

APPENDIX A

AVIATION TRENDS

In preparing a master plan update for the Ohio State University Airport, it is important to have an understanding of recent and anticipated trends in the general aviation industry. When these trends are considered, it is important to review factors that could impact the use of general aviation, as well as the funding sources that support this component of aviation activity.

Having an understanding of the general aviation industry is also important to developing projections of future demand for this component of the industry. Included in this examination of general aviation trends will be a discussion of changing patterns in the business use of general aviation aircraft.

The general aviation trends presented in this chapter are generally for the United States as a whole, and they are intended to provide a general frame of reference for the reader of this report. This trends analysis sets the stage for an understanding of how general aviation activity at the Ohio State University Airport compares to general aviation in the country, and it establishes a basis for predicting how general aviation may be expected to grow and change in the future. Having this frame of reference is essential to realistic projections of general aviation demand and to identifying viable alternatives for improving the Ohio State University Airport.

A.1 TRENDS AFFECTING GENERAL AVIATION AIRPORTS

General aviation aircraft are all aircraft that are not flown by airlines or the military. This class of aircraft operates at the Ohio State University Airport. Following a decline that lasted throughout most of the 1980s and into the mid-1990s, the general aviation industry and general aviation activity appear to be revitalized. Prior to 1994, declines in the number of manufacturers and shipments of single-engine aircraft continued to indicate a sagging general aviation industry. Other indicators such as active aircraft, hours flown, and active pilots, all of which are important indicators of the overall health of the general aviation industry, also declined annually during that time period. The impact of this downturn was the decline in production of new aircraft from almost 18,000 aircraft in 1978 to 928 aircraft in 1994. This decline in the production of new aircraft resulted in the loss of approximately 100,000 jobs in the industry. The enactment of the General Aviation Revitalization Act of 1994, which established an 18-year Statute of Repose on all general aviation aircraft and components, in terms of liability to the manufacturer, signaled a significant change in the industry. This Act spurred manufacturers such as Cessna and Piper Aircraft to re-enter the single-engine manufacturing sector. In January 1997, Cessna produced its first new single-engine aircraft since 1986. Lancer International, Diamond Aircraft, and Mooney are also producing new piston aircraft domestically.

The positive impacts that the Act has had on the general aviation industry since its passage are reflected in the various general aviation activity statistics tracked by the FAA. Since 1994, activity statistics indicate an increase in general aviation activity at FAA air traffic facilities, an increase in the number of active general aviation aircraft, and record shipments of and billings

for fixed-wing general aviation aircraft. These recent positive trends in the general aviation industry are anticipated to continue into the future due to a number of factors including the following:

- Construction of new aircraft manufacturing facilities
- Expansion of existing manufacturing facilities
- Increased expenditures on research and development of aircraft and avionics intended to make flying even safer and easier to learn

In addition, the general aviation industry is giving increased attention to “learn to fly” educational and promotional activities that should bring new pilots and aircraft mechanics into the industry.

Specific trends related to general aviation activity, as identified in the Fiscal Year 2000 FAA Aerospace Forecasts developed by the U.S. Department of Transportation, will be identified in following sections. These anticipated future trends will be discussed in terms of the number of aircraft shipments and billings, active aircraft and pilots, changes in the active aircraft fleet mix, and business use of general aviation aircraft.

A.1.1 Aircraft Shipments and Billings

The General Aviation Manufacturers Association (GAMA) tracks and reports total shipments and billings of general aviation aircraft. GAMA statistics for 1999 indicate continued strong growth in the sales of general aviation aircraft, both piston and turbojet. During 1999, general aviation aircraft shipments totaled 2,504 aircraft, an increase of approximately 12.8 percent over 1998 and an increase of nearly 119 percent since 1990. This represents the fifth consecutive year of increased demand for general aviation aircraft. Statistics also indicate that growth in turboprop and jet aircraft shipments are outpacing other sectors of the general aviation aircraft market. A number of factors contribute to this increase in general aviation aircraft shipments including the production of new aircraft such as the Boeing Business Jet, the general strength of the U.S. economy, increases in the number of fractional ownership arrangements, and increases in the number of traditional corporate flight departments among U.S. businesses.

In addition, GAMA tracks total billings of general aviation aircraft, for both domestic and international customers. During 1999, aircraft billings totaled over \$7.8 billion, an increase of approximately 34 percent over total billings in 1998 and a 290 percent increase since 1990. Included in this increase is a strong growth experienced in international billings. Currently, international general aviation shipments and billings represent over 20 percent of the U.S. manufactured aircraft.

The following table, **Table A-1**, presents total general aviation aircraft shipments and billings, on an annual basis, over the time period 1990 through 1999.

TABLE A-1

GENERAL AVIATION AIRCRAFT SHIPMENT AND BILLINGS

Year	Total General Aviation Aircraft Shipments	Total General Aviation Aircraft Billings (\$ millions)
1990	1,444	\$2,007.50
1991	1,021	\$1,968.30
1992	941	\$1,839.60
1993	964	\$2,143.80
1994	928	\$2,357.10
1995	1,077	\$2,841.90
1996	1,130	\$3,126.50
1997	1,569	\$4,674.30
1998	2,200	\$5,873.90
1999	2,504	\$7,843.60
% increase 1990-1999	118.9%	290.7%

Source: GAMA

The statistics presented by GAMA illustrate the continued strength of the general aviation aircraft manufacturing industry. In addition to the significant increases in total shipments and billings of general aviation aircraft, it is important to note that the strongest growth appears to be occurring in the jet and turboprop segments of the market. The growth in these segments can be attributed to increased business use of aircraft and their desire to operate safe, efficient, and high-performance aircraft. These high-performance aircraft require airport facilities to be developed to a relatively higher and more demanding standard, a factor that will be considered as development plans are identified in this analysis.

The booming economy in the Columbus Metropolitan area and, more specifically, the extensive commercial development in northwest Columbus are expected to result in an increase use of general aviation aircraft in this area, due to its location, and the pressures to divert in general aviation air traffic from Port Columbus International Airport as its own commercial traffic continues to rise. The Ohio State University Airport is expected to experience an increased number of business jet and turboprop aircraft operations.

A.1.2 Active Pilots

In 1999, the four major segments of the pilot population, student pilots, private pilots, commercial pilots, and airline transport pilots, each experienced growth. As a result, the total number of U.S. active pilots increased to approximately 640,110 pilots in 1999, an increase of almost 22,000 pilots compared to 1998. One of the strongest growth rates was experienced in

the student pilot population, which increased by approximately 4.4 percent. These students represent the future of general aviation and are not only learning to fly for recreational reasons, but also because of career opportunities created by the needs of air carriers, fractional ownership providers, and corporate flight departments. Also worthy of noting is the 2.9 percent growth rate experienced in instrument-rated pilots in 1999. Currently, approximately 57.5 percent of the total active pilot population is instrument-rated, another reflection of the increased sophistication of aircraft and pilot.

The FAA has developed forecasts of the future pilot population, by certificate type, based on historic trends as well as anticipated future trends. These projections estimate that the total active pilot population in the U.S. will increase from 640,113 in 1999 to 824,490 by 2011, representing an average annual growth rate of approximately 2.1 percent.

Table A-2 presents the FAA forecasts of the active pilot population, by pilot certificate type, on an annual basis over the forecast period.

TABLE A-2

FAA ACTIVE PILOT FORECAST

Year	Student	Private	Commercial	Airline Transport	Other 1/	Total
1994	96,254	284,236	138,728	117,434	17,436	654,088
1995	101,279	261,399	133,980	123,877	18,649	639,184
1996	94,947	254,002	129,187	127,486	16,639	622,261
1997	96,101	247,604	125,300	130,858	16,479	616,342
1998	97,736	247,226	122,053	134,612	16,671	618,298
1999	102,000	258,749	124,261	137,642	17,461	640,113
Average Annual Growth Rate	1.2%	-1.9%	-2.2%	3.2%	0.03%	-0.4%
2000	106,100	260,700	126,200	139,700	17,696	650,396
2001	110,300	267,400	128,400	144,400	17,936	668,436
2002	114,700	272,000	130,600	149,500	18,140	684,940
2003	119,300	277,500	133,300	154,400	18,345	702,845
2004	124,000	283,700	136,300	159,300	18,544	721,844
2005	128,300	288,000	138,300	164,000	18,744	737,344
2006	132,700	291,400	139,900	169,300	18,943	752,243
2007	137,000	294,600	141,500	174,400	19,137	766,637
2008	141,000	297,600	142,900	180,000	19,347	780,847
2009	145,000	300,600	144,300	186,000	19,561	795,461
2010	148,800	303,600	145,800	192,000	19,771	809,971
2011	152,500	306,600	147,300	198,100	19,990	824,490
Average Annual Growth Rate	3.4%	1.4%	1.4%	3.1%	1.1%	2.1%

Note: 1/ Other pilot category includes pilots with recreational, rotorcraft only, and glider only certificates.

Source: FAA U.S. Civil Airmen Statistics

FAA Aerospace Forecasts, Fiscal Years 2000-2011

The data presented above show relatively strong growth, ranging from an average annual rate of 1.4 percent in the private and commercial pilot categories to an average annual rate of 3.4 percent in the student pilot category. The strong growth anticipated in the student pilot category is important to note because of the potential impacts this growing number of pilots may have on all components of general aviation activity in the future. Student pilots, in most cases, will graduate to become active private, commercial, and/or airline transport pilots, which in turn may impact overall active aircraft fleet and general aviation activity statistics.

The national increase projected in the number of student pilots indicates that the flight training activities at the Airport should continue to grow. Likewise, the Ohio State University Department of Aviation is reportedly expanding its flight education program, which will result in its own increase in student pilot activity at the Airport.

A.1.3 Aircraft Fleet

The FAA annually tracks the number of active aircraft in the U.S. Active aircraft are those that are currently registered and fly at least one hour during the year. By tracking this information, the FAA is able to identify trends in the total number of active aircraft, as well as the types of aircraft operating in the active fleet. Based on FAA estimates, the active general aviation aircraft fleet is anticipated to increase from 206,530 aircraft in 1999 to 230,995 in 2011, representing an average annual growth rate of approximately 0.9 percent. FAA forecasts for the total active aircraft fleet, as well as each major type of aircraft, are summarized in **Table A-3**.

TABLE A-3

FAA AIRCRAFT FLEET MIX

Year	SE	ME	Turbo Turboprop	Turbo Jet	Rotor Craft	Other 2/	Total
	Piston	Piston			1/		
1994	127,351	14,801	4,092	3,914	4,728	18,050	172,936
1995	137,049	15,739	4,995	4,559	5,830	19,917	188,089
1996	137,401	16,150	5,716	4,424	6,570	20,869	191,129
1997	140,038	16,017	5,619	5,178	6,785	18,772	192,414
1998	144,234	18,729	6,174	6,066	7,426	22,082	204,710
1999	145,250	18,750	6,250	6,400	7,590	22,290	206,530
Average Annual Growth Rate	2.7%	4.8%	8.8%	10.3%	9.9%	4.3%	3.6%
2000	146,400	18,750	6,340	6,820	7,745	22,600	208,655
2001	147,600	18,750	6,430	7,240	7,895	22,910	210,825
2002	148,800	18,750	6,520	7,660	8,010	23,230	212,970
2003	150,000	18,750	6,610	8,080	8,135	23,550	215,125
2004	151,200	18,750	6,700	8,500	8,240	23,880	217,270
2005	152,400	18,750	6,790	8,910	8,355	24,210	219,415
2006	153,400	18,750	6,870	9,320	8,465	24,540	221,345
2007	154,400	18,750	6,950	9,725	8,575	24,880	223,280
2008	155,400	18,750	7,030	10,125	8,690	25,220	225,215
2009	156,400	18,750	7,100	10,520	8,805	25,570	227,145
2010	157,400	18,750	7,170	10,910	8,920	25,920	229,070
2011	158,400	18,750	7,240	11,295	9,040	26,270	230,995
Average Annual Growth Rate	0.7%	0.0%	1.2%	4.8%	1.5%	1.4%	0.9%

Note: 1/ Includes both piston and turbine rotorcraft.

2/ Includes aircraft classified by FAA as experimental and other.

Source: FAA Aerospace Forecasts, Fiscal Years 2000-2011

As shown in the preceding table, the total active aircraft fleet is forecasted to experience an average annual growth rate of less than 1 percent. One of the most important trends identified in these forecasts is the relatively strong growth anticipated in active jet and turboprop aircraft. This trend illustrates a movement in the general aviation community towards higher performing, more demanding aircraft. This will impact the types of activities occurring at general aviation airports with facilities to accommodate demanding business aircraft.

It is also useful to examine the existing and anticipated active aircraft fleet in terms of the percentage of the total fleet that each aircraft class represents. The following table, **Table A-4**, examines the existing mix of the national 1999 active fleet and the anticipated mix projected for the fleet of 2011 as projected by the FAA.

TABLE A-4

FAA PERCENTAGE OF ACTIVE AIRCRAFT FLEET MIX

Aircraft Type	1999	2011
Single-engine piston	70%	68%
Multi-engine piston	9%	8%
Turboprop	3%	3%
Jet	3%	5%
Rotorcraft 1/	4%	4%
Other 2/	11%	12%

Note: 1/ Includes both piston and turbine rotorcraft.

2/ Includes both "other" (gliders and lighter-than-air) aircraft and experimental aircraft

Source: FAA Aerospace Forecasts, Fiscal Years 2000-2011

As shown in the table, the majority of the active aircraft in the current fleet are single-engine piston aircraft. The table also depicts the anticipated future active fleet mix for 2011. It is anticipated that the percentage of single-engine piston aircraft will decline as older aircraft are retired and replaced with more demanding general aviation aircraft.

Forecast data presented by the FAA indicates that each component of the general aviation aircraft fleet mix will either remain steady (multi-engine piston) or grow in terms of total number of active aircraft. Data depicted in the table presented above indicates that jet and other aircraft will be the only components of the general aviation aircraft fleet mix that will see their share of the active fleet grow over the forecast period. Jet aircraft are anticipated to grow from approximately 3 percent of the active general aviation fleet mix in 1998 to approximately 5 percent of the active fleet by 2011, indicating the relative increase in sophistication anticipated in the active aircraft fleet and pilot population. The other category of aircraft are also forecasted to become a larger component of the active fleet, primarily because of growth in experimental aircraft, growing from approximately 11 percent of the fleet to 12 percent of the fleet by 2011.

As the aircraft fleet mix, nationwide, shifts from one dominated by piston-engine aircraft to one entailing more turbine-powered aircraft, similar trends are being experienced locally. Many of the businesses/pilots currently using the Ohio State University Airport, as well as surrounding facilities, are converting their own fleets from piston-engine aircraft to turboprop or jet engine aircraft.

A.1.4 Business Use of General Aviation Aircraft

Many businesses throughout the U.S. depend on general aviation aircraft to add to their productivity and efficiency. The Ohio State University Airport, with its large fleet of business aircraft, is an essential component of the Columbus Metropolitan Area's business transportation infrastructure. Air transportation makes possible the quick movement of millions of people and billions of dollars worth of goods to markets around the world. Similarly, the growth of a competitive domestic economy depends more and more on our ability to move by air. More and more businesses throughout the nation are looking to general aviation aircraft, and the flexibility and efficiency that they provide, to support their domestic and international business operations.

Many of the nation's leading employers that use general aviation as a business tool are members of the National Business Aircraft Association (NBAA). Data from NBAA shows that many of the top U.S. businesses use general aviation aircraft. The NBAA's *Business Aviation Fact Book 2000* indicates that approximately 70 percent of all businesses included in the *Fortune 500* operate general aviation aircraft. In addition, 90 of the *Fortune 100* companies operate general aviation aircraft. A detailed analysis conducted for NBAA in 1998 also indicated that, among the *Fortune 500*, there were more than twice as many companies operating general aviation aircraft as non-operators.

Business use of general aviation aircraft can range from the rental of small single-engine aircraft to multiple aircraft corporate fleets supported by dedicated flight crews and mechanics. The use of general aviation aircraft allows employers to efficiently transport priority personnel and air cargo. Businesses use general aviation aircraft to link multiple office locations and to reach existing and potential customers. The use of business aircraft by smaller companies has escalated as various chartering, leasing, time-sharing, interchange agreements, partnerships, and management contracts have emerged. NBAA statistics support this claim by indicating that the number of flight departments among all the nation's businesses had increased from 6,584 in 1991 to 8,778 in 1999, an increase of approximately 33 percent. Fractional ownership arrangements have also experienced a recent trend of rapid growth. In 1998, NBAA estimated that 1,125 companies used fractional ownership arrangements; by 1999, that number had grown to 1,693 companies, a growth of over 50 percent in a single year.

Regardless of how the aircraft are owned or what type of aircraft is flown, businesses choose to use general aviation because it provides safe, efficient, flexible, and reliable transportation. Of all the benefits provided to business by general aviation, flexibility is the most valued by all businesses using general aviation aircraft. While there are many reasons businesses use general aviation in their day-to-day operations, the some of the most important factors, according to the businesses themselves, are as follows:

- Flexibility
- Time Savings
- Reliability

- Safety
- Improved Marketing Efficiency
- Facility/Branch Office Control
- Personnel Development Training
- Privacy and Comfort
- Efficiency
- Security

One other benefit that is becoming increasingly important to both employees and employers using general aviation aircraft for business travel is that it minimizes non-business hours away from home. Using business aircraft increases the flexibility of scheduling and provides rapid, safe, and efficient access to meeting locations. These factors allow employees using general aviation aircraft to travel to and from their destination in less time than would be required in a traditional commercial service airline schedule that includes layovers, delays, and other time-consuming events. The positive effect that minimizing non-business time away from home has on employee morale and productivity is impossible to measure, yet growing in importance.

The use of general aviation as a business tool adds to productivity and to the bottom line. According to an NBAA survey of key *Forbes and Fortune 500* companies, those businesses that use general aviation aircraft routinely significantly outperform businesses that do not use general aviation aircraft. Performance indicators such as annual sales, number of employees, value of assets, and annual income are significantly higher for employers using general aviation aircraft.

The Ohio State University Airport has been, for a long time, recognized as a business-use airport, capable of supporting the growth in business activity occurring in the Columbus Metropolitan Area. With plans for the extension of a runway, and the construction of additional hangar space, the Airport will be able to better accommodate the growing demand for business class aircraft. Improvement to the existing Airport terminal building, and the concepts for a new terminal building, allow the Airport to better serve the needs of visiting pilots and executives.

A.2 SUMMARY

This trends analysis shows that general aviation activity in the United States has been on the rise and is expected to continue increasing in the future. Positive growth in the number of aircraft shipments and billings, active aircraft, the number and makeup of pilots, changes in the active aircraft fleet mix, and business use of general aviation aircraft have all occurred within the country.

Current and/or forecasted trends affecting general aviation can be summarized as follows:

- Recent and continued increases in the number of annual general aviation aircraft shipments
- Growth in the number of licensed pilots augmented by a relatively strong growth in the number of student pilots

- Moderate growth in the active aircraft fleet and a trend toward the operation of more demanding and more sophisticated jet aircraft as opposed to piston or turboprop aircraft

These anticipated national growth trends in general aviation activity can be applied to project general aviation trends at the Ohio State University Airport. With the planned expansion projects for the Airport, and the economic growth of the area, the Airport will continue to be a primary facility for accommodating regional general aviation demand. The University's flight training program at the Airport will undoubtedly benefit from a national increase in student pilot training activity, as well.