



*Buchanan Field Airport
Master Planning Program*

Buchanan Field

**B. FORECASTS OF
AVIATION ACTIVITY**

B > Forecasts of Aviation Activity

INTRODUCTION. Forecasting is a key element in the master planning process. The forecasts are essential for analyzing existing airport facilities and identifying future needs and requirements of the facilities. Forecasting, by its very nature, is not exact, but it does establish some general estimates for future aviation activity levels and provides a defined rationale for various changes at the airport as demands increase. The amount and kind of aviation activity occurring at an airport are dependent upon many factors, but are usually reflective of the services available to aircraft operators, the meteorological conditions under which the airport operates (daily and seasonally), the businesses located on the airport or within the community the airport serves, and the general economic conditions prevalent within the surrounding area.

Aviation activity forecasting generally commences by utilizing the present time as an initial point and baseline, supplemented with historical trends obtained from previous years' activity and recorded information. This data has evolved from a comprehensive examination of historical airport records from airport personnel, FAA Form 5010-1 data, FAA Terminal Area Forecasts (TAF), FAA Aerospace Aviation Forecasts Fiscal Year 2005-2016, The 2003 Regional Airport System Plan General Aviation Element Final Report, and the 1990 Buchanan Field Airport Master Plan. These documents were assembled in different years, making the base year data quite variable, and emphasizing the need for establishing a well-defined and well-documented set of base information from which to project future aviation activity trends.

Prior to an examination of current and future activity levels at the Airport, there are conditions and assumptions that should be noted that form the basis or foundation for the development of the forecasts contained here. These variables represent a variety of physical, operational, and socioeconomic considerations and, to varying degrees, relate to and affect aviation activity at Buchanan Field Airport.

Socioeconomic Conditions

Historically, the socioeconomic conditions of a particular area affect aviation activity within that region. It is usually helpful to incorporate an analysis of local and regional socioeconomic data into the forecast for future aviation demands at an airport. Typically, the most often analyzed indicators are population, employment, and income. Socioeconomic data was obtained from recognized sources, including local, regional, state, and federal planning organizations.

POPULATION. During the 1990s, the Bay Area became a major high-tech center by attracting a high concentration of technology firms and workers. However, by the late 1990s and going into 2000 and 2001, the region began to encounter an economic slump, with the downturn of the technology boom and the national economic recession.

As a result of the national economic downturn, the Bay Area has naturally suffered a downturn in economy, as well as population. However, the lack of affordable housing and high cost of living have affected economic and population growth. Beginning in the mid 2000s, the national economy is beginning to turn, and signs of economic growth and recovery are evident.

Nonetheless, the region has remained strong and continues to boast a highly-skilled work force, national and international presence, and diversified economy. This, paired along with vibrant arts, nightlife, culture, mild climate, and breathtaking scenery, provides a high quality of life for its residents.

Contra Costa County is the ninth largest county in California and has one of the fastest growing work forces in the Bay region. Additionally, the County has a large concentration of highly-skilled jobs, along with relatively wealthy residents. The following table, entitled *POPULATION PROJECTIONS*, provides a summary of the population information for various Bay Area cities and counties. As the below table highlights, the overall population of the region is projected to increase steadily from 2000 to 2030.

Table B1
POPULATION PROJECTIONS

	2000	2010	2020	2030	Average Growth Rate ²
Regional Population ¹	6,783,762	7,419,600	8,094,000	8,747,100	0.96%
Alameda County	1,443,741	1,584,500	1,714,500	1,884,600	1.02%
Contra Costa County	948,816	1,055,600	1,150,900	1,244,800	1.04%
San Francisco County	776,733	810,700	859,200	924,600	0.63%
San Mateo County	707,163	741,000	806,500	848,400	0.67%
Solano County	394,542	466,100	532,400	581,800	1.58%
NAPA Valley MSA	124,279	139,700	148,100	153,400	0.78%
SJ/Sunnyvale/Santa Clara MSA	1,682,585	1,855,500	2,073,300	2,267,100	1.16%
Santa Rosa Petaluma MSA	458,614	508,000	534,100	558,400	0.73%
SF/Oakland/Fremont MSA	4,123,742	4,450,300	4,806,100	5,186,400	0.86%
Vallejo/Fairfield MSA	394,542	466,100	532,400	581,800	1.58%
City of Antioch	90,532	107,400	116,600	125,500	1.29%
City of Concord	121,780	127,000	139,400	153,600	0.87%
City of Lafayette	23,908	24,400	25,400	26,100	0.31%
City of Martinez	35,866	36,900	40,100	43,200	0.68%
City of Pittsburg	56,769	61,300	70,600	79,400	1.33%
City of Pleasant Hill	32,837	33,700	35,300	36,800	0.40%
City of Walnut Creek	64,296	66,900	72,000	77,700	0.69%

Source: Association of Bay Area Governments Projections 2005 (all projections use Jurisdictional Boundary Data). 1. Includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties. 2. Average Annual Growth Rate over 30-year period, 2000 to 2030. MSA – Metropolitan Service Area. 3. SJ – San Jose. 4. SF – San Francisco.

EMPLOYMENT. According to demographic information provided by the Association of Bay Area Governments (ABAG) *Projections 2005* report, there were over 3,452,117 employed residents in the nine-county region in 2000. This number is forecast to grow an average annual rate of approximately 1.20% over the next 30 years to 4,698,800 employed residents. The following table, entitled *EMPLOYMENT PROJECTIONS*, provides a summary of the employment growth rates for various Bay Area cities and counties.

Table B2
EMPLOYMENT PROJECTIONS

	No. of Employed Residents 2000	No. of Employed Residents 2030	Average Growth Rate ²
Regional ¹	3,452,117	4,698,800	1.20%
Alameda County	709,557	1,032,100	1.52%
Contra Costa County	461,992	667,800	1.48%
San Francisco County	437,533	558,700	0.92%
San Mateo County	369,725	464,600	0.86%
Solano County	182,964	269,800	1.58%
City of Antioch	42,779	65,410	1.76%
City of Concord	62,596	87,670	1.34%
City of Lafayette	12,790	15,360	0.67%
City of Martinez	22,633	30,380	1.14%
City of Pittsburg	33,904	52,730	1.85%
City of Pleasant Hill	21,595	26,370	0.74%
City of Walnut Creek	39,139	52,990	1.18%

Source: Association of Bay Area Governments Projections 2005. 1. Includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma counties. 2. Average Annual Growth Rate over 30-year period, 2000 to 2030.

INCOME. According to the ABAG *Projections 2005* report, the mean household income for the nine-county Bay Area in 2000 was \$92,500 and is projected to increase an average annual rate of 0.94%, to \$118,700 in 2030.

The following table, entitled *INCOME PROJECTIONS*, provides a summary of the income growth rates for various Bay Area cities and counties.

Table B3
INCOME PROJECTIONS

	Mean Household Income 2000	Mean Household Income 2030	Average Growth Rate ²
Regional ¹	\$92,500	\$118,700	0.94%
Alameda County	\$79,500	\$104,800	1.06%
Contra Costa County	\$89,300	\$117,500	1.05%
San Francisco County	\$87,400	\$115,600	1.08%
San Mateo County	\$121,700	\$148,700	0.74%
Solano County	\$69,300	\$97,100	1.34%
City of Antioch	\$72,600	\$99,800	1.25%
City of Concord	\$72,100	\$90,900	0.87%
City of Lafayette	\$150,800	\$192,900	0.93%
City of Martinez	\$78,400	\$99,500	0.90%
City of Pittsburg	\$60,900	\$76,900	0.88%
City of Pleasant Hill	\$82,100	\$107,400	1.03%
City of Walnut Creek	\$87,500	\$114,500	30.86%

Source: Association of Bay Area Governments Projections 2005. 1. Includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties. 2. Average Annual Growth Rate over 30-year period, 2000 to 2030.

Community Support

Buchanan Field Airport benefits from the support of local governments, Contra Costa County, and local Contra Costa County businesses and residents. The Airport is recognized as a vital asset contributing to the economic stability of Contra Costa County, the surrounding cities, region, and State and provides an excellent recreational amenity for its residents.

Community/Airport Location and Potential

Buchanan Field Airport is ideally situated in a location where numerous educational and recreational opportunities and tourist activities exist. This, combined with an affluent population base, provides a strong and definable market area for continued business and recreational flying opportunities. The Airport is in a position to continue to support the economic vitality of the surrounding community with the potential to be a significant economic influencer throughout the planning period.

Moreover, when factoring overall Bay Area indicators and potential, including an economy of almost \$300 billion, the following generalized San Francisco Bay Area statistics, as reported by the *Bay Area Economic Forum*, cannot be overemphasized:

- 1 The nation's largest concentration of national laboratories, corporate and independent research labs, and leading research universities;**
- 2 The largest number of top-ten ranked graduate programs in business, law, medicine and engineering in the nation; the highest density of venture capital firms in the world;**
- 3 More Fortune 500 companies than any region except New York;**
- 4 The highest level of internet penetration of any U.S. region; the highest level of patent generation in the nation, with more patent generated per employee than any other major metropolitan area;**
- 5 The most highly educated workforce in the nation, with the highest percentage of residents with graduate and professional degrees;**
- 6 A leading position in global trade, with exports larger than all but one U.S. state; and,**
- 7 The highest economic productivity in the nation – almost twice the U.S. average¹.**

Other Aviation Considerations

As it has during the past planning period, the Airport will remain a busy general aviation airport in the next 20 years. The role and importance of the Airport will continue to support a broad cross section of the general aviation marketplace, with the strongest growth percentage being led by corporate aviation activity.

Nationally, the business jet component of general aviation is growing at a much faster rate than other aspects of the industry. The growth of this sector, which was statistically significant to begin with, has been advanced even more by the events of September 11, 2001. In the post-9/11 environment, the speed and efficiency of business jet travel has created large dividends for the corporate community in terms of offering greater schedule flexibility over the commercial air carriers and less aggravated security considerations.

In addition to recognizing the ever growing importance of business/corporate aviation on reliever airports such as Buchanan Field Airport, the emergence of the newest segment of the jet market, the Very Light Jet (VLJ) is also worthy of comment. VLJs are a much anticipated future addition to the general aviation marketplace, both in their own right, and as a key element of NASAs Small Aircraft Transportation System (SATS) program. According to *AOPA Pilot* magazine, Very Light Jets are to be roughly the size of light to medium twin-engine aircraft such as the Pressurized Baron or the Cessna 421, have maximum speeds of 375 knots, and are expected to be able to operate from runways as short as 3,000 feet². Such aircraft have the promise to transport six to eight adults in safety and comfort, at operating costs and to destinations currently unreachable with existing jet aircraft fleet.

¹ Bay Area Economic Forum, *The Region*, www.bayeconfor.org/baefregion.html.

² Jack Olcott, "Dawn of an Era", *AOPA Pilot*, June 2005, 88-90.

There are two primary markets for VLJs, (1) the existing heavy single-engine to medium twin-engine aircraft owner, both piston-engine and turbo-prop, who is looking to move up, and, (2) Air Taxi operators. The move up aircraft owner is less speculative and it is anticipated that VLJs may well replace existing aircraft on a one-for-one basis and are anticipated to generally have a net neutral impact on a particular airport. The more speculative proposition is the use of VLJs in creating a paradigm shift and an explosion in the use of air taxis, taking passengers away from the airlines and off the highways. Air-taxi operators are responsible for about half of the approximately 3,000 VLJ orders, to date³. The source of speculation seems to stem from the aggressive number of hours per year these aircraft will need to fly to meet the economic expectation of the potential operators – almost 1, 500 hours annually – which is significantly more than current business jets are flown. Further, the effective use of VLJs as paradigm-shifting air taxi “limousines” will be tremendously dependent upon how successful each individual Air Taxi operator will be in minimizing back haul trips with no passengers. This will not be an easy feat for start-up operators with relatively small fleets and customer bases.

There is no concurrence regarding their potential impact. Some say that they will revolutionize the way the small business person travels, some say that it is all over rated and that they will believe it when they see it.

In addition to their attractiveness to the owners of existing heavy single-engine and twin-engine aircraft, many air taxi operators are stepping up to the VLJ as well, in fact. In the *FAA Aerospace Forecasts Fiscally Years 2005-2016*, the FAA anticipates that VLJs will enter the active general aviation fleet in 2006 and that these aircraft will grow to 4,500 units by the end of the current forecast period in 2016. While 4,500 units is a statistically meaningful number, and it is anticipated that the popularity of VLJs will be relatively strong, it remains speculative to anticipate the specific employment of such aircraft. Therefore, this Airport Master Plan will not forecast the operations of Very Light Jets at Buchanan Field Airport.

Negative or Neutral Factors

As a general comment, the Airport has very few negative physical factors and is in an enviable position, due to its many positive features and conditions. However, there are some broad factors that can have a negative or neutralizing impact on the Airport, and the aviation industry, and these are considered in the planning process. As an example, limited runway length and availability of hangar space could be considered potential negative factors that can create a ceiling on the Airport’s potential to meet optimal aviation demand.

³ Ibid. 90.

From a national perspective, one negative factor is due to the current state of the economy and the attitude of the traveling public toward commercial airline travel since the events of 9/11. Certainly, business and pleasure travel declined in the aftermath of those events; however, strong recovery trends began in 2004 at many airports around the country. The economic condition of many of the hub-and-spoke “legacy” airlines is also of concern. This is being offset to a great degree by the positive economic conditions being experienced by the low-cost, point-to-point carriers.

The overall condition of the general aviation industry in the United States has been a negative factor for several years. Beginning in 1978, many sectors of the general aviation industry have been in recession, and the FAA has identified several factors that precipitated this downturn, including economic recessions, fuel crises, the termination of the GI Bill, and the repeal of the Investment Tax Credit. Factors including the rising expense of owning and operating an aircraft (i.e., costs of insurance, fuel, and maintenance), increase in air space restrictions affecting fair-weather flying, reductions in personal leisure time, and shifts in personal preference as to how leisure time is spent have tended to restrict the single-engine light aircraft segment of the industry in particular.

There are also a number of bright spots having a positive impact in certain segments of the general aviation industry. They include the passage of the General Aviation Revitalization Act (GARA) of 1994. This legislation has caused renewed interest and optimism among U.S. aircraft manufacturers, who are either re-entering the single-engine aircraft market after several years’ absence, or are increasing future production schedules to meet expected renewed demand. The growth in the amateur-built aircraft market, and the strength of the used aircraft market, indicate that demand for inexpensive personal aircraft is still relatively strong.

Historical Airport Activity Summary

The starting point for any forecasting effort is to compile data on historical operational activity. The following table provides a tabulation of the historical operations data that we have been able to compile from Airport Traffic Control Tower records. The following table, entitled *HISTORICAL AVIATION ACTIVITY, 1994-2004*, provides a tabulation of Buchanan Field Airport’s historical aviation activity since 1994.

Table B4
HISTORICAL AVIATION ACTIVITY, 1994-2004

Year	FAA TAF ¹	AIR TRAFFIC CONTROL TOWER COUNTS				Total Aircraft Operations
		Air Carrier Operations	Air Taxi Operations	Military Operations	General Aviation Operations	
1994	224,398	---	---	---	---	230,998
1995	222,003	---	---	---	---	219,805
1996	227,297	---	---	---	---	225,324
1997	226,082	---	---	---	---	227,681
1998	214,094	---	---	---	---	216,371
1999	225,939	---	---	---	---	232,939
2000	216,138	13	2,087	193	199,372	201,665
2001	155,713	---	---	---	---	143,649
2002	142,329	0	3,171	205	135,196	138,572
2003	124,737	3	3,594	317	115,172	119,106
2004	123,974	0	3,961	213	124,201	128,375

Source: Airport Air Traffic Control Records. ¹FAA TAF – FAA Terminal Area Forecasts Issued January 2005.
 --- No data available.

As can be seen, total aircraft operations (an operation is defined as either a takeoff or a landing) at Buchanan Field Airport have been declining since 2000, bottoming in 2003, and a rebound occurring in 2004. It is important to note that the large decrease in operations from 1999 to 2000 is a proximate result of the loss of 25 based helicopters from Helicopters Adventures, Incorporated (HAI) who moved their principal training base from Buchanan Field Airport to an airport in Florida during this time frame. Each of the 25 training helicopters was estimated by HAI to produce approximately 2,000 annual operations. Declining operations in 2001 and 2002 are attributable to the national impacts of the events of September 11, 2001.

In addition, it is estimated that 54% of the operational activity at the Airport are itinerant operations and 46% are local operations. Local operations are aircraft operating in the local traffic pattern or within sight of the tower, or aircraft executing practice instrument approaches at the Airport. Touch-and-go operations are perhaps the best example of a local operation.

Air Carrier Aircraft Operations. There currently is no passenger air carrier service at Buchanan Field Airport. However, passenger service existed at the Airport intermittently in the 1960s through the early 1990s, with the most significant operational period being from 1986 to 1992.

General Aviation Operations. General aviation operations are typically more directly tied to economic conditions than commercial passenger operations, and this trend is often reflected in

the historical operations data for a particular airport. The amount of general aviation activity at many airports around the country has remained flat or declined since the early 1980s. The data available for Buchanan Field Airport illustrates fluctuations in general aviation activity since 1994. As economic conditions in the region and nation change in the future, fluctuations in the number of general aviation operations at the Airport will likely continue, although an increasing trend is expected over the long-term.

Air Taxi Operations. During the last five years, the number of air taxi operations has remained, for the most part, steady. Similar to the air carrier classification of aircraft at airports with ATCT facilities, Airport Traffic Control personnel categorize "Air Taxi" as those aircraft capable of seating less than 60 passengers, which are being utilized for commercial passenger or air freight service and which use a three letter company designator or the "Tango" designation. For purposes of this study, "Air Taxi" aircraft will be included in the general aviation operations category.

Military Operations. Historically, military aircraft have infrequently utilized Buchanan Field Airport for training and/or operational purposes, primarily Coast Guard and Army helicopters (and an occasional military King Air C-12). Annual military aircraft operations during 2004 were approximately 213, and are expected to remain roughly the same throughout the planning period.

Based Aircraft

The number of aircraft that can be expected to base at any airport is dependent upon many factors, such as aircraft maintenance facilities, airport communication practices, services provided at the airport, airport proximity and access, and similar factors. A historical summary of based aircraft is presented in the following table entitled *SUMMARY OF BASED AIRCRAFT, 1994-2004*.

Table B5
SUMMARY OF BASED AIRCRAFT, 1994-2004

Year	FAA TAF	Total Based Aircraft ¹
1994	579	---
1995	579	---
1996	579	---
1997	579	---
1998	579	576
1999	579	541
2000	579	540
2001	579	503
2002	579	---
2003	594	512
2004	599	497

FAA TAF- Issued January 2005. ¹Based aircraft count conducted by airport personnel. This count does not take seasonal changes or fluctuations into account. --- No data available.

According to Airport records in 2004, there were 497 based aircraft at Buchanan Field Airport, of which 406 were single-engine aircraft, 32 were multi-engine piston aircraft, 16 were turboprop aircraft, 14 were helicopters, and 29 were business jets.

Aircraft Operations Forecasts

Forecasts can be utilized for various purposes. The ultimate use of the forecast data may influence the assumptions used to develop the forecasts. For instance, if the forecasts are to be used for financial planning, the goal being to make sure the airport can properly fund its operation and capital improvement program, the assumptions that are used will tend to minimize revenue generation capabilities of the airport. If the forecasts are to be used for facilities development planning, the assumptions will tend to maximize the operational activity expectations in order to make sure the airport has adequate area set aside to build the facilities

required to accommodate potential demand. The preferred forecast scenario may change, depending on the ultimate use of the forecast data.

Aviation activity forecasts for airports are often established using several sets of assumptions that generate different forecast scenarios. Several forecast scenarios are used in this Master Plan, the primary purpose of which is to provide a long-term facilities development plan for the Airport that safely and efficiently accommodates anticipated demand. Additionally, they are used to establish an on-Airport/off-Airport land use compatibility program in consideration of aircraft generated noise and other environmental influences.

The forecasting of any type of future activity is as much an art as a science, particularly in the current era of airline deregulation and changing operating methodologies (legacy airline hub and spoke systems vs. low cost carriers' point-to-point systems). Any forecast represents a "deducted guess" or "best hypothesized circumstance" at a particular point in time. It must, therefore, be revised and updated periodically to reflect new conditions and developments.

Commercial Passenger Service Forecast

Commercial passenger service will not be a focal point of this Master Plan; however, the potential for the future re-instatement of passenger service remains a possibility. Given the present economics of the airline industry, with the lack of financial stability of the Legacy Carriers (United, American, Delta, Northwest, Continental, and US Airways) and the growing market share of the Low Cost Carriers (Southwest, JetBlue, AirTran Airways, etc.) exacerbating the financial condition of the Legacy Carriers, new small markets are not being aggressively pursued and may not be for the near-term future. The potential for future passenger service will be considered, with possible facility requirements discussed; however, due to market uncertainties and the speculative nature of likely outcomes, it is not anticipated that specific commercial passenger service activity forecasts will be presented in this Master Plan.

Based on these reasons and others, the *Association of Bay Area Governments Regional Airport System Plan – General Aviation Element 2003* sums up the current state of scheduled passenger service at Bay Area General Aviation Airports: "Based on discussion with the Bay Area general aviation airport managers, they do not see the future role of their airports changing to accommodate any aviation activity beyond what currently exists; e.g., future scheduled commuter-type airline service."

Military Operations Forecast

As a percentage of total annual aircraft operations, the number of military operations at the Airport has historically been relatively insignificant. No factors have been identified that would significantly increase or decrease the number of military operations in the future; therefore, the

number of military aircraft operations is projected to remain at historic levels through the end of the planning period.

General Aviation Activity Forecasts

In 2004, 128,162 general aviation operations were conducted at the Airport, which include an estimated 3,961 air taxi operations. Several forecast scenarios were developed to appropriately reflect current general aviation operation activity and provide realistic projections for the 20-year planning period. The forecast scenarios generated for this Master Plan assume, for the most part, straight-line growth. While it is recognized that straight-line (consistent) growth never occurs year after year for many years, average annual growth methodologies often serve to illustrate intermediate and long-range planning quite well. It should be noted that it is not the actual numbers that are most important, but the reasoning, assumptions, and trends that the numbers represent.

FAA TAF – Data from the *January 2005 FAA Terminal Area Forecast (TAF)* is shown.

SCENARIO ONE – The *January 2005 FAA Terminal Area Forecast (TAF)* indicates an average growth rate of 0.76% annually from 2004 to 2020.

SCENARIO TWO - According to the *FAA Aerospace Forecasts Fiscal Years 2005-2016*, the general aviation operations at towered airports nationwide is expected to increase at an average rate of 1.33% annually.

SCENARIO THREE - As previously mentioned in the *Association of Bay Area Governments Projections 2005* forecasting document, the socioeconomic conditions of a particular area can affect aviation activity. Typically, population, employment, and income are analyzed and used as a forecast scenario. Scenario Three utilizes the forecast average annual population growth for Alameda County and Contra Costa County. According to the *Association of Bay Area Governments Regional Airport System Plan 2003*, the majority of based aircraft owners reside in Contra Costa County, followed by Alameda County. This forecast growth scenario uses the average of the two growth rates, corresponding to a growth rate of 1.03%.

SCENARIO FOUR – Projects an average growth rate of 1.55%, which corresponds to the average annual increase of the number of total jobs growth rate forecast for Contra Costa County.

SCENARIO FIVE – This forecast scenario is based on the assumption that, during the first five years of the planning period (2004-2009), business jet operations will increase at a greater rate than other general aviation operations. Business jet activity was projected to grow 6.7% annually during the initial 12 years of the planning forecast, which corresponds to the *FAA Aerospace*

Forecasts Fiscal Years 2005-2016 nationwide forecast for Turbo Jet hours flown. Moreover, airport personnel report an anticipated increase in based corporate jets at Buchanan Field Airport because of new landside facilities, including 40,000 square feet of hangar space that is currently under construction. Each additional based jet is capable of generating at least 200 operations per year, conservatively. Business jet activity is then forecast to increase at an average rate of 1.33% from 2017 through to the end of the planning forecast (2024), which corresponds to the FAA Aerospace Forecasts general aviation growth at towered airports nationwide. The remaining general aviation operations are expected to grow at an average rate of 1.33% (again, corresponding to the FAA Aerospace Forecasts general aviation growth at towered airports nationwide). This Scenario results in an average compound growth rate of 1.75% over the 20-year planning forecast.

The following table, entitled *GENERAL AVIATION OPERATIONS FORECAST SCENARIOS, 2004-2024*, shows several general aviation operational forecasts, including the FAA TAF (from January 2005), and five forecast scenarios developed for this study.

Table B6
GENERAL AVIATION OPERATIONS FORECAST SCENARIOS, 2004-2024

Year	FAA TAF ¹	Scenario One 0.76%	Scenario Two 1.33%	Scenario Three 1.03%	Scenario Four 1.55%	Scenario Five ² Variable %
2004	123,639	128,162	128,162	128,162	128,162	128,162
2005	124,642	129,136	129,867	129,482	130,149	130,555
2006	125,645	130,117	131,594	130,816	132,166	133,026
2007	126,573	131,106	133,344	132,163	134,214	135,578
2008	127,510	132,103	135,117	133,524	136,295	138,218
2009	128,460	133,107	136,915	134,900	138,407	140,948
2014	132,373	138,242	146,265	141,992	149,472	156,152
2019	137,534	142,493	154,203	147,933	158,956	167,438
2024	---a	149,115	166,925	157,314	174,324	181,252

Source: BARNARD DUNKELBERG & COMPANY. 1 FAA Terminal Area Forecast, Fiscal Years 2004 – 2020 Issued January 2005. Includes Air Taxi Operations. 2 1.75% compounded average annual growth rate. --- No data available.

RECOMMENDED FORECAST SCENARIO. The Consultant’s Preferred Forecast for this Master Plan is Scenario Five. This Scenario recognizes the fact that operations will grow much faster for business jet operations at the Airport. It is important to note that the total number of operations at the end of the planning period remain lower than those observed during several years in the 1980s and 1990s at Buchanan Field Airport.

Operations Forecast by Aircraft Type

A further assessment of the forecasts involves the individual and collective use of the Airport by various types of aircraft. The types of aircraft expected to use the Airport assist in determining the amount and type of facilities needed to meet the aviation demand.

The following table, entitled *SUMMARY OF OPERATIONS FORECAST BY AIRCRAFT TYPE, 2004-2024*, depicts the approximate level of use by aircraft types that are projected to use Buchanan Field Airport. This table reflects a growing percentage of turbine and multi- engine powered aircraft anticipated to operate at the Airport, and a decreasing percentage of single-engine powered aircraft. This is indicative of the type of facility the Airport is, the prevailing local economic conditions, and regional/national trends in general aviation. As mentioned previously, there is no expected growth in military operations from the base year (2004).

Table B7
SUMMARY OF OPERATIONS BY AIRCRAFT TYPE, 2004-2024

Operations by Type	2004¹	2009	2014	2019	2024
<i>General Aviation</i>	128,162	140,948	156,152	169,665	181,252
Single Engine	89,713	94,435	101,499	106,889	112,376
Multi Engine	8,971	10,148	11,711	12,895	13,775
Turboprop	3,845	4,510	5,153	5,599	6,163
Business Jet	12,816	17,618	21,861	26,807	30,269
Helicopter	12,816	14,236	15,927	17,475	18,669
<i>Military</i>	213	213	213	213	213
TOTAL	128,375	141,161	156,365	169,878	181,465

Source: BARNARD DUNKELBERG & COMPANY.
 1. Airport Traffic Control Tower records.

Currently, it is estimated that approximately 70% of all general aviation operations are single-engine operations, while 7% are multi-engine, 3% are turbo-prop, 10% are business jet, and 10% are helicopters. At the end of the forecast period (2024), approximately 62% of all general

aviation operations are forecast to be single-engine, 7.6% are multi-engine piston, 3.4% are turbo-prop, 16.7% are business jet, and 10.3% are helicopter.

Local and Itinerant Operations Forecast

Forecasts of operations have also been categorized accordingly into local and itinerant operations. The *Air Traffic Control Handbook* defines a local operation as any operation performed by an aircraft operating in the local traffic pattern or within sight of the air traffic control tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the Airport. Touch-and-go operations are perhaps the best example of a local operation.

At Buchanan Field Airport, local operations account for 54% of all airport operations, and this percentage is expected to decrease slightly (to 42% at the end of the planning period), due to increased business-related flight activity. Based on this consideration, forecasts of local and itinerant operations are shown on the following table, entitled *SUMMARY OF LOCAL AND ITINERANT OPERATIONS, 2004-2024*.

Table B8
SUMMARY OF LOCAL AND ITINERANT OPERATIONS, 2004-2024

Year	Local	Itinerant	Total
2004 ¹	59,161	69,214	128,375
2009	63,522	77,638	141,161
2014	68,800	87,564	156,365
2019	73,047	96,830	169,878
2024	76,215	105,250	181,465

Source: BARNARD DUNKELBERG & COMPANY.

1. Airport Traffic Control Tower Records.

Peak Period Forecast

An additional element in assessing airport use and determining various capacity and demand considerations is to ascertain peak period activities. Air traffic records indicate that October was the peak month in 2004, with 14,014 total operations occurring in that month. The following assumptions were made: 11% of annual operations occur in the peak month, a 31-day peak month is assumed, and peak hour operations are 10% of the average day of the peak month. The peak period operational activities are illustrated in the following table, entitled *PEAK PERIOD AIRCRAFT OPERATIONS, 2004-2024*.

Table B9
PEAK PERIOD AIRCRAFT OPERATIONS, 2004-2024

Year	Annual	Peak Month	Average Day of Peak Month	Peak Hour/ Average Day Ratio	Peak Hour
2004	128,375	14,014	452	10.0%	45
2009	141,161	15,284	493	10.0%	49
2014	156,365	16,669	538	10.0%	54
2019	169,878	18,179	583	10.0%	59
2024	181,465	19,827	640	10.0%	64

Source: BARNARD DUNKELBERG & COMPANY.
 Operation counts were tabulated based on methodology from FAA AC 150/5070-6A Airport Master Plans and FAA AC 150/5060-5 Airport Capacity and Delay.

General Aviation Based Aircraft Forecast

The number of general aviation aircraft, which can be expected to base at an airport facility, is dependent on several factors, such as airport radio communications, available facilities, airport operator services, airport proximity and access, aircraft basing capacity available at adjacent airports, and similar considerations. General aviation operators are particularly sensitive to both the quality and location of their basing facilities, with proximity of home and work often being identified as the primary consideration in the selection of an aircraft basing location.

Several forecast scenarios were developed to appropriately reflect current based aircraft and provide realistic projections for the 20-year planning period. The forecast scenarios generated for this Master Plan assume, for the most part, straight-line growth. While it is recognized that straight-line (consistent) growth never occurs year after year for many years, average annual growth methodologies serve intermediate and long-range planning purposes quite well. It should be noted that it is not the actual numbers that are most important, but the reasoning, assumptions, and trends that the numbers represent.

FAA TAF – Data from the *January 2005 FAA Terminal Area Forecast (TAF)* is shown.

SCENARIO ONE – The *January 2005 FAA Terminal Area Forecast (TAF)* indicates an average growth rate of 0.85% annually from 2004 to 2020.

SCENARIO TWO - According to the *FAA Aerospace Forecasts Fiscal Years 2005-2016*, the FAA active general aviation fleet is forecast to increase at an average rate of 1.10% annually.

SCENARIO THREE - As previously mentioned in the *Association of Bay Area Governments Projections 2005* forecasting document, the socioeconomic conditions of a particular area can affect aviation

activity. Typically, population, employment, and income are analyzed and used as a forecast scenario. Scenario Three utilizes the forecast average annual population growth for Alameda County and Contra Costa County. According to the *Association of Bay Area Governments Regional Airport System Plan 2003*, the majority of based aircraft owners reside in Contra Costa County, followed by Alameda County. This forecast growth scenario uses the average of the two growth rates, corresponding to a growth rate of 1.03%.

SCENARIO FOUR – Projects an average growth rate of 1.5%, which corresponds to the average annual total jobs growth rate for Contra Costa County.

SCENARIO FIVE – This forecast scenario is based on several assumptions. First is the previously mentioned consideration of additional business jets that, in all likelihood, will be basing at Buchanan Field Airport in the near-term. It is anticipated that up to 20 additional business jets will be based at Buchanan Field Airport because of new hangar facilities being built within the next five years. Secondly, with the potential for exceptional landside facilities at the Airport, and the Airport itself being located in a superior location (close to area businesses and executive residences alike), business jet activity is forecast to increase substantially more than other general aviation activity. Therefore, this forecast scenario uses a variable rate of adding these additional business jets at a rate of four per year during the initial five years of the planning period. Business jets are then predicted to increase 5.4% annually from 2010 to 2016, which corresponds to the *FAA Aerospace Forecasts Fiscal Years 2005-2016* FAA active general aviation fleet forecast for turbo jet aircraft. Business jets are then forecast to grow 1.10% annually for the remainder of the forecast period (2017 to 2024), which corresponds to the *FAA Aerospace Forecasts Fiscal Years 2005-2016* FAA total average active general aviation fleet forecast. The remaining based aircraft at the Airport (single-engine, multi-engine piston, turbo-prop, and helicopters) are projected to increase 1.10% annually during the entire 20-year planning period (which, as mentioned previously, corresponds to the *FAA Aerospace Forecasts Fiscal Years 2005-2016* FAA average total active general aviation fleet forecast.) This forecast scenario results in an average compound growth rate of 1.43%.

The following table, entitled *BASED AIRCRAFT FORECAST SCENARIOS, 2004-2024*, presents the based aircraft forecast for the 20-year planning period.

Table B10
BASED AIRCRAFT FORECAST SCENARIOS, 2004-2024

Year	FAA TAF ¹	Scenario One 0.85%	Scenario Two 1.10%	Scenario Three 1.03%	Scenario Four 1.55%	Scenario Five ² Variable %
2004	599	497	497	497	497	497
2005	605	501	502	502	505	506
2006	610	505	508	507	513	515
2007	615	510	514	513	520	525
2008	620	514	519	518	529	534
2009	626	518	525	523	537	551
2014	647	541	554	551	580	586
2019	674	560	579	574	616	618
2024	---	589	619	610	676	660

Source: BARNARD DUNKELBERG & COMPANY. 1 FAA Terminal Area Forecast, Fiscal Years 2004 – 2020 Issued January 2005. 2 1.43% compounded average annual growth rate. --- No data available.

RECOMMENDED FORECAST SCENARIO. The Consultant’s Preferred Forecast for this Master Plan is Scenario Five. This Scenario again recognizes the fact that based aircraft will grow much faster for business jet operations at the Airport based on the local conditions, industry trends and regional economic indicators mentioned in the preceding pages of this chapter.

Operations per Based Aircraft

Generally, there is a relationship between aviation activity and based aircraft, stated in terms of operations per based aircraft (OPBA). Sometimes a trend can be established from historical information of operations and based aircraft. The national trend has been changing with more aircraft being used for business purposes and less for pleasure flying. This impacts the OPBA in that business aircraft are usually flown more often than pleasure aircraft. In 2004, the OPBA at Buchanan Field Airport was 258. In consideration of the recommended general aviation operations and based aircraft scenarios (as more aircraft based there are used for business purposes), it is expected that the number of operations per based aircraft will increase at the Airport to 275 by the end of the planning forecast.

General Aviation Aircraft Fleet Mix

The mix of based aircraft for incremental periods throughout the planning period is illustrated in the following table, entitled *GENERAL AVIATION BASED AIRCRAFT FLEET MIX, 2004-2024*. With an existing high percentage of single-engine aircraft based at the Airport, the percentage of turbo-prop and business jet aircraft is expected to increase as a part of the total based aircraft population. This is in line, first, with overall trends in general aviation, but even more importantly, parallels the economic development and growth expectations and projections characteristics locally and regionally.

Table B11
GENERAL AVIATION BASED AIRCRAFT FLEET MIX, 2004-2024

Aircraft Type	2004	2009	2014	2019	2024
Single-Engine	406 (81.7%)	424 (78.1%)	441 (75.3%)	463 (74.1%)	481 (72.9%)
Multi-Engine	32 (6.4%)	35 (6.4%)	39 (6.7%)	42 (6.7%)	46 (7.0%)
Helicopter	14 (2.8%)	17 (3.1%)	21 (3.6%)	25 (4.0%)	30 (4.5%)
Turbo-Prop	16 (3.2%)	18 (3.3%)	21 (3.6%)	23 (3.7%)	26 (3.9%)
Business Jet	29 (5.8%)	49 (9.0%)	64 (10.9%)	72 (11.5%)	77 (11.7%)
TOTAL	497 (100.0%)	543 (100.0%)	586 (100.0%)	625 (100.0%)	660 (100.0%)

Source: BARNARD DUNKELBERG & COMPANY.

Summary

The following tables summarize the forecasts of aviation activity, which has been presented in this chapter. This information will be utilized in the following chapter to document and analyze both airside and landside facility requirements. Therefore, the forecasts of aviation activity are an important part of the information base, which will be used to develop future plans for the Airport and formulate implementation decisions relating to Airport development. Overall, total aircraft operations at Buchanan Field Airport are anticipated to increase over the course of the 20-year planning period.

Table B12
SUMMARY OF AVIATION ACTIVITY FORECASTS, 2004-2024

Operations	2004	2009	2014	2019	2024
General Aviation	128,162	140,948	156,152	169,665	181,252
Single-Engine	89,713	94,435	101,499	106,889	112,376
Multi-Engine	8,971	10,148	11,711	12,895	13,775
Turbo-Prop	3,845	4,510	5,153	5,599	6,163
Business Jet	12,816	17,618	21,861	26,807	30,269
Helicopter	12,816	14,236	15,927	17,475	18,669
Military	213	213	213	213	213
TOTAL OPERATIONS	128,375	141,161	156,365	169,878	181,465
Local Operations	59,161	63,522	68,800	73,047	76,215
Itinerant Operations	69,214	77,638	87,564	96,830	105,250
Based Aircraft by Type					
Single-Engine	406	424	441	463	481
Multi-Engine	32	35	39	42	46
Turbo-Prop	16	18	21	23	26
Business Jet	29	49	64	72	77
Helicopter	14	17	21	25	30
Total Based Aircraft	497	543	586	625	660

Source: BARNARD DUNKELBERG & COMPANY.