

**FAA-APO-00-5**

**FAA LONG-RANGE  
AEROSPACE FORECASTS  
FISCAL YEARS  
2015, 2020 AND 2025**

**OFFICE OF  
AVIATION POLICY AND PLANS**

**JUNE 2000**

# FAA LONG-RANGE AEROSPACE FORECASTS FISCAL YEARS 2015, 2020 AND 2025

## I. SUMMARY

To assure consistency in agency planning, the Office of Aviation Policy and Plans provides an extension of its annual 12-year forecasts of aviation demand. Although forecast values are shown for specific years, year-to-year fluctuations are difficult to forecast precisely. Therefore, the projections reflect the trend of average conditions expected during the forecast period.

The Federal Aviation Administration's (FAA) annual 12-year forecast is utilized for both manpower and facility planning as well as for policy and regulatory analysis. The latest 12-year forecast (FAA-APO-00-1, FAA Aerospace Forecasts: Fiscal Years 2000-2011, March 2000) provides projections of aviation activity and FAA workload measures through the year 2010. Periodically, a need arises for projections of aviation demand and activity beyond the published horizon. This document was developed to meet these needs, and contains projections for commercial and general aviation aircraft fleet and hours, air carrier and regional/commuter passenger enplanements (domestic and international), air carrier air cargo revenue ton miles (RTMs) pilots, and FAA workload measures for the years 2015, 2020 and 2025.

The economic assumptions used in developing these extended forecasts are as follows:

- o there will be slightly slower economic growth relative to the immediate 12-year period--2.8 percent versus 2.6 percent annually;
- o moderately higher increases in inflation--2.9 versus 2.6 percent annually;
- o minimally higher real fuel prices--up 0.5 annually compared to an decrease of 0.5 percent annually; and
- relatively small increases in long-term interest rates beyond 2011.

These assumptions translate into slower growth of aviation activity and FAA workload measures during the extended 14-year period (2011 to 2025) than was forecast for the immediate 12-year period (1999 to 2011).

	<u>AVERAGE ANNUAL PERCENT CHANGES</u>	
	<u>1999 - 2011</u>	<u>2011 - 2025</u>
<u>AVIATION ACTIVITY</u>		
<u>PASSENGER ENPLANEMENTS</u>		
U.S. DOMESTIC		
AIR CARRIERS	3.6	3.2
REGIONALS/COMMUTERS	5.5	4.2
INTERNATIONAL*	5.1	4.9
AIR CARGO FREIGHT RTMs		
DOMESTIC	5.4	5.2
INTERNATIONAL	6.7	5.5
AIRCRAFT FLEET		
AIR CARRIER	4.0	3.2
REGIONAL/COMMUTER**	2.9	1.8
CARGO JETS	4.0	3.5
GENERAL AVIATION	0.9	0.8
HOURS FLOWN		
AIR CARRIER	4.0	3.5
REGIONAL/COMMUTER	3.0	3.0
GENERAL AVIATION	2.2	1.5
PILOTS		
TOTAL	2.1	1.5
INSTRUMENT RATED	1.7	1.5
<u>FAA WORKLOAD MEASURES</u>		
TOWER OPERATIONS***	2.0	1.7
INSTRUMENT OPERATIONS***	2.2	1.9
IFR AIRCRAFT HANDLED	2.4	2.1
FLIGHT SERVICE STATIONS	(0.3)	(0.3)

\* Total international passengers to and from the United States—U.S. and Foreign Flag Carriers.

\*\* Includes regional jets.

\*\*\* Includes combined activity at FAA and contract towers.

## **II. LONG-RANGE FORECAST ASSUMPTIONS**

The long-range aviation forecasts are based on assumptions concerning the future of the commercial and general aviation industries and on the latest macroeconomic projections. For the purposes of this report, the forecast period refers to the long-range outlook, particularly the 2012 to 2025 period. Much of the discussion assumes some familiarity with the forecasts contained in FAA Aerospace Forecasts: Fiscal Years 2000-2011, dated March 2000. Copies of this report can be obtained from the FAA Statistics and Forecast Branch, APO-110, by calling (202) 267-3355. The Executive Summary and 45 forecast tables can be found on the Internet at [http://api.hq.faa.gov/apo\\_pubs.htm/](http://api.hq.faa.gov/apo_pubs.htm/).

### **A. Economic Assumptions**

The long-range economic forecasts are based on an average of the economic projections developed by DRI/McGraw-Hill (DRI) and WEFA Inc. (WEFA) for the years in which the two forecasts overlap. The DRI economic projections extend through the year 2024 and the WEFA economic forecasts extend through the year 2019. Both sets of economic forecasts were developed utilizing trend projections and assume that the economy experiences relatively stable growth throughout the entire forecast period. Essentially, these projections represent the average of the possible paths that the U.S. economy could follow. Using trend projections assumes that: (1) no major shocks will occur (the current rapid run-up in oil prices is assumed to a temporary condition); (2) economic policies remain stable; (3) national and international markets do not experience dramatic shifts in either the supply or demand for economic goods and services; and (4) the forecasts are not capacity constrained, and assume that the FAA and the airlines will develop cost efficient solutions to mitigate cost efficient solutions to mitigate any delay/congestion problems. These long-term economic projections represent appropriate points from which to evaluate the effects of variations about the mean of expected values of various activity measures, transportation services, or FAA workload measures.

The consensus long-range economic outlook from DRI and WEFA is relatively unchanged from the 1999 projections. The two forecasting services are fairly consistent in their expectations for growth in economic output and prices. The only major difference is in the outlook for 30-year Treasury Bonds yields. The DRI expects a general rising rate throughout the 26-year forecast period, from 5.87 to 8.73 percent. WEFA, on the other hand, projects a short-term rise in the 30-year Treasury Bond yield (to 6.79 percent in 2001), then a long-term decline through the balance of the forecast period to 5.15 percent.

The latest DRI and WEFA forecasts are both positive and consistent in their expectations for continued Federal budget surpluses during the long-term forecast horizon. In 2000, as in the last two years, the Treasury Department will be using part of the budget surplus to pay down the national debt. To the extent that the Treasury continues to use a portion of the current and expected budget surpluses to pay down the outstanding national debt, it will further reduce each succeeding year's debt and interest payments. This, together with the expected reduction in military spending and reduced growth

in entitlement expenditures, will contribute to a continuing decline in government spending as a percent of GDP, and result in a more positive environment for sustained economic growth.

### **Real Gross Domestic Product**

Currently, the U.S. economy is expected to grow at a moderate rate during the 26-year forecast period. Growth in real gross domestic product (GDP), adjusted for price changes and expressed in 1996 dollars, is projected to average 2.6 percent annually over the extended 14-year forecast period. This is slower than both the historical past (2.9 percent between 1974 and 1999) and the economic projections for the immediate 12-year forecast period (a rate of 2.8 percent between 2000 and 2011). During the entire 26-year period between 2000 and 2025, real GDP is expected to increase at a 2.7 percent average annual rate.

### **Consumer Price Index**

Inflation is not expected to return to the high rates experienced during the latter half of the 1970s and early 1980s (8.7 percent annual growth between 1972 and 1982) during the entire 26-year forecast period. The opinion of the major economic forecasting services is that there will be little upward pressure from real wage rates and commodity prices, and that the Federal Reserve is committed to controlling inflation while providing for sufficient growth in the money supply to ensure growth in output. The consumer price index is projected to increase at an average annual rate of 2.8 percent a year during the 26-year time period--2.6 percent during the immediate 12-year period (to 2011) and 2.9 percent during the extended forecast period (to 2025).

### **Fuel Prices**

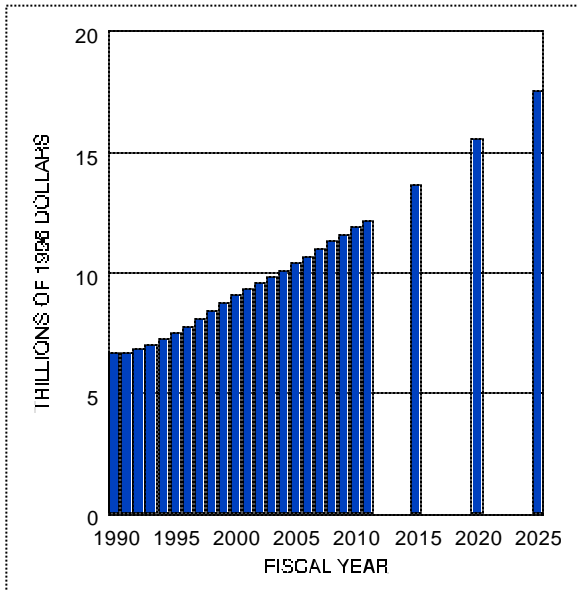
Fuel prices, as measured by the Oil and Gas Deflator, are forecast to increase at an annual rate of 2.8 percent over the 26-year forecast period--comparable to expected overall inflation rate. Between 1999 and 2011, nominal fuel prices are projected to increase at an annual rate of only 2.1 percent, a decline of 0.5 percent annually in real terms. Between 2011 and 2025, nominal fuel prices are projected to increase at an annual rate of 3.4 percent, an increase of 0.5 percent in real terms.

### **Interest Rates**

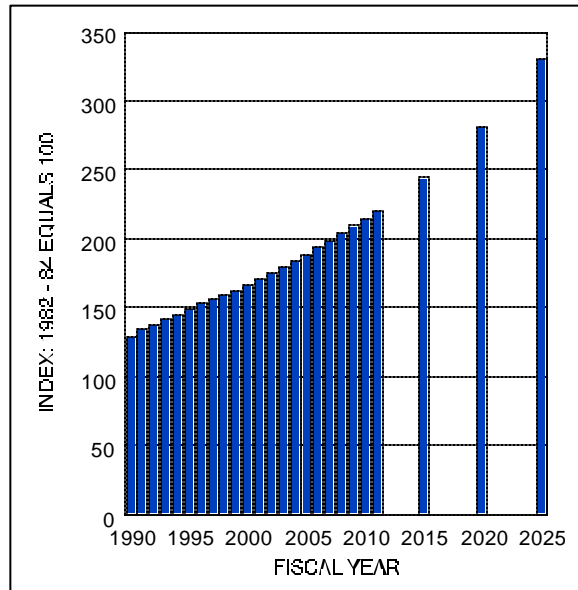
Long-term nominal interest rates are tied to inflationary expectations. The Federal Reserve is expected to pursue a monetary policy that keeps inflation in check and allows for sufficient monetary aggregate growth to sustain economic output gains. With budget deficit pressures apparently under control, and with the positive long-term outlook for the rate of inflation, long-term interest rates are expected to remain relatively stable over the immediate 12-year forecast period before rising slightly through 2025. Interest rates are expected to remain almost unchanged during the immediate 12-year forecast period--5.9 percent in 1999 compared to 6.0 percent in 2011. During the extended forecast period, interest rates are expected to increase to 7.0 percent, not significantly above the average rate during the 1990's.

# ECONOMIC VARIABLES FORECASTS

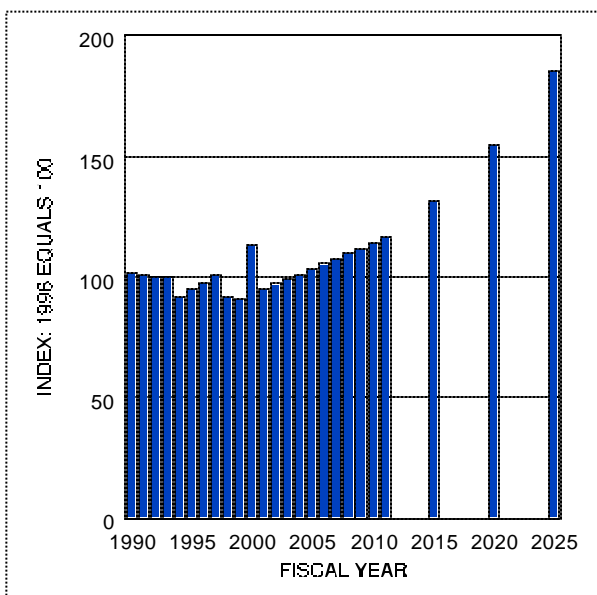
REAL GDP



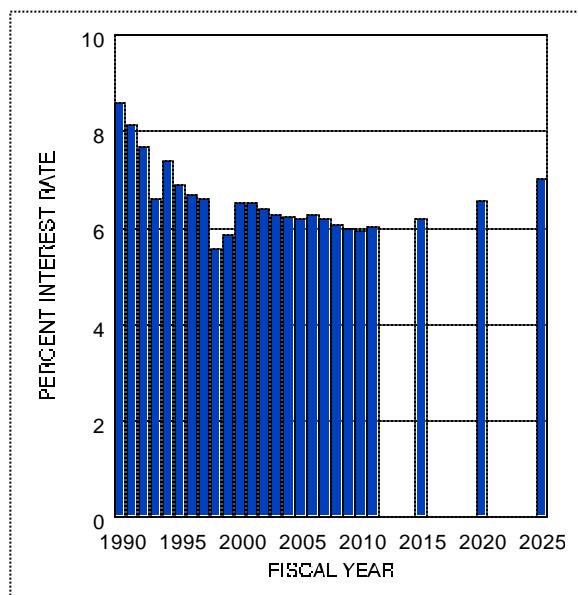
CONSUMER PRICE INDEX



OIL AND GAS DEFLATOR



30-YEAR GOVERNMENT BONDS



## **B. Operational Variables**

The long-range forecasts of various operational variables discussed below are, for the most part, a continuation of the trends discussed in greater detail in FAA Aerospace Forecasts: Fiscal Years 2000-2011. As with the economic projections, these forecasts reflect an average trend of the possible paths that the various operational variables could follow. They assume that (1) no major shocks will occur (such as a rapid run-up in oil prices), (2) economic policies remain stable, and (3) no dramatic shifts in either the supply or demand for aviation services. These long-term projections represent appropriate points from which to evaluate the effects of variations about the expected values of various activity measures, transportation demand and services, or FAA workload measures.

### **Air Carrier Passenger Yield**

The current 12-year and extended 14-year forecasts assume that real domestic passenger yields (expressed as revenue per passenger mile) will continue the historical long-term gradual downward trend. Real domestic passenger yields are projected to decline by 0.9 percent annually over the 26-year period. The downward trend in real domestic yields is based on the assumptions of continued strong competition in the industry, and continued improvements in efficiency and productivity.

There has been a long-term decrease in international real yields similar to that experienced in the domestic market. However, real yields in international markets are generally lower than in the domestic market, because of lower operating costs. These lower costs are associated with longer average stage length and with the use of larger aircraft, which tend to have lower seat mile costs. It is assumed that over the forecast period productivity and competition will expand in international markets, which will continue to push real yields down. Market efficiencies will be achieved with the use of more productive aircraft, expanded open-skies agreements, and extended global alliances. Total international real yields for U.S. flag carriers are expected to decline 1.1 percent through 2011. Over the 26-year period, international yields, adjusted for inflation, are expected to decline 0.8 percent a year.

### **Average Aircraft Size**

The increase in the average seat size of the U.S. domestic fleet will be relatively small through the middle years of the immediate 12-year forecast period, averaging just under 0.4 seats per year between 1999 and 2006. After 2006 many of the smaller hush-kitted stage-2 aircraft will be replaced with generally larger stage-3 aircraft, the result being an increase in the average aircraft size of about one seat per year through 2011. Over the entire 12-year forecast period, the average seat size of the domestic fleet is expected to grow by just over 0.6 seats per year--from 141.3 to 148.7.

The average seating capacity of the domestic air carrier fleet is expected to continue to increase over the extended 14-year forecast period. The new aircraft entering the fleet during this period are expected to be generally larger than the aircraft being replaced. Therefore, the average seating capacity of the domestic air carrier fleet is expected to increase by one

seat annually over the extended forecast period, reaching 162.7 seats in 2025.

The average aircraft size of the U.S. air carrier international fleet is expected to gradually increase over the 26-year forecast period as the U.S. carriers expand the number of non-stop city-pair service into deep South America, Europe, and Asia. The carriers--over this extended period--will begin to use larger two-engine and four-engine two-aisle aircraft. The average size of the aircraft is expected to increase from 232.4 seats in 1999 to 265.0 seats in 2025.

The average seating capacity of regional/commuter aircraft is forecast to increase by just under 0.7 seats annually between 1999 and 2011 (from 36.0 to 44.3 seats). This trend is expected to continue over the extended forecast period, with the average seating capacity of regional/commuter aircraft averaging approximately 54.1 seats in the year 2025. This reflects the continued introduction of larger high-speed turboprop and regional jet aircraft into the regional/commuter fleet. The extended range and greater speed offered by these aircraft are expected to expand the market potential for the regional industry, and continue to blur the distinction between regional/commuters and the large commercial operators.

#### **Load Factor**

Domestic air carrier load factors are projected to remain at their current historical high levels throughout the remainder of the immediate and extended forecast period. During the past several years, airline scheduling policies have allowed air carriers to rapidly adjust capacity levels to more closely correspond to changes in passenger demand. This ability to make rapid adjustments to meet changing demand conditions has enabled the airlines to push up load factors to all-time highs. It is expected that present fleet plans will provide capacity levels that should maintain the air carrier load factor at between 69 and 70 percent throughout the forecast period.

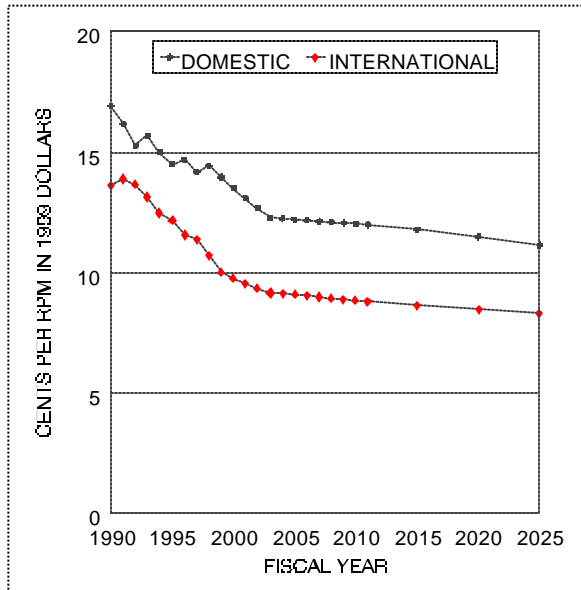
As in domestic markets, the wide range of aircraft capable of international flight also allows U.S. airlines to adjust their international capacity levels to changing levels of demand. The international load factor is forecast to remain relatively stable during the 26-year forecast period, increasing slightly from 73.9 percent in 1999 to 75.0 percent in 2025.

Regional/commuter load factors are projected to increase from 57.6 percent in 1999 to 61.6 percent in 2011. During the extended forecast period, regional/commuter load factors are expected to rise to approximately 66.1 percent by 2025. The higher load factors result from the continued introduction of larger high-speed turboprop and regional jet aircraft and the need to cover the higher cost per seat mile associated with these aircraft.

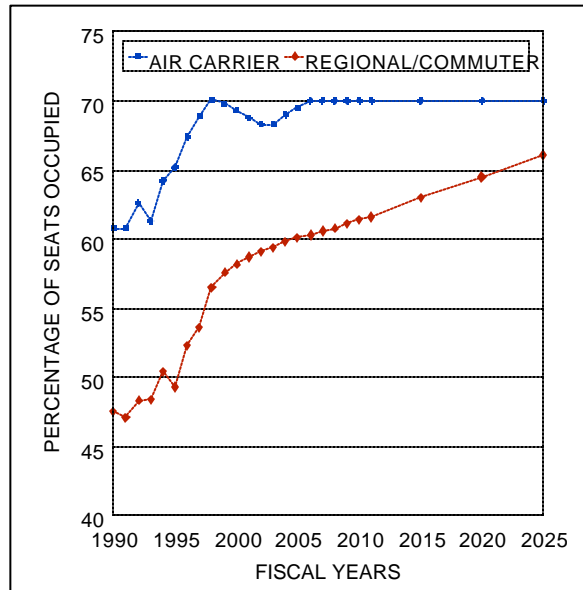


# OPERATIONAL VARIABLES FORECAST

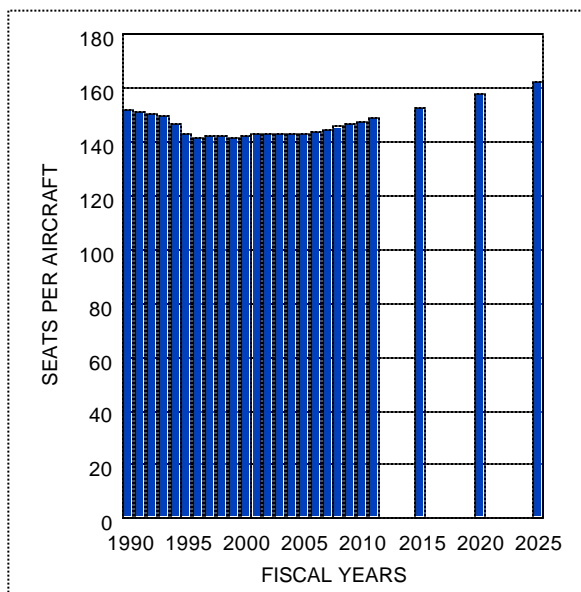
REAL DOMESTIC AND INTERNATIONAL YIELDS



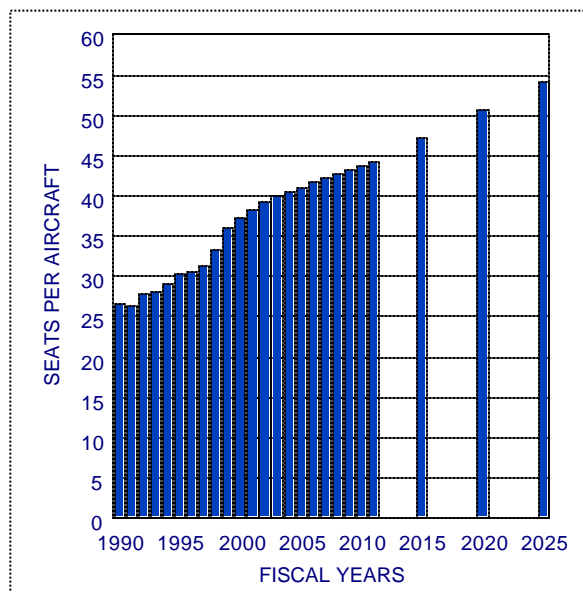
DOMESTIC PASSENGER LOAD FACTORS



AVERAGE SEATING CAPACITY DOMESTIC AIR CARRIER AIRCRAFT



AVERAGE SEATING CAPACITY REGIONAL/COMMUTER AIRCRAFT



### **III. LONG-RANGE AVIATION ACTIVITY FORECASTS**

Forecasts of various measures of aviation activity for 2000 and 5-year increments between 2000 and 2025 are provided in Table 1, page 13. A discussion of some of these measures of aviation activity follows in the paragraphs below.

#### **A. Passenger Enplanements and Cargo**

##### **Air Carrier**

Air carrier demand, as measured by domestic passenger enplanements, is projected to continue to grow faster than the general economy. For the period 2000 to 2011, domestic passenger enplanements are forecast to increase at an average annual rate of 3.6 percent compared to a 2.8 percent annual growth rate in real GDP. Over the extended forecast period (2011-2025), domestic passenger enplanements are projected to increase at an average annual rate of 3.2 percent compared to real GDP growth of 2.6 percent annually.

Forecasts of total passenger traffic (U.S. and foreign flag carriers) are provided between the United States and three world travel areas--Atlantic, Latin America (including Mexico and the Caribbean), and the Pacific/Far East--as well as for U.S./Canadian transborder traffic. Total passenger traffic between the United States and the rest of the world is expected to grow from 132.0 million in 1999 to 466.8 million in 2025, an average annual growth rate of 5.0 percent. Passenger traffic is expected to be strongest in Latin American and Pacific markets, growing at annual rates of 5.9 percent over the forecast period. Passenger traffic is projected to grow 4.1 percent annually in Atlantic markets and 3.4 percent a year in Canadian markets.

##### **Regionals/Commuters**

The regional/commuter industry is projected to continue to grow at a relatively faster pace than the large air carriers through both the immediate and extended forecast periods, averaging 5.5 and 4.2 percent, respectively. A large part of the growth during the early years of the immediate forecast period is expected to result from a continuation of the shift of low-density, short-haul markets from the larger air carriers to their commuter code-share partners. However, most of the growth during the extended forecast period is expected to be derived from markets created by the expanded use of regional jet aircraft.

The introduction and popularity of regional jets is expected to open up new growth opportunities in thin, intermediate range markets that cannot be served economically with large jet aircraft. The speed and range of the regional jet also offers the opportunity for more point-to-point (hub bypass) operations in markets which are currently served only via connecting flights through large hubs. There are currently 11 regional/commuter operators operating regional jet aircraft, and up to four more are expected to be operating jets by the end of 2000. This, together with the public preference for jet aircraft, should ensure that the regional/commuter industry should continue to grow more rapidly than the large air carriers.

## Air Cargo

The air cargo forecast discussed here is comprised of domestic and international revenue freight/express carried by U.S. air carriers and is measured by revenue ton-miles (RTMs). Air cargo is moved in the bellies of passenger aircraft and in dedicated all-cargo aircraft on both scheduled and non-scheduled service.

In 1999, combined domestic and international RTMs flown by U.S. commercial air carriers totaled 25.0 billion. By 2011, this figure is projected to reach 51.1 billion, an average annual increase of 6.1 percent. During the extended forecast period, total domestic and international freight/express is projected to total 106.3 billion RTMs, an average annual increase of 5.4 percent. Over the entire 26-year period, growth in total freight/express RTMs is expected to average 5.7 percent annually.

Domestic freight/express RTMs are forecast to increase from 11.5 billion in 1999 to 43.7 billion in 2025, an average annual increase of 5.3 percent for over 26-year forecast period. International freight/express RTMs are forecast to grow faster rate than domestic RTMs, increasing from 13.6 billion in 1999 to 62.6 billion in 2025, averaging 6.0 percent growth annually for the 26-year forecast period. This expectation is based on the projected strong economic growth in world GDP, especially in the Latin American and Asian regions.

## B. Aircraft Fleets and Hours Flown

### Commercial Air Carriers

The commercial air carrier passenger jet fleet is forecast to increase at an annual rate of 3.3 percent from 4,312 aircraft in 1999 to 6,400 aircraft in 2011. 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 166 aircraft (4.2 percent) annually. By 2011, the two-engine narrowbody aircraft category is expected to total 5,124 units and account for 80 percent of the fleet.

Slower growth in passenger demand during the extended forecast period is expected to result in a slowing in the expansion of the air carrier fleet. Between 2011 and 2025, the air carrier fleet is forecast to increase at an average annual rate of 3.2 percent, reaching a total of 9,941 aircraft in 2025.

The cargo jet fleet is projected to increase at an annual rate of 4.0 percent during the immediate 12-year forecast period, from 1,013 aircraft in 1999 to 1,931 in 2011. During the extended 14-year forecast period, the cargo jet fleet is forecast to increase at a 3.4 percent average annual rate reaching 2,600 aircraft by 2025. Over the entire 26-year forecast period, the cargo jet fleet is forecast to grow at a faster average annual rate than the passenger fleet (3.7 percent compared to 3.2 percent), reflecting the expected higher sustained growth in cargo traffic - especially international traffic.

The number of hours flown by the large commercial passenger and cargo jet aircraft is forecast to increase by 4.0 percent annually between 1999 and 2011, and by 3.5 percent annually between 2011 and 2025. The immediate and extended range fleet forecasts imply that U.S. air carriers will use larger aircraft and continued high load factors to accommodate increasing passenger demand. The forecasts of hours flown imply that the average utilization of the U.S. fleet will increase gradually over the 26-year forecast period.

The regional/commuter fleet (60 seats or less) is expected to grow from its current 2,237 aircraft in 1999 to 4,000 by the year 2025. This is an average annual growth rate of 2.3 percent over the 26-year forecast period, or approximately 68 aircraft annually. This includes the smaller regional jets (30 to 70 seats) which will be introduced into the fleet in significant numbers over the forecast period. By comparison, regional/commuter flight hours are forecast to increase at an average annual rate of 3.0 percent during the same time period--from 3.7 million hours in 1999 to 8.0 million in 2025.

### **General Aviation Aircraft**

In 1999, general aviation completed its fifth year of operation following the enactment of the General Aviation Revitalization Act of 1994. During this period the industry has posted significant positive results: 254,000 new jobs have been created; production of general aviation aircraft has increased 100 percent; revenues from the export of general aviation aircraft have doubled; investment in research and development by general aviation companies has increased 150 percent; and the number of student pilots is growing again. Based on the results of the 1998 General Aviation and Air Taxi Activity Survey, the active general aviation fleet and hours flown have increased for four consecutive years. Additionally, general aviation activity counts at combined FAA and contract towers and en route centers have increased significantly over the past 3 years, up 13.4 and 12.1 percent, respectively. These trends bode well for the future outlook for the general aviation industry.

The number of active general aviation aircraft is expected to increase from 206,530 aircraft in 1999 to 230,995 in 2011, and then expand to 256,900 by 2025. This represents an average annual growth of 0.9 percent during the immediate forecast period and 0.8 percent over the extended forecast period. The piston engine portion of the general aviation fixed-wing aircraft fleet is forecast to increase by 0.6 percent during the immediate 12-year forecast period and 0.5 percent over the extended 14-year forecast period. Fixed-wing turbine powered general aviation aircraft are expected to grow at a faster rate than the piston powered aircraft, increasing 3.2 percent annually between 1999 and 2011, and by 2.2 percent during the 2011 to 2025 period. The higher growth rate for the turbine portion of the fleet is based on the expectations of a greater business and corporate use of general aviation aircraft in an expanding U.S. economy.

Growth in general aviation flight hours is forecast to increase at a faster rate than the active fleet. General aviation activity is very sensitive to changes in fuel price and variations in the rate of economic growth. Based on the assumptions of sustained economic growth, relative stability in fuel prices, and the continued growth in fractional ownership programs and corporate flying, it is expected that aircraft utilization rates will return to the higher levels experienced prior to the 1990-1991 economic recession. As such, general aviation flight hours are forecast to increase from

29.8 million in 1999 to 38.8 million in 2011, and to 47.7 million in 2025--2.2 and 1.5 percent annual growth, respectively.

The positive forecasts for general aviation fleet and flight hours are heavily dependent on the assumptions related to continued economic growth and price stability. However, equally important to future growth are continued investment in plant expansion and production by general aviation manufactures and the success of industry programs, such as "GA Team 2000," to foster the growth in number of student pilots. If the general aviation industry falters in its efforts to stimulate the production of new general aviation products and services, the outlook for the active fleet, hours flown, and general aviation activity at FAA air traffic facilities could be considerably lower than the current projections.

### **C. Number of Pilots**

The total pilot population is forecast to increase from 640,113 in 1999 to over one million by the year 2025, an average annual growth rate of 1.8 percent over the 26-year forecast period. Much of the growth results from the continuing demand for airline transport pilots. Additionally, recent industry program initiatives designed to promote the benefits of general aviation flying to businesses and the public, to stimulate growth in the number of new pilots, and to develop an improved flight training infrastructure are also expected to contribute to the growth in the pilot population. During this same time period, the number of instrument rated pilots is expected to increase from 308,951 to 463,600. The percentage of instrument rated pilots decreases from 48.3 percent in 1999 to 45.8 percent in 2025 because of the projected increases in student pilots relative to the total pilot population.

### **D. Total Aviation Activity**

Total civil aircraft activity at towered and non-towered airports (based on projections for just under 4,000 public use airports in the Terminal Area Forecast database) is forecast to reach 154.5 million by the year 2025, an average annual growth rate of 0.9 percent over the activity level forecast for 2011 (136.1 million operations). This in turn represents an average annual growth rate of 1.1 percent over the 119.7 million total aircraft operations recorded in 1999.

Commercial aircraft operations (the sum of air carrier and commuter/air taxi) at all U.S. airports, towered or non-towered, are projected to increase from 28.9 million in 1999 to 36.7 million in 2011, and to 46.9 million in 2025. These forecasts imply an average annual growth rate of 2.0 percent over the immediate forecast period, and 1.8 percent over the extended forecast period.

The number of general aviation operations at towered and non-towered airports is forecast to increase from 90.8 million in 1999 to 99.4 million in 2011 and to 107.6 million in 2025. The average annual growth rate for the immediate forecast periods is 0.8 percent and 0.6 percent for the extended forecast period. Much of the growth is the result of increased use of the turbine fleet for business/corporate related flying.

**TABLE 1**

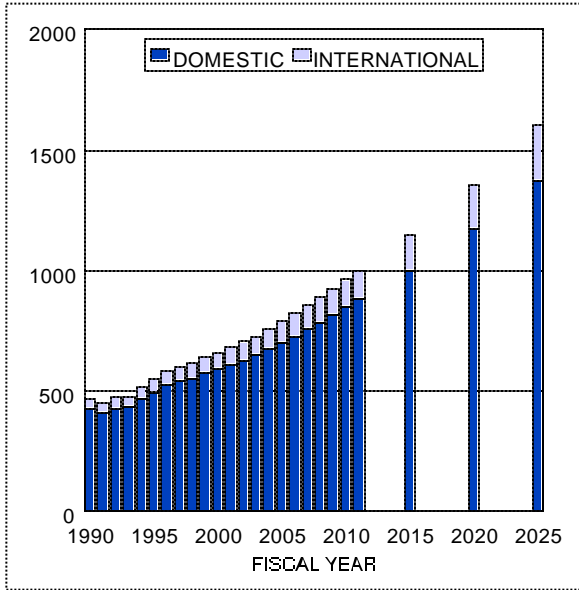
**LONG-RANGE FORECASTS**  
**AVIATION DEMAND AND ACTIVITY**

	<u>ACTUAL</u>	<u>MARCH 2000 FORECAST</u>			<u>LONG-RANGE FORECAST</u>		
	<u>1999</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>
<b><u>Enplanements and Air Cargo (In Millions)</u></b>							
Enplanements							
Air Carrier							
Domestic	576.1	594.8	701.0	848.5	1,002.9	1,174.0	1,374.2
International*	132.0	137.6	175.7	227.3	291.8	370.9	466.8
Regional/Commuter	72.3	78.2	103.0	131.7	165.7	203.5	244.1
Freight/Express RTMs	25.1	26.6	36.5	48.4	63.7	82.7	106.3
<b><u>Aircraft Fleets</u></b>							
(In Thousands)							
Air Carrier-Large Jets	4.3	4.4	5.1	6.2	7.3	8.6	9.9
Cargo-Jet Aircraft	1.0	1.0	1.3	1.6	1.9	2.3	2.6
Regional/Commuter	2.2	2.3	2.9	3.1	3.5	3.7	4.0
Regional Jets	0.3	0.5	1.1	1.5	1.9	2.2	2.6
Turboprops	1.9	1.9	1.8	1.6	1.6	1.5	1.4
General Aviation	184.3	186.1	195.3	203.2	211.5	218.8	226.1
Piston Engine	164.0	165.2	171.2	176.2	181.5	186.1	190.7
Turbine Engine	12.7	13.2	15.7	18.1	20.5	22.7	24.9
Helicopter	7.6	7.7	8.4	8.9	9.5	10.0	10.5
<b><u>Hours Flown</u></b>							
(In Millions)							
Air Carrier	13.6	13.9	17.0	21.0	25.3	30.1	35.3
Regional/Commuter	3.7	3.9	4.3	5.1	6.0	7.0	8.0
General Aviation	28.4	29.1	32.8	36.5	39.6	42.5	45.6
<b><u>Active Pilots</u></b>							
(In Thousands)							
Total	640.1	650.4	737.3	810.0	881.2	949.0	1,011.7
Instrument Rated	309.0	315.1	345.5	372.8	401.5	432.4	463.6
<b><u>Estimated Civil U.S. Operations</u></b>							
(In Millions)							
Commercial	28.9	29.4	32.6	36.0	39.5	43.2	46.9
General Aviation	90.8	91.4	95.0	98.6	102.4	105.1	107.6

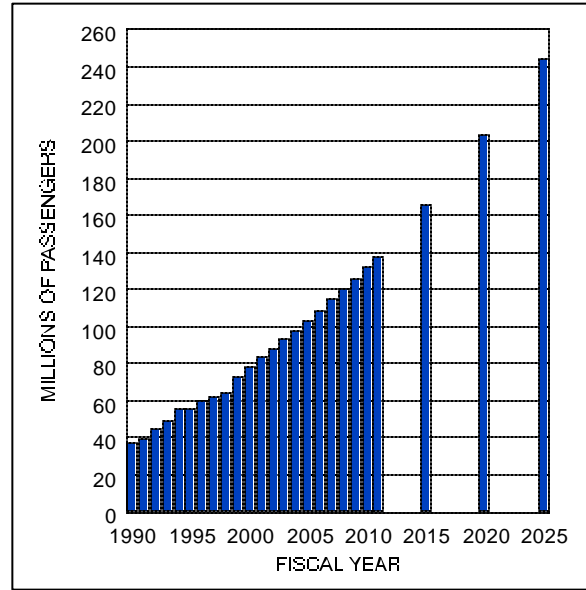
\* Total international passengers to and from the United States—U.S. and Foreign Flag carriers

# AVIATION ACTIVITY FORECASTS

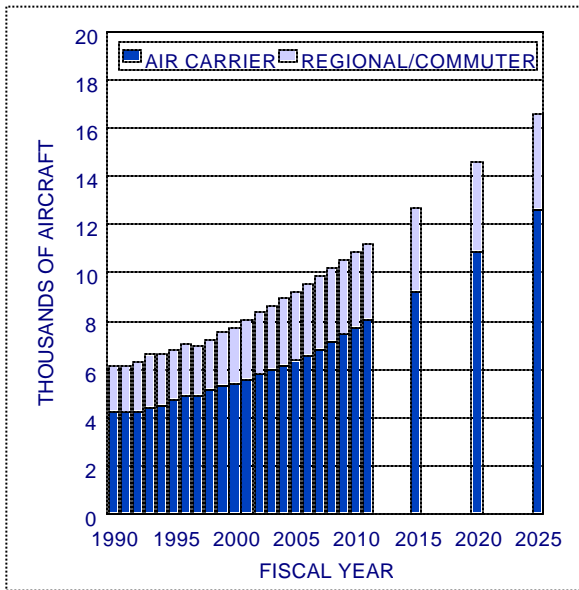
AIR CARRIER  
PASSENGER ENPLANEMENTS



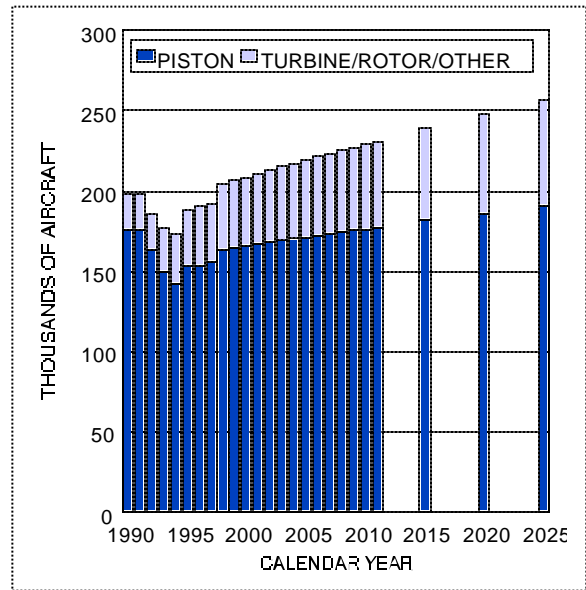
REGIONAL/COMMUTER  
PASSENGER ENPLANEMENTS



COMMERCIAL AIRCRAFT FLEET



GENERAL AVIATION FLEET



## **IV. LONG-RANGE WORKLOAD MEASURE FORECASTS**

Forecasts of FAA workload measures by user groups for 1999 and 5-year increments between 2000 and 2025 are provided in Table 2, page 17. A discussion of the forecasts follows in the paragraphs below.

### **A. Towered Operations**

At the end of FY 1999 the number of FAA towers totaled 288, down from 402 in 1994. During this same period of time, the number of FAA contract towers has increased from 33 to 166. An additional 22 FAA towers are slated to be converted to contract tower status in 2000: the year-end figures totaling 266 FAA towers and 188 contract towers. Given the uncertainty about current and future year conversions, the forecasts presented in this document are combined forecasts independent of the distinction between FAA and contract tower status.

Aircraft operations at combined FAA and contract towered airports are forecast to total 86.9 million in 2011 and 110.2 million in 2025--an average annual growth rate of 1.9 percent over the 26-year forecast period). Most of the growth is expected to come from commercial activity (the sum of air carrier and commuter/air taxi), which is projected to grow 2.7 percent annually during the immediate forecast period and 2.4 percent annually during the extended forecast period. The slower growth in commercial activity relative to enplanements (3.6 and 3.2 percent during the immediate and extended forecast periods) is due to a combination of continued high load factors, larger aircraft, and longer passenger trip lengths.

Although regional/commuter enplanements increase at much faster rate than the larger air carriers over the 26year forecast period (5.0 percent compared to 3.1 percent), commuter/air taxi activity increases at a 2.5 percent annual rate compared to air carrier growth of 2.6 percent annually. This slower commuter/air taxi activity growth is largely due to the large numbers of the regional jet aircraft that are expected to enter the regional/commuter fleet over the forecast period. As such, regional/commuter average aircraft size, load factors, and passenger trip lengths all increase at significantly faster rates than do those of the larger air carriers.

General aviation activity, which accounted for 58.6 percent of combined tower activity in 1999, grows at a considerably slower pace relative to commercial activity over the 26-year forecast period--1.7 and 1.2 percent, respectively, during the immediate and extended forecast periods. In the year 2025, general aviation is expected to account for just over 53.1 percent of combined tower activity. Military activity is projected to remain constant at the 2.9 million operations posted in 1999 throughout the 26-year forecast period.



## **B. Instrument Operations**

Instrument operations at combined FAA and contract towered airports are forecast to total 67.6 million in 2011 and 88.2 million in 2025, average annual growth rates of 2.2 and 1.9 percent, respectively, during the immediate and extended forecast periods. Most of the growth is expected to come from commercial activity, which is projected to grow 2.7 percent annually during the immediate forecast period and 2.4 percent annually during the extended forecast period. Air carrier instrument activity is forecast to grow 2.6 percent annually over the 26-year forecast period while commuter/air taxi activity is forecast to increase at a 2.5 percent average annual rate during the same time period.

General aviation activity is projected to increase at a relatively slower pace over the forecast period, averaging 1.6 percent through the immediate forecast period and 1.4 percent during extended forecast periods. Military activity is forecast to remain constant at the 3.5 million operations recorded in 1999 throughout the 26-year forecast period.

Commercial activity is expected to increase from 52.9 percent of total instrument activity at combined FAA and contract towers in 1999 to 60.0 percent by the year 2025.

## **C. ARTCC Aircraft Handled**

The number of aircraft handled at FAA en route traffic control centers is forecast to reach 59.4 million in 2011 and 79.7 million in 2025, an average annual growth rate of 2.4 percent for the 1999-2011 time period and 2.1 percent for the 2011-2025 time period. Much of the growth occurs in the number of commercial aircraft handled, which increases by 2.8 and 2.4 percent, respectively, over the two forecast periods. The number of air carrier aircraft handled increases by an average annual rate of 2.6 percent over the 26-year forecast period--2.8 and 2.4 percent, respectively, over the immediate and extended time periods. The number of commuter/air taxi aircraft handled is forecast to increase by 2.6 percent annually during the immediate forecast period and 2.4 percent over the extended forecast period--2.5 percent over the entire 26-year period.

The number of general aviation aircraft handled at FAA en route centers increases at a slower rate over the two forecast periods, 2.0 percent annually over the immediate 12-year period and 1.5 percent over the extended 14-year period. The number of military aircraft handled is forecast to remain constant at the 4.1 million recorded in 1999 through 2025.

By the end of the 26-year forecast period, commercial activity is expected to account for 77.5 percent of the total center activity compared to 71.2 percent in 1999.

## **D. Flight Services**

The number of services provided by FAA flight service stations is forecast to total 31.2 million in 2011 and 30.1 million in 2025, an annual decline of 0.3 percent over the 26-year forecast period. The projected decline in services provided by FAA flight service stations reflects both the continued consolidation of flight service stations and a greater use of automated and alternative flight services that are not provided directly by the FAA.

Average annual growth rates for each of the three flight service categories for the immediate and extended forecast periods are: flight plans originated: up 0.6 and 0.3 percent; pilot briefs: down 0.7 and 0.5 percent; and number of aircraft contacted; down 2.8 and 2.5 percent.

Automated services provided through the Direct User Access Terminal System (DUATS) are forecast to grow throughout the immediate and extended forecast periods. DUATS services are projected to increase to 18.1 million in 2011 (2.8 percent annual growth) and to 26.3 million in 2025 (2.5 percent annual growth). During the 26-year period, the combined FSS and DUATS services are forecast to increase at an average annual rate of 0.8 percent.

These forecasts of FSS and DUATS services assume that there will be no changes in the current definitions of flight service measures nor any change in the manner in which they are delivered to the general aviation pilot. There is, however, significant uncertainty concerning the impact of technology on the set of flight services to be provided by the FAA in the future. As more specific information becomes known about the future flight service system the forecasts will be adjusted accordingly.

## TABLE 2

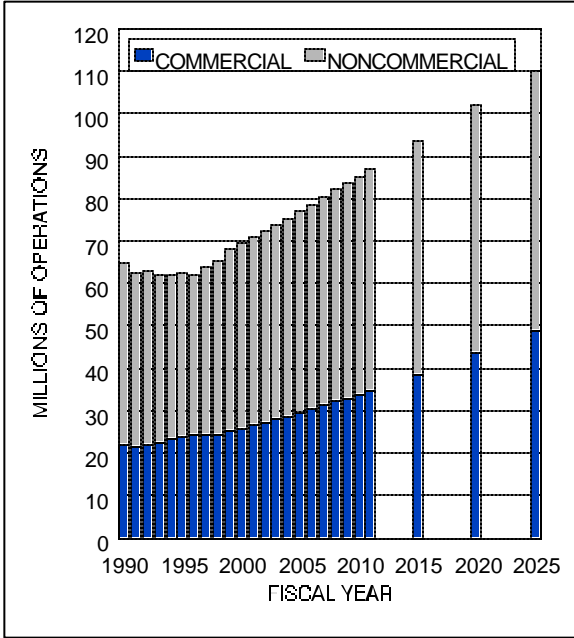
### LONG-RANGE FORECASTS FAA WORKLOAD MEASURES (In Millions)

	<u>ACTUAL</u>	<u>MARCH 2000 FORECAST</u>			<u>LONG-RANGE FORECAST</u>		
	<u>1999</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>2025</u>
<b><u>Tower Operations*</u></b>							
Total	68.2	69.5	77.0	85.3	93.7	102.0	110.2
Itinerant	49.6	50.7	56.6	63.3	70.2	77.1	84.1
Air Carrier	14.6	15.0	17.2	19.9	22.7	25.6	28.7
Commuter/Air Taxi	10.6	10.9	12.2	14.0	15.9	17.9	20.0
General Aviation	23.0	23.4	25.7	28.0	30.2	32.2	34.0
Military	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Local	18.5	18.8	20.4	22.0	23.5	24.8	26.0
General Aviation	17.0	17.3	18.9	20.5	22.0	23.3	24.5
Military	1.5	1.5	1.5	1.5	1.5	1.5	1.5
<b><u>Instrument Operations*</u></b>							
Total	51.8	52.9	59.1	66.2	73.4	80.7	88.2
Air carrier	15.8	16.2	18.7	21.6	24.6	27.7	31.1
Commuter/Air Taxi	11.6	11.9	13.4	15.4	17.4	19.6	21.8
General Aviation	20.9	21.3	23.5	25.8	27.9	29.9	31.8
Military	3.5	3.5	3.5	3.5	3.5	3.5	3.5
<b><u>ARTCC Aircraft Handled</u></b>							
Total	44.7	45.7	51.5	58.1	65.1	72.2	79.7
Air Carrier	24.0	24.7	28.4	32.4	36.8	41.4	46.1
Commuter/Air Taxi	7.7	7.9	9.0	9.3	10.4	11.6	12.7
General Aviation	8.8	9.0	10.0	11.0	12.0	12.9	13.8
Military	4.1	4.1	4.1	4.1	4.1	4.1	4.1
<b><u>FSS Services</u></b>							
Total	32.4	32.3	32.1	31.6	31.1	30.6	30.1
Pilot Briefs	8.3	8.2	8.0	7.7	7.5	7.3	7.1
Flight Plans Filed	6.3	6.3	6.6	6.7	6.8	6.9	7.0
Aircraft Contacted	3.3	3.2	3.0	2.8	2.5	2.2	1.9
DUATs	13.4	13.7	16.0	18.2	21.1	23.8	26.3

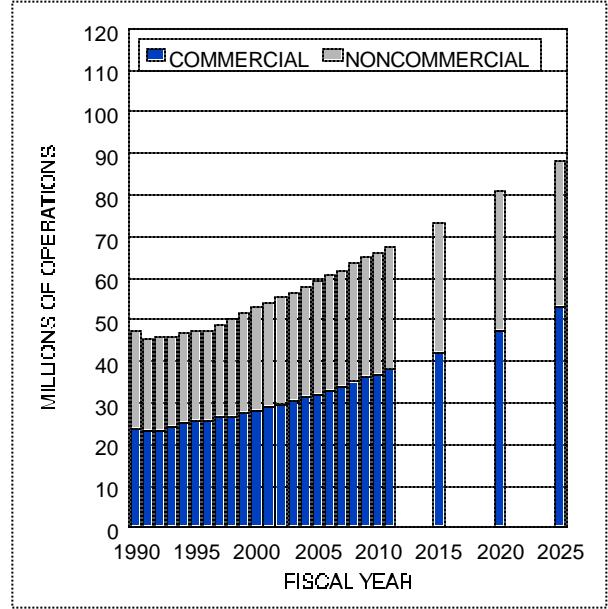
\* Includes combined activity at FAA and contract towers.  
Note: Totals may not add due to independent rounding.

# WORKLOAD MEASURES FORECAST

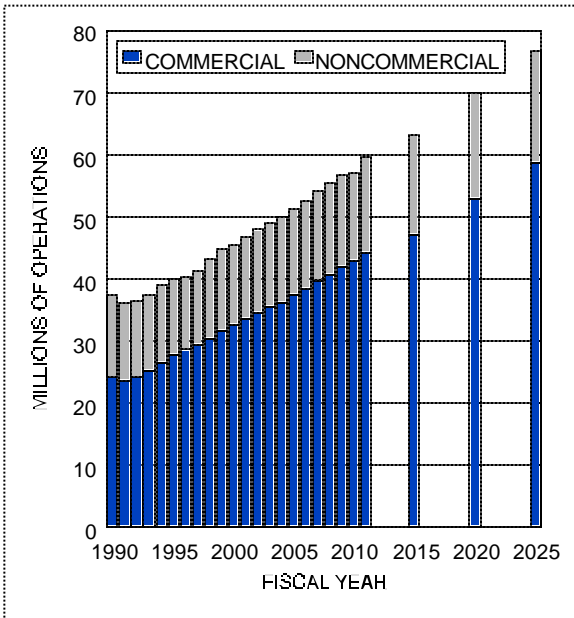
TOWER OPERATIONS



INSTRUMENT OPERATIONS



ARTCC AIRCRAFT HANDLED



TOTAL FLIGHT SERVICES

