CHAPTER III

MAINLINE AIR CARRIERS

In fiscal year 2004 there were 67 U.S. mainline air carriers (both scheduled and nonscheduled) reporting traffic and financial data to the Bureau of Transportation Statistics (BTS), U.S. Department of Transportation (DOT), on the Form 41 schedules. There were 43 passenger airlines (operating aircraft with over 70 seats) and 24 all-cargo carriers.

Twenty-seven of the airlines provided scheduled passenger service and constitute the focus of the air carrier forecasts (both domestic and international) discussed in this chapter. Twenty-eight of the carriers provided scheduled domestic service (within the 50 States, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands), while 17 of the carriers provided scheduled international service. Of the carriers providing scheduled international service, 7 served Atlantic routes, 13 served Latin American routes, and 7 served Pacific routes.

Air carrier traffic forecasts and assumptions discussed here are presented in Chapter X (Tables 7 through 25). FAA air carrier workload forecasts are discussed in Chapter VII and presented in Chapter X (Tables 36 through 53).

It should be noted that all specified years in the remainder of this chapter are fiscal years (October 1 through September 30), and specified quarters are fiscal year quarters, unless designated otherwise.

REVIEW OF 2004

FINANCIAL RESULTS

For the fourth year in a row, U.S. mainline air carriers posted an operating loss. Operating revenues increased by 10.3 percent while operating expenses increased by 5.1 percent, driven by escalating costs for fuel resulting from rising oil prices. The operating loss for U.S. mainline air carriers was only $85.1 million in 2004, but after losses totaling $20.7 billion in the prior three years, the narrow operating loss was welcome news. The industry posted operating losses in all quarters except for the third quarter of the year.

The increase in operating expenses in 2004 was largely due to rising fuel costs. After increasing 18.7 percent in 2003, fuel prices rose
another 22.2 percent in 2004, increasing operating expenses by $3.3 billion. Industry labor costs, accounting for 32 percent of total operating expenses, fell 4.3 percent to $37.7 billion.

Domestic nominal yield for the mainline air carriers fell 2.2 percent, while yield, adjusted for inflation decreased 4.4 percent. Yield fell in the latter half of the year as carriers discounted fares in order to fill expanded capacity. Competition in the industry is intense as low fare carriers continue to expand their market share, and they are expected to continue to increase their share in domestic markets throughout the forecast period.

Nominal international yield increased 5.0 percent as increases in the Atlantic and Pacific markets offsetting a decline in the Latin market. Real yield increased 8.2 percent and 3.3 percent in the Pacific and Atlantic markets, respectively, but declined 3.2 percent in Latin markets. The increase in the Pacific market was driven by a strong rebound in demand following the Severe Acute Respiratory Syndrome (SARS) episode in 2003 coupled with a fall in the U.S. dollar.

During 2004, eight of the ten major passenger carriers reduced their real unit costs (estimated without fuel and oil expenses). American had the largest decline—down 9.2 percent, followed by American Trans Air with unit costs declining 6.7 percent. Northwest had the largest increase, with unit costs up 4.9 percent.
System average real operating cost per available seat mile (excluding fuel and oil) for the major passenger carriers was 9.48 cents in 2004, down 2.3 percent from 2003. System real unit costs (including fuel and oil) decreased 2.2 percent. In 2004, Southwest had the lowest operating cost (excluding fuel and oil) per available seat mile (6.42 cents). The highest unit cost among the major network carriers was US Airways with 12.33 cents.\(^1\)

In 2004, U.S. mainline commercial carriers posted a net loss of $5.1 billion, a $0.9 billion improvement from the net loss of $6.0 billion recorded in 2003. The next two graphs show operating and net profit and loss for the 10 major passenger air carriers.\(^2\) Of the 10 carriers, 9 had operating losses in 2004. Only Southwest reported operating profits while Delta recorded the largest operating and net loss of any of the major passenger carriers.

Controlling costs remains the key for the major passenger carriers' ability to return to sustained profitability. Fuel costs are expected to remain high, and insurance and security costs are expected to increase with higher outlays for security enhancements and infrastructure improvements. Major carriers will need to lower their non-security and infrastructure related costs in order to return and sustain profitability throughout the forecast period. After 2005 revenues are projected to rise at a modest rate over the balance of the forecast period through a combination of slowly rising yield and economic growth expanding activity.

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\(^1\) Operating cost comparisons may be skewed by individual carrier accounting practices regarding the treatment of write-downs of equipment following September 11th attacks.

\(^2\) A Major carrier by definition is one that has annual operating revenues in excess of $1B. American Eagle, considered a regional carrier, has been excluded from this analysis.
U.S. MAINLINE AIR CARRIERS: REVENUE AND COST TRENDS

OPERATING REVENUES AND EXPENSES (CURRENT DOLLARS)

BILLIONS OF DOLLARS

FISCAL YEAR

PASSenger YIELDS ($2004)

DOMESTIC INTERNATIONAL

CENTS PER RPM

FISCAL YEAR

JET FUEL PRICES ($2004)

DOMESTIC INTERNATIONAL

CENTS PER GALLON

FISCAL YEAR
SCHEDULED PASSENGER TRAFFIC AND CAPACITY

In 2004, total (domestic plus international) scheduled U.S. mainline carrier revenue passenger miles (RPMs) increased 9.2 percent as enplanements increased by 4.9 percent. Despite rapid growth in 2004, system RPMs are 1 percent lower than in 2000, despite a 10% increase in real U.S. Gross Domestic Product (GDP).

System available seat miles (ASM) increased for the first time since 2001, up 5.6 percent. System load factor increased 2.5 points to a record 75.9 percent.

Domestic Passenger Traffic and Capacity

In 2004, a strong economy, stronger consumer confidence in flying, and falling fares resulted in domestic RPMs increasing 7.7 percent, the highest annual growth since 1987. Enplanements rose for the first time since 2000, up 4.0 percent. Traffic was up year-over-year in all quarters with the highest growth recorded in the third quarter. Capacity grew by 4.9 percent resulting in load factor rising 2.0 points to a record 74.7 percent.
U.S. MAINLINE CARRIER
DOMESTIC TRAFFIC TRENDS
(Data through August 04)

AVAILABLE SEAT MILES

FISCAL YEAR BY MONTH

REVENUE PASSENGER MILES

FISCAL YEAR BY MONTH

AIRCRAFT DEPARTURES

FISCAL YEAR BY MONTH

ENPLANEMENTS

FISCAL YEAR BY MONTH
U.S. Mainline Air Carriers’
International Passenger
Traffic and Capacity

In 2004, total international RPMs increased for the first time since 2001, rising 13.7 percent. Enplanements increased by 13.4 percent, the fastest since 1988. Both RPMs and enplanements were up throughout the year with the highest growth occurring in second and third quarters, in part due to depressed year earlier figures resulting from the outbreak of SARS and beginning of the war in Iraq.

Total international ASMs rose 7.9 percent in 2004. Capacity was down year-over-year in the first 4 months of the year then was up 13.6 percent from February thru September. Despite the large increase, international capacity was still 7 percent below the levels recorded in 2000. Capacity increased fastest in the Latin market, up 12.1 percent, while increases in the Atlantic and Asia/Pacific markets were 7.3 and 5.4 percent, respectively.
U.S. MAINLINE CARRIER INTERNATIONAL TRAFFIC TRENDS (through August 04)

AVAILABLE SEAT MILES

FISCAL YEAR BY MONTH

REVENUE PASSENGER MILES

FISCAL YEAR BY MONTH

AIRCRAFT DEPARTURES

FISCAL YEAR BY MONTH

ENPLANEMENTS

FISCAL YEAR BY MONTH
Atlantic Routes

In 2004, marking the first time since 2000, scheduled transatlantic RPMs grew. RPMs rose by 12.3 percent to 82.1 billion. Enplanements also grew for the first time since 2000, up 11.7 percent. After being down year-over-year in October, traffic growth turned positive for the remainder of the year with the greatest increases occurring in March through May.

Capacity in Atlantic markets followed a similar pattern to traffic. Despite being down for the first 4 months of the year, capacity in 2004 grew 7.3 percent with the largest increases in April and May, followed by double-digit increases throughout the summer season. Load factor increased 3.6 points to a record 81.7 percent with year-over-year gains occurring in every month except May.

Immigration and Naturalization Service (INS) data, compiled by the U.S. Department of Commerce, showed that in CY 2003 U.S. flag carrier market share in the region fell for the first time in three years, down 2.8 points to 39.3 percent. However, data through June 2004 indicate that U.S. flag carrier market share was up modestly (less than 1 point) in 2004.

In 2004 U.S. scheduled passenger carriers posted an operating profit of $970.7 million on routes in the market, the first operating profit since 2000. This result is a $1.3 billion improvement over the $324.8 million operating loss recorded in 2003. Revenues were up 16.0 percent as the large gains in traffic were coupled with higher yields while costs rose only 1.5 percent.
U.S. MAINLINE CARRIER TRAFFIC TRENDS:
ATLANTIC ROUTES (through August 2004)

AVAILABLE SEAT MILES

AIRCRAFT DEPARTURES

REVENUE PASSENGER MILES

ENPLANEMENTS

FISCAL YEAR BY MONTH

FISCAL YEAR BY MONTH

FISCAL YEAR BY MONTH

FISCAL YEAR BY MONTH
Latin American Routes

Similar to other international markets, traffic to Latin America (destinations in South America, Central America, Mexico, and the Caribbean) grew in 2004. In 2004, scheduled RPMs and passenger enplanements were up 13.7 and 12.9 percent, respectively.

After increasing 9 percent in the first quarter, traffic growth picked up, averaging over 15 percent for the remaining three quarters of the year. Scheduled capacity increased less than traffic in the first two quarters and a little faster (about 0.5 percent) than traffic in the second half of the year. As a result load factor for the year increased 1 point to 70.3 points, although it was down year-over-year during the last 2 quarters.

For the first time since 2001, the average trip length rose in the region. Trip length increased 0.7 percent (11.5 miles) in 2004 to 1,599.7 miles, as carriers expanded service to Caribbean and Central American markets, and restored previously cut service to South American markets.

As a result of the higher traffic, scheduled U.S. passenger carriers posted an operating profit of $350.8 million in Latin markets in 2004. This represented a $354.2 million improvement over the $3.4 million operating loss in 2003.
U.S. MAINLINE CARRIER TRAFFIC TRENDS:
LATIN AMERICAN ROUTES (through August 2004)
Pacific Routes

Following declines in 2002 and 2003, scheduled traffic in Asia/Pacific markets rose in 2004, with RPMs up 15.8 percent versus 2003. After being down in the first quarter of the year, traffic growth shot up in the last two quarters of the year due, in large part, to the collapse in traffic in 2003 with the outbreak of the SARS epidemic and the beginning of the war in Iraq. For the March-September period, RPMs were up 28.6 percent on a year-over-year basis with a peak increase of 62.1 percent in May. Enplanements, following a similar pattern to RPMs, ended the year up 17.3 percent, with the highest growth rates recorded during the second half of the year.

After declining in each of the first 6 months of the year, U.S. flag carrier ASMs finished the year up 5.4 percent versus 2003. Prior year capacity had been cut significantly in the March-September period with the SARS outbreak and the war in Iraq. Load factor for the region increased 7.6 points to a record 84.2 percent. Load factor was up in every month from October to July, with the largest gains recorded in March, April, and May.

The huge increase in traffic coupled with a large increase in yield led a 23 percent increase in operating revenue in 2004 while operating expenses increased 7.1 percent. Following an operating loss of $746.7 million in 2003, U.S. passenger carriers posted a modest $31.5 million operating profit in 2004, an improvement of $778.1 million, and the first operating profit for U.S. passenger carriers in region since 2000.

Restructuring of the Pacific market continues as carriers consolidate routes and rationalize fleets. Over the long-term U.S. flag carriers should benefit from the open-skies agreements and liberal bilateral agreements with the countries of the region. These agreements will stimulate aviation growth by providing travelers with service to more cities and lower fares.
U.S. MAINLINE CARRIER TRAFFIC TRENDS: PACIFIC ROUTES (through August 2004)

AVAILABLE SEAT MILES

AIRCRAFT DEPARTURES

REVENUE PASSENGER MILES

ENPLANEMENTS

FISCAL YEAR BY MONTH

FISCAL YEAR BY MONTH

FISCAL YEAR BY MONTH
NON SCHEDULED TRAFFIC AND CAPACITY

The number of nonscheduled (charter) passengers flying on U.S. commercial air carriers rose an estimated 20.7 percent in 2004, to a total of 9.3 million. Domestic enplanements increased 38.0 percent, while international enplanements grew 8.2 percent. Nonscheduled RPMs increased 28.3 percent while ASMs rose 15.3 percent, which resulted in an increase in the load factor from 59.3 to 65.9 percent.

AIR CARGO TRAFFIC

U.S. air carriers flew 35.1 billion revenue ton miles (RTMs) in 2004, up 4.8 percent from 2003. Domestic cargo RTMs (15.5 billion) increased 3.8 percent, while international RTMs (19.6 billion) were up 5.5 percent. The increase in total cargo RTMs reflects domestic and worldwide economic growth.

Air cargo RTMs flown by all-cargo carriers were 66.9 percent of total RTMs in 2004; passenger carriers flew the remainder, or 33.1 percent of the total. Total RTMs flown by all-cargo carriers increased 2.4 percent in 2004, from 22.9 billion to 23.5 billion. Total RTMs flown by passenger carriers were 11.6 billion in 2004 (up 9.8 percent).

INDUSTRY STRUCTURE AND RISK

The present forecasts (2005 to 2016) are based upon a set of assumptions concerning changes in the economy, structural changes in the air carrier industry, and changes in the market for air transportation. The probability of achieving these forecasts depends on realizing the economic projections discussed in Chapter II and industry assumptions discussed in the following section.

STRUCTURAL CHANGES

Significant structural changes in both domestic and international markets were underway well throughout the later part of the 1990’s and have continued following the September 11th attacks. The changes resulted in intensified competition and moved carriers to increase efficiency and productivity, reduce operating costs, and lower fares. As the industry continues to recover from the unprecedented set of events that have occurred during the past few years, the pieces are in place for the most significant structural change in the industry since deregulation.

Encouraged by their own financial success, large profit margins on many routes, and the weakened financial condition of the larger network carriers, low-cost carriers are expanding rapidly in the domestic market. The benefits to the American consumer brought about by low-cost, low-fare airlines have been substantial and are well documented. Low-cost, low-fare carriers such as Southwest, JetBlue, AirTran, American Trans Air, America West, and Frontier continued to add routes and planes in FY 2004, even while the larger network carriers cut routes and shrank their fleets. What is striking about the expansion is that it is taking place in longer-haul markets that had previously been the domain of the network carriers. In the 12 months ended in June 2004, the low-cost carriers increased their capacity in markets over 750 miles by 14.2 percent, compared to an increase of 9.5 percent overall. Passenger growth was similar with markets over 750 miles in length growing by 15.9 percent compared to
domestic growth for these carriers of 10.1 percent. Since 1998 low-cost carriers have increased their capacity in markets over 750 miles by 180 percent, compared to an increase of 97.1 percent overall.

The expansion of the low-cost carriers accelerated in 2004 as JetBlue began service in Boston in January while Southwest began service in Philadelphia in May. As the low-cost carriers continue to expand their networks, it is increasingly likely that not only will they compete against the network carriers, but they will also begin to compete among themselves. The expansion of these low-cost, low-fare carriers will help to ensure that competitive forces remain strong in the industry.

With net losses of $6.0 billion in FY 2004, network carriers remain under intense pressure to reduce their unit costs and narrow the gap between themselves and the low-cost carriers. Since September 11th, the network carriers have laid off thousands of employees, negotiated significant wage reductions, eliminated unprofitable routes and transferred others to aligned commuter carriers, negotiated work rule changes, deferred aircraft deliveries, and adjusted schedules at key hubs to smooth out the flow of departures and arrivals. While profitability has not occurred yet, the cost gap between the network carriers and the low-cost carriers appears to be narrowing. A recent report by JP Morgan estimated the unit cost gap between the two to be the lowest since 2000. All of the network carriers are seeking reductions in labor costs, though they are taking different paths to achieve them. The two network carriers that are currently operating under bankruptcy protection, United and US Airways, are using the bankruptcy court to forge new agreements with labor groups. Delta used the threat of imminent bankruptcy to reach a new wage agreement with its pilots. Other carriers such as Continental and Northwest, have been able to conduct labor negotiations without the threat of imminent bankruptcy, and have achieved some success, as evidenced by Northwest’s recently concluded agreement with its pilots (resulting in $300M per year in savings). Attention has been given to Delta’s Song and United’s TED subsidiary as a way to address the cost gap. Both Delta and United expect the unit costs of their subsidiaries to be competitive with the low-cost carriers primarily through higher utilization and flexibility in work rules.

While the network carriers seek ways to reduce their unit costs, many obstacles will make their task more difficult. Massive debt and large unfunded pension obligations threaten the future viability of these carriers. Network carriers have had to borrow large amounts of money just to remain operating since the events of September 11th. On June 30, 2001, the 6 largest network carriers had a total of $31.2 billion in debt outstanding. As of September 30, 2004, that figure had risen to $48.5 billion, an increase of 55.3 percent. Thus, despite falling interest rates, the increase in the volume of debt has resulted in higher interest payments for these carriers. Not only do the carriers face higher interest payments in the future, but they will need to divert resources in the future to service the higher level of debt, resources that could have been used instead for new equipment (both aircraft and machines) that could have lowered unit costs.

In addition to having large amounts of debt that will need to be paid off, network carriers also have huge unfunded pension liabilities. The current pension plans of the network carriers and their future cash obligations limit the amount of funds these carriers can generate to shore up their heavily leveraged balance sheets and continue to acquire the equipment needed to sustain capacity growth and productivity gains. While Congress in FY 2004 passed legislation reducing the threat of higher cash pension

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3 JP Morgan report issued Nov 11, 2004

4 American, Continental, Delta, Northwest, United, US Airways
outlays over the next 2 years, eventually network carriers may need to terminate these plans as part of their ultimate survival strategy. Already United and US Airways have asked their bankruptcy judges for permission to terminate their existing defined benefit plans.

With discussions underway between the U.S. and the European Union, the possibility exists for the most significant change in international markets since the sale of the Pan Am and TWA Atlantic route networks in the late 1980's. Historically, international markets have been subject to a series of bilateral agreements. Such agreements, which started back in the 1940s, have severely restricted competition. History has demonstrated that competition improves efficiency, productivity, and worldwide economic growth. The current negotiations were prompted by a ruling by the European Court of Appeals that essentially voided the open skies agreements that had been negotiated with individual countries within the European Union. The talks are focusing on wider access for U.S. carriers to London's Heathrow airport and U.S. limits on foreign airline ownership. If an agreement is reached, carriers such as Continental, Delta, or Northwest could gain access to new markets and introduce new competition. The expansion of “open skies” agreements over the next several years could significantly increase the level of activity of the more efficient U.S. carriers vis-à-vis foreign flag carriers.

The industry is expected to continue toward globalization, through the use of code-sharing agreements and alliances. Four large alliances have formed and continue to seek members and add network connections. The four are SkyTeam (Delta-Air France), Star Alliance (United-Lufthansa), Oneworld (American-British Airways), and Northwest-KLM. The alliances have been able to reduce costs through economies of scale. They have also increased revenues and passenger traffic by expanding the reach of the networks and providing seamless travel for their passengers.

To summarize, the industry continues to be dynamic, in the face of uncertainty following the September 11th attacks and the bankruptcy of United and US Airways. Some trends that were taking place prior to September 11th have been accelerated, while others will not proceed as rapidly as before. The outcome could fundamentally alter the structure of the industry. Although some of these changes could result in decreased short-term demand, in the long run the net effect will be reduced unit costs and fares, increased air carrier efficiency, and increased demand for air travel.

**MARKET TRENDS**

As the U.S. airline industry continues to recover from the devastating effects of the events of September 11, 2001, a number of important trends have emerged. Among these are: 1) the more widespread use of simplified fare structures that reduce the ability of network carriers to more closely adjust the number of discounted seats to maximize revenues and profits; 2) the growth of competition by low-cost carriers in long-haul markets; 3) an increase in routes being transferred from mainline to regional operators; 4) a continued shift in capacity from domestic markets to international markets where there is less low-cost carrier competition and more profits; and 5) declining real fares. In the near-term, continuing concerns about the increased passenger processing time and the cost of new security measures will offset some of the benefits of the trends mentioned above. In the long run we see the cost of business travel falling, reducing the sensitivity of business travelers to the cost of air trips. It is also expected that consumers will continue to prefer travel by air versus other modes and a long-term expansion of the economy.
The trends that have made the demand for business air travel more price elastic should continue in the future. Technology continues to expand choices for business travelers (fractional ownership for example), and has made it easier for business travelers to find low fares using internet search engines. Low cost carrier networks continue to expand allowing more and more business travelers to take advantage of the lower business fares the low cost carriers offer without having to utilize more remote or in many cases, more inconvenient airports to depart from. In addition, as network carriers lower their cost structures, they are increasing their use of simplified fare structures leading to greater offering of lower business fares.

However, security concerns continue to reduce the propensity for business travel, especially over shorter distances. Since the September 11th attacks, the advantages of air travel versus other modes of transport for short-haul travel has been reduced due to concerns about the increased processing time. For shorter haul trips this processing time is a significant percentage of the total travel time and as this percentage increases, more business travelers will use substitutes.

Despite the events of September 11th, the war in Iraq and high oil prices, the demand for leisure travel has continued to grow. According to the Travel Institute of America (TIA), domestic leisure travel volume was up 1.9 percent in 2003 and an estimated 2.9 percent in 2004. In addition, international demand has begun to rebound. According to U.S. Office of Travel and Tourism Industries, preliminary data through September indicate that U.S. citizen air traffic to overseas destinations was up 15 percent in 2004 over 2003.

As international travel demand has rebounded, carriers have been dedicating an increasing share of their capacity to international markets. International capacity as a share of mainline system capacity peaked at 26.2 percent in 2001 and then fell to 24.7 percent by 2003, reaching a low point of 23 percent in May. Since May 2003, the share of capacity flying to international markets has increased to 26.3 percent in July 2004. International markets are increasingly viewed as more attractive growth markets by mainline carriers as there is generally less competition from traditional low cost carriers and greater profitability. Carrier announcements and OAG schedules indicate that the rapid growth of international capacity will continue into 2005. On December 10, 2004 United announced a 14 percent reduction in domestic capacity beginning in January 2005 while simultaneously increasing international capacity.

While the relative price of flying has decreased consistently since deregulation, the airline industry has, for the most part, been profitable, albeit marginally. However, the events of September 11th and the ensuing financial turmoil has resulted in fewer airlines, and record losses. While many carriers have been able to increase worker productivity in recent years through a variety of means (bankruptcy, contract renegotiation, layoffs), the competitive nature of the industry has resulted in yield declines in excess of productivity increases. It is not clear that future increases in productivity, capacity growth, and competition will be sufficient to keep relative fares declining. These market conditions would make it difficult for the industry to achieve acceptable rates of return on capital.

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5 Travel Industry of America forecast summary, October 29, 2004
7 Associated Press article, Dec 10, 2004
GLOBAL RISKS AND UNCERTAINTIES

The forecasts of scheduled commercial air carrier demand are based on a specific set of assumptions concerning economic growth in the United States and abroad, Government tax policy, and changes in industry structure. The uncertainties surrounding these assumptions are large and could cause outcomes to be significantly different from those forecast. Developments that could alter the forecasts include:

- additional terrorist attacks utilizing commercial aircraft in the U.S. or abroad;
- the movement of future oil prices;
- the impact of regional jets
- the impact of additional security measures on costs and travel convenience;
- the continued recovery of consumer confidence in flying commercial airlines;
- the strength of the United States and world economic recovery;
- the number of business cycles that occur over the forecast period;
- the degree of competition in both the domestic and international markets;
- the potential for consolidation within the industry;
- how far network carriers can reduce unit costs;
- how fast yields decline due to increased competition and cost reductions.

In addition, 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 of air carriers operating in these international regions and restrain traffic growth. On the other hand, the move towards deregulation, privatization of national carriers, and expansion of open-skies agreements could result in significantly greater traffic growth.

DOMESTIC TRAFFIC: ASSUMPTIONS, MODELS AND FORECASTS

During the past several years the FAA has adopted a decision-theoretic forecasting system. The approach is generally accomplished in two stages. Initially, projections are made with the use of econometric and time series models. The model equations and outcomes are then adjusted based upon “expert industry opinion” to arrive at subsequent forecasts for use in the decision-making process. As was done last year, the forecast for 2005 has been developed utilizing a set of assumptions regarding capacity and demand. Forecasts for the years 2006 and beyond were based on results derived from the models described below.

In developing the short-run demand forecasts it was assumed that: 1) no new terror attacks against U.S. airlines will occur; and 2) U.S. large carriers will not reach pre-September 11th levels of capacity until after 2005. In addition, it was assumed for the long-run demand forecasts that: 1) industry improvements in efficiency and productivity continue but at less than recent historical rates; 2) taxes and fees on airline tickets remain at current levels; 3) competitive forces remain strong; and 4) capacity is continuously adjusted so that demand and supply are in equilibrium.
Since models are relatively simple descriptions of very complex systems, they cannot account for all the political, social, psychological, and economic factors and their interactions that will lead to a particular set of outcomes. Therefore, it is essential to use judgment to account for the complexities of the operating environment. This can be accomplished by adjusting the exogenous variables, adjusting the model outputs, or revising the models initial parameter estimates.

FAA periodically reviews and adjusts its projections based on forecasts and discussions with analysts outside FAA. Some important outside sources for adjusting FAA’s projections are forecasts developed by: 1) the International Civil Aviation Organization’s (ICAO) Asia/Pacific Area Traffic Forecasting Group (May 2003); 2) ICAO’s North Atlantic Traffic Forecasting Group (April 2004); and 3) the National Academy of Sciences’ Transportation Research Board Future Aviation Activities International Workshop (September 2002).

MODELING DOMESTIC RPMS AND ENPLANEMENTS

The model used to develop the FAA’s domestic commercial air carrier forecasts relies upon a system of statistical and deterministic equations. The pivotal equations of the system relate RPMS and enplanements to two primary independent variables—income (measured by GDP, Personal Consumption Expenditures (PCE), or Disposable Personal Income (DPI)) and yield—both adjusted for inflation. This analytical framework for forecasting enplanements ties the domestic forecast model closer to projected changes in economic activity and reduces the number of subjective inputs. This approach is expected to reduce the standard errors of the forecasts.

Market forces quickly took hold following deregulation of the industry in 1978. To adjust for the jointly dependent variables in the demand and supply equations, three-stage least squares is used to estimate the demand equations.

In recent years the amount of excise taxes and fees added on to the base price of a ticket has increased significantly and may influence the modal choice of travelers. In addition, as more and more consumers have access to low base fares, the percentage of the average ticket price that taxes and fees account for is increasing. For example, the $200 round trip ticket to Florida may actually cost the customer $250-$260 after all the taxes and fees are levied. If airline demand is becoming increasingly leisure oriented and price sensitive, ignoring the tax impacts on behavior may lead to an overestimation of the level of demand in the future. The traditional definition of yield does not include the amount of taxes that the consumer paid and may represent a misspecification of the price variable that should be used in models estimating aviation demand. In order to address this problem, the FAA has constructed a measure of yield that incorporates the tax and fees paid by consumers. Both yield series move in similar fashion over time but in recent years the gap between the two series has widened. Although the excise taxes that provide funding for the Aviation and Airway Trust Fund expire in 2007, it is assumed that they will be reauthorized in the same format for the purposes of this forecast.
Although it is aggregate demand that we forecast, it would be preferable to use different models to estimate the two distinct components of each market—business and personal travel. A further refinement would distinguish the long-haul from the short-haul market. This approach would provide important information for developing public policy and would most likely improve the accuracy of the forecasts. Clearly, these markets are affected by different sets of variables, and adjust at different rates to them.

For example, most experts in the industry would agree that the price elasticity of demand for business travel differs from the price elasticity of demand for pleasure travel. Furthermore, theory would suggest that business profits are a factor in determining business travel, and that some measure of personal or family income is an important variable affecting pleasure travel.

At this time, however, the lack of an adequate database subdivided into these four components precludes the development of forecasts for each market at the national level. Additional research and data collection is necessary to advance this approach.

### U.S. MAINLINE AIR CARRIER YIELD AND OPERATIONAL VARIABLES

#### Domestic Capacity

Between 1978 and 1990, domestic capacity grew an average of 5.5 percent annually, matching the growth of traffic during the same period. From 1991 through 1997, capacity grew 2.4 percent annually. During this period, the carriers developed the capability to rapidly adjust capacity to changing conditions in domestic demand while pushing up load factors. For the first time in 3 years, mainline carrier domestic capacity increased, up 4.9 percent. Capacity was up in the first quarter by 0.8 percent and was up in excess of 5 percent for the balance of the year, with peak growth of 8.0 percent in the third quarter.

In 2005, capacity is forecast to increase 0.6 percent, as network carriers continue to shrink while low-cost carriers continue to grow rapidly with deliveries of new aircraft fueling expansion of their own networks. The capacity decrease by the legacy carriers is a result of cuts by United, American, and Delta. For the balance of the forecast, domestic capacity is forecast to grow 3.5 percent a year. Over the 12-year forecast period, the average annual increase in domestic ASMs is forecast to be 3.4 percent, with domestic ASMs totaling 973.8 billion in 2016.

#### Passenger Yield

Between 1978 (when the industry was deregulated) and 2000, domestic real yield declined an average of 2.0 percent per year. In the 1980s the decline resulted from the airlines adjusting to deregulation by rationalizing their route structures and increasing labor productivity. In the 1990’s, financial weakness in the early part of the decade along with excess capacity, and the growth of low-cost carriers into new markets increased fare competition. Increased competition led to restructuring of the high-cost carriers resulting in higher productivity and lower unit costs.

In 2003 nominal yield declined 1.1 percent with decreases during the first 3 quarters of 2003 as increased competition from low-cost carriers and discounting by the network carriers to attract traffic in the wake of the war in Iraq prevented fares from rising. In the fourth quarter of 2003, nominal yield finally rose year-over-year for the first time since the second quarter of 2001 as surging demand
coupled with tight capacity led to higher fares. In 2004, nominal yield fell 2.2 percent, as the rebound in yield was short-lived. Year-over-year decreases were recorded beginning in the second quarter of 2004 and by the 4th quarter, year-over-year nominal yield fell 6.6 percent, due to heavy discounting of summer leisure fares in combination with the effects of the four hurricanes that hit Florida in August and September.

Nominal yield is forecast to decline 3.1 percent in 2005 as the low fares that were prevalent in the fourth quarter of 2004 continue to plague the industry in the first half of 2005. The continued expansion of low-cost carrier networks and the growth of the network carriers low fare subsidiaries will limit the prospects for quick rebound. However, by the third quarter of 2005, yield is projected to be up modestly versus 2004.

In the long run, the effects of continued competition (especially from low-cost carriers), productivity increases, and expanding capacity more than offset higher jet fuel and security costs. It is also assumed that the air carriers will optimally adjust their capacity to meet future demand. During the period 2006 through 2016, nominal yield increases 1.2 percent a year, while real yield declines 1.2 percent annually. Over the 12-year forecast period, nominal yield increases from 11.46 cents in 2004 to 12.54 cents in 2016, with real yield falling 1.7 percent a year.

## Passenger Trip Length

In 2004 the average domestic passenger trip length for U.S. mainline carriers increased 33.5 miles. This was due largely to the continued transfer of medium and short-haul routes to code-sharing regional partners and the expansion of Southwest and other low-cost carriers into longer-haul markets.

![Domestic Passenger Yield Fiscal Year 2003/2004](image)

The rapid integration of new state-of-the-art aircraft into the regional/commuter fleet—especially regional jets with ranges of up to 1,500 miles—has significantly altered the route system of the industry. These new aircraft have enabled regional/commuters to greatly expand the number and types of markets they serve.

In 2005, the turnover of short-haul markets by the network carriers to their code-sharing regional partners is expected to continue, albeit not as rapidly as in previous years. In addition, it is expected that low-cost carriers will continue to add capacity in transcontinental and Florida markets. As a result, domestic trip length is projected to increase 9.7 miles in 2005. During
the period from 2006 to 2016, expansion of low-cost carriers into longer-haul markets, restructuring of the regional/commuter fleets, and expansion of point-to-point service, are expected to increase the domestic trip length modestly. For the entire forecast period, the average trip length increases 7.1 miles per year, increasing from 972.6 miles in 2004 to 1,058.2 miles in 2016.

Average Aircraft Size

After rising by 0.5 seats in 2003, average seats per aircraft mile for domestic U.S. mainline carriers rose another 1.2 seats in 2004. The increase was driven by increases at American and Continental as they retired their MD-80’s (Continental) and F-100’s (American).

Current fleet plans by the mainline air carriers show that the average seats per aircraft mile is flat to slightly increasing. However, most network carriers have deferred taking delivery of new aircraft until 2006 at the earliest. Thus increases in aircraft size will be very small in the near term. Those aircraft that will enter the fleet are larger than those in the existing fleet. The result will be a modest increase in the average seats per aircraft mile throughout the forecast period.

Average seats per aircraft mile for domestic mainline air carriers are forecast to increase 0.5 seats in 2005 and increase an average of 0.5 seats per year for the balance of the forecast. In 2016, the average seats per aircraft mile will be 155.0 seats, up from 149.7 seats in 2004.

Passenger Load Factor

From 1993 through 2000, domestic load factor rose from 61.4 percent to 71.2 percent. During this period carriers developed the capability to adjust capacity to changing conditions in the domestic market to meet demand while increasing load factor. However during the last few years of the 1990’s, load factor remained relatively stagnant and declined in the aftermath of the events of September 11th.

In 2004, domestic load factor rose 2.0 points from 2003 to an all-time record of 74.7 percent. Year-over-year load factor was up in every quarter, ranging between 1.5 to 2.4 points higher. Traffic increases (in excess of 5 percent year-over-year after the first quarter) outpaced increases in capacity throughout the year.

Although traffic is projected to increase modestly in 2005, domestic load factor is forecast to rise 0.8 points to 75.5 percent as capacity grows slower. Year-over-year load factor is projected to be up during the first half of the year, and then run flat for the balance of the year.

For the remainder of the forecast period, domestic load factor is projected to rise slowly as the industry returns to a more stable operating environment, resulting in a load factor of 76.1 percent in 2016.

FORECASTS

Revenue Passenger Miles

During the economic expansion of the 1990’s, domestic RPMs grew an average of 4.0 percent per year over the 10-year period. In the 2 years following their peak in 2000, scheduled domestic RPMs for U.S. mainline carriers declined 9.6 percent. RPM growth returned in 2003 and continued on into 2004 with domestic RPMs up 7.7 percent versus 2003. Traffic grew at a 6.1 percent rate during the first half of the year and then accelerated to a 9.2 percent rate
during the second half of the year as demand in
the prior year fell in the wake of the war in Iraq.
RPM growth was 11.2 percent in the third
quarter before slowing to 7.4 percent in the
fourth quarter.

Traffic growth is projected to slow substantially
in 2005, rebound in 2006, and then return to
modest rates for the balance of the forecast. In
2005, domestic mainline carrier RPMs are
forecast to grow 1.7 percent with the highest
growth occurring in the first half of the year.
Low-cost carrier traffic growth is projected to
exceed 10 percent while network carrier
capacity reductions will result in traffic declines
for those carriers. RPMs are forecast to grow
4.9 percent in 2006 as economic growth remains
above its long-term historic average. As the
economy returns to its historic long-term growth
rate in 2007 and beyond, traffic increases, on
average, 3.6 percent a year for the remainder of
the forecast period. The average annual increase
in domestic RPMs over the 12-year planning
horizon is forecast to be 3.5 percent, with
domestic mainline carrier RPMs reaching
740.7 billion in 2016.

Passenger Enplanements

For the first time since 2000, passengers
enplaned by U.S. scheduled domestic mainline
air carriers increased. A total of 502.2 million
passengers were enplaned in 2004, up
4.0 percent from 2003, but 10.6 percent below
the 2000 peak. Similar to RPMs, domestic
enplanements were up throughout the year with
the largest increases occurring in the later half.
Enplanements were up 5.7 percent on a year-
over-year basis in the second half of the year as
the war in Iraq and subsequent capacity
reductions curtailed demand. Enplanements are
forecast to increase just 0.7 percent in 2005 with
growth occurring only in the first half of the
year and being concentrated in the low-cost
carriers. During the remainder of the forecast
period, enplanements are projected to increase
2.9 percent a year. For the 12-year forecast
period, enplanements growth is projected to
average 2.8 percent annually with the number of
domestic mainline carrier enplanements totaling
700.0 million in 2016.

INTERNATIONAL
PASSENGERS:
METHODOLOGY AND
FORECASTS

MODELING INTERNATIONAL
RPMS AND ENPLANEMENTS

Similar to the forecasts of domestic traffic,
forecasts for U.S. flag carriers’ international
RPMS and enplanements for the three world
regions--Atlantic, Pacific, and Latin America,
are a combination of near-term expert judgment
forecasts coupled with longer term forecasts
based on the forecast methodology described
below. Forecasts for 2005 were developed
using assumptions about capacity and load
factor. Forecasts for 2006 and beyond were
developed by initially estimating total
passengers (U.S. and foreign flag carriers) for
each world region based on the economic
activity in both the region and in the U.S. These
forecasts coupled with assumptions concerning
U.S. market share in each region, are used to
forecast U.S. flag carrier international
enplanements. Models relating U.S. flag carrier
RPMS to enplanements are used to derive U.S.
flag carrier international RPM projections. This
approach ties U.S. flag carrier activity in the
international regions to total demand and
should, over the long-term, increase the
accuracy of the FAA facility workload and trust
fund revenue projections.
U.S. MAINLINE AIR CARRIERS: DOMESTIC OPERATIONAL VARIABLES

PASSenger Trip Length

FORECAST

MILES
9 5 0
9 0 0
8 5 0
8 0 0

9 6 9 8 0 0 0 2 0 4 0 6 0 8 1 0 1 2 1 4 1 6
FISCAL YEAR

SEATs per aircRafT MILE

FORECAST

SEATs
160
1 5 5
1 5 0
1 4 5
1 4 0

9 6 9 8 0 0 0 2 0 4 0 6 0 8 1 0 1 2 1 4 1 6
FISCAL YEAR

LOaD FACTOR

FORECAST

PERCeNT
7 8
7 6
7 4
7 2
7 0
6 8
6 6
6 4

9 6 9 8 0 0 0 2 0 4 0 6 0 8 1 0 1 2 1 4 1 6
FISCAL YEAR
Although economic theory suggests that fares, exchange rates, and relative country consumer prices should be important arguments in an international demand equation, the analyses clearly demonstrate that aggregate economic activity explains a large percentage of the variability in demand and is sufficient to develop accurate macro international forecasts. However, these aggregate results may differ significantly from micro-analyses of individual markets categorized by distance, type of flying, and level of competition.

ATLANTIC MARKET

U.S. Mainline Air Carrier Yield and Operational Variables

Capacity

After falling 3.4 percent in 2003, U.S. carrier capacity in Atlantic markets rose 7.3 percent in 2004. Year-over-year capacity was down through January but was positive for the balance of the year with the largest increases occurring in April and May (the height of the Iraq conflict in 2003). Based on published OAG schedules and discussions with carriers, capacity is projected to increase 9.5 percent in 2005 with growth fairly consistent throughout the year. By the summer, U.S. carrier capacity in Atlantic markets is projected to be roughly 9 percent up from the summer of 2004.

For the period 2006 through 2016, forecast capacity growth averages 3.7 percent per year with the rates of growth diminishing over the course of the forecast. The average annual growth over the 12-year forecast period is 4.5 percent with Atlantic ASMs totaling 170.9 billion in 2016.

Passenger Yield

In 2004 current dollar yield (10.15 cents) increased 5.7 percent, while real yield in the market rose 3.3 percent. This followed an increase in real yield in 2003 of 1.0 percent. Yield was up in every quarter with the largest gains occurring in the second and third quarters. In 2005, yield is forecast to be up on a year-over-year basis in the first half of the year before capacity increases result in falling fares. For all of 2005, yield in Atlantic markets is forecast to remain unchanged from 2004 in nominal terms, but fall 2.7 percent in real terms.

For the balance of the forecast period, real yield is projected to decline 0.5 percent a year, while nominal yield is expected to increase at an annual rate of 1.9 percent. For the period 2004 through 2016, nominal yield increases from 10.15 to 12.44 cents.
Passenger Trip Length

Reversing a two-year decline, average passenger trip length in the Atlantic market increased 20.3 miles. Increases in trip length occurred at Continental, Northwest, and United, with American recording the largest decrease. Although the passenger trip length in the Atlantic market is still below the peak recorded in 2001, the general trend over the past dozen years is increasing. The increase in average passenger trip length since 1993 has been primarily due to more direct flights from non-East Coast U.S. gateways and expanded service into Central and Eastern Europe. In the future, we expect that trip length will increase with continued expansion of service from non-East Coast U.S. gateways.

The average trip length is forecast to increase 49.1 miles in 2005 as capacity additions by the industry will lead to a greater share of the traffic flying on longer haul routes. Increases in passenger trip length are then projected to moderate and increase an average 9.4 miles annually for the balance of the forecast period. For the period 2004 through 2016, trip length in Atlantic markets increases from 4,125.7 miles to 4,288.5 miles--up 162.8 miles.

Average Aircraft Size

The average seats per aircraft mile in the Atlantic market continuously increased during the 1970s and early 1980s as the widebody trijets (DC-10s/L-1011s) and B-747s dominated the market, peaking at 332.0 seats in 1985. The introduction of the B-767 and other aircraft flying Extended-Range Twin-Engine Operations (ETOPS) in the mid 1980s resulted in the average seats per aircraft mile falling by 100 seats to 231.9 by 1993. Although the average seats per aircraft mile has fluctuated since 1993, the number of seats averaged 231.6 seats in 2004—0.3 seats below the 1993 level. Over the 12-year forecast period, the average seats per aircraft mile in the Atlantic market gradually increases as the major carriers expand the number of non-stop city-pair services and use of larger two-engine widebody aircraft. Average seats per aircraft mile in the Atlantic market increases 0.6 seats per year to 239.0 seats by 2016.

Passenger Load Factor

In 2004, the Atlantic market load factor rose 3.6 points to a record 81.7 percent as RPMs grew 12.3 percent while capacity rose by 7.3 percent. Year-over-year load factor was up 4.8 points in the first quarter of the year and 5.6 points in the second quarter before trailing off to 1.9 and 1.6 points respectively in the third and fourth quarters when prior year capacity was cut following the conflict in Iraq.

Despite the capacity increase forecast for the Atlantic market, the load factor is projected to rise 0.8 points to 82.4 percent in 2005 as traffic increases faster than capacity. After being down in the first quarter, year-over-year increases in load factor are forecast for the balance of the year. A slight decline to 82 percent is forecast for 2006, and load factor remains at that level for the balance of the forecast.
U.S. MAINLINE AIR CARRIERS:
ATLANTIC PASSENGER YIELD

CURRENT DOLLARS

FORECAST

2004 DOLLARS

FORECAST

III-30
Forecasts

Total Passengers: U.S. and Foreign Flag Carriers

Based on Immigration and Naturalization Service (INS) data, compiled by the Department of Commerce, passengers in the Atlantic market increased 0.4 percent in CY 2003 (the latest full year for which data is available), following declines of 10.5 and 9.4 percent, respectively, in CY 2001 and CY 2002. Data for the first half of 2004 indicate that the increase in traffic that began in the summer of 2003 has continued into 2004.9

After falling steadily through the 1990’s, U.S. air carrier market share for the Atlantic region increased from 38.6 percent in 1999 to 42.1 percent in 2002. U.S. carrier market share fell to 39.3 percent in 2003, as U.S. flag carriers did not experience a rebound in traffic following the end of major combat in Iraq in May 2003. Preliminary data through June 2004 indicate that some of the decrease in U.S. flag carrier share has been reversed. Based on the available data, U.S. carrier market share is projected to rise to 39.9 percent.

Total passengers traveling in the Atlantic market are forecast to grow slower than the rate of U.S. flag carriers for CY 2005. In CY 2005, passengers are forecast to increase 7.6 percent with the highest rates of growth occurring in the first half of the year. For the remainder of the forecast period, total passengers increase an average of 3.8 percent per year. Over the entire forecast period, total passengers increase an average of 4.3 percent per year, from 48.4 million in 2004 to 80.3 million in 2016.

The International Civil Aviation Organization (ICAO) North Atlantic Traffic Forecasting Group (Canada, U.S., U.K., and Portugal) was formed with the primary objective of developing forecasts of air traffic over the North Atlantic and between North American and the Caribbean. Annual forecasts are provided for both total passengers and aircraft movements to support air navigation systems planning activity for ICAO and its member states.


U.S. Mainline Carrier Passenger Enplanements

U.S. scheduled air carriers in the Atlantic market enplaned a total of 19.9 million passengers in 2004, up 11.7 percent, the first increase since 2000. Enplanement growth was positive every month of the year after October, with the highest growth rates occurring from March through May, when prior year figures were impacted by the conflict in Iraq. Atlantic passenger enplanements are forecast to continue to grow rapidly in 2005, with the largest year-over-year increases occurring in the second half of the year. For the year, enplanements are forecast to increase 9.3 percent. During the period 2006 through 2016, enplanements are forecast to increase 3.5 percent per year on average, stimulated by economic growth and declining real yields. For the entire 12-year forecast period, enplanements grow an average of 4.2 percent annually. The number of Atlantic market enplanements reaches 32.7 million in 2016—64.2 percent higher than in 2004.

9 CY 2004 data is available through July. Estimates for the remainder of the year are based on ATA (thru Nov) and AEA (thru Oct) data
U.S. Mainline Carrier
Revenue Passenger Miles

During the 1990's, Atlantic market RPMs continuously increased at a rate of 7.1 percent per year, due to strong, steady economic growth in the U.S. and Europe and declining real yields. However the first decade of the 21st century has been a different story. Traffic declined in the first 3 years of the decade, falling a total of 16 percent. In 2004, Atlantic market RPMs grew 12.3 percent to 82.1 billion. Traffic was up on a year-over-year basis in all quarters with the fastest growth rates in the third quarter. Traffic is projected to increase 10.6 percent in 2005, driven by economic growth in the U.S. and capacity additions in the second half of the year. Beyond 2005 for the balance of the forecast period, RPMs are projected to grow an average of 3.7 percent per year. The average annual increase in RPMs over the 12-year forecast horizon is 4.6 percent, reaching 140.2 billion in 2016.

LATIN AMERICAN MARKET

U.S. Mainline Air Carrier Yield and Operational Variables

Capacity

In 2004, regional capacity increased 12.1 percent, following an increase of 1 percent in 2003. Capacity was up 3.4 percent year-over-year during the first quarter and up 15 percent for the balance of the year as carriers (especially American and US Airways) added capacity in the region.

Based on OAG schedules and discussions with carriers, capacity growth in the Latin American market is projected to be higher than in other international markets. Capacity is projected to increase about 13 percent on a year-over-year basis in the first half of FY 2005 then slow to about 12 percent during the second half of the year. For the year as a whole, capacity is projected to increase 12.7 percent. For the period 2006 through 2016, capacity in the region is forecast to grow an average of 5.8 percent per year. The average annual growth for Latin American ASMs over the 12-year forecast period is 6.5 percent with Latin American ASMs totaling 121.9 billion in 2016.

Passenger Yield

In 2004 Latin American yield (12.28 cents) fell 1 percent while real yield declined 3.2 percent. This followed declines in 2003 of 0.8 and 3.1 percent for nominal and real yield, respectively. Since 1998, real yield in the market has declined 21.2 percent.

In 2005 real yield is forecast to fall 1.3 percent as competition in Caribbean and Central American markets pushes fares lower. From 2006 through the remainder of the forecast
period, real yield continues its historic decline, falling at a rate of 0.5 percent a year, driven by increasing demand in longer-haul, lower yield markets like Argentina and Brazil. During the 12-year forecast period, nominal yield increases at an annual rate of 1.9 percent, reaching 15.34 cents in 2016.

Passenger Trip Length

After falling for two consecutive years, passenger trip length in Latin America increased 11.5 miles to 1,599.7 miles. While carriers continued to add capacity to relatively shorter haul destinations in the Caribbean and Mexico, capacity was also added to the long-haul South American markets. Despite the increase in 2004, the average trip length in the region is now just 13.0 miles higher than the 1998 level.

From 1990 to 2001, the average trip length in the region increased by 453 miles. The primary reason for the increased trip length during the 1990’s was the continued expansion of U.S. carriers into deep South America--Argentina, Brazil and Chile--and the expansion of routes from the Northeast to the Caribbean. We expect this trend to resume over the forecast period. The average trip length is forecast to increase 39.8 miles in 2005 as carriers continue to increase capacity to longer haul destinations in South America. Over the forecast period—2004 to 2016--capacity growth to the longer haul destinations of the region will be faster than that to the Caribbean and Central America. This results in trip length increases averaging 20.3 miles a year, from 1,599.7 to 1,843.2 miles.

Average Aircraft Size

The average seats per aircraft mile in the Latin American market increased during the 1970s and early 1980s as widebody aircraft dominated the market, peaking at 220.2 seats in 1986. With the advent of the B-757 and others flying ETOPS since the mid 1980s, the average seats per aircraft mile has steadily declined, except for a 2-year period from 1994 to 1996. In 2004 average seats per aircraft mile increased 2.8 seats to 174.6 seats, only the 3rd annual increase since 1986. Despite the increase in 2004, average seats per aircraft mile in the region are down 45.6 seats from their 1986 peak.

Average seats per aircraft mile is projected to increase to 175.0 seats in 2005, due, in large part, to the continued increase in capacity to South American markets. For the balance of the forecast, the average seats per aircraft mile in the Latin American market is expected to gradually increase as the major carriers expand the number of non-stop city-pair services into deep South America, and their use of larger two-engine widebody aircraft. The average seats per aircraft mile are forecast to increase approximately 0.5 seats per year to 180.5 seats by 2016.

Passenger Load Factor

In 2004, load factor increased by 1.0 points to an all-time high of 70.3 percent as gains in RPMs exceeded the increase in capacity. Year-over-year load factor increases of 1 to 4 points were recorded up to May and then turned negative with decreases ranging 2 to 3 points until September. While the gains in the first half of the year were driven by strong traffic growth, the declines in the later half of the year were a result of accelerating capacity growth.

Load factor is forecast to increase 0.9 points to 71.2 percent in 2005 with increases occurring after the first quarter. During the period 2006 to 2013, load factor is forecast to climb gradually to 72 percent. For the duration of the forecast the load factor remains at 72 percent as the market reaches equilibrium.
U.S. MAINLINE AIR CARRIERS: 
LATIN AMERICAN OPERATIONAL VARIABLES

PASSENGER TRIP LENGTH

FORECAST

MILES
1,900
1,800
1,700
1,600
1,500
1,400
1,300

96 98 00 02 04 06 08 10 12 14 16
FISCAL YEAR

SEATS PER AIRCRAFT MILE

FORECAST

190
185
180
175
170
165

96 98 00 02 04 06 08 10 12 14 16
FISCAL YEAR

LOAD FACTOR

FORECAST

74
72
70
68
66
64
62
60
58
56
54
52

96 98 00 02 04 06 08 10 12 14 16
FISCAL YEAR
Forecasts

Total Passengers: U.S. and Foreign Flag Carriers

Based on INS data, total passengers in the Latin American market (South America, Central America/Mexico, and the Caribbean) rose 5.0 percent in CY 2003. The Central America/Mexico region had the fastest growth at 7.1 percent, followed by the Caribbean region at 6.6 percent. The South American region declined 2.0 percent. During the period 1991-2001 the South American region had been the fastest growing with passengers increasing 6.2 percent annually. At the same time, the Central America/Mexico market increased 4.6 percent per annum, while the Caribbean market increased only 2.2 percent a year, reflecting the impact made by cruise traffic in the region.

For the sixth consecutive year, U.S. air carrier passenger share increased in the region, rising 1 point to 66.6 percent in 2003, as gains were recorded in all regions. In CY 2003 U.S. carrier passenger share was 74.0, 65.5, and 61.5 percent, respectively, in the Caribbean, South American, and Central America/Mexico regions.

Throughout most of the 1990’s the percentage of total passengers that were U.S. citizens traveling in the Latin American market decreased steadily from 67.3 percent in 1990 to 63.4 percent by 1998. Beginning in 1999 the trend reversed itself and the ratio had increased to 65.2 percent in 2001. After falling by 1.8 points in 2002, the U.S. citizen ratio rose 4 points in 2003 as all regions saw gains in excess of 2.5 points led by a 5.8 point gain in the South America region.

Preliminary data for 2004 indicates that the growth in total passengers traveling in the Latin America market accelerated. Total passengers in the Latin America market are forecast to increase 10.5 percent in 2004, with U.S. carriers posting higher growth rates. In 2005, Latin American market passengers are projected to grow 7.5 percent with growth higher in the first half of the year. For the period 2006-2016, total passengers traveling in the Latin market are projected to increase at an average annual rate of 4.8 percent. Over the entire forecast period, total passengers in the Latin America market are projected to increase 5.1 percent per year, from 42.8 million in 2004 to 77.9 million in 2016.

U.S. Mainline Carrier Passenger Enplanements

U.S. scheduled mainline air carriers in the Latin American market enplaned a total of 25.2 million passengers in 2004, up 12.9 percent from 2003. Year-over-year increases occurred in each quarter with the second quarter recording the highest increase at 16.0 percent. For the remaining quarters, year-over-year increases in passengers ranged between 7.0 to 13.8 percent.

In 2005, passenger growth is forecast to remain robust (up 11.4 percent), with solid gains recorded throughout the year. For the remainder of the forecast, economic growth in both the U.S. and Latin America fuel enplanements upward at a rate of 4.9 percent per year. Enplanement growth is projected to average 5.5 percent annually during the 12-year forecast period, with Latin American market enplanements reaching 47.6 million in 2016.
U.S. Mainline Carrier Revenue Passenger Miles

Following a 5.3 percent rise in 2003, U.S. mainline carriers RPMs in the market rose to 40.3 billion in 2004, a 13.7 percent increase. Year-over-year increases were posted in every quarter, with the largest increase in the second quarter.

RPMs are forecast to increase 14.2 percent in 2005 with growth evenly distributed throughout the year. For the balance of the forecast period RPMs are forecast to grow faster than enplanements, at 5.8 percent per year, as it is anticipated that demand in the deep South America markets will increase faster than in the Caribbean or Central American markets. The average annual increase in RPMs over the 12-year forecast horizon is 6.7 percent, reaching 87.8 billion in 2016.

PACIFIC MARKET

U.S. Mainline Air Carrier Yield and Operational Variables

Capacity

After falling in each of the prior 2 years, U.S. mainline carrier ASMs in Pacific markets grew 5.4 percent in 2004. Despite the rise in capacity in 2004, U.S. carrier capacity in the region is 22.7 percent below its 1997 peak. Capacity was down in the first half of the year as carriers remained hesitant to add back capacity that had been removed with the onset of the war in Iraq and the SARS epidemic. In the second half of the year capacity was up 19.1 percent versus 2003, reflecting the pull down in 2003. In 2005, capacity growth remains high with a projected increase of 14.2 percent. For the balance of the forecast period, capacity growth is projected to be more moderate, increasing an average of 5.1 percent per year. For the 12-year forecast period, average annual capacity growth is forecast to be 6.1 percent with ASMs in Pacific markets totaling 129.2 billion in 2016.

Passenger Yield

Rebounding demand and a weaker dollar led to a nominal yield increase in the Pacific market of 10.7 percent in 2004. Real yield in 2004 rose 8.2 percent following three years of declines. Nominal yield was up 5 percent in the first quarter, and then was up between 10 and 14 percent for the balance of the year.

A modest increase in yield is forecast in 2005. Year-over-year increases are forecast to diminish over the course of the year and turn to declines in the last quarter of the year.

For the year as a whole, nominal yield is forecast to increase 1.3 percent but fall 1.4 percent in real terms. For the balance of the forecast real yield declines averaging one percent per year are projected. Nominal yield reaches 11.15 cents by 2016--an increase of 1.4 percent a year.
Passenger Trip Length

Passenger trip length in Pacific markets fell 53.7 miles in 2004 to 4,365.9 miles. The decline in 2004 follows declines in 2002 and 2003. Decreases in trip length occurred at United, Northwest, and American. In 2005 the average trip length is forecast to increase 125.4 miles as capacity increases in the relatively longer haul markets of the region grow faster than overall regional capacity. For the remainder of the planning period—2006 through 2016—modest increases in trip length are projected with the trip length increasing an average of 10 miles per year, primarily due to more direct flights from non-coastal gateways and expanded service into the Asia/Pacific region. For the 12-year forecast period, the Pacific market trip length increases 241.7 miles from 4,365.9 to 4,607.6 miles.

Average Aircraft Size

For the fourth consecutive year, the average seats per aircraft mile in the Pacific market declined. The 2004 figure of 281.8 is the lowest since 1978. Large decreases in seats per aircraft mile at both Northwest and United occurred in the early part of the year reflecting the reduction in capacity (primarily B747's) that resulted from the outbreak of SARS in the region and the onset of the war in Iraq. The large decreases moderated in the third quarter as the prior year figures reflected the SARS and war in Iraq related capacity reductions.

Based on OAG schedules, average seats per aircraft mile are projected to increase in 2005. Average seats per aircraft mile in 2005 are forecast to increase by 0.8 seats to 282.6 seats and then grow slowly for the balance of the forecast. By 2016 average seats per aircraft mile are forecast to be 288.0 seats, up 6.2 seats from the 2004 figure.

Passenger Load Factor

In 2004 load factor in the Pacific market jumped 7.6 points to a record 84.2 percent as traffic rose 15.8 percent while capacity increased 5.4 percent. Year-over-year increases were recorded during the first 3 quarters of the year with the largest increase (16.8 points) in the third quarter. By the fourth quarter year-over-year gains in load factor had disappeared as the growth in traffic was being matched by increases in capacity.

Load factor is forecast to fall from the 2004 record levels to 81.5 percent as traffic growth slows a bit from 2004’s pace while the capacity growth exhibited during the later half of 2004 continues on into 2005. Year-over-year load factor declines are projected for all quarters except the last quarter of the year. As traffic growth slows from its peak in 2004, load factor is projected to decrease to 81.0 percent by 2008, and remain at that level for the balance of the forecast as ASMs and RPMs expand at the same rate.

Forecasts

Total Passengers: U.S. and Foreign Flag Carriers

Based on INS data, total passengers in the Pacific market decreased 10.1 percent in CY 2003. This marked the third consecutive year of falling passenger counts in the region. U.S. carrier market share dropped 0.8 points from 36.6 percent to 35.8 percent.

Preliminary data for 2004 indicate that traffic is rising while U.S. carrier share is declining. Passengers are projected to rise 17.7 percent
U.S. MAINLINE AIR CARRIERS:
PACIFIC PASSENGER YIELD

CURRENT DOLLARS

2004 DOLLARS

FORECAST

III-42
U.S. MAINLINE AIR CARRIERS:
PACIFIC OPERATIONAL VARIABLES

PASSENGER TRIP LENGTH

FORECAST

MILES

3,600 3,900 4,200 4,500 4,800 5,100 5,400

3,600 3,900 4,200 4,500 4,800 5,100 5,400

FISCAL YEAR

FISCAL YEAR

SEATS PER AIRCRAFT MILE

LOAD FACTOR

FORECAST

FORECAST

85
82
80
79
76
73
70

PERCENT

PERCENT
during the year as U.S. carrier share slides another 0.5 points to 35.3 percent. In CY 2005 it is assumed that passenger growth of the U.S. flag carriers will still be below that of the Pacific market. Total Pacific region passengers are forecast to increase 11.6 percent in 2005 with the largest increase occurring in the 1st quarter.

For the period 2006 to 2016, passengers are forecast to increase an average of 4.6 percent per year fueled by strong economic growth in the Pacific region. Total passengers increase from 23.5 million in 2004 to 44.8 million in 2016, an average annual rate of 5.5 percent per year.

U.S. Mainline Carrier
Passenger Enplanements

U.S. scheduled mainline air carriers in the Pacific market enplaned a total of 12.3 million passengers in 2004, up 17.3 percent from 2003. Year-over-year enplanements were flat with the prior year in the first quarter and up 9.8 percent in the second quarter before posting a 52.9 percent gain in the third quarter as the outbreak of SARS and the war in Iraq curtailed demand in the prior year. In 2005 passengers are forecast to be up 7.4 percent, with year-over-year increases projected for all quarters. For the period 2006 to 2016, passenger growth is projected to average of 4.8 percent annually. Enplanement growth is projected to average 5.3 percent annually during the 12-year forecast period, with Pacific market enplanements reaching 22.7 million in 2016.

U.S. Mainline Carrier
Revenue Passenger Miles

Traffic in the Pacific market increased 15.8 percent in 2004, following a 5.7 percent decrease in 2003. After being down 1.2 percent in the first quarter, year-over-year traffic was up the remaining 3 quarters, highlighted by a 55.4 percent increase in the third quarter. Growth is projected to continue in 2005, although not at the rates exhibited in 2004. RPMs are forecast to increase 10.5 percent with slightly faster growth in the second half of the year. Pacific market RPMs are forecast to increase an average of 5 percent per year from 2006 to 2016 as the economies of the region return to their long-term historical growth. RPMs grow at an average rate of 5.7 percent per year during the forecast, totaling 104.7 billion in 2016.

U.S./CANADA
TRANSBORDER TRAFFIC

The transborder forecasts shown in this document (Chapter X, Table 7) were developed in conjunction with Transport Canada and FAA’s projections of expected growth in this market. In CY 2004, transborder traffic is estimated to have grown for the first time in four years, rising 10.5 percent. The 2004 increase followed a 4.2 percent fall in passengers in 2003 caused by about SARS in Canada and a drop in demand with the war in Iraq. Passenger growth continues in 2005 with passengers up 9.3 percent. Over the balance of the forecast period passenger growth moderates averaging 2.8 percent per year. For the 12-year forecast period transborder traffic increases an average of 3.7 percent a year, totaling 29.8 million by 2016.
AIR CARGO

Air cargo traffic is comprised of domestic and international revenue freight/express and mail. The demand for air cargo transportation is a derived demand resulting from economic activity. Cargo is moved in the bellies of passenger aircraft and in dedicated all-cargo aircraft, on both scheduled and nonscheduled service.

REVENUE TON MILES

Historic data and forecasts are presented for domestic and international cargo RTMs. In addition, within each of these two components trends and forecasts are presented for all-cargo carriers and passenger carriers. Passenger carriers transport cargo predominantly in the bellies of their aircraft.

The forecast of cargo RTMs could not be further disaggregated into freight/express and mail components due to a continuing reporting problem in the historic data. FedEx is reporting their activity under a contract with the U.S. Postal Service as freight/express, rather than as mail. This reporting, which began in August 2001, affects the consistency of the historic distribution between freight/express and mail RTMs.

In 2003 there were changes in the reporting requirements for cargo activity. The two most significant changes that affect the comparability with reported RTM figures before 2003 were: 1) the inclusion of contract service by U.S. carriers for foreign flag carriers and 2) the inclusion of activity by Airborne Express. The first change affects the consistency of international RTMs by all-cargo carriers and the second change affects the consistency of domestic RTMs by all-cargo carriers.

Industry Structure and Market Assumptions

Historically, air cargo activity has been highly correlated with GDP. Additional factors that have affected the growth in air cargo traffic include declining real yields, improved productivity, and globalization. Ongoing trends that could potentially stimulate demand for air cargo include increased market opportunities from open skies agreements, decreased costs from global airline alliances, and increased business volumes attributable to e-commerce. Ongoing trends that could potentially limit growth include increased use of e-mail, decreased costs of sending documents via facsimile, and the increased costs to airlines in meeting environmental and security restrictions.

Significant structural changes have occurred in the air cargo industry. Among these changes are the following:

- **Security regulations**
  In October, 2001 the FAA issued a new security directive under 14 CFR Part 108 to strengthen security standards for transporting cargo on passenger flights. This directive, which exempts all-cargo flights, was in response to the September terrorist attacks. This significantly impacted air cargo activity in 2002, including a shift from passenger carriers to all-cargo carriers. The Transportation Security Administration (TSA) issued additional security directives in November, 2003 requiring passenger carriers and all-cargo carriers to conduct random inspections of cargo.

- **Security regulations**
  In November, 2004 TSA issued a notice of proposed rulemaking (NPRM) that applies security requirements throughout the supply chain and would impact airports, aircraft operators, indirect air carriers (freight forwarders), and foreign air carriers. The provisions of the NPRM that address aircraft
operators include codifying previous cargo screening requirements; codifying and further strengthening the “Known Shipper” program; and establishing a security program specific to all-cargo operations with aircraft with a maximum certificated takeoff weight of more than 45,500 kg.

- **Market maturation**
  The U.S. domestic express market, which grew rapidly in the 1980’s and 1990’s, has matured. This type of service represents the majority of domestic cargo activity.

- **Modal shift from air to other modes (especially truck) is maturing**
  The majority of this shift, which resulted from improved service and economics of alternative modes, has already happened. The modal shift occurred for the integrated carriers (e.g., FedEx and United Parcel Service) and for the U.S. Postal Service.

- **Increased use of all-cargo carriers (e.g., FedEx) by the U.S. Postal Service to transport mail**
  This initially resulted from the need to improve control over delivery. The trend continued based on security considerations.

- **Increased use of mail substitutes**
  The use of substitutes (e.g., e-mail) affects mail volume. Residual fear of mail because of terrorism has also been a factor in the use of substitutes.

The forecasts of RTMs are predicated on several basic assumptions. These assumptions include the following: 1) security restrictions concerning air cargo transportation will remain in place; 2) there will be no additional terrorist attacks in the U.S. and confidence in flying will return; 3) there will be continued domestic and international economic growth; 4) most of the modal shift from air to ground has occurred; and 5) in the long-term cargo activity will be tied to economic growth. Specific factors and assumptions affecting the domestic and international components of air cargo activity are noted in the following section.

The forecasts of cargo RTMs were prepared by considering the changes in industry structure and market assumptions discussed above. The near-term forecasts were also based, in part, on a consideration of economic conditions and discussions with industry representatives. These discussions included talks with cargo carriers and cargo consultants. The long-term forecasts of RTMs were based primarily on regressions with GDP. Forecasts of domestic cargo RTMs were developed from a regression equation using real U.S. GDP as the independent variable. Projections of international cargo RTMs were derived from an equation based on world GDP, adjusted for inflation. The distribution of RTMs between passenger carriers and all-cargo carriers was forecast based on an analysis of historic trends in shares; the changes in industry structure and market assumptions; and discussions with industry representatives.

Growth in domestic cargo RTMs has been dominated by all-cargo carriers. These carriers have significantly increased their market share, accounting for approximately three-quarters of domestic cargo RTMs in 2004. FedEx and United Parcel Service (UPS) are the two largest domestic all-cargo carriers. Both of these carriers are integrated carriers who provide door-to-door service using intermodal systems. International cargo RTMs have increased more rapidly than domestic cargo RTMs since 1990. This reflects the lower stage of maturation of international air cargo markets and the expansion of trade with open skies agreements.
Revenue Ton Miles Forecast

The total number of air cargo RTMs flown by U.S. commercial air carriers was 35.1 billion in 2004, an increase of 4.8 percent over 2003. This increase reflects the growth in domestic and worldwide economic activity. Furthermore, cargo activity is a leading economic indicator and thus reflects the economic growth projected for 2005.

Total RTMs are forecast to increase 5.5 percent in 2005 and 5.2 percent in 2006. Over the 10-year period from 2007 to 2016, total RTMs are forecast to increase at an average annual rate of 5.1 percent, based primarily on economic growth. The forecast level of 63.8 billion RTMs in 2016 represents an average annual increase of 5.1 percent over the entire forecast period.

Domestic Revenue Ton Miles

Domestic cargo RTMs flown by U.S. commercial air carriers were 15.5 billion in 2004, an increase of 3.8 percent. This increase was due to economic growth in the U.S. Domestic cargo RTMs are forecast to increase 3.9 percent in 2005 and 3.5 percent in 2006 based on strong economic activity. Over the 10-year period from 2007 to 2016, domestic cargo RTMs are forecast to increase at an average annual rate of 3.2 percent, based on projected growth in U.S. GDP. The forecast level of 22.9 billion RTMs in 2016 represents an average annual increase of 3.3 percent over the entire forecast period.

The freight/express component of domestic air cargo is highly correlated with capital spending. Consequently, the growth of this component in the future will be tied to improvements in the economy. The mail component of domestic air cargo will be affected by overall mail volume, which is related to the economy. This component will also be impacted by the increased use of substitutes (e.g., e-mail) and possible residual fear related to terrorism.

Historically all-cargo carriers have increased their share of domestic cargo RTMs flown, from 64.6 percent in 1996 to 75.9 percent in 2004. This has resulted from the significant growth of express service by FedEx and United Parcel Service and the lack of growth of domestic freight/express business for passenger carriers. In addition, recent factors which account for the relative growth of the all-cargo sector include the October, 2001 FAA security directive for passenger carriers; the U.S. Postal Service use of all-cargo carriers as a means to improve control over mail delivery; and the inclusion of Airborne Express. The all-cargo share is forecast to increase to 80.0 percent by 2016 based on the advantages of the integrated carriers.

\[\text{DOMESTIC CARGO RTMS} \quad 2004 - 2016\]

\[\begin{array}{ccccccc}
\text{FY} & \text{CY} \\
2004 & 3.8 & 3.4 \\
2005 & 3.9 & 4.1 \\
2006 & 3.5 & 3.4 \\
2007-16 & 3.2 & \\
\end{array}\]

10 For the 12 months ending July 2001, domestic cargo RTMs were comprised of 83.6 percent freight/express and 16.4 percent mail. Therefore, the domestic cargo RTM forecast discussed below is driven largely by factors that impact domestic freight/express.
U.S. COMMERCIAL AIR CARRIERS: CARGO REVENUE TON MILES *

DOMESTIC

INTERNATIONAL

* 2003, 2004, and forecast includes changes in reporting requirements
International Revenue Ton Miles

International cargo RTMs flown by U.S. commercial air carriers were 19.6 billion in 2004, an increase of 5.5 percent over 2003. This increase was due to the economic growth of world GDP. Increases in international cargo activity for 2004 also reflect increased activity from the war in Iraq. International cargo RTMs are forecast to increase 6.7 percent in 2005 and 6.5 percent in 2006 due to improvements in the world economy and expansion in trade with open skies agreements. Over the 10-year period from 2007 to 2016, international cargo RTMs are forecast to increase at an average annual rate of 6.3 percent based on projected growth in world GDP. The forecast level of 40.9 billion RTMs in 2016 represents an average annual increase of 6.3 percent over the entire forecast period. The growth may vary by world region depending on regional economic activity and the predominance of individual carriers.

Both the freight/express and mail components of international cargo will be affected by economic growth. The mail component will also be affected by some residual fear of terrorism as well as improvements in mail delivery services.

All-cargo carriers increased their share of international cargo RTMs flown from 52.0 percent in 1996 to 59.7 percent in 2004. This increase has resulted from the demand for expedited service and includes the change in reporting of contract services. The all-cargo share is forecast to increase to 63.6 percent by 2016 due to increased capacity.

MAINLINE AIR CARRIER FLEET

Commercial Orders & Deliveries

In CY 2003, U.S. air carriers placed orders for an estimated net total of 395 jet aircraft, spurred by large orders of regional jets. The 2003 total represents an increase of 405 net orders from the 2002 figure of -12.

In 2003, orders for regional jets (CRJs and EMBs) totaled 246, 62.3 percent of the total orders. Net orders for narrow-body two-engine aircraft (A-318/319/320/321 and B-717/737/757) totaled 141, or 35.7 percent of the total. Net orders for two-engine wide-body aircraft (A-300/330 and B-767/777) were 9 while there was 1 cancellation of an A340.

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\[\text{International Revenue Ton Miles}^{11}\]

\[\text{For the 12 months ending July 2001, international cargo RTMs were comprised of 96.5 percent freight/express and 3.5 percent mail. Consequently, the international cargo RTM forecast discussed below is overwhelmingly driven by factors that impact international freight/express.}\]
Aircraft manufacturers delivered 431 jet aircraft to U.S. customers in CY 2003—11.1 percent fewer than in 2002. Of this total, 110 (25.5 percent) were two-engine narrow-body aircraft, 30 (7.0 percent) were for two-engine wide-body aircraft, and 291 were for regional jets (67.5 percent).

![Bar chart](image)

**Passenger Jet Aircraft**

In CY 2004, the fleet of passenger jet aircraft for U.S. mainline air carriers increased by an estimated 23 aircraft to 4,046 aircraft. This marks the first increase in the fleet following 3 consecutive annual declines. Despite the increase, the U.S. mainline air carrier passenger jet fleet remains 416 aircraft (9.4 percent) below the CY 2000 peak of 4,462 aircraft. Two categories had net increases: two-engine narrow-body aircraft (up 20 or 0.6 percent), and the two-engine wide-body aircraft (up 14 or 3.0 percent).

Based on the backlog of aircraft orders and the projections of air carrier traffic, seat capacity, load factors, fleet requirements, and aircraft productivity, the U.S. large commercial air carrier passenger fleet is projected to increase from an inventory of 4,046 aircraft in 2004 to 5,999 aircraft by 2016. This involves a net addition to the fleet (after retirements of obsolete aircraft) of approximately 163 aircraft annually.

The two-engine narrow-body fleet is projected to grow by an average of 136 aircraft annually, spurred on by a large increase in the low cost carrier fleet. By 2016, two-engine narrow-body aircraft are expected to account for 83.8 percent of the fleet. The number of three-engine narrow-body (B-727) aircraft declines from 65 aircraft (1.6 percent of fleet) in 2004 to 58 (1.0 percent of fleet) by 2016. The number of four-engine narrow-body aircraft was zero in 2004 and remains at that level throughout the balance of the forecast.

The fleet of two-engine wide-body aircraft (A-300/310/330 and B-767/777) is the fastest growing of the wide-body group. This group is expected to increase by an average of 12 aircraft per year (2.3 percent), expanding from 478 aircraft in 2004 to 627 aircraft in 2016.

The three-engine wide-body fleet (MD-11, DC-10, and L-1011) is projected to shrink at an average annual rate of 11.4 percent, from 34 aircraft in 2004 to just 8 aircraft in 2016.

Four-engine wide-body (B-747 and A-340) aircraft are forecast to decline from 66 aircraft in 2004 to 58 aircraft in 2016, an annual average decrease of 1.1 percent.

The regional jet fleet for the mainline air carriers consisting of aircraft ranging in size from 35 to 70 seats, is forecast to expand from 4 aircraft in 2004 to 219 aircraft in 2016, an increase of 39.6 percent a year. By 2016 the regional fleet will account for 3.7 percent of the mainline carrier passenger jet fleet; in 2004 the regional jet fleet accounted for only 0.1 percent of the fleet.
Cargo Jet Aircraft

In CY 2004, the jet fleet of U.S. air carrier cargo aircraft decreased by 1.9 percent to 974 aircraft. Based on the backlog of aircraft orders and the projections of air cargo demand, the U.S. commercial cargo fleet is projected to increase to 1,312 aircraft by CY 2016. This involves an average net addition to the fleet (after retirements of obsolete aircraft) of 28 aircraft annually or 2.5 percent per year.

Narrow-body aircraft, which accounted for 54.2 percent of the cargo fleet in 2004, are projected to account for 38.6 percent in 2016. The fleet of two-engine remains constant over the forecast period at 174. Narrow-body three-engine aircraft decrease from 243 aircraft in 2004 to 231 aircraft in 2016. Narrow-body four-engine aircraft total 111 in 2004 and fall to 101 in 2016.

Wide-body aircraft accounted for 45.8 percent of the cargo fleet in 2004. The fleet of wide-body aircraft is forecast to increase to 61.4 percent of the cargo fleet in 2016. The largest increase in the number of wide-body aircraft is projected to occur in the two-engine wide-body category. This category grows an average of 24 aircraft per year (7.3 percent annually), expanding from 215 aircraft in 2004 to 498 aircraft in 2016.

The three-engine wide-body fleet is projected to increase an average of 5 aircraft annually, or 2.6 percent, over the forecast period from 170 aircraft in 2003 to 232 aircraft in 2016. Conversions of DC-10 passenger aircraft to MD-10’s and new MD-11F orders drive the growth in this category. The four-engine wide-body aircraft fleet increases an average of 1.3 percent per year, from 61 aircraft in 2004 to 76 aircraft in 2016. Similar to last year’s forecast, the current forecast does assume a number of A380’s entering the U.S. fleet beginning in 2008.

AIRBORNE HOURS

U.S. mainline air carriers (passenger and cargo but excluding regional jets) flew an estimated 13.7 million hours in 2004, up from 13.3 million hours in 2003. The increase in hours was driven by increases in activity spurred by strong passenger demand. Two-engine aircraft accounted for more than 91 percent of total airborne hours: narrow-body (76.5 percent), and wide-body (15.1 percent).

In 2016, the total number of hours is forecast to expand to 20.8 million, an average annual increase of 3.5 percent. Airborne hours are projected to increase 4 percent in 2005 to 14.3 million, and then increase at an average rate of 3.4 percent between 2006 and 2016.

Two-engine aircraft (both narrow-body and wide-body) are expected to account for 94.1 percent of all airborne hours flown in 2016. Narrow-body two-engine aircraft hours, which make up 77.1 percent of total hours in 2016, increase an average of 3.6 percent per year. Wide-body two-engine aircraft hours are forecast to increase 4.6 percent per year and account for 17.0 percent of total hours in 2016. Four-engine wide-body aircraft hours are forecast to increase an average of 0.4 percent.

The number of hours flown by three-engine aircraft is projected to increase slightly through 2016. Three-engine wide-body hours flown are forecast to increase 1.4 percent a year, reflecting the growth in cargo operations. Three-engine narrow-body aircraft hours are forecast to fall 1.5 percent annually, reflecting the retirement of B-727 aircraft and the increasing proportion of cargo aircraft in this fleet. Hours for the four-engine narrow-body fleet, made up primarily of DC-8 cargo aircraft, decrease at a rate of 0.8 percent a year, reflecting the retirement of these aircraft from the fleet.
U.S. MAINLINE AIR CARRIERS:
CARGO JET AIRCRAFT

FORECAST

NUMBER OF AIRCRAFT

PERCENT BY AIRCRAFT TYPE

2004

2016

III-54
U.S. MAINLINE AIR CARRIERS:
AIRBORNE HOURS 1/

PERCENT BY AIRCRAFT TYPE

2004

2016

1/Includes both passenger (excluding regional jets) and cargo aircraft.