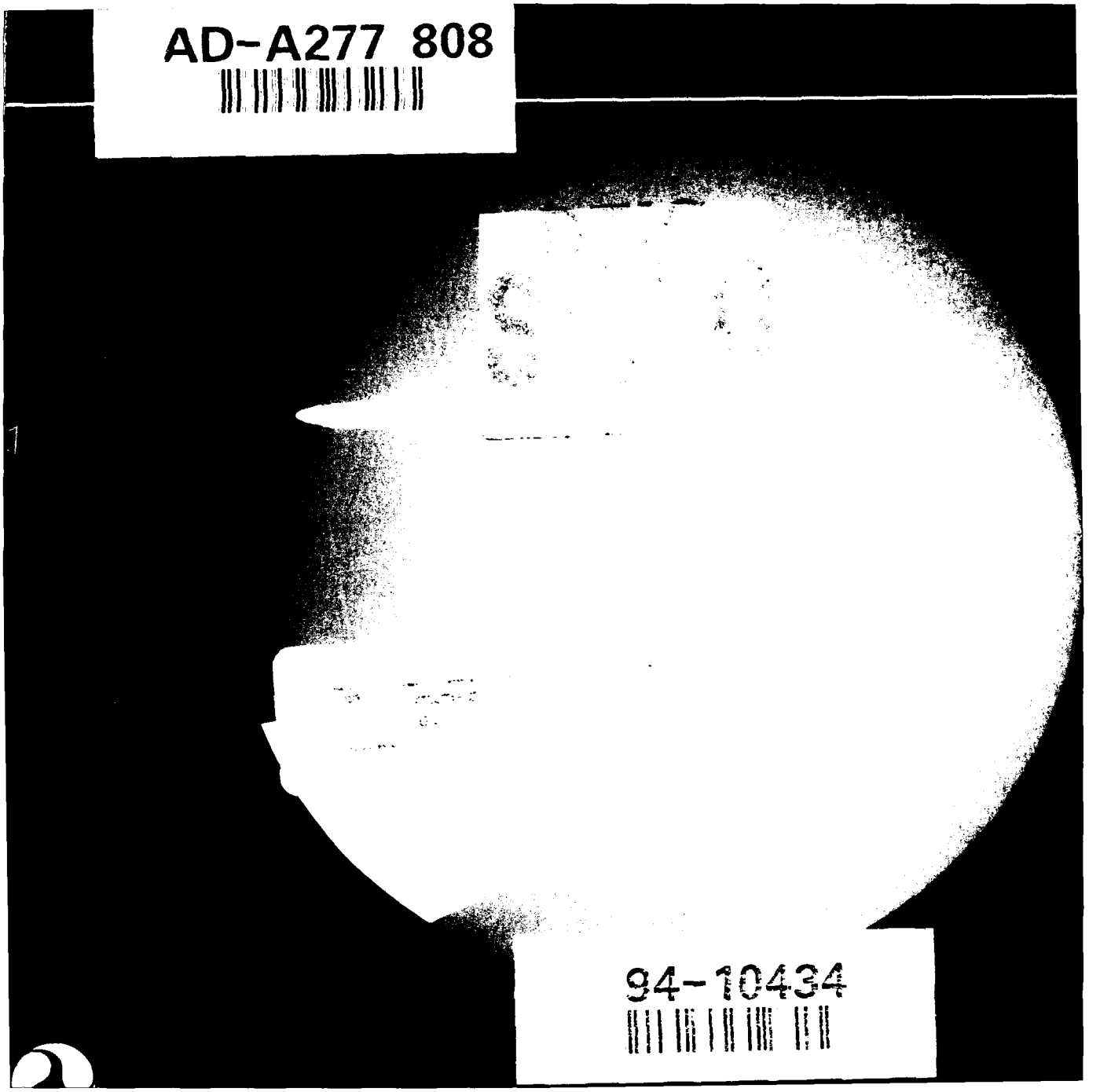

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16. Abstract

This report contains the Fiscal Years 1994-2005 Federal Aviation Administration (FAA) forecasts of aviation activity at FAA facilities. These include airports with FAA control towers, air route traffic control centers, and flight service stations. Detailed forecasts were made for the major users of the National Aviation System: air carriers, air taxi/commuters, military, and general aviation. The forecasts have been prepared to meet the budget and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the general public.

The slow pace of the economic recovery in United States and economic recessions in several of the major world trade areas have caused the aviation industry to experience continued slow traffic growth. However, the outlook for the 12-year forecast period is for moderate economic growth, stable real fuel prices, and modest inflation. Based on these assumptions, aviation activity for fiscal year 2005 is forecast to increase by 22.6 percent at towered airports and 24.0 percent at air route traffic control centers. The general aviation active fleet is forecast to decline by 3.8 percent during the forecast period but increased utilization (hours flown by aircraft) results in a 12.0 percent increase in general aviation hours flown during the same period. Scheduled domestic revenue passenger miles (RPMs) are forecast to increase 55 percent, scheduled international RPMS are forecast to increase by 108 percent, and regional/commuter RPMs are forecast to increase by 166 percent.

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PREFACE

I am pleased to submit to the aviation community FAA Aviation Forecasts, Fiscal Years 1994-2005. These forecasts are developed annually by Robert L. Bowles and his staff in the Statistics and Forecast Branch for use by the agency in its planning and decision-making processes. In addition, the forecasts are used extensively within the aviation and transportation communities as the industry looks to and prepares for the future.

This year's report consists of nine chapters, discussing in detail three major areas: (1) the economic environment, assumptions, and predictions that are used to develop the forecasts; (2) historical data and forecasts of future traffic demand and aircraft activity for each of the major nonmilitary user groups--commercial air carriers, regional/commuter airlines, general aviation, and helicopters; and (3) workload measures for FAA towers, centers, and flight service stations. The report concludes with a discussion of our forecast accuracy and year-by-year data for our individual forecasts of aviation activity.

Briefly, the forecast predicts a moderate recovery and continued expansion of both the U.S. economy and U.S. commercial aviation activity following 6 years of slow traffic growth (1.1 percent annual) in the domestic market. International markets are anticipated to grow more rapidly than domestic markets, especially in Latin America and along the Pacific Rim. However, recessions in Japan and many European countries will restrict growth in these areas during the early years of the forecast period.

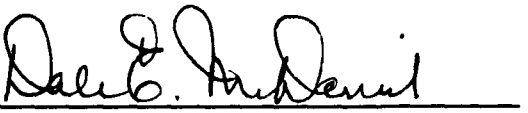
Based on economic projections provided by the Office of Management and Budget and by DRI/McGraw-Hill, Evans Economics, and The WEFA Group, we expect the U.S. economy (as measured by real gross domestic product) to grow at an average annual rate of 2.6 percent between 1994 and 2005, with higher increases projected for many major foreign countries and regions. Combining information on economic projections (e.g., GDP growth and oil prices) and industry assumptions (e.g., industry

capacity and yield management) with analyst expertise results in an anticipated average annual growth rate (as measured in revenue passenger miles) of 4.5 percent from 1993 to 2005. Annual domestic growth is expected to average 3.8 percent and annual international growth is projected to be 6.5 percent.

In reading and using the information in this book, it is important to recognize the limits of forecasting. That is, forecasting is not an exact science. Its accuracy depends heavily on underlying economic and political assumptions.

While there is basic agreement between the Administration's short-term economic projections and those of the various econometric forecasting services, Federal policy and programs may change. Such shifts could result in changes to the short-term economic outlook, altering the demand for aviation services.

If in using this document you see opportunities for improvement, I would appreciate hearing from you. You are encouraged to send your comments to me at the Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591.



Dale E. McDaniel
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Policy, Planning, and
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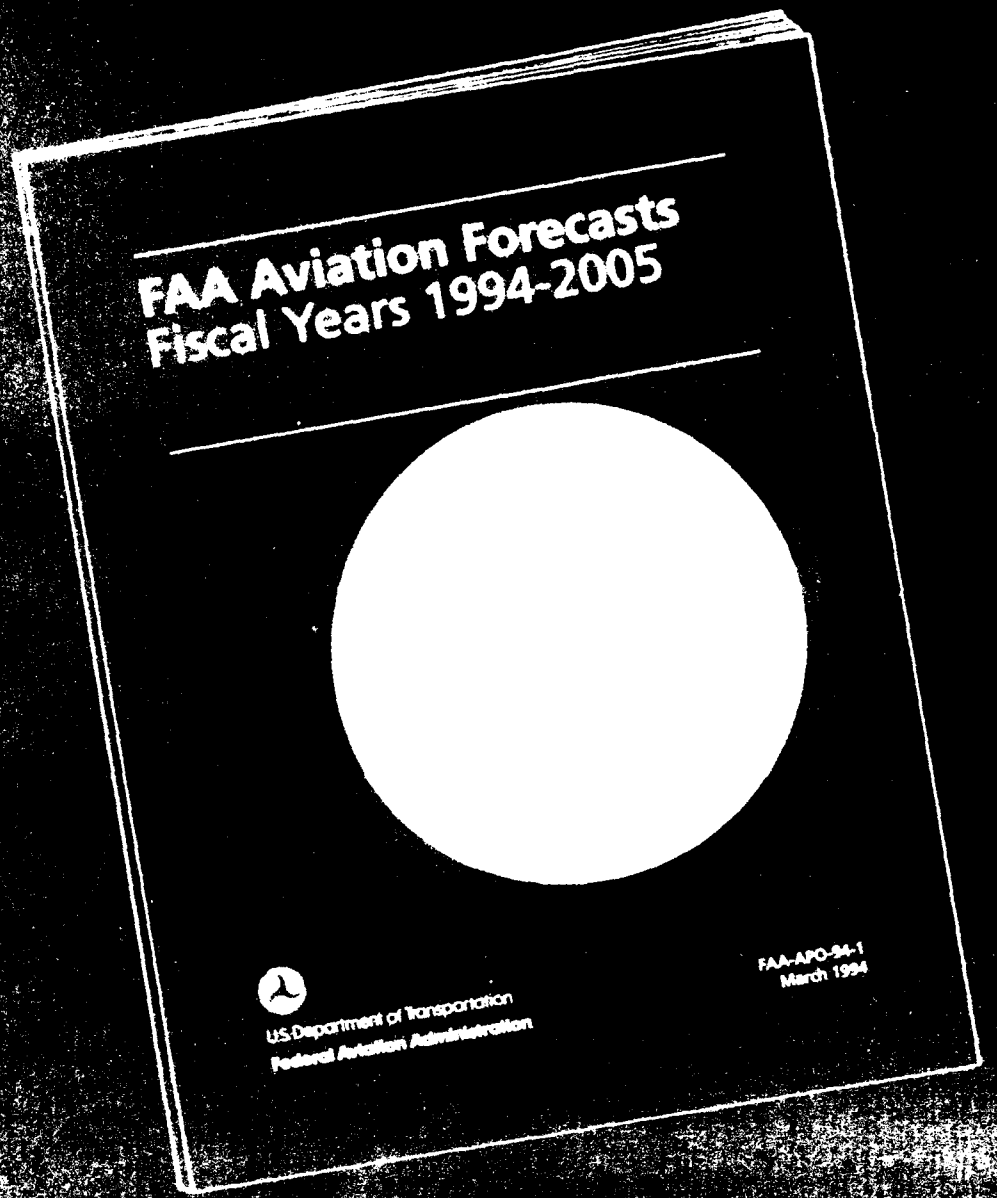
EXECUTIVE SUMMARY



CHAPTER I

EXECUTIVE SUMMARY

THE EARLY 1990s SOME GROWTH-- CONTINUED UNCERTAINTY

The decade of the 1990s continues to be one of uncertainty for the aviation industry. The lethargy of both the U.S. and the world economies has presented both the U.S. and world aviation industry with a number of serious challenges.

In the United States, economic growth has averaged only 1.9 percent annually during the 1990s, a period that included a three-quarter economic recession in 1990/1991. Although the U.S. economy has now grown for ten consecutive quarters, the slow pace of the recovery (2.4 percent annual rate) is unprecedented in postwar U.S. history. However, growth in fiscal year 1993 was a respectable 3.2 percent.

Globally, economic growth has averaged less than half that of the United States, with worldwide real GDP increasing at an annual rate of only 0.7 percent during the 1990s. This included a 0.5 percent decline in 1991 and a no-growth year in 1992. Growth in 1993 is estimated to be an anemic 1.2 percent.

With the possible exception of Latin America (GDP up 2.6 percent annually), no major world trade area has been immune to economic slowdown and/or recession during the 1990s. Canada (GDP down 0.2 and 1.7 percent, respectively in 1990 and 1991), Western Europe (GDP down 0.3 percent in 1993), Eastern Europe (GDP down an average 7.8 percent in 1990-1993), and Japan (down 0.3 percent in 1993) all have experienced stubborn economic downturns.

This sluggish economic activity has had a major impact on the demand for aviation services. U.S. commercial air carrier domestic passenger enplanements increased at an annual rate of only 0.8 percent during the last 4 years. Worldwide traffic growth was also depressed and actually recorded its first traffic decline in history in 1991.

Financially, U.S. commercial airlines experienced losses totaling $4.8 billion during the 1990s. Worldwide losses are expected to total more than $10.0 billion during the same time period.

Although the combination of slow traffic growth and dismal financial performance was detrimental to a number of large U.S. commercial air carriers--the liquidation of Eastern Air Lines, Pan American Airways, Midway Airlines, and Braniff International and the Chapter 11 bankruptcy of America West,

Continental, Hawaiian, and Trans World Airlines--the past year has proved to be a turnaround year for much of the industry.

Both Continental and Trans World emerged from bankruptcy protection, while America West was one of six (out of 11) majors to report a profit in 1993. In addition, the phenomenal success of Southwest Airlines during the 1990s--traffic up almost 75 percent and cumulative profits of $545 million--spawned a large number of look-alike airlines. During the past year, a total of 18 new air carriers were certificated and more than 20 applications are still pending. Among the more successful and best known of the new Southwest clones are Reno Air, Kiwi International, and Morris Air. (In early December, it was announced that Southwest would purchase Morris Air.)

In addition, Southwest's success has also led to a restructuring at many of the larger full-service U.S. airlines. One of the more innovative changes was the creation of CALite--a spinoff from Continental Airlines--a low-fare, no-frills carrier serving more than 50 short-haul routes. Other major carriers are studying similar spin-offs to remain competitive.

In another major change, United Airlines sold majority control of the airline to its employees in exchange for major concessions in wages and changes in work rules. The agreement also calls for the creation of U2--a new "airline within an airline" which is expected to match the lower pay scales and relaxed work rules of Southwest and the other low-cost, low-fare carriers.

Although restructuring has taken many different directions at the individual airlines, there are some common themes among the changes taking place. These include deferring new aircraft deliveries, selling off non-airline business, route realignments (both domestic and international) and/or transferring of short-haul routes to regional code-sharing partners, reducing or eliminating capacity at secondary hubs, cutting jobs and salaries, and launching premium business service on trans-continental and international routes.

Restructuring is also in evidence in the international arena as both U.S. and foreign-flag carriers jockey for more favorable positions to compete in the global market. The increasing penetration of U.S. carriers into foreign markets has created a strong incentive for foreign-flag carriers to gain a foothold in the large U.S. domestic market. This has led to a number of alliances between U.S. and foreign-flag carriers--including British Airways and USAir, Air Canada and Continental, KLM and Northwest, and Lufthansa and United. These alliances represent just one step in the race among the world's airlines to establish themselves as multinational or "multi-mega" carriers.

The regional/commuter airline industry continues to be the fastest growing sector of the aviation community, with passenger traffic up 69.5 percent (14.1 percent annually) during the 1990s. A large part of this growth is a direct result of the restructuring and/or route rationalization/realignment taking place among the larger air carriers. Additionally, the regional carriers have recently started to operate small jet aircraft such as the Canadair Regional Jet (50 seats). Moreover, a number of the regionals will soon begin accepting delivery of the Avro RJ-70, a 75-seat jet aircraft. The operation of jet aircraft will further blur the distinction between the smaller regional carriers and the larger air carriers and should lead to greater acceptance of the regional/commuter carriers by the traveling public.

Most activity measures for general aviation have continued to decline during the 1990s. The number of active general aviation aircraft and hours

flown declined 6.0 and 19.4 percent, respectively. The number of student pilots was down 16.3 percent, while the number of private pilots declined 3.9 percent. Shipments of general aviation aircraft were down 47.2 percent. Billings, however, were up 7.8 percent during this same 4-year period, due to a large increase in the unit value of the aircraft being shipped.

Unfortunately, the higher price of general aviation aircraft continues to be one of the major challenges confronting the industry. Although legislation has been proposed to enact a statute of repose for general aviation aircraft to limit the liability of manufacturers to 15 years from the date of manufacture, the legislation has yet to be enacted by Congress.

Congress did, however, enact the Budget Reconciliation Act of 1993, legislation that included several measures that have direct impacts on general aviation. On a positive note, the "luxury tax" on general aviation aircraft was repealed. However, the Act also included provisions that increased the tax on general aviation fuels by 4.3 cents per gallon.

Despite the overall general decline that touched upon all segments of the aviation industry during the 1990s, there are a number of encouraging signs that point to future growth.

The U.S. economy grew by 3.2 percent in fiscal year 1993. The Conference Board's index of consumer confidence rose 11 points in November (from 60.5 to 71.2), one of the largest gains in the survey's 25-year history. Consumers have started to spend once again, with consumer expenditures rising at annual rates of 3.4 and 4.4 percent during the last two quarters of fiscal year 1993.

Sales of existing single-family homes rose 3.6 percent in October to an annual rate of 4.08 million, the sixth increase in the last seven months and the highest level in 14 years. Factory orders for durable goods (such as furniture and cars) rose 2.0 percent in October, the third consecutive increase, to an all-time high.

The Department of Commerce's composite index of leading indicators jumped 0.8 percent in November, following a 0.5 percent increase in October. These increases in the various economic indexes, in combination with recent gains in employment, point to renewed business confidence and stronger economic growth in 1994 and beyond.

In the aviation industry itself, there are also a number of positive indications of a sustained recovery. The reductions/delays in air carrier capital acquisition plans, in combination with fare stability over the past year, have significantly improved the balance sheets of most U.S. commercial air carriers. In 1993, the industry posted an operating profit of $438 million. The restructuring plans of many of the larger air carriers, whose main goals are to reduce expenses and increase employee productivity, should lead to significant improvements in the profitability of both individual carriers and the industry as a whole.

There are also a number of positive influences on the general aviation industry. The FAA recently streamlined the certification process for new entry-level aircraft (Primary Category Rule) and this should increase the production of new small, affordable aircraft. The used aircraft market has remained strong over the past several years and prices for used piston aircraft have also remained strong. This reflects some pent-up demand for these aircraft.

The amateur-built market has also shown steady growth over the last couple of years. The use of general aviation aircraft in international travel has also increased over the past several years.

Despite the many positive statistics and/or trends, there are a number of uncertainties that could limit growth in the aviation industry. Many businesses continue to downsize and/or automate their operations. This downsizing has eliminated many middle management positions and may have significantly reduced the base of business travelers, both current and future. Technological improvements in communications, including advances in teleconferencing and facsimile mail, may also have contributed to the recent decline in business travelers. More importantly, teleconferencing is expected to have an even bigger impact on future business travel. If the percentage of seats occupied by the higher fare business travelers continues to decline, airlines will have no alternative but to try to fill these seats with more price sensitive discretionary travelers. Rather than entering an era of price stability and rational fare policies, the industry could revert to lowering fares. That will give rise to financial problems unless costs are also reduced.

Additionally, many in the industry claim that the domestic travel market is now a "mature market," i.e., future growth will approximate the growth of the general economy. If the domestic market has reached its maturity, then the demand for all aviation services could be significantly lower than the forecasts discussed in subsequent chapters in this document.

REVIEW OF 1993

In fiscal year 1993, the large U.S. air carriers increased their system capacity (available seat miles) by 2.7 percent, while demand (revenue passenger miles) increased by 1.3 percent. The net result was a decline in the load factor from 63.7 percent in 1992 to 62.9 percent in 1993.

Although domestic capacity was up 2.2 percent in 1993, domestic traffic was basically flat (up 0.1 percent). However, traffic growth in 1993 is understated because of the deep-discounted promotional fares (50 percent fare cuts), which caused exceptional traffic growth in 1992. Summer traffic (June through September) was up 11.8 percent in 1992, compared to a decline of 0.6 percent during the remainder of the year. In summer 1993, traffic was down 6.2 percent. However, traffic was up 4.1 percent during the first eight months of fiscal 1993, perhaps a more realistic indication of traffic growth in 1993.

International traffic was up only 4.6 percent in 1993, primarily the result of the economic recession in Japan. Transpacific traffic, which had increased at an average annual rate of 17.5 percent since 1986, declined by 2.2 percent in 1993, the first decline since 1981. North Atlantic traffic was up 5.8 percent despite an economic downturn that affected much of Europe. Latin American traffic increased 21.4 percent, largely the result of a buildup in replacement service by United Airlines on routes formerly served by Pan American.

A return to rational fare policies in 1993 resulted in some improvement to the industry's balance sheet--$438 million profit versus a $1.9 billion loss in 1992. However, significantly higher profits are required for the industry to be able to finance the replacement and new aircraft needed to accommodate future growth.

New commercial aircraft orders totaled only 296 (down 26.0 percent) in fiscal year 1993, while new aircraft deliveries totaled 667 (down 18.7 percent). Although narrowbody aircraft orders (57.7 percent of the total) and deliveries (66.1 percent) continue to outpace those for widebody aircraft, it is the narrowbody aircraft that have suffered year-to-year declines--narrowbody orders and deliveries down

27.8 and 24.8 percent, respectively. The decline in orders and deliveries reflects the current restructuring taking place among large U.S. commercial air carriers.

Contrary to the relatively slow growth experienced by the large U.S. air carriers in 1993, the regional/commuter airline industry continued to expand at a rapid pace. In 1993, regional/commuter airline passenger enplanements totaled 47.2 million, while revenue passenger miles totaled 9.5 billion, up 10.3 and 15.9 percent, respectively, over 1992.

In fiscal year 1993, there were 811 general aviation aircraft shipments, 8.8 percent fewer than in 1992. The shipments consisted of 436 piston aircraft (down 17.4 percent) and 375 turbine-powered aircraft (up 3.9 percent). Because of the greater average dollar value of the aircraft being shipped, billings increased 5.3 percent over 1992 to just over $1.9 billion.

The active general aviation fleet is estimated to have totaled 184,430 on January 1, 1993, a decline of 7.1 percent from the previous year's estimate. These aircraft flew an estimated 25.8 million hours in fiscal year 1993, down 5.8 percent from the 1992 estimate.

Air carrier operations at FAA air traffic control towers in fiscal year 1993 declined 2.2 percent from the previous year. This was due to the large declines in general aviation (down 4.6 percent) and military (down 5.7 percent) activity. Commercial activity was up 2.8 percent in fiscal year 1993.

Instrument operations at FAA towered airports increased slightly in fiscal year 1993, up 0.1 percent from 1992 activity levels. The number of IFR aircraft handled at the air route traffic control centers increased 2.0 percent in 1993, largely on the strength of a 4.1 percent increase in the commercial sector. The number of general aviation aircraft handled at the en route centers was up 0.5 percent in 1993, while the number of military aircraft handled declined 5.7 percent over the same time period.

In summary, the impact of a relatively slow economic recovery in the United States and declining economic activity in both Japan and Europe, the forces of deregulation, and fierce competition (both domestically and abroad) continue to alter the structure of the commercial aviation industry. Despite the slow growth experienced over the past several years by most aviation user groups, activity at FAA facilities is expected to resume slow to moderate levels of growth as the U.S. economic recovery continues to gather momentum.

ECONOMIC FORECASTS

Gauging the strength of the current U.S. economic recovery, which has been relatively weak compared to historical standards, has been a source of consternation for many economists and economic forecasting services. This uncertainty, in turn, has made it extremely difficult to predict the demand for aviation services with any degree of confidence.

This year, however, there does appear to be basic agreement as to both the short- and long-term economic outlook. This basic agreement applies not only among the three economic forecasting services used by the FAA (DRI/McGraw-Hill, Evans Econometrics, and The WEFA Group) but also between the Office of Management and Budget's (OMB) economic assumptions and the consensus economic forecasts of the three forecasting services.

The economic forecasts anticipate moderate growth of 2.9 percent in both

FAA FORECAST ECONOMIC ASSUMPTIONS

FISCAL YEARS 1994 - 2005

ECONOMIC VARIABLE	HISTORICAL 1985	HISTORICAL 1992	HISTORICAL 1993	FORECAST 1994	FORECAST 1995	FORECAST 2005	PERCENT AVERAGE ANNUAL GROWTH 85-93	92-93	93-94	94-95	93-05
Gross Domestic Product (Billions 1987$)	4,247.0	4,939.1	5,096.1	5,245.4	5,396.7	6,945.4	2.3	3.2	2.9	2.9	2.6
Consumer Price Index (1982-84 = 100)	106.7	137.2	141.2	145.0	149.5	218.0	3.6	2.9	2.7	3.1	3.7
Oil & Gas Deflator (1987 = 100)	122.2	123.5	123.3	118.0	120.7	203.6	0.1	(0.2)	(4.3)	2.3	4.3

Source: 1994-99; Executive Office of the President, Office of Management and Budget

2000-2005; Consensus growth rate of DRI/McGraw-Hill, Evans Economics, Inc., and The WEFA Group

fiscal years 1994 and 1995. For the 10 remaining years of the forecast period (through 2005), the consensus is that the U.S. economy will experience moderate economic growth of approximately 2.5 percent annually.

Worldwide economic growth is expected to exceed that of the United States, averaging 3.5 percent over the 12-year forecast period. Economic growth is forecast to be greatest in Latin America (4.6 percent) and the Far East/Pacific Basin countries (4.5 percent annually). Economic growth in Europe/Africa/Middle East countries averages 3.1 percent during the 12-year forecast period.

It is the uncertain short-term economic outlook, particularly in Japan and Western Europe, that presents both U.S. and world aviation with the greatest challenges to future growth. While economic recovery is progressing as expected in North America, Latin America, and the Pacific Basin, the expected recoveries in many Western European countries and Japan have not yet materialized. With the exception of the United Kingdom, the economies of most European countries are still in recession. The Japanese economy appears to be headed into a "double-dip" recession. Political uncertainty continues to cloud the economic outlook for the former Soviet Union and Eastern Europe.

The bottom line is that short-term U.S. economic growth will not be driven by export trade. U.S. economic growth in general, and air carrier traffic specifically, will have to rely on the U.S. consumer for growth over the next several years.

Inflation (as measured by the consumer price index) is projected to remain in the low to moderate range, averaging 3.2 percent over the first six years of the forecast period and 4.2 percent over the last six years.

Oil prices are expected to decline 4.3 percent in 1994 then increase at an average annual rate of 5.1 percent over the remaining 11 years of the forecast period. This forecast assumes no major disruptions in the price or availability of oil.

The projected growth of aviation demand discussed in subsequent chapters of this document is consistent with these national short- and long-term economic growth forecasts. The table on the preceding page summarizes the key economic assumptions used in developing the aviation demand forecasts. The economic forecasts are presented in tabular form in Chapter IX.

It should be stressed, however, that in any given year there is likely to be some perturbation around the long-term trend. None of the current economic models is sufficiently precise to predict interim business cycles. In addition, unanticipated developments, such as the 1990 Iraqi invasion of Kuwait and subsequent Gulf War, cannot be predicted at all.

AVIATION ACTIVITY FORECASTS

Domestic air carrier revenue passenger miles are forecast to increase at an annual rate of 3.7 percent between 1994 and 2005. The forecast assumes relatively modest growth in 1994 (3.4 percent), followed by stronger growth in both 1995 (4.3 percent) and 1996 (4.0 percent). Domestic enplanements are forecast to increase by 3.2 percent in 1994, 4.0 percent in 1995, 3.7 percent in 1995, and average 3.5 percent over the 12-year forecast.

The forecasts assume that real domestic passenger yields will decline slowly over the forecast period (0.5 percent annually) as competitive forces and current restructuring efforts continue

to exert downward pressure on fare levels.

Air carrier aircraft operations are forecast to increase at an annual rate of 1.9 percent during the 12-year forecast period. The higher growth predicted for revenue passenger miles (RPMs) (3.7 percent) and passenger enplanements (3.5 percent) relative to aircraft activity is the result of significantly higher load factors, larger seating capacity for air carrier aircraft, and longer passenger trip lengths.

International air carrier revenue passenger miles and passenger enplanements are forecast to increase at annual rates of 6.3 and 6.5 percent, respectively, over the 12-year forecast period. International travel is, to a large extent, being driven by the strong demand projected in Latin American markets (8.3 percent annually in RPMs). While both the Transpacific (6.0 percent) and North Atlantic (5.9 percent) markets are expected to exhibit fairly strong growth over the forecast period, growth in the short-term is constrained somewhat by economic conditions in Europe and Japan.

The air carrier forecasts assume that the industry will benefit from the economic recovery taking place both within the United States and worldwide. In addition, it is assumed that the industry will continue to embrace a more rational pricing policy, thus improving the industry's overall financial performance. The delivery of large numbers of new stage-3 aircraft is expected to increase industry productivity, also improving the industry's financial performance. The forecast further assumes that U.S. air carriers will convert to an all stage-3 fleet (including retrofitted stage-2 aircraft) by the year 2000. Present aircraft orders, options, and retrofit prospects support this assumption.

In 1993, the regional/commuter airlines enplaned 47.2 million passengers, 10.2 percent of all passenger traffic in scheduled domestic air service. By the year 2005, these carriers are expected to carry 105.3 million passengers (6.9 percent growth annually) and to account for 14.7 percent of all domestic passenger enplanements.

Regional/commuter airlines are also expected to continue the trend toward purchase of small jet aircraft and larger, propeller-driven aircraft, thus significantly increasing the average seating capacity of the regional fleet, from an average 22.9 seats in 1993 to 35.5 seats in 2005.

The forecast projects increased business use of general aviation. This is reflected in the changing character of the general aviation fleet. The more expensive and sophisticated turbine-powered part of the fixed wing fleet is expected to grow much faster than the piston aircraft portion. In 1993, there were an estimated 8,726 turbine-powered aircraft in the fixed wing general aviation fleet--5.1 percent of the total fixed wing fleet. By the year 2005, it is projected that there will be 11,600 turbine-powered aircraft--7.2 percent of the total fixed wing fleet. Similarly, there were 3,541 turbine-powered aircraft in the helicopter fleet in 1993--61.5 percent of the total rotorcraft fleet. By the year 2005, it is projected that there will be 5,800 turbine-powered aircraft--76.3 percent of the total helicopter fleet.

The general aviation piston fleet is projected to decline in absolute numbers over the 12-year forecast period. Single engine piston aircraft declined from 143,580 in 1993 to 131,100 in 2005. Multi-engine piston aircraft declined from 18,536 to 17,600 over the same time period.

The FAA aviation traffic and activity forecasts are summarized in the table on page I-9.

AVIATION ACTIVITY FORECASTS

FISCAL YEARS 1994 - 2005

AVIATION ACTIVITY	HISTORICAL 1985	1992	1993	FORECAST 1994	1995	2005	PERCENT AVERAGE ANNUAL GROWTH 85-93	92-93	93-94	94-95	93-05
AIR CARRIER											
Enplanements (Millions)											
Domestic	350.4	429.2	428.8	442.7	460.6	645.9	2.6	(0.1)	3.2	4.0	3.5
International	24.3	42.6	45.0	47.7	51.5	96.3	8.0	5.6	6.0	8.0	6.5
Atlantic	11.4	14.8	15.6	16.3	17.4	30.1	4.0	5.4	4.5	6.7	5.6
Latin America	7.9	13.6	15.8	17.3	19.2	39.2	9.1	16.2	9.5	11.0	7.9
Pacific	5.0	14.2	13.6	14.1	14.9	27.0	13.3	(4.2)	3.7	5.7	5.9
System	374.5	471.8	473.8	490.4	512.1	742.2	3.1	0.4	3.5	4.4	3.8
RPMs (Billions)											
Domestic	265.8	346.5	346.8	358.6	374.0	537.4	3.4	0.1	3.4	4.3	3.7
International	64.4	128.5	134.4	141.2	151.6	279.6	9.6	4.6	5.1	7.4	6.3
Atlantic	36.1	57.7	61.1	64.2	68.4	120.0	6.8	5.9	5.1	6.5	5.8
Latin America	9.7	17.1	20.8	22.9	25.6	54.1	10.0	21.6	10.1	11.8	8.3
Pacific	18.6	53.6	52.5	54.1	57.6	105.5	13.8	(2.1)	3.1	6.5	6.0
System	330.2	475.0	481.2	499.8	525.6	817.0	4.8	1.3	3.9	5.2	4.5
COMMUTERS/REGIONALS											
Enplanements (Millions)	24.4	42.8	47.2	52.0	56.5	105.3	8.6	10.3	10.2	8.7	6.9
RPMs (Billions)	3.6	8.2	9.5	10.7	11.9	25.3	12.9	15.9	12.6	11.2	8.5
FLEET											
Air Carrier	2,938	4,203	4,247	4,363	4,396	6,063	4.7	1.1	2.7	0.8	3.0
Commuter	1,551	1,960	2,064	2,157	2,262	2,936	3.6	5.3	4.5	4.9	3.0
General Aviation (000)	220.9	198.5	184.4	180.9	178.4	177.4	(2.3)	(7.1)	(1.9)	(1.4)	(0.3)
HOURS FLOWN (Millions)											
Air Carrier	7.7	10.7	11.1	11.5	11.6	16.6	4.7	3.7	3.6	0.9	3.4
General Aviation	36.2	27.4	25.8	26.1	26.3	28.9	(4.3)	(5.8)	1.2	0.8	1.0

Source: 1985-93; DOT-RSPA, FAA data
1994-2005; FAA forecast

FAA WORKLOAD FORECASTS

The FAA forecasting process is a continuous one that requires the FAA's Statistics and Forecast Branch to interact with various FAA offices and services, other government agencies, and aviation industry groups, including individual discussions with most major carriers and manufacturers. In addition, the process uses a number of different economic and aviation data bases, the outputs of several econometric models and equations, and several other analytical techniques. The FAA workload measures, which are summarized in the table on page I-11, are the resultant forecasts of this process. These forecasts are used by the agency for manpower staffing and facility planning.

Following three consecutive years of declining activity, the demand for FAA operational services is expected to increase moderately during the 12-year forecast period. This anticipated growth results not only from the increased activity levels of commercial aircraft, but from increased activity levels of general aviation aircraft as well. As such, total aircraft operations at FAA towered airports are forecast to increase to 73.7 million in the year 2005, an annual growth rate of 1.7 percent over the 60.1 million operations recorded in 1993.

The increased use of avionics by regional/commuter airlines and general aviation aircraft, combined with the implementation of additional airport radar service areas, is expected to result in instrument operations at FAA towered airports increasing at a somewhat faster rate than total aircraft operations. Instrument operations are forecast to increase from 45.7 million in 1993 to 57.1 million in fiscal year 2005, a 1.9 percent annual growth rate.

The workload at the air route traffic control centers is forecast to increase at an average annual rate of 1.8 percent during the 12-year forecast period. In 2005, FAA en route centers are expected to handle 46.5 million IFR aircraft, up from 37.5 million in 1993.

The lower growth rate at en route centers, relative to activity at towered airports, results from the fact that military activity accounts for a significantly larger percentage of center activity (12.9 versus 4.4 percent at towers). Therefore, the expected decline in military traffic will have a much greater impact on total center traffic.

For each of the three workload measures, commercial aircraft activity (the sum of air carrier and commuter/air taxi) is expected to increase at a significantly faster rate than is noncommercial aircraft activity (the sum of general aviation and military). Forecast growth rates for commercial and noncommercial activity during the 12-year period are as follows: 2.6 versus 1.2 percent for FAA towered airports; 2.5 versus 1.2 percent for instrument operations at FAA towered airports; and 2.3 versus 0.7 percent for IFR aircraft handled at FAA air route traffic control centers.

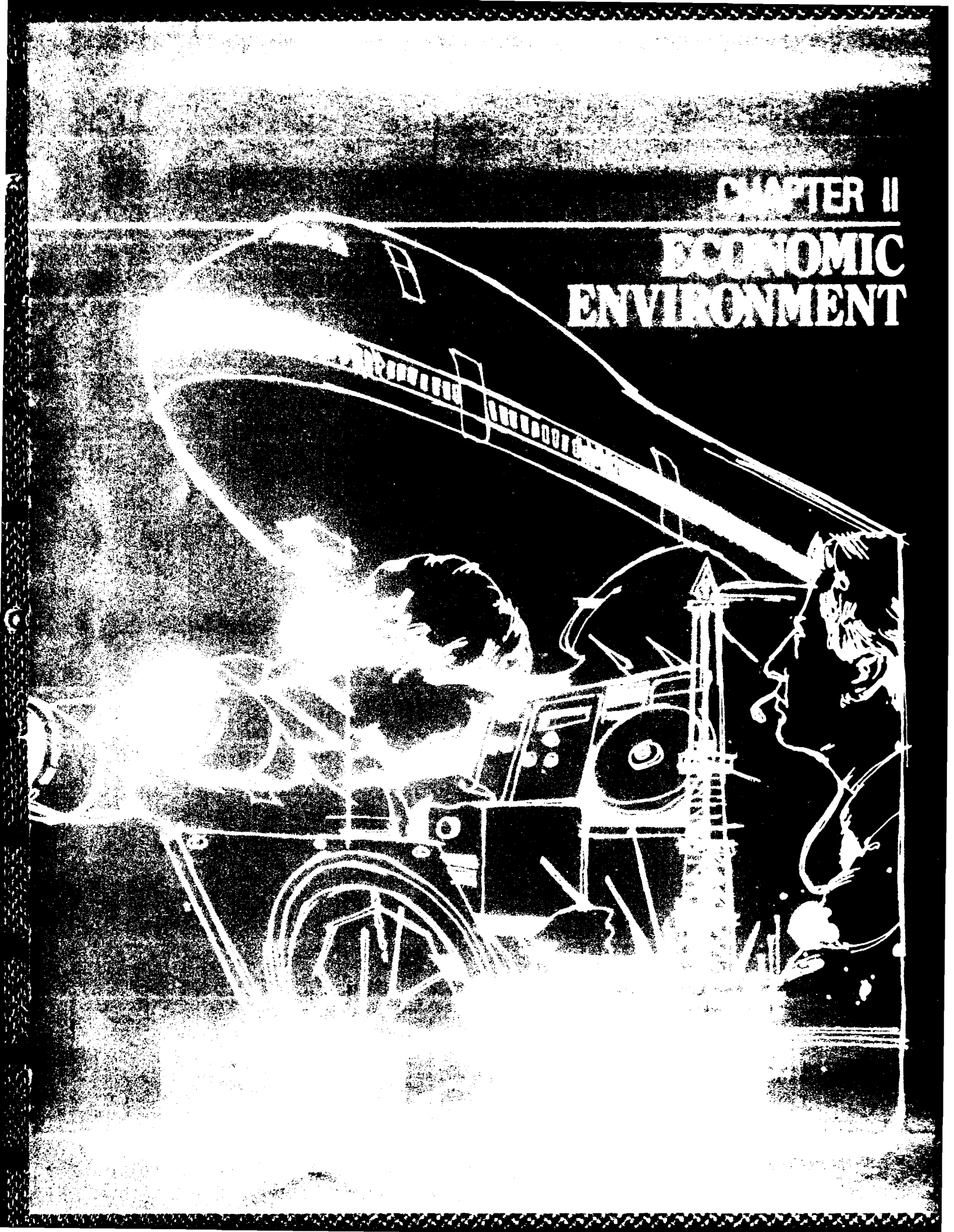
In summary, aviation activity at FAA facilities is expected to grow at a somewhat slower rate than the general economy (1.8 percent versus 2.6 percent). The primary reason for the disparity between the two rates is the contraction of military aviation and a large portion of general aviation. Air transportation is expected to continue to dominate all other transportation modes in both long distance domestic intercity travel and in international passenger markets. Commuter/air taxi aircraft activity and the business component of general aviation are expected to achieve somewhat greater growth than that forecast for both the larger commercial air carriers and the general aviation pleasure sector.

FAA WORKLOAD MEASURES

FISCAL YEARS 1994 - 2005

WORKLOAD MEASURES (IN MILLIONS)	HISTORICAL			FORECAST			PERCENT AVERAGE ANNUAL GROWTH				
	1985	1992	1993	1994	1995	2005	85-93	92-93	93-94	94-95	93-05
Aircraft Operations											
Air Carrier	11.3	12.4	12.6	12.7	12.9	15.8	1.4	1.2	0.8	1.6	1.9
Commuter/Air Taxi	6.9	9.3	9.7	10.1	10.5	14.4	4.3	4.0	4.2	4.0	3.3
General Aviation	37.2	37.0	35.2	35.6	36.0	41.1	(0.7)	(4.6)	1.1	1.1	1.3
Military	2.5	2.8	2.6	2.5	2.4	2.4	0.5	(5.7)	(3.9)	(4.0)	(0.7)
TOTAL	57.9	61.5	60.1	60.9	61.8	73.7	0.5	(2.2)	1.4	1.5	1.7
Instrument Operations											
Air Carrier	11.8	13.4	13.6	13.7	14.0	17.2	1.8	1.5	0.7	2.2	2.0
Commuter/Air Taxi	6.4	9.9	10.4	10.8	11.2	15.1	6.3	5.8	3.9	3.7	3.2
General Aviation	16.4	18.2	17.7	17.9	18.1	21.1	1.0	(2.5)	1.1	1.1	1.5
Military	4.1	4.1	3.9	3.8	3.7	3.7	(0.6)	(4.9)	(2.6)	(2.6)	(0.4)
TOTAL	38.7	45.6	45.7	46.2	47.0	57.1	2.1	0.1	1.1	1.7	1.9
IFR Aircraft Handled											
Air Carrier	14.6	18.3	19.0	19.2	19.6	23.9	3.4	3.5	1.1	2.1	1.9
Commuter/Air Taxi	4.8	5.9	6.2	6.5	6.7	9.3	3.3	5.9	4.8	3.1	3.4
General Aviation	8.3	7.4	7.4	7.5	7.7	8.7	(1.4)	0.5	1.4	2.7	1.4
Military	5.0	5.1	4.8	4.7	4.6	4.6	(0.6)	(5.7)	(2.1)	(2.1)	(0.4)
TOTAL	32.7	36.7	37.5	37.9	38.6	46.5	1.7	2.0	1.1	1.9	1.8
Flight Services											
Pilot Briefs	15.0	10.7	9.9	9.6	9.5	9.1	(5.3)	(7.5)	(3.0)	(1.0)	(0.7)
Flight Plans Originated	8.4	6.4	6.2	6.0	6.0	5.6	(3.9)	(3.1)	(3.2)	(0.0)	(0.9)
Aircraft Contacted	8.2	5.5	5.1	4.9	4.8	4.6	(6.1)	(7.3)	(3.9)	(2.0)	(0.9)
TOTAL	55.0	39.7	37.2	36.1	35.8	34.0	(5.0)	(6.3)	(3.0)	(0.8)	(0.8)

Source: FY 1985-93; FAA data
FY 1994-2005; FAA forecasts



CHAPTER II
ECONOMIC ENVIRONMENT

CHAPTER II

ECONOMIC ENVIRONMENT

REVIEW OF 1993

UNITED STATES

In fiscal year 1993, the economy of the United States recovered steadily, though gradually, from economic recession. Real gross domestic product (GDP, the value of all goods and services produced in the nation) increased by 3.2 percent, almost twice the growth of 1.7 percent that occurred in 1992. The rate of inflation remained low; the consumer price index (CPI) increased by 2.9 percent in 1993, compared to 1.7 percent in 1992.

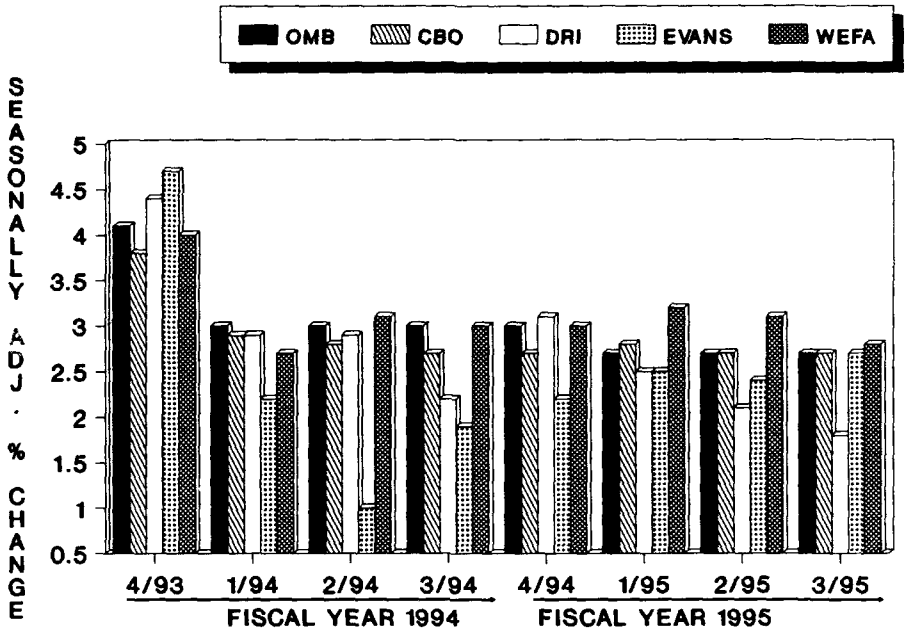
Oil prices declined for the second consecutive year following the spike in prices caused by the invasion of Kuwait in August 1990. The oil and gas deflator decreased by 0.2 percent in 1993 and is expected to fall further in 1994 despite the increase in transportation fuel taxes.

During the first quarter of fiscal year 1993 the economy appeared poised for substantial economic growth when GDP rose by a strong 5.7 percent. Some degree of consumer confidence in the economy had returned after the 1992 presidential and congressional elections. Further, retail sales were buoyed by holiday shoppers. But this buoyancy and optimism did not spill over into the second and third quarters.

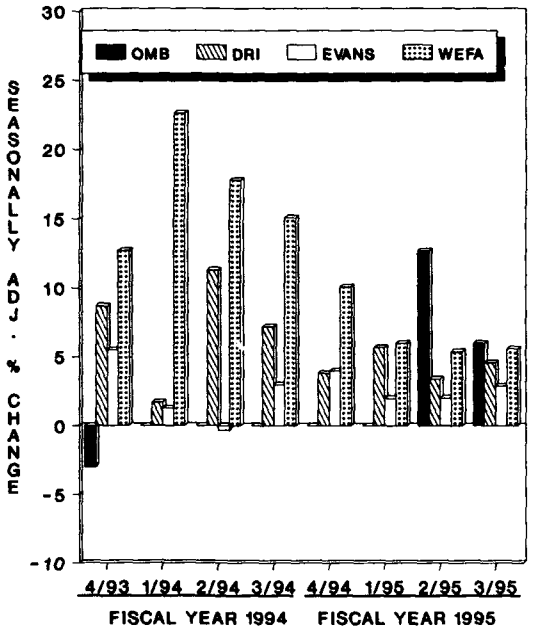
As the fiscal year ended, there were multiple economic and social concerns. The major ones were the federal budget deficit, the growing costs of health care, reinventing government, the effects of the North American Free Trade Agreement (NAFTA) on the migration of American jobs and businesses, the balance of trade, and poverty, crime, and violence. The budget deficit was running at about $206 billion a year in the fourth quarter of the fiscal year, down substantially from the $291 billion one year earlier. The number of unemployed totaled 8.6 million (6.7 percent of the labor force of 128.1 million). Government purchases and military spending fell $2.7 billion and $5.3 billion, respectively, and business inventories increased by $7.3 billion. Although exports rose by $1.7 billion, imports climbed by $3.1 billion, thereby raising the balance of trade deficit to $80.1 billion.

U.S. SHORT-TERM ECONOMIC FORECASTS

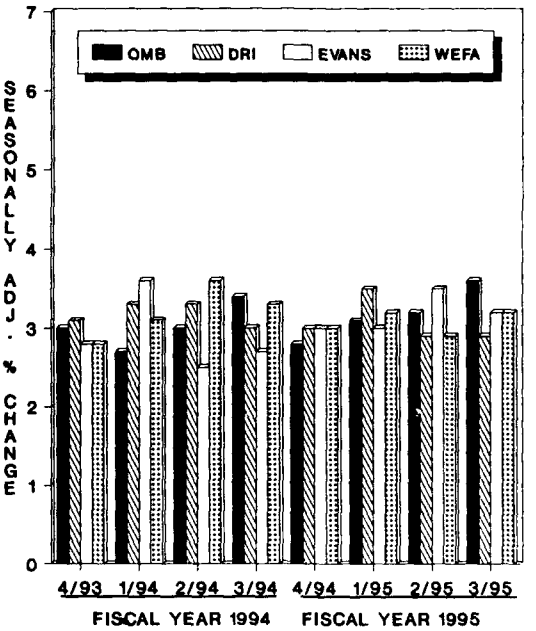
REAL GROSS DOMESTIC PRODUCT



OIL AND GAS DEFLATOR



CONSUMER PRICE INDEX



Despite these seemingly negative influences, the economy ended the fiscal year on a moderate expansionary path, with preliminary GDP growth indicated at a 2.7 percent annual average rate for the final quarter. Output rose by $35.9 billion in the final quarter of the fiscal year, fueled principally by consumer spending, which increased by a healthy 4.1 percent or $35.2 billion.

The widening trade deficit prompted the Administration to put on a full-court pro-NAFTA press and encouraged Congress to approve the landmark legislation governing trade with Mexico and Canada. The negative balance of trade also provided an appropriate frame of reference for President Clinton's discussions with the national leaders of the Asia-Pacific Economic Conference in Seattle in mid-November and to the discussions pertinent to the Uruguay round of the General Agreement on Tariffs and Trade (GATT) concluded in December.

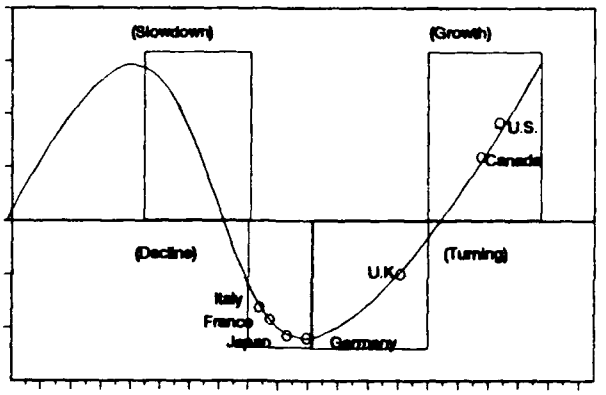
WORLD

Many of the world's economies remained sluggish through most of 1993. The combined world economy, measured by GDP, increased by only 1.2 percent in calendar year 1993. This represented a slow recovery from the small declines (-0.5 and -0.04 percent) registered in 1991 and 1992, respectively. The first decline in estimated world GDP in the post-World War II era had occurred in 1991.

In terms of the rate of growth, the Pacific Basin and the Middle East regions ranked first and second, with large increases in GDP of 6.0 and 5.0 percent, respectively. However, growth rates in the United States (2.8 percent), Canada (2.6 percent), and the United Kingdom (1.7 percent) were not as robust. At the same time, many countries had negative growth: Japan and United Germany (down 0.3 and 1.4 percent, respectively) and the Centrally Planned Economies in transition fell 3.2 percent.

The graphics below reflects the position of the G-7 countries relative to various stages in the business cycle. Both the United States and Canada are well ahead in the growth stage, while the United Kingdom is moving towards this stage. Germany appears to have reached the bottom of the cycle. However, Japan, France, and Italy are sill in decline.

G-7 COUNTRIES AND
THE RELATIVE STAGES OF THE BUSINESS CYCLE

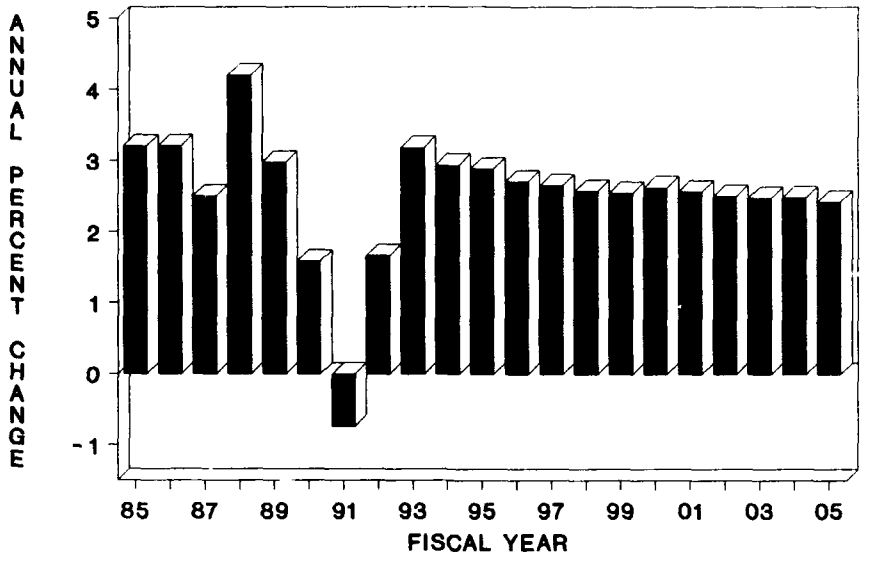


Western Europe's GDP decreased approximately 0.3 percent in 1993, down from the 1.0 percent growth achieved in 1992. The weak economic conditions in Europe restrained inflation. The consumer price index for the members of the European Community rose only 3.8 percent in 1993, down from the 4.5 percent rate in 1992.

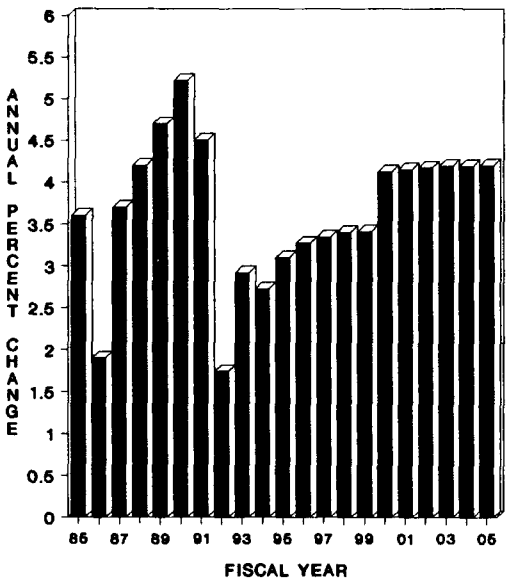
The rates of inflation varied among the key industrial countries of the world. In Japan, for example, consumer prices rose only 1.0 percent in 1993. In United Germany prices increased 4.9 percent, reflecting the higher interest rates prevailing in the former East Germany. In the United Kingdom and France, the rates of inflation were 1.7 and 2.1 percent, respectively.

U.S. LONG-TERM ECONOMIC FORECASTS

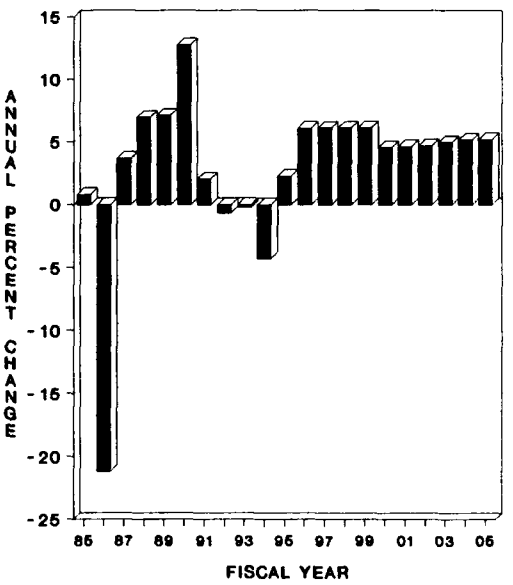
GROSS DOMESTIC PRODUCT
(1987 DOLLARS)



CONSUMER PRICE INDEX
(1982-84$)



OIL AND GAS DEFLATOR
(1982 = 100)



U.S. ECONOMIC OUTLOOK

The economic scenario used to develop the FAA Aviation Forecasts for the period 1994 through 1999 was provided by the Executive Office of the President, Office of Management and Budget (OMB). For the period from 2000 through 2005, the economic scenario used consensus growth rates of the economic variables, based on forecasts prepared by DRI/McGraw-Hill (DRI), Evans Economics (Evans), and The WEFA Group.

The principal series used in the individual aviation models to develop the FAA aviation forecasts are discussed in the following pages. The data are presented in tabular form in Chapter IX, Tables 1 through 3.

GROSS DOMESTIC PRODUCT

Gross domestic product is a significant indicator of business activity which, in turn, drives aviation activity. GDP is one of the key variables used by the FAA in developing projections of aviation activity.

The economic recovery in the United States continues at a moderate rate, perhaps somewhat slower than the equivalent phases in previous recoveries. Real GDP grew at 2.7 percent annual average rate in the fourth quarter of fiscal year 1993. Economists continue to forecast moderate growth in 1994. Recently revised short-term growth projections ranged between 2.6 percent and 2.9 percent growth in GDP in 1994 (see the figure on the previous page). In part, the differences reflect the underlying assumptions about the future course of the economy, for example, the effects of NAFTA, the costs of universal health care proposals, the reinventing of government, and assumptions about fluctuation in the supply and price of oil.

The FAA forecast reflects a moderate 2.9 percent growth in real GDP for 1994 and an average of 2.7 percent annual growth in GDP through 2000. Long-term GDP growth rates are shown graphically on page II-4. During the entire forecast period, GDP is expected to grow at an average annual rate of 2.6 percent.

CONSUMER PRICE INDEX

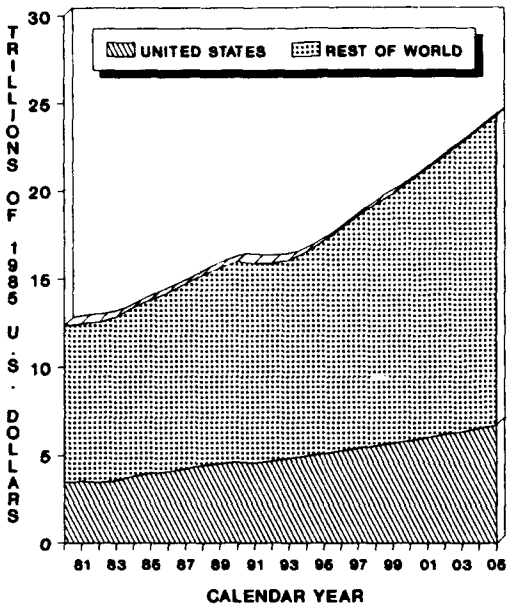
As shown on page II-4, consumer prices in the United States are expected to remain in the moderate range, increasing at an average annual rate of 3.7 percent during the forecast period. Inflation is forecast to increase by 2.7 percent in 1994 and 3.1 percent in 1995. (The CPI is used in our models to adjust airline fares and fuel costs relative to other goods and services.)

OIL AND GAS DEFLATOR

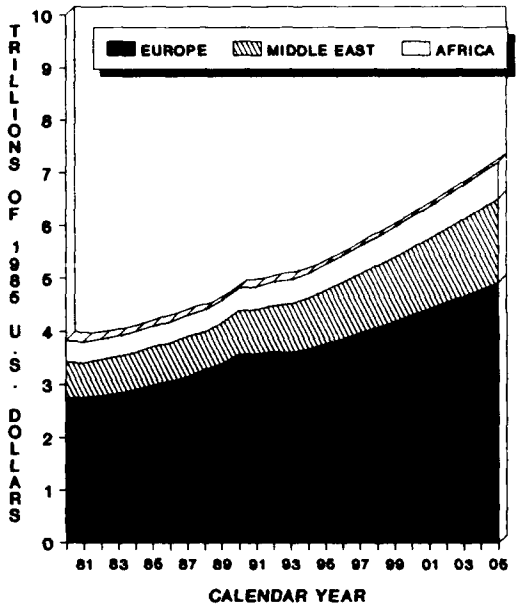
As summarized on page II-4, fuel prices in the United States are predicted to increase at an annual rate of 4.3 percent during the entire forecast period, just slightly above the rate of inflation (3.7 percent). Oil prices are expected to decline by 4.3 percent in 1994 then to increase substantially in subsequent years. Factors which tend to keep oil prices relatively low in the short run are the soft economies in many countries, the inability of the Gulf oil producers to agree on reducing supplies, and the prospects of Iraq resuming production and sales in significant quantities on the international market.

GROSS DOMESTIC PRODUCT BY WORLD REGION

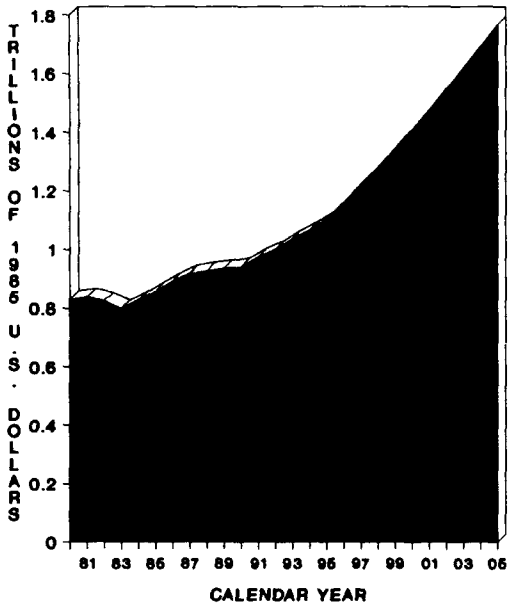
WORLD



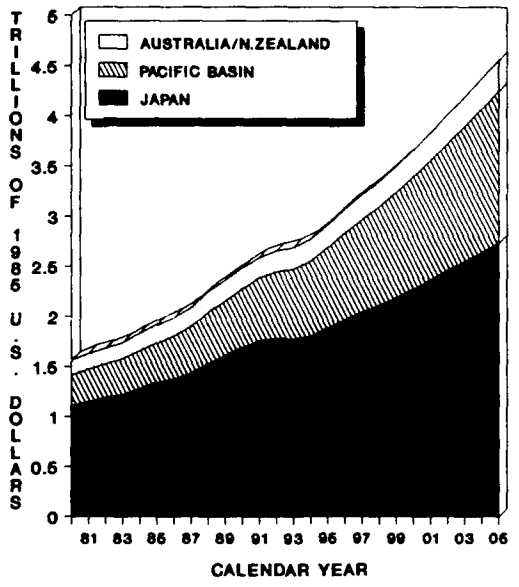
EUROPE/MIDDLE EAST/AFRICA



LATIN AMERICA



JAPAN/PACIFIC BASIN/ AUSTRALIA/NEW ZEALAND



WORLD ECONOMIC OUTLOOK

The U.S. effective exchange rate index, World GDP, CPI, and other international data for individual countries or groups of countries were derived from WEFA's World Economic Outlook. These data are for calendar years and are given in 1985 U.S. dollars. In discussing recent developments and forecasts in the international communities, particularly inflation and exchange rates, we relied heavily on work done by WEFA.

The principal series used in the individual aviation models to develop the FAA aviation international forecasts are discussed in the following pages. The data are presented in tabular form in Chapter IX, Tables 4 and 5.

GROSS DOMESTIC PRODUCT

As shown in the graph on page II-6, the combined real GDP for Europe, Africa, and the Middle East, adjusted for price changes, is expected to grow at an average annual rate of 3.1 percent during the forecast period. In the short term, real GDP for these countries will increase by 2.3 percent in 1994 and by 3.2 percent in 1995.

Gross domestic product in United Germany is forecast to grow at 1.3 percent in 1994 and to increase gradually to 3.1 percent in 1997. Like many other industrialized countries, Germany is expected to recover slowly from the economic recession, which appears to have hit bottom. West German GDP grew by 0.6 percent in the second quarter of calendar year 1993 as both domestic demand and exports improved slightly. East German GDP grew at a 6.3 percent rate. Overall, GDP in United Germany is expected to grow at approximately 2.4 percent during the forecast period.

Latin American economic growth is expected to be considerable in the forecast period. The combined GDP for Latin America (including South America, Central America, and Mexico), adjusted for price changes, is expected to grow at an average annual rate of 4.6 percent throughout the forecast period. In the short term, GDP in Latin America should increase by a moderate 2.8 to 3.6 percent in 1994 and 1995.

The combined GDP for Japan, Australia, New Zealand, and the Pacific Basin countries, adjusted for price changes, is expected to grow at an annual rate of 4.5 percent throughout the forecast period. In the short term, GDP should increase by 3.1 percent in 1994, then by a strong 5.2 percent in 1995.

The Japanese economy is expected to expand at a rate of 3.7 percent during the 1993-2005 period. The economy is expected to grow by 1.6 percent in 1994 and 4.6 percent in 1995, compared with a 0.3 percent decrease in 1993--the first negative growth in the economy since 1974. The Japanese economy was adversely affected by a drop in business investment and exports. The drop in exports is related to the high value of the yen relative to other currencies such as the U.S. dollar and the German mark. Natural disasters, which included a severe flood and an earthquake, also affected the Japanese economy negatively. Further, many Japanese companies continue to adopt cost-cutting and work force reduction measures.

The housing sector appears to be the only bright spot in the otherwise depressed Japanese economy. Housing starts reached 1.65 million units, an increase of 10.9 percent in August 1993 relative to the previous August. This represented the 15th consecutive month of year-on-year gains. In late fall, the Japanese government was concerned about the slow economic recovery and was considering measures such as deficit financing and the freezing of civil servants' wages and salaries to

help lift the economy out of the doldrums.

Among the Centrally Planned Economies, China's GDP is expected to grow by 9.0 percent in 1994 and 7.5 percent in 1995. These projected rates are down somewhat from the 12.8 and 12.4 percent registered in 1992 and 1993, respectively. Following substantial decreases in recent years, GDP in the former Soviet Union and Eastern Europe are expected to increase about 2 to 4 percent a year during 1994 and 1995.

CONSUMER PRICE INDEX

Europe

In general, consumer prices in most major industrialized countries are expected to remain relatively stable. Among the members of the European Community, for example, the consumer price index is expected to increase by 3.8 percent in 1994 and by 3.7 percent in 1995--virtually the same as the 1993 rate. For the medium term (and, perhaps, for the long term), inflation is expected to decline to approximately 3.5 percent.

In the short term, inflation in United Germany is forecast to increase by 3.6 percent in 1994 and 3.0 percent in 1995. These rates represent significant improvements over the 4.9 percent inflation experienced in 1993. During the 1993-2005 forecast period, inflation in United Germany is projected to increase at a low 2.2 percent average annual rate.

Consumer price inflation in the United Kingdom is expected to remain moderate, increasing by an average annual rate of 4.0 percent during the forecast period. Inflation is forecast to increase by 3.7 percent in 1994 and by 4.4 percent in 1995.

In France, the rate of inflation eased to 2.1 percent during 1993. High unemployment and the relative weakness of the labor unions have led to a moderation of the wage rates, which, in turn, contributed to a decrease in inflation. The need to maintain parity between the franc and the German mark also helped to keep inflation in check.

During the forecast period, inflation in France is expected to rise by an annual average of 2.5 percent. In the short term, inflation is expected to increase by only 2.3 percent in 1994 and by 2.4 percent in 1995.

Japan

Reflecting the slack in the Japanese economy, inflation is expected to remain low, with consumer prices increasing only 0.8 percent in 1994. Thereafter, inflation is expected to increase slightly and to average less than 2.0 percent during the forecast period.

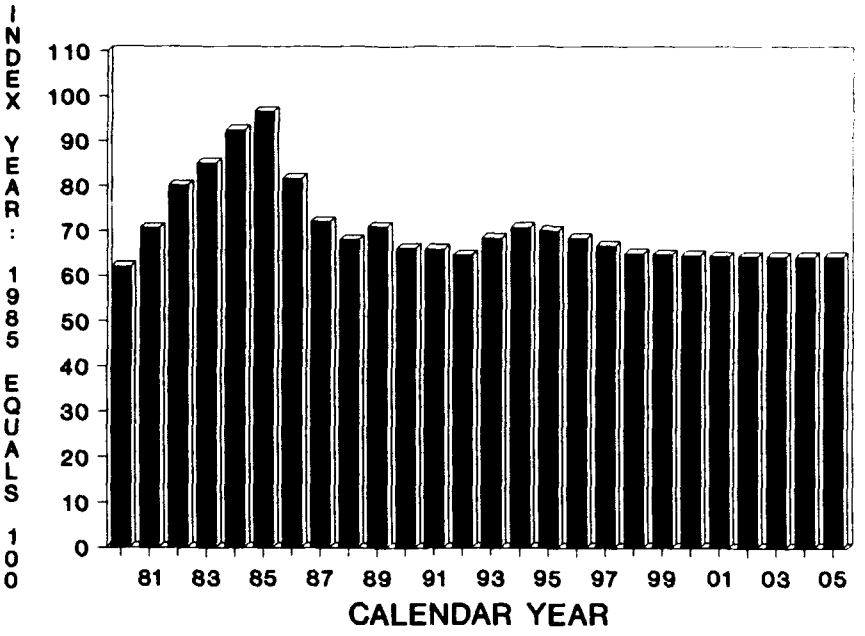
Latin America

In Brazil, consumer prices, as measured in 1980 cruzeiros, are expected to increase by an annual average rate of over 240 percent during the next five years. Many other countries anticipate inflation of higher than 10 percent per year. In Mexico, prices are expected to increase at about 8.7 percent per year. The Mexican government recognizes the slowdown in the economy, but it is reluctant to embrace monetary or fiscal policies that will boost growth at the risk of defeating its efforts to promote stability and lower inflation.

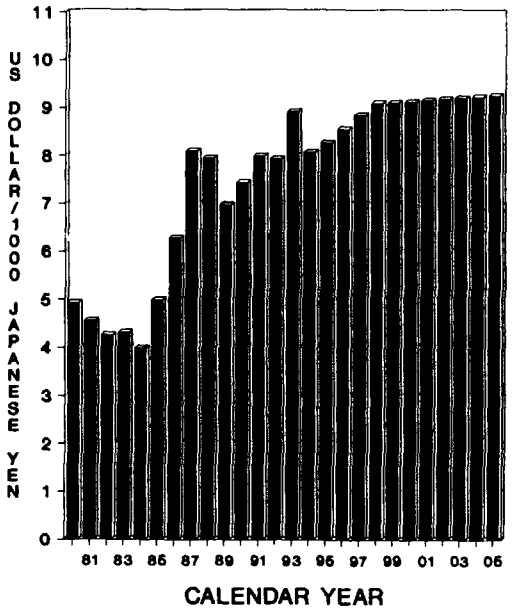
One aspect of the politics involved in gaining approval of NAFTA was a government proposal to link the minimum wage in Mexico to average increases in productivity. A possible side effect of this proposal would be to keep inflation in check, since wage

EXCHANGE RATE TRENDS AND FORECASTS

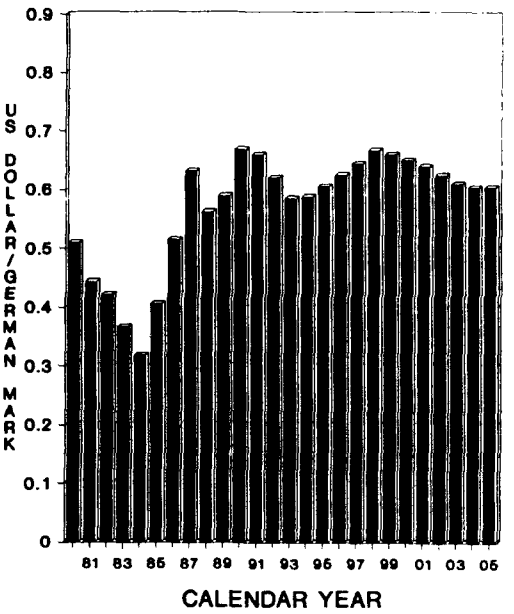
U.S. EFFECTIVE EXCHANGE RATE



JAPANESE YEN



GERMAN MARK



increases not related to productivity gains are often a factor in raising (cost-push) inflation.

DOLLAR EXCHANGE RATES

The charts on page II-9 show that the U.S. dollar effective exchange rate is expected to decline slightly throughout the forecast period, at an average annual rate of about 0.5 percent per year. Following increases of 5.7 percent in 1993 and 3.5 percent in 1994, the U.S. effective exchange rate is expected to resume a long-term decline in 1995 and beyond. The projected decline in the U.S. effective exchange rate will make imports of foreign goods more expensive to U.S. buyers, possibly reducing imports.

A country's prevailing exchange rate is generally affected by several factors such as the underlying state of the economy, changes in interest rates, speculative endeavors by foreign exchange traders, and government intervention in support of local currencies. During the past several months, there have been several such incidents involving the German mark vis-à-vis other European currencies such as the Belgian and French francs. Similarly, there have been changes in the yen/dollar relationships that affected Japan's economy through fluctuations in trade. Recent appreciation of the yen, for example, has been cited as a possible factor that might have triggered a "double-dip" recession in the already soft Japanese economy.

The German mark is expected to gain in value relative to the U.S. dollar, averaging 2.7 percent growth annually during the first five years of the forecast period. This is primarily due to a narrowing of the interest rate gap between the United States and Germany and differing rates of inflation between the two countries. Beginning in 1998 the German mark is projected to decline at an average of 1.4 percent a year towards an equilibrium level of .605 U.S. dollars per German mark (equivalent to 1.65 German marks per U.S. dollar).

Previous undervaluation that pushed the rate below 1.60 German marks per dollar was followed by an overshooting of the mark to over 1.72 marks per dollar by the end of calendar year 1993 and early 1994. This resulted, in part, from the increased perceptions and indications of a stronger U.S. economy. The extrapolated numbers for United Germany in Table 5 reflect the tendency toward equilibrium in the long term.

The Japanese yen is also expected to gain in value relative to the U.S. dollar, averaging 0.3 percent during the forecast period.

As these currencies gain in value relative to the U.S. dollar, foreign travel to the United States becomes relatively less expensive. Conversely, travel by U.S. nationals to foreign countries becomes more expensive and, other things being equal, Americans would tend to travel less to foreign destinations.

PURSUIT OF ECONOMIC CHANGES

The 1991 presidential and congressional elections were preceded by calls for economic changes: more jobs, faster growth, lower unemployment, reduction in the budget deficit, and improvement in the negative balance of trade. One year later, the executive and the legislative bodies have initiated some key measures that will have enduring effects on the economy as a whole and, to some degree, on aviation.

SHORT-TERM EXPECTATIONS

We now examine the economic prospects for both the short term--the next 12 to 18 months--and the long term--18 months and beyond. Specific measures initiated by the Administration or enacted by Congress include: the Omnibus Budget Reconciliation Act of 1993 to reduce the budget deficit and stimulate the economy; the North American Free Trade Act (NAFTA) to lower tariffs and other barriers to free trade between Canada, the United States, and Mexico; gun-control legislation to reduce crime and violence in America; an extension of unemployment benefits to further cushion the effects of loss of jobs and income; and health care reform to stem the tide of rising cost of health care and to ensure universal health care coverage.

The budget legislation, which was finally signed into law in August as the Omnibus Budget Reconciliation Act of 1993, was not as revolutionary as the measures first proposed. For example, the original bill was stripped of the Administration's energy (BTU) tax and aircraft registration fee proposals and only 50 percent of the proposed increase in taxes on corporations was enacted. Also, the final bill did not contain an investment tax credit. The broad-based energy tax was replaced by a modest 4.3 cents per gallon increase in gasoline and other transportation fuels.

The Budget Act contained some economic relief for specific groups. There was an expansion of earned-income tax credit for the working poor and increases in food stamp, foster care, and childhood immunization programs. In addition, the luxury tax provisions of previous legislation (which affected the personal ownership and use of aircraft) were amended. The imposition of higher gasoline and other transportation fuel and cigarette taxes was expected to affect some consumers adversely. The fuel tax was applicable to general aviation aircraft immediately; its application to commercial airlines is delayed until late 1995.

At the national level, the short-term economic effects of these measures may be marginal. However, there is evidence that the economy is poised for a continuation of healthy growth. The Labor Department reported that in November the unemployment rate fell sharply to 6.4 percent, a drop of 0.4 percentage points from the previous month and the biggest monthly drop in a decade. The unemployment rate of 6.4 percent represents the lowest level since 1991.

The November figures also showed that the number of people with jobs rose by 453,000 to 120.4 million. In the past two months, factory payrolls have grown by more than 50,000, while the length of the average workweek reached 41.7 hours, the highest level since the closing months of World War II. Average weekly overtime rose by six minutes to a record 4.4 hours.

Two major drags on the economy are cutbacks in defense spending and the continuing recessions in other industrialized countries. The reduction in defense spending is reflected in high unemployment in some areas such as California. Recession in the other industrialized countries tend to reduce the level of U.S. exports.

Despite these two inhibitors to economic expansion, some economists suggest that the economy is growing at a 5.0 percent rate in the first quarter of fiscal year 1994 compared to a 2.7 percent rate in the last quarter of fiscal year 1993. The strong forecast for the first quarter of fiscal year 1994 results partly from increases in holiday shopping and travel as consumer confidence in the economy has surged. In December, the Conference Board

reported one of the largest one-month increases ever in its index of consumer sentiment (from 60.5 in October to 71.2 in November)--giving additional credence to the argument that the President's economic programs are being successfully implemented.

LONG-TERM CHANGES

Even if the effects of legislative or administrative measures enacted to date are not dramatic in the short run, they may be enduring. For example, the government budget deficit is expected to decline in each of the next three years. NAFTA, according to some estimates, is expected to benefit the economy and to add 500,000 jobs as a result of trade with Mexico during the next five years.

The WEFA Group evaluated the provisions of the Budget Act vis-à-vis baseline forecasts consistent with the Congressional Budget Office's (CBO) economic assumptions and policy analysis of expenditures and revenues contained in the CBO report. The analysis showed that, relative to the baseline forecasts, the effects of the deficit reduction program were small. It would lower GDP by 1.4 percent and employment by 1.7 million in 1998. The bill lowers the budget deficit substantially during the five-year period--$413 billion by WEFA's estimates, compared to $493 billion in the Administration's figures. The 4.3 cents per gallon gasoline tax would add a negligible 0.1 percentage point to the rate of inflation.

WEFA surmised that the benefits of the bill would be achieved mainly in the long run. Lower interest rates would encourage more capital investment and increase productivity. This would enhance the competitiveness of U.S. firms. By 1998, the rate of growth in GDP would be slightly higher, inflation lower, exports up, and imports down. Further, a lowering of the national debt by $400 billion would reduce the burden on future generations of taxpayers.

EFFECTS ON AVIATION

What will the possible changes mean to aviation? The Omnibus Budget Reconciliation Act of 1993 includes an increase in taxes on corporations; thus the airlines and other corporate entities in the aviation industry may expect to see smaller profit margins.

Additionally, the increase in the fuel transportation tax will be applicable to the airlines in the latter part of 1995. This increase in cost could affect the airlines' bottom line adversely even if some of the cost increase can be passed on to the consumers. Of course, firms in the aviation industry will be able to take advantage of the lower interest rates and improved opportunities for capital investment and productivity growth, thus offsetting some of the negative impacts of increased taxes and fuel costs. The imposition of the tax on transportation fuels could have a small negative impact on general aviation activity.

NAFTA is expected to serve the long-term interests of aviation through increased sales of aircraft and aviation products and service to Mexico and Canada. Lifting trade barriers will lead to increased commerce in North America. This will be accompanied by a natural increase in air travel between the United States, Mexico, and Canada. This will create improved business opportunities for U.S. airlines and aviation manufacturers. Also, increased harmonization and standardization of operating and airworthiness regulations will allow aviation companies within the NAFTA free-trade zone to operate with greater efficiency and

profitability. Any economic stimulus that might result from the programs enacted to date should result in increased tourism and travel for business purposes.

SUMMARY

Under the FAA's baseline economic outlook, the economy is expected to rebound and to sustain a moderate rate of growth averaging 2.6 percent throughout the forecast period. In the short term--at least for 1994--the economy and the aviation industry will continue on their current courses. As a result of economic measures enacted to date, the budget deficit is expected to decline and both interest rates and the rate of inflation are expected to remain low.

Based on the WEFA analysis, the net effects of the deficit-reduction bill in the earlier years would be a slight reduction in the levels of GDP and employment, lower interest rates, slightly higher inflation, and a climate favorable to capital investment opportunities. These capital investments and subsequent productivity increases will pay higher dividends in the long run. NAFTA is expected to have positive effects on both the economy and aviation. Expansionary programs designed to improve the infrastructure and increase productivity should be beneficial to the aviation industry. While some policy measures enacted to date may impact the aviation industry negatively, the net effects on FAA's baseline forecasts are not significant.

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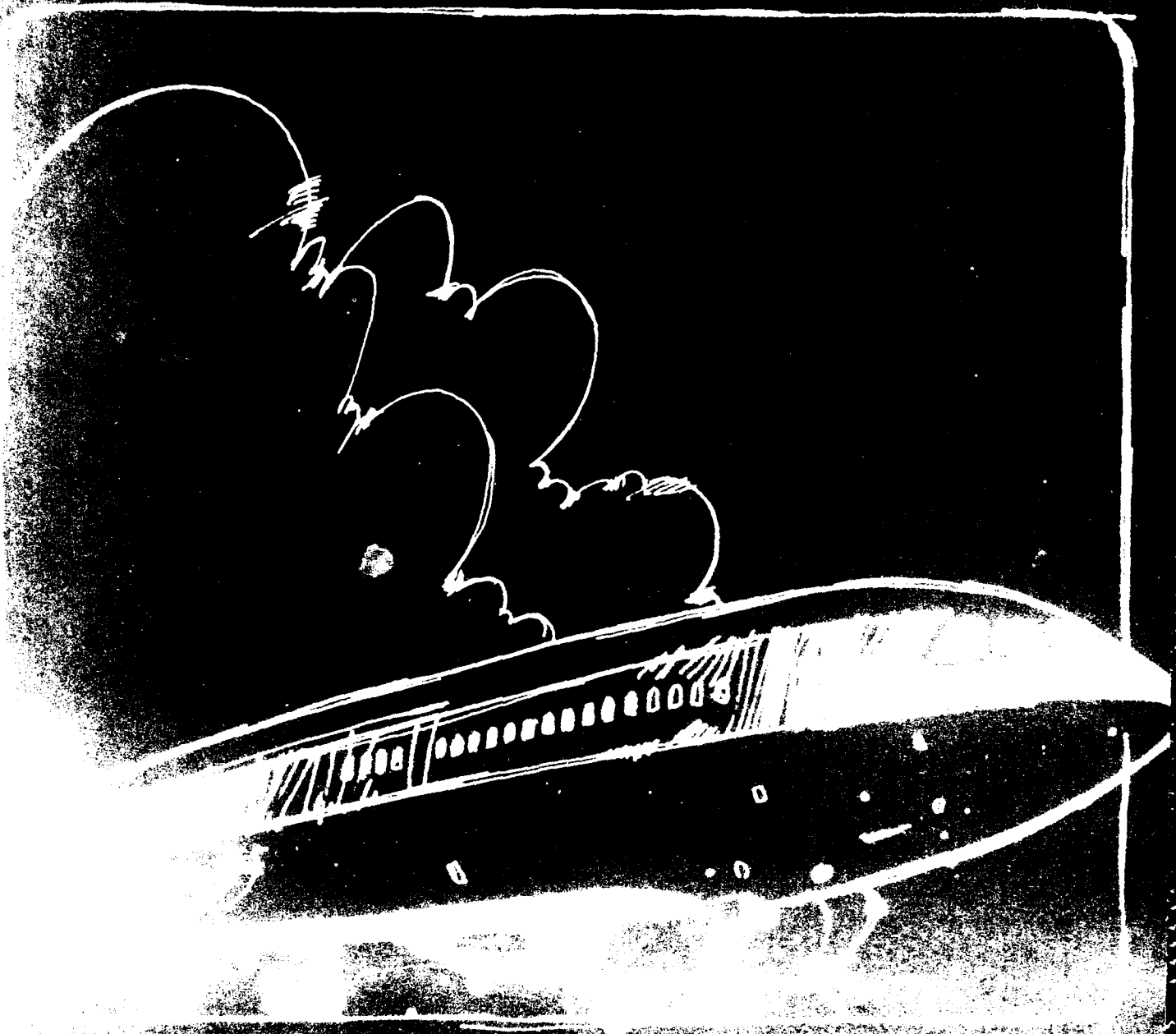


CHAPTER III

COMMERCIAL AIR CARRIERS

In fiscal year 1993 there were 73 U.S. commercial airlines (both scheduled and nonscheduled) reporting traffic and financial data to the Research and Special Programs Administration (RSPA), Department of Transportation (DOT), on Form 41. There were 54 passenger airlines (operating aircraft with over 60 seats) and 19 all-cargo carriers. While there are more carriers this year than last, additions are primarily in the nonscheduled segment of the industry.

Thirty-eight of the airlines provided scheduled passenger service and constitute the focus of the air carrier forecasts (both domestic and international) discussed in this chapter. Thirty-six of the carriers provided scheduled domestic service (within the 50 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands), while 16 of the carriers provided scheduled international service. Of the carriers providing scheduled international service, eight served Atlantic routes, 10 served Latin American routes, and seven served Pacific routes.

A list of domestic and international commercial passenger and cargo air carriers active in fiscal year 1993 is in Appendix A. A listing of inactive commercial passenger and cargo air carriers is in Appendix B.

Air carrier traffic forecasts and assumptions discussed herein are presented in Chapter IX (Tables 6 through 17). FAA air carrier workload forecasts are discussed in Chapter VII and presented in Chapter IX (Tables 27 through 37).

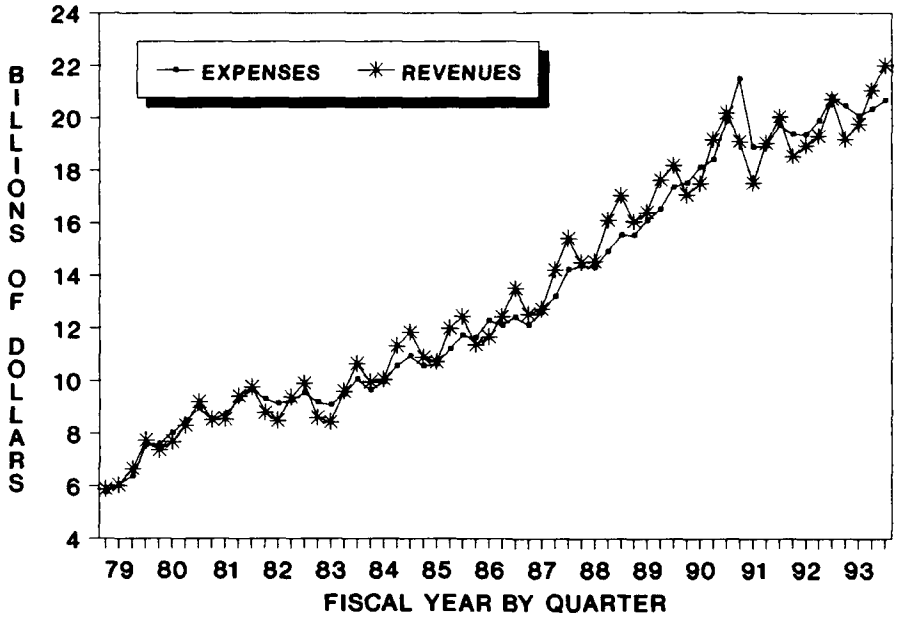
REVIEW OF 1993

FINANCIAL RESULTS

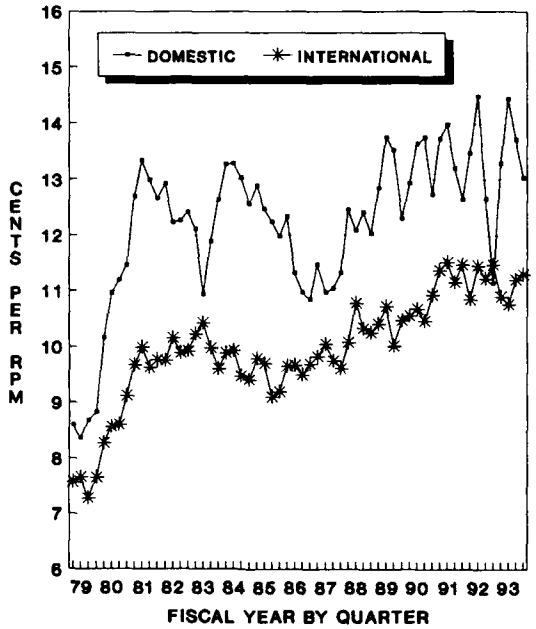
Fiscal year 1993 provided a beginning of recovery for the financial performance of the U.S. commercial airline industry. The U.S. economy improved in 1993, although key economies in Europe and Asia remained in recession. The start toward financial recovery was based on revenue improvements and capacity control, not on a strong traffic rebound. While fare competition remained strong, there was nothing in fiscal year 1993 to compare with the fare wars that occurred in the summer of 1992. Excess capacity (relative to demand) continued to be a factor in the aviation industry in 1993, but limited expansion of

U.S. AIR CARRIER REVENUE AND COST TRENDS

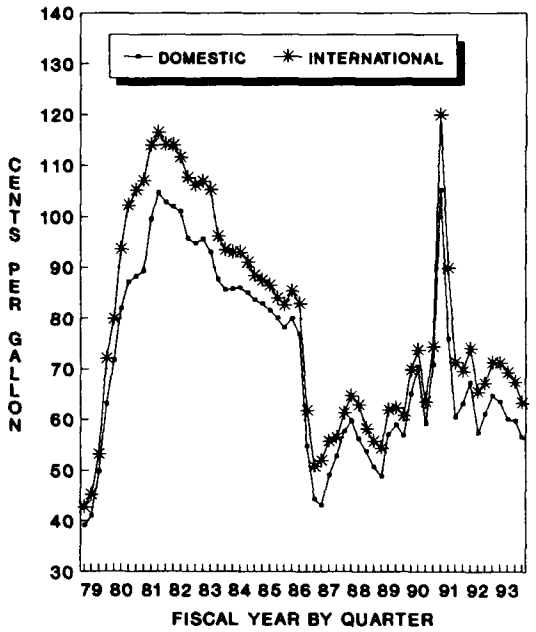
OPERATING REVENUES AND EXPENSES



PASSENGER YIELDS



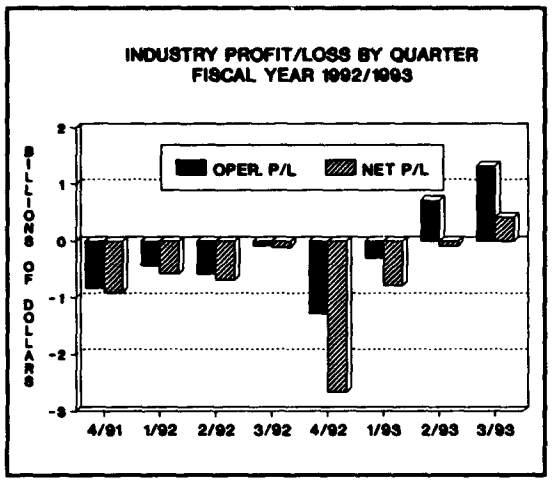
JET FUEL PRICES



(ALL VALUES IN CURRENT DOLLARS)

capacity kept load factors at reasonable levels.

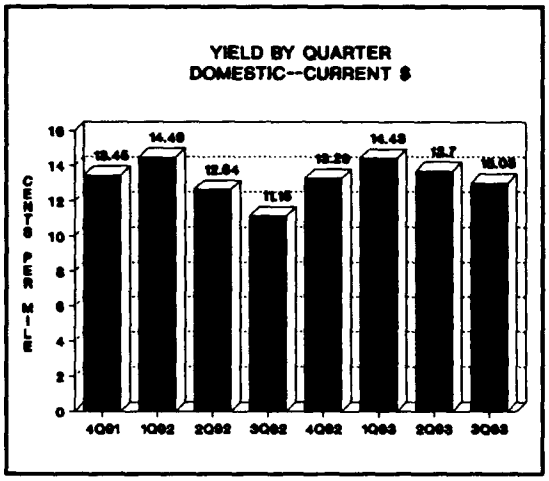
Operating losses in 1993 were less widespread than in 1992. Over half of the major carriers in the industry made an operating profit. The shift in operating profit between the years 1992 and 1993 was over $2.2 billion. The industry operating loss in 1992 was over $1.9 billion, while 1993 had a small operating profit of $438 million.



While this is not a significant level of profitability, it is significant that the year saw an operating profit in two quarters, the second and third quarters of 1993. These were the first quarterly operating profits since the third quarter of 1991. The second and third quarters of the year have historically been profitable for the airline industry. Since 1982, there were profits in the second and third quarter in every year but 1992.

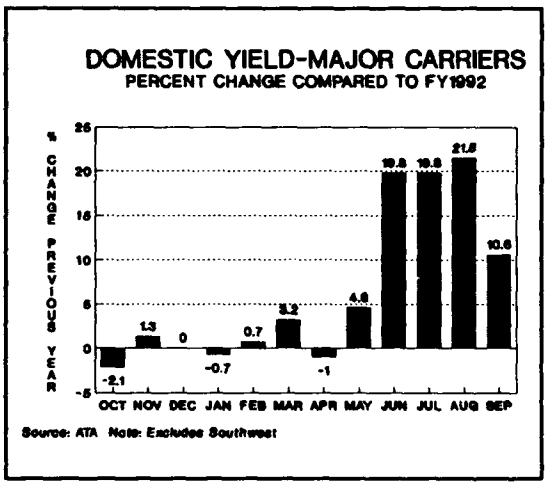
Three major carriers, Continental Airlines, America West Airlines, and Trans World Airlines, began the year in Chapter 11 bankruptcy. Continental and TWA emerged from bankruptcy protection during the year, and America West seems well on the way to the solution of its financial trouble, as it ended the fiscal year with an operating profit of $73 million.

The major financial change for the year was the improvement in the yield of the major carriers. The 1992 fare wars were devastating to the profitability of the industry, especially during the summer period, when travel is highest.

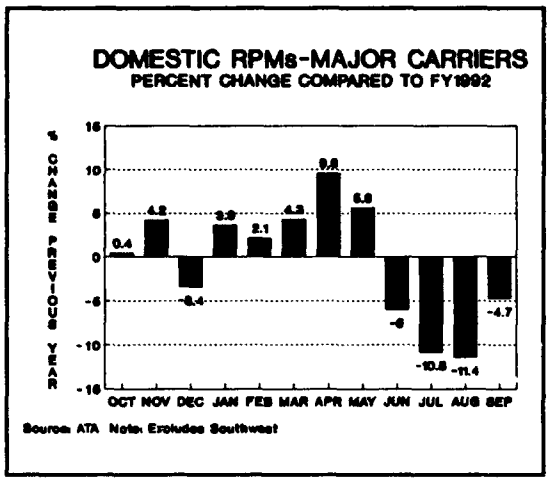


While traffic was down during the summer of 1993, yields (and passenger revenues) were up, with average fares up some 20 percent in the summer period of July and August from the prior year.

The dynamic situation with respect to yields and RPMs is shown in two graphs. Domestic average yield was fairly stable for the year, until June, when the return to "normal" fares resulted in significant increases.



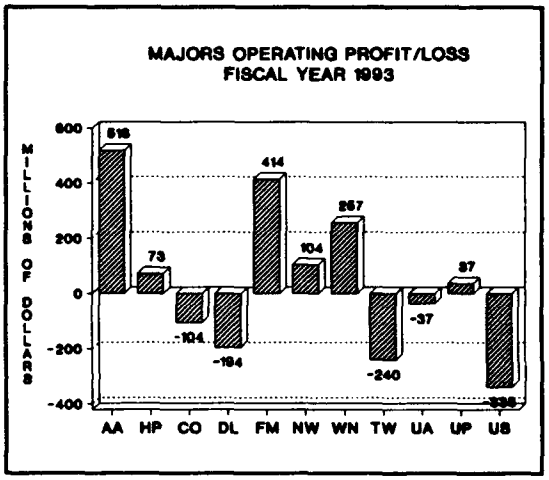
The second graph shows RPMs, which increased in all but one month through May, then dropped significantly in the June to September period. On average during the last four months of the fiscal year, domestic traffic was down approximately 8 percent while average yield was up approximately 15 percent. As a consequence, domestic traffic for the fiscal year (RPMs) was basically flat (up 0.1 percent), while domestic yield and passenger revenues increased.

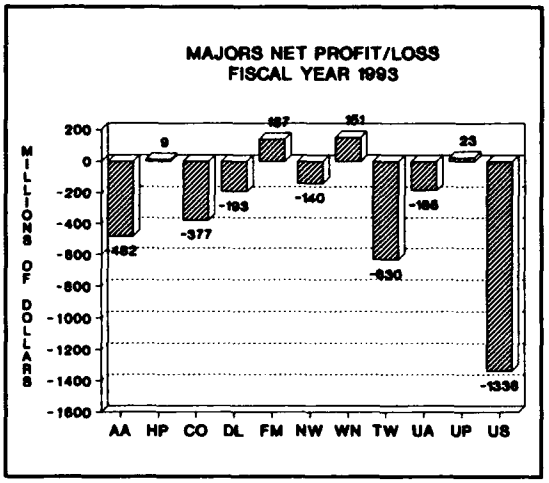


The international air travel sector, after recording a traffic (RPM) increase of 13.7 percent in 1992, grew only 4.6 percent in 1993, due to sluggish growth in the Atlantic market and a decline in Pacific market. International yields decreased slightly (1.7 percent) in current dollar terms, and decreased 5.0 percent in real dollars.

U.S. airlines posted a net loss of almost $3.1 billion in fiscal year 1993, considerably worse than the $2.3 billion net loss in 1992. The primary cause of this result was an accounting requirement to restate future costs of medical benefits to be paid to retirees. Four major airlines showed a net profit--America West, Federal Express, Southwest, and United Parcel--compared to only two, Southwest and United Parcel, in 1992.

The following two graphs show operating profit and loss and net income for the air carriers classified as majors. Both of the cargo airlines made an operating profit. Six major airlines showed an operating profit in fiscal year 1993, compared to three in fiscal year 1992. Of the nine passenger airlines, four showed an operating profit while five showed a loss. USAir showed the greatest operating loss at $338 million, and was the only carrier to have a greater loss in fiscal year 1993 than in 1992.





The industry needs a period of consistent profitability. The changes in 1993 were a first step to returning to profitability. A rational pricing

structure is needed to ensure both short- and long-term industry profitability. The current forecast assumes stability in fares, with only modest decreases or increases. This should allow for industry financial improvement in fiscal year 1994, if costs can be brought under better control.

SCHEDULED PASSENGER TRAFFIC AND CAPACITY

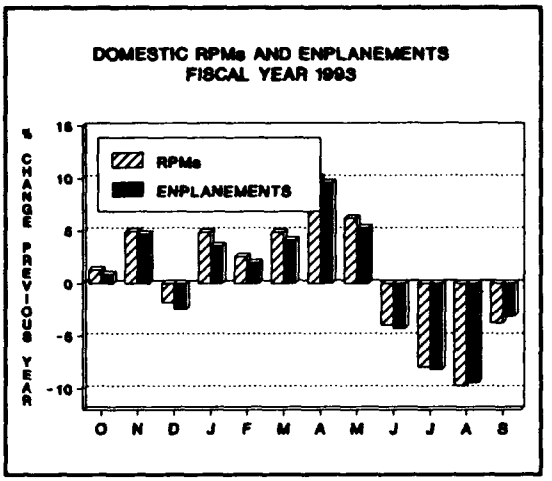
Scheduled system (domestic and international) passenger traffic on U.S. commercial airlines increased moderately in 1993. System demand for air travel (as measured in RPMs) increased 1.3 percent. This follows 1992's increase of 6.2 percent. The increase in passenger demand in 1993 was almost entirely due to international change, as there was only a slight increase in domestic RPMs from 1992 to 1993. While international travel rebounded in 1992 from the depressed levels of 1991, it slowed in 1993, growing only 4.6 percent, due to economic recession in many foreign economies.

System available seat miles (ASMs) increased 2.6 percent, resulting in a system load factor of 62.9 percent, down slightly from 1992's record high level.

Domestic Passenger Traffic and Capacity

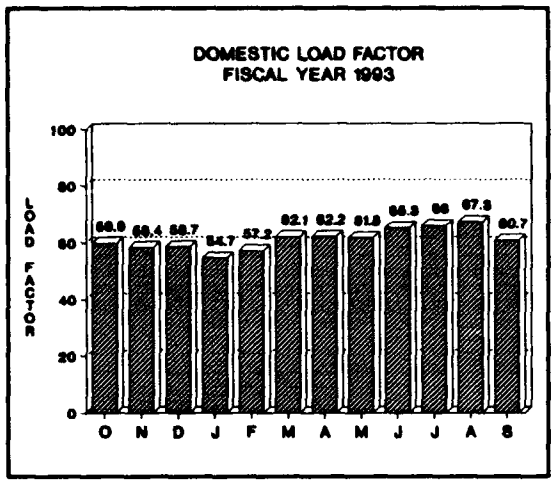
Domestic RPMs increased 0.1 percent in fiscal year 1993 to 346.8 billion. This outcome was largely a result of the return to a more normal fare structure, compared to the deeply discounted levels of 1992. As shown in a previous graph, traffic was up in most months, comparing 1992 to 1993, but dropped significantly in the busy summer period when fare wars prevailed in 1992. Domestic passenger enplanements (428.8 million) decreased by 0.1 percent in fiscal year 1993.

Perhaps the rate of growth during the first eight months of the fiscal year, 4.1 percent, reflects the true underlying growth trend.



Real yields increased by 3 percent in 1993, compared to a decline of 6.9 percent in 1992. This increase was expected, as many believed that yields had to be improved in light of the financial results for fiscal year 1992. The rebound in yield followed the 1992 decline in real yield, which was the largest since 1986.

The yield changes were most severe, of course, when comparing monthly data for yield in the summer months. As shown previously, yields averaged almost 20 percent higher in the busiest summer months. Month-to-month and quarter-to-quarter yield comparisons reflect the severe swings. Average yields, which went down significantly in 1992, went up significantly in 1993. While discount fares--and even deep discounts--were still part of the industry fare structure in 1993, they were more controlled during the peak summer season; the deep discounts were most available in off peak periods.



Domestic capacity increased by 2.2 percent in fiscal year 1993. This resulted in a load factor of 61.3 percent.

Industry concentration, in terms of the percentage of RPMs carried by the three largest carriers, increased in 1993. American, United, and Delta increased their share of RPMs to 55.8 percent in 1993, up from 54.7 percent in fiscal year 1992. The share for these three carriers is expected to decrease in the short run, although it may increase in the longer term. Short-term, the percentage concentration could decrease due to the effects of the American Airlines strike in the first quarter of fiscal 1994, and possible downsizing at any or all of the three largest carriers.

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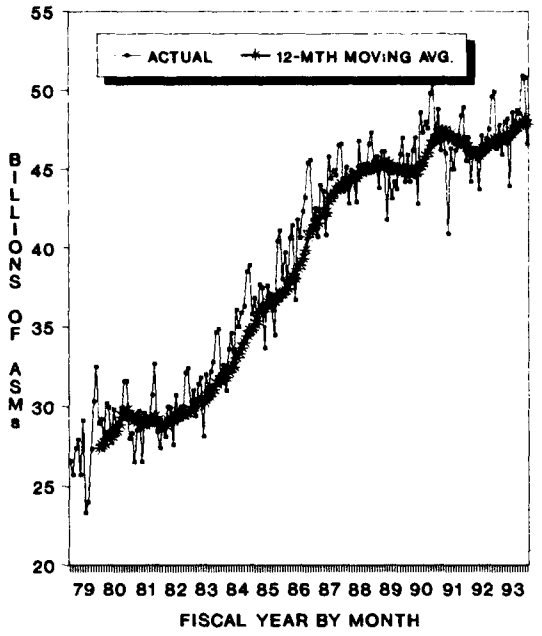
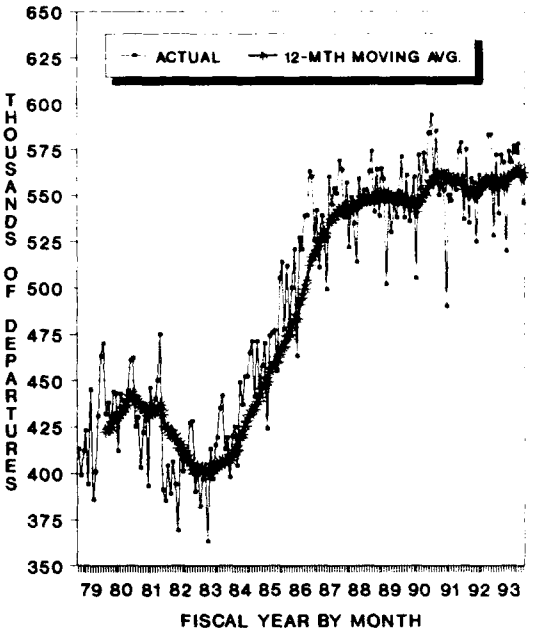
U.S. AIR CARRIER DOMESTIC TRAFFIC TRENDS

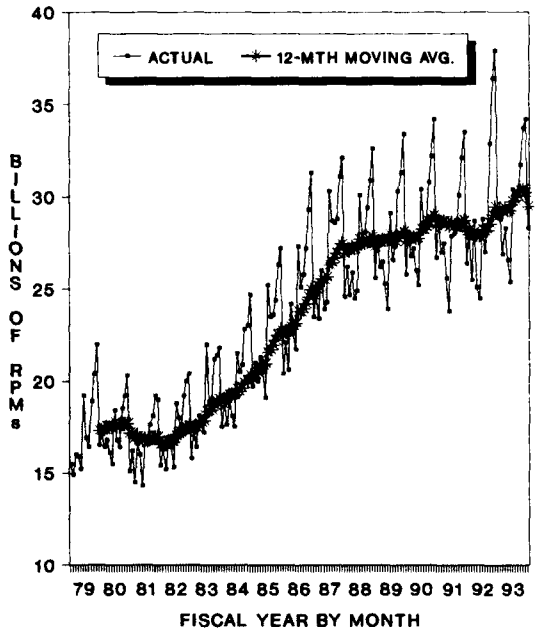
AVAILABLE SEAT MILES



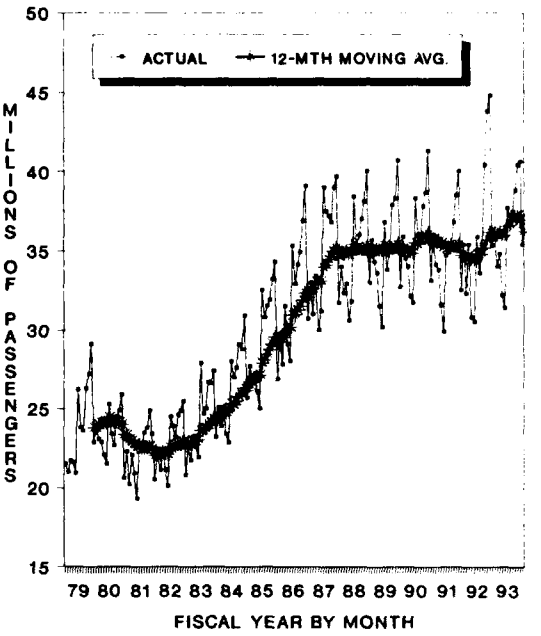
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES

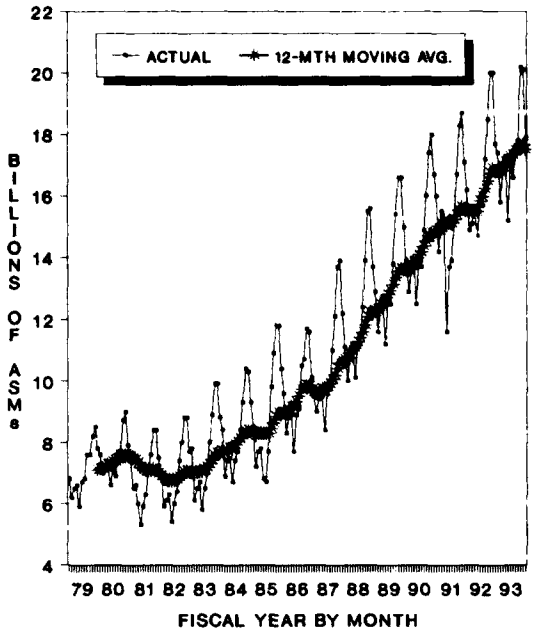


PASSENGER ENPLANEMENTS



U.S. AIR CARRIER INTERNATIONAL TRAFFIC TRENDS

AVAILABLE SEAT MILES



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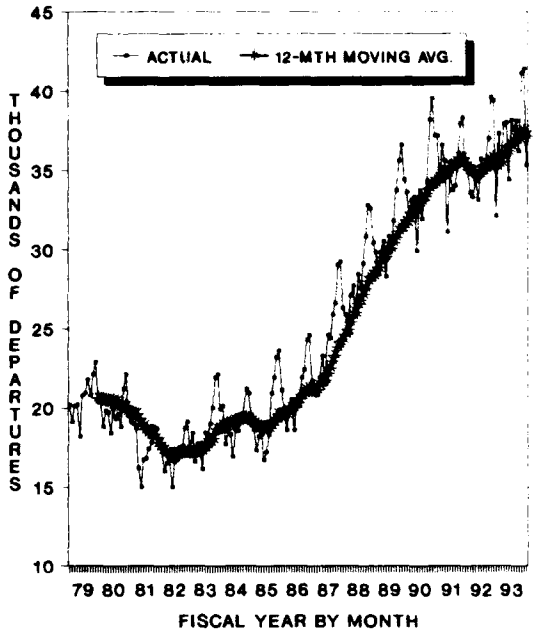
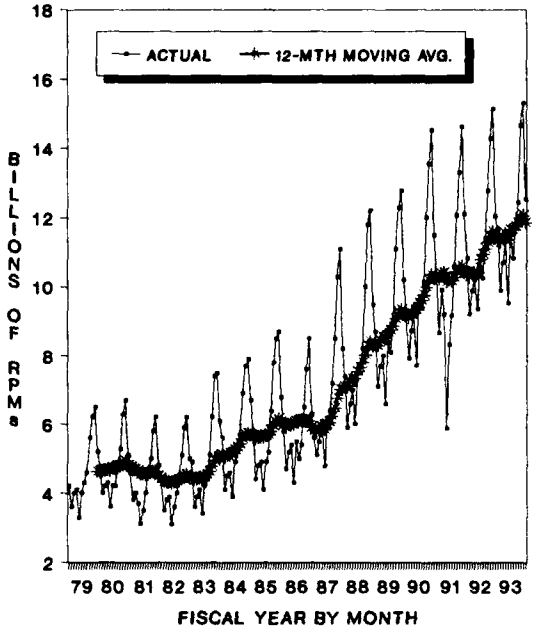
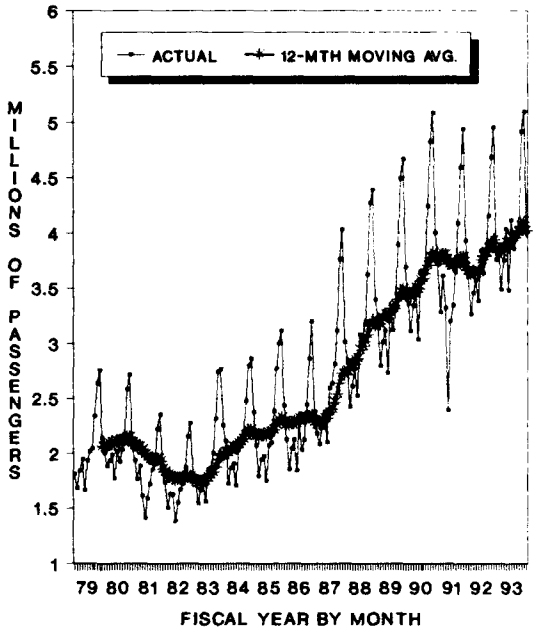


REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS



International Passenger Traffic and Capacity

International traffic and capacity increased moderately in fiscal year 1993, with RPMs increasing 4.6 percent and ASMs increasing 3.9 percent. Load factor increased 0.4 percent to 67.5 percent. These increases came on top of much higher 1992 growth levels, which represented a rebound from levels depressed due to the effects of the Gulf War in 1991.

The international load factor of 67.5 percent is the second highest load factor ever achieved in the international sector, lower by 1.7 points than the record achieved in 1990.

Traffic and capacity were up the most in the first four months of the year, and showed a low rate of increase in the final four months of the fiscal year.

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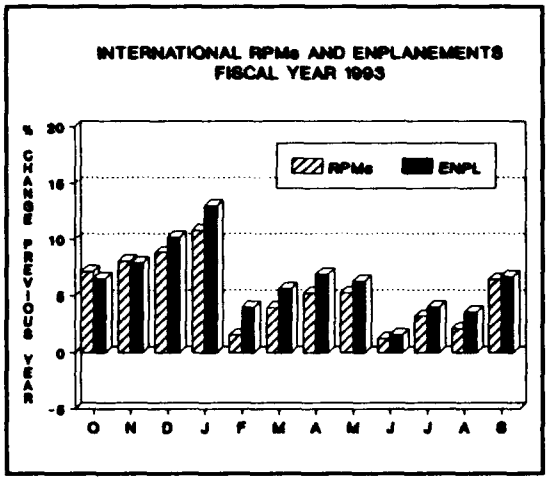
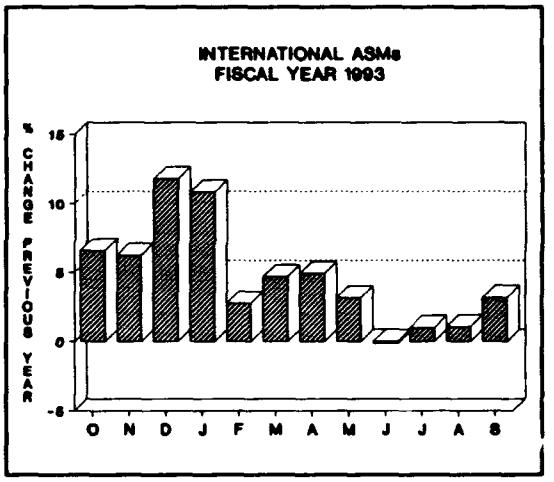
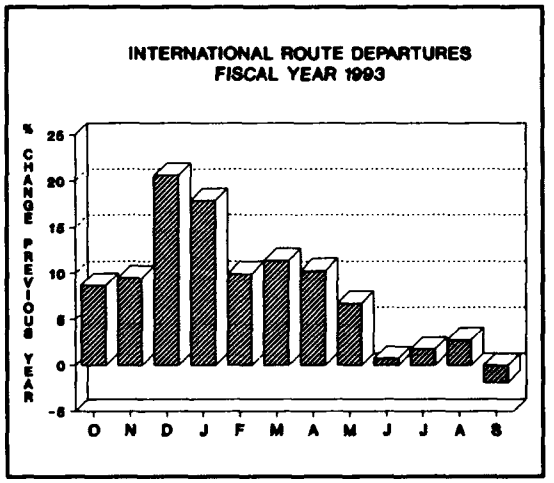
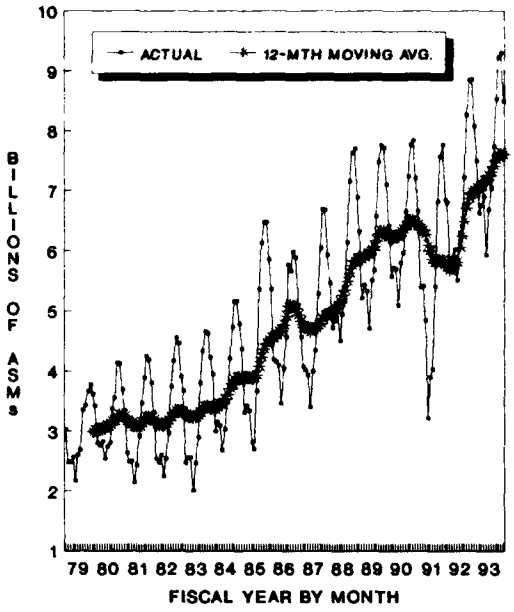




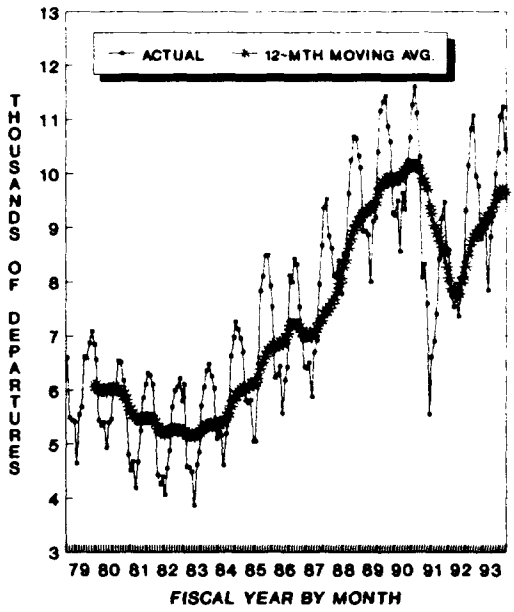


U.S. AIR CARRIER CAPACITY AND TRAFFIC TRENDS
INTERNATIONAL OPERATIONS - ATLANTIC ROUTES

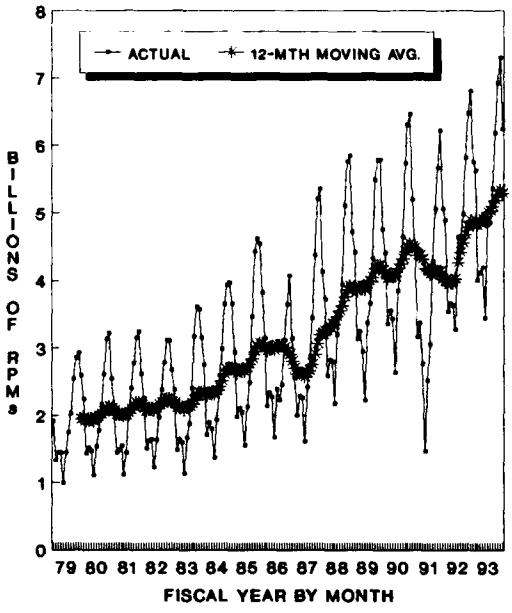
AVAILABLE SEAT MILES



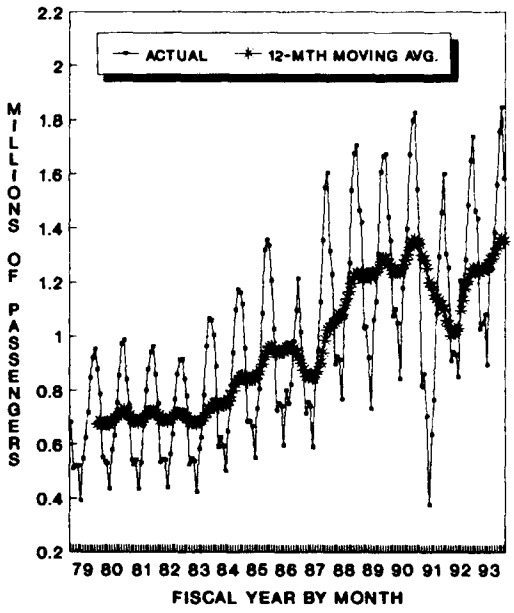
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS



Atlantic Routes

Transatlantic traffic demand was up moderately in 1993, with RPMs, ASMs, and enplanements up between 5 and 6 percent over 1992. The months of February and March 1993 showed almost no change compared to the previous year.

Current dollar and real yields in the Atlantic market decreased 4.9 and 7.6 percent, respectively, in 1993. Heavy price discounting affected the Atlantic markets. The heavy discounting was largely responsible for the losses in this market. According to data filed by operating entity, the U.S. passenger carriers serving the market had an operating loss of $750 million in fiscal year 1993.

The Atlantic markets were affected by the weak economy in Europe and negative publicity in the United States related to safety of foreign tourists. Cheaper fares were part of the strategy to keep traffic up on these routes.

The number of passengers enplaned on the Atlantic routes in fiscal year 1993 totaled 15.6 million, an increase from 1992's 14.8 million, but lower than the peak of 16.1 million in 1990 (which included Pan American's intra-Germany traffic).

The trend toward smaller aircraft size continued in 1993, with the average flight having 12 fewer seats, down from 245.2 in 1992 to 231.6 in 1993. Departures increased in each month of 1993, with highest increases in the first 4 months of the fiscal year, and moderating thereafter. Load factor in 1993 was 69.2 percent, up somewhat from 68.9 percent in 1992.

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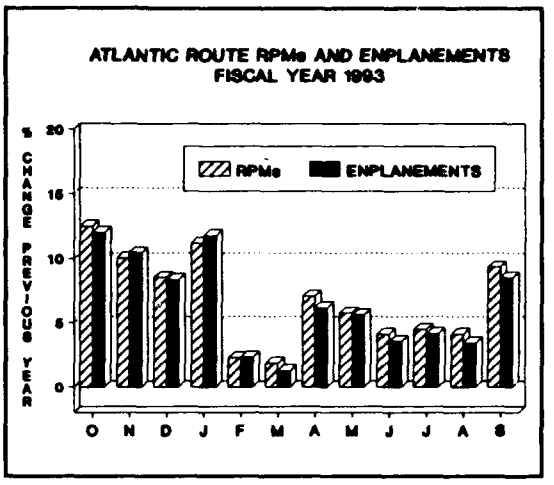
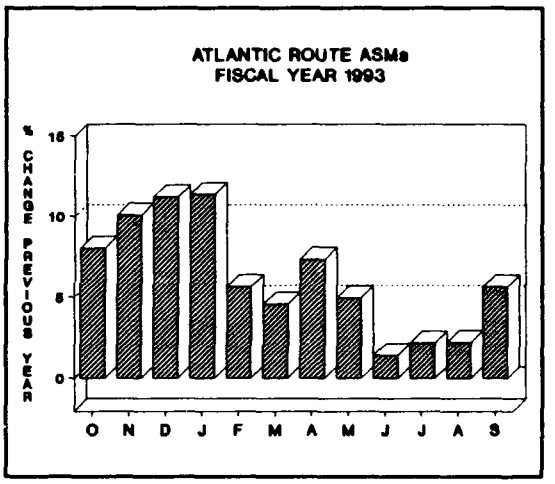
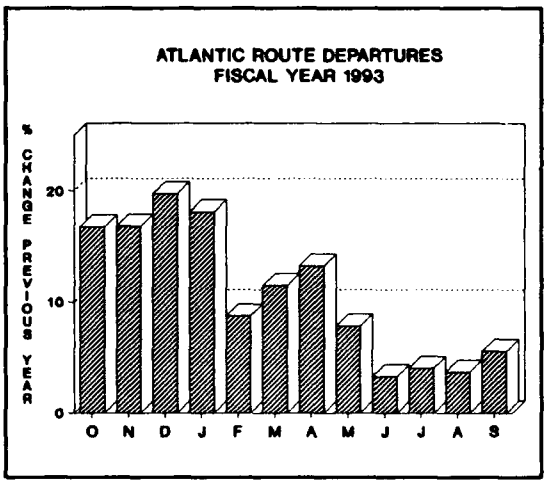


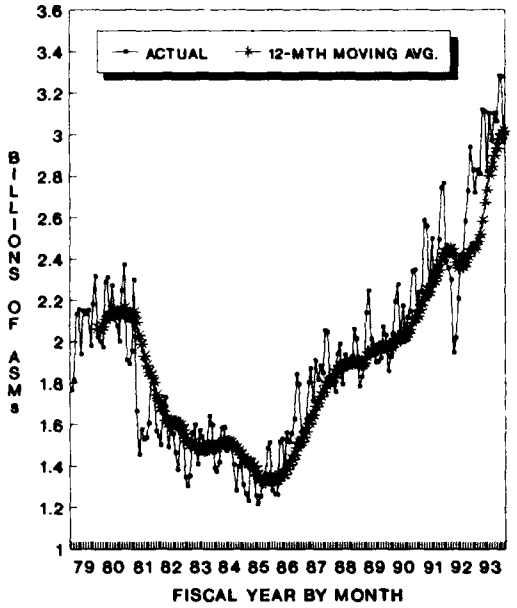




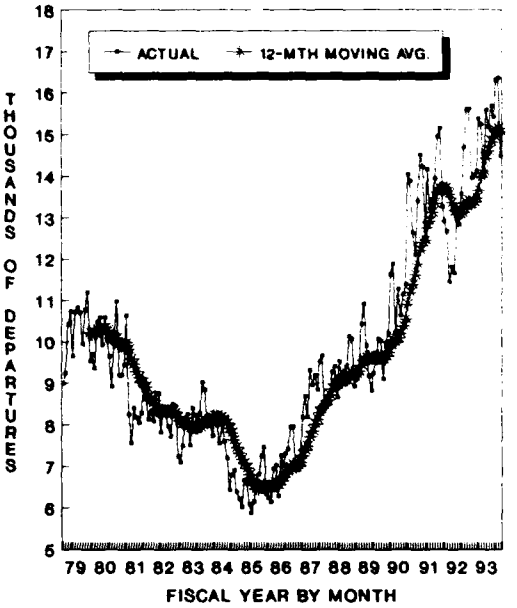
U.S. AIR CARRIER CAPACITY AND TRAFFIC TRENDS

INTERNATIONAL OPERATIONS - LATIN AMERICAN ROUTES

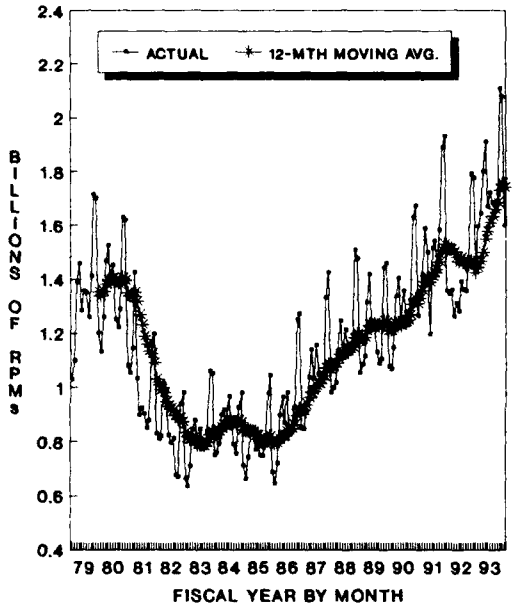
AVAILABLE SEAT MILES



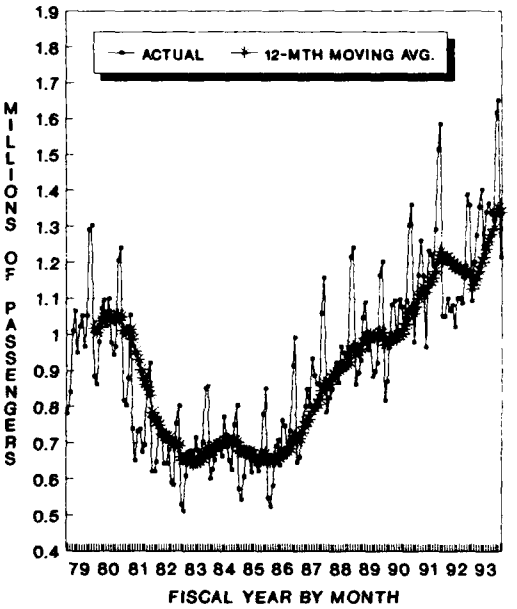
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS



Latin American Routes

Traffic demand to Latin America (destinations in South America, Central America, Mexico, and the Caribbean) increased significantly in 1993. RPMs were up 21.4 percent, capacity increased 22.2 percent, and load factor decreased 0.4 points to 57.9 percent. Passenger enplanements were 15.8 million, up 16.0 percent over 1992.

Growth resulted from service and traffic improvements. Pan American routes which were taken over by United were provided with upgraded frequencies and capacity in 1993. Yield was stable in the Latin American market in 1993, with real yield increasing one half of one percent.

Monthly changes in capacity and traffic illustrate the consolidation and improvement in capacity during the year. Traffic and capacity increased significantly in December and January, due to a slow startup by United (of routes taken over from Pan American) in December and January 1992. Capacity and traffic for the balance of the fiscal year increased fairly evenly.

According to data filed by operating entity, the U.S. passenger carriers serving the market had an operating profit of $100 million in fiscal year 1993, making it the most profitable of the international entities.

Real yield increased 0.5 percent in 1993, while current yield increased 3.4 percent.

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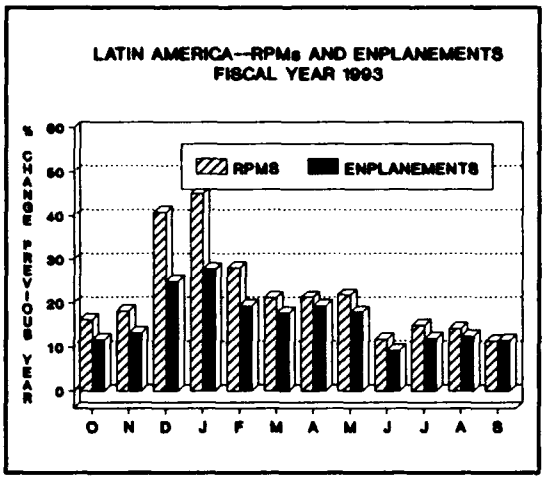
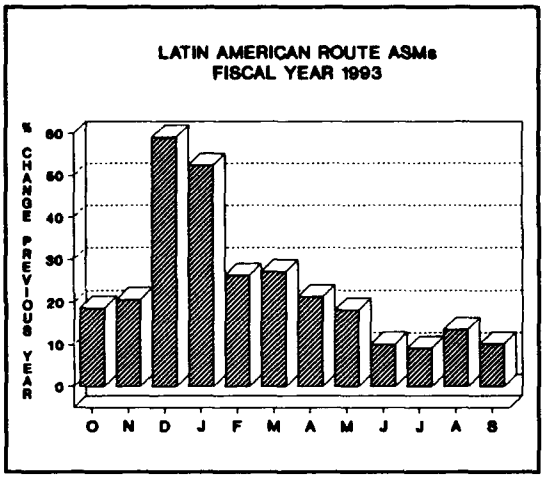
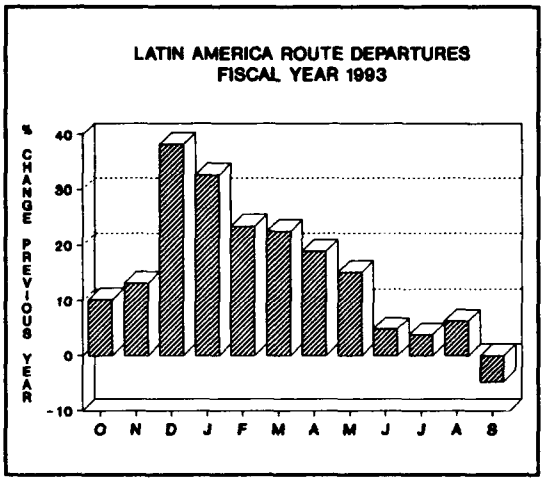


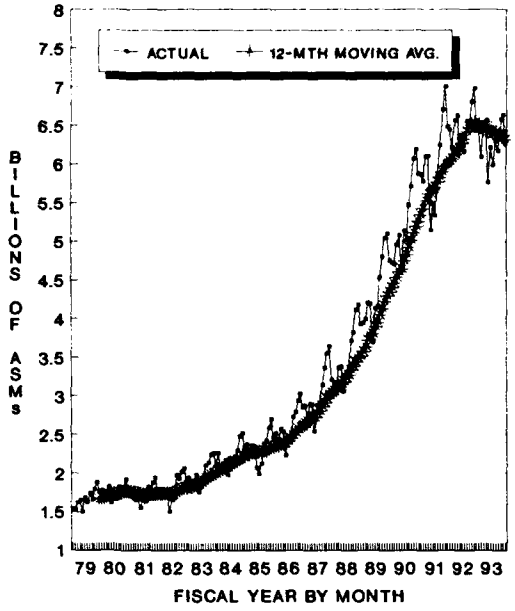




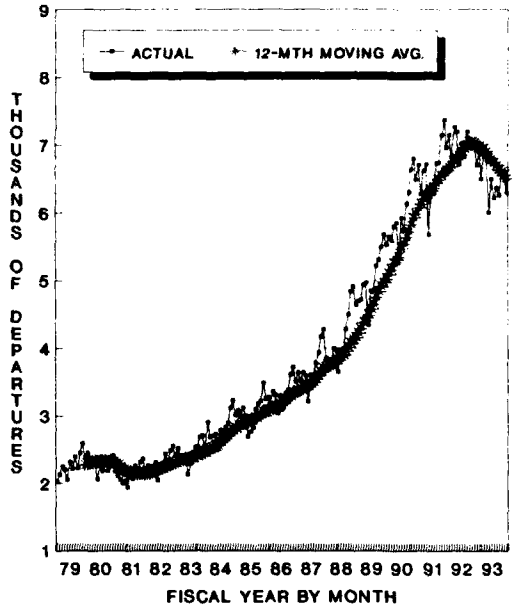
U.S. AIR CARRIER CAPACITY AND TRAFFIC TRENDS

INTERNATIONAL OPERATIONS - PACIFIC ROUTES

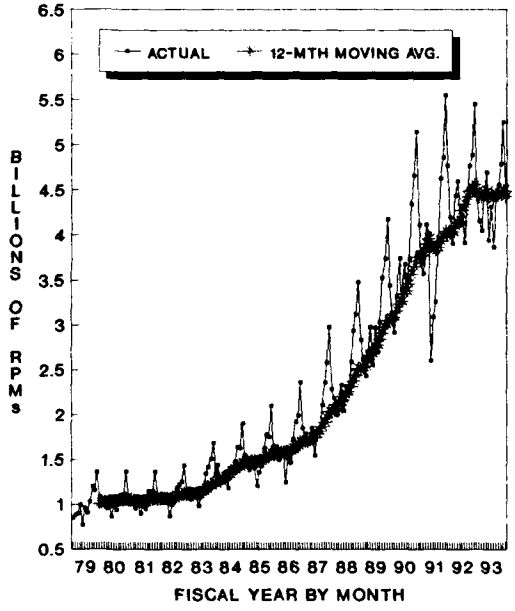
AVAILABLE SEAT MILES



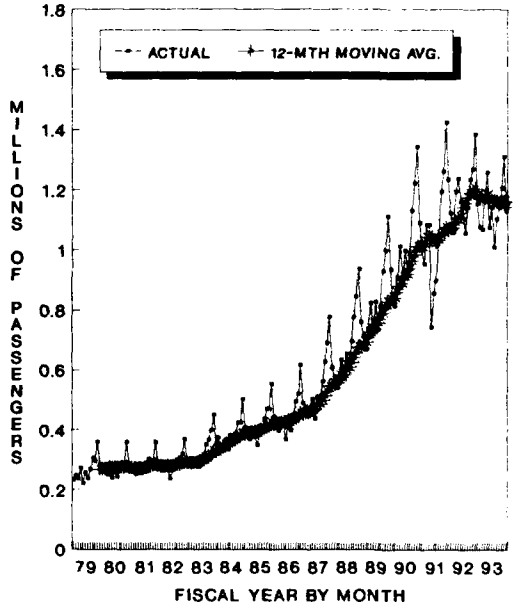
AIRCRAFT DEPARTURES



REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS



Pacific Routes

Passenger traffic to Pacific destinations decreased for the first time in eleven years. During the period from 1982 to 1992, RPMs and passenger enplanements have more than quadrupled, each increasing at an average annual rate of 14 percent. The reduction in 1993 is therefore a surprise in the market, and provides an indication of the depth of recession in the Japanese economy.

Demand was weak in 1993 with RPMs down 2.2 percent and enplanements down 3.6 percent. Capacity on the transpacific routes decreased 4.5 percent, and load factor increased 1.7 points to 70.1 percent. The market is costly to serve, in terms of operating cost, and high load factors are required.

The high load factor created only a modest profit for the Pacific markets. According to data filed by operating entity, the U.S. passenger carriers serving the market made only $32 million operating profit in fiscal year 1993.

Real yield decreased 1.3 percent in 1993, while current dollar yield increased 1.6 percent. Yields do not necessarily reflect the net to airlines in this market, as the expenses (commissions) can represent a very high percentage in international markets, especially in the Pacific area.

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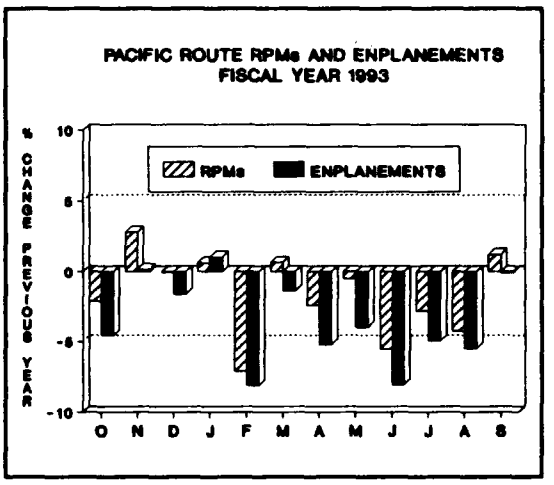
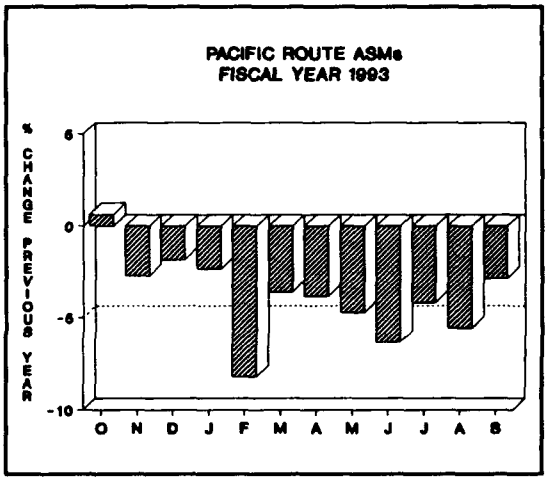
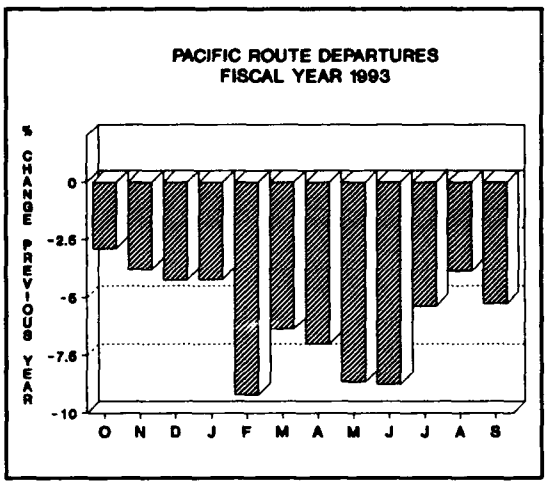






NONSCHEDULED TRAFFIC AND CAPACITY

The number of nonscheduled (charter) passengers flying on U.S. commercial air carriers increased 18.1 percent in fiscal year 1993, to a total of 10.9 million. Domestic enplanements increased 31.1 percent, while international enplanements decreased 2.2 percent.

Nonscheduled revenue passenger miles and available seat miles also increased. Historical (1983-1993) nonscheduled traffic, capacity, and load factor statistics are in Appendix C.

AIR CARGO TRAFFIC

Air cargo revenue ton miles (RTMs) flown by U.S. air carriers reporting on RSPA Form 41 totaled 18.3 billion in fiscal year 1993, up 8.7 percent from 1992. Freight/express RTMs increased 8.6 percent, while mail RTMs increased 9.9 percent.

Domestic cargo RTMs were up 9 percent, while international RTMs increased 8.3 percent. Historical (1983-1993) domestic and international air cargo statistics may be found in Appendix D.

FORECAST ASSUMPTIONS

The background against which the present forecast is developed involves three major factors--changes in the economy, structural changes in the air carrier industry, and changes in the market for air transportation. The baseline forecasts of commercial air carrier traffic and activity during the next 12-year period (1994 to 2005) are made against an uncertain background, particularly with respect to the industry structure and changes in the market.

ECONOMY

The economy is expected to enter an extended period of moderate expansion. Chapter II discusses the economic assumptions in detail. An important assumption is that the economic recovery, while not robust, will provide a stable base of air travel in both the business and leisure travel markets.

The general economy has recovered from recession, and unemployment, while it is still high, is not as big a factor as it was during the worst of the recession. While there are still "downsizing" type layoffs in a number of companies, total employment is increasing. Also, there does not seem to be the widespread fear of layoff among white collar workers that seemed to affect consumer behavior during the worst of the 1991-1992 recession. Corporate travel budgets have apparently recovered, along with an improved business profit outlook.

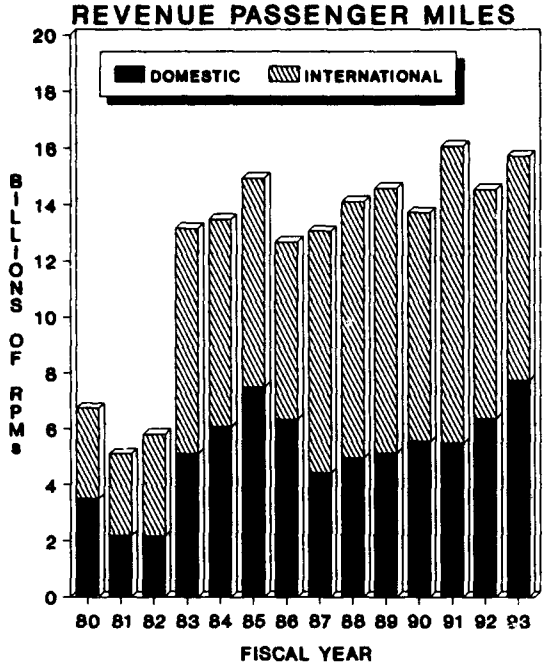
One major concern for the future involves pressures on disposable income that might impede the growth of air travel. In particular, unknowns include the potential cost of health care in the future, as well as the impact of increased tax rates.

Internationally, the economic outlook is negative for Japan and Europe for the short run. Growth rates for economic activity and air travel should improve after 1994.

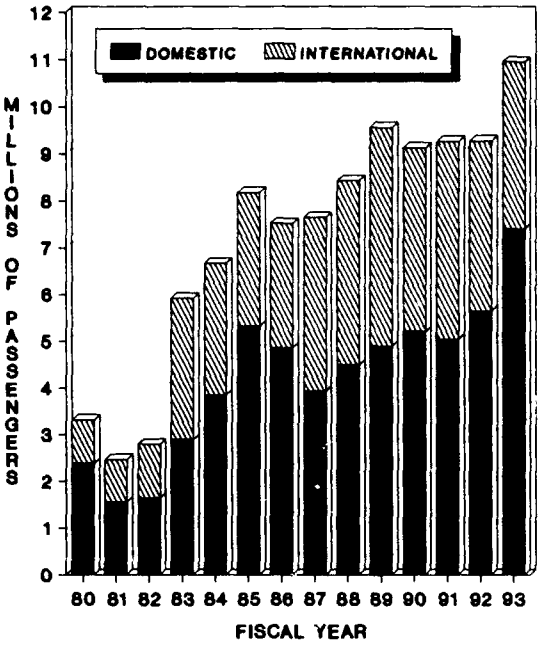
On the leisure travel side, consumer confidence seems to have improved in recent months. One measure of consumer confidence, the University of Michigan Index of Consumer Sentiment, shows much improved consumer sentiment in 1993, and a projection indicates further

U.S. AIR CARRIER NONSCHEDULED TRAFFIC

REVENUE PASSENGER MILES

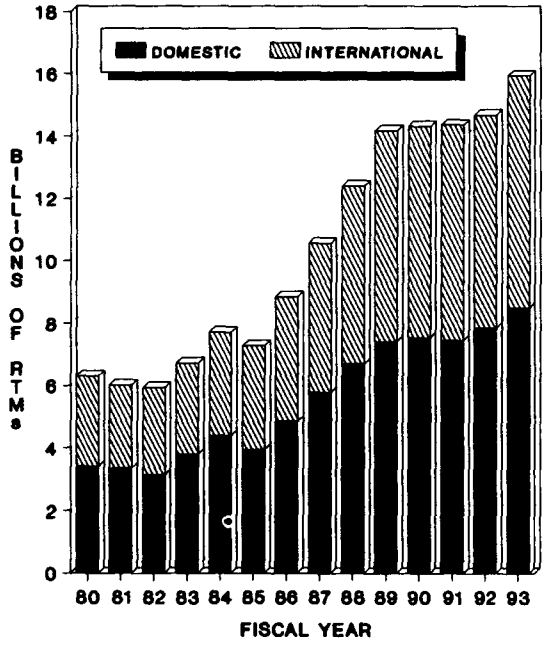


PASSENGER ENPLANEMENTS

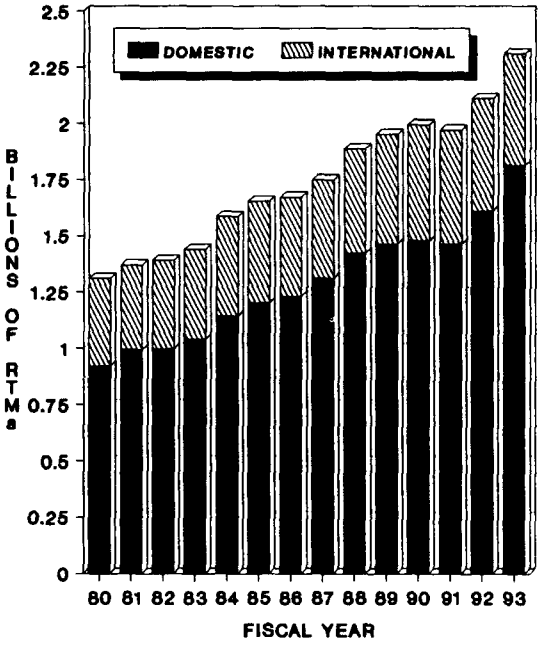


U.S. AIR CARRIER AIR CARGO TON MILES

FREIGHT/EXPRESS TON MILES



MAIL TON MILES



improvements in 1994 and 1995. The Conference Board index of consumer confidence also showed significant improvement in late 1993.

In summary, the economy is expected to be a positive influence, despite short term softness in the international sector.

INDUSTRY STRUCTURE

Two related elements of the industry structure are creating pressures toward lower cost in the domestic airline industry. First, a new wave of entry is under way, fueled in part by the availability of inexpensive aircraft, and partly by the financial success of Southwest Airlines and other new entrants. In 1993, through November, there were 18 new jet operators certificated by the Department of Transportation, and a similar number of requests for operator approval were pending at the end of 1993.

New entrants ensure that competitive forces remain strong, and new entrants will remain a factor in the industry. The availability of aircraft at favorable lease rates and the potential for profitable operations stimulate new entry.

The forecast assumes only limited additional industry concentration. It is probable that there will be some added consolidation of air carriers. In December 1993 Southwest Airlines announced that it would merge with Morris Air. While no "trend" is set by a few mergers, it is safe to say more mergers may occur among compatible new entrants, and new viable carriers will emerge from the large number of new entrants. Present low-cost carriers, such as Southwest, will continue to exert an important competitive force in the market.

The development of modified services provided by existing carriers--USAir's low-cost service and Continental's CALite, for example--has created an additional dynamic force in the industry. If these new operations are successful, additional carriers may attempt to lower their costs and increase their product differentiation by entering this market.

The present forecast does not develop high/low scenarios, but presents a most likely scenario. The near-term forecast could be understated if new entry formation and operations increase at a high rate. This is particularly difficult to project, since venture capital can expand (and contract) very rapidly.

Another factor that might influence developments among the major carriers is the spreading employee ownership of majority interests in major carriers. In particular, United Airlines has announced that employees will come to own a majority of the parent firm, UAL Inc. While the immediate impacts of this change in ownership are not clear, there are changes in incentive and employee outlook implied by this type of arrangement. The ramifications are positive for the basic goal of lowering the cost structure of the larger major carriers. Wide extension of employee ownership programs could have a major impact on the structure of the industry.

Hub development in the past year was aimed at cutting back, rather than increasing hubbing. Since hubbing can be quite expensive, all hubbing carriers subjected their systems to intense scrutiny in order to cut costs. Through much of the fiscal year, carriers cut back some of their established hubs. Through the first three quarters of fiscal year 1993, major hub reductions were seen at Washington Dulles (air carrier operations down 19.0 percent from 1992), Baltimore (down 9.7 percent) Charlotte (down 8.8 percent), San Jose

(down 8.7 percent), and Indianapolis (down 8.0 percent).

At San Jose, cutbacks of American Airlines were made in conjunction with a Reno Air buildup, which took over some flights discontinued by American. This type of service change could increase in 1994, as more carriers seek ways to reduce their costs.

The industry is expected to continue toward globalization, although there seems to have been a cooling of the industry ardor for large capital commitments on the part of carriers interested in major international alliances. The British Airways/USAir arrangement, approved in early 1993, is being watched closely, but has not started a new round of such agreements.

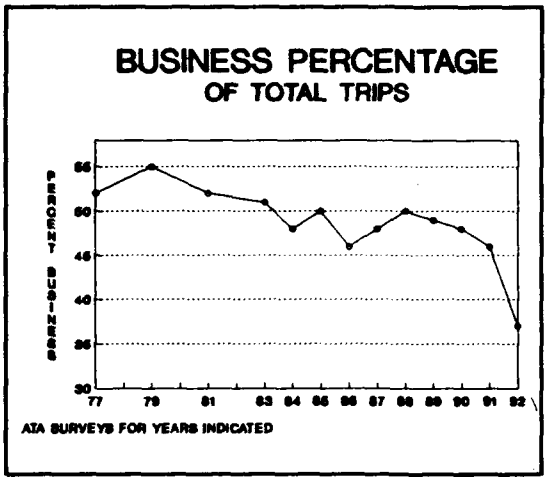
Existing arrangements, such as the association between Northwest and KLM, continued to grow in 1993. One other association that was approved involved Continental and Air Canada. United and Lufthansa are also working toward an extensive code sharing arrangement.

While stronger international alliances are high on the list of industry needs, the immediate major priorities of the industry appear to involve labor issues, ownership, and cost controls.

In summary, the industry is dynamic, with new entrants, new low cost options on the part of existing carriers, and possibly a number of mergers among new carriers. All of these forces tend toward slightly lower costs for the domestic industry.

MARKET CHANGES

Perhaps the major reason for the dynamic state of the industry is that attempts to achieve profitability through major pricing initiatives alone have failed. The only sure way to profitability seems to require lowering costs to increase efficiency. But the ultimate driver appears to be the increasing sensitivity of travelers (both business and leisure) to the cost of the air trip. Thus, costs and fares must be kept low to profitably attract more travelers, especially leisure travelers.



The air travel market is broadly divided into two sectors--business and leisure. There has been an historically declining percentage of air travel classified as "business." In recent years we believe that the decline in the percentage is associated with improvements in other communication technologies, such as fax, computer interfaces, and teleconferencing. The graph above shows the secular decline for the business percentage during the period from 1977 to 1992, based on results of Air Transport Association surveys.

The 1992 drop in business percentage was precipitous, and may be misleading, due to the fact that the survey was conducted during the period when the half-price fare wars were in effect, and the share of leisure travelers surveyed may have been overstated. But the decline was probably still large in 1992, as business travel was widely reported to have declined.

The future would appear to be a continuation of the historical trend--the market for air travel will rely more and more on non-business demand as the communications revolution continues to change the way America does business. The future development of video/computer conferencing is another force on the horizon that will change business travel patterns.

The much heralded "information highway" will allow a video and data link between two or more individuals or groups so that video images, voice, and data can be exchanged in real time. This capability may gradually further erode business travel. While it will always be necessary to conduct "in person" meetings, innovative new technologies such as video conferencing will likely substitute for many of today's business trips.

In summary, leisure travel, which is highly price sensitive, will be more important in the future. And as businesses demand more efficiency, they can be expected to be more price sensitive. It seems an inescapable conclusion that cost efficiencies must be achieved to keep fares low and create stable financial returns for the industry. This is the fundamental presumption of the forecasts that follow.

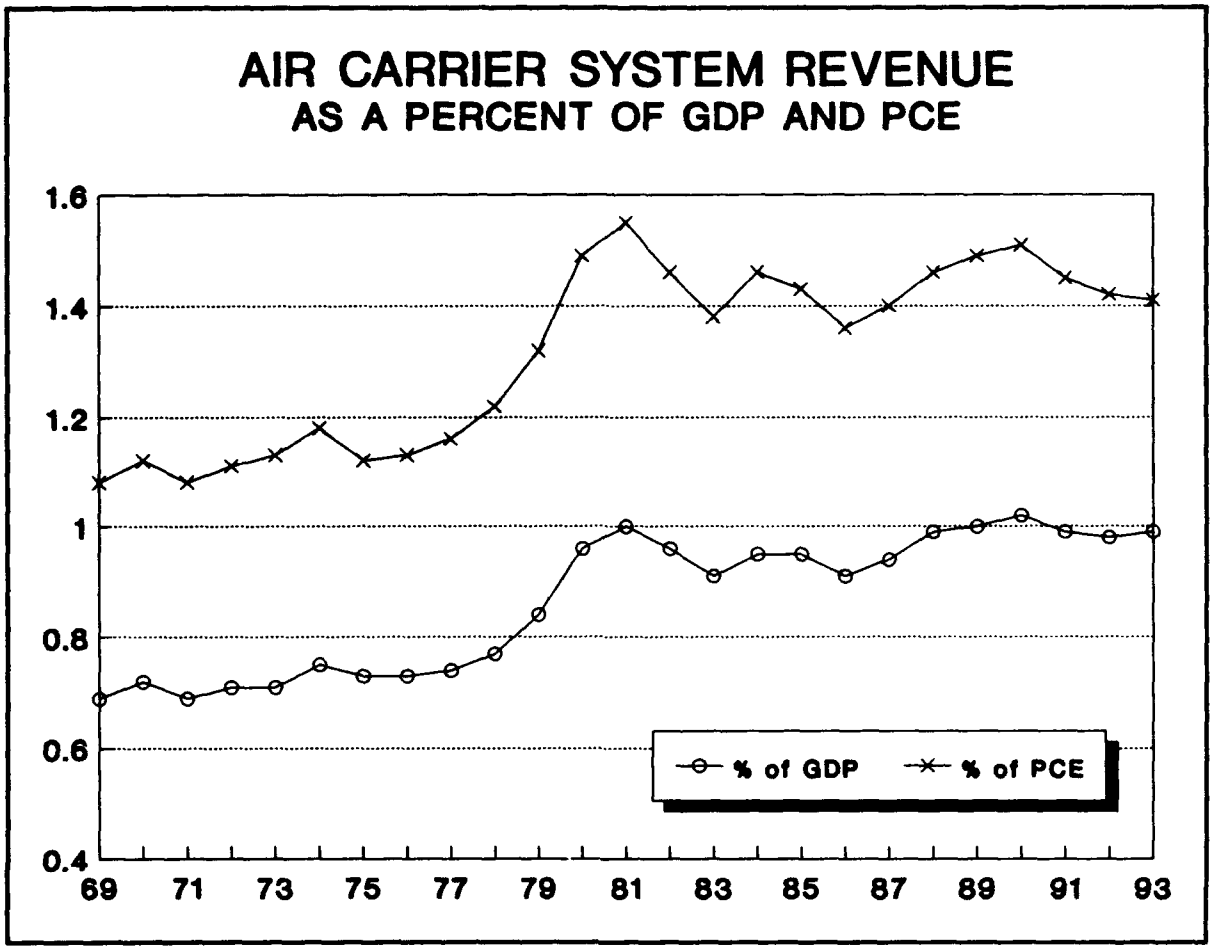
MODEL APPROACH USED

The economic forecast models applied in developing FAA forecasts use two primary independent variables, GDP and yield. GDP change is discussed in Chapter II, and yield is discussed below. In developing the forecasts, each year we test a number of alternative approaches. This year three alternatives were evaluated. One dealt with splitting the market into two parts--business travel and personal travel; the second applied our standard model, but assessed using different time periods as a basis for forecasts; the third dealt with possible relationships between total airline revenues and major variables such as GDP or Personal Consumption Expenditures (PCE).

From a methodological standpoint it might be preferable to use models which divide the market into business and personal travel, then add the two segments to obtain estimated total travel. This approach was rejected because of a lack of data. The only time series material available (the ATA survey discussed above) is missing some years and the 1992 results may understate business travel due to the survey timing. More research is required to develop a sound time series for these two different markets.

The second approach analyzed different alternative historical time frames for developing a regression model. FAA's forecast model uses a time series which starts in 1969, when the electronic data base used for airline data started. We considered using a model based on only the period since deregulation. However, the use of a shorter period (e.g., 14 years instead of 25 years) reduces the statistical quality of the model, without notably changing the forecast results. The domestic RPM forecast for 2005 using a 14 year history would be only 4 percent lower than the forecast using the 25 year history. The use of a model based on the shorter period was rejected.

A third forecast approach explored was based on possible relationships between total airline passenger revenues and economic variables such as GDP or PCE. The share of GDP that an industry comprises is the result of complex preferences and competing values. The graph below shows the percentage of GDP and PCE which went to airline revenues in recent years. We attempted to develop a satisfactory forecast based on projecting the aviation share of GDP and/or PCE, but found no reasonable



statistical method to make such a forecast. The regression equations showed no causal relationship between the shares and economic variables. The only meaningful trend might be a simple relationship between time and the system revenue shares.

However, in the above chart, one can see that a critical factor in forecasting a share approach would be the period of time to be used for establishing the statistical values.

If one uses a short period of time (say, 1980-1993) to project an estimated aviation "share" of GDP, then the industry share of general economic activity can only be seen as static or declining. We believe that the longer trend should be assessed, but the appropriate period to use is one of the unanswered questions.

While a share of GDP methodology is not incorporated into the forecast this year, the underlying concept--namely, industry maturity--is an important concern. FAA plans additional research to further review data and determine appropriate ways to incorporate the concept into the forecasts.

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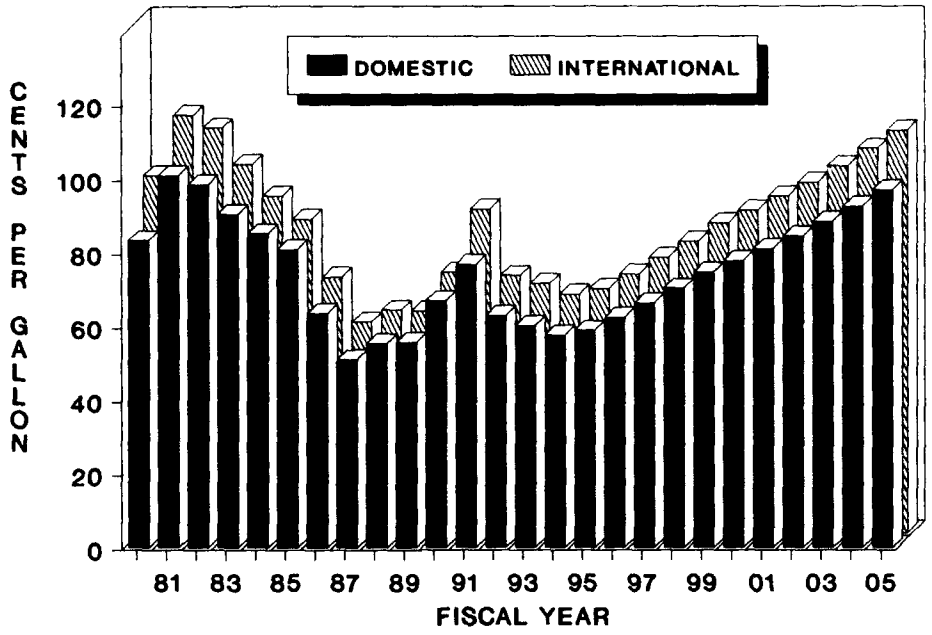
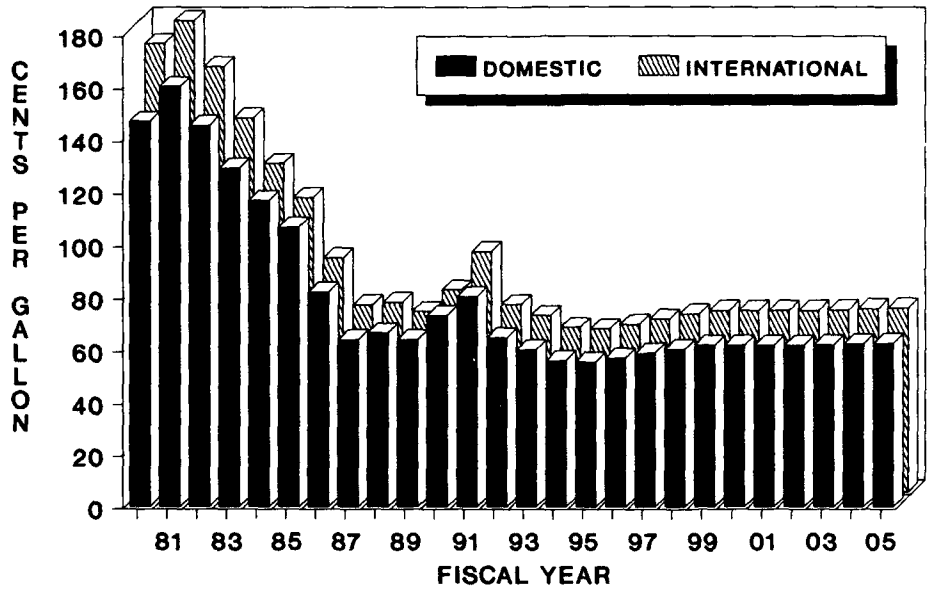
JET FUEL PRICES - CURRENT DOLLARS



JET FUEL PRICES
CONSTANT (FY-1993) DOLLARS

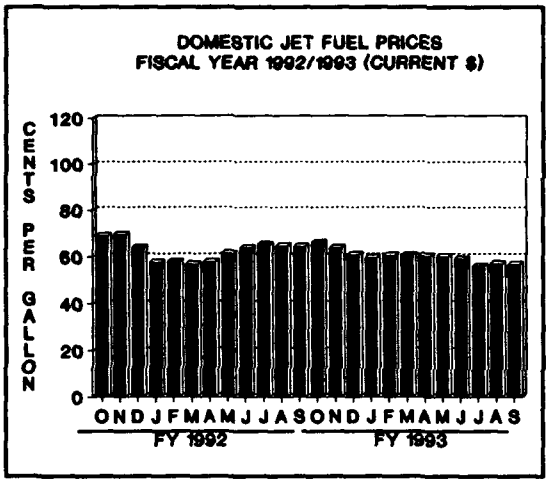


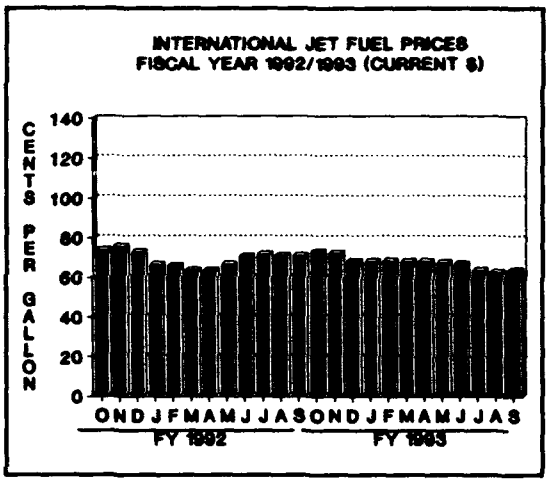
OTHER VARIABLES AND ASSUMPTIONS

In addition to the industry and economic variables discussed above, FAA's forecast approach involves specific review of independent variables that influence the forecast. The principal variables are the cost of jet fuel for air carriers, and the yields which we expect air carriers to obtain.

JET FUEL PRICES

During fiscal year 1993, jet fuel prices generally declined, as stability returned to the jet fuel market. Fuel costs averaged 61.9 cents a gallon in fiscal year 1993, with the average 60.0 cents for the domestic purchases and 67.5 cents for international. The system price was 4.0 percent lower than the average paid in 1992.





Changes in jet fuel prices can have a major impact on air carrier financial performance. Barring any unforeseen fuel supply disruptions or major new oil discoveries, jet fuel costs are expected to increase only gradually in real terms during the 12-year forecast period.

System jet fuel constant dollar costs are expected to decrease 6.8 percent in 1994, then to remain relatively stable, increasing only 13 percent during the ten year period 1995 to 2005. Jet fuel price stability will be an aid to the industry in achieving financial stability in the future. The forecast of fuel prices is shown in Chapter IX.

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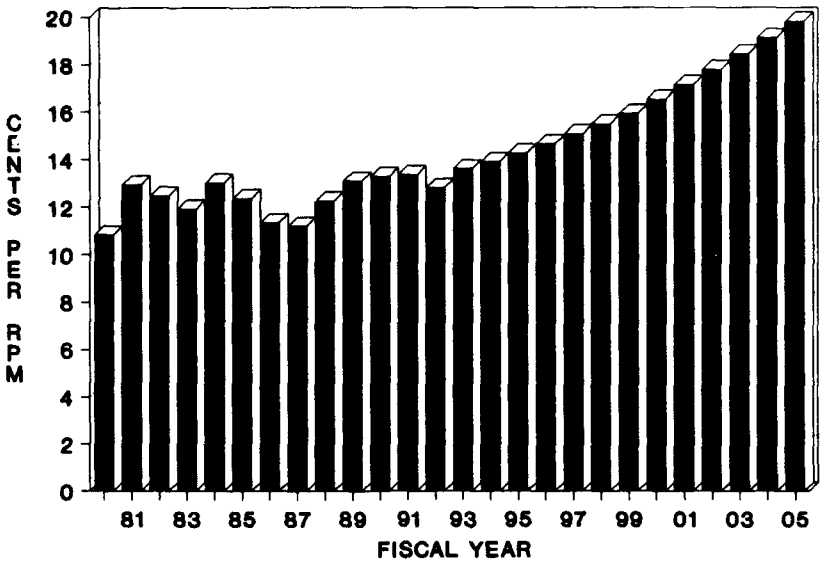
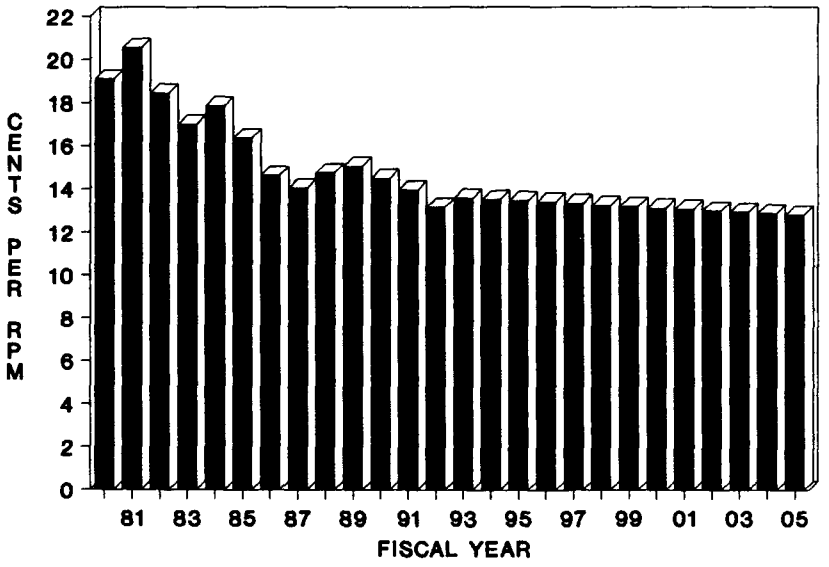
U.S COMMERCIAL AIR CARRIERS
DOMESTIC PASSENGER YIELD

CURRENT DOLLARS



CONSTANT (FY-1993) DOLLARS



PASSENGER YIELDS

There has been a long-term downward trend in airline passenger yields during the modern history of transportation. In terms of real yield (discounting fares for inflation), fares in the years 1969 to 1971 averaged 21 cents per passenger mile (1993 dollars). There has been a steady decrease in real yield over the years, with the causes of the decrease changing, but always with the result that fares have trended downward. By 1993 the average yield had fallen to 13 cents per mile.

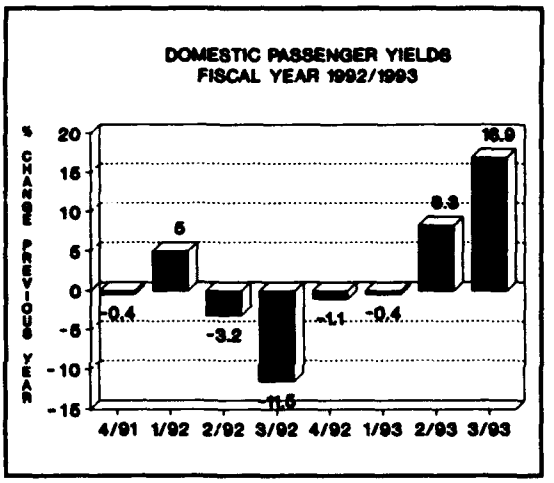
In the 1970s the dominant reason for the decrease was the introduction of large numbers of more efficient jet aircraft into the fleets operated by air carriers. In the 1980s the continued decrease was fueled by the deflationary impact deregulation had on the industry. Not only were airlines able to rationalize their route structures, but some labor costs decreased. In the last several years, financial weakness in the industry, coupled with high levels of capacity relative to demand, brought about intense fare competition.

We expect a stable future for yields, with moderate decreases in the domestic market and unchanged real yields in most international markets. We believe that the Atlantic yields must increase slightly. There is no new engine on the horizon to fuel major decreases in real yield, and the market and competitive pressures will result in only minor changes in average real yield.

On a system basis, real yield is expected to decrease 0.1 percent in 1994, then to decrease 0.3 or 0.4 percent in each year through 2005.

Domestic Passenger Yields

The yield change in 1993, comparing industry quarterly changes in current dollar yield, shows the important effect of the fare wars during the peak third quarter of 1992. Yield was down 11.5 percent during the third quarter of 1992, compared to the previous year. Then in 1993, yield in the third quarter was up approximately 17 percent. The forecast assumes no deep discount "fare wars."



Domestic real yield decreased approximately 3.3 percent per year from 1982 to 1992, and approximately 1.3 percent per year in the decade before that. In the period of this forecast, we project only a 0.5 percent decrease annually in real yield. Current dollar or nominal yields will increase at an average of 3.2 percent per year during the forecast period.

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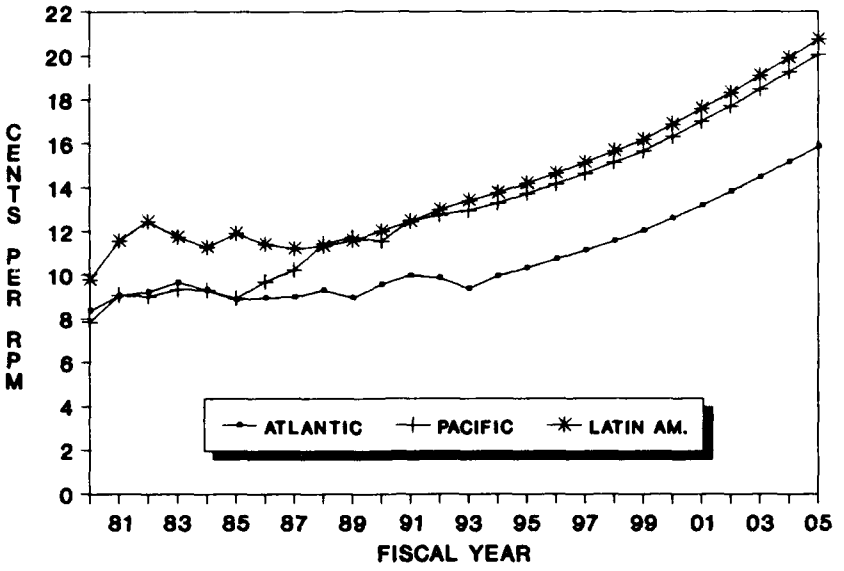
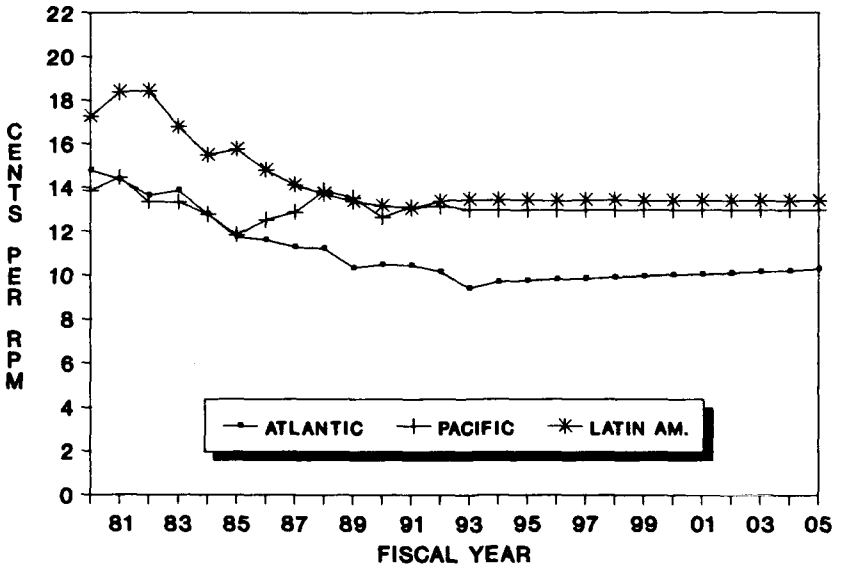
U.S COMMERCIAL AIR CARRIERS

INTERNATIONAL PASSENGER YIELD

CURRENT DOLLARS



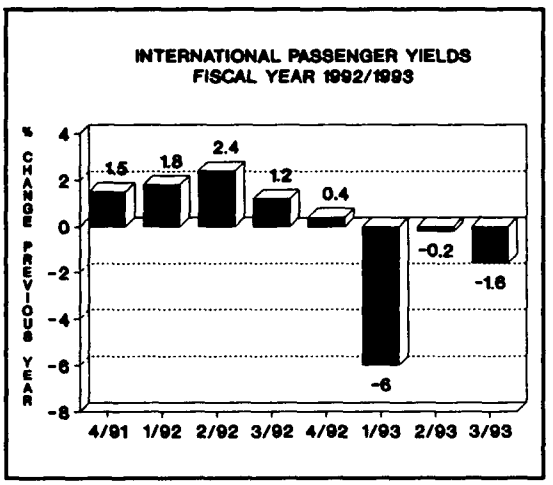
CONSTANT (FY-1993) DOLLARS



International Passenger Yields

The setting of international fare levels differs from the domestic process in that many international fares must meet International Air Transport Association (IATA) guidelines and/or be approved by foreign governments.

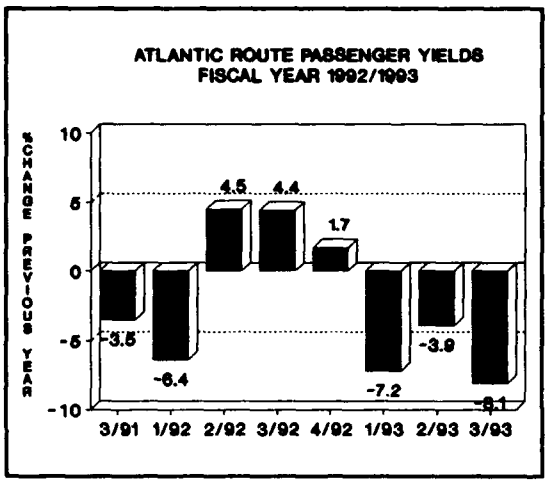
There has been a long-term decrease in international real yield similar to that in the domestic industry (and for similar reasons). Real international yield decreased an average of 2 percent per year from 1982 to 1993 and an average of 1.5 percent per year in the decade before that. Real yields in the international market are generally lower than in the domestic market, primarily because operating costs tend to be lower in these markets. These lower costs are associated with the long average stage length internationally and with the use of larger aircraft, which tend to have lower seat mile costs.



We assume that the international markets have few additional efficiencies to allow significant decreases in real yield in the future. The total international real yield is expected to increase 1.3 percent in 1994 as a result of an increase in the Atlantic markets, then to increase about 0.3 or 0.4 percent per year through the forecast period. Current dollar yield is expected to increase 4.1 percent yearly.

Atlantic Routes

In 1993, the major U.S. carriers on the transatlantic routes were American, Delta, and United. Average real yield in the market decreased 7.6 percent for the year, following a drop of 2.9 percent in 1992.



Real yield in the Atlantic segment of the international market is expected to increase in 1994 by 3.5 percent. There were very deep discounts in the January-March quarter of 1993, which are not expected to be repeated in 1994. After 1994, the market is expected to edge upward for the balance of the forecast period, increasing 0.5 percent per year.

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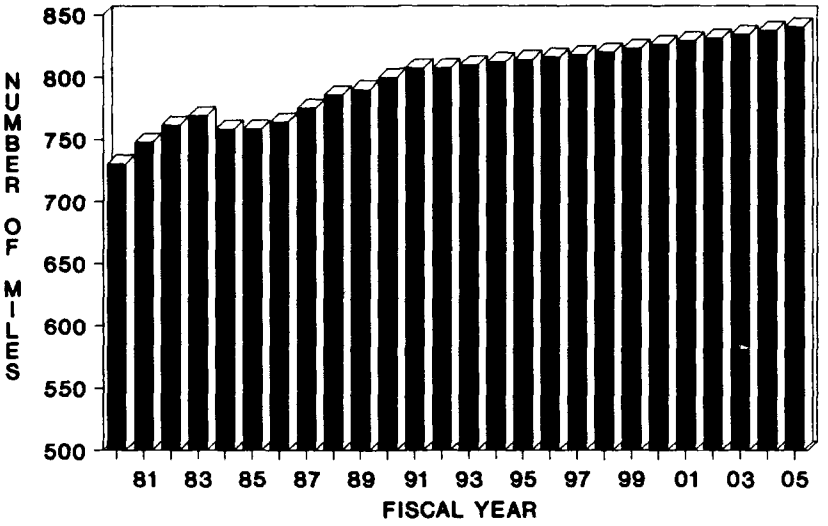
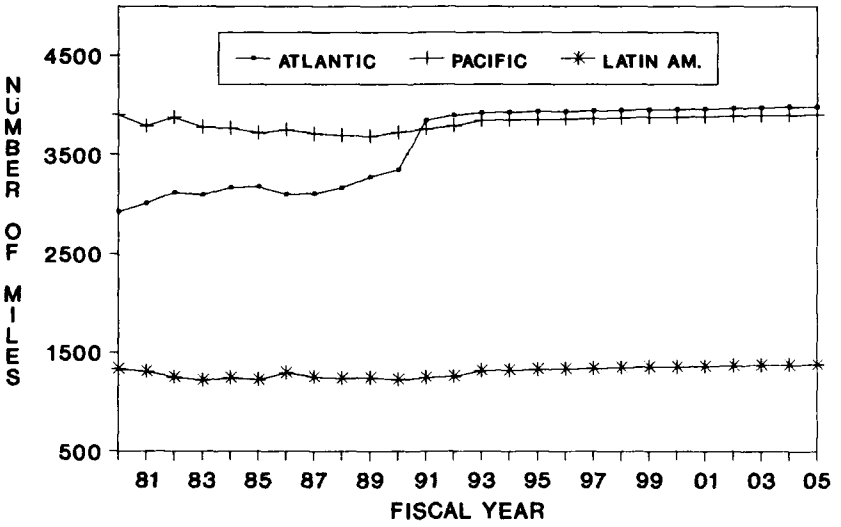
U.S COMMERCIAL AIR CARRIERS
PASSENGER TRIP LENGTH

DOMESTIC



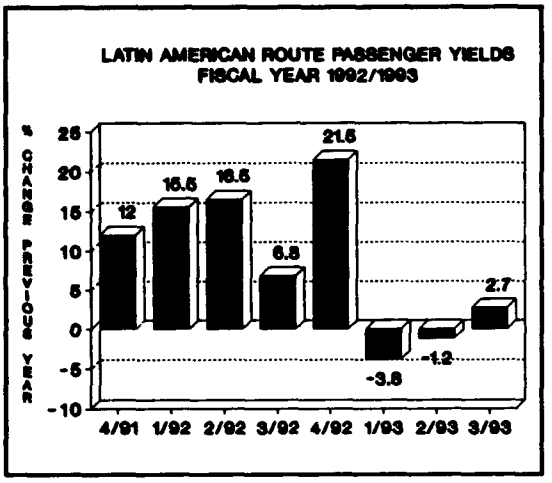
INTERNATIONAL



Latin American Routes

Latin American real yield increased marginally in 1993, up 0.5 percent from 1992.

We expect that real yield will be level for the forecast period. Current dollar yields are expected to increase 3.7 percent per year, equal to the rate of inflation.

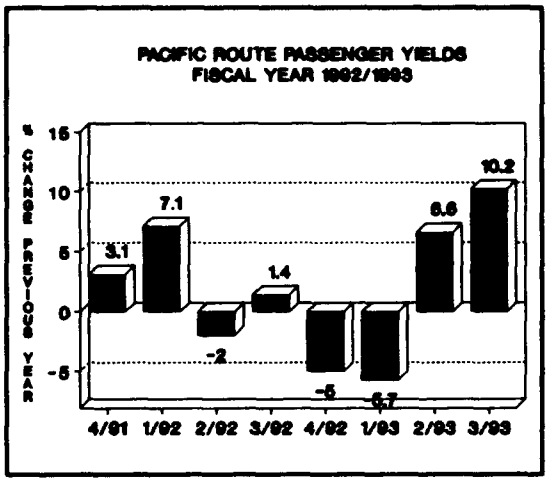


Pacific Routes

Real yield in the Pacific markets decreased 1.3 percent in 1993, and increased 1.6 percent in current dollar terms.

No significant change is anticipated in these markets. The forecast period is expected to show virtually unchanged real yield. Nominal yield is forecast to increase an average of 3.2 percent per year during the same period.

The individual market yield projections are shown in Chapter IX.



PASSENGER TRIP LENGTH

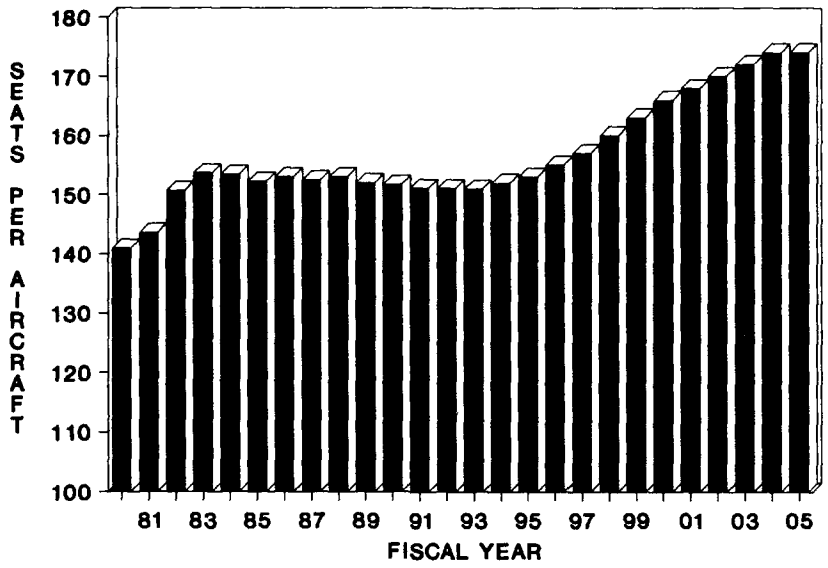
The average system passenger trip length (1,015.5 miles) increased by 8.7 miles in fiscal year 1993, largely the result of a change in the mix of domestic and international traffic.

Average trip length is forecast to increase by approximately 6 to 8 miles per year during the forecast period, continuing the historical trend. The trends are shown graphically and in relevant tables in Chapter IX. Domestic trip length is expected to increase from 809 miles in 1993 to 832 miles in 2005. The trip lengths in individual international markets are expected to increase:

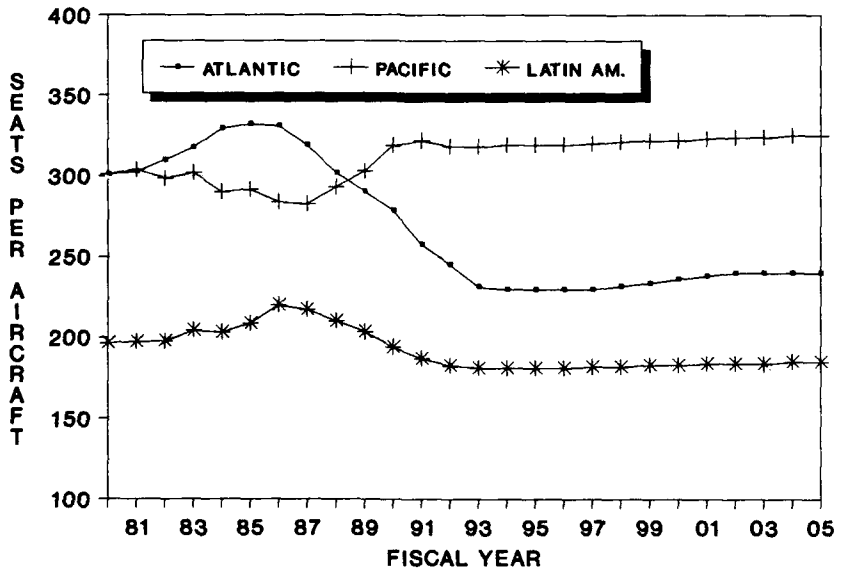
- Atlantic trip length increases from 3,923 miles in 1993 to 3,983 miles in 2005.
- Latin American trip length increases from 1,315 miles in 1993 to 1,380 miles in 2005.
- Pacific trip length increases from 3,847 miles in 1993 to 3,905 miles in 2005.

U.S COMMERCIAL AIR CARRIERS
SEATS PER AIRCRAFT

DOMESTIC SERVICE



INTERNATIONAL SERVICE



AVERAGE AIRCRAFT SIZE

Between 1978 and 1983, the average system seating capacity of aircraft used by U.S. commercial air carriers increased by almost 20 seats (from 147.2 to 167.1 seats). Since 1983, however, the average seating capacity of the U.S. fleet has remained surprisingly stable, standing at 167.7 seats in 1993, down one seat from 1992, and almost identical to 1983.

New legislation will require stage-2 aircraft to be removed from the U.S. fleet by January 1, 2000 (with waivers possible for some continued use until December 31, 2003). This legislation should result in the retirement of significant numbers of the smaller stage-2 fleet throughout the forecast period. This, added to the fact that the aircraft being delivered to the U.S. fleet are generally larger than the ones being replaced (the exception being the Fokker 100), should result in an increase in the average seating capacity of the air carrier fleet throughout the 12-year forecast period.

The forecast assumes that the average seating capacity of the U.S. commercial airline fleet will increase by an average of about two seats per year over the 12-year forecast period. The history and forecast of average seat size is shown graphically and in the relevant tables of Chapter IX.

PASSENGER LOAD FACTOR

U.S. scheduled air carriers recorded a systemwide load factor of 62.9 percent, down slightly from 63.7 percent in fiscal year 1992. The 1992 load factor was the record high system load factor.

The major unknown that will influence the near-term load factor is the capacity plans of the major carriers. Most carriers have made dramatic changes over the last two years in their equipment plans, particularly with respect to delivery of equipment in the 1993 to 1996 time frame. Deliveries less retirements define the fleet changes for airlines. Available seat miles could go down in 1994 and 1995, if recently reported carrier plans are implemented, and remain unchanged.

One must consider load factor assumptions in the context of demand and capacity constraints. We expect a 3.4 percent increase in traffic in 1994 and a 4.3 percent increase in 1995. Normally, we assume that available seat miles will be adjusted in response to changes in demand, thereby resulting in a "normal" load factor. However, if capacity goes down, as many think it will, load factor may increase.

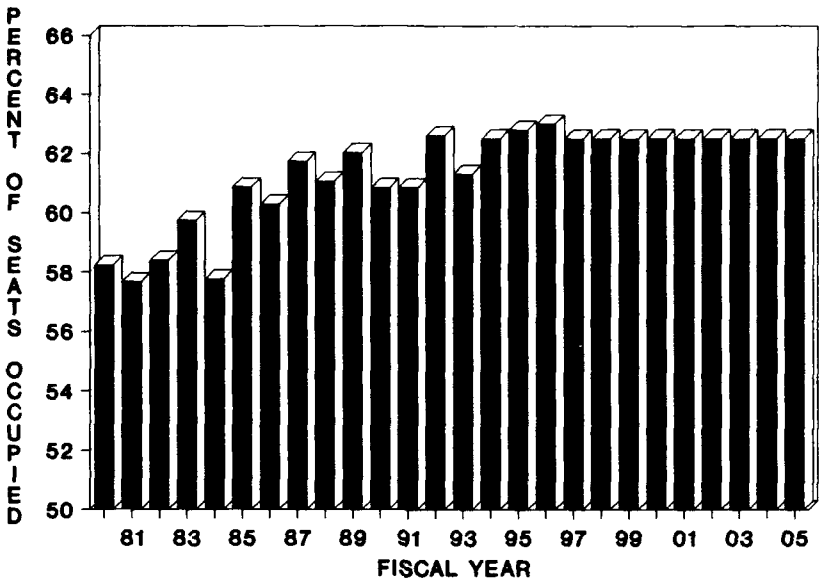
Looking at fiscal year 1994, if capacity declines 3.0 percent from 1993 (as some estimate it will), and there is a 3.4 percent increase in domestic RPMs, this results in a load factor of 65.3 percent. The industry had 63.0 percent for its previous record high load factor. If capacity is really limited, carriers could increase their fares (or greatly limit space for discounted traffic). The result would be fewer RPMs than forecast but greater profits.

We forecast a different scenario for the domestic industry in fiscal year 1994, namely that it will match its record load factor of 63.0 percent, and have an 0.6 percent increase in ASMs, rather than a 3 percent reduction. We believe that this result represents the most likely outcome because present conditions in the market will not allow carriers to increase fares. A fare increase of significance (in real terms) would not hold in the market, because a number of carriers are still competing by offering low prices.

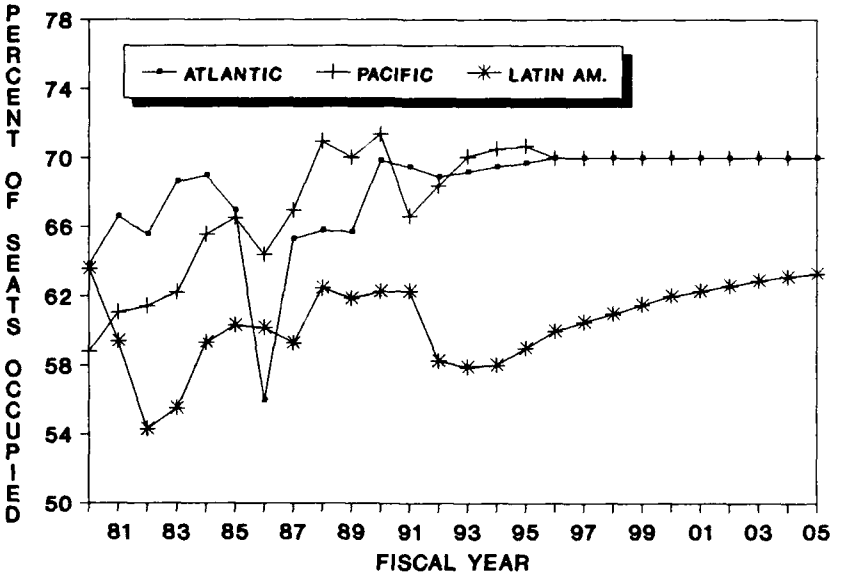
The real question is whether capacity will go down, given known equipment

U.S COMMERCIAL AIR CARRIERS
PASSENGER LOAD FACTOR

DOMESTIC



INTERNATIONAL



plans. There are two ways to provide additional capacity for the domestic market beyond what is "planned" today. First, aircraft and crew utilization has some slack in it. Second, there are a number of "parked" aircraft, and some carriers may return some of this capacity to the market. We believe that available seat miles will increase in response to increased demand.

Domestic Passenger Load Factor

U.S. scheduled domestic air carriers had a load factor of 61.3 percent in fiscal year 1993, down 1.3 points from 1992. Domestic load factors have varied very little over the past 9 years, ranging from a low of 60.3 percent in 1986 to 62.6 percent in 1992.

Capacity increased 2.1 percent in 1993, and is expected to increase only slightly next year, up 0.6 percent. Load factor should increase to 63.0 percent, equal to the highest ever in the domestic market. Beyond 1994 we expect that present fleet plans will provide capacity levels that should make load factors increase moderately to 63.4 percent in 1995 and 1996, before leveling off at 63.0 percent for the balance of the forecast.

International Passenger Load Factor

The international load factor edged up to 67.5 percent in 1993, up from 67.1 percent in 1992. While lower than the record of 69.2 percent in 1990, it is still the second highest annual load factor in history.

The same forces that affect domestic capacity (fleet plans and breakeven load factors) affect international capacity. As in domestic markets, U.S. airlines are capable of adjusting their international capacity levels to changing levels of demand. The international load factor is forecast to increase moderately during the forecast period, increasing to 68 percent in 1995/1996, and increasing slightly from 1997 through the balance of the forecast period.

The expectations for the individual market segments are as follows:

- In the Atlantic, the 1992 load factor was 69.2 percent, up slightly over 1992. We expect it to increase slightly and average 70.0 percent in the later years of the forecast period.

- In Latin America, load factor declined to 57.9 percent in 1993, down 1.6 points from 1992. We forecast that it will increase gradually over the forecast period to 63.3 percent in 2005.

- In the Pacific, load factor increased to 70.1 percent in 1993, up 1.8 points from 1992. We forecast the load factor to increase gradually for two years then to level off at the 70.0 percent level for the period 1996 and beyond.

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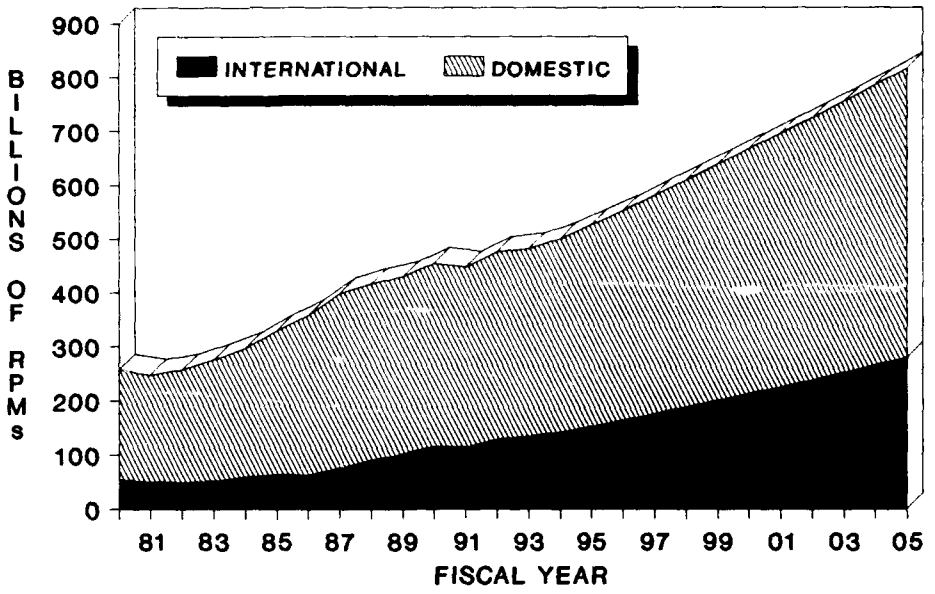
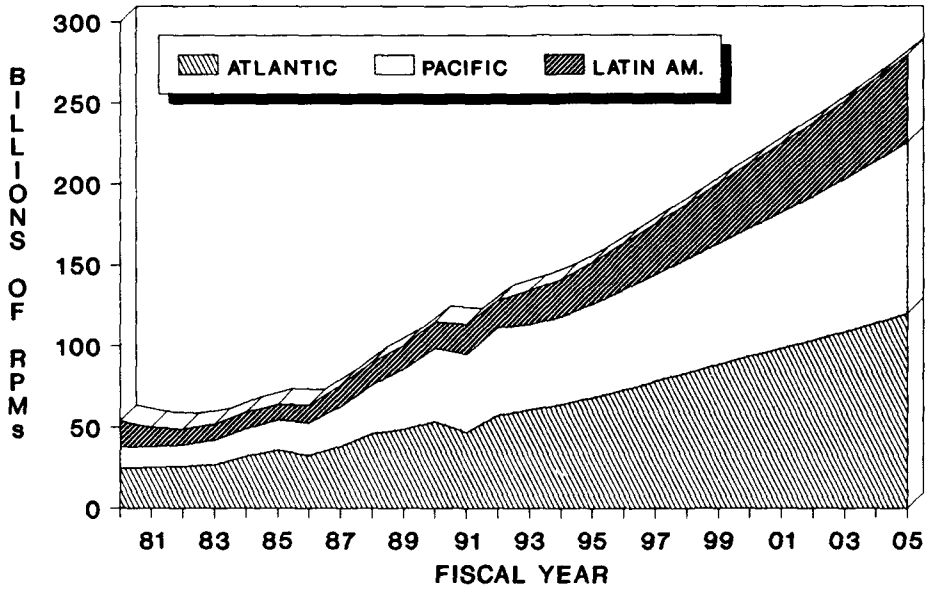
U.S. COMMERCIAL AIR CARRIERS
SCHEDULED REVENUE PASSENGER MILES



SCHEDULED INTERNATIONAL RPMS
BY TRAVEL REGION



AIR CARRIER FORECASTS

The forecasts of air carrier demand are based on a specific set of assumptions, not the least of which is the economic and political environment in which they will take place. There are a number of uncertainties that could significantly alter the short- and/or long-term environment and cause the results to be significantly different from those forecast.

Some of the economic and/or political developments that could significantly alter the forecast results include:

(1) the current U.S. economic recovery could be stronger or weaker than anticipated;

(2) oil prices could be much higher than predicted;

(3) the economies in Europe and Japan could be weaker or stronger than expected, affecting growth in international markets, and;

(4) structural changes in the international markets could affect U.S. carrier shares, either positively or negatively.

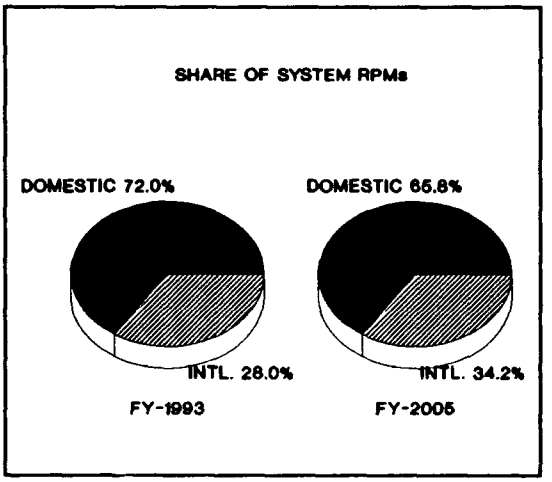
As always, the network of bilateral pacts that the United States currently has in place in Europe, the Far East, and South America could significantly inhibit the expansion plans (current and future) of air carriers operating in these international regions and restrain traffic growth.

Two air carriers--America West and Hawaiian--are currently operating under Chapter 11 bankruptcy protection. Additional bankruptcies or liquidations of U.S. airlines could negatively affect the financial health of the industry.

REVENUE PASSENGER MILES

U.S. scheduled air carriers recorded a total of 481.2 billion revenue passenger miles in fiscal year 1993, up 1.3 percent. System passenger miles are forecast to increase 3.9 percent in 1994, then increase 5.2 percent in 1995 and taper off thereafter through the balance of the forecast period. Average annual growth in system RPMs is expected to be 4.5 percent.

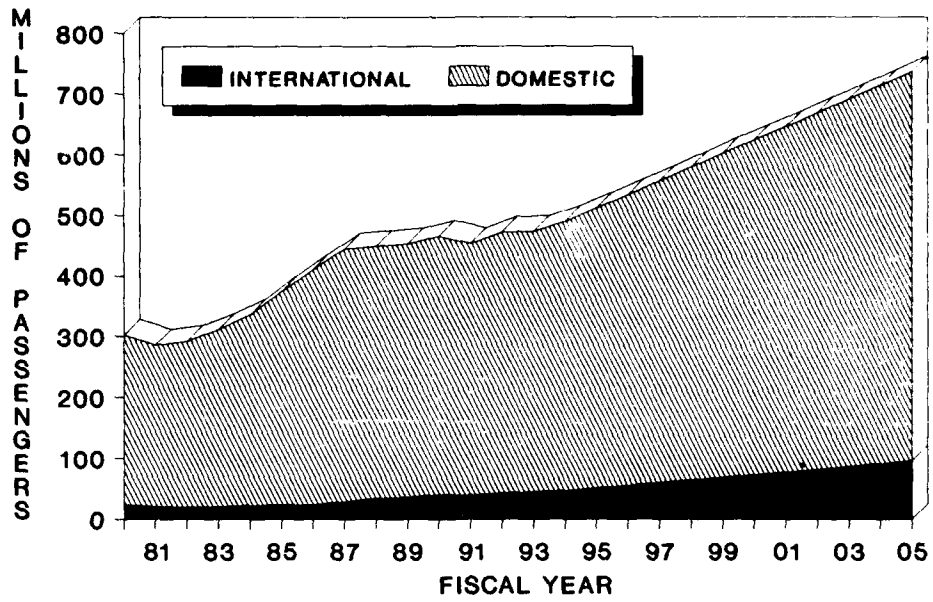
International growth is anticipated to be somewhat higher than domestic growth, with the average annual international growth in RPMs during the 12-year forecast period being 6.3 percent, versus 3.7 percent for the domestic market. In the year 2005, the international share of the U.S. carriers' system RPMs is expected to be 34.2 percent, up from 27.7 percent in 1993, and 21.1 percent in 1980.



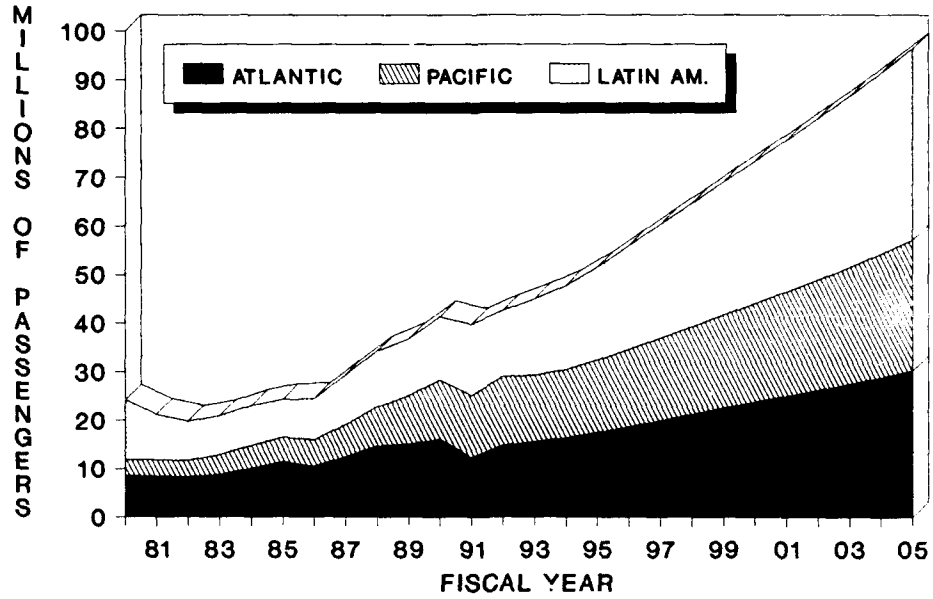
Domestic Revenue Passenger Miles

Scheduled domestic revenue passenger miles totaled 346.8 billion in fiscal year 1993, up 0.1 percent from 1992. Domestic traffic is projected to increase moderately in 1994, with RPMs

U.S. COMMERCIAL AIR CARRIERS
SCHEDULED PASSENGER ENPLANEMENTS



SCHEDULED INTERNATIONAL ENPLANEMENTS
BY TRAVEL REGIONS



totaling 358.6 billion, up 3.4 percent. The relatively slow traffic growth in 1994 is largely influenced by growth of the U.S. general economy (real GNP up 2.9 percent) and capacity tightness in the domestic air carrier market.

In 1995, traffic is expected to increase slightly more than 4 percent, and to taper gradually over the balance of the forecast period. Average annual increase in domestic RPMs is estimated at 3.7 percent.

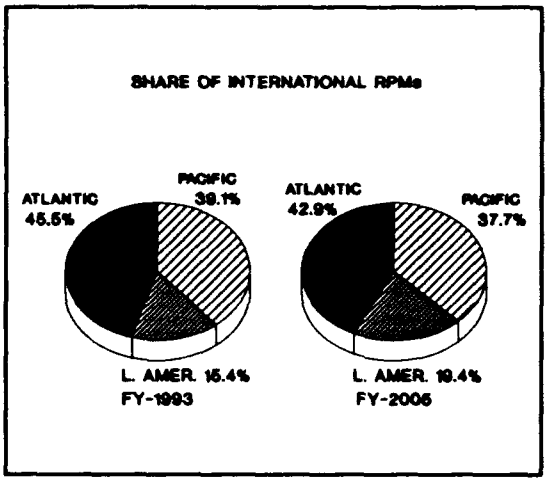
International Revenue Passenger Miles

International RPMs grew 4.6 percent in 1993. The growth was uneven, however, with increases of 21.4 percent in Latin American markets and 5.8 percent in Atlantic markets, and a decline of 2.2 percent in Pacific markets.

Total RPMs in international markets are expected to more than double during the forecast period, from 134.4 billion in 1992 to 279.6 billion in 2005. The average annual growth rate over this period is 6.3 percent. This is 2.6 percentage points higher than the domestic growth rate and continues a trend that will see a greater percentage of system RPMs in the international market.

International RPMs are forecast to increase to 141.2 billion in 1994, up 5.1 percent, and to 151.6 billion in 1995, up 7.4 percent.

The relative importance of international market areas is expected to change during the forecast period, with Atlantic RPMs decreasing from 45.5 percent of the total in 1993 to 42.9 percent in 2005. The Pacific RPMs share decreases from 39.1 percent in 1993 to 37.7 percent in 2005. Latin American RPMs increase from 15.5 percent in 1993 to 19.3 percent in 2005. These changes



result from the differing market growth rates anticipated during the forecast period.

The RPMs for the Atlantic, Pacific, and Latin America markets are shown in Chapter IX.

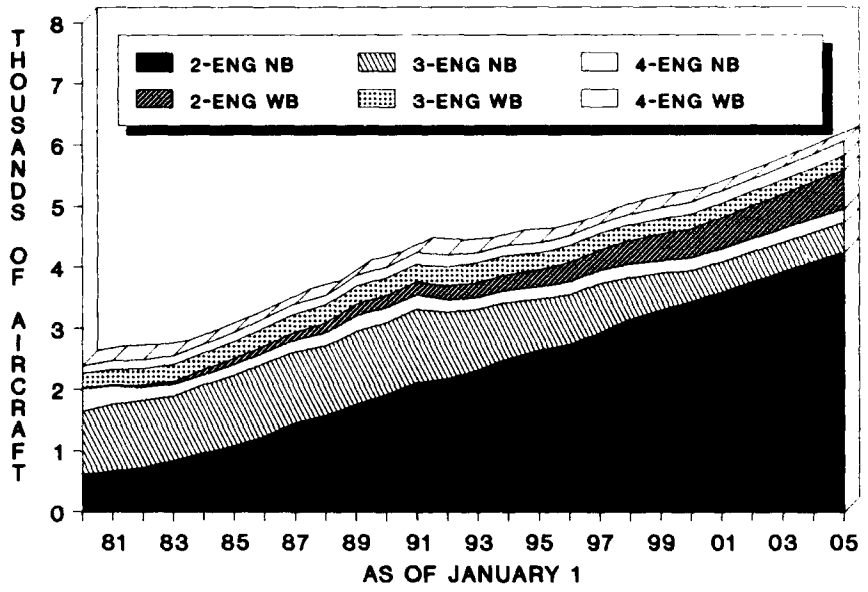
PASSENGER ENPLANEMENTS

In fiscal year 1993, U.S. scheduled air carriers enplaned a total of 473.9 million passengers, up 0.4 percent. The gradual recovery of the U.S. economy is expected to result in moderate traffic growth in 1994, followed by somewhat higher volumes in 1995 and beyond. System passenger enplanements are forecast to increase to 490.4 million in 1994, up 3.5 percent, with increases of 4.4 percent in 1995 and 4.2 percent in 1996. Thereafter, the growth rate will taper off, similar to the change in RPMs discussed above. Overall average annual growth of enplanements for the 12-year forecast period is expected to be 3.8 percent.

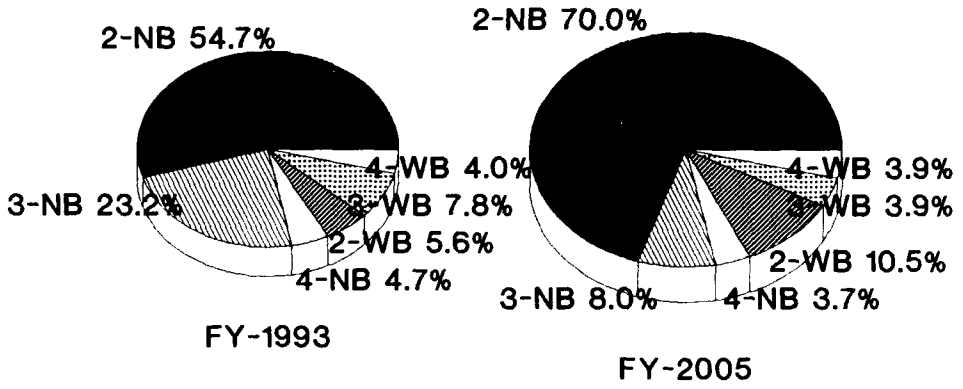
Enplanements grow at a slightly lower rate than RPMs because of the gradual increase in average trip length.
In 1993, 90.5 percent of enplanements were domestic. This will drop to 86.9 percent in 2005.

U.S. COMMERCIAL AIR CARRIERS

LARGE JET AIRCRAFT

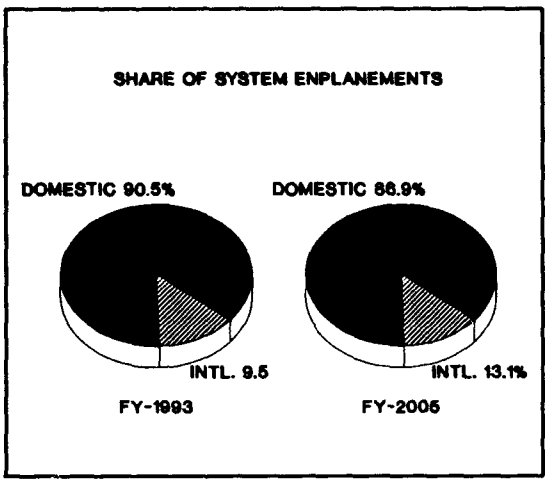


PERCENT BY AIRCRAFT TYPE



Domestic Passenger Enplanements

U.S. scheduled domestic air carriers enplaned a total of 428.8 million passengers in fiscal year 1993, down 0.1 percent. Domestic passenger enplanements are forecast to increase to 442.7 million in fiscal year 1994, up 3.2 percent.



Domestic passenger enplanements are forecast to increase gradually over the forecast period, at about the same rate as for RPMs.

The projected growth in domestic enplanements is expected to average 3.5 percent annually during the 12-year forecast period, with the number of domestic enplanements reaching 645.9 million in fiscal year 2005.

International Passenger Enplanements

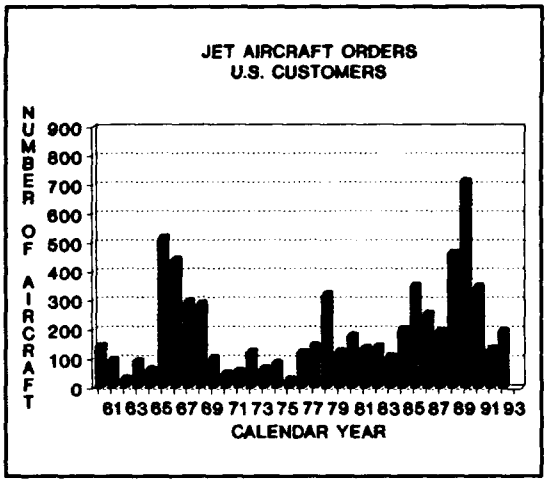
A total of 45.0 million passengers were enplaned by U.S. scheduled international airlines in fiscal year 1993, up 5.7 percent. International enplanements are forecast to increase to 47.7 million in 1994, up 5.9 percent.

Enplanements will grow at about the same rate as RPMs, and the average annual rate of growth during the forecast period will be 6.5 percent.

The individual international markets will all see significant growth during the forecast period, with Latin American enplanements increasing 7.9 percent annually over the forecast, Pacific increasing 5.9 percent, and Atlantic increasing 5.6 percent annually.

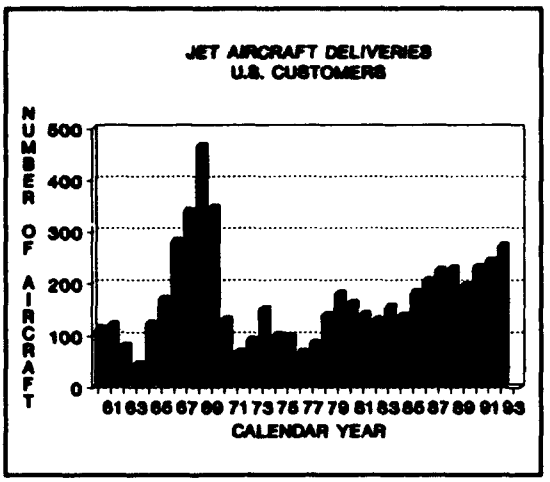
AIR CARRIER FLEET

World air carriers placed orders for an estimated 315 large jet aircraft with U.S. and foreign aircraft manufacturers during 1993, 23.4 percent fewer orders than in fiscal year 1992. Of this total, 190 (60.3 percent) were for two-engine narrowbody (B-737, B-757, MD-80, Canadair RJ-100, and F-100) aircraft.



Aircraft manufacturers delivered approximately 686 large jet aircraft worldwide in 1993. Of this total, 460 (67.1 percent) were two-engine narrowbody aircraft.

Looking at the year ending December 1993, the fleet for U.S. air carriers increased by an estimated 116 aircraft, an increase of 2.7 percent. This compares to 1992, when the fleet



increased by 44 aircraft. Fleet changes in 1993 were similar to changes which occurred in 1992, namely a steep increase in stage-3 aircraft (up 192 aircraft or 8.4 percent) and a decline in stage-2 aircraft (down 69 aircraft or 3.8 percent).

This forecast assumes a 25-year life cycle for aircraft, but also follows guidelines of the national noise legislation. In particular, stage-2 aircraft will be withdrawn from the U.S. fleet by the end of 1999, although waivers could possibly delay some withdrawals until the end of 2003.

At the end of 1993, there were approximately 1,753 stage-2 aircraft (40.2 percent of the total fleet) remaining in the U.S. air carrier jet fleet. The forecast reflects a decreasing number of stage-2 aircraft in the fleet in each year, declining to zero in 2000. Numerous changes were made in the fleet plans of air carriers in fiscal year 1993. The major effects of these changes are to reduce the number of aircraft on order and option, and to delay delivery of aircraft on order. Additional carrier fleet plans will stretch out the life of some existing stage-2 aircraft. These changes have been incorporated into the fleet forecast. The forecast goes beyond the period covered by existing fleet plans, so future aircraft deliveries are assumed adequate to serve the forecast of demand.

Based on the backlog of aircraft orders and the projections of air carrier traffic, seat capacity, load factors, and fleet requirements, the U.S. commercial air carrier fleet is projected to increase from an inventory of 4,247 aircraft on January 1, 1993, to 6,063 aircraft by January 1, 2005. This involves a net addition to the fleet (after retirements of obsolete aircraft) of approximately 151 aircraft annually (3.0 percent annually).

By far the largest increase, in terms of number of aircraft, is projected to occur in the two-engine narrowbody aircraft category, which is expected to grow by an average of 160 aircraft (5.1 percent) annually. By the year 2004, two-engine narrowbody aircraft are expected to total 4,087 units and to account for 70.0 percent of the fleet, up from 54.5 percent in 1993.

Three-engine narrowbody (B-727) aircraft are expected to decline from 985 aircraft (23.2 percent of fleet) in 1993 to 486 (8.0 percent of fleet) in the year 2005. All of these must be modified by 2000 to satisfy noise regulations. Four-engine narrowbody aircraft will increase moderately, from 200 aircraft in 1993 to 223 aircraft in 2005. Growth in this group results from additions of BAE-146 aircraft.

Widebody aircraft, which accounted for 17.4 percent of the fleet in 1993, are expected to account for 18.3 percent in 2005. The two-engine widebody fleet (A-300/310/330, B-767, and B-777) aircraft are the fastest growing of the widebody group. These are expected to increase by an average of 33 aircraft per year (8.5 percent), from 239 aircraft in 1993 to 634 aircraft in 2005.

Four-engine widebody (B-747 and A-340) aircraft are forecast to increase from 169 aircraft in 1993 to 238 aircraft in 2005, an annual increase that averages 2.9 percent. This category dropped in 1993, and declines moderately until 1996, due to retirement of B-747

aircraft. The category increases after 1996. The three-engine widebody fleet (MD-11, DC-10, and L-1011) is projected to decrease over the forecast period, from 330 aircraft in 1993 to 236 in 2005, an average of 2.8 percent annually. This category of aircraft represents a change from prior fleet forecasts. In the past year, major carriers have decided in the past year to take some three-engine widebodies out of active service. The forecast assumes that this continues through the future, and when additions to capacity are needed, the carriers will add smaller aircraft, and not bring back the three-engine widebody aircraft.

AIRBORNE HOURS

U.S. commercial air carriers flew an estimated total of 11.1 million hours in fiscal year 1993, up from 10.7 million hours in 1991. Two aircraft categories accounted for almost three-fourths of total airborne hours: two-engine narrowbody aircraft (56.8 percent) and three-engine narrowbody (16.7 percent). In fiscal year 2005, the number of hours is forecast to increase to 16.6 million, an average annual increase of 3.4 percent.

Airborne hours are forecast to increase 2.1 percent in 1994 to 11.3 million, and 2.6 percent in 1995, to 11.6 million. Airborne hours generally increase at rates similar to the rate of growth of traffic, with some adjustment made for moderate increase in the average aircraft size.

Two-engine aircraft (both narrowbody and widebody) are projected to account for 86.7 percent of all airborne hours flown in fiscal year 2005. Narrowbody two-engine aircraft make up 71.5 percent of hours in 2005, up an average of 5.4 percent per year. Widebody two-engine aircraft make up 15.2 percent of the hours in 2005, up an average of 6.1 percent per year.

The share and the number of hours flown by three-engine widebody aircraft are forecast to decrease during the forecast period, based on known plans for carriers to reduce the number of aircraft in this group. The share for four-engine widebody aircraft will also decrease, from 4.8 percent in 1993 to 4.6 percent in 2005, although the hours increase by an average annual rate of 3.0 percent.

The number of hours flown by three-engine narrowbody aircraft will decline significantly over the forecast period, as will the hours. Hours for this aircraft type drop from 1.9 million in 1993 to 0.5 million in 2005, or 71.2 percent. This reflects the retirement of large numbers of B-727 aircraft during the forecast period. Hours for the four-engine narrowbody fleet, made up primarily of DC-8's, are expected to remain virtually unchanged.

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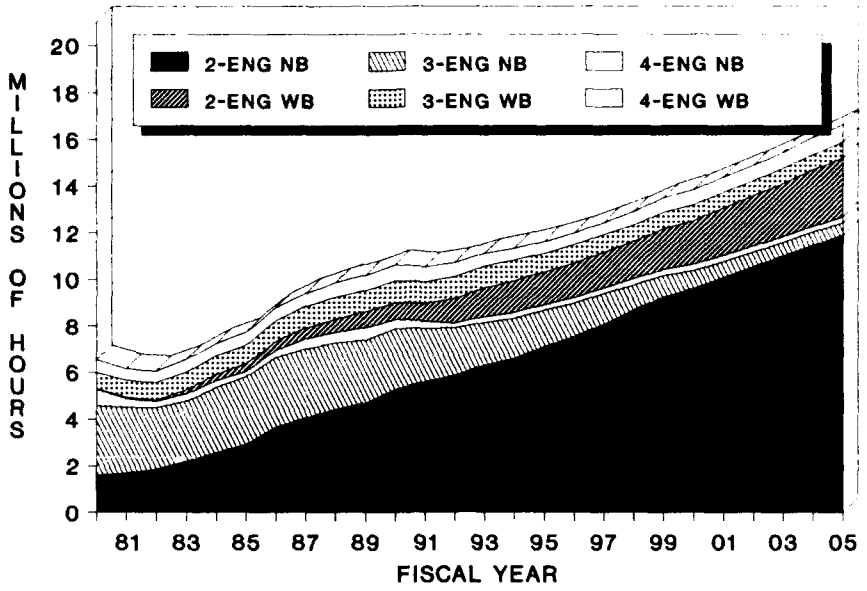
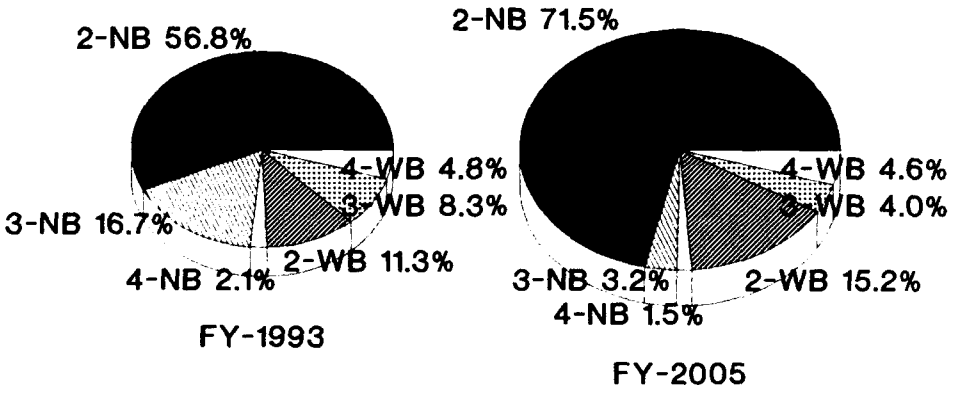
U.S. COMMERCIAL AIR CARRIERS

AIRBORNE HOURS

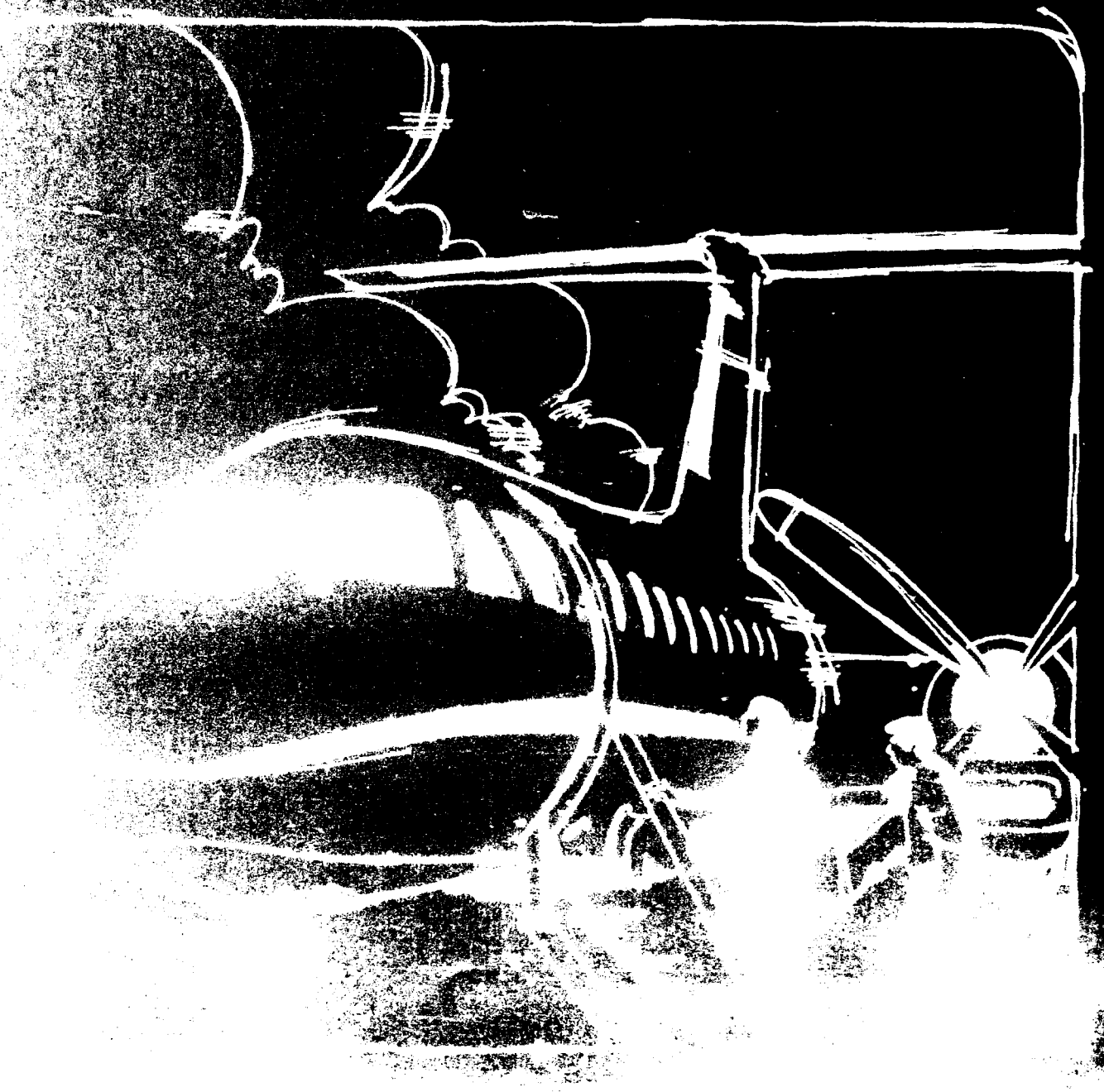


PERCENT DISTRIBUTION BY AIRCRAFT TYPE



CHAPTER IV

SIONALS/COMMUTERS



CHAPTER IV

REGIONALS/COMMUTERS

The regional/commuter airline industry, for the purpose of this forecast, is defined as those air carriers that provide regularly scheduled passenger service and whose fleets are composed predominantly of aircraft having 60 seats or less. During 1993, 136 regional/commuter airlines reported traffic data to RSPA on Form 298-C and Form 41 (A listing of these carriers is presented in Appendix E). The FAA historical database includes activity for all regional/commuters operating in the 48 contiguous states, Hawaii, Puerto Rico, and the U.S. Virgin Islands. Excluded from the data base is activity in Alaska, other U.S. territories, and foreign territories. Additionally, the regional/commuter traffic statistics include duplicated data for selected operators included in the commercial air carrier traffic statistics. The duplication is for those air carriers operating both large turboprop and turbojets (over 60 seats) and commuter type aircraft (see technical notes at the beginning of Chapter IX for Table 10 and Table 19).

REVIEW OF 1993

Since 1984, the regional/commuter airline industry has been in a period of transition. In 1985, there was a dramatic growth in the number of code-sharing agreements with the major air carriers. This was followed in 1986 by a wave of large jet air carrier acquisitions of, or equity interest in, their regional/commuter code-sharing partners. The evolution of the relationships with the large air carriers has led to further route rationalization policies on the part of the larger partner in the form of transferring an increasing number of short haul jet routes to their regional partners, which has sustained the regional industry's high rate of growth. Together, these actions have resulted in a process of industry consolidation, increasing concentration, and increasing integration with the large commercial air carriers that has continued through 1993.

INDUSTRY SUMMARY

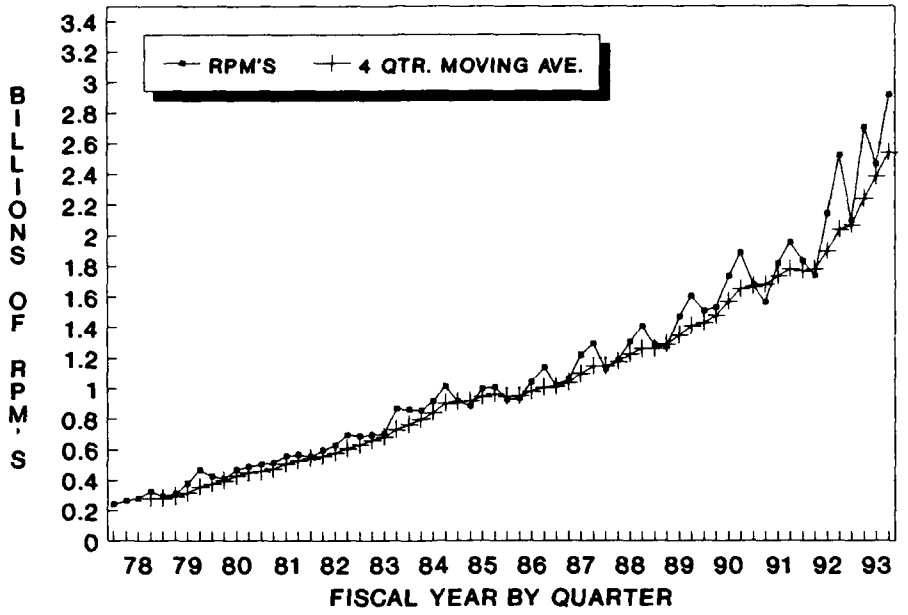
During fiscal year 1993 the number of regional/commuter airlines totaled 136, compared to 140 in 1992. While the number of reporting airlines declined, industry growth continues to out-pace the growth of the larger air carriers.

REVENUE PASSENGER ENPLANEMENTS

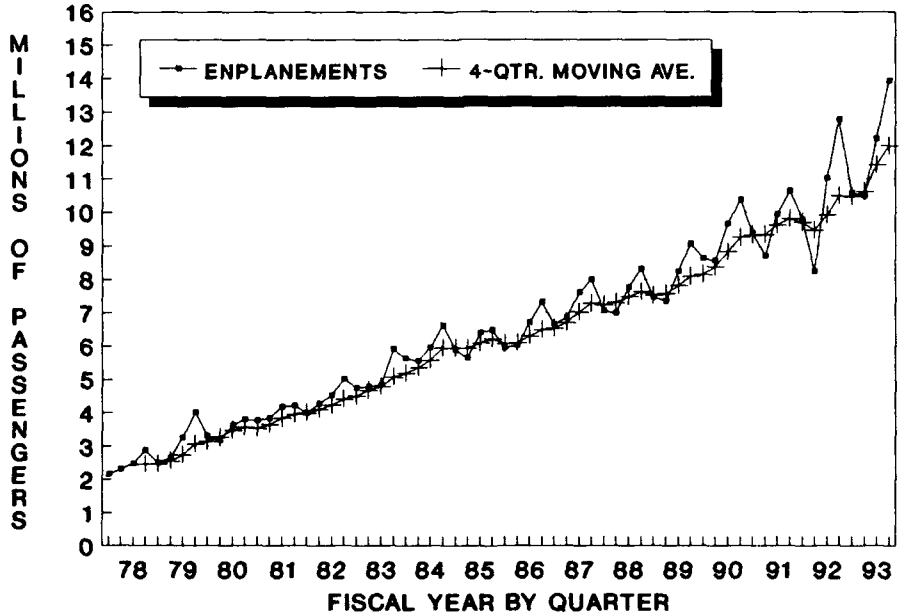
Total revenue passenger enplanements for the regional/commuter airlines, including Alaska and foreign terri-

U.S. REGIONALS/COMMUTERS TRAFFIC TRENDS

REVENUE PASSENGER MILES



PASSENGER ENPLANEMENTS



tories, totaled 49.3 million, an increase of 10.0 percent compared to 1992. Excluding Alaska and foreign territories, enplanements totaled 47.2 million, up 10.3 percent over 1992.

For the 48 contiguous states, enplanements increased 10.9 percent to 45.6 million. Enplanements in Hawaii, Puerto Rico, and the Virgin Islands totaled 1.6 million--down from the 1.7 million reported in 1992.

Enplanements in Hawaii increased 3.7 percent compared to 1992. During the same period, enplanements in Puerto Rico and the Virgin Islands posted a decline of 8.6 percent.

While not included in the forecast base, enplanements in Alaska and other U.S. and foreign territories totaled 2.1 million, an increase of 4.0 percent compared to 1992. Enplanements in Alaska were almost unchanged compared to 1992, while enplanements in all other areas increased 12.1 percent.

REVENUE PASSENGER MILES

Revenue passenger miles (RPMs) totaled just under 9.9 billion in 1993, an increase of 15.5 percent from 1992. For the 48 states, revenue passenger miles increased 16.2 percent in 1993 to just over 9.4 billion. The reason for the significantly higher growth in RPMs relative to passenger enplanements is that the average passenger trip length increased by 6.4 miles in 1993 to 203.3 miles.

Passenger miles in Hawaii, Puerto Rico, and the Virgin Islands increased almost 4.2 percent to 142.9 million, while in Alaska and other areas, revenue passenger miles totaled 352.4 million, an increase of 2.4 percent compared to 1992.

INDUSTRY COMPOSITION

The fundamental character of the regional/commuter industry has changed dramatically since the mid-1980s. These changes range from the relative size and sophistication of airline operations, the players involved (especially the dominant industry operators), and aircraft fleets, to the industry's relationship with the large commercial air carriers in the national air transportation system. While the role of the industry, in the past and today, is to provide feeder service to the large hubs served by the large commercial air carriers, the exact scope and relationships of its role have changed dramatically.

In 1993 the composition of the regional/commuter airline industry continued to evolve. The factors contributing to this change included economic and competitive influences and marketing strategies and alliances. Two distinct but interrelated trends form the basis for the changing character and composition of the industry since the mid-1980s. They are industry consolidation and increasing integration of operations with the larger air carriers.

INDUSTRY CONSOLIDATION

From a high of about 250 carriers in 1981, the number of regional/commuter operators has declined to 136 in 1993. The 136 operators in 1993 represents a drop of 4 carriers compared to 1992 when 140 carriers reported traffic data to RSPA. Of the 140 carriers that reported traffic data in 1992, 128 were in operation at the end of the year. Of the total of 136 carriers that operated in 1993, 127 were still in

TOP 50

REGIONAL/COMMUTER AIRLINES

RANKED BY TOTAL PASSENGER ENPLANEMENTS

FISCAL YEAR 1993

1. Continental Express
2. Flagship Airlines
3. Simmons
4. Atlantic Southeast
5. Comair
6. Horizon
7. Piedmont Airlines
8. Allegheny Commuter
9. WestAir
10. Mesa Airlines
11. Business Express
12. Sky West Aviation
13. Mesaba Aviation
14. Trans States Airlines
15. Express Airlines I
16. Atlantic Coast Airlines
17. Wings West Airlines
18. Executive Airlines
19. CCAir
20. Jetstream International
21. Trans World Express
22. Great Lakes Aviation
23. Chautauqua Airlines
24. Commutair
25. Aloha IslandAir
26. Metro-flight Airlines*
27. Air Midwest
28. Crown Airways
29. Sunaire
30. Paradise Island
31. Northeast Express Regional
32. StatesWest Airlines
33. ERA Aviation
34. Express Airlines II
35. MarkAir Express
36. Precision Airlines
37. Lake Powell Air Service
38. Viequies Air Link
39. Scenic Airlines*
40. Air Cape
41. Conquest Airlines
42. Grand Airways
43. Peninsula Airways
44. GP Express Airlines
45. Lone Star Airlines
46. Cape Air
47. Airways International
48. Air Nevada
49. Pacific Island Aviation
50. Gulfstream International

* These reporting entities were no longer operating at the end of FY 1992.

Source: RSPA Form 298-C and Form 41 enplanement data

TOP 30 CORPORATE STRUCTURES

Carrier/ Carrier Group	Percent of Industry Enplanements	Carrier/ Carrier Group	Percent of Industry Enplanements
1. American Eagle	20.0	16. Chautauqua	1.1
2. Delta Connection	13.5	17. Commutair	.9
3. USAir Express	10.7	18. Aloha IslandAir	.8
4. Mesa	8.9	19. Metro-Flight	.8
5. Continental Express	8.4	20. Crown Airways	.7
6. Alaska	5.0	21. Sunaire	.7
7. Business Express	3.8	22. Paradise Island	.7
8. Express Airlines	3.3	23. StatesWest	.6
9. Mesaba	2.8	24. ERA Aviation	.6
10. Trans States	2.7	25. Lake Powell Aviation	.5
11. Atlantic Coast	2.5	26. MarkAir Express	.5
12. CCAir	1.8	27. Viequies Air Link	.3
13. Trans World Express	1.5	28. Air Cape	.2
14. Northeast Express	1.2	29. Conquest	.2
15. Great Lakes	1.1	30. Grand Airways	.2

operation at the end of the year. Because of the increased integration of operations with the large air carriers (through code-sharing agreements and acquisition of regionals totally or in part), the success of many regionals is tied closely to the success of their larger partners. At the present time, there is no reason to assume that the trend towards greater consolidation of the regional/commuter industry will not continue.

INDUSTRY CONCENTRATION

While the number of carriers has declined, the size of the dominant industry carriers has increased dramatically. This has resulted in increased industry concentration, with the top 50 carriers accounting for approximately 97.4 percent of total industry passenger enplanements in 1993, basically unchanged from 1992. While total industry enplanements increased by 10.0 percent in 1993, the top 50 carriers grew at a slightly higher rate (10.6 percent). The top 50 carriers for 1993 are listed in the table on page IV-4. Although the relative ranking has changed for many carriers, the composition of the group is basically unchanged from 1992.

The above data are based on RSPA Form 298-C and Form 41 reporting entities. However, looking at the industry only in this manner does not reflect the true level of industry consolidation,

AIR CARRIER/COMMUTER AIRLINES CODE-SHARING AGREEMENTS

Air Carrier Program Name	Designated Commuter Carrier	Hubs Served
1. Alaska Airlines	Horizon*	Boise Portland Seattle Spokane
2. Aloha Airlines	Aloha IslandAir	Honolulu
3. America West Express	Mesa	Columbus Phoenix
4. American Eagle	Executive Airlines Flagship Airlines	San Juan Boston Miami Nashville New York Raleigh/Durham
	Simmons	Dallas/Ft. Worth Chicago
	Wings West	Los Angeles San Jose
5. Continental Express	Continental Express	Cleveland Houston Newark Denver
6. Delta Connection	Atlantic Southeast	Atlanta Dallas/Ft. Worth
	Business Express	Boston New York
	Comair	Cincinnati Florida
	SkyWest	Los Angeles Salt Lake City
7. Midwest Express	Mesa	Milwaukee
8. Northwest Airlink	Express Airline I Express Airlines II	Memphis Minneapolis/St. Paul Minneapolis/St. Paul
	Horizon*	Portland Seattle
	Mesaba	Detroit Minneapolis/St. Paul

AIR CARRIER/ COMMUTER AIRLINES
CODE-SHARING AGREEMENTS (Continued)

Air Carrier Program Name	Designated Commuter Carrier	Hubs Served
8. Northwest Airlink (Continued)	Northeast Express	Boston
		Newark
	Precision	Boston
		Newark
9. Trans World Express	Air Cape	Boston
	Westates	New York
	Trans States	St. Louis
	Trans World Express	New York
		St Louis
10. United Express	Atlantic Coast	Washington, D.C.
	Mesa	Denver
		Portland
		Seattle
	Great Lakes	Chicago
	Sunaire Express	St. Thomas/St. Croix
	WestAir	Los Angeles
		San Francisco
11. USAir Express	Air Midwest	Kansas City
	Allegheny Commuter	Baltimore
		Pittsburgh
		Philadelphia
	CCAir	Charlotte
	Chautauqua	Orlando
		Pittsburgh
	Commutair	Boston
		New York
		Syracuse
	Crown	Pittsburgh
	Henson	Baltimore
		Charlotte
		Florida
		Philadelphia
	Jetstream	Baltimore
		Indianapolis
	Mesa	Tampa
	Trans States	Los Angeles

* Carrier operates both large aircraft (over 60 seats), and commuter aircraft.

concentration, and integration with the large air carriers. Many of the regionals are owned, totally or in part, by their larger code-sharing partners, and still others are owned by other regionals. A better picture of the current industry composition is presented by looking at the industry from a corporate structure point of view. A total of 14 regionals are owned, totally or in part, by four of the larger air carriers, and seven more are owned by three other regionals. The table at the top of page IV-5 presents the top 30 corporate structures and their percent share of 1993 industry enplanements. Viewed in this manner, it can be seen that there is a much higher level of industry concentration and a higher degree of integration with the large commercial airlines. In 1993, enplanements for these carriers grew by 15.0 percent and accounted for 96.6 percent of total industry enplanements.

FORECAST ASSUMPTIONS

Industry growth is expected to continue to out-pace that of the larger air carriers and be driven by increased demand. The introduction of new state-of-the-art aircraft offering amenities similar to those found on large jet aircraft is expected to contribute to greater public acceptance and stimulate higher growth. Increasing integration of service with the larger commercial air carriers, together with the introduction of new aircraft, is expected to lead to further route rationalization programs by the larger air carriers, opening new opportunities for growth for the regional/commuter industry. While there are risks, the regional airline industry is expected to benefit from continued service integration with the larger air carriers and the introduction of larger aircraft. This will create new opportunities for growth through service substitution and expansion in markets currently served with large jet aircraft.

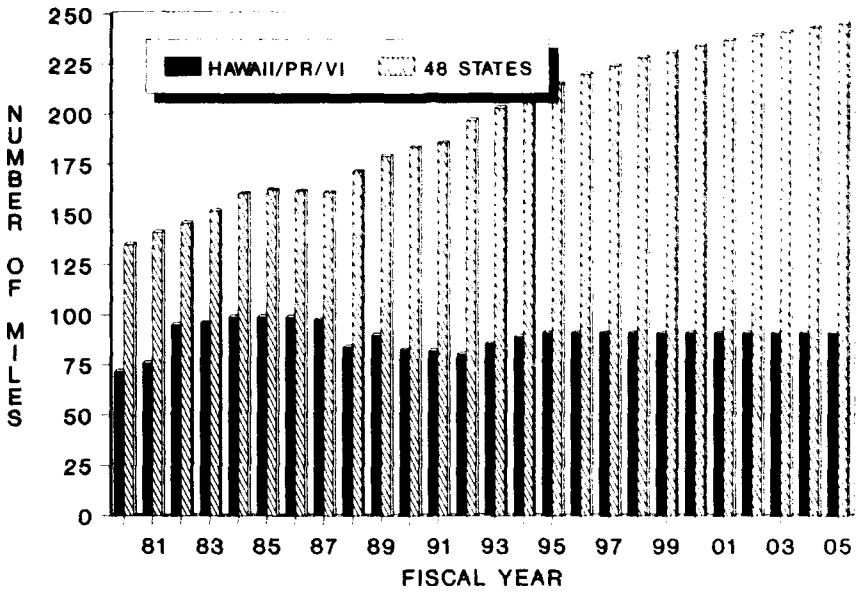
While the average passenger trip length is expected to increase during the forecast period, the regional/commuter carriers will continue to serve primarily short-haul markets. The emphasis, however, will be on improved quality and schedule frequency in the markets best suited to their operations.

It is expected that the aircraft fleet will continue to grow during the forecast period. The average seats per aircraft is expected to increase from 22.9 in 1993 to 35.5 in 2005, an average annual growth of approximately 3.7 percent per year. The most significant change in the fleet composition will result from the introduction of regional jet aircraft, many of which fall in the "40 to 60 seat" category. These aircraft will contribute to increase public acceptance of regional airline service, and will offer greater potential for replacement service on selected jet routs.

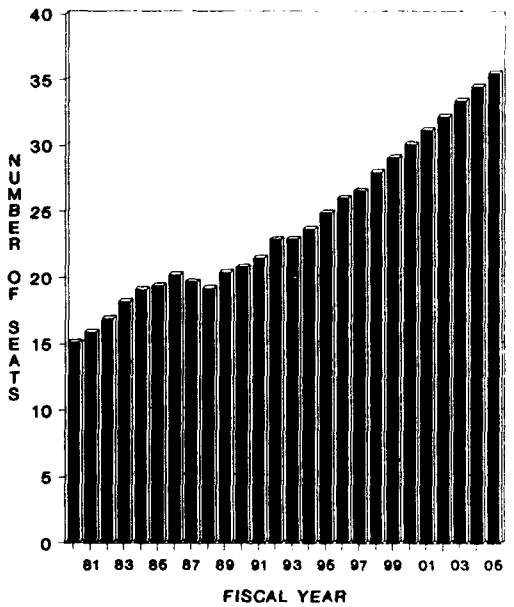
The average passenger trip length in the 48 states is projected to increase from 203.3 miles in 1993 to 245.0 miles in 2005, an average annual growth rate of 1.6 percent. The average trip length for Hawaii, Puerto Rico, and the Virgin Islands is expected to increase from 85.6 miles in 1993 to 91.0 miles in 1997, and remain constant through the remainder of the forecast period. The growth in the average passenger trip length and resulting growth in RPM's will be driven by the increased introduction of regional jet aircraft. With increased speed and capacity, these aircraft will contribute to an expanded market area that can be served on a timely and efficient basis by the regional airline industry.

U.S. REGIONALS/COMMUTERS
FORECAST ASSUMPTIONS

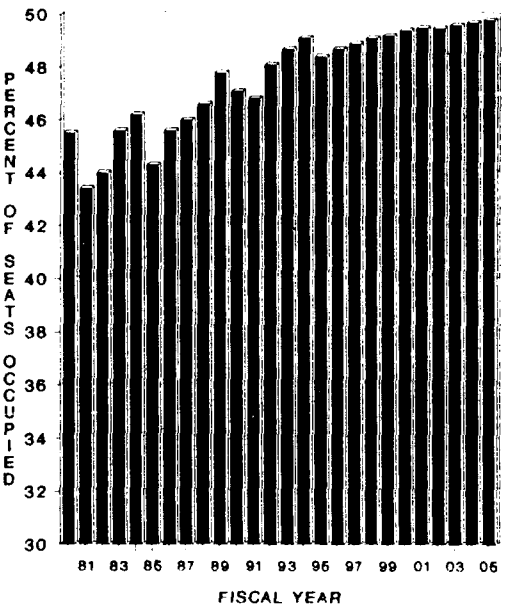
PASSENGER TRIP LENGTH



AVERAGE AIRCRAFT SIZE

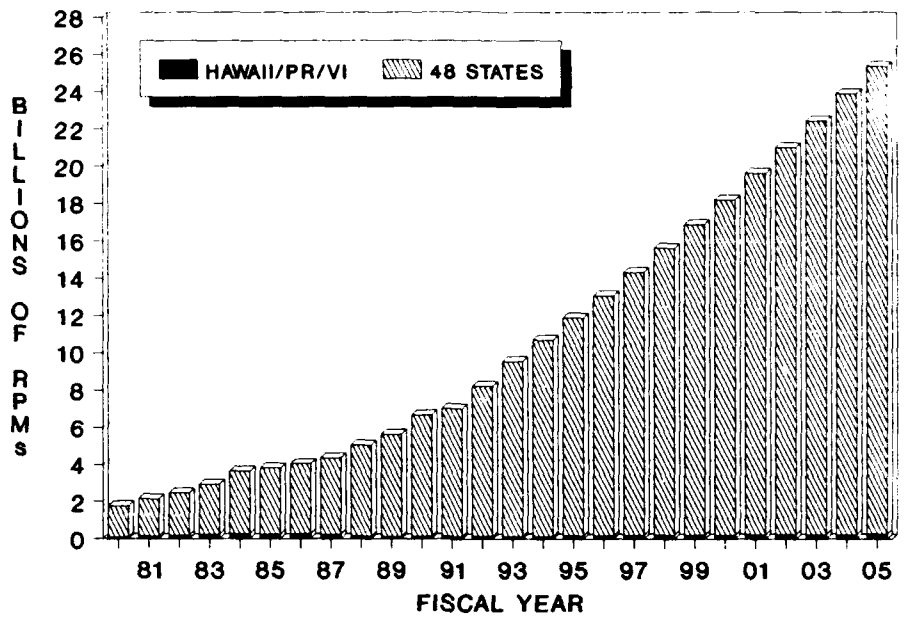


PASSENGER LOAD FACTOR

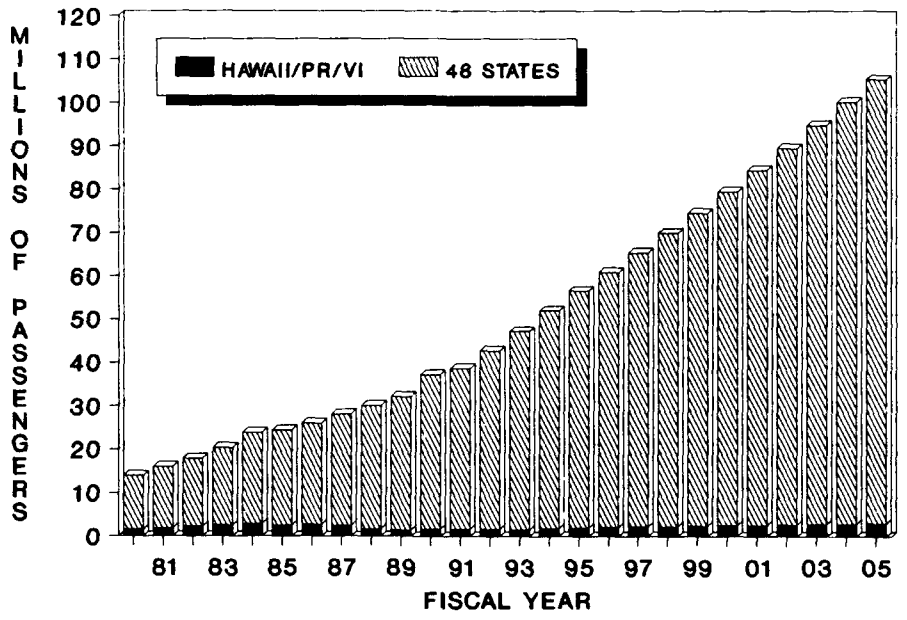


U.S. REGIONALS/COMMUTERS

SCHEDULED REVENUE PASSENGER MILES



SCHEDULED PASSENGER ENPLANEMENTS



The average industry load factor is expected to increase only slightly from 48.7 in 1993 to 49.8 in 2005, reflecting a continuing emphasis on frequency of service.

The baseline assumptions for the average seats per aircraft, passenger trip length, and load factors are presented in Chapter IX, Table 18.

REGIONAL/COMMUTER FORECASTS

REVENUE PASSENGER MILES

Revenue passenger miles are projected to increase to 10.9 billion (up 14.1 percent) in 1994 and to 12.3 billion (up 13.2 percent) in 1995. Passenger miles are expected to increase at an average annual rate of 9.1 percent during the 12-year forecast period, totaling 27.0 billion in 2005.

Passenger miles in the 48 states are projected to increase to 10.7 billion (up 14.1 percent) in 1994 and to 12.1 billion (up 13.2 percent) in 1995. During the 12-year forecast period passenger miles are expected to increase at an average annual rate of 9.1 percent, totaling 26.80 billion in 2005. Passenger miles in Hawaii, Puerto Rico, and the Virgin Islands are projected to increase to 163.8 million (up 14.6 percent) in 1994 and to 182.0 million (up 11.1 percent) in 1995. During the forecast period passenger miles are expected to grow at an average annual rate of 5.5 percent, totaling 273.0 million in 2005.

REVENUE PASSENGER ENPLANEMENTS

Passenger enplanements are projected to increase to 52.9 million (up 12.1 percent) in 1994 and to 58.5 million (up 10.6 percent) in 1995. Passenger enplanements are expected to increase at an average annual rate of 7.5 percent during the 12-year forecast period, totaling 112.2 million in 2005.

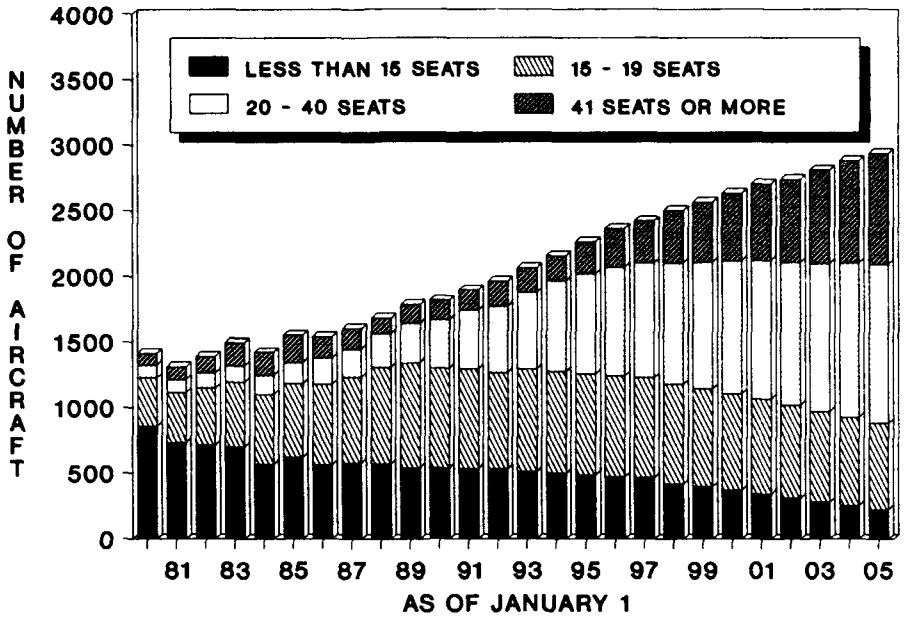
Passenger enplanements in the 48 states are projected to increase to 51.1 million (up 12.1 percent) in 1994 and to 56.5 million (up 10.6 percent) in 1995. During the 12-year forecast period, passenger enplanements are expected to increase at an average annual rate of 7.5 percent, totaling 109.2 million in 2005. Passenger enplanements in Hawaii, Puerto Rico, and the Virgin Islands are projected to increase to 1.8 million (up 12.5 percent) in 1994 and to 2.0 million (up 11.1 percent) in 1995. During the forecast period, passenger enplanements are expected to increase at an average annual rate of 5.4 percent, totaling 3.0 million in 2005.

REGIONAL/COMMUTER FLEET

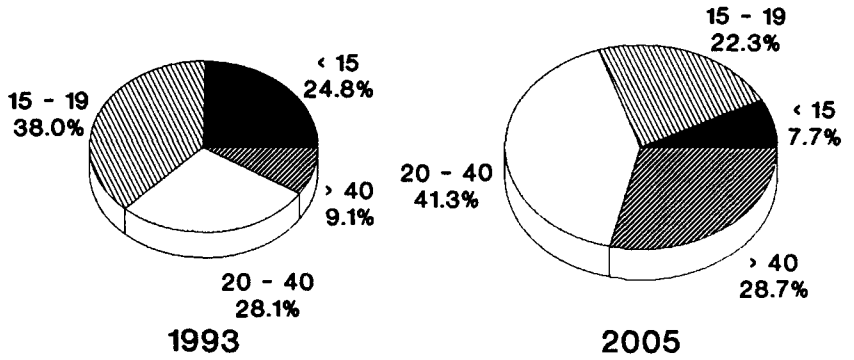
The current composition of the regional/commuter fleet underscores the growth of the industry and quality of service provided. From a fleet once composed predominantly of general aviation type aircraft, today's fleet is increasingly composed of new state-of-the-art aircraft offering amenities similar to those found on large jet

U.S. REGIONALS/COMMUTERS

PASSENGER AIRCRAFT



PERCENT BY AIRCRAFT SEAT SIZE



aircraft. Today's regional/commuter airlines have a large variety of aircraft from which to choose. Consequently, they can tailor their fleet to the specific markets they serve.

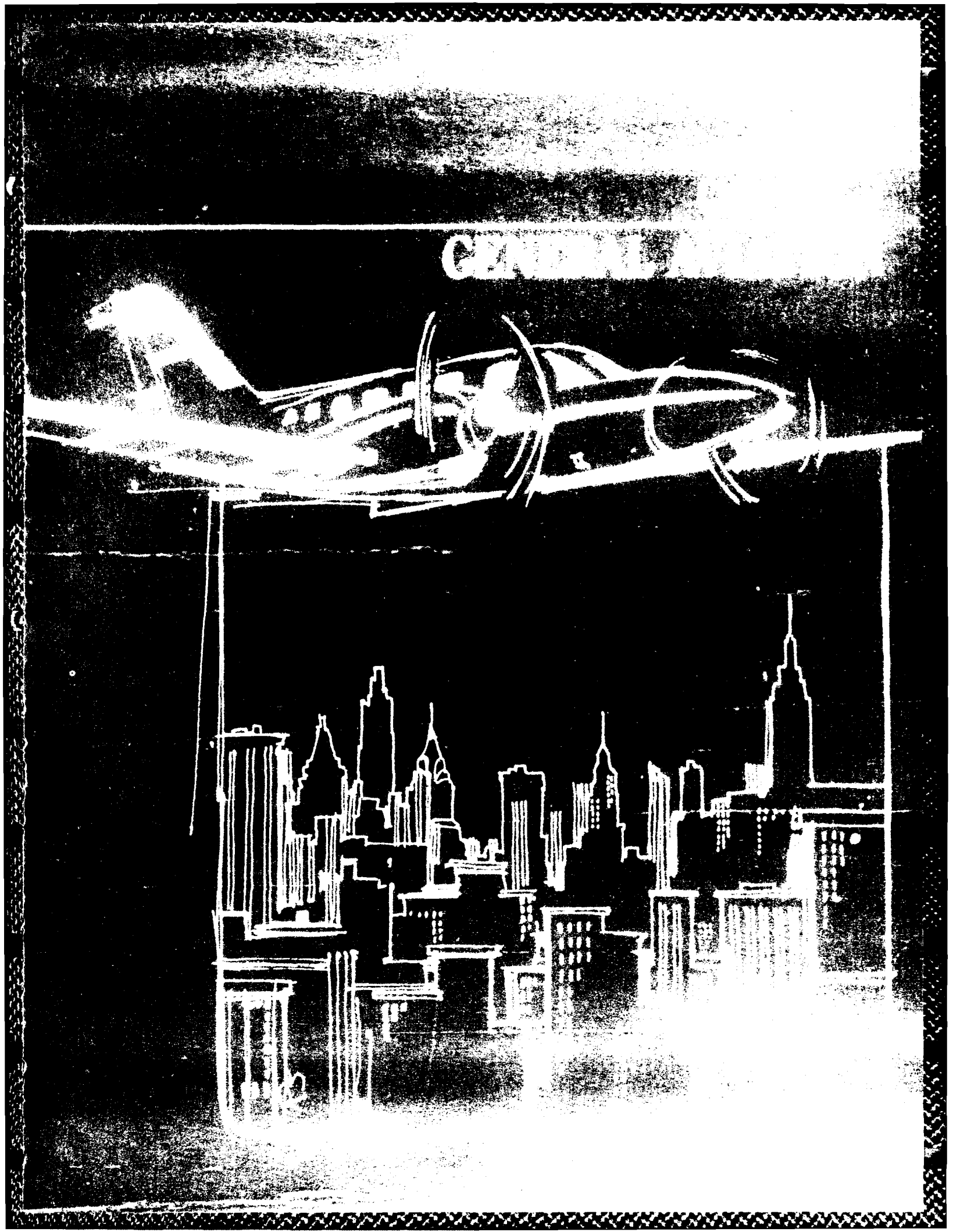
While there are numerous aircraft models to choose from in the categories presented in this forecast, the most significant are the new aircraft with larger seating capacities--primarily the "20 to 40 seats" and the "greater than 40 seats" categories. The introduction of the larger new aircraft is reflected in the growth of the average seats per aircraft from 15.1 in 1980 to 22.9 in 1993, an increase of 51.8 percent, while the regional fleet grew by only 46.1 percent reflecting growth in the average seat size per aircraft.

During the forecast period, it is projected that the average seats per aircraft will continue to grow at a rate significantly higher than the fleet. This reflects the continued introduction of larger aircraft into the fleet. The fleet is projected to grow at an average annual rate of 3.0 percent, increasing from 2,064 aircraft in 1993 to 2,936 aircraft in 2005.

The number of aircraft having less than 15 seats--which once made up the bulk of the fleet--totaled 512 in 1993, and accounted for 24.8 percent of the fleet. Between 1993 and 2005, the number of aircraft in this category is expected to decline to 226, a drop of 55.9 percent. By 2005 it will represent only 7.7 percent of the total fleet.

In 1993, the "15 to 19 seats" category accounted for the largest portion of the fleet (38.0 percent). During the last 10 years, most of the growth of the regional/commuter fleet has occurred in this category. However, this group is expected to decline steadily throughout the forecast period. It is projected that the "15 to 19 seats" category will decline from 785 aircraft in 1993 to 656 in 2005. However, this aircraft group will still account for 22.3 percent of the fleet in 2005.

The greatest growth in the fleet is expected to be in the "20 to 40 seats" and "greater than 40 seats" categories. This is due to the continued substitution of service and new route opportunities created through the use of larger, longer range aircraft. In 1993, aircraft in the "20 to 40 seats" category accounted for 28.1 percent of the regional fleet, while aircraft in the "greater than 40 seats" accounted for 9.1 percent. By the year 2005, these two categories are expected to account for a combined 70.0 percent of the total fleet, with 41.3 percent being in the "20 to 40 seats" category and the "greater than 40 seats" category accounting for 28.76 percent. During the forecast period, aircraft in the "20 to 40 seats" category are expected to increase from 579 aircraft in 1993 to 1,212 in 2005, an average annual increase of 6.3 percent. Aircraft in the "greater than 40 seats" category are expected to increase from 188 in 1993 to 842 in 2005, an average annual growth of 13.3 percent.



CHAPTER V

GENERAL AVIATION

The term general aviation is used to describe a diverse range of aviation activities and includes all segments of the aviation industry except commercial air carriers and military. Its activities include the training of new pilots, the display of banners at beaches and athletic contests, crop dusting, and flying for business or personal reasons. Its aircraft range from a one-seat single engine piston to the long-range corporate jet.

General aviation is an important component of both the aviation industry and our national economy. It provides on-the-spot efficient and direct aviation services that commercial aviation cannot or will not provide. In addition, the production and sale of general aviation aircraft, avionics, and other equipment, along with the provision of support services such as flight schools, fixed base operators, finance, and insurance, make the general aviation industry an important contributor to the nation's economy.

REVIEW OF 1993

AIRCRAFT SHIPMENTS/BILLINGS

In fiscal year 1993, the number of general aviation aircraft shipments totaled only 811, down 8.8 percent from fiscal year 1992. Billings, however, increased 5.3 percent in 1993 to almost $2.0 billion. The increase in billings reflects the higher value of the aircraft being shipped.

Exports of general aviation aircraft totaled 355 in fiscal year 1993, a decline of only 0.6 percent from 1992. Export billings totaled $765 million, up 12.0 percent over billing in 1992. Exports accounted for almost 44 percent of the total general aviation aircraft shipments and 39 percent of total billings in fiscal year 1993.

Despite the overall decline in the number of shipments, there were some positive trends. Turboprop aircraft shipments (207) were up 22.5 percent in 1993. Shipments of jet aircraft (168), although down 12.5 percent, actually increased during the latter half of the year. Piston aircraft shipments (436) declined 17.4 percent in 1993.

PILOT POPULATION

As of January 1, 1993, the total pilot population was 682,959. This was 9,136 fewer pilots than a year earlier when the number of pilots totaled 692,095, a decline of 1.3 percent. The four major pilot grouping--student, private, commercial, and airline transport--accounted for 97.4 percent of all

pilots in 1993. Of the four, only airline transport pilots (115,855) registered an increase in 1993, up 3.3 percent. The other three categories all showed declines in 1993--students pilots (114,597) declined 4.7 percent; private pilots (288,078) declined 1.8 percent; and commercial pilots (146,385) declined 1.3 percent.

The number of helicopter pilots also declined in 1993, down 2.1 percent to 9,652. The number of glider (8,205) and recreational (187) pilots increased 2.1 and 16.2 percent, respectively.

It is important to note that the number of instrument rated pilots increased for the ninth consecutive year in 1993, up 1.2 percent to 306,169. Since 1984, this category of pilots is up 20.4 percent. In 1993, 44.8 percent of all pilots were instrument rated, compared to 42.8 percent in 1992 and 35.4 percent in 1984. This reflects the increased sophistication of both the aircraft and pilots utilizing the National Airspace System.

OPERATIONS

The number of general aviation aircraft operations at FAA towered airports (35.1 million) declined 5.1 percent in fiscal year 1993. Itinerant operations (20.3 million) were down 4.6 percent while local operations (14.8 million) declined 5.7 percent.

General aviation instrument operations (17.5 million) at FAA towered airports were down 3.9 percent. However, the number of general aviation aircraft handled at FAA en route centers (7.4 million) was up slightly in 1993.

1992 GENERAL AVIATION ACTIVITY SURVEY

The historical general aviation active fleet and hours flown discussed in this chapter are derived from the General Aviation Activity Survey that is conducted annually by the FAA's Statistics and Forecast Branch. The fleet data are estimated using a sample from the FAA aircraft registry and are subject to variation due to errors in the registry and statistical sampling procedures. Active fleet and hours flown, by aircraft type and use category, for the period 1988 to 1992 are detailed in Appendix F.

The 1992 survey results for active aircraft are the January 1, 1993 totals in Tables 21 and 22 (Chapter IX). The hours flown for fiscal year 1992 are derived by combining the hours flown from the 1991 and 1992 surveys (e.g., one quarter of 1991 hours plus three quarters of 1992 hours). See Table 23 in Chapter IX.

ACTIVE AIRCRAFT

The "active fleet" consists of any aircraft flown at least one hour during the previous year. Based on the results of the 1992 survey, the general aviation active fleet totaled 184,430. This represents a decline of 7.1 percent from the 198,475 active aircraft in 1991.

With the exception of the "other category" (gliders and lighter-than-air aircraft--blimps, dirigibles, and balloons), all general aviation aircraft categories declined in 1992. The number of single engine piston aircraft declined from 154,102 to 143,580 (6.8 percent); multi-engine piston aircraft from 21,245 to 18,536 (12.8 percent); turboprop aircraft from 4,920 to

4,704 (4.4 percent); turbojet aircraft from 4,353 to 4,022 (7.6 percent); and rotorcraft from 6,292 to 5,752 (8.6 percent). The "other category" increased 3.6 percent in 1992, 7,563 to 7,836 aircraft.

HOURS FLOWN

Based on the 1992 survey results, the number of general aviation hours flown totaled 26.5 million, a decline of 11.9 percent from 1991. Declines were registered in all of the aircraft categories in 1992--single engine pistons (18.1 million) down 12.0 percent; multi-engine pistons (3.2 million) down 10.8 percent; turboprops (1.5 million) down 2.3 percent; turbojets (1.1 million) down 13.3 percent; rotorcraft (2.3 million) down 17.2 percent; and "others" (0.4 million) down 10.8 percent.

Looking at the hours flown by primary use category, we find that personal use continues to be the major reason given for general aviation activity. In 1992, personal flying accounted for 32.4 percent of general aviation activity, up from 32.2 percent in 1991. Instructional flying declined slightly in 1992, from 20.4 percent to 20.2 percent. The percentage of use for both business and corporate flying declined significantly in 1992--business use from 13.8 to 13.4 percent and corporate use 8.9 to 8.5 percent.

GENERAL AVIATION DOMINATES AVIATION

General aviation continues to be the dominant force in the aviation industry. In 1991, there were 669 airports with commercial service certificates (also used by general aviation) and a total of 16,912 airports/heliports used exclusively by general aviation aircraft. In terms of active aircraft, there were a total of 184,430 active general aviation aircraft in 1993--compared to 4,200 commercial jet aircraft and 6,200 military aircraft.

Of the 692,095 certificated pilots in 1993, general aviation accounted for almost 84 percent of the total. In 1992, general aviation operations totaled 100.8 million, almost 75 percent of the total 134.7 million operations at U.S. airports, both towered and nontowered.

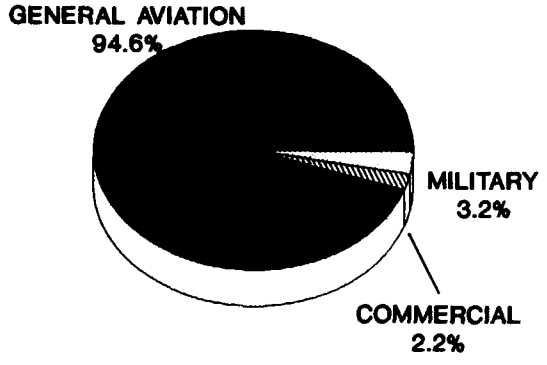
Based on data obtained from the study The Economic Impact of Civil Aviation on the U.S. Economy--Update '91 (Wilbur Smith Associates, April 1993), it is estimated that general aviation-related activity had a total economic impact of $45.2 billion in 1991. General aviation and related activity employed approximately 543,000 people whose wages totaled $14.5 billion in 1991.

The U.S. general aviation industry is also a leader in world aviation. Based on 1991 statistics compiled and published by the International Civil Aviation Organization (ICAO), the United States accounted for 73 percent of the 292,000 general aviation aircraft owned and operated by ICAO member States. In addition, the United States accounted for nearly 67 percent of the hours flown by ICAO member States. By comparison, Canada with 12,545 aircraft and the United Kingdom with 7,855 aircraft (4.3 and 2.7 percent, respectively) represent countries with the next highest levels of aircraft concentration.

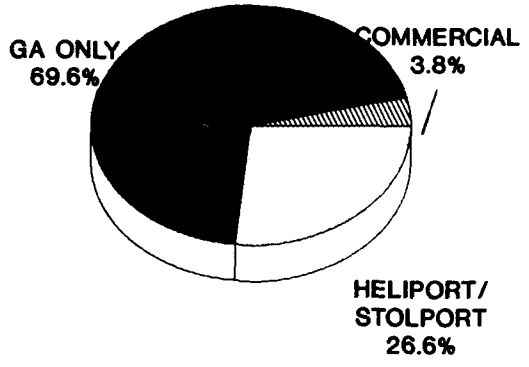
The leadership of the U.S. general aviation industry is further illustrated by the proportion of private pilot licenses held. Of the approximately 568,000 civilian private pilots reported by ICAO in 1991, about 50 percent of the aeroplane pilots and 43 percent of the helicopter pilots are in the United States.

GENERAL AVIATION DOMINATES AVIATION

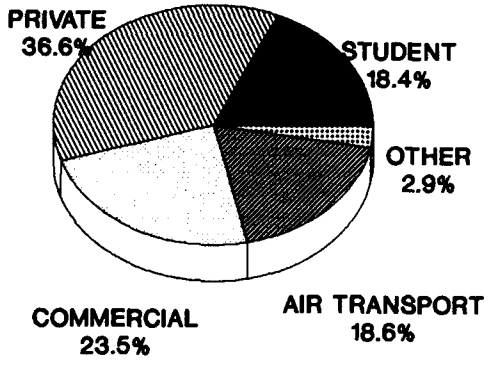
ACTIVE AIRCRAFT



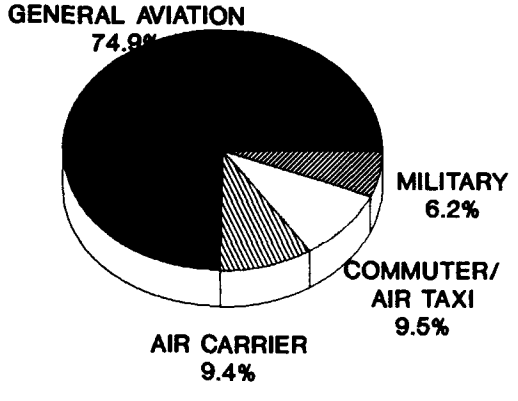
U.S. AIRPORTS



ACTIVE PILOTS



AIRPORT OPERATIONS



THE LONG DECLINE

Despite its dominance, general aviation has been in a state of decline throughout most of 1980s and the early 1990s. This decline is evidenced by the following statistics:

- General aviation aircraft shipments fell from a high of 17,811 in 1979 to 811 in 1993 (down 95.5 percent);
- The active general aviation fleet fell from a high of 213,300 in 1984 to 184,430 in 1993 (down 13.5 percent);
- Hours flown by general aviation aircraft fell from a high of 41.9 million in 1980 to an estimated 25.8 million in 1993 (down 38.4 percent);
- General aviation operations at FAA towered airports fell from a high of 51.7 million in 1979 to 35.1 million in 1993 (down 32.1 percent);
- The number of private pilots fell from a high of 357,500 in 1980 to 288,078 in 1993 (down 19.4 percent); and
- The number of student pilots fell from a high of 210,200 in 1980 to 114,597 in 1993 (down 45.5 percent).

The decline is most evident and perhaps most critical in the U.S. general aviation manufacturing industry. In 1980, there were 29 United States and 15 foreign manufacturers of piston aircraft. Today, there are nine U.S. and 29 foreign manufacturers. In 1980, 100 percent of the single engine pistons sold in the United States were manufactured in the United States. Today, less than 70 percent are manufactured in the United States.

The continuing decline in the number of manufacturers and shipments of the single engine piston aircraft is a major cause for concern in the industry. The single engine piston aircraft is the base on which general aviation activity must build its future. Historically, new pilots are trained in single engine piston aircraft and work their way up through retractable landing gear and multi-engine piston to turbine aircraft. When the single engine piston market is in decline, it signals a slowing of expansion in the general aviation fleet and, consequently, a slowing in the rate of growth of general aviation activity.

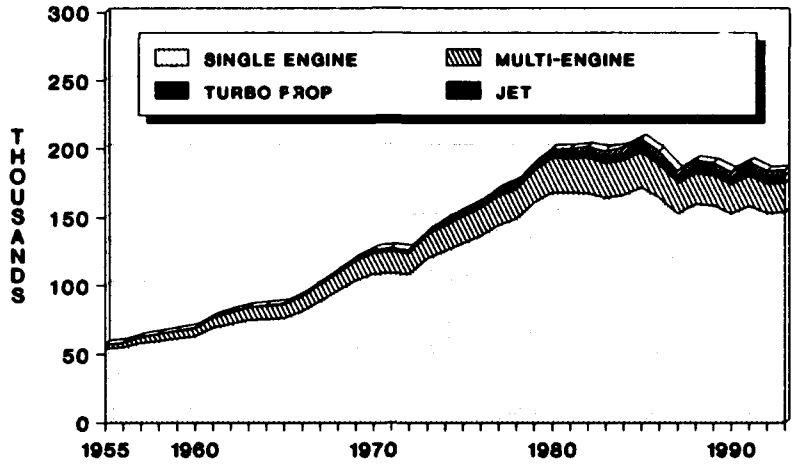
Major events that have contributed to this downturn in general aviation activity include U.S. economic activity, the cost of owning and operating general aviation aircraft, and the deregulation of the commercial airline industry.

GENERAL ECONOMIC GROWTH

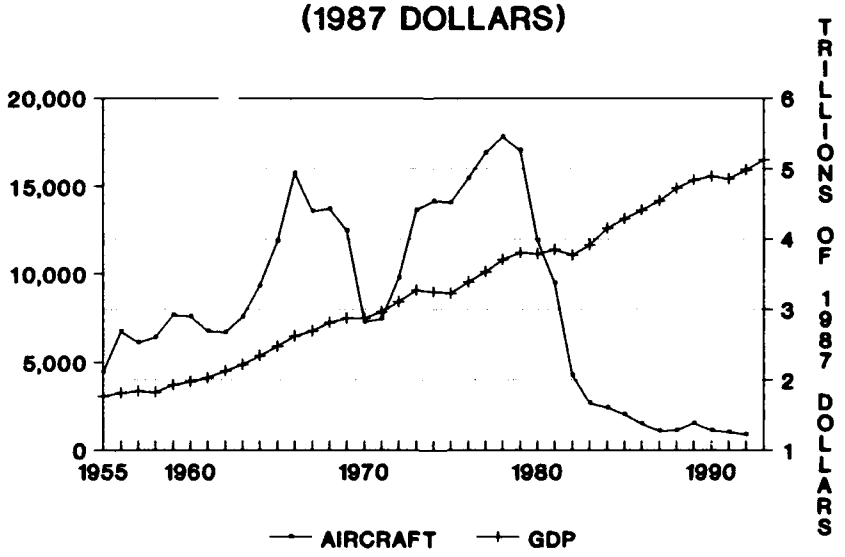
Fundamental changes continue to take place within the general aviation industry. Prior to 1978, growth in the general aviation industry generally paralleled growth in business activity. However, the decline in aircraft shipments that began in the late 1970s, marked a fundamental change in this relationship.

The graph at the bottom of the next page displays annual shipments of new general aviation aircraft relative to growth in U.S. real gross domestic product. The graph shows past declines in aircraft sales have often been associated with downturns in the national economy--for example, recessions in 1960, 1970, and 1975--but sales usually resumed as the recession subsided. This has not been the case since 1978. Despite generally strong economic

HISTORICAL TREND OF GENERAL AVIATION FIXED WING FLEET
(IN THOUSANDS)



GENERAL AVIATION UNITS SHIPPED VERSUS GROSS DOMESTIC PRODUCT (1987 DOLLARS)



growth during much of the 1980s, general aviation aircraft shipments continued to decline.

Because of these changes, it becomes exceedingly difficult to make inferences relative to rises in general economic activity and the total general aviation fleet. Sales of piston general aviation aircraft have declined from 17,032 in 1978 to 436 in 1993. During this same time period, real GDP increased at an average annual rate of 2.0 percent.

While the sales of turbine-powered aircraft have also declined, the drop has been less dramatic. Sales of turbine powered aircraft totaled 779 in 1978, declining to 375 units in 1993. However, since increases in economic activity do presage increased business activity, it is believed that increased U.S. economic activity can still be used as a predictor of future corporate and business aviation sales and activity.

OWNERSHIP COST FACTORS

The cost of owning (maintaining and operating) all classes of general aviation aircraft have been steadily increasing. Although the total nominal cost of owning and operating an aircraft has increased between 4.2 and 4.9 percent annually since 1978, these costs have largely been inflationary and compare favorably to increases in the consumer price index over the same period. In fact, the real cost (1982-84$) of maintaining and operating a general aviation aircraft has actually declined since the early 1980s.

In contrast, the nominal cost of purchasing a general aviation aircraft has risen dramatically, far exceeding the rise in inflation. Since 1978, the average cost of purchasing general aviation aircraft has increased as follows: single engine piston aircraft up 126 percent through 1986 (30.6 percent in 1982-1984$); multi-engine piston aircraft up 230 percent (62.4 percent in 1982-1984$); turboprop aircraft up 207 percent (24.1 percent in 1982-1984$); and turbojet aircraft up 186 percent (29.2 percent in 1982-1984$). Despite relatively low inflation over the past several years, the purchase price of multi-engine pistons, turboprops, and turbojets increased 11.0, 13.2, and 16.8 percent, respectively, in nominal dollars.

Increases in product liability costs were one of the key factors responsible for the large increases in the purchase price of a general aviation aircraft. Over the last 10 years, annual claims paid by manufacturers have increased from $24 million to over $210 million, despite an improved safety record.

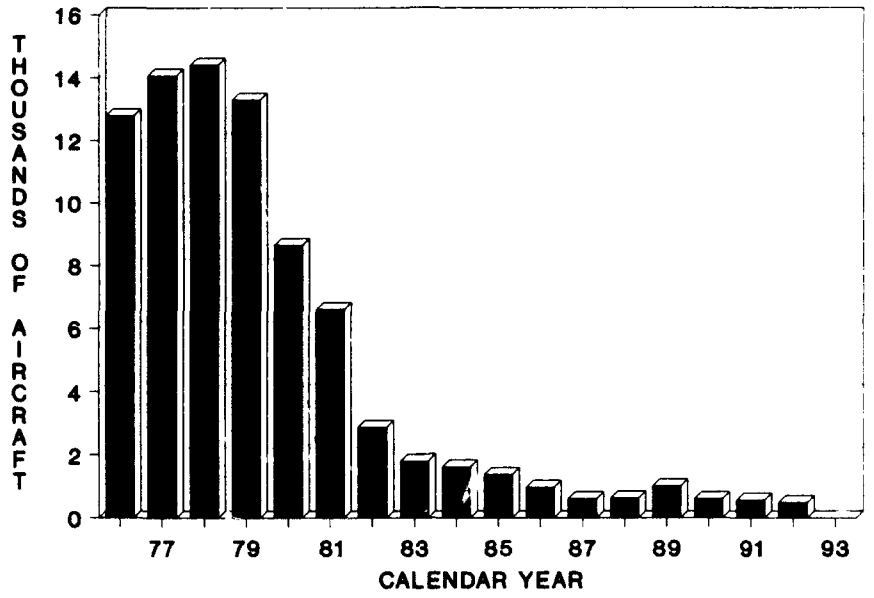
Clearly, these ownership cost increases, especially those in the purchase price, have a negative impact on general aviation and are, in large part, responsible for the decline in aircraft shipments over the last several years.

The tables in Appendix G and the graphs on the next four pages depict the real cost of purchasing and maintaining/ operating a general aviation aircraft. Nominal or current purchase prices and operating costs have been deflated by the consumer price index (an average of 1982-1984$) and were indexed to 1983, i.e., 1983 = 100.

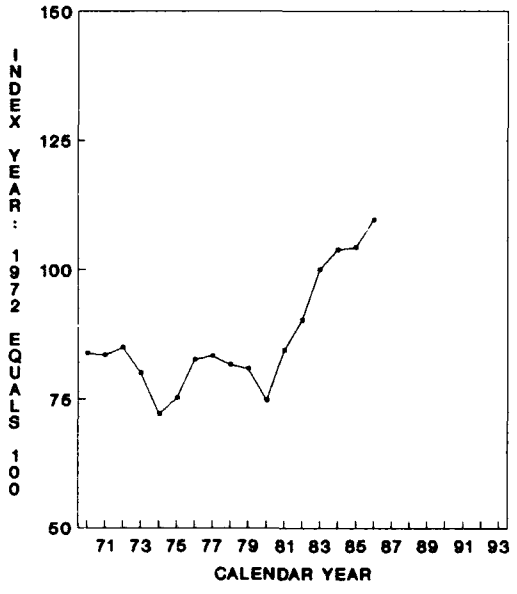
It should be noted that these tables and graphs represent a substantial change from those contained in previous forecast documents. In prior years, the costs of purchasing and operating general aviation aircraft were expressed in nominal or current dollars. In addition, prior year's costs were indexed to 1970.

SINGLE ENGINE PISTON AIRCRAFT TRENDS

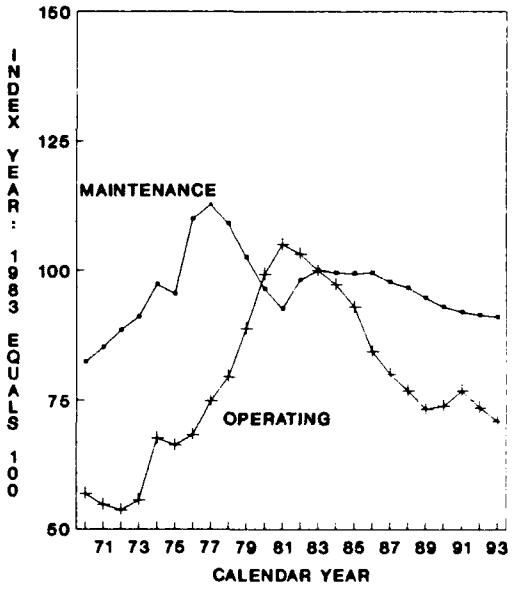
AIRCRAFT SHIPMENTS



AIRCRAFT PRICES ($1983)

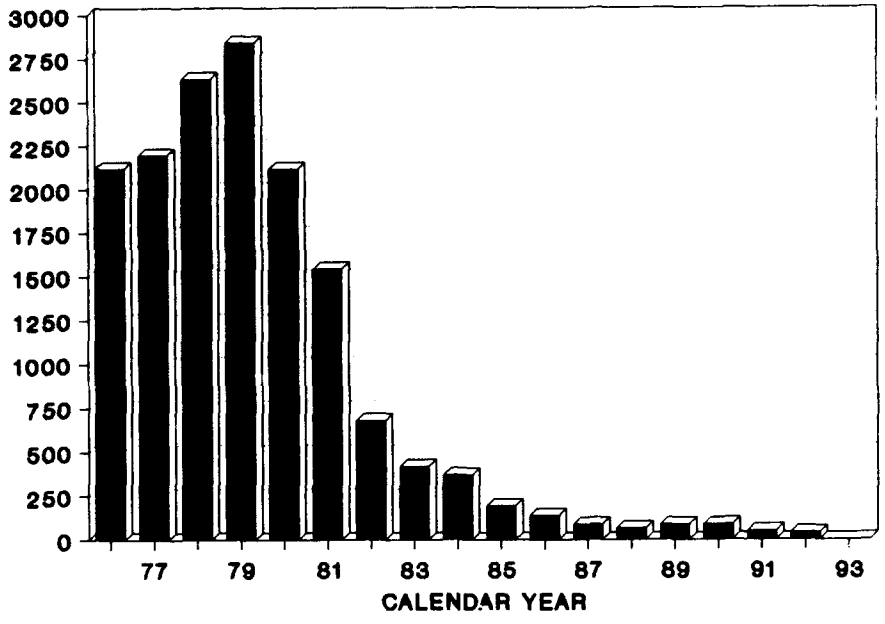


OPERATING AND MAINTENANCE COSTS ($1983)

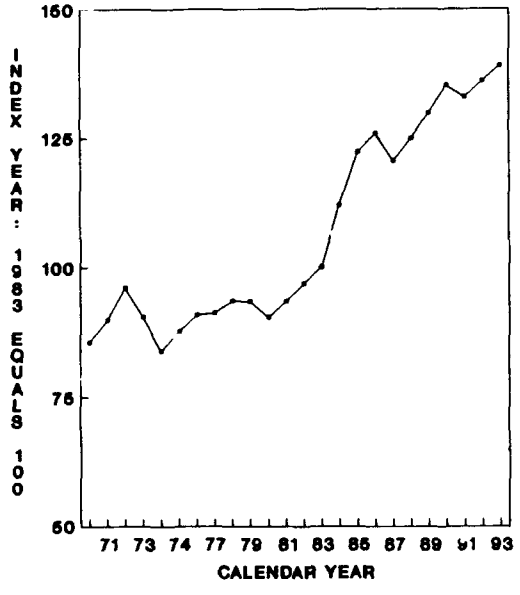


MULTI-ENGINE PISTON AIRCRAFT TRENDS

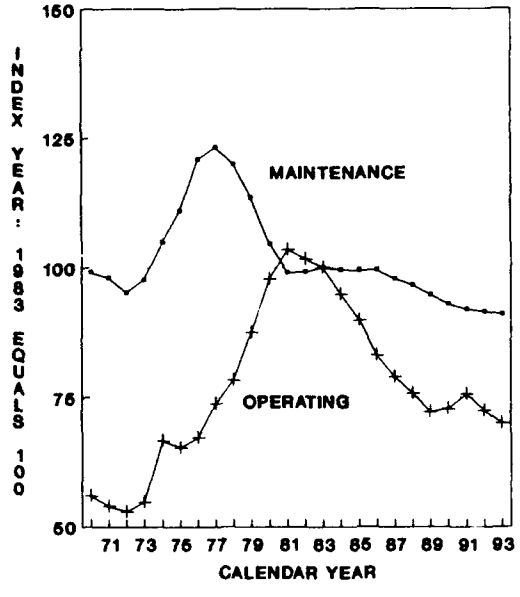
AIRCRAFT SHIPMENTS



AIRCRAFT PRICES ($1983)

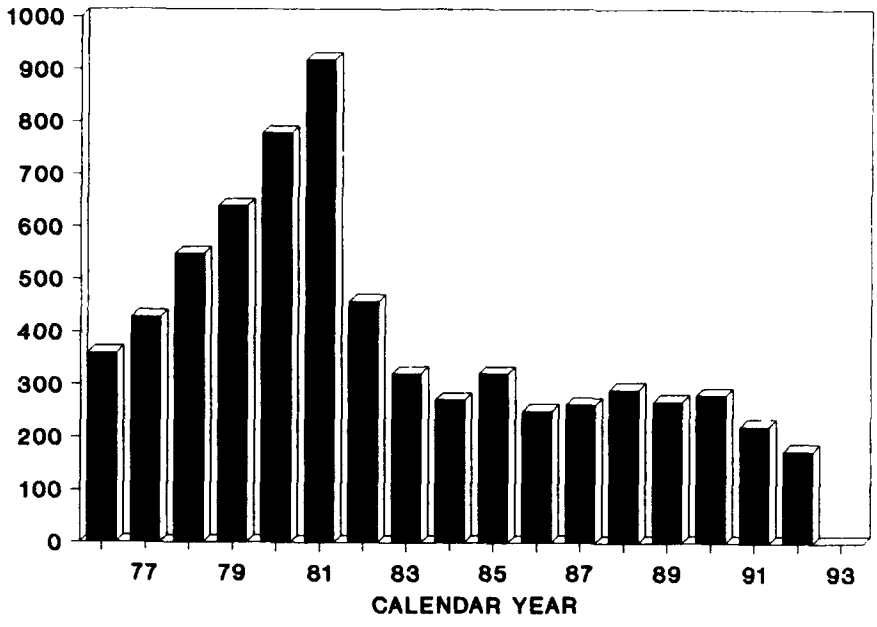


OPERATING AND MAINTENANCE COSTS ($1983)

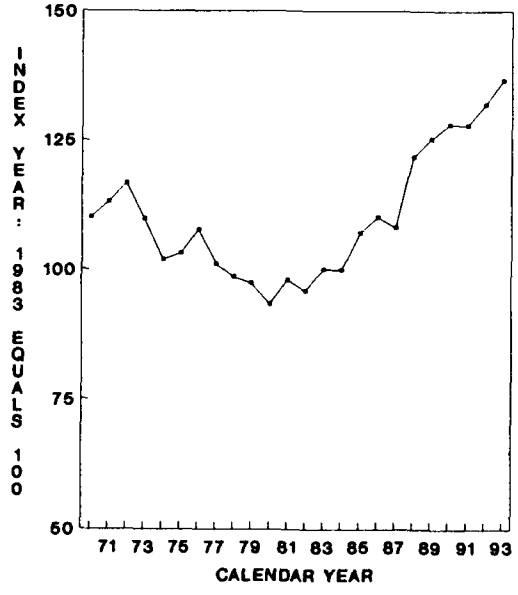


TURBOPROP AIRCRAFT TRENDS

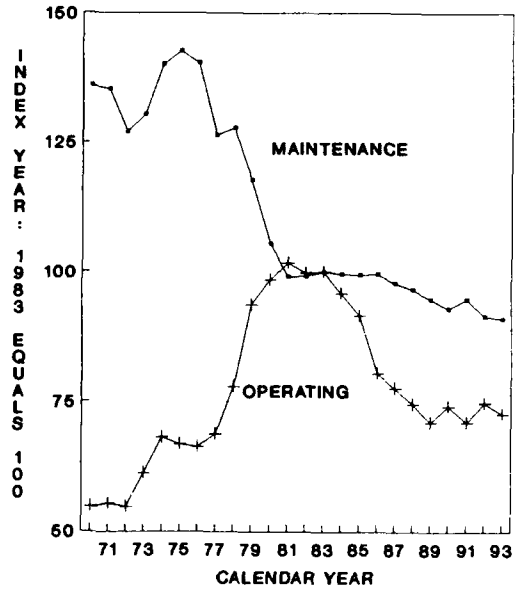
AIRCRAFT SHIPMENTS



AIRCRAFT PRICES ($1983)

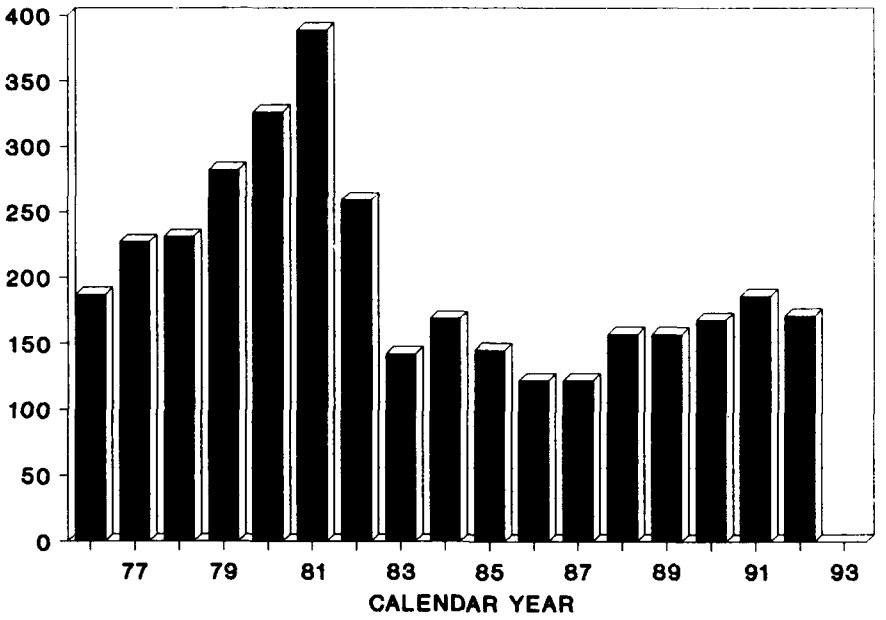


OPERATING AND MAINTENANCE COSTS ($1983)

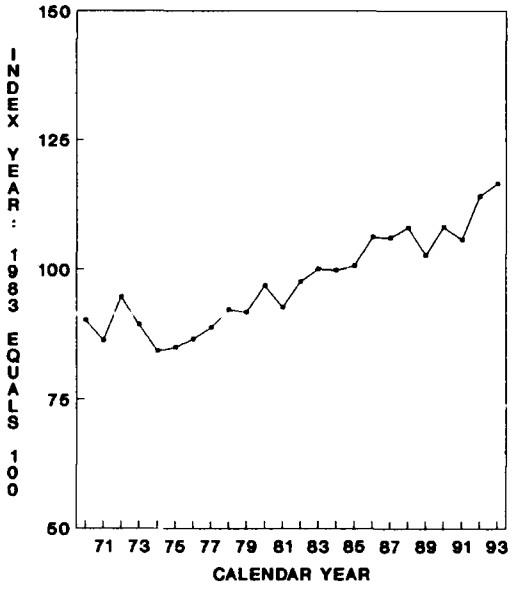


TURBOJET AIRCRAFT TRENDS

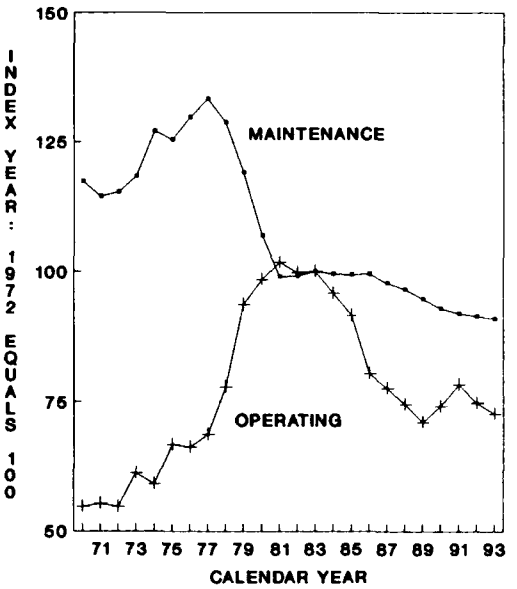
AIRCRAFT SHIPMENTS



AIRCRAFT PRICES ($1983)



OPERATING AND MAINTENANCE COSTS ($1983)



DEREGULATION OF THE U.S. COMMERCIAL AIRLINE INDUSTRY

The deregulation of the U.S. commercial airline industry has also affected general aviation. In 1979, only about 9,000 markets received single carrier service. Today, more than 21,000 markets receive single carrier service. This increased service, combined with better connections and low fares, has reduced the desirability of using private, general aviation aircraft when planning business or pleasure trips.

Commercial carriers have recently begun a restructuring and/or rationalization of their entire route systems, including the reduction or discontinuance of service at many of the secondary hubs established during the mid to late 1980s. While much of this service will be replaced by regionals/commuters, it does represent, in most cases, a substitution of turboprop aircraft for jet aircraft. Some regional carriers have begun to utilize small jet equipment and this will further blur the distinction between the large air carriers and regionals/commuters. Whether general aviation will benefit from these service reductions or substitutions depends in large part on the flying public's perception of the service being offered by the smaller regional/commuter carriers.

In addition, there are proposals to cut essential air service subsidies to small communities. Conceivably, this could provide a stimulus to general aviation, which may substitute for loss of air service in such communities. Further, if real air fares and delays on short- and medium-haul markets were to increase substantially over time, general aviation might once again become a more attractive and viable alternative to the business traveler.

OTHER FACTORS

Other factors possibly affecting general aviation, especially personal use, include: changes in disposable, discretionary income; increases in airspace restrictions applied to VFR aircraft; reductions in leisure time; and shifts in personal preferences as to how leisure time is spent. All of these factors may contribute to the decline in general aviation during the 1980s. These factors may influence future general aviation activity levels.

REASONS TO BE OPTIMISTIC ABOUT GENERAL AVIATION

There are a number of reasons for guarded optimism in the general aviation industry. A number of ongoing events suggest that general aviation may experience a renaissance. There is, in fact, a growing realization in the aviation community that general aviation must "reinvent" itself and create a new demand/growth curve.

The main reason for this optimism is that the industry perceives that product liability legislation has a better chance of being enacted by Congress. Current legislative proposals would limit the liability on general aviation aircraft manufacturers to 15 years from the date of manufacture. The industry feels that passage of this legislation would not only lower its insurance costs, but would also enable manufacturers to begin to design and produce new technology and cheaper general aviation aircraft.

Additionally, the amateur-built aircraft market has shown steady growth over the last several years. Almost

1,000 new amateur-built experimental aircraft received airworthiness certificates and over 2,000 kits were sold by 14 major kit manufacturers in 1992.

The used aircraft market has also remained strong during the past several years with almost 36,000 aircraft changing hands in 1992. Additionally, prices for piston aircraft have also remained strong, thus reflecting some pent-up demand for these aircraft. The success of the kits and the strength of the used aircraft market show the creativity and resilience that still exists in the market.

The international use of general aviation aircraft has increased during the past several years. Based on sample flight-strip data obtained from the North Atlantic oceanic centres, weekly operations of general aviation aircraft increased from 119 in 1983 to 338 in 1991 and 293 in 1992. Some of this increase results from the concerns of business for the safety and security of its traveling employees. However, a large part of it is also the result of business adapting to meet expanding global markets and opportunities. The new Gulfstream 5, capable of flying 7,500 miles nonstop, will help meet this new demand.

Although total general aviation activity at FAA towered airports has declined substantially since 1978, instrument operations at FAA towered airports have actually increased 7.4 percent since that time. This points to continued growth among the more sophisticated general aviation using the national airspace system.

In addition, general aviation operations at nontowered airports increased 9.0 percent since 1978. This lends some credence to those who contend that much of general aviation has, because of increased commercial air carrier activity, been forced out of many towered airports. It also supports the results of the General Aviation Activity Survey, which shows that personal flying continues to increase as a percentage of total general aviation activity--from 27.2 percent in 1985 to 32.4 percent in 1992.

Additionally, there is the growing climate of partnership between the FAA and the general aviation community. The FAA recently streamlined its certification process for new entry-level aircraft (Primary Category Rule) and this could also increase the production of new small, affordable aircraft.

Another example of cooperation is that 11 general aviation organizations have formed the General Aviation Action Plan Coalition to support implementation of the General Aviation Action Plan.

There is also a growing effort to unlock general aviation's transportation potential through product innovation. In this area, the FAA and the National Aeronautics and Space Administration (NASA) have collaborated with the general aviation community to implement a research program to bring new technologies to general aviation.

The FAA has spent considerable effort cooperating with the aviation authorities in Russia, China, and elsewhere to develop common aviation standards. These initiatives, combined with efforts by industry, could tap vast new markets for general aviation products in places when general aviation does not currently exist.

GENERAL AVIATION FORECASTS

The general aviation forecasts discussed in the following paragraphs are based on a set of assumptions, not the least of which is the outlook for moderate and sustained growth in the U.S. economy. The forecasts also

assume that legislation limiting the liability of manufacturers of general aviation aircraft will be enacted in the 1994-95 time frame. Growth in general aviation activity will, to some degree, be driven by an expanding U.S. economy. However, whether the predicted recovery in general aviation actually materializes will depend, in large part, on what happens with product liability. Without the passage of product liability legislation, both the active fleet and hours flown forecasts could be considerably lower than currently forecast.

ACTIVE FLEET

The active general aviation fleet is expected to decline slightly (down 0.3 percent annually) during the 12-year forecast period, with most of the decline occurring in the early years. The decline is driven primarily by reductions in the piston engine fleet.

The number of active single engine aircraft is projected to decline from 143,580 aircraft in 1993 to 131,100 aircraft in 1998 and to remain at that level throughout the remainder of the forecast period. The decline is due in large part to the expected large numbers of retirements and/or shifts to nonactive status of many of the older aircraft in the fleet. The retirement of these older aircraft is expected to continue to occur throughout the forecast period. However, after 1998, the gap caused by these retirements is expected to be replaced by newer technology aircraft that are, in part, a result of the passage of product liability legislation.

Multi-engine piston aircraft are also expected to decline in absolute numbers during the early years of the forecast period, from 18,536 in 1993 to 17,300 in 1998. The decline in these aircraft is also due to retirements of many of the older aircraft in the fleet. However, the multi-engine piston fleet is expected to increase somewhat during the latter years of the forecast period (to 17,600 in 2005) as purchases of new technology aircraft begin to outpace retirements.

The active turbine-powered fleet is expected to grow throughout the forecast period (2.4 percent annually), largely the result of an expanding U.S. economy. The number of turboprop aircraft grows from 4,704 in 1993 to 6,500 in 2005. Turbojet aircraft increase from 4,022 in 1993 to 5,100 in 2005.

The rotorcraft fleet is forecast to increase at an annual rate of 2.3 percent over the forecast period. All of this growth, however, occurs in the turbine fleet, which increases from 3,541 in 1993 to 5,800 in 2005. Piston-powered rotorcraft are expected to decline from 2,211 to 1,800 over the same time period.

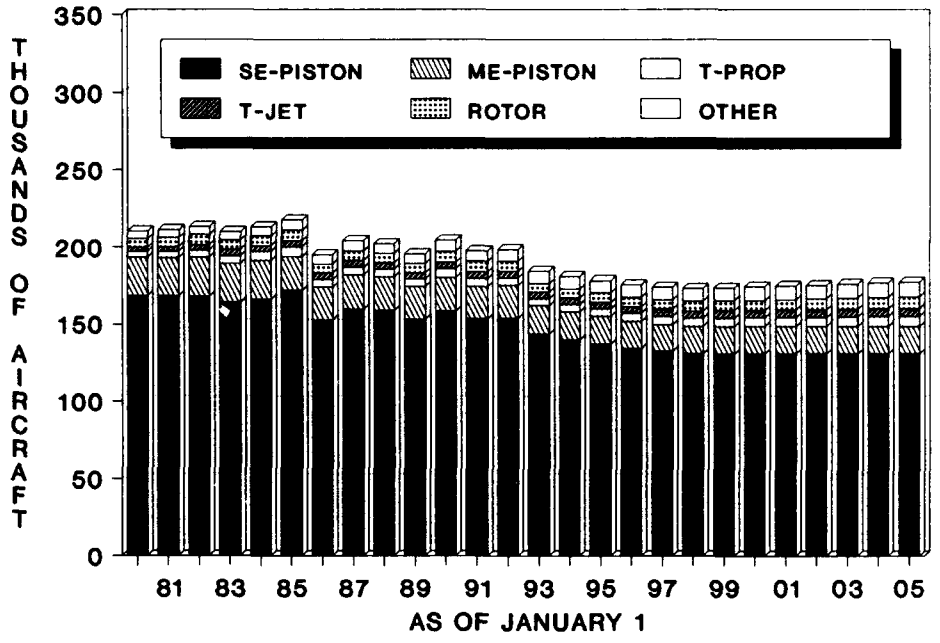
Gliders and lighter-than-air aircraft are forecast to increase by 1.6 percent annually, growing from 7,836 in 1993 to 9,500 aircraft in 2005.

AIRCRAFT UTILIZATION

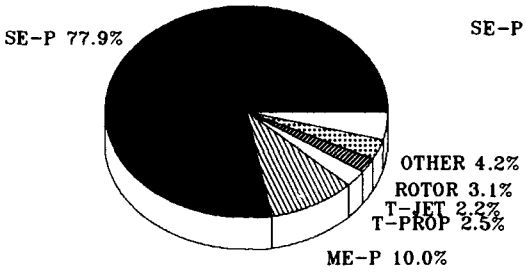
The average number of hours flown by general aviation aircraft has declined significantly during the past several years, especially in the turbine-powered fleet. It is assumed the decline is in large part the result of the U.S. economic slowdown/recession in 1990-91 and slow recovery in 1992.

Between 1989 and 1992, the average number of hours flown by single and multi-engine piston aircraft declined by 9.3 and 22.5 percent, respectively. However, turboprop and turbojet utilization declined by 45.5 and 35.0 percent, respectively, during the same time period. Based on economic assump-

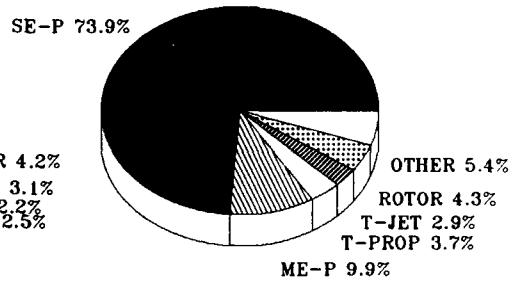
ACTIVE GENERAL AVIATION AIRCRAFT



PERCENT BY AIRCRAFT TYPE



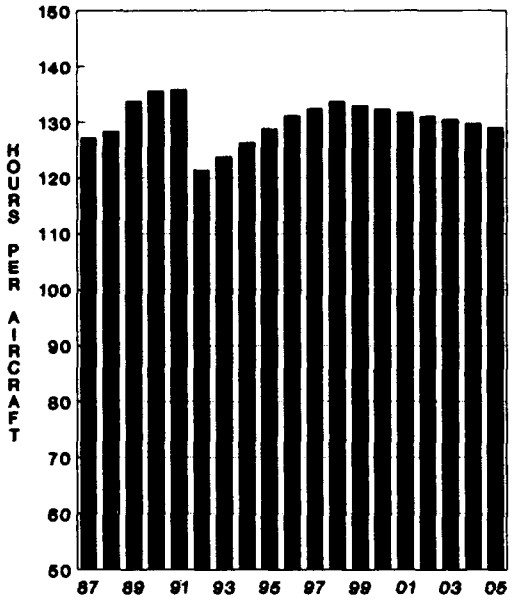
1993



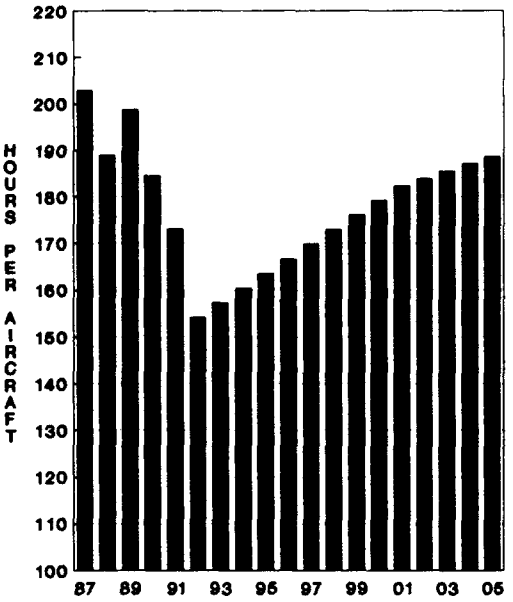
2005

GENERAL AVIATION AIRCRAFT UTILIZATION

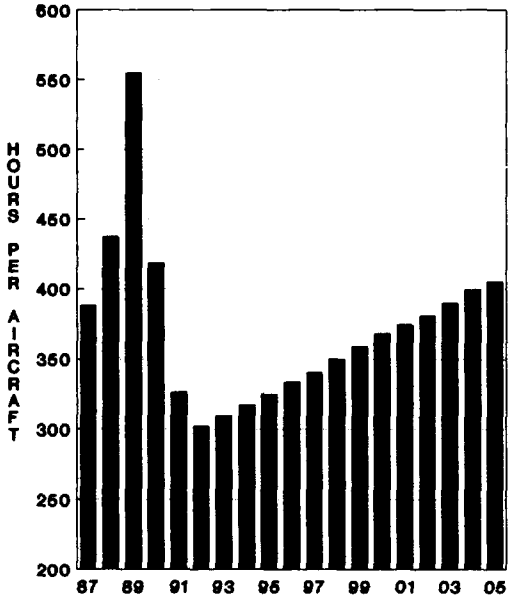
SINGLE ENGINE PISTON



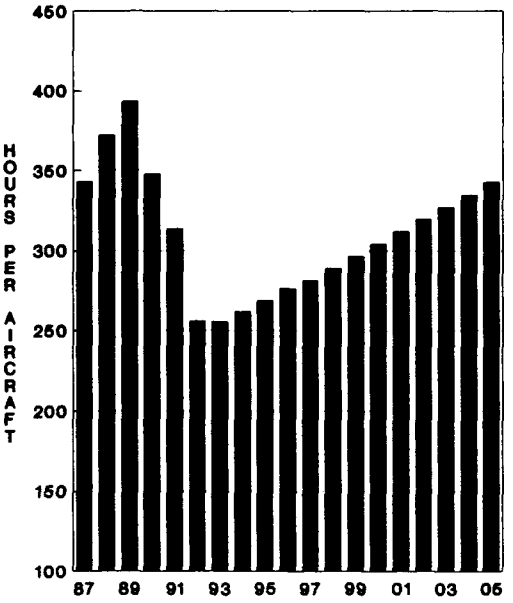
MULTI-ENGINE PISTON



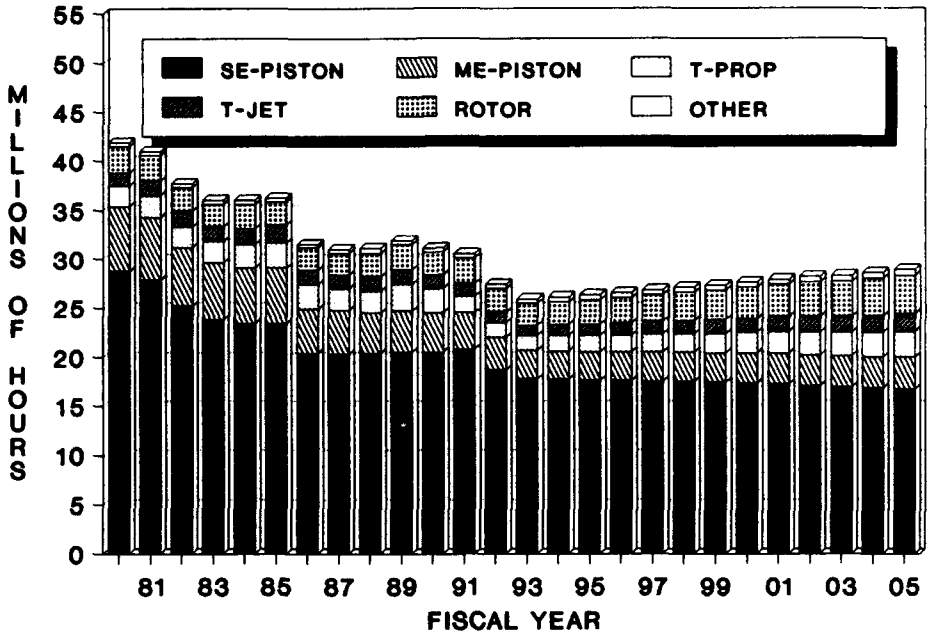
TURBOPROPS



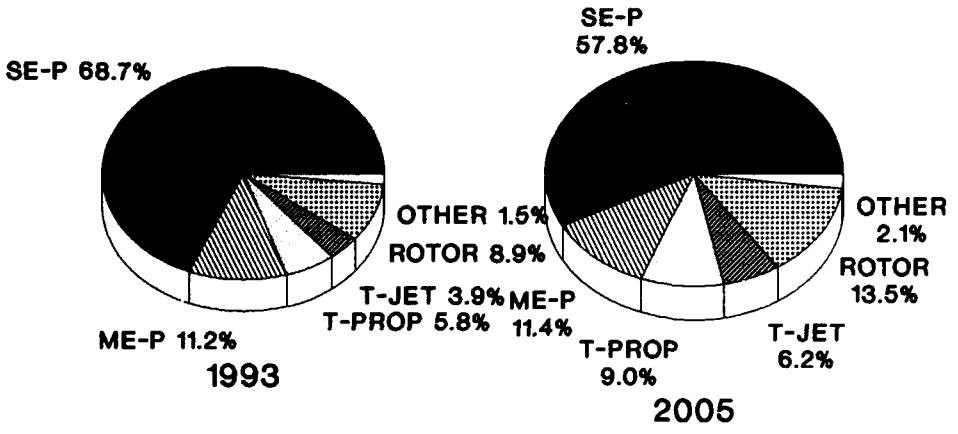
TURBOJETS



GENERAL AVIATION HOURS FLOWN

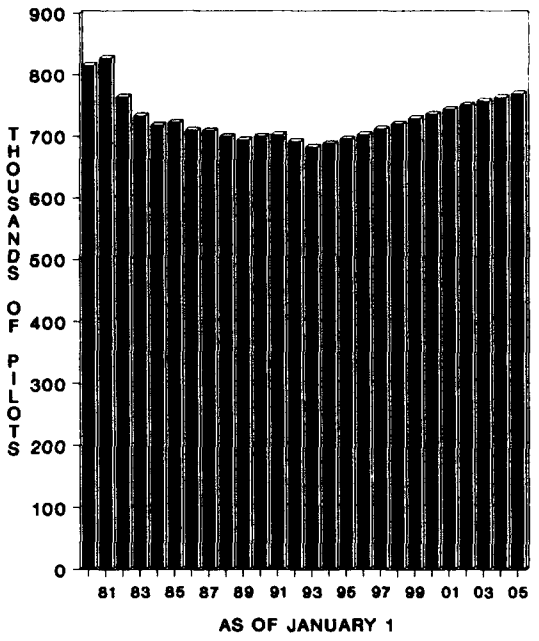


PERCENT BY AIRCRAFT TYPE

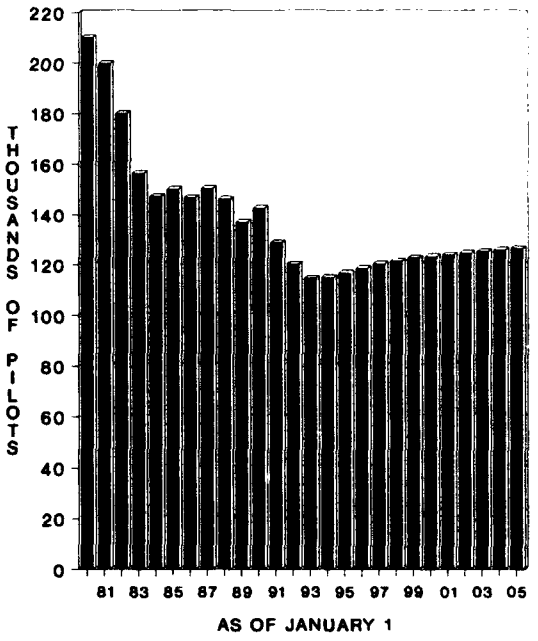


ACTIVE PILOT TRENDS AND FORECASTS

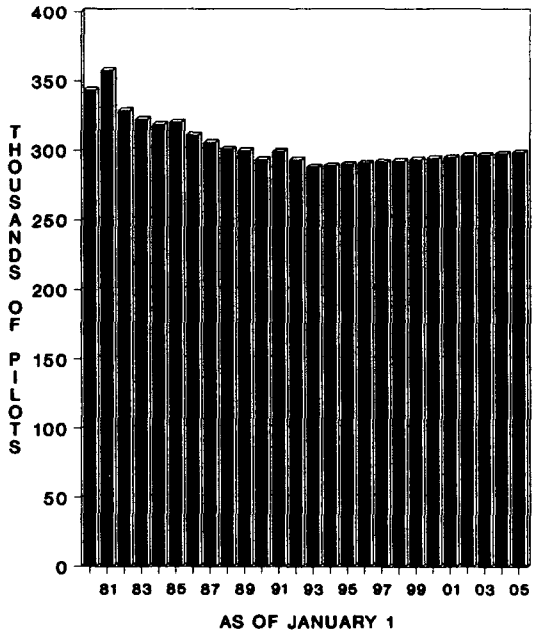
TOTAL PILOTS



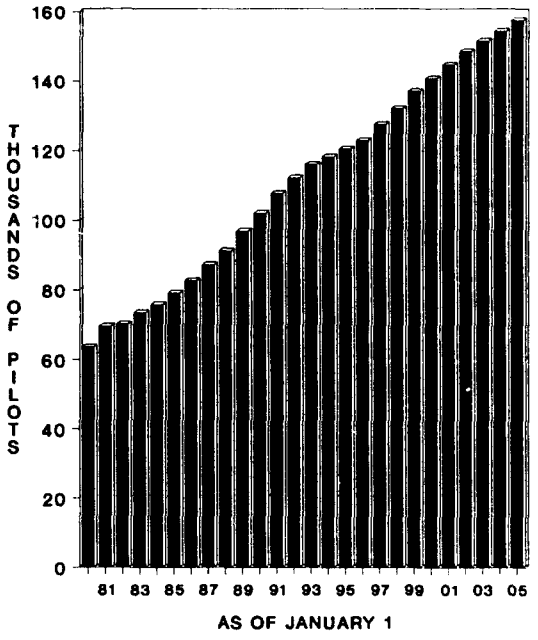
STUDENT PILOTS



PRIVATE PILOTS



AIRLINE TRANSPORT PILOTS



tions that forecast moderate and sustained growth throughout the 12-year forecast period, it has been assumed that the average hours flown per aircraft will gradually return to utilization levels achieved prior to the economic downturn during the 1990s.

Single engine piston aircraft utilization is forecast to increase from 121.3 hours in 1992 to 133.6 in 1998, then gradually decline to 127.0 hours in 2005. Multi-engine piston aircraft utilization is forecast to increase gradually (1.6 percent annually) over the forecast period, from 154.1 hours in 1992 to 188.6 hours in 2005.

The average hours flown by turbine-powered aircraft is forecast to increase at an average annual rate of 2.3 percent annually over the forecast period. Turboprop aircraft utilization increases from 302.1 hours in 1992 to 405.3 hours in 2005. Turbojet hours grow from 255.8 to 342.4 over the same time period.

Rotorcraft fleet utilization also increases over the forecast period--piston rotorcraft from 185.5 hours to 212.0 hours (1.0 percent annually) and turbine rotorcraft from 508.3 hours to 607.8 hours (1.4 percent annually).

HOURS FLOWN

Although the active general aviation fleet is expected to decline slightly over the forecast period, the projected increases in aircraft utilization result in an increase in the number of hours flown by general aviation aircraft. Growth in general aviation hours flown is expected to average 1.0 percent annually over the 12-year forecast period, reaching 28.9 million hours in 2005.

Single engine piston aircraft hours flown are forecast to decrease from 17.8 million in 1993 to 16.7 million in 2005, an annual rate of decline of 0.5 percent. Multi-engine piston aircraft hours are expected to increase from 2.9 million in 1993 to 3.3 million in 2005, 1.1 percent annually.

Turbine-powered aircraft hours flown are projected to increase from 2.5 million in 1993 to 4.4 million in 2004, an annual growth rate of 4.8 percent. Turbine rotorcraft hours flown are expected to increase at an annual rate of 4.9 percent over the same time period, from 2.2 million to 3.9 million.

PILOT POPULATION

The total pilot population is forecast to increase to 769,700 by 2005, a 1.0 percent annual growth rate. The number of student and recreational pilots is forecast to increase by 0.9 percent annually over the forecast period, largely in response to a strengthening U.S. economy. This also assumes some growth in general aviation pilot training and flight schools which, in turn, implies future growth in the industry.

The projected growth for selected pilot categories include: private pilots, 0.3 percent annually; commercial pilots, 1.0 percent annually; and airline transport pilots, 2.6 percent annually.

The number of instrument rated pilots is expected to increase from 306,169 in 1993 to 356,100 in 2005, a 1.3 percent annual rate of growth. In 1993, 44.8 percent of all pilots were instrument rated. By 2005, the percentage of instrument rated pilots increases to 46.3 percent. This implies continued increases in the sophistication of the aircraft and pilots using the National Airspace System.

CHAPTER VI
HELICOPTERS

CHAPTER VI

HELICOPTERS

REVIEW OF 1993

SHIPMENTS

Preliminary data for calendar year 1993 indicate that shipments of new U.S. civil helicopters will total 251 units. Compared to the 324 units shipped in 1992, shipments for 1993 declined by 22.5 percent. The value of the shipments totaled $73 million in 1993 compared to $142 million in 1992, or a decline of 48.6 percent.

FLEET AND HOURS FLOWN

Based on the 1992 General Aviation Activity Survey, there were 5,753 active civil rotorcraft in the United States as of January 1, 1993, just over 9.5 percent less than the 6,292 reported as active in 1992.

The number of active turbine helicopters declined 7.3 percent in 1993 from 3,822 to 3,542. The 3,542 turbine helicopters made up 61.6 percent of the active rotorcraft fleet in 1993, up slightly from 60.7 percent in 1992. The number of active piston powered rotorcraft decreased by 10.5 percent in 1993 to 2,211.

Rotorcraft flew an estimated 2.2 million hours in 1993. This represents a decline in total flight hours of just over 8.3 percent compared to 1992. Turbine powered rotorcraft flew an estimated 1.8 million hours. This represents 81.8 percent of the total rotorcraft flight hours in 1993 compared to 79.2 percent in 1992. However, the 1993 turbine hours are 5.3 percent below the level recorded in 1992. The number of hours flown by piston powered rotorcraft totaled 0.4 million 1993. This represents a decline of 20.0 percent compared to 1992.

HELICOPTER FORECASTS

The forecasts of the rotorcraft fleet and flight hours discussed in this section are derived from the general aviation forecasts (see Chapter V), which are prepared using econometric models and time series analyses. Forecasts of helicopter activity are generated by user category (executive, business, personal, etc.) and were combined to obtain the national forecasts. The independent variables used in the estimates include the cost of owning a helicopter, total employment, and the cost of oil and gas relative to other prices. One of the underlying assumptions in applying these models to project future fleet size and flight hours is that the cost of fuel will increase. As this occurs, increased petroleum production and exploration will be more profitable, leading to increased rotorcraft usage, particularly in

off-shore drilling operations. This, together with increased use of helicopters in the general economy, will lead to an increase in the fleet and flight hours.

ACTIVE FLEET

The active rotorcraft fleet is expected to reach 7,600 in 2005. Compared to the 5,753 in 1993, this represents an average annual growth rate of 2.4 percent in the active rotorcraft fleet during the forecast period.

Growth in the active fleet is expected to occur totally in the turbine powered portion of the fleet. The number of turbine powered rotorcraft is expected to reach 5,800 by 2005, an average annual growth of 4.3 percent. In 2005 turbine powered rotorcraft are expected to account for 76.3 percent of the rotorcraft fleet compared to 61.4 percent in 1993. The piston powered portion of the rotorcraft fleet is expected to decline from 2,211 in 1993 to 1,800 in 2005, an average annual decline of 1.7 percent. During the forecast period, the piston portion of the rotorcraft fleet will decline from 38.6 percent in 1993 to 23.7 percent in 2005.

FLIGHT HOURS

The anticipated growth in the active rotorcraft fleet will be accompanied by growth in rotorcraft flight hours, which are expected to increase from 2.2 million in 1993 to 3.9 million in 2005. This represent an average annual growth rate of 4.9 percent.

Given that the growth in the active fleet will occur totally in turbine powered rotorcraft, so too will the growth in flight hours for the active fleet. Turbine powered helicopter flight hours are projected to increase by approximately 94.4 percent during the forecast period, reaching 3.5 million by 2005. This represents an average annual growth 5.7 percent between 1993 and 2005.

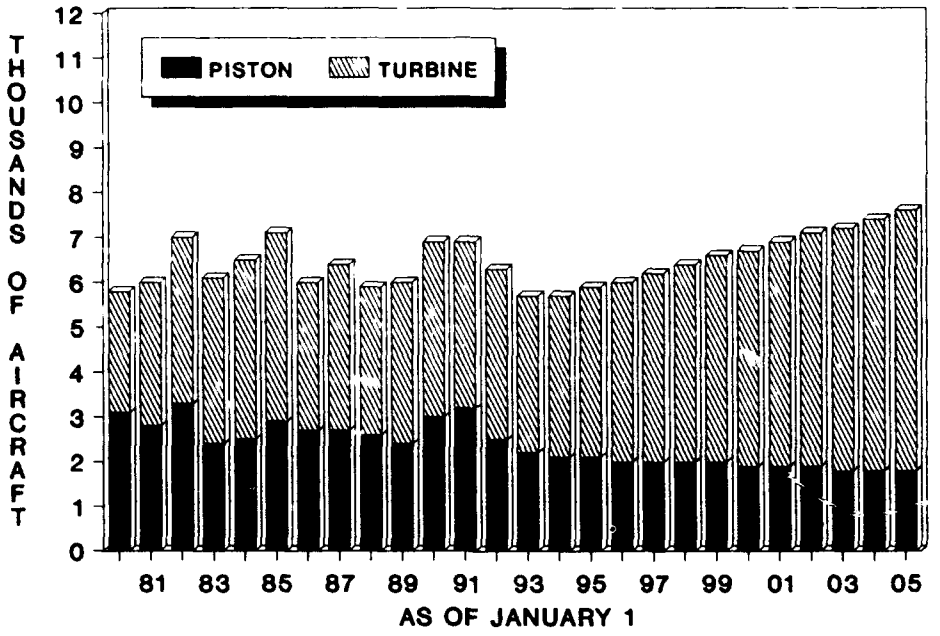
Flight hours for the piston powered portion of the active rotorcraft fleet are expected to remain constant at 400,000 hours throughout the forecast period. Given that the number of active piston powered helicopters is expected to decline during the forecast period, the projected stability in flight hours reflects an increasing level of utilization of the active piston powered portion of the rotorcraft fleet.

FUEL CONSUMED

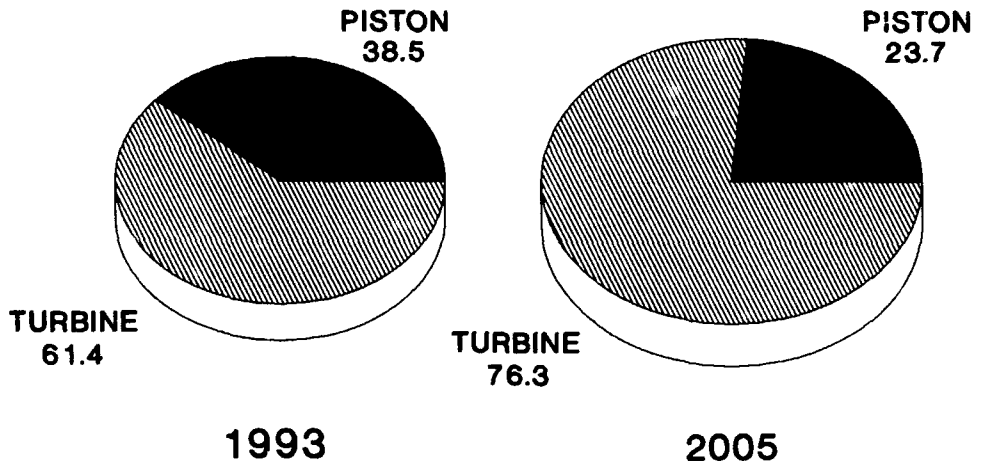
In 1993, fuel consumption by rotorcraft was estimated to have totaled 74.2 million gallons, a decrease of 5.7 percent compared to 1992. Piston powered helicopters consumed 5.2 million gallons, while turbine powered helicopters consumed 69.0 million gallons. By 2005, fuel consumption by rotorcraft is projected to total 137.7 million gallons, 85.6 percent higher than the 1993 level. This represents an average annual growth in fuel consumed of 5.3 percent during the forecast period.

The growth in rotorcraft fuel consumption is expected to come totally from the growth in use of turbine powered helicopters. Fuel consumed by turbine powered helicopters is forecast to reach 132.7 million gallons by 2005, an average annual growth rate of 5.6 percent. Fuel consumed by piston powered helicopters is expected to decline slightly to 4.9 million gallons in 2005.

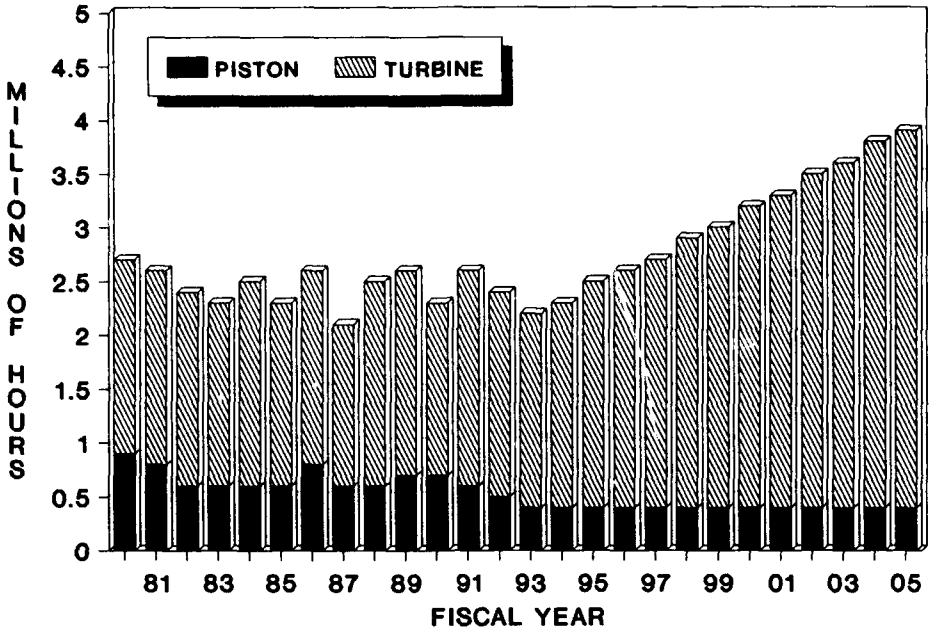
ACTIVE ROTORCRAFT



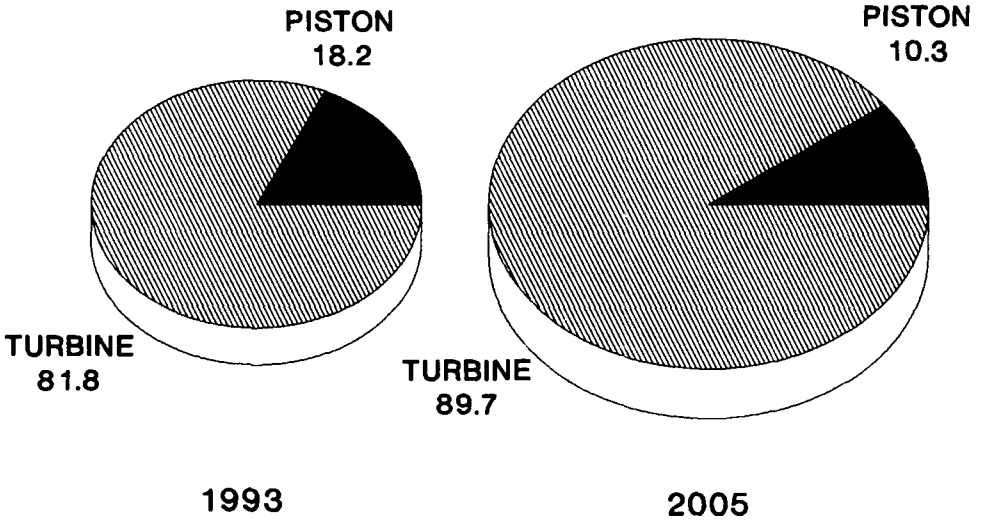
PERCENT BY AIRCRAFT TYPE



ROTORCRAFT HOURS FLOWN



PERCENT BY AIRCRAFT TYPE



CHAPTER VII

FAA WORKLOAD MEASURES

CHAPTER VII

FAA WORKLOAD MEASURES

The FAA provides the aviation community with three distinct air traffic services: (1) air traffic control tower service at selected airports (402 in fiscal year 1993); (2) traffic surveillance and aircraft separation by air route traffic control centers (22 in fiscal year 1993); and (3) flight planning and pilot briefings at flight service stations (172 in fiscal year 1993). All four aviation system user groups--air carriers, commuters/air taxis, general aviation, and military--use these FAA operational services to enhance the flow and safety of aviation traffic.

Because the four aviation system user groups differ in the demands they impose on the air traffic system, multiple indicators are used to describe the total FAA operational workload. No single measure typifies past trends or future demand for the services provided by the FAA. There have been, and will continue to be, different socioeconomic forces driving the growth of each of the aviation-user categories.

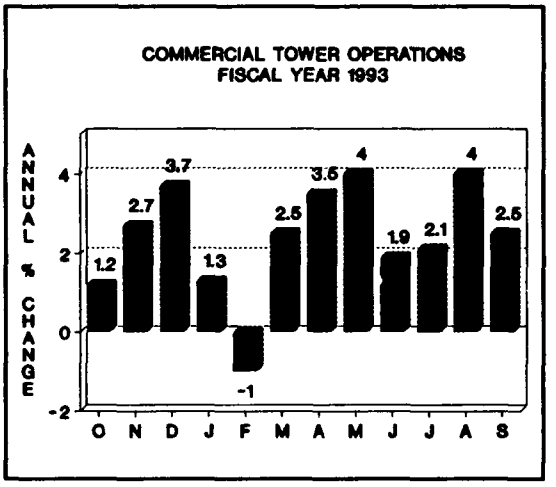
REVIEW OF 1993

FAA TOWER ACTIVITY

Aircraft activity at the 402 FAA towered airports totaled 60.1 million operations in fiscal year 1993, down 2.2 percent from fiscal year 1992. During the last decade (1984 to 1993), towered airport activity has registered increases in all but the last 3 years.

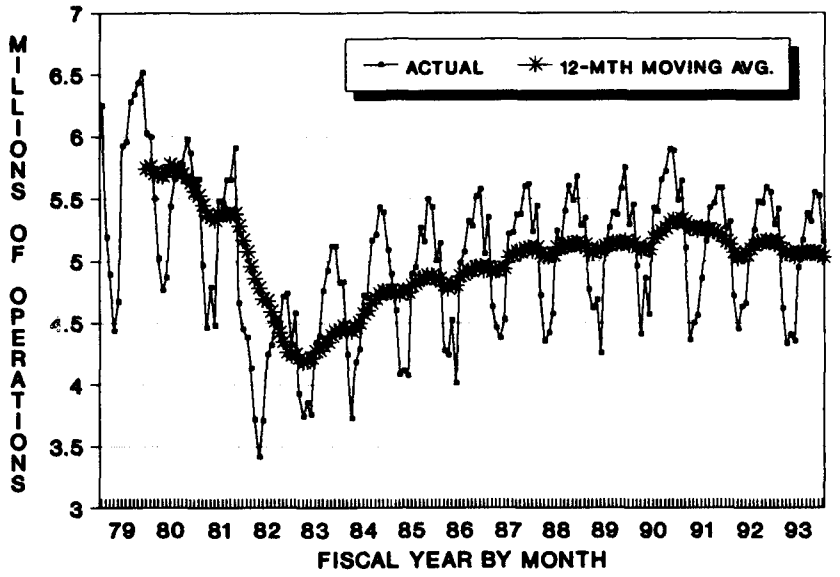
The level of activity recorded at FAA towered airports in 1993 remains 6.1 percent below the operation counts recorded (64.0 million) during the 12-month period immediately preceding the August 1981 air traffic controllers' strike (hereafter referred to as the pre-strike period).

Since 1982, there has been strong demand for commercial aviation services. Commercial activity (the sum of air carrier and commuter/air taxi operations) is up 57.4 percent (3.9 percent annually) since 1982. Commercial

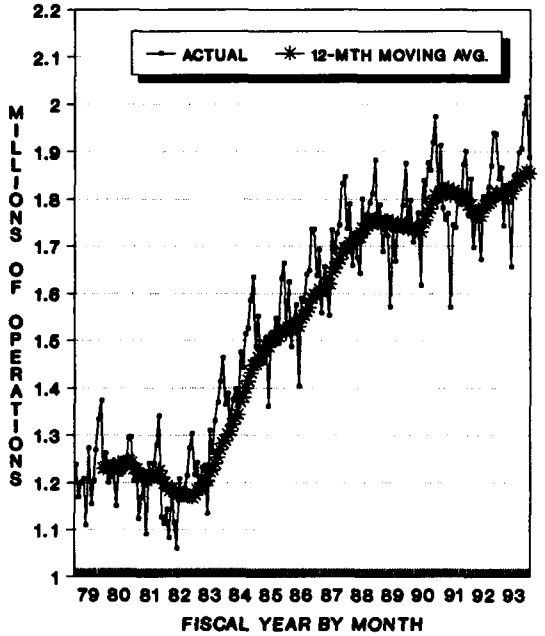


TOWERED AIRPORT OPERATIONS
ACTUAL AND 12-MONTH MOVING AVERAGE

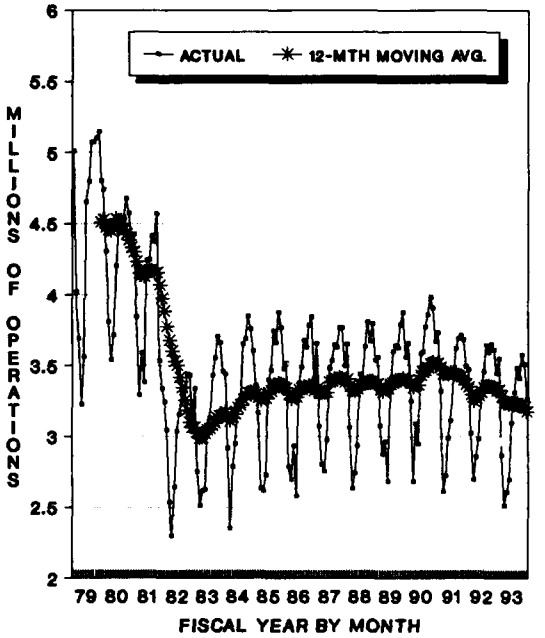
TOTAL OPERATIONS



COMMERCIAL OPERATIONS



NONCOMMERCIAL OPERATIONS

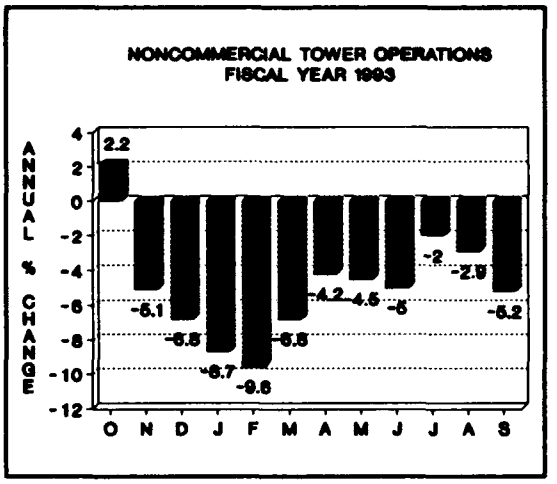


activity increased 2.4 percent in 1993, based on moderate growth in air carrier activity and air taxi activity. Air carrier activity at FAA towered airports (12.6 million operations), while it reflects a moderate increase, is still down some 3.8 percent from the high reached in 1987 (13.1 million).

Much of the decline since 1987 is due to the bankruptcy and liquidation of three commercial air carriers: Eastern Air Lines in January 1991 (4.2 percent of air carrier operations in fiscal year 1990), Pan American Airways in December 1991 (1.8 percent of air carrier operations in FY-91), and Midway Airlines, also in December 1991 (1.6 percent of air carrier operations in FY-91). This factor alone is estimated to have reduced the number of air carrier operations at FAA towered airports by approximately 385,000 operations (3.1 percent) in 1991 and beyond. Capacity cutbacks by other carriers in 1993 as part of efforts to reduce costs have reduced operation counts still further.

Commuter/air taxi activity increased by 4.0 percent in fiscal year 1993 and continues to be the fastest growing of all user groups. Its activity level has increased in every year since the user category was designated in 1972. During the past decade, commuter/air taxi activity at FAA towered airports has grown at an average annual rate of 3.8 percent, from 6.6 million operations in fiscal year 1984 to 9.7 million in 1993. Much of this growth is the result of commuter code-sharing and schedule tie-in agreements with the larger commercial air carriers.

Noncommercial activity (the sum of general aviation and military operations), on the other hand, has decreased by 2.3 percent (-0.2 percent annually) during the past decade. In fiscal year 1993, noncommercial activity totaled 37.9 million operations, down 4.7 percent from 1992 activity.



After recording increased activity counts in six of the nine years following the 1981 air traffic controllers strike, general aviation activity has declined for three consecutive years. General aviation activity totaled 35.2 million operations in fiscal year 1993, a 8.8 percent decline from 1990 and a 4.0 percent decline from 1992. In fact, the 1993 operations count was only 74.7 percent of general aviation's pre-strike level of 47.1 million operations.

After increasing by 7.8 percent during the 1989-90 time period, the number of local general aviation operations (14.9 million) has declined 9.6 percent during the past 3 years, down 5.8 percent in fiscal year 1993, reflecting a weak U.S. economy and the resultant decline in student training. Itinerant general aviation operations declined by 4.2 percent in fiscal year 1993 to 20.4 million, reflecting a decline in corporate business flying as a result of continued slow U.S. economic growth. Itinerant operations in 1993 were at 74.2 percent of pre-strike activity levels (27.5 million), while local operations were at 77.2 percent of the pre-strike level (19.3 million).

Military operations totaled 2.6 million in fiscal year 1993, a 5.7 percent decrease from 1992 activity levels.

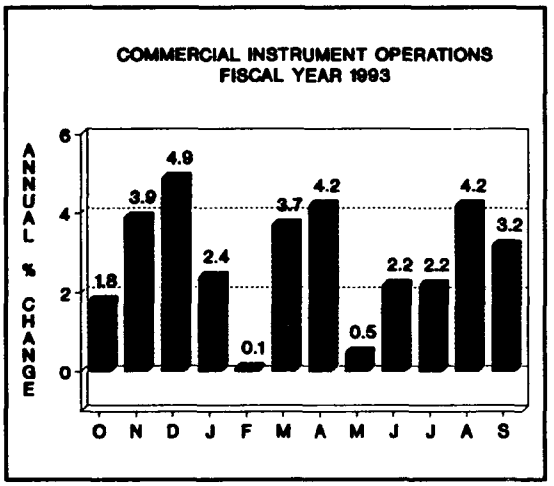
Local military operations were down 4.3 percent in 1993 at 1.2 million, while itinerant military operations decreased by 6.7 percent to 1.4 million.

INSTRUMENT OPERATIONS

Instrument operations handled at FAA towers totaled 45.7 million in fiscal year 1993, 0.1 percent above the 1992 activity level and 17.8 percent above the level of activity recorded in the pre-strike period (38.8 million). Much of the increase in instrument operations during the past decade (up 22.0 percent) can be attributed to the increase in commercial activity (up 38.2 percent) and to commuter code-sharing and schedule tie-in agreements with the larger commercial airlines.

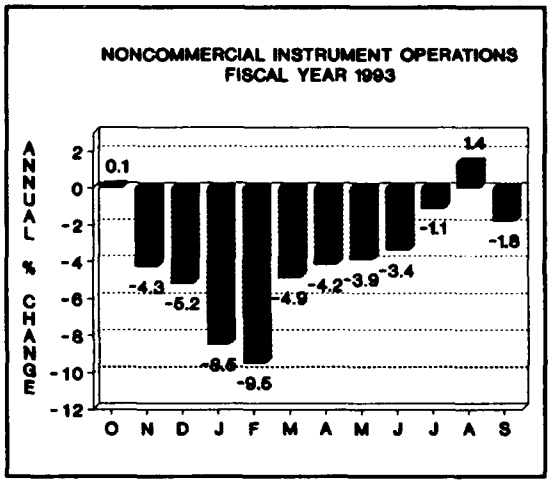
Commercial aircraft activity (24.1 million operations) increased by 3.3 percent in fiscal year 1993. Air carrier instrument operations totaled 13.6 million, up 1.5 percent in fiscal year 1992, but down 2.9 percent from 1990.

Of course, air carrier instrument activity counts since 1991 were affected by the liquidation of Eastern, Pan American, and Midway, as discussed above. It is estimated that these shutdowns reduced air carrier instrument operation counts by almost 800,000 per year (3.0 percent) during each of the past 3 years.



Commuter/air taxi instrument operations at FAA towered airports totaled 10.4 million in fiscal year 1993, up 5.8 percent over 1992 activity levels.

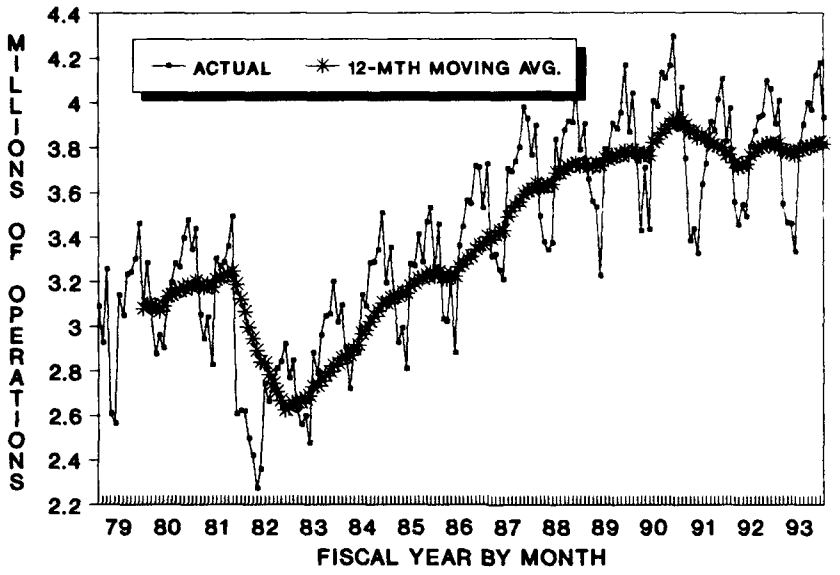
Noncommercial instrument operations (21.6 million) decreased 3.1 percent in fiscal year 1993 but are up 8.0 percent (0.8 percent annual growth) during the past decade. General aviation activity totaled 17.7 million in 1993, 2.5 percent lower than the activity level recorded in 1992. However, general aviation activity increased 10.0 percent during the past 10 years. Most of the increase in general aviation activity since 1982 can be attributed to the formation of Airport Radar Service Areas (ARSAs) at 137 locations in the United States. Under the previous Terminal Radar Service Area (TRSA) concept, general aviation aircraft could enter the TRSA without communicating with and without being counted by air traffic control (ATC). Under the ARSA concept all aircraft must be in contact with ATC, and, hence, are now counted.



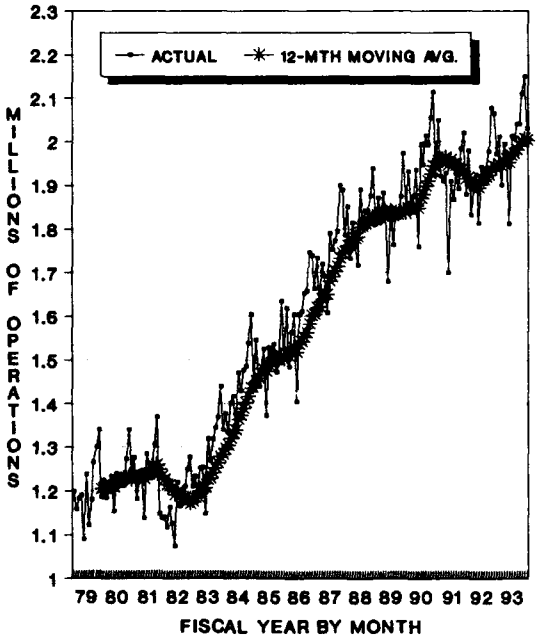
Military instrument operations totaled 3.9 million in fiscal year 1993, down 6.2 percent from 1992 operation counts.

INSTRUMENT OPERATIONS
ACTUAL AND 12-MONTH MOVING AVERAGE

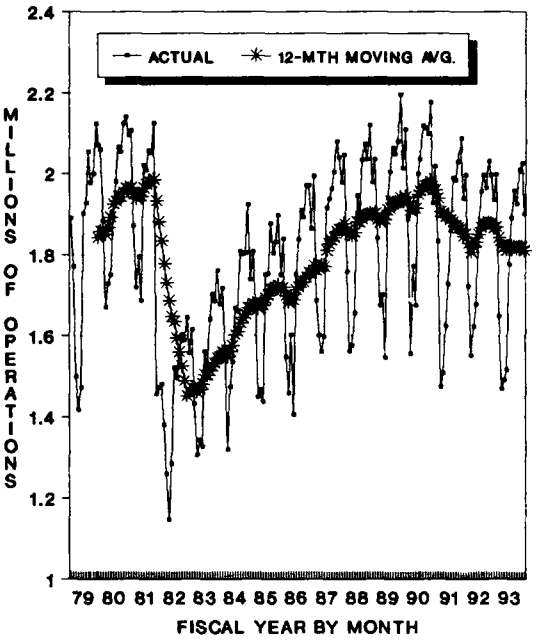
TOTAL OPERATIONS



COMMERCIAL OPERATIONS

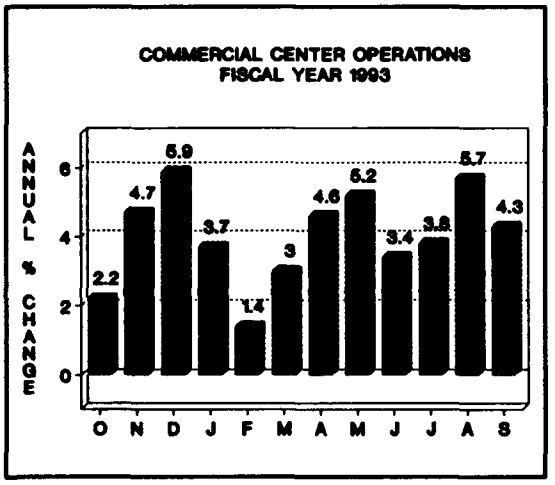


NONCOMMERCIAL OPERATIONS



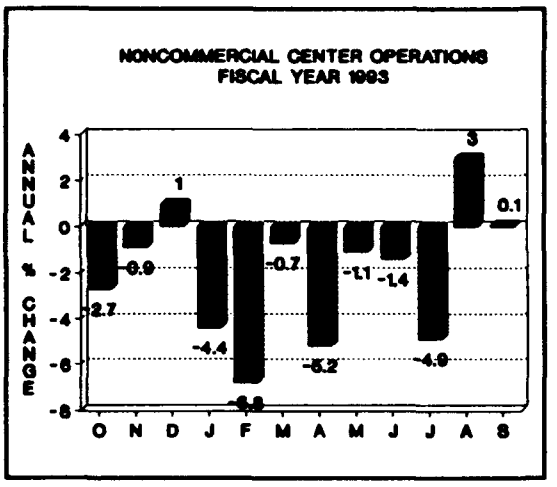
CENTER ACTIVITY

In fiscal year 1993, the number of aircraft flying under instrument rules handled by FAA air route traffic control centers totaled 37.5 million, an increase of 2.0 percent over 1992 activity counts. The increase at en route centers in the last 10 years (up 18.4 percent) can be attributed to the growth in commercial aviation activity (up 35.7 percent). The number of commercial aircraft handled at the centers (25.2 million) increased 4.0 percent in fiscal year 1993. The number of air carrier aircraft handled totaled 19.0 million, while the number



of commuter/air taxi aircraft handled totaled 6.2 million (up 5.9 percent). Again, the liquidations of Eastern, Pan American, and Midway depressed both air carrier and commuter/air taxi center activity counts for the period after 1991.

The number of noncommercial aircraft handled (12.3 million) was down 2.0 percent in fiscal year 1993. The number of general aviation aircraft handled totaled 7.4 million, while military activity totaled 4.8 million. Military activity had stabilized at 5.1 million in 1991 and 1992, and the decline in 1993 appears to result from a general cutback in military activity levels.



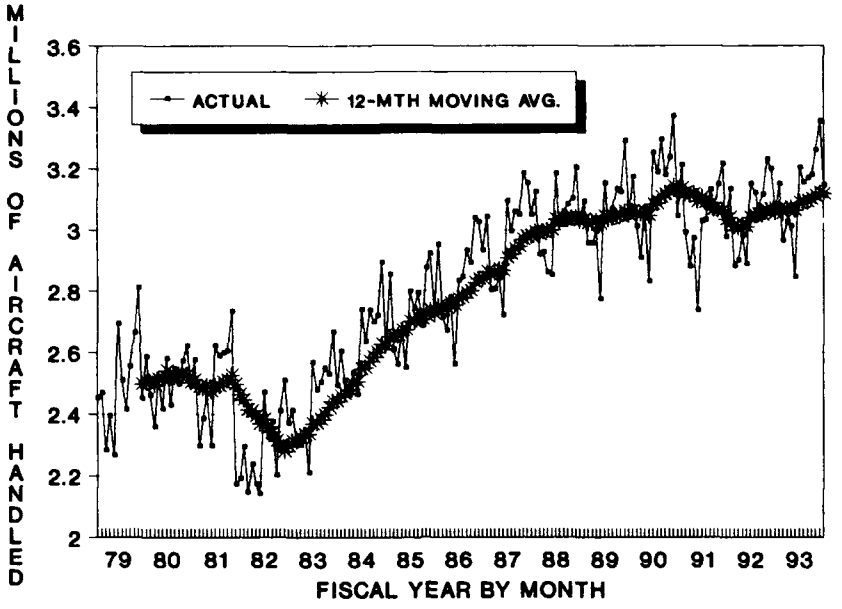
FLIGHT SERVICE STATION ACTIVITY

Pilot briefings, the filing of flight plans, and aircraft contacts by flight service stations (FSSs) totaled 37.2 million in fiscal year 1993, a decline of 6.3 percent from 1992 activity levels. Activity declined in each of these categories. The number of aircraft contacted dropped 7.3 percent to 5.1 million, the number of pilot briefings declined 7.5 percent to 9.9 million, and the number of flight plans originated decreased 3.1 percent to 6.2 million.

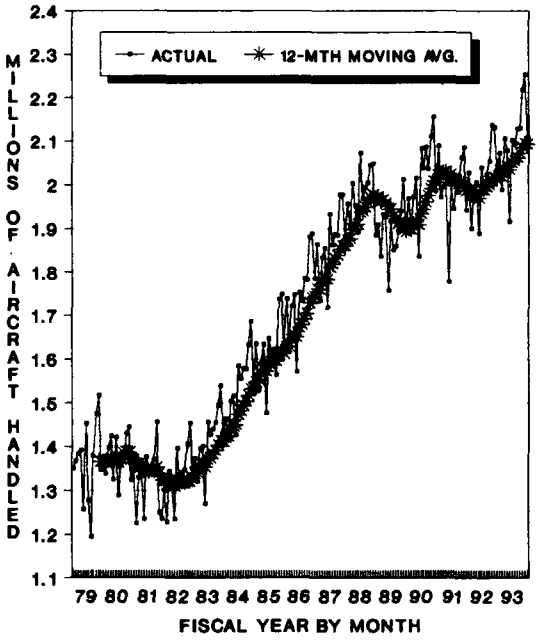
However, the FAA also provides automated flight services, which supplement FSS activity. The Direct User Access Terminal System (DUATS) provides an alternative to the FSS for obtaining pilot briefing information and filing flight plans. Use of this service, introduced in February 1990, is growing. If the services provided through DUATS are included with traditional FSS services, total flight plans filed have decreased by only 1.4 percent and pilot briefs have increased 2.1 percent. Thus, the total flight services provided by the FAA in 1993 were unchanged from 1992 (see graph below).

IFR AIRCRAFT HANDLED
ACTUAL AND 12-MONTH MOVING AVERAGE

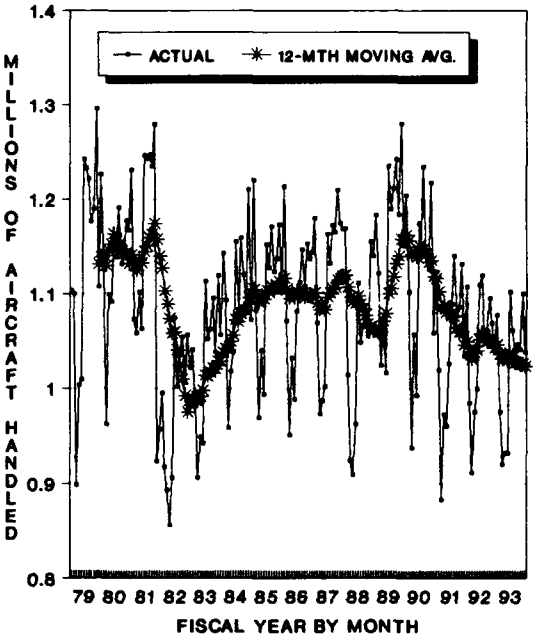
TOTAL AIRCRAFT HANDLED

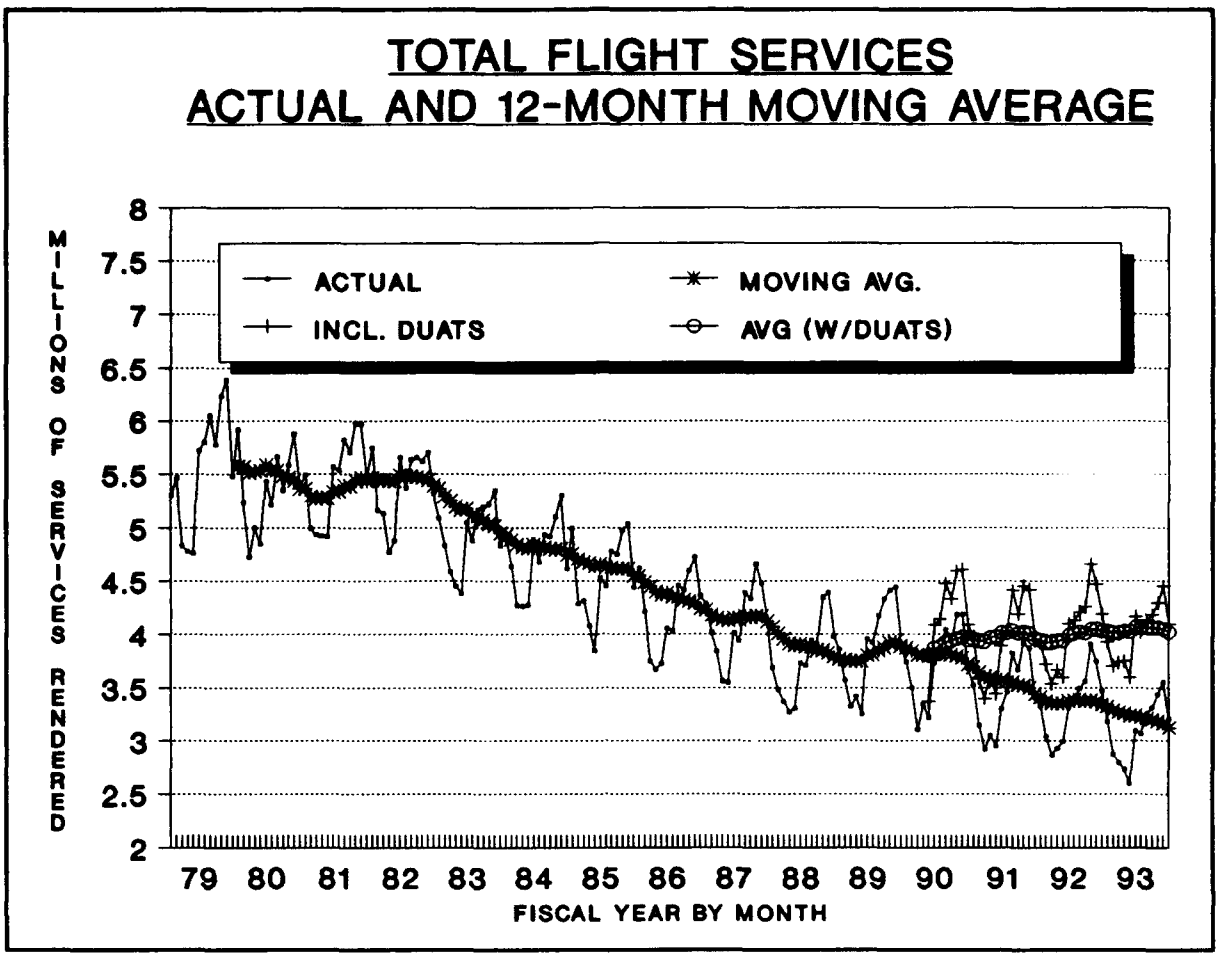


COMMERCIAL AIRCRAFT HANDLED



NONCOMMERCIAL AIRCRAFT HANDLED





At the end of fiscal year 1993, there were a total of 59 automated flight service stations (AFSSs) and 74 flight service stations. During 1993, a total 39 FSSs were consolidated with their respective AFSSs.

CONTRACT TOWERS

The FAA currently contracts out "low activity towers," and the operation counts at these locations are not included in the FAA tower workload measures. There were 27 contract towers in operation during fiscal year 1993, the same as in 1991.

Operations at contract towers totaled over 1.7 million in fiscal year 1993, an increase of 6.2 percent over 1992. General aviation accounted for the vast majority (83.6 percent) of the activity at these contract towers, about the same as the level of activity in 1992. Commuter/air taxi operations totaled 168,200 (up 8.8 percent), while military operations totaled 103,400 (up 11.8 percent). Air carrier activity at contract towers increased 48.0 percent in 1993, although accounting for only 13,300 operations in 1993 (0.8 percent of total contract tower activity).

A listing of the current contract towers can be found in Appendix H. Operation counts for the 402 FAA towered airports and the 25 contract towers, by user group, can be found in the publication FAA Air Traffic Activity FY 1993, compiled by the Statistics and Forecast Branch, Office of Aviation Policy, Plans, and Management Analysis (APO-110), phone (202) 267-3355.

FORECAST ASSUMPTIONS

Forecast growth in FAA workload measures includes not only the demand imposed on the existing National Airspace System, but also aviation activity at new locations not previously provided with FAA services. Aviation activity at contract towers is excluded from the workload measures.

NUMBER OF FAA FACILITIES

One new FAA towered airport, Myrtle Beach, South Carolina (MYR), was commissioned during fiscal year 1993, bringing the total number of FAA towered airports to 402. The current forecast assumes that the number of FAA towered airports will remain constant at the 1993 level of 402 airports throughout the 12-year forecast period.

There are currently 29 Terminal Control Areas (TCAs) and 121 ARSAs. This forecast assumes that there will be three additional TCAs and two additional ARSAs added to the system during the next 2 years. This expansion of controlled airspace is reflected in the forecast for instrument operations at airports with FAA traffic control service.

The number of flight service stations and automated flight service stations totaled 133 at the end of fiscal year 1993: 59 AFSSs and 74 FSSs. Of the remaining FSSs, 43 will be closed and 31 will continue in operation as auxiliary flight service stations in locations of unique weather or operational conditions. This will be in addition to the 61 fully consolidated AFSSs. The current schedule calls for all 61 automated AFSSs to be commissioned and fully consolidated by 1994.

EXTERNAL FACTORS

Despite projections of moderate to strong growth in the U.S. economy and in activity levels at FAA facilities, there is uncertainty associated with these forecasts. A number of external events could significantly alter the short-term environment and cause the activity levels to be significantly lower than those forecast.

In 1994, the course of the U.S. economy and the financial health of the U.S. air carrier industry are still to be resolved. While one U.S. air carrier is operating in Chapter 11 bankruptcy, it seems to have a reasonably good chance of emerging from bankruptcy. However, the industry is not yet in good overall financial condition, and one or more carriers may still have major difficulty controlling costs. Should one or more of these carriers be forced into liquidation, it would significantly reduce aircraft activity at FAA facilities, both in total, but more significantly, at those airports and hubs currently served by those carriers.

In addition, a number of U.S. air carriers--most notably American, Delta, Northwest, and United--have significantly reduced their capital expansion/acquisition plans, especially in the short term. This has resulted in the cancellation of some aircraft orders and options and in the delay of significant numbers of aircraft deliveries until the mid to late 1990s. As a result, fewer aircraft are expected to enter the U.S. air carrier fleet during the early years of the forecast period, compared to deliveries in the last few years. Lowered deliveries of air carrier aircraft in the short run make for slow growth in air carrier activity levels during the early years of the forecast period.

If the air carriers' current capital acquisition plans are reduced or delayed further, this could reduce the growth in air carrier activity levels at FAA air traffic facilities. Of course, should both U.S. economic growth and passenger demand exceed expectations, thereby resulting in improved air carrier finances, current capital acquisition plans could be revised upward. This, in turn, could result in relatively higher air carrier activity levels.

One additional factor to be considered is the impact of the phase-out of air carrier stage-2 aircraft on regional/commuter carriers' activity levels. As stage-2 aircraft are phased out of the air carrier fleet, it is expected that some of the larger carriers may elect to transfer the routes formerly served by these aircraft to their code-sharing partners. Should the number of route transfers greatly exceed current expectations, regional/commuter operations at FAA air traffic facilities could be higher than currently forecast. Conversely, air carrier operations would be lower.

WORKLOAD FORECASTS

FAA TOWER ACTIVITY

Activity at FAA towered airports is expected to exceed the pre-strike level of 64.0 million operations in 1997 and to exceed the 1979 all-time peak (69.0 million) in 2001.

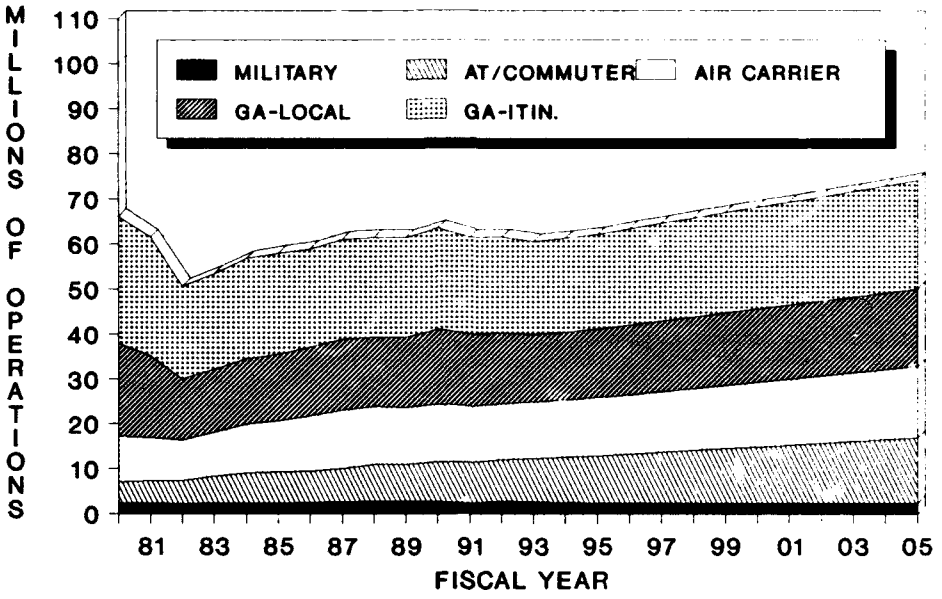
Operations at FAA towered airports are forecast to increase by 1.8 percent (to 61.2 million) in fiscal year 1994. The growth in 1994 is in large part due to the expected recovery in the U.S. economy (GDP up 2.9 percent) from the relatively slow growth experienced during the last several years. This is expected to provide the impetus for a recovery of both commercial activity and corporate business flying. In addition, the economic recovery is expected to spur a recovery in student/pilot training.

As the U.S. economic recovery gathers momentum during 1995 and 1996, so will activity at FAA towered airports. FAA tower activity is forecast to increase to 62.1 million operations (up 1.5 percent) in 1995 and to 63.4 million operations (up 2.1 percent) in 1996. During the 12-year forecast period, operations at FAA towered airports are projected to increase by 1.7 percent annually. In absolute numbers, towered operations are projected to total 74.1 million in fiscal year 2005.

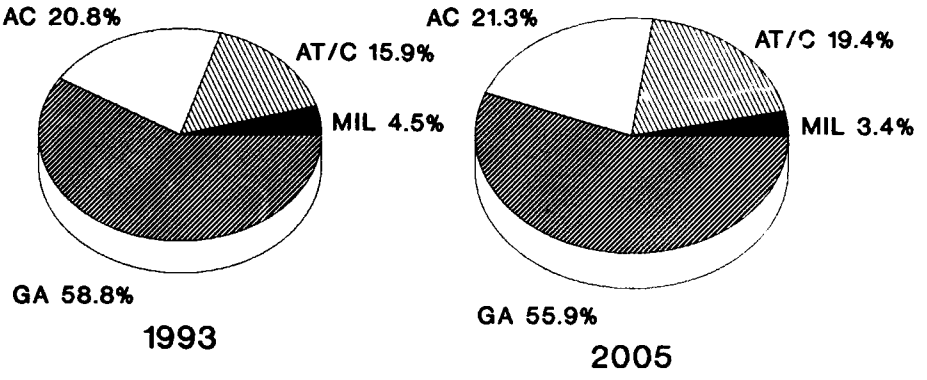
The mix of aircraft using FAA towered airports is expected to remain approximately the same, as the combined total of general aviation and commuter/air taxi operations (i.e., operations performed by smaller aircraft) is expected to grow by about 23.5 percent while the number of air carrier operations is expected to increase 25.4 percent. The combined activities of general aviation and commuters/air taxis are expected to account for 75.3 percent of total tower operations in fiscal year 2005, up only slightly from a 74.7 percent share in 1993. Air carrier operations share of towered airport activity is expected to increase at a similar pace during the forecast period, from 20.9 percent in 1993 to 21.3 percent in fiscal year 2005.

The forecasted activity levels and average annual growth rates for each aviation user group from the year 1993 to the year 2005 are: commuter/air taxi, from 9.7 to 14.4 million operations (3.4 percent annual growth); air carrier, from 12.6 to 15.8 million operations (1.9 percent); and general aviation, from 35.2 to 41.4 million operations (1.0 percent). Itinerant general aviation operations are forecast to increase from 20.4 to 24.1 mil-

AIRCRAFT OPERATIONS AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE



DISTRIBUTION OF WORKLOAD BY USER GROUP



lion operations (1.3 percent annually) and local general aviation operations from 14.9 to 17.3 million operations (1.2 percent annually). Military operations are expected to drop by 100,000 operations in both 1994 and 1995, leveling off at 2.4 million operations yearly thorough 2005.

Commercial aircraft activity at FAA towered airports is expected to grow at an average annual rate of 2.6 percent during the 12-year forecast period, from 22.2 to 30.2 million. Noncommercial activity is forecast to increase from 37.9 million in 1993 to 43.9 million in fiscal year 2005, an average annual increase of 1.1 percent.

INSTRUMENT OPERATIONS

Instrument operations are forecast to grow by 1.3 percent in 1994, by 1.7 percent in 1995, and by 2.1 percent in 1996. During the 12-year forecast period, instrument operations are expected to increase at an average annual rate of 1.9 percent, growing from a total of 45.7 million operations in 1993 to 57.1 million operations in fiscal year 200›

The mix of instrument operations is not expected to change dramatically during the forecast period. The number of commuter/air taxi and general aviation operations performed by smaller aircraft will increase only slightly more than the number of operations performed by the larger, more sophisticated air carrier aircraft (29.4 versus 26.5 percent). By fiscal year 2005, 63.2 percent of all instrument operations are expected to be performed by commuter/-air taxi and general aviation aircraft, up from 61.3 percent in 1993.

The projected activity levels and average annual growth rate for each user group from the year 1993 to 2005 are: commuter/air taxi, from 10.4 to 15.1 million operations (3.2 percent annually); air carrier, from 13.6 to 17.2 million operations (2.0 percent annually); and general aviation, from 17.7 to 21.0 million operations (1.5 percent annually). Military activity is expected to decrease by 100,000 operations in both 1994 and 1995, and to remain at that level (3.8 million) through 2005.

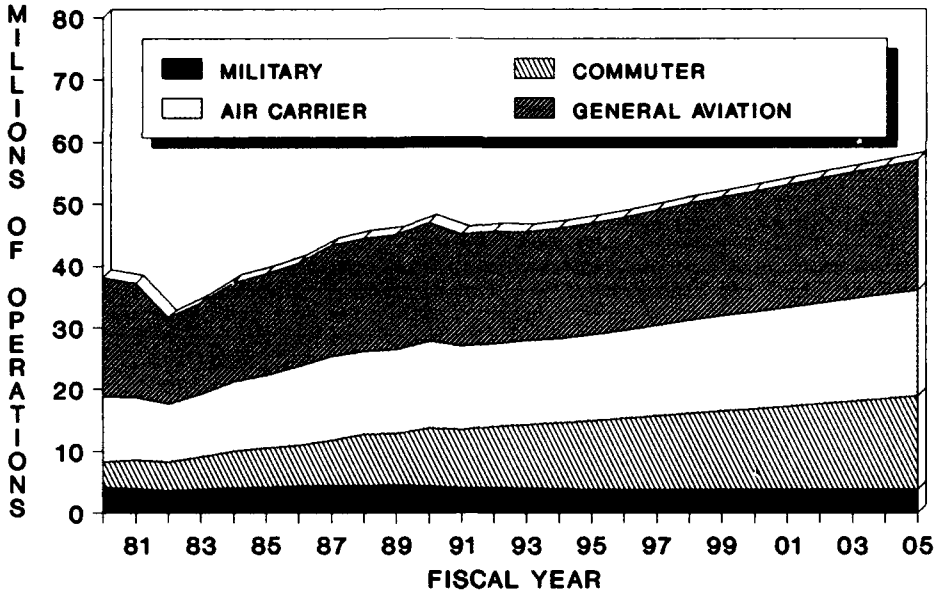
During the 12-year forecast period, commercial activity is expected to increase at an average rate of 2.5 percent annually, from 24.1 to 32.3 million. Noncommercial activity is forecast to increase from 21.6 million in 1993 to 24.8 million in fiscal year 2005, an average annual growth rate of 1.2 percent.

CENTER ACTIVITY

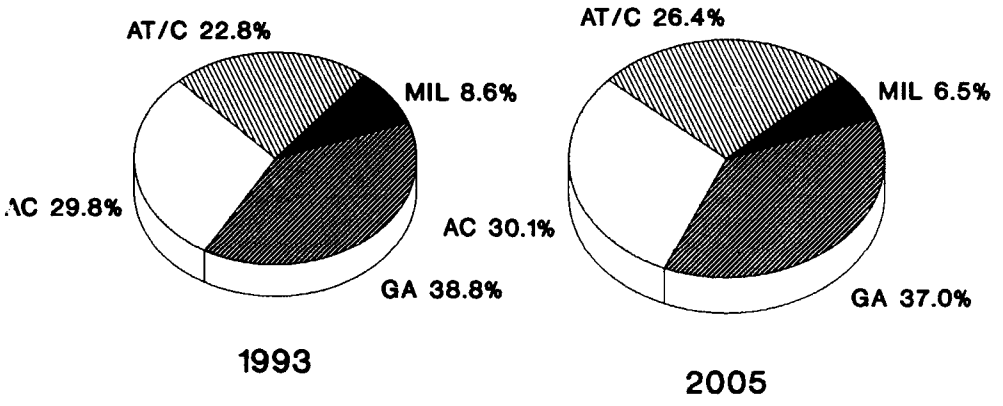
The workload at FAA air route traffic control centers is expected to exhibit relatively moderate growth during the early years of the forecast period, increasing by 1.3 percent in 1994, 1.9 percent in 1995, and 2.1 percent in 1996. During the 12-year forecast period, the number of aircraft handled at en route centers is forecast to increase at an average annual rate of 1.8 percent. In absolute numbers, the center workload is forecast to increase from 37.5 million aircraft handled in 1993 to 46.5 million in fiscal year 2005.

Commercial aircraft activities' share of center workload is forecast to increase from 67.3 percent in 1993 to 71.2 percent in 2005. Between 1993 and the year 2005, the air carrier share is forecast to increase from 50.7 percent to 51.4 percent. The commuter/air taxi share is expected to increase from 16.6 percent to 19.8 percent during the same time period.

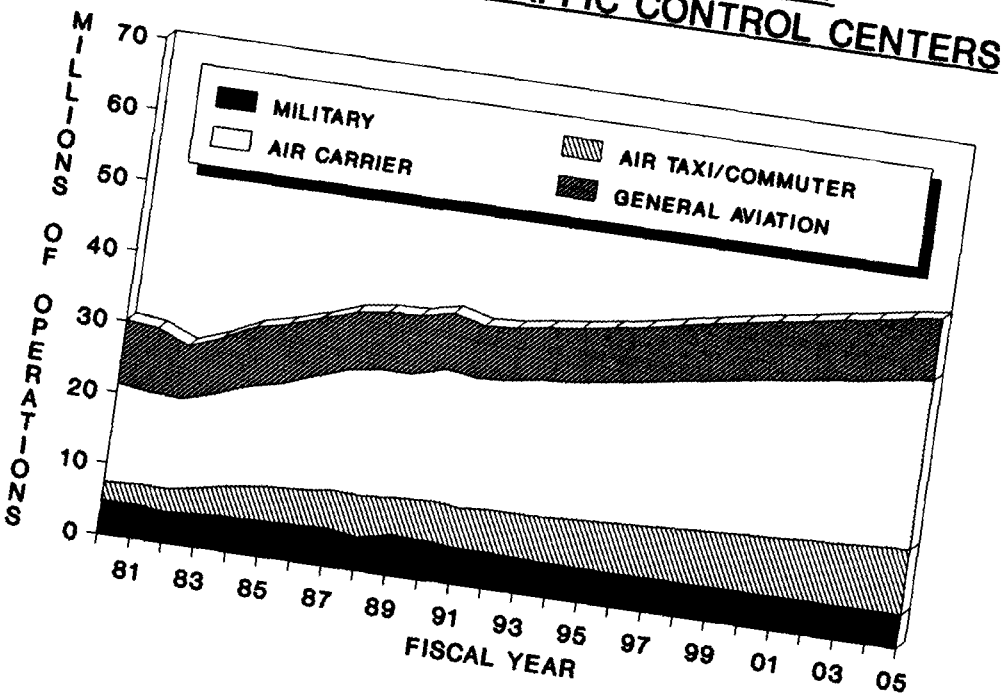
INSTRUMENT OPERATIONS AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE



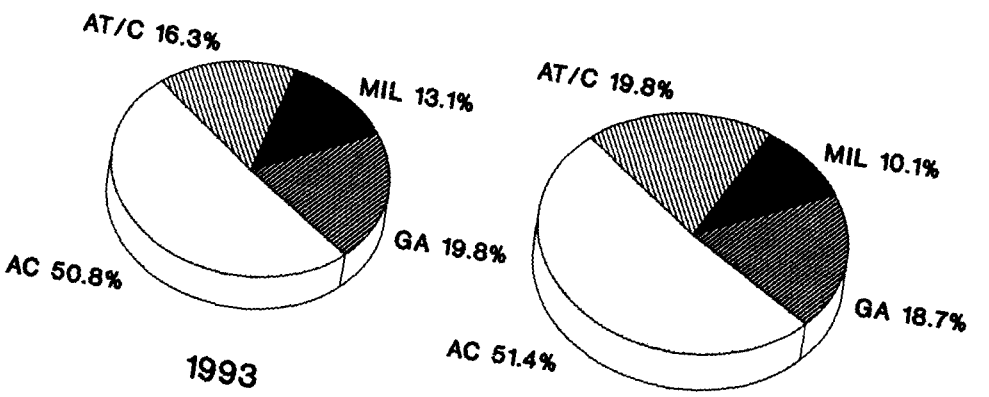
DISTRIBUTION OF WORKLOAD BY USER GROUP



IFR AIRCRAFT HANDLED AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS



DISTRIBUTION OF WORKLOAD BY USER GROUP



The projected activity levels and average annual growth rates for each user group from 1993 to 2005 are: commuter/air taxi, from 6.2 to 9.2 million aircraft handled (3.5 percent annual growth); air carrier, from 19.0 to 23.9 million aircraft handled (1.9 percent annually); and general aviation, from 7.4 to 8.7 million aircraft handled (1.4 percent annually). The number of military operations is expected to drop by 100,000 operations in 1994 and 1995, then remain level at 4.7 million for the balance of the forecast period.

Commercial activity is expected to grow at an average annual rate of 2.4 percent during the 12-year forecast period, from 25.2 to 33.2 million. Noncommercial activity is forecast to increase by 0.7 percent annually, from 12.3 million in 1993 to 13.4 million in fiscal year 2005.

Forecasts for individual centers are available upon request from the Statistics and Forecast Branch, Office of Aviation Policy, Plans, and Management Analysis (APO-110), phone (202) 267-3355.

FLIGHT SERVICE STATION ACTIVITY

Forecast

Total traditional (non-automated) flight services originating at FAA flight service stations are projected to decline throughout the forecast period. In absolute numbers, the number of total flight services is expected to decline to 36.1 million (down 3.0 percent) in 1994, to 35.8 million (down 0.8 percent) in 1995, and to 35.6 million (down 0.6 percent) in 1996.

By the end of the forecast period, 2005, total flight services provided by the FAA flight service stations is projected to total 34.0 million (an average annual decline of 0.7 percent).

Non-automated Service

The number of pilot briefings is forecast to decline to 9.6 million (down 3.8 percent) in 1994, 9.5 million (down 1.0 percent) in 1995 and 1996. Again, pilot briefings are projected to continue to decline throughout the forecast period, declining to 9.1 million in 2005 (an average annual rate of decline of 0.7 percent).

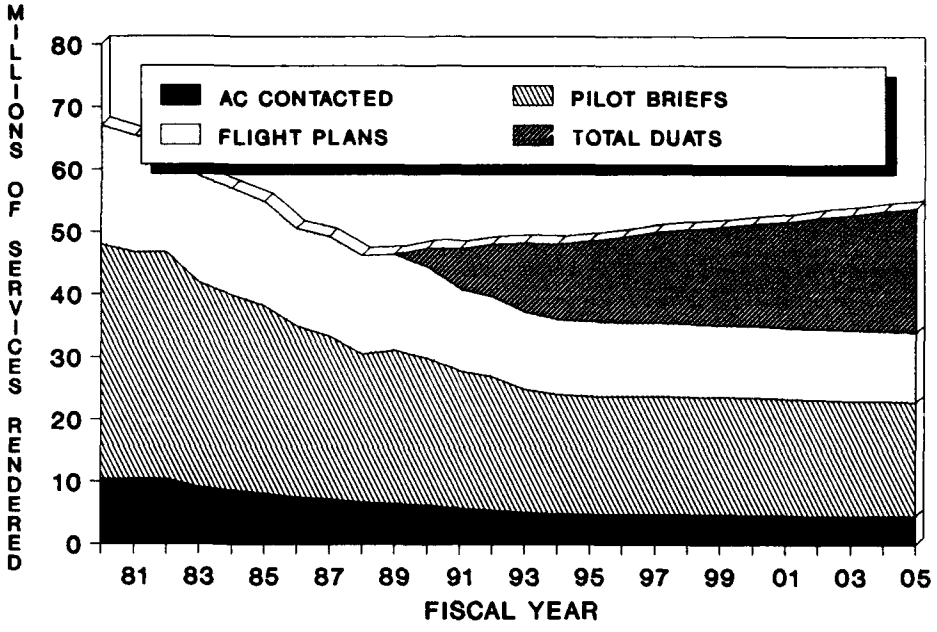
The number of flight plans originated is projected to decline to 6.0 million (down 3.2 percent) in 1994 and 1995, and to 5.9 million (down 1.7 percent) in 1996. During the balance of the forecast period, flight plans originated through FAA flight service stations is also expected to continue to decline. By the year 2005, total flight plans originated are projected to be 5.6 million (a 0.8 percent average annual decline).

The number of aircraft contacted is forecast to decline to 4.9 million (down 3.9 percent) in 1994, and 4.8 million (down 5.8 percent) in 1995 and 1999. Thereafter, the number of aircraft contacted is expected to decline marginally to 4.6 million in 2005 (a 0.9 percent average annual decline).

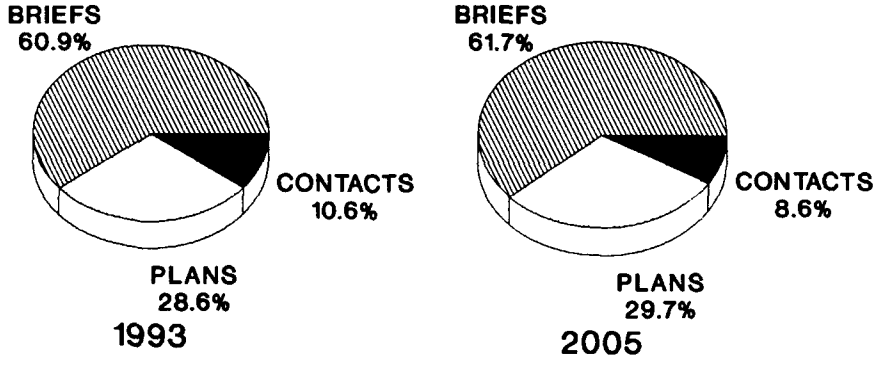
Automated Flight Service Activity Data

The introduction of new technology for flight service applications has significantly changed the operating environment of the flight service system. Viewed in the larger context of the total National Airspace System, the recent workload trends do not necessarily indicate declining demand for

FLIGHT SERVICES ORIGINATED AT FAA FLIGHT SERVICE STATIONS



DISTRIBUTION OF WORKLOAD BY USER GROUP



flight planning services. Rather, they may indicate that demand is being met through increased use of automation and new system capabilities resulting in increased system efficiencies and productivity.

Specifically, several factors resulting from automation will tend to dampen the growth in FSS workload measures, as currently defined. First, pilots can now obtain weather briefings through the Telephone Information Briefing System (TIBS), which does not require contact with a flight service specialist, and is not, therefore, included in the FSS pilot briefings count. Second, private weather briefing vendors, participating in recently implemented memorandums of agreement, can also file flight plans for their customers without going through an FSS. Third, starting February 1990, DUATS became operational. Using DUATS, pilots with access to a computer, modem, and telephone can directly access a national weather data base for weather briefings and flight plan filing without ever going through an FSS.

This automated access may be through the pilot's own computer or through those of fixed-based operators offering the service to their customers. None of the flight planning services provided through the above sources is included in the FSS workload measures.

During fiscal year 1993, there was a total of 4.8 million DUATS transactions (a 32.2 percent increase over 1992). If each transaction involves a weather briefing, this represents 4.8 million pilot briefs. In addition, just over 715,200 flight plans were filed through the DUATS system (up 16.6 percent). Using the weighted total flight services formula (two times pilot briefs plus flight plans filed), this translates into approximately 11.0 million total flight services that are not included in the FAA flight service station workload measure.

In fiscal year 1994, with over 3 years of historical DUATS data, forecasts of total system flight service activity have been developed by source of service--DUATS versus FAA flight service stations.

DUATS transactions are projected to increase from 4.8 million in 1993 to 7.5 million in 2005 (3.8 percent average annual increase). During the same period, flight plans filed through DUATS are expected to increase from just over 715,000 to 2.4 million (a 10.8 percent average annual increase). By the year 2005, total services provided through DUATS are projected to account for 19.8 million flight services, or 36.8 percent of total system services.

Total Flight Services

The continued decline in activity at FAA flight service stations is the result of the continuing process of FSS consolidation, and the growing acceptance and utilization of DUATS services.

Total flight services, including non-automated and automated services, are expected to total 48.1 million in 1994 (down 0.2 percent), 48.6 million in 1995 (up 1.0 percent), and 49.2 million in 1996 (up 1.2 percent). By 2005, total flight services are forecast to reach 53.8 million, an average annual increase of 0.9 percent.

Forecasts for individual flight service stations are available upon request from the Statistics and Forecast Branch, Office of Aviation Policy, Plans, and Management Analysis (APO-110), phone (202) 267-3355.

CHAPTER VIII

FORECAST ACCURACY

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FORECAST ACCURACY

The Federal Aviation Administration has developed forecast models and established a forecast process that attempts to anticipate changes that may affect the future direction of the industry. Using this forecast process, the FAA provides 12-year forecasts of workload measures annually for aviation-related manpower and facility planning. The FAA frequently sponsors workshops to critique techniques and practices currently used by the FAA and other aviation forecasters and to examine the outlook for the aviation industry and its prospects for future growth. The workshops focus on the forecasting process and ways to improve the reliability and utility of forecasting results.

The tables on pages VIII-3 and VIII-4, provide some measure of the accuracy of FAA workload forecasts. The tables compare forecast data for both the short-term and the long-term periods. The short-term period, 1 to 5 years, is the critical period for manpower planning; the long-term period, for 10 years out, is important for facility planning. The two key FAA workload measures employed are instrument operations and aircraft handled.

For short-term trends, the forecast errors normally tend to be small: the 1993 forecast for ARTCC aircraft handled was right on the mark--37.5 million. Although total en route center activity was exactly as forecast, there were relatively large variances among the individual user groups. Military activity was 5.2 percent lower than forecast but commercial activity (the sum of air carrier/ commuter activity) was 1.2 percent higher than predicted. Fortunately, the two forecast errors compensated for one another.

The 10 year out forecast errors are high because of unanticipated external events that have had long-term impacts on the aviation system. Contributing external factors include the Gulf War and the concomitant rise in fuel prices, the outbreaks of terrorism in 1986 and 1991, and the failure of general aviation to respond to the economic recovery of the 1980s. Further, the FAA does not use cyclical economic projections in preparing its long-term forecasts. As a result, the recessions of 1980, 1982, and 1991 were not considered in any of the forecasts prepared prior to 1980.

THE FAA AVIATION FORECASTING PROCESS

INTRODUCTION

The FAA's forecasting process is a continuous and interactive one that involves the FAA Forecast Branch, other FAA Offices and Services, other Govern-

ment agencies, and aviation industry groups. In addition, the process uses various economic and aviation data bases, econometric models and equations, and other analytical techniques.

Forecasting aviation activity is an essential component of the FAA's planning process. The forecasts are used to determine staffing levels and capital expenditures that will be needed to accommodate growth of activity while maintaining a safe and efficient environment. The forecasts are also used for short-term budget preparation, cost-benefit analyses, and safety analyses. The relative importance of the forecasting function in the planning process can be gauged by examining the major changes being made to the airspace infrastructure through the Capital Investment Plan out to the year 2005. These changes are being made, in large part, to accommodate the projected growth in air traffic.

To improve the air traffic control and air navigation systems, the FAA is installing new aircraft landing systems, developing new radar and communication systems, and upgrading the weather services it provides to aircraft operators. Because of the sizeable investments being made in the National Airspace System, it is essential that the FAA develop and use the most accurate and reliable forecasts possible. Thus, the periodic review and evaluation of the forecasting procedures, models, forecast assumptions, and forecast results constitute an essential part of the process.

SYSTEM BACKGROUND

As part of the need to ensure safe and efficient operation of the National Airspace System, FAA operates 402 air traffic control towers, 22 air route traffic control centers, and 133 flight service stations. Many of the nonautomated flight service stations (FSSs) will be absorbed into 59 new automated facilities (AFSSs). However, given the Congressional mandate to implement a system of auxiliary flight service stations in addition to the 59 AFSSs, 31 of the FSSs that were scheduled to be closed will remain open.

FAA facilities perform a large and diverse number of services for the aviation community. The FAA towers provide sequencing and separation services to pilots and aircraft arriving at or departing from individual airport facilities. These services are provided to the various categories of aircraft: air carriers, commuters/air taxis, general aviation, and military. Arrivals and departures (landings and takeoffs) are generally referred to as aircraft operations. Arrivals and departures are further classified as itinerant or local operations depending on the purpose of the flight or the distance between the airports from which the landings and takeoffs were made. These operations are measures of workload or activity at individual airports. The sum of these operations at all towered airports makes up the national count of aircraft operations.

Another important workload measure at FAA towered airports is the number of instrument operations; i.e., aircraft operations performed in accordance with an instrument flight rule (IFR) flight plan, or an aircraft flight where IFR separation between aircraft is provided by the facility. At times, advisory services may be offered to aircraft flying under visual flight rules (VFR). Instrument operations are further subdivided into: (1) primary instrument operations--separations and sequencing services provided to aircraft landing at the airport providing the service; (2) secondary instrument operations--services provided to aircraft landing at a nearby airport; and (3) overs--services provided to aircraft that originate outside the ARTCC area and pass through the area without landing.

FAA INSTRUMENT OPERATIONS FORECAST EVALUATION

Year Being Forecast	Actual Activity (Millions)	Forecast Activity Level (Millions) Published--Years Earlier					
		1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1987	43.4	41.7	42.3	42.3	42.4	44.3	45.9
1988	44.5	45.4	43.0	43.8	43.6	44.2	49.9
1989	45.0	45.8	47.2	44.2	45.7	45.5	53.9
1990	46.8	46.4	47.7	49.1	45.4	47.3	54.2
1991	45.1	47.8	48.0	49.5	50.7	46.4	52.4
1992	45.6	46.1	48.9	49.6	51.3	51.8	51.5
1993	45.7	46.7	47.4	50.1	50.8	52.5	50.3
1994		***45.9***	47.6	48.8	51.4	52.2	52.0
1995			***46.7***	48.9	50.1	52.9	52.2
1996				***47.7***	50.0	51.2	51.7
1997					***48.8***	51.0	57.3
1998						***49.9***	58.5
1999							57.6
2003							***54.9***

Year Being Forecast	Forecast Activity Percent Error Published -- Years Earlier					
	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1987	(3.9)	(2.5)	(2.5)	(2.3)	2.1	5.8
1988	2.0	(3.4)	(1.6)	(2.0)	(0.7)	12.1
1989	1.8	4.9	(1.8)	1.6	1.1	19.8
1990	(0.8)	1.9	4.9	(3.0)	1.1	13.6
1991	6.0	6.4	9.8	12.4	2.9	16.2
1992	1.1	7.2	8.8	12.5	13.6	12.9
1993	2.1	3.7	9.6	11.2	14.9	10.1

Note on how to read this table: In 1992 we forecast 46.7 million operations would occur in 1993. In fact 45.7 million operations were recorded, meaning the forecast was 2.1 percent higher than actual. In 1988 we forecast 47.7 million operations would occur in 1990. This forecast was 1.9 percent higher than actual. The 1993 forecast is shown in bold italics.

FAA ARTCC AIRCRAFT HANDLED FORECAST EVALUATION

Year Being Forecast	Actual Activity (Millions)	Forecast Activity Level (Millions) Published--Years Earlier					
		1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1987	35.8	35.4	35.1	35.0	34.0	34.0	39.6
1988	36.4	37.0	36.6	36.1	36.1	35.1	42.8
1989	36.6	37.2	38.0	37.6	37.2	37.4	42.0
1990	37.4	37.8	38.2	39.2	38.7	38.4	42.2
1991	36.4	38.5	39.1	39.7	40.3	39.6	40.3
1992	36.7	37.3	39.6	40.1	40.8	41.4	39.3
1993	37.5	37.5	38.3	40.6	41.0	41.6	40.7
1994		*37.8*	38.4	39.4	41.5	41.9	43.6
1995			*38.5*	39.3	40.3	42.7	43.6
1996				*39.3*	40.0	41.1	44.0
1997					*40.2*	40.7	46.0
1998						*41.1*	46.1
1999							46.0
2003							*44.9*

Year Being Forecast	Forecast Activity Percent Error Published -- Years Earlier					
	1 Year	2 Years	3 Years	4 Years	5 Years	10 Years
1987	(1.1)	(2.0)	(2.2)	(5.0)	(5.0)	10.6
1988	1.6	0.5	(0.8)	(0.8)	(3.6)	17.6
1989	1.6	3.8	2.7	1.6	2.2	14.7
1990	1.1	2.1	4.8	3.5	2.7	12.8
1991	5.8	7.4	9.1	10.7	8.8	10.7
1992	1.6	7.9	9.2	11.1	12.8	7.1
1993	0.0	2.1	8.3	9.3	10.9	8.5

Note on how to read this table: In 1992 we forecast 37.5 million aircraft would be handled in 1993. In fact 37.5 million aircraft were recorded, meaning the forecast was right on the mark. In 1988 we forecast 38.2 million aircraft would be handled in 1990. This forecast was 2.1 higher than actual. The 1993 forecast is shown in bold italics.

Each air route traffic control center (ARTCC) controls aircraft that are flying under instrument flight rules in the center's designated geographic control area. The workload measure for the centers is the number of IFR aircraft handled, which is 2 times departures, plus overs. The IFR counts are categorized by user groups.

Flight service stations provide a variety of services to the aviation community. They collect and disseminate meteorological and other flight information, provide briefings to pilots, and provide assistance in emergencies to lost, disoriented, or downed airmen. The workload measures at flight service stations are weighted sums of the number of flight plans filed, pilot briefings provided, and aircraft contacted.

The introduction of new technology to flight service stations has changed operating environments. It appears that an apparent decline in demand for flight planning services may actually signify that demand is being met through increased use of automation and new system capabilities. The result is increases in system efficiency and productivity.

The FAA must consider at least 133 variables when producing a set of national forecasts. (The number does not include derived subtotals and totals.) Of these, four economic independent variables are obtained from sources external to the FAA and the FAA has no control over these truly exogenous variables. There are 12 quantifiable air carrier forecast assumptions and 4 quantifiable regional/commuter carrier forecast assumptions. Within justifiable limits, these forecast assumptions are under the control of the analysts. There are 83 aviation variables that are not FAA workload measures but that influence the workload measures in one way or another. Finally, there are 30 aviation variables that are the workload measures used by the FAA for policy and planning considerations and for manpower and investment planning.

The table at the end of this chapter contains a list of the variables and the sources of the historical data and their relationship to the forecast process. Forecasts of the economic variables and the military fleet and its hours flown are developed outside the FAA. All other forecasts are developed by the FAA.

Research undertaken in the early- and mid-1970s indicated that some measures of economic activity (such as gross domestic product or total employment) and some measures of prices (for example, aircraft prices and aviation fuel prices) were useful predictors of aviation activity. Some unique events (including the failure of U.S. air carriers to follow rational pricing policies; e.g., the destructive fare wars of 1986 and 1992, and the prolonged depressed state of the general aviation manufacturing industry) have altered the relationships between the key aviation variables and the economic variables used previously. It has been difficult, therefore, to produce economic or econometric models that predict aviation activity with the same degree of reliability as the models developed in earlier periods. Thus, for the present, the forecasters must rely to a greater degree on subjective judgment, evaluation, and expertise than was required previously. This is not at all unusual in times of significant change in a volatile industry.

THE FAA FORECASTING PROCESS

The FAA forecasting process is an interactive system that combines econometric and time series model results with aviation industry forecasts, expert opinions, and anticipated policy impacts to derive a set of FAA

aviation forecasts that are used in the decisionmaking process. The following flow diagram shows a generalized version of the FAA aviation forecasting process.

The first step in developing the forecasts is to enter the economic and demographic variables into a set of econometric models or equations that represent a simplified version of the real world. The degree of accuracy of the forecasts of aviation activities depends on both the accuracy of the forecasts of the independent variables and the ability of the models to portray activities in the real world.

The mechanical execution of forecast models is only the first step in producing a set of forecasts. In general, these models and equations are simple portrayals of a complex system. They cannot account for a number of political, social, psychological, and economic variables and for all the interrelated actions and reactions that eventually lead to a particular set of results. It is particularly important, therefore, that the initial model results are reviewed, revised, and adjusted to reflect the analysts' best judgment of the impacts of the events occurring or expected to occur during the forecast period.

The FAA forecasting process is both continuous and iterative. As such, it is important to evaluate the forecast results and to determine the basis of the deviations of the forecast values from the actual values observed in the real world. The analysis of the errors generally identifies the causes of the deviations and helps determine the proportion due to improper model specifications, erroneous forecasts of independent variables, erroneous forecast assumptions, or incorrect analysts' judgments and opinions. If warranted, the forecast error analysis may lead to a reformulation of the model and to additions or deletions of independent variables, revisions of forecast assumptions, and/or changes in analysts' opinions and judgments about future events.

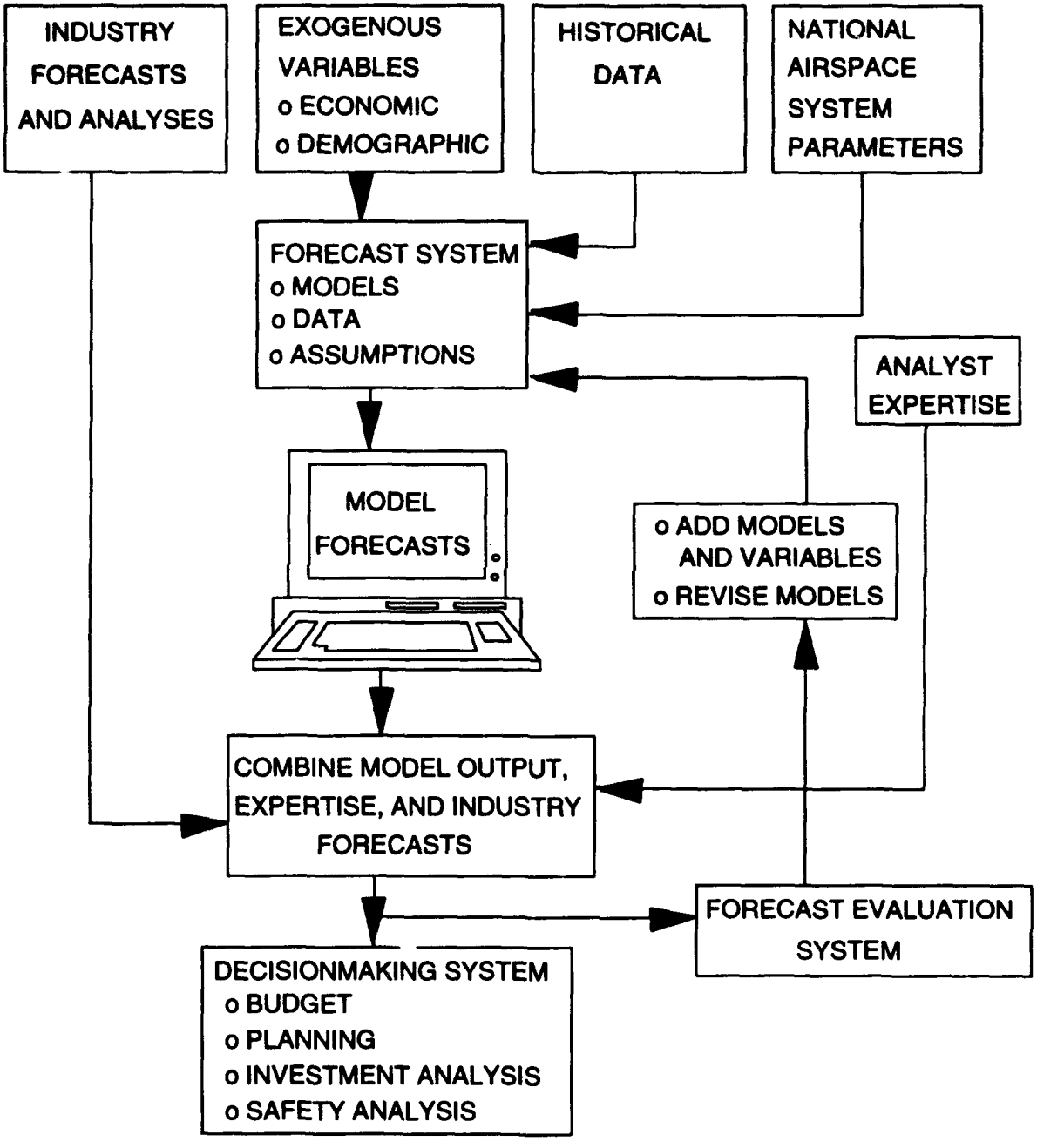
FORECAST EVALUATION

It is essential that the FAA forecasts of the demand for services at the FAA towers, air route traffic control centers, and the flight service stations be accurate. Large forecast errors can lead to inefficient allocation of resources which, in turn, could lead to capacity constraints and delays or to excess capacity in the National Airspace System. For this reason, FAA must continuously evaluate the forecasting process and its results.

The evaluation of the forecast process proceeds on several fronts. On a monthly basis, FAA tracks its short-term forecasts of aircraft operations, instrument operations, IFR aircraft handled, and flight services vis-a-vis the actual counts at the facilities. This tracking system alerts FAA management to unexpected deviations from the trends suggested by the forecasts. Inquiries are then initiated to determine the cause(s) of the differences and revised short-term forecasts may be generated, if necessary.

To help the analysts make correct decisions and informed judgments when developing the forecast assumptions, FAA holds meetings with industry representatives to discuss industry trends, recent developments, and possible future courses of events. Every two years, for example, in cooperation with the National Academy of Sciences, Transportation Research Board (TRB), the FAA sponsors a "forecast assumptions workshop." This workshop is attended by 70 to 80 industry planners and forecasters representing the airlines, aircraft manufacturers, engine manufacturers, and other industry groups.

FAA FORECASTING SYSTEM



The participants in various subgroups identify specific assumptions about the short-term and long-term future trends of the economic and aviation variables that are important to their segments of the industry, indicate why these are considered important, and show why specific trends are anticipated. After discussing the assumptions, the entire group attempts to reach a consensus about the key variables affecting the industry and the most likely future courses of these variables. Finally, the TRB publishes a workshop report. The participants benefit from the discussions and the analysts have the TRB workshop report as a benchmark for preparing forecasts or for evaluating forecasts prepared by other organizations. Assumptions developed at the Eighth International Workshop (September 13-15, 1993) have been used in preparing this year's forecasts.

Formal and informal meetings with individuals and representatives of specific industry groups are another way the FAA promotes dialogue and discussion with the aviation community and solicits input and comments. Meetings are held regularly with the aircraft manufacturers, with members of the Air Transport Association, and with members of the General Aviation Manufacturers Association. In addition, FAA analysts maintain one-on-one contact with industry representatives.

Another intermediate step in the FAA aviation forecast process is the public dissemination of the forecast results, solicitation of industry comments, and critique of the forecasts. One of the main avenues for this purpose is the Commercial Aviation Forecast Conference held annually in February or March. Now in its nineteenth year, the conference is generally attended by 400 to 500 participants who include airline executives, aircraft and engine manufacturers, consumer groups and other industry representatives, and the news media. To the maximum extent possible, FAA responds to questions raised about the forecasts both during and after the conference.

Because the importance of U.S. general aviation and the fact that its issues and problems cannot be adequately addressed in a single conference, the FAA also holds an annual two-day General Aviation Forecast Conference. This conference, now in its fourth year, is attended by 200 participants from all segments of the general aviation community.

An important part of the conferences is the opportunity for various segments of the aviation community to make technical presentations on a variety of topics of interest to the aviation community. The forecast conferences establish avenues of communication through which FAA releases its forecast to the aviation community and the public and receives comments, criticisms, and feedback about the forecasts. The FAA also receives valuable information and insights through the papers presented at the forecast conferences.

FAA also seeks to improve forecast accuracy and credibility by inviting FAA regional and state participation in the forecast process. For example, facility level terminal area forecasts and flight service station forecasts are circulated to FAA regions for review and comments. The comments and suggested changes are incorporated in the final facility level reports. In the case of the terminal area forecasts, the FAA regions have the capability to make changes on personal computers. The final facility level forecasts derived by this procedure must be consistent with the national forecasts.

Periodically, FAA prepares a technical report that compares the accuracy of the forecasts of key workload measures with the accuracy of forecasts of economic variables prepared by major forecasting services. Based on the results of these studies, the FAA forecasts compare favorably with those produced by these major forecasting services.

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
ECONOMIC:	
Gross Domestic Product (GDP)	OMB, DRI, Evans, WEFA
Consumer Price Index (CPI)	OMB, DRI, Evans, WEFA
Oil and Gas Deflator	OMB, DRI, Evans, WEFA
AIR CARRIER:	
FORECAST ASSUMPTIONS	
Domestic Operations:	
Average seats per aircraft	RSPA/computed
Average passenger trip length	RSPA/computed
Revenue per passenger mile (current $)	RSPA/computed
Revenue per passenger mile (1982-84 $)	Computed
Average jet fuel prices (current $)	RSPA/computed
Average jet fuel prices (1982-84 $)	Computed
International Operations:	
(Same as Domestic)	(Same)
SCHEDULED PASSENGER TRAFFIC	
Domestic:	
Revenue passenger miles (RPM's)	RSPA
Revenue passenger enplanements	RSPA
Available seat miles	RSPA
Load factors	Computed
International:	
Revenue passenger miles by Regions	RSPA
Revenue passenger enplanements by Regions	RSPA
Available seat miles	RSPA
Load factors	Computed
FLEET	
2-Engine narrowbody	FAA/AFS-620
3-Engine narrowbody	FAA/AFS-620
4-Engine narrowbody	FAA/AFS-620
2-Engine widebody	FAA/AFS-620
3-Engine widebody	FAA/AFS-620
4-Engine widebody	FAA/AFS-620

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (Continued)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
HOURS FLOWN BY EQUIPMENT	
(Same as Fleet)	RSPA
FUEL CONSUMED	
Jet:	
Domestic air carriers	RSPA
International air carriers	RSPA
General aviation	FAA/APO-110
Aviation Gasoline:	
Air carriers	FAA/APO-110
General aviation	FAA/APO-110
REGIONAL/COMMUTER:	
FORECAST ASSUMPTIONS	
Average seats per aircraft	RSPA/Computed
Average passenger trip length (48 states and Hawaii, Puerto Rico, Virgin Islands)	RSPA/Computed
Average load factor	RSPA/Computed
PASSENGER TRAFFIC	
Revenue passenger enplanements (48 states and Hawaii, Puerto Rico, Virgin Islands)	RSPA
Revenue passenger miles (48 states and Hawaii, Puerto Rico, Virgin Islands)	RSPA
FLEET	
Less than 15 seats	FAA/AVN-120
15 to 19 seats	FAA/AVN-120
20 to 40 seats	FAA/AVN-120
More than 40 seats	FAA/AVN-120

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (Continued)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
GENERAL AVIATION:	
FLEET	
Single engine piston aircraft	FAA/APO-110
Multi-engine piston aircraft	FAA/APO-110
Turboprop aircraft	FAA/APO-110
Turbojet aircraft	FAA/APO-110
Piston-powered rotorcraft	FAA/APO-110
Turbine-powered rotorcraft	FAA/APO-110
Other general aviation aircraft	FAA/APO-110
NUMBER OF AIRCRAFT BY REGION	
Total aircraft in each of nine FAA Regions	FAA/APO-110
HOURS FLOWN	
Hours flown by equipment type (See general aviation fleet)	FAA/APO-110
FUEL CONSUMED	
Fuel consumed by equipment type (See general aviation fleet)	FAA/APO-110
ACTIVE PILOTS:	
Students	FAA/APO-110
Private pilots	FAA/APO-110
Commercial	FAA/APO-110
Airline transport	FAA/APO-110
Helicopter	FAA/APO-110
Glider	FAA/APO-110
Other	FAA/APO-110
Instrument rated	FAA/APO-110

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (Continued)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
FAA WORKLOAD MEASURES:	
FAA TOWERS	
Number of FAA Towers	FAA/APO-110
Aircraft Operations:	
Air carrier itinerant operations	FAA/APO-110
Air taxi/commuter itinerant operations	FAA/APO-110
General aviation itinerant operations	FAA/APO-110
Military itinerant operations	FAA/APO-110
General aviation local operations	FAA/APO-110
Military local operations	FAA/APO-110
Instrument Operations:	
Air carrier	FAA/APO-110
Air taxi/commuter	FAA/APO-110
General aviation	FAA/APO-110
Military	FAA/APO-110
Non-IFR Instrument Operations:	
Terminal control areas	FAA/APO-110
Expanded radar service areas	FAA/APO-110
AIR ROUTE TRAFFIC CONTROL CENTERS	
IFR Departures:	
Air carrier	FAA/APO-110
Air taxi/commuter	FAA/APO-110
General aviation	FAA/APO-110
Military	FAA/APO-110
IFR Overs:	
(Same as IFR departures)	FAA/APO-110
FLIGHT SERVICE STATIONS	
IFR-DVFR flight plans originated	FAA/APO-110
VFR flight plans originated	FAA/APO-110
Pilot briefings	FAA/APO-110
Air carrier aircraft contacted	FAA/APO-110
Air taxi/commuter aircraft contacted	FAA/APO-110
General aviation aircraft contacted	FAA/APO-110
Military aircraft contacted	FAA/APO-110
IFR-DVFR aircraft contacted	FAA/APO-110
VFR aircraft contacted	FAA/APO-110

FAA AVIATION FORECAST VARIABLES AND DATA SOURCES (Continued)

TYPES OF VARIABLES AND VARIABLE NAMES	DATA SOURCES
MILITARY:	
FLEET	
Jet	DOD
Turboprop	DOD
Piston	DOD
Helicopter	DOD
HOURS	
Hours flown by equipment (See Fleet)	DOD
TERMINAL AREA FORECASTS (2000 Towered and Nontowered Airports):	
ENPLANEMENTS:	
U.S. Air Carrier	RSPA
Foreign Flag Carrier	INS
Commuter	RSPA
Air Taxi	FAA/TSC
OPERATIONS (Towered Airports):	
Air Carrier	FAA/APO-110
Commuter/Air Taxi	FAA/APO-110
General Aviation	FAA/APO-110
Military	FAA/APO-110
OPERATIONS (Nontowered Airports)	FAA/NFDC

CHAPTER IX

YEAR-BY-YEAR DATA FOR FAA AVIATION FORECASTS

CHAPTER IX

YEAR-BY-YEAR DATA FOR FAA AVIATION FORECASTS

FISCAL YEARS 1994 - 2005

Chapter X provides the detailed data for the National Aviation and FAA workload series forecasted by the FAA Office of Aviation Policy and Plans. The following should be noted:

- o Table 10 - Contains the unduplicated passenger traffic reported by U.S. scheduled air carriers reporting on RSPA Form 41 and commuter carriers reporting on RSPA Form 298-C.

- o Table 11 - Those carriers contained in the Air Carrier forecast data base are listed in Appendices A and B.

  - Includes the following traffic which is also reported as commuters/regionals traffic in Table 19.

	ENPLANEMENTS (Millions)	RPM'S (Millions)		ENPLANEMENTS (Millions)	RPM'S (Millions)
1987	4.100	683.6	1991	6.559	1,315.3
1988	3.117	583.3	1992	9.981	1,906.5
1989	4.072	861.2	1993E	12.284	2,461.5
1990	4.674	984.9			

- o Table 19 - Includes the duplicated traffic above for those air carriers and commuters/regionals reporting on both RSPA Forms 41 and 298-C.

  - Forecasts and historical data exclude Alaska and foreign territory traffic.

  - The forecasts excludes Air Wisconsin (beginning in 1987) because of the predominance of jet aircraft in its fleet.

- Table 20 - Includes only aircraft with 60 seats or less. Aircraft also included with general aviation fleet shown in Tables 21 and 22.

- Table 26 - Includes the rotorcraft fleet and hours flown shown in Tables 21 and 23.

TABLE 1

U.S. SHORT-TERM ECONOMIC FORECASTS

ECONOMIC VARIABLE	FISCAL YEAR 1994				FISCAL YEAR 1995			
	1ST QTR.	2ND QTR.	3RD QTR.	4TH QTR.	1ST QTR.	2ND QTR.	3RD QTR.	4TH QTR.
REAL GDP								
(Billions 1987$)								
DRI/McGRAW-HILL	5,191.0	5,227.7	5,265.7	5,294.4	5,334.9	5,367.3	5,394.9	5,418.6
EVANS ECONOMICS	5,197.5	5,225.7	5,238.1	5,263.3	5,292.4	5,325.4	5,357.1	5,393.4
THE WEFA GROUP	5,186.1	5,220.7	5,260.5	5,300.1	5,339.3	5,380.9	5,421.6	5,458.7
OMB	5,187.4	5,225.8	5,264.6	5,303.6	5,343.0	5,378.6	5,414.6	5,450.7
OIL AND GAS DEFLATOR								
(1987 EQUALS 100)								
DRI/McGRAW-HILL	121.3	121.8	125.1	127.3	128.5	130.3	131.4	132.9
EVANS ECONOMICS	120.4	120.8	120.7	121.6	122.8	123.4	124.0	124.9
THE WEFA GROUP	122.5	128.9	134.3	139.1	142.5	144.6	146.5	148.5
OMB	118.0	118.0	118.0	118.0	118.0	118.0	121.5	123.3
CONSUMER PRICE INDEX								
(1982-84 EQUALS 100)								
DRI/McGRAW-HILL	145.9	147.1	148.3	149.4	150.5	151.8	152.9	154.0
EVANS ECONOMICS	145.8	147.1	148.0	149.0	150.1	151.2	152.5	153.7
THE WEFA GROUP	145.8	146.9	148.2	149.4	150.5	151.7	152.8	154.0
OMB	143.4	144.4	145.5	146.7	147.7	148.9	150.0	151.4

Source: DRI/McGraw-Hill, Inc., December 1993; Evans Economics, Inc., December 1993; The WEFA Group, December 1993; and OMB, December 1993.

TABLE 2

U.S. LONG-TERM ECONOMIC FORECASTS

OMB (1994-1999) AND CONSENSUS (2000-2005)

FISCAL YEAR	GROSS DOMESTIC PRODUCT (Billions 1987$)	CONSUMER PRICE INDEX (1982-84 = 100)	OIL AND GAS DEFLATOR (1987 = 100)
Historical			
1988	4,680.0	117.1	100.8
1989	4,818.8	122.7	108.0
1990	4,894.7	129.0	121.8
1991	4,858.3	134.8	124.3
1992	4,939.1	137.2	123.5
1993E	5,096.1	141.2	123.3
Forecast			
1994	5,245.4	145.0	118.0
1995	5,396.7	149.5	120.7
1996	5,542.4	154.4	128.0
1997	5,689.3	159.5	135.9
1998	5,835.5	165.0	144.2
1999	5,984.0	170.6	153.1
2000	6,142.2	177.6	160.1
2001	6,299.9	185.0	167.5
2002	6,457.1	192.7	175.3
2003	6,617.7	200.8	184.1
2004	6,782.2	209.2	193.6
2005	6,945.4	218.0	203.6

Source: 1994-1999; Office of Management and Budget, December 1993
2000-2005; Consensus forecast based on average growth rates of DRI/McGraw-Hill, Evans, and WEFA forecasts (See Table 3), adjusted to fiscal year basis.

TABLE 3

ALTERNATIVE U.S. LONG-TERM ECONOMIC FORECASTS

CALENDAR YEAR	GROSS DOMESTIC PRODUCT (Billions 1987$)			CONSUMER PRICE INDEX (1982-84 = 100)			FUEL PRICE INDEX (1987 = 100)		
	DRI	EVANS	WEFA	DRI	EVANS	WEFA	DRI	EVANS	WEFA
Historical									
1988	4,718.6	4,718.6	4,718.6	118.3	118.3	118.3	100.9	100.9	100.9
1989	4,838.1	4,838.1	4,838.1	124.0	124.0	124.0	110.3	110.3	110.3
1990	4,897.3	4,897.3	4,897.3	130.7	130.7	130.7	125.7	125.7	125.7
1991	4,861.4	4,861.4	4,861.4	136.3	136.3	136.3	123.9	123.9	123.9
1992	4,986.2	4,986.2	4,986.2	140.4	140.4	140.4	123.3	123.3	123.3
1993E	5,126.8	5,129.0	5,125.5	144.6	144.6	144.5	122.4	122.2	122.7
Forecast									
1994	5,280.6	5,254.9	5,280.2	148.8	148.6	148.7	125.7	121.5	136.2
1995	5,406.2	5,377.0	5,439.4	153.6	153.1	153.4	132.9	124.5	147.6
1996	5,529.7	5,420.5	5,596.3	158.7	162.8	158.5	141.5	137.1	154.3
1997	5,707.0	5,565.0	5,741.5	163.8	169.7	164.0	148.2	141.7	162.4
1998	5,870.0	5,737.2	5,881.7	169.3	178.0	169.9	153.8	146.3	171.1
1999	6,014.0	5,902.6	6,044.9	175.3	187.1	176.1	160.5	151.8	180.0
2000	6,143.0	6,070.7	6,219.1	181.6	196.6	182.5	168.1	157.6	189.2
2001	6,271.0	6,239.0	6,392.5	188.3	206.4	189.3	176.5	163.5	198.9
2002	6,408.0	6,396.5	6,566.6	195.5	216.5	196.4	185.5	169.7	209.0
2003	6,552.0	6,556.4*	6,744.9	203.1	227.1*	203.7	194.8	178.4*	219.7
2004	6,699.0	6,720.3*	6,927.4	211.2	238.2*	211.0	205.3	187.5*	230.9
2005	6,833.0*	6,888.3*	7,109.4	219.7*	249.9*	218.6	216.4*	197.0*	242.7

Source: DRI/McGraw-Hill, November, 1993; Evans Economics, Inc., December 1993; and The WEFA Group, Fourth Quarter 1993

* Extrapolated to 2005 for forecast purposes

TABLE 4

INTERNATIONAL GDP FORECASTS

CALENDAR YEAR	GROSS DOMESTIC PRODUCT (In Billions of 1985 U.S. Dollars) EUROPE/ AFRICA/ MIDDLE EAST	LATIN AMERICA	JAPAN/ PACIFIC BASIN/ AUSTRALIA/N. ZEALAND	WORLD
Historical*				
1988	4,388.8	926.5	2,242.9	15,232.4
1989	4,573.2	935.1	2,359.0	15,644.4
1990	4,807.2	940.1	2,480.4	15,973.7
1991	4,839.6	975.4	2,586.4	15,892.8
1992	4,928.1	1,000.2	2,648.1	15,887.0
1993E	4,969.2	1,036.1	2,688.2	16,075.8
Forecast				
1994	5,085.5	1,064.8	2,771.6	16,535.6
1995	5,249.7	1,103.2	2,915.8	17,172.9
1996	5,424.7	1,160.0	3,073.5	17,880.1
1997	5,601.2	1,220.6	3,211.7	18,583.0
1998	5,779.5	1,281.0	3,348.0	19,281.4
1999	5,965.4	1,343.8	3,496.4	19,821.3
2000	6,158.9	1,409.6	3,661.0	20,522.0
2001	6,357.5	1,477.3	3,831.2	21,242.3
2002	6,559.8	1,546.7	4,008.6	21,979.0
2003	6,763.1	1,617.9	4,188.8	22,720.3
2004	6,975.2	1,692.3	4,368.4	23,485.8
2005	7,194.0	1,768.4	4,554.9	24,274.5

Source: The WEFA Group, World Economic Outlook, October 1993

TABLE 5

INTERNATIONAL EXCHANGE RATE FORECASTS

CALENDAR YEAR	FOREIGN EXCHANGE RATES (US$/Local Currency, End of Year) UNITED KINGDOM	WEST*/UNITED GERMANY	JAPAN	UNITED STATES EFFECTIVE EXCHANGE RATE (1985 EQUALS 100)
Historical*				
1988	1.809	.562*	7.946	67.8
1989	1.605	.589*	6.971	70.8
1990	1.928	.669	7.440	66.1
1991	1.871	.660	7.987	65.9
1992	1.512	.620	8.016	64.6
1993E	1.497	.585	8.929	68.3
Forecast				
1994	1.494	.588	8.065	70.7
1995	1.527	.606	8.264	70.0
1996	1.562	.625	8.547	68.3
1997	1.606	.645	8.850	66.6
1998	1.653	.667	9.091	64.9
1999	1.675	.660	9.100	64.7
2000	1.700	.650	9.125	64.5
2001	1.725	.640	9.150	64.3
2002	1.750	.625	9.175	64.3
2003	1.775	.610	9.200	64.2
2004	1.800	.605	9.225	64.2
2005	1.825	.605	9.250	64.2

Source: The WEFA Group, World Economic Outlook, October 1993
(Note: 1999-2005 extrapolated for forecast purposes.)

TABLE 6

BASELINE AIR CARRIER FORECAST ASSUMPTIONS

TOTAL SYSTEM OPERATIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE CURRENT $ (Cents)	REVENUE PER PASSENGER MILE FY 1993 $ (Cents)	AVERAGE JET FUEL PRICE CURRENT $ (Cents)	AVERAGE JET FUEL PRICE FY 1991 $ (Cents)
Historical*						
1988	168.4	927.8	11.82	14.25	56.2	67.7
1989	168.8	948.4	12.43	14.32	56.4	65.0
1990	169.0	976.0	12.61	13.80	67.6	74.0
1991	167.9	986.8	12.87	13.48	79.4	83.2
1992	169.0	1,006.8	12.44	12.81	64.5	66.4
1993E	167.7	1,015.5	12.98	12.98	61.9	61.9
Forecast						
1994	169	1,019	13.31	12.97	59.3	57.7
1995	170	1,026	13.68	12.92	60.6	57.3
1996	172	1,034	14.07	12.87	64.3	58.8
1997	174	1,042	14.48	12.82	68.3	60.4
1998	178	1,050	14.92	12.77	72.4	62.0
1999	181	1,058	15.37	12.72	76.9	63.6
2000	184	1,065	15.97	12.68	80.1	63.6
2001	186	1,072	16.59	12.64	83.5	63.6
2002	188	1,079	17.23	12.60	87.0	63.6
2003	190	1,086	17.91	12.56	91.1	63.9
2004	192	1,093	18.61	12.52	95.4	64.2
2005	193	1,101	19.33	12.48	99.9	64.5

* Source: RSPA, Form 41

TABLE 7

BASELINE AIR CARRIER FORECAST ASSUMPTIONS

DOMESTIC OPERATIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE CURRENT $ (Cents)	REVENUE PER PASSENGER MILE FY 1993 $ (Cents)	AVERAGE JET FUEL PRICE CURRENT $ (Cents)	AVERAGE JET FUEL PRICE FY 1993 $ (Cents)
Historical*						
1988	153.0	785.9	12.23	14.75	55.1	66.4
1989	152.0	790.2	13.07	15.05	55.4	63.8
1990	151.7	799.7	13.26	14.51	66.8	73.1
1991	151.1	807.0	13.35	13.98	76.6	80.2
1992	151.1	807.3	12.80	13.17	62.7	64.5
1993E	151.0	808.7	13.59	13.59	60.0	60.0
Forecast						
1994	152	810	13.89	13.52	57.4	55.9
1995	153	812	14.25	13.45	58.7	55.5
1996	155	814	14.64	13.39	62.3	57.0
1997	157	816	15.05	13.32	66.1	58.5
1998	160	818	15.49	13.25	70.2	60.0
1999	163	820	15.93	13.19	74.5	61.7
2000	166	822	16.52	13.12	77.6	61.6
2001	168	824	17.13	13.06	80.9	61.7
2002	170	826	17.77	12.99	84.3	61.7
2003	172	828	18.43	12.93	88.2	61.9
2004	174	830	19.11	12.86	92.4	62.2
2005	174	832	19.81	12.80	96.7	62.5

* Source: RSPA, Form 41

TABLE 8

BASELINE AIR CARRIER FORECAST ASSUMPTIONS

INTERNATIONAL OPERATIONS (PART 1)

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH (Miles)	REVENUE PER PASSENGER MILE CURRENT $ (Cents)	REVENUE PER PASSENGER MILE FY 1993 $ (Cents)	AVERAGE JET FUEL PRICE CURRENT $ (Cents)	AVERAGE JET FUEL PRICE FY 1993 $ (Cents)
Historical*						
1988	278.9	2,644.2	10.35	12.48	60.2	72.5
1989	275.8	2,734.5	10.36	11.93	59.9	69.0
1990	273.3	2,786.2	10.68	11.70	70.5	77.2
1991	262.8	2,856.4	11.45	11.99	87.7	91.8
1992	255.9	3,016.5	11.48	11.82	69.6	71.6
1993E	244.3	2,984.1	11.40	11.40	67.5	67.5
Forecast						
1994	243	2,960	11.86	11.55	64.6	62.9
1995	242	2,944	12.27	11.59	66.1	62.4
1996	242	2,918	12.71	11.62	70.1	64.1
1997	242	2,904	13.16	11.65	74.4	65.9
1998	243	2,898	13.65	11.68	79.0	67.6
1999	244	2,897	14.15	11.71	83.8	69.4
2000	245	2,900	14.77	11.73	87.3	69.4
2001	247	2,897	15.44	11.77	91.1	69.4
2002	248	2,896	16.13	11.80	94.9	69.4
2003	248	2,897	16.86	11.83	99.3	69.6
2004	248	2,900	17.62	11.86	104.0	70.0
2005	248	2,903	18.40	11.88	108.8	70.3

* Source: RSPA, Form 41

TABLE 9

BASELINE AIR CARRIER FORECAST ASSUMPTIONS

INTERNATIONAL OPERATIONS (PART 2)

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT			REVENUE PER PASSENGER MILE					
				ATLANTIC		LATIN AMERICA		PACIFIC	
	ATLANTIC (Seats)	LATIN AMERICA (Seats)	PACIFIC (Seats)	CURRENT $ (Cents)	FY 1993 $ (Cents)	CURRENT $ (Cents)	FY 1993 $ (Cents)	CURRENT $ (Cents)	FY 1993 $ (Cents)
Historical*									
1988	301.9	210.3	293.1	9.31	11.23	11.35	13.69	11.47	13.83
1989	290.3	203.6	302.9	8.97	10.33	11.59	13.35	11.74	13.52
1990	278.6	194.0	318.6	9.56	10.46	12.01	13.15	11.55	12.64
1991	257.7	187.0	321.9	9.98	10.45	12.45	13.04	12.50	13.09
1992	245.2	182.8	318.4	9.86	10.15	12.97	13.35	12.76	13.13
1993E	231.6	181.3	318.1	9.38	9.38	13.41	13.41	12.96	12.96
Forecast									
1994	230	181	319	9.97	9.71	13.76	13.40	13.31	12.96
1995	230	181	319	10.33	9.76	14.19	13.40	13.72	12.96
1996	230	181	319	10.72	9.81	14.65	13.40	14.17	12.96
1997	230	182	320	11.13	9.85	15.14	13.40	14.64	12.96
1998	232	182	321	11.57	9.90	15.66	13.40	15.14	12.96
1999	234	183	322	12.03	9.95	16.19	13.40	15.66	12.96
2000	236	183	322	12.60	10.00	16.87	13.40	16.32	12.96
2001	238	184	323	13.19	10.05	17.59	13.40	17.01	12.96
2002	240	184	324	13.82	10.10	18.33	13.40	17.72	12.96
2003	240	184	324	14.48	10.15	19.10	13.40	18.48	12.96
2004	240	185	325	15.16	10.20	19.91	13.40	19.26	12.96
2005	240	185	325	15.88	10.26	20.75	13.40	20.06	12.96

* Source: RSPA, Form 41

TABLE 10

UNITED STATES COMMERCIAL AIR CARRIERS AND REGIONALS/COMMUTERS

TOTAL SCHEDULED PASSENGER TRAFFIC [1/]

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (Millions)			REVENUE PASSENGER MILES (Billions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
Historical*						
1988	441.2	34.3	475.5	329.9	90.5	420.4
1989	443.6	36.8	480.4	333.2	100.6	433.8
1990	456.6	41.3	497.9	344.9	115.1	460.0
1991	447.3	39.7	487.0	339.3	113.5	452.8
1992	462.0	42.6	504.6	352.8	128.3	481.1
1993E	463.7	45.0	508.7	353.8	134.4	488.2
Forecast						
1994	480.5	47.7	528.2	366.4	141.2	507.6
1995	500.8	51.3	552.3	382.5	151.6	534.1
1996	520.3	55.9	576.2	398.1	163.1	561.2
1997	541.8	60.4	602.2	415.4	175.4	590.8
1998	563.3	64.7	628.0	432.4	187.5	619.9
1999	586.5	69.1	655.8	449.7	200.2	649.9
2000	606.2	73.3	679.5	466.6	212.6	679.2
2001	628.2	77.8	705.8	483.9	224.8	708.7
2002	650.0	82.0	732.0	501.2	237.5	738.7
2003	671.9	86.6	758.5	518.7	250.9	769.6
2004	695.0	91.3	786.3	536.3	264.8	801.1
2005	715.7	96.3	812.0	553.8	279.6	833.4

* Source: RSPA, Forms 41 and 298-C

[1/] Sum of Tables 11 and 19 less duplicated traffic. See note on page IX-1.

TABLE 11

UNITED STATES COMMERCIAL AIR CARRIERS

SCHEDULED PASSENGER TRAFFIC

FISCAL YEAR	REVENUE PASSENGER ENPLANEMENTS (Millions)			REVENUE PASSENGER MILES (Billions)		
	DOMESTIC	INTERNATIONAL	TOTAL	DOMESTIC	INTERNATIONAL	TOTAL
Historical*						
1988	414.2	34.3	448.5	325.5	90.5	416.0
1989	415.6	36.8	452.4	328.4	100.6	429.0
1990	424.1	41.3	465.4	339.2	115.1	454.3
1991	413.3	39.7	453.0	333.6	113.5	447.1
1992	429.2	42.6	471.8	346.5	128.5	475.0
1993E	428.8	45.0	473.9	346.8	134.4	481.2
Forecast						
1994	442.7	47.7	490.4	358.6	141.2	499.8
1995	460.6	51.5	512.1	374.0	151.6	525.6
1996	477.9	55.9	533.8	389.0	163.1	552.1
1997	497.2	60.4	557.6	405.7	175.4	581.1
1998	515.9	64.7	580.6	422.0	187.5	609.5
1999	534.6	69.1	603.7	438.4	200.2	638.6
2000	553.0	73.3	626.3	454.6	212.6	667.2
2001	571.6	77.6	649.2	471.0	224.8	695.8
2002	590.2	82.0	672.2	487.5	237.5	725.0
2003	608.8	86.6	695.4	504.1	250.9	755.0
2004	627.3	91.3	718.6	520.7	264.8	785.5
2005	645.9	96.3	742.2	537.4	279.6	817.0

* Source: RSPA, Form 41

TABLE 12

UNITED STATES COMMERCIAL AIR CARRIERS

SCHEDULED INTERNATIONAL PASSENGER TRAFFIC

	REVENUE PASSENGER ENPLANEMENTS (MIL)				REVENUE PASSENGER MILES (BIL)			
FISCAL YEAR	ATLANTIC	LATIN AMERICA	PACIFIC	TOTAL	ATLANTIC	LATIN AMERICA	PACIFIC	TOTAL
Historical*								
1988	14.6	11.5	8.2	34.3	46.1	14.2	30.2	90.5
1989	15.0	11.8	10.0	36.8	49.1	14.7	36.8	100.6
1990	16.1	13.0	12.2	41.3	53.7	16.0	45.4	115.1
1991	12.2	14.7	12.8	39.7	47.1	18.3	48.1	113.5
1992	14.8	13.6	14.2	42.6	57.7	17.1	53.6	128.5
1993E	15.6	15.8	13.6	45.0	61.1	20.8	52.5	134.4
Forecast								
1994	16.3	17.3	14.1	47.7	64.2	22.9	54.1	141.2
1995	17.4	19.2	14.9	51.5	68.4	25.6	57.6	151.6
1996	18.6	21.3	16.0	55.9	73.1	28.4	61.6	163.1
1997	19.9	23.5	17.0	60.4	78.3	31.5	65.6	175.4
1998	21.1	25.5	18.1	64.7	83.3	34.3	69.9	187.5
1999	22.5	27.4	19.2	69.1	88.8	37.0	74.4	200.2
2000	23.8	29.2	20.3	73.3	94.1	39.6	78.9	212.6
2001	24.9	31.2	21.5	77.6	98.8	42.4	83.6	224.8
2002	26.1	33.1	22.8	82.0	103.7	45.2	88.6	237.5
2003	27.4	35.1	24.1	86.6	108.9	48.1	93.9	250.9
2004	28.7	37.1	25.5	91.3	114.3	51.0	99.5	264.8
2005	30.1	39.2	27.0	96.3	120.0	54.1	105.5	279.6

* Source: RSPA, Form 41

TABLE 13

UNITED STATES COMMERCIAL AIR CARRIERS

SCHEDULED PASSENGER CAPACITY, TRAFFIC AND LOAD FACTORS

	DOMESTIC			INTERNATIONAL		
FISCAL YEAR	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR
Historical*						
1988	533.3	325.5	61.0	135.4	90.5	66.9
1989	529.5	328.4	62.0	151.1	100.6	66.6
1990	557.6	339.2	60.8	166.2	115.1	69.2
1991	548.4	333.6	60.8	169.3	113.5	67.0
1992	553.5	346.5	62.6	191.6	128.5	67.1
1993E	565.8	356.8	61.3	199.1	134.4	67.5
Forecast						
1994	569.2	358.6	63.0	208.6	141.2	67.7
1995	589.9	374.0	63.4	223.0	151.6	68.0
1996	612.6	389.0	63.5	239.7	163.1	68.0
1997	644.0	405.7	63.0	257.7	175.4	68.1
1998	669.8	422.0	63.0	275.1	187.5	68.2
1999	695.9	438.4	63.0	293.4	200.2	68.2
2000	721.6	454.6	63.0	311.0	212.6	68.4
2001	747.6	471.0	63.0	328.6	224.8	68.4
2002	773.8	487.5	63.0	346.9	237.5	68.5
2003	800.2	504.1	63.0	366.2	250.9	68.5
2004	826.5	520.7	63.0	386.2	264.8	68.5
2005	853.0	537.4	63.0	407.6	279.6	68.5

* Source: RSPA, Form 41

TABLE 14

UNITED STATES COMMERCIAL AIR CARRIERS

SCHEDULED PASSENGER CAPACITY, TRAFFIC AND LOAD FACTORS BY INTERNATIONAL TRAVEL REGIONS

	ATLANTIC			LATIN AMERICA			PACIFIC		
FISCAL YEAR	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR	ASM'S (BIL)	RPM'S (BIL)	% LOAD FACTOR
Historical*									
1988	70.1	46.1	65.8	22.7	14.2	62.5	42.5	30.2	71.0
1989	74.8	49.1	65.7	23.7	14.7	61.9	52.6	36.8	70.1
1990	77.0	53.7	69.8	25.7	16.0	62.3	63.6	45.4	71.4
1991	67.8	47.1	69.5	29.4	18.3	62.3	72.1	48.1	66.7
1992	83.8	57.7	69.6	29.4	17.1	58.3	78.4	53.6	68.4
1993E	88.3	61.1	69.2	35.9	20.8	57.9	74.9	52.5	70.1
Forecast									
1994	92.4	64.2	69.5	39.5	22.9	58.0	76.7	54.1	70.5
1995	98.1	68.4	69.7	43.4	25.6	59.0	81.5	57.6	70.7
1996	104.4	73.1	70.0	47.3	28.4	60.0	88.0	61.6	70.0
1997	111.9	78.3	70.0	52.1	31.5	60.5	93.7	65.6	70.0
1998	119.0	83.3	70.0	56.2	34.3	61.0	99.9	69.9	70.0
1999	126.9	88.8	70.0	60.2	37.0	61.5	106.3	74.4	70.0
2000	134.4	94.1	70.0	63.9	39.6	62.0	112.7	78.9	70.0
2001	141.1	98.8	70.0	68.1	42.4	62.3	119.4	83.6	70.0
2002	148.1	103.7	70.0	72.2	45.2	62.6	126.4	88.6	70.0
2003	155.6	108.9	70.0	76.5	48.1	62.9	134.1	93.9	70.0
2004	163.3	114.3	70.0	80.8	51.0	63.1	142.1	99.5	70.0
2005	171.4	120.0	70.0	85.5	54.1	63.3	150.7	105.5	70.0

* Source: RSPA, Form 41

TABLE 15

UNITED STATES COMMERCIAL AIR CARRIERS

LARGE JET AIRCRAFT

AS OF JANUARY 1	NARROWBODY			WIDEBODY			TOTAL
	2 ENGINE	3 ENGINE	4 ENGINE	2 ENGINE	3 ENGINE	4 ENGINE	
Historical*							
1988	1,578	1,135	221	153	296	159	3,542
1989	1,764	1,191	257	187	300	171	3,870
1990	1,911	1,185	250	197	283	181	4,007
1991	2,113	1,194	244	210	290	191	4,242
1992	2,178	1,086	208	221	309	201	4,203
1993E	2,324	985	200	239	330	169	4,247
Forecast							
1994	2,506	921	204	251	315	166	4,363
1995	2,636	838	211	266	285	160	4,396
1996	2,731	823	216	306	283	160	4,519
1997	2,930	805	220	333	270	164	4,722
1998	3,151	683	222	385	256	179	4,876
1999	3,296	601	216	429	248	191	4,981
2000	3,432	513	214	466	244	200	5,069
2001	3,595	495	215	504	243	201	5,253
2002	3,761	489	218	535	241	203	5,447
2003	3,923	488	220	566	234	213	5,644
2004	4,087	487	223	600	235	226	5,858
2005	4,246	486	223	634	236	238	6,063

* Source: FAA Aircraft Utilization and Propulsion Reliability Report

TABLE 16

UNITED STATES COMMERCIAL AIR CARRIERS

TOTAL AIRBORNE HOURS

(In Thousands)

	NARROWBODY			WIDEBODY			
FISCAL YEAR	2 ENGINE	3 ENGINE	4 ENGINE	2 ENGINE	3 ENGINE	4 ENGINE	TOTAL
Historical*							
1988	4,392	2,884	439	557	957	613	9,842
1989	4,691	2,704	546	655	939	641	10,176
1990	5,272	2,605	408	701	951	671	10,608
1991	5,598	2,274	337	745	919	659	10,531
1992	5,854	2,035	239	1,021	961	586	10,696
1993E	6,299	1,857	229	1,252	918	537	11,092
Forecast							
1994	6,766	1,750	235	1,357	882	531	11,521
1995	7,117	1,550	243	1,401	798	512	11,621
1996	7,510	1,440	250	1,477	792	512	11,981
1997	8,058	1,328	250	1,525	756	525	12,442
1998	8,665	1,093	250	1,605	717	573	12,903
1999	9,229	932	250	1,759	694	611	13,475
2000	9,610	770	250	1,887	683	640	13,840
2001	10,066	693	250	2,041	680	643	14,373
2002	10,531	636	250	2,140	675	650	14,882
2003	10,984	610	250	2,264	655	682	15,445
2004	11,444	584	250	2,400	658	723	16,059
2005	11,889	535	250	2,536	661	762	16,633

* Source: RSPA, Form 41

TABLE 17

TOTAL JET FUEL AND AVIATION GASOLINE FUEL CONSUMPTION

UNITED STATES CIVIL AVIATION AIRCRAFT

(In Millions of Gallons)

FISCAL YEAR	JET FUEL					AVIATION GASOLINE			TOTAL FUEL CONSUMED
	U.S. AIR CARRIERS			GENERAL AVIATION	TOTAL	AIR CARRIER	GENERAL AVIATION	TOTAL	
	DOMESTIC	INT'L.	TOTAL						
Historical*									
1988	11,902	3,192	15,094	654	15,748	4	394	398	16,146
1989	12,087	3,537	15,624	799	16,423	3	394	397	16,820
1990	12,439	3,812	16,251	682	16,933	3	374	377	17,310
1991	11,657	3,998	15,655	588	16,243	2	355	357	16,600
1992	11,704	4,065	15,769	520	16,289	2	317	319	16,607
1993E	11,899	4,109	16,008	489	16,497	2	295	297	16,794
Forecast									
1994	11,958	4,275	16,233	516	16,749	2	293	295	17,044
1995	12,367	4,542	16,909	546	17,455	2	294	296	17,750
1996	12,789	4,852	17,641	576	18,217	2	294	296	18,512
1997	13,389	5,185	18,574	604	19,178	2	293	295	19,473
1998	13,868	5,502	19,370	636	20,006	2	294	296	20,302
1999	14,348	5,833	20,181	669	20,850	2	295	297	21,147
2000	14,817	6,146	20,963	701	21,664	2	295	297	21,962
2001	15,288	6,456	21,744	732	22,476	2	296	298	22,774
2002	15,760	6,775	22,535	765	23,300	2	297	299	23,599
2003	16,231	7,111	23,342	799	24,141	2	297	299	24,440
2004	16,697	7,455	24,152	833	24,985	2	297	299	25,284
2005	17,163	7,823	24,986	865	25,851	2	297	299	26,150

* Source: Air carrier jet fuel, RSPA Form 41; All others, FAA APO estimates

TABLE 18

BASELINE REGIONALS/COMMUTERS FORECAST ASSUMPTIONS

FISCAL YEAR	AVERAGE SEATS PER AIRCRAFT (Seats)	AVERAGE PASSENGER TRIP LENGTH 48 STATES (Miles)	AVERAGE PASSENGER TRIP LENGTH HA/P.R./V.I. (Miles)	AVERAGE PASSENGER LOAD FACTOR (Percent)
Historical*				
1988	19.2	171.6	84.3	46.6
1989	20.4	179.3	89.8	47.8
1990	20.8	183.5	82.8	47.1
1991	21.5	185.7	82.0	46.8
1992	22.9	196.9	80.5	48.1
1993E	22.9	203.3	85.6	48.7
Forecast				
1994	23.7	210.0	89.3	49.1
1995	24.9	215.0	91.0	48.4
1996	26.0	220.0	91.0	48.7
1997	26.6	224.0	91.0	48.9
1998	28.0	228.0	91.0	49.1
1999	29.1	231.0	91.0	49.2
2000	30.1	234.0	91.0	49.4
2001	31.2	237.0	91.0	49.5
2002	32.2	239.0	91.0	49.5
2003	33.4	241.0	91.0	49.6
2004	34.5	243.0	91.0	49.7
2005	35.5	245.0	91.0	49.8

* Source: RSPA, Form's 298-C and 41

TABLE 19

UNITED STATES REGIONALS/COMMUTERS

SCHEDULED PASSENGER TRAFFIC

(In Millions)

	REVENUE PASSENGER ENPLANEMENTS			REVENUE PASSENGER MILES		
FISCAL YEAR	48 STATES	HAWAII/ PUERTO RICO/ VIRGIN ISLANDS	TOTAL	48 STATES	HAWAII/ PUERTO RICO/ VIRGIN ISLANDS	TOTAL
Historical*						
1988	28.4	1.7	30.1	4,875.3	152.6	5,027.9
1989	30.7	1.4	32.1	5,504.8	125.3	5,630.1
1990	35.5	1.7	37.2	6,513.1	140.7	6,653.8
1991	37.0	1.7	38.7	6,870.1	139.4	7,009.5
1992	41.1	1.7	42.8	8,091.7	137.2	8,228.9
1993E	45.6	1.6	47.2	9,402.6	142.9	9,545.5
Forecast						
1994	50.2	1.8	52.0	10,540.3	163.8	10,704.1
1995	54.5	2.0	56.5	11,720.8	182.0	11,902.8
1996	58.7	2.1	60.8	12,904.6	191.1	13 095.7
1997	63.1	2.2	65.3	14,130.6	200.2	14,330.8
1998	67.6	2.3	69.9	15,416.5	209.3	15,625.8
1999	72.1	2.4	76.5	16,665.2	218.4	16,883.6
2000	76.9	2.5	79.4	17,998.4	227.5	18,225.9
2001	81.8	2.6	84.4	19,384.3	236.6	19,620.9
2002	86.8	2.7	89.5	20,741.2	245.7	20,986.9
2003	91.9	2.8	94.7	22,151.6	254.8	22,406.4
2004	97.2	2.9	101.1	23,613.6	263.9	23,877.5
2005	102.3	3.0	105.3	25,054.0	273.0	25,327.0

* Source: RSPA, Form's 298-C and 41

TABLE 20

UNITED STATES REGIONALS/COMMUTERS

PASSENGER AIRCRAFT

AS OF JANUARY 1	LESS THAN 15 SEATS	15 TO 19 SEATS	20 TO 40 SEATS	MORE THAN 40 SEATS	TOTAL
Historical*					
1988	573	740	251	120	1,684
1989	538	802	303	139	1,782
1990	541	762	366	150	1,819
1991	535	762	445	154	1,896
1992	534	735	503	188	1,960
1993E	512	785	579	188	2,064
Forecast					
1994	500	777	690	190	2,157
1995	486	773	762	241	2,262
1996	470	771	826	294	2,361
1997	467	762	871	319	2,419
1998	420	759	922	398	2,499
1999	397	747	963	455	2,562
2000	372	737	1,007	514	2,630
2001	343	727	1,051	582	2,703
2002	311	710	1,084	633	2,738
2003	281	691	1,126	710	2,808
2004	253	675	1,171	778	2,877
2005	226	656	1,212	842	2,936

* Source: FAA Aircraft Utilization and Propulsion Reliability Report

TABLE 21

ACTIVE GENERAL AVIATION AIRCRAFT

(In Thousands)

AS OF JANUARY 1	FIXED WING				ROTORCRAFT			
	PISTON							
	SINGLE ENGINE	MULTI-ENGINE	TURBOPROP	TURBOJET	PISTON	TURBINE	OTHER	TOTAL
Historical*								
1988	159.7	21.8	4.9	4.1	2.6	3.3	6.3	202.7
1989	153.7	21.2	4.9	3.9	2.4	3.6	6.4	196.2
1990	158.9	21.9	5.9	4.1	3.0	4.0	7.2	205.0
1991	154.0	21.1	5.3	4.1	3.2	3.7	6.5	198.0
1992	154.1	21.2	4.9	4.4	2.5	3.8	7.6	198.5
1993E	143.6	18.5	4.7	4.0	2.2	3.6	7.8	184.4
Forecast								
1994	140.0	18.2	4.9	4.1	2.1	3.6	8.0	180.9
1995	137.2	17.9	5.1	4.2	2.1	3.8	8.1	178.4
1996	134.4	17.6	5.2	4.3	2.0	4.0	8.2	175.7
1997	132.4	17.4	5.3	4.5	2.0	4.2	8.3	174.1
1998	131.1	17.3	5.5	4.6	2.0	4.4	8.4	173.3
1999	131.1	17.3	5.6	4.7	2.0	4.6	8.5	173.8
2000	131.1	17.3	5.8	4.7	1.9	4.8	8.7	174.3
2001	131.1	17.3	5.9	4.8	1.9	5.0	8.8	174.8
2002	131.1	17.4	6.0	4.9	1.9	5.2	9.0	175.5
2003	131.1	17.5	6.2	5.0	1.8	5.4	9.2	176.2
2004	131.1	17.6	6.4	5.1	1.8	5.6	9.4	177.0
2005	131.1	17.6	6.5	5.1	1.8	5.8	9.5	177.4

Source: FAA Statistical Handbook of Aviation.

* Adjusted to reflect nonrespondent sampling error.

Notes: Detail may not add to total because of independent rounding. An active aircraft must have a current registration and it must have been flown at least one hour during the previous calendar year.

TABLE 22

ACTIVE GENERAL AVIATION AIRCRAFT

BY FAA REGION

(In Thousands)

AS OF JANUARY 1	FAA REGION ANE	AEA	ASO	AGL	ACE	ASW	AWP	ANM	AAL	TOTAL
Historical*										
1988	8.5	22.4	32.4	35.9	12.3	28.4	35.3	19.7	7.1	202.7
1989	8.9	22.3	32.2	34.8	11.3	27.4	34.2	18.5	5.9	196.2
1990	8.7	23.5	34.3	36.6	11.1	28.8	35.1	20.1	6.1	205.0
1991	8.1	23.0	32.7	34.7	11.0	26.4	34.7	20.3	6.5	198.0
1992	8.3	22.5	32.4	34.8	11.4	26.5	36.5	19.4	6.6	198.5
1993E	7.2	21.7	30.8	32.9	10.3	24.9	31.4	19.2	6.1	184.4
Forecast										
1994	7.1	21.2	30.3	32.2	10.0	24.4	30.6	19.0	6.1	180.9
1995	6.9	20.9	30.0	31.7	9.8	24.0	30.0	18.9	6.1	178.4
1996	6.8	20.6	29.7	30.9	9.6	23.6	29.7	18.8	6.1	175.7
1997	6.7	20.4	29.5	30.3	9.4	23.5	29.5	18.8	6.1	174.1
1998	6.7	20.2	29.4	29.8	9.2	23.4	29.5	18.9	6.1	173.3
1999	6.8	20.1	29.7	29.6	9.2	23.6	29.6	19.0	6.1	173.8
2000	6.8	20.2	29.8	29.7	9.2	23.7	29.7	19.1	6.1	174.3
2001	6.8	20.2	30.0	29.7	9.2	23.8	29.8	19.2	6.2	174.8
2002	6.9	20.3	30.3	29.8	9.2	23.8	29.8	19.3	6.2	175.5
2003	7.0	20.3	30.5	29.8	9.3	23.9	29.9	19.3	6.2	176.2
2004	7.0	20.4	30.6	29.9	9.3	24.1	30.0	19.4	6.2	177.0
2005	7.0	20.4	30.7	30.0	9.3	24.2	30.1	19.5	6.3	177.4

Source: FAA Statistical Handbook of Aviation.
* Adjusted to reflect nonrespondent sampling error.

Notes: Detail may not add to total because of independent rounding. An active aircraft must have a current registration and it must have been flown at least one hour during the previous calendar year.

TABLE 23

GENERAL AVIATION HOURS FLOWN

(In Millions)

	FIXED WING							
	PISTON				ROTORCRAFT			
FISCAL YEAR	SINGLE ENGINE	MULTI-ENGINE	TURBOPROP	TURBOJET	PISTON	TURBINE	OTHER	TOTAL
Historical*								
1988	20.4	4.1	2.2	1.5	0.6	1.9	0.5	31.1
1989	20.5	4.2	2.7	1.5	0.7	1.9	0.4	32.0
1990	21.5	4.0	2.5	1.4	0.7	1.6	0.4	32.0
1991	20.8	3.7	1.7	1.3	0.6	2.0	0.4	30.5
1992	18.7	3.3	1.5	1.1	0.5	1.9	0.4	27.4
1993E	17.8	2.9	1.5	1.0	0.4	1.8	0.4	25.8
Forecast								
1994	17.7	2.9	1.6	1.1	0.4	1.9	0.5	26.1
1995	17.6	2.9	1.7	1.1	0.4	2.1	0.5	26.3
1996	17.6	2.9	1.7	1.2	0.4	2.2	0.5	26.5
1997	17.5	3.0	1.8	1.3	0.4	2.3	0.5	26.8
1998	17.5	3.0	1.9	1.3	0.4	2.5	0.5	27.1
1999	17.4	3.0	2.0	1.4	0.4	2.6	0.5	27.3
2000	17.3	3.1	2.1	1.4	0.4	2.8	0.6	27.7
2001	17.2	3.2	2.2	1.5	0.4	2.9	0.6	28.0
2002	17.0	3.2	2.3	1.6	0.4	3.1	0.6	28.2
2003	16.9	3.3	2.4	1.6	0.4	3.2	0.6	28.4
2004	16.8	3.3	2.5	1.7	0.4	3.4	0.6	28.7
2005	16.7	3.3	2.6	1.8	0.4	3.5	0.6	28.9

Source: FAA Statistical Handbook of Aviation.
* Adjusted to reflect nonrespondent sampling error.

Notes: Detail may not add to total because of independent rounding.

TABLE 24

ACTIVE PILOTS BY TYPE OF CERTIFICATE
(In Thousands)

AS OF JANUARY 1	STUDENTS	RECREATIONAL[2] LIGHTER-THAN-AIR[3]	PRIVATE	COMMERCIAL	AIRLINE TRANSPORT	HELICOPTER	GLIDER	TOTAL	INSTRUMENT RATED[1]
Historical*									
1988	146.0	1.2	300.9	143.6	91.3	8.7	7.9	699.7	266.1
1989	136.9	1.1	299.8	143.0	97.0	8.6	7.6	694.0	273.8
1990	142.5	1.1	293.2	144.5	102.1	8.9	7.7	700.0	282.8
1991	128.7	0.1	299.1	149.7	107.7	9.6	7.8	702.7	297.1
1992	120.2	0.2	293.3	148.4	112.2	9.9	8.0	692.1	303.2
1993E	114.6	0.2	288.1	146.4	115.9	9.7	8.2	683.0	306.2
Forecast									
1994	115.0	0.3	288.9	148.6	118.2	9.7	8.2	688.9	309.8
1995	116.8	0.4	289.8	150.1	120.5	9.8	8.3	695.7	313.6
1996	118.5	0.5	290.7	151.6	122.9	10.0	8.4	702.6	317.3
1997	120.3	0.7	291.6	153.2	127.5	10.1	8.5	711.9	321.4
1998	121.5	0.8	292.4	154.6	132.1	10.3	8.6	720.3	325.3
1999	122.7	0.9	293.3	156.2	137.0	10.4	8.7	729.2	329.9
2000	123.4	1.0	294.1	157.7	140.7	10.5	8.7	736.1	334.8
2001	124.0	1.1	295.0	159.3	144.5	10.6	8.8	743.3	339.5
2002	124.6	1.2	296.0	160.9	148.4	10.7	8.8	750.6	344.2
2003	125.2	1.3	296.8	162.5	151.4	10.8	8.8	756.8	348.4
2004	125.8	1.3	297.7	164.1	154.4	10.9	8.9	763.1	352.6
2005	126.5	1.4	298.6	165.8	157.5	11.0	9.0	769.8	356.1

* Source: FAA Statistical Handbook of Aviation.

1/ Instrument rated pilots should not be added to other categories in deriving total.
2/ Recreational rating not available until 1991.
3/ Lighter-than-air type rating is no longer issued after 1990.
Notes: Detail may not add to total because of independent rounding.

TABLE 25

GENERAL AVIATION AIRCRAFT FUEL CONSUMPTION

(In Millions of Gallons)

	FIXED WING							
	PISTON				ROTORCRAFT			
FISCAL YEAR	SINGLE ENGINE	MULTI-ENGINE	TURBOPROP	TURBOJET	PISTON	TURBINE	OTHER	TOTAL
Historical*								
1988	173.4	144.0	195.6	403.5	5.9	54.9	0.1	977.4
1989	174.2	147.6	246.3	406.1	7.0	56.9	0.1	1,038.1
1990	240.6	124.7	222.1	399.7	8.8	59.9	0.1	1,055.9
1991	233.5	113.3	154.8	358.0	7.6	75.2	0.1	942.6
1992	209.3	101.5	134.2	312.6	5.7	73.0	0.1	836.4
1993E	198.9	90.3	131.4	288.6	5.2	69.0	0.1	783.5
Forecast								
1994	197.8	90.3	140.8	303.1	5.2	71.8	0.1	809.1
1995	197.7	90.7	149.3	319.0	5.2	77.4	0.1	839.4
1996	197.4	91.0	156.9	337.0	5.2	81.7	0.1	869.3
1997	196.3	91.8	164.3	351.7	5.2	88.0	0.1	897.4
1998	196.2	92.6	173.0	369.8	5.2	92.9	0.1	929.8
1999	195.3	94.3	182.0	387.8	5.2	99.0	0.1	963.7
2000	194.3	96.0	191.4	405.4	4.9	104.5	0.1	996.6
2001	193.4	98.0	199.5	423.1	4.9	109.3	0.1	1,028.3
2002	192.4	99.3	207.8	440.8	4.9	116.2	0.1	1,061.5
2003	191.5	100.5	218.1	458.4	4.9	122.1	0.1	1,095.6
2004	190.4	101.8	229.2	476.1	4.9	127.6	0.1	1,130.1
2005	189.4	103.1	238.4	493.8	4.9	132.7	0.2	1,162.5

Source: FAA APO Estimates

* Adjusted to reflect nonrespondent sampling error.

Notes: Detail may not add to total because of independent rounding.

TABLE 26

ACTIVE ROTORCRAFT FLEET AND HOURS FLOWN

AS OF JANUARY 1	ACTIVE FLEET (Thousands) PISTON	TURBINE	TOTAL	HOURS FLOWN (1) (Millions) PISTON	TURBINE	TOTAL
Historical*						
1988	2.6	3.3	5.9	0.6	1.9	2.5
1989	2.4	3.6	6.0	0.7	1.9	2.6
1990	3.0	3.9	6.9	0.7	1.6	2.3
1991	3.2	3.7	6.9	0.6	2.0	2.6
1992	2.5	3.8	6.3	0.5	1.9	2.4
1993E	2.2	3.6	5.8	0.4	1.8	2.2
Forecast						
1994	2.1	3.6	5.7	0.4	1.9	2.3
1995	2.1	3.8	5.9	0.4	2.1	2.5
1996	2.0	4.0	6.0	0.4	2.2	2.6
1997	2.0	4.2	6.2	0.4	2.3	2.7
1998	2.0	4.4	6.4	0.4	2.5	2.9
1999	2.0	4.6	6.6	0.4	2.6	3.0
2000	1.9	4.8	6.7	0.4	2.8	3.2
2001	1.9	5.0	6.9	0.4	2.9	3.3
2002	1.9	5.2	7.1	0.4	3.1	3.5
2003	1.8	5.4	7.2	0.4	3.2	3.6
2004	1.8	5.6	7.4	0.4	3.4	3.8
2005	1.8	5.8	7.6	0.4	3.5	3.9

* Source: FAA Statistical Handbook of Aviation

(1) Helicopter hours flown are on a fiscal year basis.

TABLE 27

TOTAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL	NUMBER OF FAA TOWERS
Historical*						
1988	12.8	8.3	37.5	2.8	61.3	399
1989	12.5	8.3	37.8	2.8	61.4	399
1990	12.9	8.8	39.0	2.8	63.5	403
1991	12.5	8.9	37.6	2.5	61.5	399
1992	12.4	9.3	37.0	2.8	61.5	401
1993E	12.6	9.7	35.2	2.6	60.1	402
Forecast						
1994	12.7	10.1	35.6	2.5	60.9	402
1995	12.9	10.5	36.0	2.4	61.8	402
1996	13.1	10.9	36.7	2.4	63.1	402
1997	13.4	11.2	37.2	2.4	64.2	402
1998	13.7	11.6	37.7	2.4	65.4	402
1999	14.0	12.0	38.2	2.4	66.6	402
2000	14.3	12.4	38.7	2.4	67.8	402
2001	14.6	12.8	39.1	2.4	68.9	402
2002	14.9	13.2	39.6	2.4	70.1	402
2003	15.2	13.6	40.1	2.4	71.3	402
2004	15.5	14.0	40.6	2.4	72.5	402
2005	15.8	14.4	41.1	2.4	73.7	402

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of rounding.

TABLE 28

ITINERANT AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1988	12.8	8.3	22.1	1.4	44.5
1989	12.5	8.3	22.1	1.4	44.3
1990	12.9	8.8	22.4	1.4	45.5
1991	12.5	8.9	21.5	1.3	44.2
1992	12.4	9.3	21.3	1.5	44.5
1993E	12.6	9.7	20.4	1.4	44.0
Forecast					
1994	12.7	10.1	20.6	1.3	44.7
1995	12.9	10.5	20.8	1.3	45.5
1996	13.1	10.9	21.2	1.3	46.5
1997	13.4	11.2	21.5	1.3	47.4
1998	13.7	11.6	21.8	1.3	48.4
1999	14.0	12.0	22.1	1.3	49.4
2000	14.3	12.4	22.4	1.3	50.4
2001	14.6	12.8	22.7	1.3	51.4
2002	14.9	13.2	23.0	1.3	52.4
2003	15.2	13.6	23.3	1.3	53.4
2004	15.5	14.0	23.6	1.3	54.4
2005	15.8	14.4	23.9	1.3	55.4

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of rounding.

TABLE 29

LOCAL AIRCRAFT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	GENERAL AVIATION	MILITARY	TOTAL
Historical*			
1988	15.4	1.4	16.8
1989	15.7	1.4	17.1
1990	16.6	1.4	18.0
1991	16.0	1.2	17.2
1992	15.7	1.3	17.0
1993E	14.9	1.2	16.1
Forecast			
1994	15.0	1.2	16.2
1995	15.2	1.1	16.3
1996	15.5	1.1	16.6
1997	15.7	1.1	16.8
1998	15.9	1.1	17.0
1999	16.1	1.1	17.2
2000	16.3	1.1	17.4
2001	16.4	1.1	17.5
2002	16.6	1.1	17.7
2003	16.8	1.1	17.9
2004	17.0	1.1	18.1
2005	17.2	1.1	18.3

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of rounding.

TABLE 30

INSTRUMENT OPERATIONS

AT AIRPORTS WITH FAA TRAFFIC CONTROL SERVICE

(In Millions)

FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL	
Historical*						
1988	13.4	8.4	18.3	4.4	44.5	(9.5)
1989	13.6	8.4	18.6	4.5	45.0	(9.4)
1990	14.0	9.4	19.1	4.4	46.8	(10.0)
1991	13.5	9.5	18.1	4.0	45.1	(9.5)
1992	13.4	9.9	18.2	4.1	45.6	(9.4)
1993E	13.6	10.4	17.7	3.9	45.7	(9.1)
Forecast						
1994	13.7	10.8	17.9	3.8	46.2	(9.2)
1995	14.0	11.2	18.1	3.7	47.0	(9.4)
1996	14.3	11.6	18.4	3.7	48.0	(9.4)
1997	14.7	11.9	18.7	3.7	49.0	(9.4)
1998	15.1	12.3	19.0	3.7	50.1	(9.4)
1999	15.4	12.7	19.3	3.7	51.1	(9.4)
2000	15.7	13.1	19.6	3.7	52.1	(9.4)
2001	16.0	13.5	19.9	3.7	53.1	(9.4)
2002	16.3	13.9	20.2	3.7	54.1	(9.4)
2003	16.6	14.3	20.5	3.7	55.1	(9.4)
2004	16.9	14.7	20.8	3.7	56.1	(9.4)
2005	17.2	15.1	21.1	3.7	57.1	(9.4)

* Source: FAA Air Traffic Activity.

Notes: Non-IFR instrument counts at Terminal Control Area (TCA) facilities and expanded area radar service are included in totals and are shown in parenthesis (See Table 31). Data include instrument operations at FAA operated military radar approach control facilities.

Detail may not add because of rounding.

TABLE 31

NON-IFR INSTRUMENT OPERATIONS
(In Millions)

FISCAL YEAR	TERMINAL CONTROL AREAS	AIRPORT RADAR SERVICE AREAS	TOTAL
Historical*			
1988	1.7	7.8	9.5
1989	1.6	7.8	9.4
1990	1.9	8.1	10.0
1991	2.5	7.0	9.5
1992	2.5	6.9	9.4
1993E	2.2	6.9	9.1
Forecast			
1994	2.2	7.0	9.2
1995	2.3	7.1	9.4
1996	2.3	7.1	9.4
1997	2.3	7.1	9.4
1998	2.3	7.1	9.4
1999	2.3	7.1	9.4
2000	2.3	7.1	9.4
2001	2.3	7.1	9.4
2002	2.3	7.1	9.4
2003	2.3	7.1	9.4
2004	2.3	7.1	9.4
2005	2.3	7.1	9.4

* Source: FAA

TABLE 32

IFR AIRCRAFT HANDLED

AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS

(In Millions)

FISCAL YEAR	IFR AIRCRAFT HANDLED				
	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	TOTAL
Historical*					
1988	17.9	5.8	8.1	4.6	36.4
1989	17.5	5.2	8.2	5.7	36.6
1990	18.5	5.6	7.9	5.5	37.4
1991	18.3	5.6	7.4	5.1	36.4
1992	18.3	5.9	7.4	5.1	36.7
1993E	19.0	6.2	7.4	4.8	37.5
Forecast					
1994	19.2	6.5	7.5	4.7	37.9
1995	19.6	6.7	7.7	4.6	38.6
1996	20.0	7.1	7.7	4.6	39.4
1997	20.5	7.3	7.9	4.6	40.3
1998	21.0	7.6	7.9	4.6	41.1
1999	21.5	7.8	8.1	4.6	42.0
2000	21.9	8.2	8.1	4.6	42.8
2001	22.3	8.4	8.3	4.6	43.6
2002	22.7	8.6	8.3	4.6	44.2
2003	23.1	8.8	8.5	4.6	45.0
2004	23.5	9.1	8.5	4.6	45.7
2005	23.9	9.3	8.7	4.6	46.5

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of rounding.

TABLE 33

IFR DEPARTURES AND OVERS

AT FAA AIR ROUTE TRAFFIC CONTROL CENTERS

(In Millions)

FISCAL YEAR	AIR CARRIER IFR DEPARTURES	AIR CARRIER OVERS	AIR TAXI/COMMUTER IFR DEPARTURES	AIR TAXI/COMMUTER OVERS	GENERAL AVIATION IFR DEPARTURES	GENERAL AVIATION OVERS	MILITARY IFR DEPARTURES	MILITARY OVERS	TOTAL DEPARTURES	TOTAL OVERS
Historical*										
1988	6.1	5.6	2.7	0.4	3.4	1.3	1.6	1.5	13.8	8.7
1989	6.0	5.4	2.5	0.3	3.4	1.4	1.9	1.9	13.8	9.0
1990	6.3	5.9	2.6	0.4	3.3	1.3	1.8	1.8	14.0	9.4
1991	6.2	5.8	2.6	0.3	3.1	1.2	1.7	1.7	13.6	9.0
1992	6.3	5.9	2.7	0.4	3.1	1.3	1.8	1.8	13.9	9.4
1993E	6.3	6.4	2.9	0.5	3.1	1.3	1.7	1.4	14.0	9.6
Forecast										
1994	6.4	6.4	3.0	0.5	3.1	1.3	1.7	1.3	14.2	9.5
1995	6.6	6.4	3.1	0.5	3.2	1.3	1.7	1.2	14.6	9.4
1996	6.7	6.6	3.3	0.5	3.2	1.3	1.7	1.2	14.9	9.6
1997	6.9	6.7	3.4	0.5	3.3	1.3	1.7	1.2	15.3	9.7
1998	7.1	6.8	3.5	0.6	3.3	1.3	1.7	1.2	15.6	9.9
1999	7.3	6.9	3.6	0.6	3.4	1.3	1.7	1.2	16.0	10.0
2000	7.4	7.1	3.8	0.6	3.4	1.3	1.7	1.2	16.3	10.2
2001	7.6	7.1	3.9	0.6	3.5	1.3	1.7	1.2	16.7	10.2
2002	7.7	7.3	4.0	0.6	3.5	1.3	1.7	1.2	16.9	10.4
2003	7.9	7.3	4.1	0.6	3.6	1.3	1.7	1.2	17.3	10.4
2004	8.0	7.5	4.2	0.7	3.6	1.3	1.7	1.2	17.5	10.7
2005	8.2	7.5	4.3	0.7	3.7	1.3	1.7	1.2	17.9	10.7

* Source: FAA Air Traffic Activity.

Note: Totals may not add because of rounding.

TABLE 34

TOTAL FLIGHT SERVICES

AT FAA FLIGHT SERVICE STATIONS

(In Millions)

FISCAL YEAR	FLIGHT PLANS ORIGINATED	PILOT BRIEFS	AIRCRAFT CONTACTED	TOTAL FLIGHT SERVICES	FLIGHT SERVICES INCLUDING DUATS
Historical*					
1988	7.9	11.9	6.7	46.3	46.3
1989	7.7	12.3	6.5	46.6	46.6
1990	7.3	11.8	6.3	44.6	47.6
1991	6.6	11.0	5.8	41.1	47.5
1992	6.4	10.7	5.5	39.7	48.1
1993E	6.2	9.9	5.1	37.2	48.2
Forecast					
1994	6.0	9.6	4.9	36.1	48.1
1995	6 0	9.5	4.8	35.8	48.6
1996	5.9	9.5	4.8	35.6	49.2
1997	5.9	9.5	4.8	35.6	50.0
1998	5.9	9.4	4.8	35.4	50.4
1999	5.8	9.4	4.8	35.2	50.8
2000	5.8	9.4	4.7	35.1	51.3
2001	5.7	9.3	4.7	34.7	51.9
2002	5.7	9.3	4.6	34.6	52.4
2003	5.7	9.2	4.6	34.4	52.8
2004	5.6	9.2	4.6	34.2	53.4
2005	5.6	9.1	4.6	34.0	53.8

* Source: FAA Air Traffic Activity.

Notes: Total flight services is equal to the sum of flight plans originated and pilot briefs, multiplied by two, plus the number of aircraft contacted.

TABLE 35

FLIGHT PLANS ORIGINATED

AT FAA FLIGHT SERVICE STATIONS

(In Millions)

FISCAL YEAR	FLIGHT PLANS ORIGINATED IFR-DVFR	VFR	TOTAL
Historical*			
1988	6.0	1.9	7.9
1989	5.9	1.8	7.7
1990	5.5	1.8	7.3
1991	4.9	1.7	6.6
1992	4.8	1.6	6.4
1993E	4.7	1.5	6.2
Forecast			
1994	4.6	1.4	6.0
1995	4.6	1.4	6.0
1996	4.5	1.4	5.9
1997	4.5	1.4	5.9
1998	4.5	1.4	5.9
1999	4.4	1.4	5.8
2000	4.4	1.4	5.8
2001	4.4	1.3	5.7
2002	4.4	1.3	5.7
2003	4.4	1.3	5.7
2004	4.3	1.3	5.6
2005	4.3	1.3	5.6

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of rounding.

TABLE 36

AIRCRAFT CONTACTED

AT FAA FLIGHT SERVICE STATIONS

(In Millions)

	USER CATEGORY				FLIGHT RULES		
FISCAL YEAR	AIR CARRIER	AIR TAXI/ COMMUTER	GENERAL AVIATION	MILITARY	IFR-DVFR	VFR	TOTAL
Historical*							
1988	0.3	1.0	5.0	0.4	1.9	4.8	6.7
1989	0.3	0.9	4.9	0.4	1.9	4.5	6.5
1990	0.3	0.8	4.8	0.4	1.8	4.5	6.3
1991	0.2	0.8	4.4	0.4	1.7	4.1	5.8
1992	0.2	0.8	4.1	0.4	1.7	3.8	5.5
1993E	0.2	0.8	3.8	0.4	1.7	3.5	5.1
Forecast							
1994	0.2	0.7	3.6	0.4	1.6	3.3	4.9
1995	0.2	0.7	3.5	0.4	1.5	3.3	4.8
1996	0.2	0.7	3.5	0.4	1.5	3.3	4.8
1997	0.2	0.7	3.5	0.4	1.5	3.3	4.8
1998	0.2	0.7	3.5	0.4	1.5	3.3	4.8
1999	0.2	0.7	3.5	0.4	1.5	3.3	4.8
2000	0.2	0.6	3.5	0.4	1.4	3.3	4.7
2001	0.2	0.6	3.5	0.4	1.4	3.3	4.7
2002	0.1	0.6	3.5	0.4	1.4	3.2	4.6
2003	0.1	0.6	3.5	0.4	1.4	3.2	4.6
2004	0.1	0.6	3.5	0.4	1.4	3.2	4.6
2005	0.1	0.6	3.5	0.4	1.4	3.2	4.6

* Source: FAA Air Traffic Activity.

Notes: Detail may not add to total because of rounding.

TABLE 37

AUTOMATED FLIGHT SERVICES

DUATS TRANSACTIONS

(In Millions)

FISCAL YEAR	DUATS FLIGHT PLANS	DUATS TRANSACTIONS	TOTAL DUATS
Historical*			
1989	-	-	-
1990	0.2	1.3	3.0
1991	0.5	2.7	6.4
1992	0.6	3.6	8.4
1993E	0.7	4.8	11.0
Forecast			
1994	0.9	5.1	12.0
1995	1.0	5.4	12.8
1996	1.2	5.6	13.6
1997	1.3	5.9	14.4
1998	1.4	6.1	15.1
1999	1.6	6.2	15.6
2000	1.7	6.4	16.2
2001	1.9	6.7	17.2
2002	2.0	6.9	17.8
2003	2.1	7.1	18.4
2004	2.3	7.3	19.2
2005	2.4	7.5	19.8

* Source: FAA Air Traffic Activity. DUATS data begin in 1990.

Notes: Total DUATS transactions are equal to the sum of flight plans originated and other transactions, multiplied by two.

TABLE 38

ACTIVE U.S. MILITARY AIRCRAFT

IN THE CONTINENTAL UNITED STATES [1/]

FISCAL YEAR	FIXED WING AIRCRAFT			HELICOPTER	TOTAL
	JET	TURBOPROP	PISTON		
Historical*					
1988	9,954	2,222	305	8,529	21,210
1989	9,501	2,131	261	7,330	19,223
1990	10,360	2,199	258	7,200	20,017
1991	10,221	2,119	247	7,379	19,966
1992	9,672	2,035	229	7,274	19,210
1993E	8,399	1,917	208	7,136	17,660
Forecast					
1994	7,685	1,856	222	6,330	16,093
1995	7,211	1,792	259	5,955	15,217
1996	7,118	1,750	276	5,729	14,873
1997	6,950	1,707	271	5,605	14,533
1998	6,884	1,677	270	5,564	14,395
1999	6,896	1,661	269	5,529	14,355
2000	6,901	1,651	268	5,517	14,337
2001	6,951	1,652	266	5,518	14,387
2002	6,927	1,639	265	5,505	14,336
2003	6,951	1,639	264	5,505	14,359
2004	6,961	1,638	264	5,503	14,366
2005	6,961	1,638	264	5,503	14,366

* Source: Office of the Secretary of Defense, Department of Defense.

[1/] Includes Army, Air Force, Navy and Marine regular service aircraft, as well as Reserve and National Guard aircraft.

TABLE 39

ACTIVE U.S. MILITARY AIRCRAFT

HOURS FLOWN IN THE CONTINENTAL UNITED STATES [1/]

(In Thousands)

	FIXED WING AIRCRAFT				
FISCAL YEAR	JET	TURBOPROP	PISTON	HELICOPTER	TOTAL
Historical*					
1988	3,339	808	92	1,763	6,002
1989	3,905	913	93	1,706	6,617
1990	3,849	908	202	1,772	6,731
1991	3,689	863	208	1,471	6,231
1992	3,407	843	197	1,770	6,217
1993E	2,727	725	65	1,854	5,371
Forecast					
1994	2,615	776	70	1,485	4,946
1995	2,510	781	78	1,631	5,000
1996	2,431	781	82	1,525	4,819
1997	2,403	761	82	1,446	4,692
1998	2,395	744	81	1,403	4,623
1999	2,386	723	80	1,365	4,554
2000	2,422	723	80	1,372	4,597
2001	2,446	723	80	1,372	4,621
2002	2,449	723	80	1,372	4,624
2003	2,463	723	80	1,372	4,638
2004	2,486	723	80	1,372	4,661
2005	2,486	723	80	1,372	4,661

* Source: Office of the Secretary of Defense, Department of Defense.

[1/] Includes Army, Air Force, Navy and Marine regular service aircraft, as well as Reserve and National Guard aircraft.

Appendix A

ACTIVE U.S. LARGE CERTIFICATED AIR CARRIERS FY 1993

Air Carrier	Code	REPORTING ENTITIES DOM	INT	ATL	LAM	PAC
Major Carriers						
America West		X	X		X	X
American		X	X	X	X	X
Continental		X	X	X	X	X
Delta		X	X	X	X	X
Federal Express		X	X	X	X	X
Northwest		X	X	X		X
Southwest		X				
Trans World		X	X	X		
United		X	X	X	X	X
United Parcel	C	X	X	X	X	X
USAir		X	X	X	X	
National Carriers						
Air Wisconsin		X				
Alaska		X			X	
Aloha		X				
American Trans Air		X	X			
Atlantic Southeast		X				
DHL	C	X	X	X	X	
Emery	C	X	X			
Evergreen		X	X			
Hawaiian		X	X			X
Horizon Air		X				
Markair		X				
Midwest Express		X				
Southern Air	NS	X	X			
Sun Country	NS	X	X			
Tower			X	X		
USAir Shuttle		X				
Westair		X				
World	NS	X	X			
Large Regional Carriers						
Air Transport Intl.	C	X	X	X		
American Intl.	C	X	X			
Amerijet	C	X	X			
Arrow	C	X	X			
Carnival		X	X		X	
Challenge	C		X		X	
Executive Airlines		X	X		X	
Express One	NS	X	X			
Florida West	C/NS	X	X			
Key		X	X		X	

ACTIVE U.S. LARGE CERTIFICATED AIR CARRIERS FY 1993 (cont.)

Air Carrier	Code	REPORTING ENTITIES DOM	INT	ATL	LAM	PAC
Large Regional Carriers (cont.)						
Kiwi		X				
MGM Grand		X				
Morris	NS	X	X			
Northern Air	C	X				
Private Jet		X	X			
Reeve		X				
Reno		X				
Rich	NS	X	X			
Simmons		X				
Trans States		X				
Zantop	C	X				
Medium Regional Carriers						
Aerial	C		X		X	
Airline of the Americas		X	X			
Airmark	NS	X				
Atlas Air	C/NS		X			
Av Atlantic	NS	X	X			
Buffalo	NS	X				
Casino Express		X				
Continental Micronesia			X			X
Eagle	NS	X				
Empire		X	X			
Fine	C	X	X			
Great American	NS	X				
Intl. Cargo Express	NS		X			
Miami Air	NS	X	X			
Millon	C/NS		X			
North American	NS	X				
Patriot	C/NS	X	X			
Ryan Intl.	C	X	X			
Sierra Pacific	NS	X				
Spirit		X				
Trans Air Link	C/NS	X	X			
Worldwide	NS	X	X			
Wrangler	C/NS		X			

Codes: C=Cargo only, NS=Nonscheduled.

NOTE: Some carriers listed are included in the data base because they operated during the year, even though they were out of business by the end of the fiscal year. Carriers are classified by RSPA based on annual operating revenues as follows: Major=$1 billion +; Nationals=$100 million to $1 billion; Large Regionals= $20 million to $99.99 million; Medium Regionals=$0 to $19.99 million.

Appendix B

CARRIERS NO LONGER INCLUDED IN AIR CARRIER DATA BASE

Air Carrier	Carrier Type (1)	Carrier Grouping (2)	Date of First Reported Traffic (3) Domestic	Int'l.	Date of Last Reported Traffic (4)
1. Aeromech (KC)	S	MR	7-79		5-81**
2. Aeron	F	MR		4-83	5-89*
3. Air America	S	LR			12-89*
4. Air Atlanta (CC)	S	LR	2-84		7-86*
5. AirCal (OC)	S	N	1-79		3-87m
6. Air Florida (QH)	S	N	1-79	7-80	5-84*
7. Air Illinois (UX)	S	LR	1-83		2-84*
8. Airlift (RD)	C	MR	7-84	7-84	12-85*
9. Airmark	C	MR	8-84	9-84	12-84*
10. Air Midwest (ZV)	S	LR	X		12-84**
11. Air National (AH)	C	LR		4-84	6-84*
12. Air Nevada (LW)	S	MR	4-81		7-82**
13. Air New England (NE)	S	MR	X		10-81*
14. Air North (NO)	S	MR	6-80		8-82**
15. Air North/Nenana (XG)	S	MR	3-81		8-82**
16. Air One (CB)	S	LR	4-83		7-84*
17. AirPac (RI)	S	LR	4-84		12-85*
18. All Star (LS)	S	MR	4-83	4-83	10-85*
19. Altair (AK)	S	MR	1-79		9-82*
20. American Int'l. (AV)	S	LR	11-82		9-84*
21. Apollo (ID)	S	MR	5-79		7-81**
22. Arista (RI)	C	MR	12-82	8-82	3-84*
23. Aspen (AP)	S	LR	1-85		4-91m
24. Atlantic Gulf (ZY)	C	MR	9-85		7-86*
25. Best (IW)	S	MR	7-82		10-85**
26. Big Sky (GQ)	S	MR	6-79		9-82**
27. Blue Bell (BB)	C	MR	6-83		2-84*
28. Braniff (BN) (8)	S	N	3-84		6-89*
29. Braniff International	S	LR	7-91		5-92*
30. Britt (RU)	S	LR	10-84		6-87**
31. Cascade (CZ)	S	LR	1-85		11-85*
32. Capitol (CL)	S	N	7-80	7-81	9-84*
33. Challenge (CN)	F	MR		8-82	6-86*
34. Challenge Air Int'l.	S	MR		7-86	8-87*
35. Cochise (DP)	S	MR	1-79		12-81*

CARRIERS NO LONGER INCLUDED

IN AIR CARRIER DATA BASE (Continued)

Air Carrier	Carrier Type (1)	Carrier Grouping (2)	Date of First Reported Traffic (3) Domestic	Int'l.	Date of Last Reported Traffic (4)
36. Coleman (CH)	S	MR	9-79		3-80*
37. Colgan (CJ)	S	MR	4-81		3-83**
38. Connor	F	MR		X	7-91*
39. Discovery	S	LR	3-90		7-90*
40. Eastern (EA)	S	M	X	X	1-91*
41. Emerald (OD)	S	LR	7-82		6-91*
42. Empire (UR)	S	LR	10-79		4-86m
43. Five Star (12)	C	LR	12-85		5-89*
44. Flagship Express	F	LR	X	X	12-91*
45. Flight International	C	MR	4-84	6-84	9-85*
46. Florida Express (ZO)	S	LR	1-84	1-87	2-89m
47. Flying Tiger (FT)	F	M	X	X	8-89m
48. Frontier (FL)	S	N	X	X	8-86m
49. Frontier Horizon (FH)	S	LR	1-84		1-85*
50. Galaxy (GY)	C	MR	10-83	12-83	5-87*
51. Global (GL)	C	LR	X	X	12-84*
52. Golden Gate (GG)	S	MR	5-80		7-81*
53. Golden West (GW)	S	MR	2-79		7-82**
54. Gulf Air Transport (GA)	C	MR		1-85	12-89*
55. Guy America (HX)	S	MR		8-81	2-83*
56. Hawaii Express (LP)	S	LR	10-82		10-83*
57. Imperial (II)	S	MR	1-80		6-82**
58. Independent Air	C	MR			7-90
59. International Air Service	C	LR	7-88		3-89*
60. Int'l. Air Service (IE)	C	LR	11-83		5-85*
61. Interstate	F	LR	5-85	5-85	10-87*
62. Jet America (SI)	S	N	1-82		8-87m
63. Jet Charter	C	MR	7-82	7-82	5-85*
64. Kodiak (KO)	S	MR	X		11-82**
65. L.A.B. (JF)	S	MR	1-82		8-82**
66. McClain (MU)	S	LR	11-86		2-87**
67. Mid-South (VL)	S	MR	6-80		2-84*
68. Midstate (IU)	S	MR	7-81		7-82**
69. Mid Pacific (HO)	S	LR	10-85		9-87*
70. Midway (ML)	S	N	11-79		11-91*

CARRIERS NO LONGER INCLUDED

IN AIR CARRIER DATA BASE (Continued)

Air Carrier	Carrier Type (1)	Carrier Grouping (2)	Date of First Reported Traffic (3) Domestic	Int'l.	Date of Last Reported Traffic (4)
71. Midway Express	S	LR	10-84		7-85*
72. Mississippi Valley (XV)	S	MR	4-79		8-82**
73. Munz (XY)	S	MR	X		8-83*
74. New Air (NC)	S	MR	5-79		9-82**
75. New York Air (NY)	S	N	12-80		12-86m
76. New Wien (WC)	S	MR	9-85		10-85*
77. Northeastern (QS)	S	LR	7-84		2-85*
78. Orion	F	MR	1-87	1-87	12-89
79. Overseas (OV)	C	LR	10-82		10-85*
80. Ozark (OZ)	S	N	X		9-86m
81. Pacific East (PR)	S	LR	9-82		3-84*
82. Pacific Express (VB)	S	LR	2-82		10-83*
83. Pacific Southwest (PS)	S	N	1-79		4-88m
84. Pan American (PA)	S	M	X	X	12-91*
85. Peninsula (KS)	S	MR	1-82		1-83**
86. People Express (PE)	S	N	5-81	5-83	12-86m
87. Piedmont (PI)	S	M	X	7-87	8-89m
88. Pilgrim (PM)	S	LR	9-85		12-86*
89. Ports of Call Travel Club	C	LR	9-85		1-86*
90. Presidential (XV)	S	LR	10-85	11-89*	
91. Pride Air (NI)	S	LR	10-85		11-85*
92. Republic (RC)	S	M	X		9-86m
93. Rocky Mountain (JC)	S	MR	7-81		9-82**
94. Royale (OQ)	S	LR	3-84		6-84**
95. Royal West	S	LR	7-86		
96. Ryan	C	LR	4-84	4-84	5-86*
97. Sea Airmotive (KJ)	S	MR	1-80		6-82**
98. Sky Bus (FW)	S	MR	7-85		11-86*
99. Skystar	C	MR	1-85	3-85	1-87*
100. Sky West (QG)	S	MR	7-79		12-84**
101. Sky World	C	LR	10-85	10-85	7-89*
102. Samoa (MB)	S	MR		2-85	6-85*
103. Southeast (NS)	S	MR	7-79		1-80*
104. South Pacific Island (HK)	S	LR		7-81	11-86*
105. Sun Coast (WS)	C	MR		5-87	9-87*

CARRIERS NO LONGER INCLUDED

IN AIR CARRIER DATA BASE (Continued)

Air Carrier	Carrier Type (1)	Carrier Grouping (2)	Date of First Reported Traffic (3) Domestic	Int'l.	Date of Last Reported Traffic (4)
106. Sunworld (JK)	S	LR	5-83		9-88
107. Swift Aire (WI)	S	MR	1-79		7-81*
108. T-Bird (DQ)	C	MR		4-82	8-84*
109. Total Air (TA)	C	MR	10-84	5-85	1-87*
110. TPI International	F	MR		3-90	8-90*
111. Transamerica (TV)	S	N		5-79	9-86*
112. Trans Continental	C	MR	1-89		1-92*
113. Trans International	F	MR	5-85	1-85	12-88*
114. Transtar (MA)	S	LR	8-81		8-87m
115. Universal	F	MR		X	3-90
116. Wien (WC)	S	N	X		11-84*
117. Wilbur's	F	MR	8-91		3-92
118. Western (WA)	S	M	X	X	3-87m
119. Western Yukon (WX)	S	MR	7-81		6-82*
120. Worldwide	C	MR	10-84	10-84	3-86*
121. Wright (FW)	S	MR	X		11-82**

(1) S - Scheduled; C - Charter; F - All-Cargo.
(2) M - Majors; N - Nationals; LR - Large Regionals; MR - Medium Regionals.
(3) Date of first reported traffic is indicated for those carriers starting service since the passage of the Airline Deregulation Act of 1978. Traffic reported by those carriers certificated prior to deregulation is indicated by an X.
(4) Carriers that have discontinued scheduled passenger service indicated by an *. Carriers now filing RSPA Form 298-C in lieu of RSPA Form 41 indicated by **. Carriers that have merged operations indicated by an m.

Appendix C

U.S. AIR CARRIERS
NONSCHEDULED TRAFFIC AND CAPACITY

DOMESTIC

FISCAL YEAR	ASMs (MIL)	RPMs (MIL)	L.F. (%)	ENPLANEMENTS (000)
Historical				
1984	8,142	6,078	74.6	3,840
1985	9,841	7,491	76.1	5,318
1986	8,404	6,345	75.5	4,856
1987	6,170	4,422	71.7	3,933
1988	6,651	4,954	74.5	4,490
1989	6,862	5,128	74.7	4,887
1990	7,393	5,551	75.1	5,208
1991	7,888	5,488	69.5	5,041
1992	8,473	6,374	75.2	5,645
1993E	10,151	7,736	76.2	7,398

INTERNATIONAL

FISCAL YEAR	ASMs (MIL)	RPMs (MIL)	L.F. (%)	ENPLANEMENTS (000)
Historical				
1984	8,513	7,385	86.8	2,824
1985	8,637	7,438	86.1	2,857
1986	7,517	6,327	84.2	2,662
1987	10,510	8,626	82.1	3,708
1988	11,118	9,148	82.3	3,932
1989	12,165	9,444	77.6	4,660
1990	11,220	8,152	72.7	3,906
1991	16,325	10,566	64.7	4,213
1992	10,804	8,152	75.5	3,619
1993E	10,958	7,978	72.8	3,538

U.S. AIR CARRIERS

NONSCHEDULED TRAFFIC AND CAPACITY (Continued)

	TOTAL			
FISCAL YEAR	ASMs (MIL)	RPMs (MIL)	L.F. (%)	ENPLANEMENTS (000)
Historical				
1984	16,655	13,463	80.8	6,664
1985	18,478	14,929	80.8	8,175
1986	15,921	12,672	79.6	7,518
1987	16,680	13,048	78.2	7,641
1988	17,769	14,102	79.4	8,422
1989	19,027	14,570	76.6	9,547
1990	18,613	13,703	73.6	9,114
1991	24,213	16,055	66.3	9,254
1992	19,277	14,526	75.4	9,264
1993E	21,109	15,714	74.4	10,937

Source: RSPA Form 41

Appendix D

U.S. AIR CARRIERS

CARGO REVENUE TON MILES
(In Millions)

FREIGHT/EXPRESS RTMs

FISCAL YEAR	DOMESTIC	INTERNATIONAL	TOTAL
Historical			
1984	4,391	3,328	7,719
1985	3,943	3,340	7,284
1986	4,869	3,988	8,857
1987	5,782	4,781	10,563
1988	6,699	5,702	12,401
1989	7,413	6,749	14,162
1990	7,542	6,771	14,313
1991	7,451	6,907	14,358
1992	7,859	6,819	14,678
1993E	8,510	7,429	15,939

MAIL RTMs

FISCAL YEAR	DOMESTIC	INTERNATIONAL	TOTAL
Historical			
1984	1,145	441	1,586
1985	1,203	450	1,653
1986	1,233	438	1,671
1987	1,314	435	1,749
1988	1,423	463	1,886
1989	1,463	488	1,951
1990	1,478	516	1,994
1991	1,463	507	1,970
1992	1,612	500	2,102
1993E	1,814	497	2,311

U.S. AIR CARRIERS
CARGO REVENUE TON MILES (Continued)
(In Millions)

TOTAL RTMs

FISCAL YEAR	DOMESTIC	INTERNATIONAL	TOTAL
Historical			
1984	5,536	3,769	9,305
1985	5,146	3,790	8,936
1986	6,102	4,426	10,528
1987	7,096	5,216	12,312
1988	8,122	6,165	14,287
1989	8,876	7,237	16,113
1990	9,020	7,287	16,307
1991	8,914	7,414	16,328
1992	9,471	7,319	16,790
1993E	10,324	7,926	18,250

Source: RSPA Form 41

Appendix E

ACTIVE U.S. REGIONALS/COMMUTERS

1. Action Air
2. Air Alpha
3. Air Cape
4. Air LA
5. Air Midwest
6. Air Molokai
7. Air Nevada
8. Air Sedona
9. Air St.Thomas
10. Air Sunshine
11. Air Vantage
12. Air Vegas
13. Airways International
14. Alaska Island Air
15. Allegheny Commuter
16. Alliance Airlines *
17. Aloha IslandAir
18. Alpha Air
19. Alpine Air
20. Arctic Circle Airlines *
21. Arizona Airways
22. Arizona Pacific Airways
23. Atlantic Coast Airlines
24. Atlantic Southeast
25. Baker Aviation *
26. Barrow Air *
27. Bellair *
28. Bemidji
29. Bering Airs *
30. Big Sky
31. Business Express **
32. Cape Air
33. Cape Smythe *
34. CCAir
35. Chalks International
36. Chautauqua Airlines
37. Chicago Express Airlines
38. Christman Air System
39. Coastal Air Transport
40. Colgan
41. Comair
42. Commutair
43. Conquest Airlines
44. Continental Express
45. Crown Airways
46. Direct Air
47. Eclipse Airlines
48. Ellis Air Taxi *
49. Empire Airlines **
50. ERA Aviation *
51. Executive Airlines
52. Express Airlines I
53. Express Airlines II
54. F. S. Air Service *
55. Flagship Airlines
56. Flamenco
57. Four Star Aviation
58. Freedon Air *
59. Frontier Flying Service *
60. GP Express
61. Grand Airways
62. Grand Canyon Helicopters
63. Great Lakes Aviation
64. Greenbrier Airlines
65. Gulf Air Taxi *
66. Gulfstream International
67. Hageland Aviation Services *
68. Haines Airways *
69. Harbor Air Services *
70. Harbor Airlines

ACTIVE U.S. REGIONALS/COMMUTERS (Continued)

71. Horizon **
72. Iliamna Air Taxi *
73. Island Express
74. Jet Express
75. Jetstream International
76. Kenmore Aire Harbor
77. Ketchikan Air Service *
78. LAB Flying Service *
79. Lake Powell Air Service
80. Lake Union Air Service *
81. Larry's Flying Service *
82. Las Vegas Airlines
83. Laughlin Express
84. Loken Aviation *
85. Lone Star Airlines
86. MarkAir Express *
87. Mesa Airlines
88. Mesaba Aviation
89. Metro-flight Airlines
90. Mowkawk Airlines
91. New England Airlines
92. New York Helicopters
93. Northeast Express Regional
94. Olson Air Service *
95. Pacific Coast Airlines *
96. Pacific Island Aviation *
97. Paradise Island
98. Peninsula Airways *
99. Precision Airlines
100. Piedmont Airlines
101. Promech *
102 Redwing Airlines
103. Ross Aviation
104. Ryan Air Service *
105. Samoa Air *
106. Scenic Airlines
107. Simmons Airlines **
108. Skagway Air Service *
109. Sky West Airlines
110. Skymaster Airlines
111. Southcentral Air *
112. Southeast Airlines
113. Springdale Air
114. StatesWest Airlines
115. Sunaire
116. Tanana Air Service *
117. Taquan Air Service *
118. Tatonduk Flying Service *
119. Trans Air
120. Trans States Airlines **
121. Trans World Express
122. Viequies Air Link
123. Village Aviation(Cami Air) *
124. Walker's International
125. Warblow's Air Venture *
126. Ward Air International *
127. West Isle Air
128. WestAir
129. Westates Airlines
130. Wing of Alaska
131. Wings West
132. WRA Inc.
133. Wright Air Service *
134. Yutana Airlines *
135. Yute Air Alaska *
136. 40-Mile Air *

* Carriers, primarily in Alaska, whose traffic is not included in the regional/commuter data base and forecast.

** Carriers operate both large turbojet and turboprop aircraft and report traffic data on RSPA Form 41.

Appendix F

GENERAL AVIATION ACTIVITY SURVEY RESULTS
1988 - 1992

GENERAL AVIATION ACTIVE AIRCRAFT
BY PRIMARY USE
(In Thousands)

Use Category	1992	1991	1990*	1989*	1988*
Corporate	9.4	10.0	10.1	11.5	10.2
Business	28.9	31.6	33.1	35.0	32.6
Personal	108.7	115.1	112.6	116.4	114.4
Instructional	16.0	17.9	18.6	16.6	15.6
Aerial Application	5.1	7.0	6.2	6.6	6.6
Aerial Observation	5.6	5.1	4.9	5.4	4.4
Other Work	1.7	1.7	1.4	2.0	1.7
Commuter Air Taxi	0.8	0.7	1.2	1.3	0.9
Air Taxi	4.6	5.5	5.8	6.6	6.0
Other	3.5	3.9	4.1	3.6	3.8
Rental	N/A	N/A	N/A	N/A	N/A
TOTAL	184.4	198.5	198.0	205.0	196.2

SOURCE: From 1988-1992 General Aviation Activity Surveys.

* 1988-1990 Surveys adjusted to reflect effects of nonresponse.
N/A Rental hours no longer collected as separate use categories.

NOTE: Columns may not add to totals due to rounding and estimation procedures.

GENERAL AVIATION ACTIVITY SURVEY RESULTS (Continued)
1988 - 1992

GENERAL AVIATION AIRCRAFT
TOTAL HOURS FLOWN BY
PRIMARY USE
(In Thousands)

Use Category	1992	1991	1990*	1989*	1988**
Corporate	2,262	2,617	2,913	3,453	3,472
Business	3,537	4,154	4,417	4,330	4,594
Personal	8,592	9,685	9,276	9,537	10,015
Instructional	5,340	6,141	7,244	5,993	4,917
Aerial Application	1,296	1,911	1,872	1,868	1,842
Aerial Observation	1,730	1,797	1,745	1,719	1,308
Other Work	343	471	572	517	525
Commuter Air Taxi	693	570	1,333	1,392	1,036
Air Taxi	2,009	2,241	2,249	3,020	2,632
Other	358	473	475	507	774
Rental	N/A	N/A	N/A	N/A	N/A
TOTAL	26,493	30,067	32,096	32,332	31,114

SOURCE: From 1988-1992 General Aviation Activity Surveys.

* 1988-1990 Surveys adjusted to reflect effects of nonresponse.
N/A Rental hours no longer collected as separate use categories.

NOTE: Columns may not add to totals due to rounding and estimation procedures.

GENERAL AVIATION ACTIVITY SURVEY RESULTS (Continued)
1988 - 1992

GENERAL AVIATION ACTIVE AIRCRAFT
BY AIRCRAFT TYPE
(In Thousands)

AIRCRAFT TYPE	1992	1991	1990*	1989*	1988*
Fixed Wing--Total	170.8	184.6	184.5	190.8	183.8
Piston--Total	162.1	175.3	175.2	180.8	175.0
One Engine	143.6	154.1	154.0	158.9	153.7
Two Engine	18.5	21.1	21.1	21.8	21.2
Other Piston	0.1	0.1	0.1	0.1	0.1
Turboprop--Total	4.7	4.9	5.3	5.9	4.9
Two Engine	4.1	4.4	4.9	5.7	4.7
Other Turboprop	0.6	0.5	0.4	0.2	0.2
Turbojet--Total	4.0	4.4	4.1	4.1	3.9
Two Engine	3.8	4.1	3.7	3.7	3.6
Other Turbojet	0.2	0.3	0.4	0.4	0.3
Rotorcraft--Total	5.8	6.3	6.9	7.0	6.0
Piston	2.2	2.5	3.2	3.0	2.4
Turbine	3.5	3.8	3.7	4.0	3.6
Other--Total	7.8	7.6	6.6	7.2	6.4
Total All Aircraft	184.4	198.5	198.0	205.0	196.2

SOURCE: From 1988-1992 General Aviation Activity Surveys.

* 1988-1990 Surveys adjusted to reflect effects of nonresponse.
N/A Rental hours no longer collected as separate use categories.

NOTE: Columns may not add to totals due to rounding and estimation procedures.

GENERAL AVIATION ACTIVITY SURVEY RESULTS (Continued)
1988 - 1992

GENERAL AVIATION AIRCRAFT
TOTAL HOURS FLOWN BY
AIRCRAFT TYPE
(In Thousands)

AIRCRAFT TYPE	1992	1991	1990*	1989*	1988*
Fixed Wing--Total	23,801	26,851	29,546	29,327	28,040
Piston--Total	21,251	24,102	25,832	24,907	24,291
One Engine	18,074	20,540	21,883	20,600	20,326
Two Engine	3,172	3,555	3,897	4,292	3,943
Other Piston	4	7	53	16	20
Turboprop--Total	1,478	1,513	2,319	2,892	2,195
Two Engine	1,238	1,359	2,162	2,776	2,117
Other Turboprop	240	154	157	116	78
Turbojet--Total	1,072	1,236	1,396	1,527	1,554
Two Engine	1,030	1,183	1,279	1,424	1,434
Other Turbojet	42	54	117	103	120
Rotorcraft--Total	2,283	2,757	2,209	2,610	2,507
Piston	416	585	716	692	533
Turbine	1,866	2,172	1,493	1,918	1,974
Other--Total	410	459	341	396	568
Total All Aircraft	26,493	30,067	32,096	32,332	31,114

SOURCE: From 1988-1992 General Aviation Activity Surveys.

* Adjusted to reflect effects of nonresponse.
N/A Rental hours no longer collected as separate use categories.

NOTE: Columns may not add to totals due to rounding and estimation procedures.

Appendix G

GENERAL AVIATION AIRCRAFT COST INDICES

SINGLE ENGINE PISTON AIRCRAFT

PRICE AND COST INDICES (in 1982-1984$)

(Index year 1983 = 100)

Calendar Year	Purchase Price	Maintenance Cost	Operating Cost	Total Cost
1970	83.9	82.4	56.8	60.7
1971	83.5	85.2	54.8	59.6
1972	85.0	88.5	53.7	59.3
1973	80.1	91.1	55.6	61.2
1974	72.1	97.3	67.7	72.2
1975	75.3	95.5	66.3	70.7
1976	82.6	110.0	68.3	74.9
1977	83.3	112.7	74.9	80.8
1978	81.6	109.0	79.5	83.8
1979	80.9	102.6	88.9	90.3
1980	74.8	96.5	99.3	97.6
1981	84.5	92.7	105.1	101.6
1982	90.2	98.2	103.2	101.0
1983	100.0	100.0	100.0	100.0
1984	103.9	99.6	97.3	95.7
1985	104.3	99.4	93.0	91.5
1986	109.6	99.6	84.4	86.1
1987	*	97.9	80.1	82.3
1988	*	96.7	76.9	79.5
1989	*	94.8	73.3	76.3
1990	*	93.0	73.9	76.4
1991	*	92.1	76.8	78.6
1992	*	91.5	73.5	75.8
1993	*	91.1	71.0	73.8

* Not calculated because all models in index have stopped production.

Source: FAA-APO Estimates

GENERAL AVIATION AIRCRAFT COST INDICES (CONTINUED)

MULTI-ENGINE PISTON AIRCRAFT

PRICE AND COST INDICES (In 1982-1984$)

(Index year 1983 = 100)

Calendar Year	Purchase Price	Maintenance Cost	Operating Cost	Total Cost
1970	85.6	99.2	56.0	69.1
1971	89.8	98.1	54.0	67.4
1972	96.1	95.2	52.9	65.7
1973	90.5	97.7	54.8	67.8
1974	83.8	104.9	66.7	78.3
1975	87.8	111.0	65.3	79.1
1976	90.8	120.9	67.3	83.5
1977	91.2	123.3	73.8	88.8
1978	93.5	119.9	78.3	90.9
1979	93.4	113.5	87.5	95.4
1980	90.3	104.6	97.8	99.8
1981	93.4	99.1	103.5	102.2
1982	96.9	99.2	101.7	102.3
1983	100.0	100.0	100.0	100.0
1984	111.9	99.6	94.9	96.3
1985	122.2	99.4	89.8	92.7
1986	125.8	99.5	83.1	88.1
1987	120.6	97.8	78.9	84.6
1988	124.8	96.6	75.7	82.0
1989	129.8	94.8	72.2	79.1
1990	135.2	92.9	72.8	78.9
1991	132.8	92.0	75.6	80.6
1992	136.0	91.4	72.4	78.1
1993	139.0	91.0	70.0	76.3

Source: FAA-APO Estimates

GENERAL AVIATION AIRCRAFT COST INDICES (CONTINUED)

TURBOPROP AIRCRAFT

PRICE AND COST INDICES (In 1982-1984$)

(Index year 1983 = 100)

Calendar Year	Purchase Price	Maintenance Cost	Operating Cost	Total Cost
1970	110.1	136.0	54.7	73.1
1971	113.0	135.3	55.4	73.5
1972	116.6	127.1	54.8	71.2
1973	109.8	130.4	61.3	77.0
1974	101.9	140.1	68.1	84.4
1975	103.1	142.6	66.8	84.0
1976	107.6	140.3	66.3	83.1
1977	101.0	126.3	68.8	81.4
1978	98.6	127.8	77.8	89.1
1979	97.4	117.7	93.7	99.1
1980	93.3	105.5	98.4	100.0
1981	98.0	99.1	101.8	101.2
1982	95.9	99.2	99.8	99.7
1983	100.0	100.0	100.0	100.0
1984	99.9	99.6	95.9	96.7
1985	107.0	99.4	91.6	93.3
1986	110.1	99.5	80.4	84.8
1987	108.1	97.8	77.6	82.2
1988	121.8	96.6	74.5	79.5
1989	125.2	94.8	71.1	76.5
1990	128.0	92.9	74.1	78.4
1991	127.9	92.0	78.3	81.4
1992	132.0	91.4	74.8	78.6
1993	136.6	91.0	72.7	76.9

Source: FAA-APO Estimates

GENERAL AVIATION AIRCRAFT COST INDICES (CONTINUED)

TURBOJET AIRCRAFT

PRICE AND COST INDICES (in 1982-1984$)

(Index year 1983 = 100)

Calendar Year	Purchase Price	Maintenance Cost	Operating Cost	Total Cost
1970	90.2	117.4	54.7	66.3
1971	86.3	114.4	55.4	66.3
1972	94.6	115.3	54.8	66.0
1973	89.4	118.3	61.3	71.8
1974	84.2	127.0	59.2	71.7
1975	85.0	125.5	66.8	77.6
1976	86.6	129.8	66.3	78.0
1977	88.7	133.3	68.8	80.7
1978	92.2	128.8	77.8	87.2
1979	91.7	119.1	93.7	98.4
1980	96.9	106.9	98.4	100.0
1981	92.7	99.1	101.8	101.3
1982	97.6	99.2	99.8	99.7
1983	100.0	100.0	100.0	100.0
1984	99.8	99.6	95.9	96.5
1985	100.7	99.4	91.6	93.0
1986	106.2	99.5	80.4	84.0
1987	106.0	97.8	77.6	81.3
1988	108.0	96.6	74.5	78.6
1989	102.7	94.8	71.1	75.5
1990	108.2	92.9	74.1	77.6
1991	105.7	92.0	78.3	80.8
1992	114.1	91.4	74.8	77.9
1993	116.5	91.0	72.7	76.1

Source: FAA-APO Estimates

APPENDIX H

FAA TOWERED AIRPORTS

Birmingham, AL (BHM)
Dothan, AL (DHN)
Huntsville Madison County, AL (HSV)
Mobile Bates Field, AL (MOB)
Montgomery Dannelly Field, AL (MGM)

Tuscaloosa Van De Graaf, AL (TCL)
Anchorage International, AK (ANC)
Anchorage Lake Hood SPB, AK (LHD)
Anchorage Merrill, AK (MRI)
Bethel, AK (BET)

Fairbanks International, AK (FAI)
Juneau, AK (JNU)
Kenai Municipal, AK (ENA)
King Salmon, AK (AKN)
Kodiak, AK (ADQ)

Deer Valley, AZ (DVT)
Falcon/Mesa, AZ (FFZ)
Goodyear, AZ (GYR)
Grand Canyon Municipal, AZ (GCN)
Phoenix Sky Harbor Int'l., AZ (PHX)

Prescott, AZ (PRC)
Scottsdale, AZ (SDL)
Tucson, AZ (TUS)
Fayetteville Drake Field, AR (FYV)
Fort Smith Municipal, AR (FSM)

Little Rock Adams Field, AR (LIT)
Texarkana, AR (TXK)
Bakersfield Meadows Field, CA (BFL)
Burbank, CA (BUR)
Camarillo, CA (CMA)

Carlsbad Palomar, CA (CRQ)
Chico, CA (CIC)
Chino, CA (CNO)
Concord, CA (CCR)
El Monte, CA (EMT)

Fresno Air Terminal, CA (FAT)
Fullerton Municipal, CA (FUL)
Hawthorne, CA (HHR)
Hayward, CA (HWD)
La Verne Brackett, CA (POC)

Lancaster Fox Airport, CA (WJF)
Livermore Municipal, CA (LVK)
Long Beach, CA (LGB)
Los Angeles International, CA (LAX)
Modesto City County, CA (MOD)

Monterey, CA (MRY)
Napa County, CA (APC)
Oakland International, CA (OAK)
Ontario, CA (ONT)
Oxnard Ventura County, CA (OXR)

Palm Springs Municipal, CA (PSP)
Palmdale, CA (PMD)
Palo Alto, CA (PAO)
Redding, CA (RDD)
Riverside Municipal, CA (RAL)

Sacramento Executive, CA (SAC)
Sacramento Metro, CA (SMF)
Salinas Municipal, CA (SNS)
San Carlos, CA (SQL)
San Diego Brown Field, CA (SDM)

San Diego Gillespi, CA (SEE)
San Diego Lindberg, CA (SAN)
San Diego Montgomery, CA (MYF)
San Franciso, CA (SFO)
San Jose International, CA (SJC)

San Jose Reid Hillview, CA (RHV)
San Luis Obispo, CA (SBP)
Santa Ana/Orange County, CA (SNA)
Santa Barbara, CA (SBA)
Santa Maria Public, CA (SMX)

FAA TOWERED AIRPORTS

Santa Monica, CA (SMO)
Santa Rosa Sonoma County, CA (STS)
South Lake Tahoe, CA (TVL)
Stockton, CA (SCK)
Torrance Municipal, CA (TOA)

Van Nuys, CA (VNY)
Aspen Pitkin County, CO (ASE)
Broomfield Jefferson County, CO (BJC)
Colorado Springs, CO (COS)
Denver Stapleton Int'l., CO (DEN)

Denver/Centennial, CO (APA)
Grand Junction, CO (GJT)
Pueblo, CO (PUB)
Bridgeport, CT (BDR)
Danbury Municipal, CT (DXR)

Groton/New London, CT (GON)
Hartford Brainard, CT (HFD)
New Haven, CT (HVN)
Windsor Locks, CT (BDL)
Wilmington Greater Wilmington, DE (ILG)

Washington National, DC (DCA)
Craig Field Jacksonville, FL (CRG)
Daytona Beach, FL (DAB)
Fort Lauderdale, FL (FLL)
Fort Lauderdale Executive, FL (FXE)

Fort Myers Page Field, FL (FMY)
Fort Myers Regional, FL (RSW)
Fort Pierce, FL (FPR)
Gainesville, FL (GNV)
Hollywood, FL (HWO)

Jacksonville International, FL (JAX)
Key West, FL (EYW)
Melbourne, FL (MLB)
Miami International, FL (MIA)
Opa Locka, FL (OPF)

Orlando Executive, FL (ORL)
Orlando International Airport, FL (MCO)
Panama City Bay County, FL (PFN)
Pensacola, FL (PNS)
Pompano Beach Airpak, FL (PMP)

Sanford, Fl (SFB)
Sarasota Bradenton, FL (SRQ)
St. Petersburg Clearwater, FL (PIE)
St. Petersburg Whitt, FL (SPG)
Tallahassee, FL (TLH)

Tamiami, FL (TMB)
Tampa International, FL (TPA)
Vero Beach, FL (VRB)
West Palm Beach, FL (PBI)
Albany, GA (ABY)

Atlanta DeKalb Peachtree, GA (PDK)
Atlanta Fulton County, GA (FTY)
Atlanta International, GA (ATL)
Augusta, GA (AGS)
Columbus, GA (CSG)

Macon Lewis B. Wilson, GA (MCN)
Savannah Municipal, GA (SAV)
Hilo General Lyman Field, HI (ITO)
Honolulu, HI (HNL)
Kahului, HI (OGG)

Kona Ke Ahole, HI (KOA)
Lihue, HI (LIH)
Molokai, HI (MKK)
Boise, ID (BOI)
Idaho Falls Fanning Field, ID (IDA)

Lewiston, ID (LWS)
Pocatello, ID (PIH)
Twin Falls, ID (TWF)
Alton St. Louis Regional, IL (ALN)
Aurora Municipal, IL (ARR)

Bloomington/Normal, IL (BMI)
Carbondale, IL (MDH)
Champaign Univeristy of Illinois, IL (CMI)
Chicago Du Page, IL (DPA)
Chicago Meigs, IL (CGX)

Chicago Midway, IL (MDW)
Chicago O'Hare International, IL (ORD)
Chicago Palwaukee, IL (PWK)
Decatur, IL (DEC)
East St. Louis State Park, IL (CPS)
Moline, IL (MLI)

FAA TOWERED AIRPORTS

Peoria, IL (PIA)
Rockford, IL (RFD)
Springfield Capital, IL (SPI)
Bloomington Monroe County, IN (BMG)
Evansville, IN (EVV)

Fort Wayne, IN (FWA)
Indianapolis International, IN (IND)
Lafayett Purdue University, IN (LAF)
Muncie Delaware County, IN (MIE)
South Bend, IN (SBN)

Terre Haute, IN (HUF)
Cedar Rapids, IA (CID)
Des Moines Municipal, IA (DSM)
Dubuque, IA (DBQ)
Sioux City Municipal, IA (SUX)

Waterloo, IA (ALO)
Hutchinson, KS (HUT)
Olathe, KS (OJC)
Salina, KS (SLN)
Topeka Forbes Field, KS (FOE)

Wichita Mid Continent, KS (ICT)
Cincinnati Greater, KY (CVG)
Lexington, KY (LEX)
Louisville Bowman, KY (LOU)
Louisville Standiford, KY (SDF)

Alexandria, LA (ESF)
Baton Rouge Ryan Field, LA (BTR)
Houma, LA (HUM)
Lafayette, LA (LFT)
Lake Charles, LA (LCH)

Monroe, LA (MLU)
New Orleans Lakefront, LA (NEW)
New Orleans Moesant, LA (MSY)
Shreveport, LA (SHV)
Shreveport Downtown, LA (DTN)

Bangor International, ME (BGR)
Portland, ME (PWM)
Baltimore Washington Int'l, MD (BWI)
Camp Springs Andrews AFB, MD (ADW)
Hagerstown, MD (HGR)

Bedford, MA (BED)
Beverly Muncipal, MA (BVY)
Boston Logan, MA (BOS)
Hyannis, MA (HYA)
Lawrence, MA (LWN)

Natucket Memorial, MA (ACK)
New Bedford, MA (EWB)
Norwood, MA (OWD)
Westfield, MA (BAF)
Worcester, MA (ORH)

Ann Arbor Municipal, MI (ARB)
Battle Creek, MI (BTL)
Detroit City, MI (DET)
Detroit Metro Wayne County, MI (DTW)
Detroit Willow Run, MI (YIP)

Flint Bishop, MI (FNT)
Grand Rapids, MI (GRR)
Jackson Reynolds Municipal, MI (JXN)
Kalamazoo, MI (AZO)
Lansing, MI (LAN)

Muskegon, MI (MKG)
Pontiac, MI (PTK)
Saginaw Tri City, MI (MBS)
Traverse City, MI (TVC)
Duluth, MN (DLH)

Minneapolis Crystal, MN (MIC)
Minneapolis Flying Cloud, MN (FCM)
Minneapolis St. Paul Int'l., MN (MSP)
Rochester, MN (RST)
St. Paul, MN (STP)

Greenville Municipal, MS (GLH)
Gulfport, MS (GPT)
Jackson Hawkins, MS (HKS)
Jackson Municipal Airport, MS (JAN)
Meridian Key, MS (MEI)

Columbia Regional, MO (COU)
Joplin, MO (JLN)
Kansas City International, MO (MCI)
Kansas City Municipal, MO (MKC)
Springfield, MO (SGF)

FAA TOWERED AIRPORTS

St. Joseph, MO (STJ)
St. Louis International, MO (STL)
St. Louis Spirit of St. Louis, MO (SUS)
Billings, MT (BIL)
Great Falls, MT (GTF)

Helena, MT (HLN)
Missoula, MT (MSO)
Grand Island, NE (GRI)
Lincoln Municipal, NE (LNK)
Omaha, NE (OMA)

Las Vegas McCarran Int'l, NV (LAS)
North Las Vegas, NV (VGT)
Reno International, NV (RNO)
Lebanon, NH (LEB)
Manchester, NH (MHT)

Atlantic City, NJ (ACY)
Caldwell, NJ (CDW)
Morristown, NJ (MMU)
Newark, NJ (EWR)
Teterboro, NJ (TEB)

Trenton, NJ (TTN)
Albuquerque Int'l, NM (ABQ)
Roswell, NM (ROW)
Santa Fe, NM (SAF)
Albany County, NY (ALB)

Binghamton Broome Cnty., NY (BGM)
Buffalo International, NY (BUF)
Elmira, NY (ELM)
Farmingdale, NY (FRG)
Islip McArthur, NY (ISP)

Ithaca Tompkins County, NY (ITH)
John F. Kennedy International, NY (JFK)
La Guardia, NY (LGA)
Niagara Falls, NY (IAG)
Poughkeepsie Dutchess County, NY (POU)

Rochester Monroe County, NY (ROC)
Syracuse Hancock International, NY (SYR)
Utica, NY (UCA)
White Plains Westchester, NY (HPN)
Asheville, NC (AVL)

Charlotte Douglas, NC (CLT)
Fayetteville Grannis, NC (FAY)
Greensboro Regional, (GSO)
Kinston, NC (ISO)
Raleigh Durham, NC (RDU)

Wilmington New Hanover County, NC (ILM)
Winston Salem, NC (INT)
Bismark, ND (BIS)
Fargo Hector Field, ND (FAR)
Grand Forks International, ND (GFK)

Minot International, ND (MOT)
Akron Canton Regional, OH (CAK)
Cincinnati Lunken, OH (LUK)
Cleveland Burke Lakefront, OH (BKL)
Cleveland Hopkins Int'l, OH (CLE)

Columbus Ohio State, OH (OSU)
Dayton, OH (DAY)
Mansfield Lahm Municipal, OH (MFD)
Port Columbus International, OH (CMH)
Toledo Express, OH (TOL)

Youngstown, OH (YNG)
Lawton Municipal, OK (LAW)
Oklahoma City Wiley Post, OK (PWA)
Oklahoma City Will Rogers, OK (OKC)
Tulsa International, OK (TUL)

Tulsa Riverside, OK (RVS)
Eugene, OR (EUG)
Hillsboro, OR (HIO)
Klamath Falls, OR (LMT)

Medford Jackson County, OR (MFR)
Portland International, OR (PDX)
Salem McNary Field, OR (SLE)
Troutdale, OR (TTD)
Allentown, PA (ABE)

Capital, City/Harrisburg, PA (CXY)
Erie, PA (ERI)
Harrisburg International, PA (MDT)
Lancaster, PA (LNS)
North Philadelphia, PA (PNE)

FAA TOWERED AIRPORTS

Philadelphia International, PA (PHL)
Pittsburgh Allegheny, PA (AGC)
Pittsburgh Greater International, PA (PIT)
Reading, PA (RDG)
Wilkes Barre, PA (AVP)

Williamsport, PA (IPT)
Providence, RI (PVD)
Charleston AFB Municipal, SC (CHS)
Columbia Metropolitan, SC (CAE)
Florence City, SC (FLO)

Greenville Municipal, SC (GMU)
Greer, SC (GSP)
Myrtle Beach, SC (MYT)
Rapid City, SD (RAP)
Sioux Falls Foss Field, SD (FSD)

Bristol Tri City, TN (TRI)
Chattanooga, TN (CHA)
Knoxville McGhee Tyson, TN (TYS)
Memphis International, TN (MEM)
Nashville Metropolitan, TN (BNA)

Abilene, TX (ABI)
Amarillo, TX (AMA)
Austin, TX (AUS)
Beaumont Port Arthur, TX (BPT)
Brownsville International, TX (BRO)

College Station, TX (CLL)
Corpus Christi, TX (CRP)
Dallas Addison, TX (ADS)
Dallas Love Field, TX (DAL)
Dallas Redbird, TX (RBD)

Dallas/Ft. Worth Int'l, TX (DFW)
El Paso International, TX (ELP)
Fort Worth Meacham, TX (FTW)
Fort Worth/Alliance, TX (AFW)
Harlingen Industrial AP, TX (HRL)

Houston Hobby, TX (HOU)
Houston Intercontinental, TX (IAH)
Longview, TX (GGG)
Lubbock, TX (LBB)
McAllen, TX (MFE)

Midland, TX (MAF)
San Angelo, TX (SJT)
San Antonio International, TX (SAT)
San Antonio Stinson, TX (SSF)
Tomball D. W. Hooks, TX (DWH)

Tyler, TX (TYR)
Waco Municipal, TX (ACT)
Ogden Municipal, UT (OGD)
Salt Lake City Int'l, UT (SLC)
Burlington International, VT (BTV)

Charlottesville Albemarle, VA (CHO)
Lynchburg, VA (LYH)
Manassas Municipal, VA (HEF)
Newport News, VA (PHF)
Norfolk International, VA (ORF)

Richmond Byrd Int'l, VA (RIC)
Roanoke, VA (ROA)
Washington Dulles Int'l, VA (IAD)
St. Croix Alex Hamilton, VI (STX)
St. Thomas H.S. Thomas, VI (STT)

Everett Paine Field, WA (PAE)
Moses Lake Grant, WA (MWH)
Olympia, WA (OLM)
Pasco Tri Cities, WA (PSC)
Renton, WA (RNT)

Seattle Boeing, WA (BFI)
Seattle Tacoma Int'l, WA (SEA)
Spokane Felts Field, WA (SFF)
Spokane International, WA (GEG)
Tacoma Narrows, WA (TIW)

Walla Walla, WA (ALW)
Yakima Air Terminal, WA (YKM)
Charleston, WV (CRW)
Clarksburg Benendum, WV (CKB)
Huntington, WV (HTS)

Morgantown, WV (MGW)
Parkersburg Wood County, WV (PKB)
Wheeling, WV (HLG)
Appleton, WI (ATW)
Green Bay Austin Straubel, WI (GRB)

FAA TOWERED AIRPORTS

Janesville, WI (JVL
Lacrosse, WI (LSE)
Madison, WI (MSN)
Milwaukee Mitchell, WI (MKE)
Milwaukee Timmerman, WI (MWC)
Oshkosh Wittman Field, WI (OSH)
Casper, WY (CPR)
Cheyene, WY (CYS)
San Juan International, PR (SJU)
San Juan Isla Grande, PR (SIG)

Kwajalein AAF, WK (KWA)
Pago Pago International, AS (TUT)

APPENDIX I

CONTRACT TOWERS

1. Flagstaff, Arizona (FLG)
2. Pacoima/Whitman, California (WHP)
3. Lakeland, Florida (LAL)
4. Valdosta Municipal, Georgia (VLD)
5. Hailey, Idaho (SUN)
6. Marion Williamson County, Illinois (MWA)
7. Waukegan, Illinois (UGN)
8. Topeka-Phillip Ballard, Kansas (TOP)
9. Owensboro-Daviees County, Kentucky (OWB)
10. Paducah Barkely Field, Kentucky (PAH)
11. New Iberia, Louisiana (ARA)
12. Martha's Vineyard, Massachusetts (MVY)
13. Cape Girardeau, Missouri (CGI)
14. Nashua, Hew Hamspire (ASH)
15. Farmington Municipal, New Mexico (FMN)
16. Hobbs Lea County, New Mexico (HOB)
17. Cleveland-Cuyahoga County, Ohio (CGF)

CONTRACT TOWERS (Continued)

18. Ardmore Municipal, Oklahoma (ADM)
19. Clinton Sherman, Oklahoma (CSM)
20. Enid Woodring Municipal, Oklahoma (WDG)
21. Pendleton, Oregon (PDT)
22. Myrtle Beach, South Carolina (CRE)
23. Smyrna, Tennesssee (MQY)
24. Laredo, Texas (LRD)
25. Bellingham, Washington (BLI)
26. Lewisburg-Greenbrier, West Virginia (LWB)
27. Mosinee, Wisconsin (CWA)

APPENDIX J

TERMINAL CONTROL AREAS AND AIRPORT RADAR SERVICE AREAS

Birmingham, AL (BHM)
Huntsville Madison County, AL (HSV)
Mobile Bates Field, AL (MOB)
Montgomery Dannelly Field, AL (MGM)
Anchorage International, AK (ANC/A11*)

Phoenix Sky Harbor Int'l., AZ (PHX/P50*)
Tucson, AZ (TUS/U90*)
Fort Smith Municipal, AR (FSM)
Little Rock Adams Field, AR (LIT)
Burbank, CA (BUR/B90*)

El Toro, CA (NZJ)*
Fresno Air Terminal, CA (FAT)
Los Angeles Int'l, CA (LAX/L56*)
Monterey, CA (MRY)
Oakland International, CA (OAK/O90*)

Ontario, CA (ONT/O40*)
Palm Springs Municipal, CA (PSP)
Sacramento Metro, CA (SME/MCC*)
San Diego Lindberg, CA (SAN/NKX*)
San Francisco, CA (SFO)

San Jose International, CA (SJC)
Santa Ana/Orange County, CA (SNA)
Santa Barbara, CA (SBA)
Colorado Springs, CO (COS)
Denver Stapleton Int'l, CO (DEN/D84*)

Hartford Bradley Int'l, CT (BDL/Y90*)
Washington National, DC (DCA)
Daytona Beach, FL (DAB)
Fort Lauderdale, FL (FLL)
Fort Myers Regional, FL (RSW)

Jacksonville International, FL (JAX)
Miami International, FL (MIA)
Orlando Int'l Airport, FL (MCO)
Pensacola, FL (PNS/P31*)
Sarasota Bradenton, FL (SRQ)

Tallahassee, FL (TLH)
Tampa International, FL (TPA)
West Palm Beach, FL (PBI)
Atlanta International, GA (ATL)
Augusta, GA (AGS)

Columbus, GA (CSG)
Macon Lewis B. Wilson, GA (MCN)
Savannah Municipal, GA (SAV)
Honolulu, HI (HNL)
Honolulu, HI (ZHN)

Kahului, HI (OGG)
Boise, ID (BOI)
Champaign Univ. of Illinois, IL (CMI)
Chicago Midway, IL (MDW)
Chicago O'Hare Int'l, IL (ORD/C90*)

Moline, IL (MLI)
Peoria, IL (PIA)
Rockford, IL (RFD)
Springfield Capital, IL (SPI)
Evansville, IN (EVV)

Fort Wayne, IN (FWA)
Indianapolis International, IN (IND)
South Bend, IN (SBN)
Cedar Rapids, IA (CID)
Des Moines Municipal, IA (DSM)

Wichita Mid Continent, KS (ICT)
Cincinnati Greater, KY (CVG)
Lexington, KY (LEX)
Louisville Standiford, KY (SDF)
Baton Rouge Ryan Field, LA (BTR)

Lafayette, LA (LFT)
Lake Charles, LA (LCH)
Monroe, LA (MLU)
New Orleans Moisant, LA (MSY)
Shreveport, LA (SHV)

TERMINAL CONTROL AREAS AND AIRPORT RADAR SERVICE AREAS

Bangor International, ME (BGR)
Portland, ME (PWM)
Baltimore Washington Int'l, MD (BWI/B95*)
Camp Springs Andrews AFB, MD (ADW)
Boston Logan, MA (BOS/A90*)

Detroit Metro Wayne County, MI (DTW/D21*)
Flint Bishop, MI (FNT)
Grand Rapids, MI (GRR)
Kalamazoo, MI (AZO)
Lansing, MI (LAN)

Muskegon, MI (MKG)
Saginaw Tri City, MI (MBS)
Minneapolis St. Paul, MN (MSP/M98*)
Gulfport, MS (GPT)
Jackson Municipal Airport, MS (JAN)

Kansas City International, MO (MCI)
St. Louis International, MO (STL/T75*)
Billings, MT (BIL)
Great Falls, MT (GTF)
Lincoln Municipal, NE (LNK)

Omaha, NE (OMA/R90*)
Las Vegas McCarrna Int'l., NV (LAS/L30*)
Reno International, NV (RNO)
Atlantic City, NJ (ACY)
Manchester, NH (MHT)

Newark, NJ (EWR)
Albuquerque International, NM (ABQ)
Albany County, NY (ALB)
Binghamton Broome County, NY (BGM)
Buffalo International, NY (BUF)

Elmira, NY (ELM)
Griffiss AFB, NY (RME)
John F. Kennedy Int'l, NY (JFK/N90*)
La Guardia, NY (LGA)
Rochester Monroe County, NY (ROC)

Syracuse Hancock Int'l, NY (SYR)
Asheville, NC (AVL)
Charlotte Douglas, NC (CLT)
Fayetteville Grannis, NC (FAY)
Greensboro Regional, NC (GSO)

Raliegh Durham, NC (RDU)
Wilmington New Hanover County, NC (ILM)
Fargo Hector Field, ND (FAR)
Akron Canton Regional, OH (CAK)
Cleveland Hopkins Int'l., OH (CLE)

Port Columbus International, OH (CMH)
Dayton, OH (DAY)
Toledo Express, OH (TOL)
Youngstown, OH (YNG)
Oklahoma City Will Rogers, OK (OKC)

Tulsa International, OK (TUL)
Portland International, OR (PDX/P80*)
Allentown, PA (ABE)
Capital City/Harrisburg, PA (CXY)
Erie, PA (ERI)

Harrisburgh International, PA (MDT)
Philadelphia International, PA (PHL)
Pittsburgh Greater Int'l, PA (PIT)
Wilkes Barre, PA (AVP)
Providence, RI (PVD/G90*)

Charleston AFB Municipal, SC (CHS)
Columbia Metropolitan, SC (CAE)
Greer, SC (GSP)
Bristol Tri City, TN (TRI)
Chattanooga, TN (CHA)

Knoxville McGhee Tyson, TN (TYS)
Memphis International, TN (MEM)
Nashville Metropolitan, TN (BNA)
Abilene, TX (ABI)
Amarillo, TX (AMA)

Austin, TX (AUS)
Beaumont Port Arthur, TX (BPT)
Corpus Christi, TX (CRP)
Dallas Love Field, TX (DAL)
Dallas/Ft. Worth Regional, TX (DFW/D10*)

El Paso International, TX (ELP)
Houston Hobby, TX (HOU)
Houston Intercontinental, TX (IAH/I90*)
Longview, TX (GCG)
Lubbock, TX (LBB)

TERMINAL CONTROL AREAS AND AIRPORT RADAR SERVICE AREAS

Midland, TX (MAF)
San Antonio International, TX (SAT)
Salt Lake City Int'l., UT (SLC/S56*)
Burlington International, VT (BTV)
Norfolk International, VA (ORF)

Richmond Byrd International, VA (RIC)
Roanoke, VA (ROA)
Washington Dulles Int'l, VA (IAD)
Seattle Tacoma Int'l, WA (SEA/S46*)
Spokane International, WA (GEG)

Charleston, WV (CRW)
Huntington, WV (HTS)
Green Bay Austin Straubel, WI (GRB)
Madison, WI (MSN)
Milwaukee Mitchell, WI (MKE)

Agana NAS, SP (GUM/ZUA*)
San International, PR (SJU/ZSU)

* Indicates that airport has terminal radar approach control (TRACON)

APPENDIX K

GLOSSARY OF TERMS

Air Carrier Operations -- Arrivals and departures of air carriers certificated in accordance with FAR Parts 121 and 127.

Air Route Traffic Control Center (ARTCC) -- A facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft.

Air Taxi -- An air carrier certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

Air Traffic -- Aircraft operating in the air or on an airport surface, exclusive of loading ramps and parking areas.

Air Traffic Hub -- Cities and Metropolitan Statistical Areas requiring aviation services. May include more than one airport. Communities fall into four classes as determined by the community's percentage of the total enplaned passengers by scheduled air carriers in the 50 United States, the District of Columbia, and other U.S. areas designated by the Federal Aviation Administration:

1. Large: 1.00 percent (4,476,260 passengers and over in CY 1992).
2. Medium: 0.25 percent to 0.999 percent (between 1,119,064 and 4,476,259 passengers in CY 1992).
3. Small: 0.05 percent to 0.249 percent (between 223,812 and 1,119,063 passengers in CY 1992).
4. Nonhub: Less than 0.05 percent (fewer than 223,812 passengers in CY 1990).

In CY 1992, the number of Hubs/non-hubs and airports by Hub classification was as follows:

1. Large: 26 Hubs which included 49 airports.
2. Medium: 31 Hubs which included 39 airports.
3. Small: 69 Hubs which included 73 airports.
4. 370 nonhubs which included 382 airports.

Air Travel Club -- An operator certificated in accordance with FAR Part 123 to engage in the carriage of members who qualify for that carriage by payment of an assessment, dues, membership fees, or other similar remittance.

Aircraft Contacted -- Aircraft with which the flight service stations have established radio communications contact. One count is made for each en route landing or departing aircraft contacted by a flight service station, regardless of the number of contacts made with an individual aircraft during the same flight. A flight contacting five FSS's would be counted as five aircraft contacted.

Aircraft Handled -- See IFR AIRCRAFT HANDLED.

Aircraft Operations -- The airborne movement of aircraft in controlled or noncontrolled airport terminal areas, and counts at en route fixes or other points where counts can be made. There are two types of operations: local and itinerant.

1. LOCAL OPERATIONS are performed by aircraft that:

   (a) operate in the local traffic pattern or within sight of the airport;

   (b) are known to be departing for or arriving from flights in local practice areas located within a 20-mile radius of the airport;

   (c) execute simulated instrument approaches or low passes at the airport.

2. ITINERANT OPERATIONS are all aircraft operations other than local operations.

Airport Advisory Service -- A service provided by flight service stations at airports not served by a control tower. This service provides information to arriving and departing aircraft concerning wind direction/speed, favored runway, altimeter setting, pertinent-known traffic/field conditions, airport taxi routes/traffic patterns, and authorized instrument approach procedures. This information is advisory and does not constitute an ATC clearance.

Airport Traffic Control Tower -- A terminal facility that through the use of air/ground communications, visual signaling, and other devices, provides ATC services to airborne aircraft operating in the vicinity of an airport and to aircraft operating on the movement area.

All-Cargo Carrier -- An air carrier certificated in accordance with FAR Part 121 to provide scheduled air freight, express, and mail transportation over specified routes, as well as to conduct nonscheduled operations that may include passengers.

Approach Control Facility -- A terminal air traffic control facility providing approach control service.

Approach Control Service -- Air traffic control service provided by an approach control facility for arriving and departing VFR/IFR aircraft and, on occasion, for enroute aircraft. At some airports not served by an approach control facility, the ARTCC provides limited approach control service.

ARTCC -- See AIR ROUTE TRAFFIC CONTROL CENTER.

ASM's -- See AVAILABLE SEAT MILES.

Available Seat Miles (ASM's) -- The aircraft miles flown in a flight stage, multiplied by the number of seats available on that stage for revenue passenger use.

Business Transportation -- Any use of an aircraft, not for compensation or hire, by an individual for transportation required by the business in which the individual is engaged.

Center -- See AIR ROUTE TRAFFIC CONTROL CENTER.

Center Area -- The specified airspace within which an Air Route Traffic Control Center (ARTCC) provides air traffic control and advisory service.

Center Radar Approach Control (CERAP) -- A combined Air Route Traffic Control Center (ARTCC) and a Terminal Radar Approach Control facility (TRACON).

CERAP -- See CENTER RADAR APPROACH CONTROL.

Commercial Air Carriers -- An air carrier certificated in accordance with FAR Part 121 or 127 to conduct scheduled services on specified routes. These air carriers may also provide nonscheduled or charter services as a secondary operation. Four carrier groupings have been designated for statistical and financial data aggregation and analysis.

1. MAJORS: Air carriers with annual operating revenues greater than $1 billion.

2. NATIONALS: Air carriers with annual operating revenues between $100 million and $1 billion.

3. LARGE REGIONALS: Air carriers with annual operating revenues between $10 million and $99,999,999.

4. MEDIUM REGIONALS: Air carriers with annual operating revenues less than $10 million.

Common IFR Room -- A highly automated terminal radar control facility. It provides terminal radar service in an area encompassing more than one major airport that accommodates instrument flight operations.

Commuter Air Carrier -- An air carrier certificated in accordance with FAR Part 135 or 121 that operates aircraft with a maximum of 60 seats, and that provides at least five scheduled round trips per week between two or more points, or that carries mail.

Commuter/Air Taxi Operations -- Arrivals and departures of air carriers certificated in accordance with FAR Part 135.

Direct User Access Terminal System -- An automated pilot self-friefing and flight plan filing system. For pilots with access to a computer, modem, and touch telephone, the system provides direct access to a national weather data base and the ability to file flight plans without contact with a flight service station.

Domestic Operations -- All air carrier operations having destinations within the 50 United States, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands.

DUATS -- See DIRECT USER ACCESS TERMINAL SYSTEM

Executive Transportation -- Any use of an aircraft, not for compensation or hire, by a corporation, company or other organization for the purpose of transporting its employees and/or property, and employing professional pilots for the operation of the aircraft.

FAA -- Federal Aviation Administration.

Facility -- See AIR TRAFFIC CONTROL TOWER.

Flight Plan -- Prescribed information relating to the intended flight of an aircraft that is filed orally or in writing with a flight service station or an air traffic control facility.

Flight Service Station (FSS) -- Air Traffic Service facilities within the National Airspace System that provide preflight pilot briefings and en route communications with IFR flights; assist lost IFR/VFR aircraft; assist aircraft having emergencies; relay ATC clearances, originate, classify, and disseminate Notices to Airmen (NOTAM's); broadcast aviation weather and NAS information; receive and close flight plans; monitor radio NAVAIDS; notify search and rescue units of missing VFR aircraft; and operate the national weather teletypewriter systems. In addition, at selected locations, FSS's take weather observations, issue airport advisories, administer airmen written examinations, and advise Customs and Immigration of transborder flights.

Flight Services -- See TOTAL FLIGHT SERVICES.

Foreign Flag Air Carrier -- An air carrier other than a U.S. flag air carrier in international air transportation. "Foreign air carrier" is a more inclusive term than "foreign flag air carrier," including those non-U.S. air carriers operating solely within their own domestic boundaries. In practice, the two terms are used interchangeably.

FSS -- See FLIGHT SERVICE STATION.

General Aviation -- All civil aviation activity except that of air carriers certificated in accordance with FAR Parts 121, 123, 127, and 135. The types of aircraft used in general aviation (GA) activities cover a wide spectrum from corporate multi-engine jet aircraft piloted by professional crews to amateur-built single engine piston acrobatic planes, balloons, and dirigibles.

General Aviation Operations -- Arrivals and departures of all civil aircraft, except those classified as air carrier and commuter/air taxi.

Hub -- See AIR TRAFFIC HUB.

IFR -- See INSTRUMENT FLIGHT RULES.

IFR Aircraft Handled -- The number of IFR departures multiplied by two, plus the number of IFR overs. This definition assumes that the number of departures (acceptances, extensions, and originations of IFR flight plans) is equal to the number of landings (IFR flight plans closed).

IFR Departures -- An IFR departure includes IFR flights that:

1. originate in a Center's area;
2. are extended by the Center; or
3. are accepted by the Center under sole enroute clearance procedures.

IFR Overs -- An IFR flight that originates outside the ARTCC area and passes through the area without landing.

IFSS -- See INTERNATIONAL FLIGHT SERVICE STATION.

International and Territorial Operations -- The operation of aircraft

flying between the 50 United States and foreign points, between the 50 United States and U.S. possessions and territories, and between two foreign points. Includes both the combination passenger/cargo and the all-cargo carriers engaged in international and territorial operations.

Instructional Flying -- Any use of aircraft for the purpose of formal instruction with the flight instructor aboard, or with the maneuvers on the particular flight(s) specified by the flight instructor.

Instrument Approach -- A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually. An instrument approach is prescribed and approved for a specific airport by competent authority (FAR Part 91).

Instrument Flight Rules (IFR) -- Rules governing the procedures for conducting instrument flight.

Instrument Operation -- An aircraft operation in accordance with an IFR flight plan or an operation where IFR separation between aircraft is provided by a terminal control facility or air route traffic control center.

International Flight Service Station (IFSS) -- A central operations facility in the flight advisory system, manned and equipped to control aeronautical point-to-point telecommunications and air/ground telecommunications with pilots operating over international territory or waters, providing flight plan filing, weather information, search and rescue action, and other flight assistance operations.

Itinerant Operations -- See AIRCRAFT OPERATIONS.

Large Regionals -- See COMMERCIAL AIR CARRIERS.

Local Operations -- See AIRCRAFT OPERATIONS.

Majors -- See COMMERCIAL AIR CARRIERS.

Medium Regionals -- See COMMERCIAL AIR CARRIERS.

Military Operations -- Arrivals and departures of aircraft not classified as civil.

Nationals -- See COMMERCIAL AIR CARRIERS.

Personal/Pleasure Flying -- Any use of an aircraft for personal purposes not associated with a business or profession, and not for hire. This includes maintenance of pilot proficiency.

Pilot Briefing -- A service provided by the flight service station to assist pilots in flight planning. Briefing items may include weather information, NOTAM's, military activities, flow control information, and other items as requested.

Radar Air Traffic Control Facility (RATCF) -- An air traffic control facility, located at a U.S. Navy (USN) or Marine Corps (USMC) Air Station, utilizing surveillance and, normally, precision approach radar and air/ground communication equipment to provide approach control services to aircraft arriving, departing, and transiting the airspace controlled by the facility. The facility may be operated by the FAA, the USN and the FAA, the USN, or

the USMC. Service may be provided to both civil and military airports.

Radar Approach Control (RAPCON) -- An air traffic control facility, located at a U.S. Air Force (USAF) Base, utilizing surveillance and, normally, precision approach radar and air/ground communication equipment to provide approach control services to aircraft arriving, departing, and transiting the airspace controlled by the facility. The facility may be operated by the FAA, or the USAF. Service may be provided to both civil and military airports.

Radio Contacts -- The initial radio call-up to a flight service station by enroute aircraft; a complete interchange of information and a termination of the contact.

RAPCON -- See RADAR APPROACH CONTROL.

RATCF -- See RADAR AIR TRAFFIC CONTROL FACILITY.

Registered Active General Aviation Aircraft -- A civil aircraft registered with the FAA that has been flown one or more hours during the previous calendar year. Excludes are aircraft owned and operated in regularly scheduled, nonscheduled, or charter service by commercial air carriers and aircraft in excess of 12,500 pounds maximum gross takeoff weight, and owned and operated by a commercial operator certificated by the FAA to engage in intrastate common carriage.

Research and Special Programs Administration (RSPA) -- The Research and Special Programs Administration of the U.S. Department of Transportation. Responsible for the collection of air carrier traffic and financial data on Form 41 that was collected formerly by the Civil Aeronautics Board.

Revenue Passenger Enplanements -- The total number of passengers boarding aircraft. Includes both originating and connecting passengers.

Revenue Passenger Load Factor -- Revenue passenger-miles as a percent of available seat-miles in revenue passenger services, i.e., the proportion of aircraft seating capacity that is actually sold and utilized.

Revenue Passenger Mile (RPM) -- One revenue passenger transported one mile in revenue service. Revenue passenger miles are computed by summation of the products of the revenue aircraft miles flown a flight stage, multiplied by the number of revenue passengers carried on that flight stage.

Revenue Ton Mile (RTM) -- One ton of revenue traffic transported one mile.

RPM -- See REVENUE PASSENGER MILE.

RSPA -- See Research and Special Program Administration

RTM -- See REVENUE TON MILE.

Secondary Airport -- An airport receiving approach control service as a satellite to a primary approach control facility, or one at which control is exercised by the approach control facility under tower en route control procedure.

Supplemental Air Carrier -- An air carrier certificated in accordance with FAR Part 121, and providing nonscheduled or supplemental carriage of passengers or cargo, or both, in air transportation. Also referred to as nonscheduled or charter air carriers.

Terminal Radar Approach Control (TRACON) -- An FAA traffic control facility using radar and air/ground communications to provide approach control services to aircraft arriving, departing, or transiting the airspace controlled by the facility. Service may be provided to both civil and military airports. A TRACON is similar to a RAPCON (USAF), RATCF (USN), and ARAC (Army).

Total Flight Services -- The sum of flight plans originated and pilot briefs, multiplied by two, plus the number of aircraft contacted. No credit is allowed for airport advisories.

Total Operations -- All arrivals and departures performed by military, general aviation, commuter/air taxi, and air carrier aircraft.

Tower -- See AIRPORT TRAFFIC CONTROL TOWER.

TRACON -- See TERMINAL RADAR APPROACH CONTROL.

U.S. Flag Carrier -- Air carrier holding a certificate issued by the Department of Transportation, and approved by the President, authorizing the carrier to provide scheduled operations over a specified route between the United States (and/or its territories) and one or more foreign countries.

VFR -- See VISUAL FLIGHT RULES.

VFR Tower -- An airport traffic control tower that does not provide approach control service.

Visual Flight Rules (VFR) -- Rules that govern the procedures for conducting flight under visual conditions. Also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. Used by pilots and controllers to indicate type of flight plan.