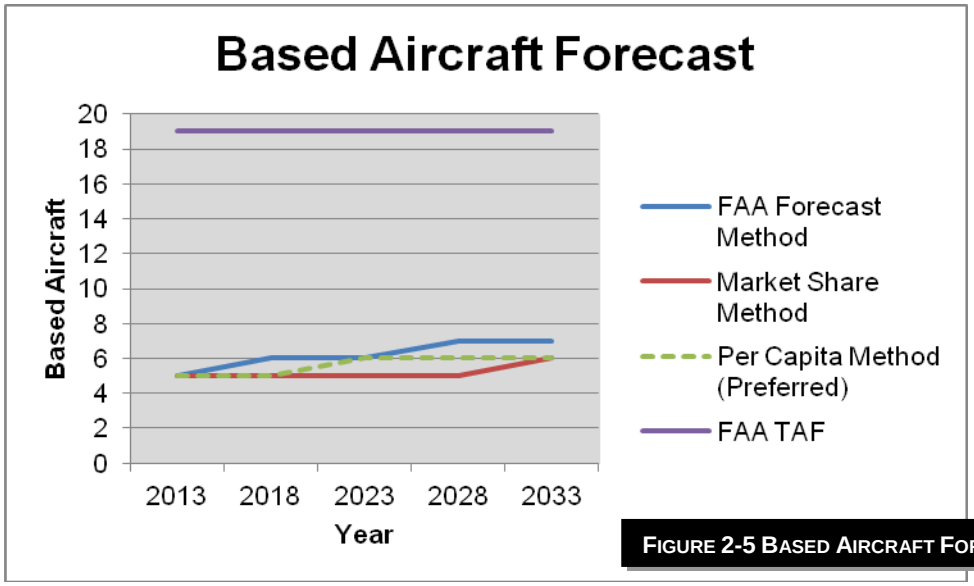


FIGURE 2-5 BASED AIRCRAFT FORECAST

2.5.2 ANNUAL AIRCRAFT OPERATIONS FORECAST

In order to develop a preferred method of forecasting aircraft operations at Bisbee Douglas International Airport, a number of methods were analyzed. Each method uses the preferred based aircraft forecast of 6 based aircraft in 2033, and then applies an Operations Per Based Aircraft (OPBA) resulting in the total annual operations forecast.

The methods are as follows:

Method 1: Existing operations and based aircraft (384 OPBA)

Method 2: FAA Order 5090.3C (750 OPBA)

Method 3: FAA Advisory Circular 150/5300-13A (538 OPBA)

Method 4: Arizona State System Plan and existing based aircraft (528 OPBA)

1. For the first method using the annual operations (minus military operations) from Cochise County airport management of 1,902, the base year level of operations per based aircraft of 5 was applied to the preferred based aircraft forecast. Applying 384 OPBA to the preferred 6 based aircraft forecast results in 2,304 annual operations in 2033.

2. For the second method, a general guideline from FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS) of 750 OPBA was applied to the based aircraft forecast. Applying 750 OPBA to the preferred 6 based aircraft forecast results in 4,500 forecast operations in 2033.

3. The third method, as outlined in FAA Advisory Circular 150/5300-13, *Airport Design*, applied 538 OPBA (for non-NPIAS public use airports) to the preferred 6 based aircraft forecast. This method results in a forecast of 3,228 operations in 2033.

4. The fourth method, the Arizona State System Plan level of operations forecast for 2030 (3,165) was divided by the forecast number of based aircraft 6. Applying 528 OPBA to the

preferred based aircraft forecast for 2018, 2023, 2028 and 2033 results in the forecast operations in those given years.

These projections provide a likely range of activity for future operations at Bisbee Douglas International Airport and are shown in **Figure 2-6**. Aircraft operations can be expected to increase with the additional based aircraft; therefore it is reasonable to anticipate that the OPBA will remain fairly constant over the 20-year planning period.

The selected forecast (Method 3) of 3,228 annual operations in 2033 will be used for further analysis. The selected forecast represents a conservative increase in annual operations over the 20–year planning period and given the size and current activities at the airport, is considered a reasonable forecast for planning purposes.

The other methods were considered, but dismissed as not being the most likely representative of the potential aviation demand.

2.5.3 ITINERANT AND LOCAL OPERATIONS

The various types of aircraft operations were presented at the beginning of this chapter. For the Bisbee Douglas International Airport the split in itinerant and local operations used for planning purposes will be in accordance with the SASP. According to the SASP, the existing split of 79 percent local operations and 21 percent itinerant operations is assumed to remain constant throughout the 20-year planning period.

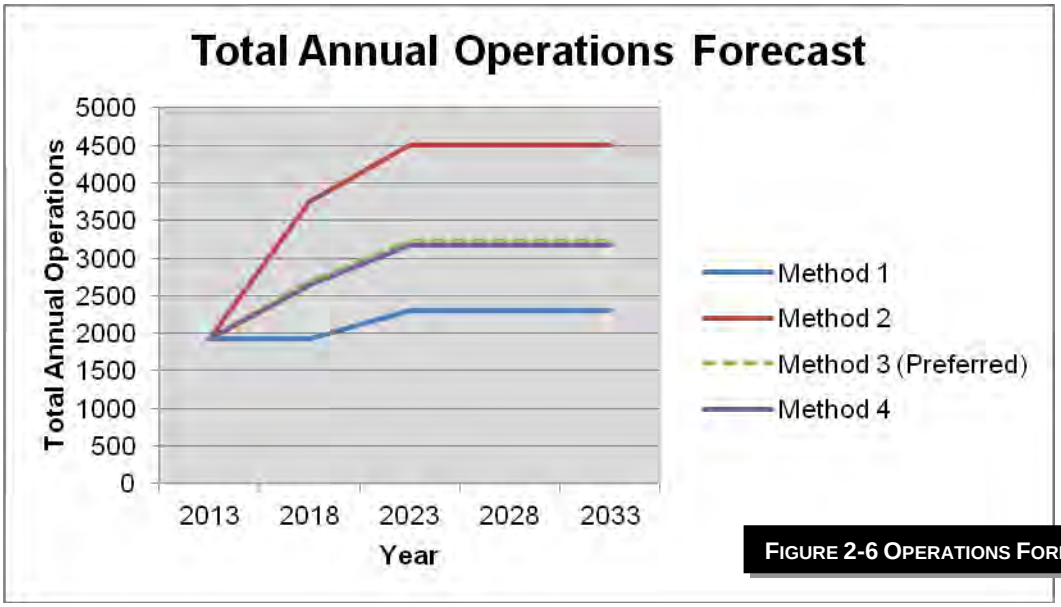


FIGURE 2-6 OPERATIONS FORECAST

2.6 INSTRUMENT OPERATIONS

An instrument approach, as defined by FAA, is an approach to an airport with the intent to land an aircraft in accordance with an Instrument Flight Rule (IFR) flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude. An

aircraft landing at an airport must follow one of the published instrument approach procedures to qualify as an instrument approach.

According to the FAA TAF, 21 percent of the total aircraft operations in Arizona are instrument operations. This number is forecasted to increase to 26 percent by 2030. Since virtually all commercial and business jet flights and most military aircraft flights are IFR (since they fly at or above 18,000 feet MSL), the number of instrument operations does not reflect the occurrence of instrument weather or the provision of instrument approaches at airports. At most general aviation airports with an instrument approach and little or no commercial service or military activity, instrument operations will comprise approximately 2.5 percent of total operations.

2.7 PREFERRED FORECAST OF AVIATION ACTIVITY

Table 2-6 depicts the preferred aviation demand forecast activity for Bisbee Douglas International Airport.

TABLE 2-6 PREFERRED FORECAST OF AVIATION ACTIVITY

Year	Based Aircraft	Local Operations	Itinerant Operations	Total Operations	Instrument Operations
2013	5	1,517	403	1,920	48
2018	5	2,125	565	2,690	67
2023	6	2,550	678	3,228	81
2028	6	2,550	678	3,228	81
2033	6	2,550	678	3,228	81

2.8 AIRPORT SEASONAL USE DETERMINATION

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

Non-towered general aviation airports generally experience a substantially higher number of operations in summer months than off-season months. The average seasonal use trend for FAA towered airports from the 1979-1984 records (total aircraft operations handled by tower facilities nationally from FAA Statistical Handbook of Aviation) was used as a baseline for determining seasonal use trends. As mentioned, seasonal fluctuation is more pronounced at non-towered airports than at towered airports. The seasonal use trend for towered airports was adjusted to approximate seasonal use trends at non-towered airports.

A review of Bisbee Doulgas International Airport's total monthly fuel sales from June 2009 through June 2013 provided a reasonable depiction of the airport's seasonal use trends. The greatest quantity of fuel sales was sold between April through June with a second smaller spike in the November timeframe. AvGas (100LL) is used predominantly by piston-powered aircraft and varies the most with each season but the month of June did see higher sales.

Some activity at Bisbee Douglas International Airport is based on annual training by the U.S. Military in the world's largest multinational personnel recovery exercise known as Angel Thunder. Angel Thunder demonstrates the broad range of capabilities and inherent flexibility in rescue forces across the spectrum of work and the range of potential contingencies. The two

week-long Angel Thunder, sponsored by Air Combat Command, is an exercise with the objective of training personnel to perform isolated personnel recovery, mass casualty operations and post-disaster operations. The annual training occurs in the spring, typically in April.

Despite 2013 not being a record year for the number of wildfires and acres burned, the need for the US Forest Service protection in Arizona will remain indefinitely into the future. During the peak of the fire season (May through July), the US Forest Service uses the airport as a base of operations and will typically bring in large tankers and helicopters on an as needed basis.

Other activity at the Bisbee Douglas International Airport which has an influence on the seasonal use is based on flight training activity from nearby Cochise College Airport. Therefore the typical non-towered seasonal use trend may be altered to a certain extent. There are higher activity levels by students during the spring and fall semesters and the low is during the summer time.

Table 2-7 represents the general seasonal use trends of U.S. airports at both non-towered and towered airports. Although every airport will vary, the non-towered percentages contained in **Table 2-7** will be used to calculate the monthly, daily and hourly peaking characteristics, in other words, the times when the airport is the busiest.

TABLE 2-7 SEASONAL USE TREND

Month	**Non-towered**	Towered
January	**3.5%**	7.2%
February	**4.0%**	8.2%
March	**4.8%**	8.6%
April	**7.5%**	9.0%
May	**11.3%**	9.1%
June	**13.5%**	9.4%
July	**14.8%**	9.1%
August	**13.0%**	8.7%
September	**10.0%**	8.7%
October	**8.0%**	7.8%
November	**5.8%**	7.1%
December	**3.8%**	7.1%

2.9 HOURLY DEMAND AND PEAKING TENDENCIES

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

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

Design Day: The average day in the peak month derived by dividing the peak month enplanements or operations by the number of days in the month.

Busy Day: The Busy Day of a typical week in the peak month. In this case, the Busy Day is equal to the Design Day.
Design Hour: The peak hour within the Design Day. This descriptor is used in airfield demand/capacity analysis, as well as in determining terminal building, parking apron and access road requirements.

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

The Seasonal Use Trend was used as a tool to determine the peaking characteristics for the Bisbee Douglas International Airport. Using the Seasonal Use information, a formula was derived which will calculate the average daily operations in a given month, based on the percentage of the total annual operations for that month. The formula is as follows:

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

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

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

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

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

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

The calculations were made for each month of each phase of the planning period. The results of the calculations are shown in **Table 2-8**. As is evident in the Table, the Design Day and Design Hour peak demand in the planning year occurs under VFR weather conditions in the months of June and July (highlighted in bold in each Table), with 12 and 32 daily operations and approximately 1 operations per hour throughout the 20-year planning period.

TABLE 2-8 ESTIMATED HOURLY DEMAND/MONTH

MONTHLY/DAILY/HOURLY DEMAND

Planning Year: 2018					Planning Year: 2023				
Operations:	2,690				Operations:	3,228			
		Operations					Operations		
Month	% Use	Monthly	Daily	Hourly	Month	% Use	Monthly	Daily	Hourly
January	3.5	94	3	0	January	3.5	113	4	0
February	4	108	4	0	February	4	129	5	0
March	4.8	129	4	0	March	4.8	155	5	0
April	7.5	202	7	1	April	7.5	242	8	1
May	11.3	304	10	1	May	11.3	365	12	1
June	**13.5**	**363**	**12**	**1**	**June**	**13.5**	**436**	**15**	**1**
July	**14.8**	**398**	**13**	**1**	**July**	**14.8**	**478**	**15**	**1**
August	13	350	11	1	August	13	420	14	1
September	10	269	9	1	September	10	323	11	1
October	8	215	7	1	October	8	258	8	1
November	5.8	156	5	0	November	5.8	187	6	1
December	3.8	102	3	0	December	3.8	123	4	0

Planning Year: 2028					Planning Year: 2033				
Operations:	3,228				Operations:	3,228			
		Operations					Operations		
Month	% Use	Monthly	Daily	Hourly	Month	% Use	Monthly	Daily	Hourly
January	3.5	113	4	0	January	3.5	113	4	0
February	4	129	5	0	February	4	129	5	0
March	4.8	155	5	0	March	4.8	155	5	0
April	7.5	242	8	1	April	7.5	242	8	1
May	11.3	365	12	1	May	11.3	365	12	1
June	**13.5**	**436**	**15**	**1**	**June**	**13.5**	**436**	**15**	**1**
July	**14.8**	**478**	**15**	**1**	**July**	**14.8**	**478**	**15**	**1**
August	13	420	14	1	August	13	420	14	1
September	10	323	11	1	September	10	323	11	1
October	8	258	8	1	October	8	258	8	1
November	5.8	187	6	1	November	5.8	187	6	1
December	3.8	123	4	0	December	3.8	123	4	0

2.10 FORECAST SUMMARY

The recommended forecasts for Bisbee Douglas International Airport are summarized in **Table 2-9.** The forecasts as presented in this chapter will be used throughout the remainder of the Airport Master Plan. The next step in the planning process is to determine the capacity of the existing facilities and to determine what facilities will be needed to meet future aviation demand.

TABLE 2-9 DETAILED FORECAST SUMMARY

		Passenger and Pilots	Itinerant Operations			Local Operations			
Year	Based Aircraft	Peak Hourly Flow	GA	Military	Total	GA	Military	Total	Total Operations
2013	5	1	403	0	403	1,517	0	1,517	1,920
2018	5	1	565	0	565	2,125	0	2,125	2,690
2023	6	1	678	0	678	2,550	0	2,550	3,228
2028	6	1	678	0	678	2,550	0	2,550	3,228
2033	6	1	678	0	678	2,550	0	2,550	3,228

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