

Point-to-Point

FINANCIAL TRENDS IN COMMERCIAL AVIATION

December 2005, Volume 1, Issue 2

www.boeing.com

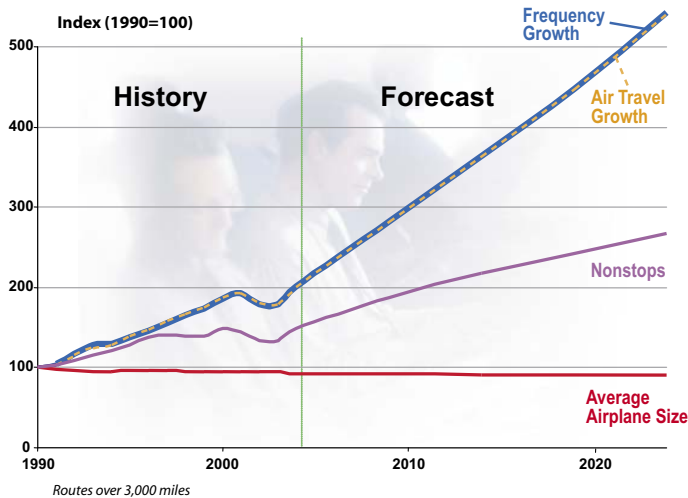
The Trend of Future Air Travel: Frequencies and Nonstops Continue To Grow

It is well known that Boeing and Airbus have differing views of how the airplane market will evolve. While both Boeing and Airbus see a vibrant commercial airplane market, the two companies disagree markedly on the future mix of airplane sizes.

Boeing sees the most growth in the mid-size airplane market. Yet Airbus anticipates a dramatic upswing in the very large airplane market. Consequently, the two companies focus their research and development on different segments of their product lines.

The Boeing market projection is based on the long view of commercial aviation history. Since the beginning of deregulation and liberalization in the mid 1980s, competition among airlines has driven a steady increase in flight frequencies, including new non-stop point-to-point service. Boeing sees no reason to expect this trend to change.

Airlines Will Continue To Meet Air Travel Growth With More Frequencies and Nonstops



Since 1990, flight frequency growth, including new nonstop city pairs, has overlapped total air travel growth, accounting for the entire increase in passenger traffic. Average airplane size has actually decreased as passenger volumes surged.

The Airbus projection, on the other hand, foresees a dramatic reversal in the historical trends. According to this scenario, sometime during the next 20 years, airlines will come to rely almost exclusively on very large airplanes to meet growing demand, raising average airplane size by a startling 20%. The Airbus scenario depends on three developments: (1) Airport congestion will constrain frequency growth; (2) Airline networks will consolidate toward heavily traveled trunk lines, forcing passengers to make one or more connections; (3) Airlines will use larger airplanes to reduce seat-mile costs.

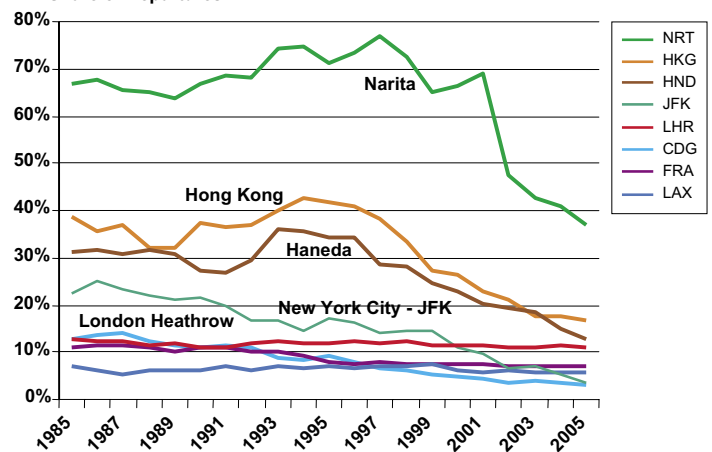
Boeing considers this scenario—clearly undesirable for passengers—to be unlikely on all counts. Data show that frequencies, including new nonstop point-to-point service, have grown continuously for the last 15 years, even as passenger traffic doubled. In fact, since 1990, all passenger traffic growth has been accommodated by increased frequencies and new nonstop service. Average airplane size has actually declined during the same period, despite the availability of larger airplanes, such as the 747-400.

Congestion Is Not Driving Large Airplane Use Up

Congestion is not driving airlines to use larger airplanes because larger airplanes are not an effective remedy to congestion. At eight of the world's busiest airports, where the effects of congestion on airplane size mix should be most visible, the percentage of departures by 747s—the largest airplane currently available—has either dropped or remained the same.

A closer look at London Heathrow is instructive. About 87% of Heathrow departures are airplanes with fewer than 300 seats. About 70% of those departures are airplanes with 200 seats or fewer. Increasing the size of the largest airplanes at the airport, which account for only 13% of the departures, could improve traffic by no more than 5%. Paradoxically, such an increase could make congestion even worse. About 40% of passengers who board large airplanes arrive on smaller airplanes. Therefore, increased use of larger

747 Share of Departures



August OAG

At three of the eight airports—Narita, Hong Kong, and Haneda—the 747's percentage of departures has dropped by half since the mid 1990s. At New York's JFK, the 747's percentage of departures has dropped from 25% in the mid 1980s to about 5% today. Only at London's Heathrow airport has the 747's percentage of departures remained nearly constant at about 10%.

airplanes could require an increase in small airplane traffic to funnel connecting passengers to the hub. Going to even larger airplanes could make the situation even worse.

The Number of Nonstop City Pairs Keeps Growing

Consolidation of routes toward major trunk lines is a second condition required for the Airbus scenario to be realized. Data show no sign of such consolidation occurring. Contrary to the Airbus projection, the number of city pairs served by nonstop flights has grown consistently from just under 6,000 in 1985 to more than 10,000 today. More than 2,000 of those new city pairs have been added in the last 10 years—about 400 of them in the last year alone.

The reason is simple: Competition. Passengers prefer to have a choice of departure times and to fly nonstop. Therefore, offering more frequent flights and nonstop service gives airlines a competitive advantage over those offering fewer flights or requiring intermediate stops in the same market.

In the past, long-range routes were not subject to this type of competition because only large aircraft had sufficient range to fly long-distance routes nonstop. The latest generation of highly efficient, long-range twinjets, however, enables airlines to offer higher frequencies in existing long-distance markets and to create new long-distance nonstop city pairs. The availability of twinjets for long-distance nonstop service makes it extremely unlikely that the historical trend toward higher frequencies and point-to-point service will diverge radically toward consolidation.

It Costs Less To Carry Passengers Nonstop

Seat-mile economics is the third condition required for the Airbus scenario to be realized. The argument is that low fares are more important to passengers than schedule or nonstop routing. It is debatable whether most passengers—especially frequent flyers and premium passengers—prefer slightly lower fares to convenience. But this argument may be moot.

When the total cost of carrying passengers from their point of origin, all the way to their point of destination is considered, it becomes clear that it actually costs an airline less to carry passengers nonstop than to require passengers to make intermediate stops at hubs.

A hub-and-spoke structure requiring two flights for every destination incurs 2% higher airplane handling and landing fees than



The low seat-mile cost of the latest generation of long-range twinjets makes it less costly for airlines to fly passengers nonstop than to require unnecessary stops at hubs.

nonstop service to the same destinations. Passenger connection costs for a two-flight routing are around 8%—\$30 to \$40 per passenger—higher than direct routing. More difficult to quantify are the costs of schedule disruptions and lost passenger loyalty that accrue to delays, cancellations, and missed connections for which hubs have become notorious. An airline can therefore afford to offer lower fares (or earn

higher profit) on a nonstop route than on a route that forces passengers to make airplane changes at a hub.

A recent article from *Aviation Week & Space Technology* concurs: “A new analysis by the Aviation Week Group’s *Aviation Daily* and partner Eclat Consulting shows that the cost to handle passengers in a hub-and-spoke-dominated system is as much as 45% higher than in a point-to-point system, a disparity that costs airlines billions of dollars annually.”

The success of low-cost carriers—which specialize in flying point-to-point—bears this out. Gary Kelly, CEO of Southwest Airlines, has gone on record saying, “We focus on nonstop traffic.... We’d prefer fewer connections. It’s what customers want least. It raises the bar. It is extra work for no more money. On a fully-allocated basis, it’s a lot cheaper for us to fly you nonstop.”

While a requirement for large aircraft will remain, this requirement constitutes a relatively small portion of the airplane market. Larger airplanes may be required to accommodate incremental growth in some very busy markets and in those few, very dense markets where use of larger airplanes does not constrain frequencies or nonstop service.

All evidence and experience point toward a continuation of established market trends. Economics and passenger preference will continue to favor point-to-point travel. As a result, increased frequencies and nonstops—not airplane seat count—will be the dominant means to accommodate growing air transport demand. ■

Point-to-Point Service Gives Passengers More Nonstop Choices

Point-to-point service is defined in terms of passenger experience. Any flight that takes a passenger nonstop from point of origin to destination is a point-to-point flight. Point-to-point service does not eliminate hubs; it reduces the need to change planes at an intermediate airport.

To appreciate how the rise of point-to-point travel will affect the future requirement for airplanes—and our experience as passengers—it is necessary to reach a common definition for the term point-to-point.

The Boeing definition of point-to-point begins with the passengers’ experience. Whenever passengers can fly nonstop from an airport near their city of origin, to an airport near their destination, that’s point-to-point service.

For passengers who wish to fly from LAX in Los Angeles to ORD in Chicago, a nonstop flight between these two airports would be a point-to-point flight—even though airlines operate hubs at both airports.

When an airline adds nonstop frequencies between an existing city pair, that is an increase in point-to-point service—whether the airports at those cities are both hubs, one or the other airports are hubs, or neither airport is a hub.

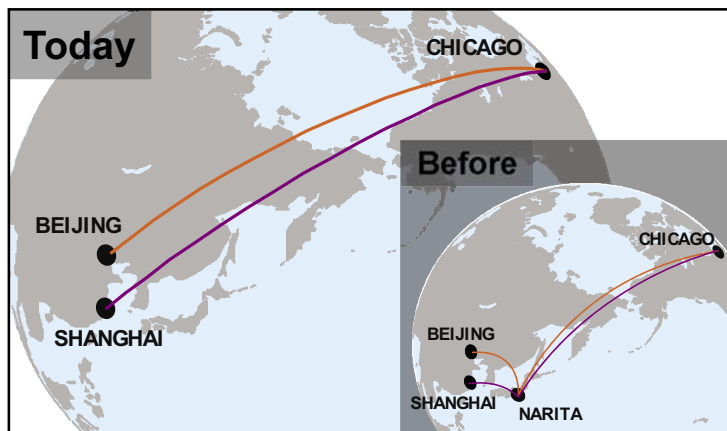
Clearly, the growth of point-to-point service does not mean that hubs will disappear. Growth in point-to-point service simply means that passengers will have more convenient schedule choices and more opportunities to fly nonstop. For airlines, point-to-point service provides new opportunities to bypass hubs, reduce congestion, and to operate hubs more efficiently.

The strategy of a hub is to offer as many flights to as many cities as possible. A hub gains a competitive advantage over other hubs by offering passengers a greater choice of convenient departure times

and destinations. Nonstop flights that bypass hubs enable airlines to manage traffic through hubs, while continuing to offer passengers the widest possible selection of departure times and nonstop destinations. Using the right mix of small and medium-size airplanes flying nonstop point-to-point, airlines can meet demand growth without aggravating congestion and without consolidation, which would reduce frequencies and destination choices.

The market for large airplanes, serving the world's dense trunk routes at the busiest travel times, will remain. However, the major driver of market growth will be the small and medium-size airplanes that can fly nonstop point-to-point to provide airlines and passengers with more choices, flexibility, and convenience, with an efficient airline network. ■

Point-to-Point Service Eliminates Unnecessary Stops



Passengers traveling from Chicago to Beijing or Shanghai formerly had to change airplanes at an intermediate hub, such as Narita. Liberalization of aviation regulation, together with the availability of airplanes that have the range and the right size to match passenger demand, have enabled airlines to offer more attractive choices to passengers at competitive fares. Passengers can now fly between Chicago and Beijing or Shanghai nonstop.

Realistic Market View Makes 787 a Superior Investment Value

The Boeing airplanes and services product line reflects the market's preference for airplanes that can flexibly serve the broad spectrum of complex airline network requirements, including frequency optimization and point-to-point service. The newest Boeing jetliner, the 787 Dreamliner, is a dramatic example. The 787's long-range capability enables airlines to extend point-to-point strategies to a whole new array of markets, including the longest distance markets in the world.

The 787's unprecedented efficiency enables airlines to achieve low per-passenger costs that rival those of their largest aircraft. Yet, the Dreamliner will offer the lowest trip costs of any twin-aisle jetliner.

Commonality Improves Airplane Liquidity

A first in aviation history, Boeing invited the financial community to define the attributes that contribute most to the value of an airplane at the earliest stages of 787 design. In response to this input, the 787 raises commonality to new heights by standardizing a large number of features that have traditionally been offered as options. In addition, the Dreamliner's highly flexible interior design makes it easier for operators to configure—and reconfigure—their airplanes to match market conditions and support brand identity.

POINT-TO-POINT December 2005

Why Air Canada Selected Boeing and the 787

In November 2005, Air Canada recommitted to upgrade its fleet with up to 36 Boeing 777s and 60 Boeing 787 Dreamliners, affirming the complementary roles of two advanced twin-jets. The firm order for 32 Boeing wide-body jetliners is valued at over US \$6 billion at list prices, with options for up to 64 additional airplanes. Speaking of the advantages of flying the game-changing pair, Robert Milton, president and chief executive officer of ACE Aviation Holdings, Inc., parent company of Air Canada, has gone on record:

“Our decision to modernize our fleet with the 777 and 787 Dreamliner will move Air Canada into a clear leadership position among North American international carriers with the world's two newest and most efficient twin-engine, long-haul airplanes. The superior customer comfort and operating economics of these aircraft will put us in the company of the leading European, Middle East and Asia Pacific carriers.”

“We're extremely pleased to move forward with the renewal of Air Canada's wide-body fleet with these new Boeing airplanes. Our analysis of these aircraft confirmed overwhelmingly attractive economics; we estimate the fuel burn and maintenance cost savings alone on the 787 to be approximately 30 percent versus the 767s they will replace. This is particularly important in the current high-fuel-price environment.”

“We believe the Boeing 787 is a true game-changer—a quantum leap in technology—the likes of which our industry has not seen in decades.”

Milton is confident that the Boeing 777 and 787 will help Air Canada significantly reduce fuel and maintenance costs and support plans for growth into new markets, especially in longer thinner routes that were not previously viable.

The 777s and 787s are uniquely suited to meet Air Canada's current route structure and growth plans for long-range, nonstop routes for both passengers and cargo. ■

The 787's standardization looks far beyond an airline's original requirements to the day when the airplane is offered for lease or resale. The 787 is the first commercial jetliner to offer engine interchangeability. Operators seeking to acquire a 787 will encounter no obstacles, either in the form of interior or systems peculiarities or engine manufacturer compatibility. The new operator will be able to integrate the Dreamliner into the fleet quicker, easier, and more economically than ever before imagined.

The Financial Community Embraces 787 Market Strategy

Asked by Boeing to present the investor's point of view, Tom Hollahan, managing director of Global Aviation Industry of Citigroup's Corporate Banking said, “From the standpoint of the financier, Boeing got the development process exactly right in the 787.”

Citing the balance between standardization and customization, Hollahan stated, “In my view, the 787 will achieve much more efficient financing than other existing airframes, based largely on the commonality, standardization, and what I perceive to be a tremendous residual value story.”

Hollahan went so far as to suggest that the 787 would change the way financiers evaluate the strength of an investment opportunity. The 787's commonality and standardization creates unparalleled airplane liquidity, enabling Citigroup to “rely more on the value of the underlying airframe itself than on the credit worthiness of the airline.” ■

Alternatives to Direct Purchase Help the Industry Grow

By John N. Feren, Vice President, Boeing Commercial Airplanes, Leasing and Asset Management



Boeing Leasing and Asset Management is responsible for marketing and placing Boeing products with our customers. The group maintains regular contact with customers in order to be ready to support their evolving business requirements.

Providing solutions, including alternatives to direct purchase, is an important part of the group's charter. Leasing is a major focus, typically accounting for 25% to 30% of the industry's delivery volume.

We cooperate closely with the Boeing Capital Corp.'s Asset Management group to remarket and lease new and used aircraft in conjunction with Boeing Sales. This sometimes involves the sale of non-Boeing products. When the market is strong, we hold few assets. But when the market is softer, we may be called upon to hold assets for future sales. On the other hand, BCC Asset Management manages

more than 500 aircraft in its portfolio as a combination of notes, leases and aircraft held for sale.

Our team has the capability to appraise, inspect, accept, and deliver planes taken in trade. Our professionals in this area know the regulatory requirements, value of ship's records, and condition of high-value components. In fact, we have a dedicated engine expert as part of the team.

We develop proactive fleet solutions, providing for bridge lift and for disposition of airplanes that will be replaced. This includes working with Commercial Aviation Services to coordinate aircraft modifications and freighter conversions.

We facilitate fleet transitions and help place Boeing aircraft with lessors by working with financial institutions to develop business assistance for prospective customers. To ensure a quality placement, we make sure that airplane capabilities match the prospective operator's needs, and plan a delivery timetable that meets the financial and lift requirements of all stakeholders.

Alternative solutions, in all their forms, ultimately produce a larger operator base, higher residual values, and greater liquidity for Boeing assets. The people of the Leasing and Asset Management group are dedicated to meeting the needs of our customers, staying informed on market developments, and providing creative solutions to help the industry grow. ■

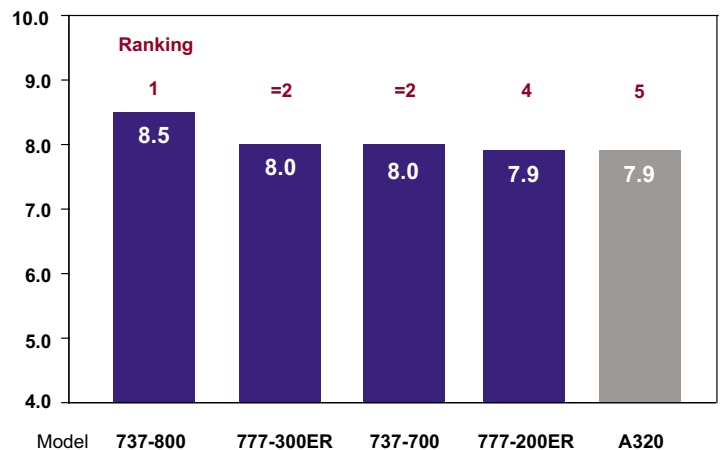
Boeing Airplanes Score a Clean Sweep With Investors and Operators

Investors and airline operators have validated the Boeing product strategy in the 2005 *AirFinance Journal* Investors' and Operators' Poll. In the overall rankings, the Boeing 737-800, 777-300ER, 737-700 and 777-200ER took the top four spots, while Boeing airplanes earned seven of the top ten positions. Along with the 737-300, these same airplanes dominated all categories in the Investors' Poll, taking the majority of the top five positions in Overall Rankings, Operational Success, Investor Appeal, Remarketing Potential, Residual Value and Value for Money. In fact, in the Value for Money category, the Boeing 777-300ER, 777-200ER, 737-800, 737-700 and 737-300 all ranked in the top five positions of the entire group.

This makes three straight years that the 737-800 has ranked number one overall and five straight years that the 777 family has ranked number one overall for wide-body aircraft. In overall rankings, the 777-300ER and 777-200ER rank number two and four, respectively, in this year's poll. Their nearest Airbus rivals, the A340-300, A340-600, and A340-500 ranked a distant 17th, 19th, and 22nd, respectively.

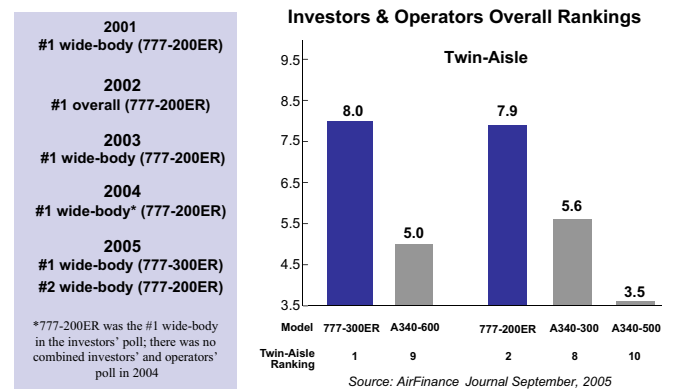
In the category of new airplane program most likely to succeed, 74% of voters chose the 787 – an unequivocal vote of confidence for the newest member of Boeing's commercial airplane family. The A380 and A350 received only 11% and 6%, respectively. The average score for Boeing airplanes among this year's top 25 rankings was 7.1, leading the average score of 5.1 for Airbus airplanes. This year's rankings affirm that investors and operators recognize Boeing airplanes as top values. ■

Top 5 Investors & Operators Overall Rankings



Source: AirFinance Journal September, 2005

777 Top Honors Among Twin-Aisle Airplanes



*777-200ER was the #1 wide-body in the investors' poll; there was no combined investors' and operators' poll in 2004

Source: AirFinance Journal September, 2005

Noteworthy Developments

Boeing Launches the 747-8

Boeing launched the new 747-8 Intercontinental and 747-8 Freighter on November 15 with orders from Cargolux and Nippon Cargo Airways. The launch marks a new era for the 747 program, introducing an advanced wing design, all new GEnx engines and an innovative new interior. A reaffirmation of Boeing's focus on improving passenger experience for long-haul flying, the 747-8 is entirely consistent with the 787 and 777 family philosophy.

The 747-8 passenger and freighter airplanes offer the right balance of risk and reward.

- The lowest operating costs and best economics of any large passenger or freighter airplane
- The only large airplane that fits today's infrastructure
- New revenue opportunities – carries more passengers and cargo
- A new benchmark in fuel efficiency and noise reduction
- The right size for the large-airplane market



Cape Town Aircraft Financing Treaty To Go Into Effect March 1, 2006

Malaysia has become the eighth country to ratify the Cape Town Treaty, enabling the treaty to go into effect March 1, 2006. This treaty will help expand asset-based financing and leasing of large commercial airplanes and engines by establishing a commercially oriented legal framework to protect financier's interests in aircraft. The treaty will reduce the cost and risk of financing international aircraft, which helps open up new markets of capital and benefits developing countries by bringing a wider range of financing alternatives within their reach.

Effective implementation includes establishing, efficiently operating, and appropriately regulating (by ICAO) a 24-hour, seven-days-per-week international registry system in which property interests in aircraft and engines will be recorded and their priority determined.

- The U.S. Export-Import Bank supports this treaty and has lowered its exposure fees by one-third on aircraft financing for buyers from countries that ratify and implement Cape Town.
- The following countries ratified the treaty: Panama, Ethiopia, Nigeria, Pakistan, the U.S., Oman, Ireland and Malaysia.

Commercial Aviation Services Launches Boeing Converted Freighter Brand

Boeing has adopted Boeing Converted Freighter (BCF) as a brand identifier to distinguish 747-400 and 767-300 passenger-to-freighter conversions from Special Freighter (SF) airplanes. The SF designation has become widely used throughout the industry for any passenger-to-freighter conversion, giving no indication of the level of Boeing involvement in the conversion process. The BCF designator ensures airlines, leasing companies and financiers that Boeing has integrated the entire conversion process, including engineering, parts, quality assurance, kitting, project management, certification, and post-conversion customer support.

- The first 747-400BCF is scheduled to enter service with Cathay Pacific in December 2005.
- To date, the 747-400BCF program has 65 firm and option conversion orders.
- Launched with 3 firm and 4 option conversions from Japan's All Nippon Airlines, the 767-300BCF program will see its first conversion enter service in the 4th quarter of 2007.

Singapore Airlines Chooses Boeing Integrated Maintenance Solution

Singapore Airlines is the launch customer for the latest advance in Boeing supply chain services. The Integrated Maintenance Solution blends Boeing Integrated Materials Management (IMM) and Airplane Health Management (AHM), enabling Boeing to assume full responsibility for:

- Materials management, including purchasing, inventory management and logistics for all expendable aircraft parts.
- Real-time information on airplane health that will reduce schedule interruptions and increase maintenance efficiency.

Please direct questions or feedback to the following:

Xenia Peet, Managing Editor
Boeing Commercial Airplanes
206-766-1398
email: xenia.peet@boeing.com

Kostya Zolotusky, Managing Director
Capital Markets Development
Boeing Capital Corporation
425-965-4053
email: kostya.l.zolotusky@boeing.com

www.boeing.com