

The Future of Light Commercial and General Aviation: Business Aviation
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Business Aviation is defined as the employment of privately owned aircraft, used primarily for transporting people, at times and to locations dictated by business needs and priorities. Business Aviation and Airline business travel together make up the total business air transportation market. As such, Business Aviation travel and Airline business travel are common substitutes. Factors affecting the choice of one mode of travel over the other often changes each mode's "share" of the total business air travel market. Still other factors lead to increased use of business air transportation, thus expanding the total market for each mode. In order to look at the future of Business Aviation, one must first understand the relative size of the air transportation market and some of the factors that have traditionally influenced it.

Business Aviation includes the full range of general aviation aircraft in the fleet today. For the purposes of this report, however, business helicopters are not directly addressed. Helicopters are considered separately in this TRB Circular, even though many of the factors discussed in this section apply equally to business helicopters.

Size of the Business Aviation Market

The total size of the U.S. business air transportation market is estimated to be \$29 billion in 1987, broken down as follows:

Table 1
 Business Air Transportation Market

Airline business travel:	\$20 billion
Business Aviation:	<u>\$ 9 billion</u>
Total business air transportation:	\$29 billion

In 1987, based on total expenditures, Business Aviation met approximately one third of U.S. business air transportation needs. The 1986 Business Aviation fleet in the U.S., according to FAA surveys, consists of the following aircraft:

Table 2
 Aircraft in the Business Aviation Fleet

Single-Engine Piston	36,908
Multi-Engine Piston	15,110
Turboprop	3,935
Turbojets/fans	3,899
Rotorcraft	<u>3,035</u>
Total Business Aircraft	62,887

Business Aviation aircraft are approximately 29 percent of the total general aviation fleet of 220,000 aircraft. In 1986, Business Aviation flew approximately 12.6 million hours, or 37 percent of all the hours flown by general aviation. The FAA has estimated that U.S. commercial air carrier aircraft flew approximately 8.5 million hours in 1986.

Because of the inherent flexibility of general aviation aircraft, they operate at many landing facilities not served by air carriers. For companies with facilities located in these areas, Business Aviation travel may be the only efficient means of transportation.

The FAA reports that there are 16,582 landing facilities in the U.S., 5,434 of which are airports open for public use. All of these airports can be used by at least one type of Business Aviation airplane. In contrast, only 213 airports in the lower 48 states receive air service from a major or national air carrier. An additional 360 airports receive service from commuter or regional air carriers.

Overview of the Business Aviation Industry

Demand for Business Aviation travel is most frequently measured by the number of hours flown by Business Aviation in a year. Table 3 indicates the results of the FAA's survey of Business Aviation for the period 1977 - 1986. Another common indicator of the Business Aviation industry is the shipments of new turbine aircraft. Table 3 presents data on these shipments from 1975 to 1987.

Table 3
Business Aviation Flight Hours and Aircraft Shipments

<u>Year</u>	<u>Bus. Aviation Hours Flown</u>	<u>Shipment of New Turbine Bus. Aircraft</u>
1975	Not Available	529
1976	Not Available	555
1977	14,439,447	655
1978	17,319,382	805
1979	18,552,625	994
1980	17,300,790	1,305
1981	17,120,911	1,456
1982	15,032,140	858
1983	13,725,332	570
1984	14,427,234	476
1985	13,429,035	455
1986	12,589,697	323
1987E	Not Available	351

Unfortunately, the annual FAA survey on the number of Business Aviation hours flown is too infrequent and the results are delayed too long (10 months from year end) to make it a useful indicator of current Business Aviation activity. Likewise, using new aircraft shipments as the primary indicator of Business Aviation activity ignores the fact that new aircraft sales comprise only 14 percent of total general aviation industry revenues. New aircraft sales are also subject to factors not directly related to the underlying demand for Business Aviation travel, such as actual or proposed changes in corporate tax laws or capital investment incentives.

Activity in the used turbine aircraft market is another indicator of Business Aviation activity. Table 4 presents used aircraft sales in the U.S. for turbine aircraft in the years 1980 - 1987.

Table 4
Used Turbine Aircraft Sales

<u>YEAR</u>	<u>RETAIL SALES</u>
1980	988
1981	1,390
1982	1,224
1983	1,902
1984	2,049
1985	2,246
1986	2,181
1987E	2,075

Since the size of the Business Aviation fleet has grown only about 2 percent per year in recent times, it is apparent that most of the current demand for Business Aviation transportation is met by the existing fleet of aircraft. How this fleet is being used, as measured by the average hours per aircraft per year, is therefore very significant.

Table 5
Average Hours Flown Per Aircraft Per Year
(General Aviation)

<u>YEAR</u>	<u>SINGLE ENG. PISTON</u>	<u>MULTI-ENG. PISTON</u>	<u>TURBOPROPS</u>	<u>JETS</u>
1976	168.1	251.1	540.6	484.3
1977	166.5	280.4	533.4	509.0
1978	172.4	263.7	509.2	475.2
1979	180.2	273.2	511.7	473.2
1980	168.2	254.8	433.4	443.6
1981	165.8	251.1	470.1	436.3
1982	149.1	230.6	396.3	404.0
1983	139.1	230.5	389.4	382.2
1984	137.7	218.2	414.2	353.6
1985	139.5	207.6	362.0	368.7

From the data presented above, the following observations can be made:

1. The use of Business Aviation peaked in 1979, while the sales of new Business Aviation turbine aircraft peaked two years later in 1981.
2. Unlike the U.S. economy, Business Aviation did not bottom-out and then turn-up after the 1981-82 recession.
3. As demand for Business Aviation lessened, remaining demand was satisfied by the existing fleet of business aircraft. This caused the retail sales market for used turbine aircraft to more than double from 1980 levels.
4. As the Business Aviation fleet ages, average utilization rates decline. Average aircraft utilization for the turboprop fleet declined 32

percent and average utilization for the jet fleet declined 28 percent in the period 1977-1985. This is a much larger drop than can be explained by the normal aging process of the fleet, thus indicating unused capacity.

Explanatory Factors

Several key factors have contributed to the decline in the use of Business Aviation aircraft. Understanding these factors will explain the past and help to predict the future.

1. Alternative Travel. Since being deregulated in 1978, average fare levels for Airline travel have increased only 38 percent, while general prices, as measured by the Consumer Price Index (CPI), have increased 69 percent. In addition, 60 percent of the airline fares available today are discount fares, and 91 percent of airline travellers are using a discount fare. During this same period, the cost of owning and operating business aircraft climbed faster than the CPI. Those cities receiving airline service also have more service than in 1978. Businesses have therefore found it relatively convenient and less expensive to fly on airlines than to use Business Aviation. Accordingly, Business Aviation has lost market share to Airline travel in spite of the fact that the total amount of business travel has increased. In fact, domestic revenue passenger miles for Airline travel grew from 203.2 million in 1980 to an expected 311.4 in 1987, a growth of 53 percent.

2. Economic Factors. In the late 1970's, as competition from foreign countries began to challenge U.S. businesses, U.S. manufacturers began to move plants into more rural areas in order to take advantage of lower labor rates. At the same time, relatively high fuel prices led natural resource companies to expand their exploration of new areas. Often times these new locations were not served by airlines, or had a frequency of airline service that made business travel very inefficient. Consequently, these companies found a need for Business Aviation. In 1980, for instance, the oil industry alone accounted for 17 percent of all the business jets (new or used) sold in the U.S. Finance and real estate companies, on the other hand, bought 9 percent of the business jets.

After the 1981 - 1982 recession, the financial state of manufacturing and natural resource companies was slow to improve. As their demand for business travel stagnated, these companies often decreased the size of their flight departments, thus putting low-time used aircraft into the market place at relatively low prices. Companies that did prosper after the recession often chose to buy used rather than new aircraft, keeping average aircraft utilization rates low. Even though the economy had recovered, real. after.tax corporate profits were not growing uniformly, and the rate of change was not as robust as many businesses had experienced in the late 70's. Consequently, the demand for Business Aviation continued to decline.

As the U.S. economy has continued to grow since the 1982 recession, it has often been service companies that have grown fastest. Because of their nature, most service companies do business in major metropolitan areas that are well-served by airlines, so their demand for Business Aviation is less than manufacturing and natural resource companies.

In 1986, oil companies accounted for only 5 percent of all the business jets sold in the U.S., while the finance and real estate industries accounted for 23 percent of the jets sold. The percent of jets bought by the textile, chemical, and machinery industries has grown only slightly. Service industries accounted for 8 percent of jet sales in 1986, about the same percent as in 1978.

3. Infrastructure Issues. The air traffic controller strike of 1981 had a chilling effect on Business Aviation. Suddenly, company aircraft valued at millions of dollars appeared to lose a great deal of their utility. Even after the initial days of the strike, Business Aviation operators had to make advance reservations to fly, and capacity was severely restricted. Many corporations realized that because of something completely out of their control, their company aircraft was no longer reliable. In spite of the fact that the air traffic system was restored, the value of a business aircraft in the mind of company executives may have been permanently altered.

Today, extensive air traffic delays, often caused by peak traffic loads associated with airline hub and spoke systems, continue to threaten the reliability of traveling by air. These delays affect the Airline traveler primarily, but also often spill over to the Business Aviation traveler. Inasmuch as airline delays increase the need for alternate, more reliable and efficient travel, airline delays may have a positive effect on Business Aviation's market share. But whereas they create fear and distrust of the air traffic control system, delays could serve to lessen air transportation's share of total inter-city travel. The effect of this shift would be primarily felt by the Airline industry, but Business Aviation could also be impacted.

As air transportation continues to grow, available landing times at major air carrier airports will be highly contested. Business Aviation travelers, for the most part, use outlying reliever airports rather than major air carrier airports. Business Aviation traffic at New York's Kennedy, La Guardia, and Newark airports, for instance, is only 7 percent of total traffic, and this percent has been declining. As unused airport capacity becomes scarcer, large airports will greatly increase landing fees for Business Aviation aircraft, and some will propose outright bans on general aviation.

It is very difficult to add new air carrier airport capacity to our air transportation system, and no new air carrier airports have been built in the last 10 years. The FAA, however, has helped fund 36 new general aviation airports since 1982. The relatively low cost of new general aviation airports, and the continued operation of the Aviation Trust Fund, makes it likely that Business Aviation travelers will be able to find landing sites near their destination city.

Business Aviation Outlook

Short Term. During the next five years, the use of business aircraft will continue to grow at approximately the same rate as the GNP. Because the size of the business aircraft fleet will stay relatively constant in the short term, aircraft utilization rates will gradually increase. As this happens, firms owning aircraft will be less likely to want to sell them unless an appropriate replacement or an additional aircraft is available. Manufacturer's aircraft

inventory, already low for many models, will dry up. Used aircraft prices will rise, and some increase in demand for new aircraft will result. New turbine aircraft shipments will increase from 350 in 1987 to 535 by 1992.

As the U.S. dollar continues to drop, and U.S. manufacturing industries find themselves more internationally competitive, they will once again assume their traditional role as significant aircraft buyers and users. Increased profitability of the oil industry could also mean their return as aircraft buyers. The lower dollar will also lead to increased U.S. aircraft exports.

If U.S. GNP should grow more slowly than expected, or not grow at all, Business Aviation will parallel that trend.

Long Term. Business Aviation's share of the business air transportation market will gradually increase. Because fuel costs are a larger percentage of the total cost of operating an airliner than a business aircraft, increases in fuel prices will increase the price of airline tickets more than it will increase the cost of operating business aircraft. The relative price advantage enjoyed by the airlines will begin to lessen.

As air traffic system congestion and delays increase, more Airline business travelers are likely to conclude that a more reliable and efficient means of transportation must be found. Although Business Aviation will be impacted by air traffic system delays too, business travelers will find that business aircraft can minimize the impact these delays have on business travel.

The high cost of producing Business Aviation aircraft will be somewhat reduced as manufacturers become more efficient through the application of advanced manufacturing technology and management techniques. Significant price benefits could result, serving to further stimulate demand. Technological improvements to new aircraft will be undertaken only when meaningful performance or cost benefits are evident.

Changes to the U.S. tax system encouraging capital investment will stimulate business aircraft purchases.

Changes in U.S. product liability laws affecting Business Aviation, if enacted, could allow a return to rational and predictable liability expenses for aircraft manufacturers. The rapid increases in aircraft prices seen in recent years could subside, and stimulation of new aircraft demand could result.