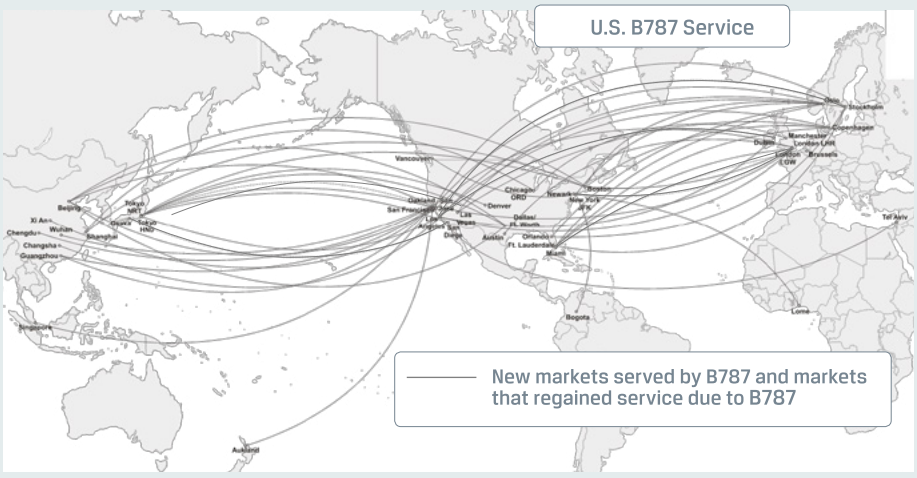
White Paper

How New Technology Aircraft Are Transforming Air Service

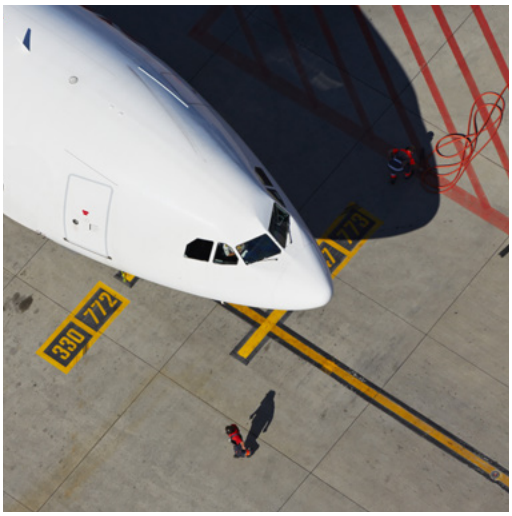
By Rob Walker

The introduction of new technology aircraft marks a change in air service marketing for cities around the globe. These advanced aircraft allow airlines to fly routes that were previously out of range or heavily reliant on large volumes of transfer passengers. They will continue to drive new nonstop services, taking advantage of longer ranges and better fuel efficiency than historical long-haul aircraft. The trend toward new international services from hubs to non-hubs and even long-haul point-to-point will continue to grow, bringing new players and opening new markets at an unprecedented rate. The map below shows new (or regained) routes enabled by the Boeing 787.

INTERNATIONAL SERVICES LAUNCHED WITH BOEING 787 AIRCRAFT FROM THE U.S.



Source: ICF analysis based on OAG July 2016 data



In addition to new routes, a further 100 routes have now switched exclusively to using new generation aircraft types, further reinforcing the trend toward service from a hub to a non-hub airport—or even point-to-point routes—and less reliance on traditional hub-to-hub routes.

A Closer Look at the New Technology Aircraft

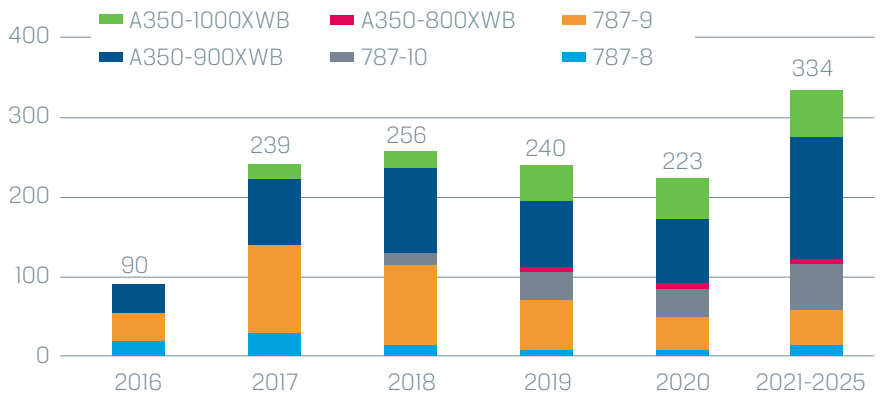
Aircraft such as the next-generation Boeing 777, the Boeing 787, and the Airbus A350 incorporate new airframe, engine, and wing designs for significant improvements in aircraft range and fuel efficiency.

Entering commercial service in 2011, the Boeing 787 "Dreamliner" was the first commercial airliner made mostly of light-weight composite carbon fiber material rather than aluminium, allowing fuel savings of around 20% compared to existing aircraft of similar size. Despite production delays and various initial in-service problems, the 787 has enjoyed a high degree of success becoming the fastest-selling airliner to date since launch.

The Airbus A350, a long-range twin-engine jetliner made primarily of composite materials, is a rival to the 787 and entered commercial service in January 2015. These new fuel-efficient aircraft are allowing carriers to serve long-haul routes profitably that were previously uneconomical with the Boeing 777, Boeing 747, Airbus A340, and other older long-range aircraft.

There are almost 500 Boeing 787 and Airbus A350 aircraft currently in service. As shown on the chart below, nearly 1,400 orders for these two aircraft have been placed by airlines worldwide. By 2020, a further 1,000 next generation aircraft will be delivered. Not all of these aircraft will be incremental to carriers' fleets. Most likely, a majority of the new aircraft will replace current, older aircraft. Asia is the leading market for next generation wide-body aircraft deliveries, with Asian carriers accounting for close to 30% of 787 and A350 aircraft orders as Asian markets boom. Carriers across the world have ordered these new technology aircraft, including the major European and U.S. airlines. Among U.S. carriers, United was the first carrier to operate the 787 – commencing in 2014 – followed by American, which received its first 787 in 2015. United, American, and Delta each expect additional 787/A350 deliveries ranging from 40 to 65 aircraft over the next ten years.

AIRCRAFT DELIVERIES FOR BOEING 787 AND A350 WORLDWIDE



Source: CAPA Fleets, September 2016

DID YOU KNOW?

The number of passengers flying nonstop between Scandinavia and North America has increased 43% since 2013 when the 787 was introduced.

Market Upheaval in Scandinavia and China

Recent developments in Scandinavia and China serve as representative cases for the enormous impact when new technology aircraft are introduced to the market. A good example of new markets opening up is the evolution of service between Scandinavia and North America. Historically, routes from Scandinavia relied heavily on the need to transfer either in Europe or one of the East Coast North American hubs. The advent of longer range, more fuel efficient aircraft and Norwegian Airlines' emergence in the market with numerous 787s has facilitated rapid growth in nonstop services between these two continents: most notably, the emergence of nonstop services between Scandinavia and the West Coast of North America, and Scandinavia and smaller East Coast markets.

In 2005, there were 12 nonstop routes between Scandinavia and North America. Today, there are 29 nonstop routes, 19 of which are served by 787s. The number of passengers flying nonstop between Scandinavia and North America has increased 43% since 2013 when the 787 was introduced.

ROUTE MAP BETWEEN SCANDINAVIA AND NORTH AMERICA

2005—12 Routes

2016—29 Routes

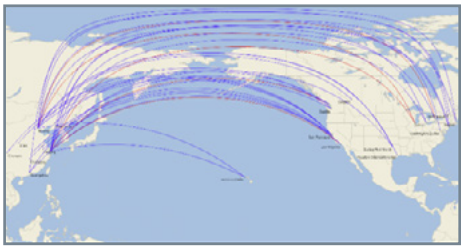
Red lines represent routes from 2005 that are still operated today. Blue lines represent new routes including 2016 announced routes.

Similarly, in 2005, Chinese access to North America was focused on large hub airports. There were 12 routes between China and North America, the majority flying between the major hubs in each region (e.g., Beijing and Shanghai to Los Angeles, San Francisco, Chicago, New York, and Toronto). Since then, 27 new routes have opened up—11 of which are operated by Boeing 787s. Of these 11 new services, only two are connecting hub-to-hub airports.

2005 ROUTE MAP BETWEEN CHINA AND NORTH AMERICA

2005—12 Routes

2016—39 Routes



Red lines represent routes from 2005 that are still operated today. Blue lines represent new routes including 2016 announced routes.

Choice of New Routes

ICF has analyzed market data from 2013 to highlight the rationale behind many of these new route launches. Indirect market sizes (those passengers travelling via hubs) provide a good guide for which markets airlines often consider. As shown in the table below, of the top 10 unserved long-haul markets from the U.S., eight are now served, mainly as a result of new aircraft technology and business models.

2013 INDIRECT MARKET SIZE DATA FOR TOP 10 UNSERVED LONG-HAUL MARKETS FROM U.S.

Rank (2013)	Market	Distance (km)	Indirect Market Size 2013 (o/w)	Status	Served or planned?	Growth since launch (L12m Market size)
1	LAX-SGN	13,130	77k	Vietnam Airlines planning with A359 in few years	Planned	n/a
2	DEL-SFO	12,381	59k	Air India served (777)	Served	37%
3	SFO-SGN	12,599	56k	Vietnam Airlines planning with A359 in few years	Planned	n/a
4	DUB-SFO	8,183	54k	Aer Lingus served A330	Served	23%
5	CPH-LAX	9,029	47k	Norwegian 787	Served	48%
6	ARN-LAX	8,863	43k	Norwegian 787	Served	45%
7	CPH-MIA	7,845	39k	Norwegian 787 to Florida (FLL)	Served	48%
8	ARN-MIA	7,996	38k	Norwegian 787 to Florida (FLL)	Served	53%
9	BRU-LAX	9,053	34k	n/a	-	22%
10	HYD-JFK	12,948	34k	n/a	-	28%

Source: IATA Airport IS

The China-U.S. market has seen even greater levels of stimulation with new non-stop service at a time when traffic between these two countries has also grown significantly. This deployment has been driven by market sizes and pent up demand as well as carrier strategies focused on their own hubs and partner airline hubs to help ensure commercial success.

What all these new routes have in common is that they received significant levels of market stimulation recognizing the importance of an effective air service development program to increase airport volumes.

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New Narrow Body Market

While the introduction of 787/A350 aircraft has often focused on the "longer" long-haul markets, airports and airlines should recognize the potential offered by next generation narrow bodies—such as the A321LR—that are just 3 years off entering service. They will have the ability to open up even more mid-long-haul markets on thinner routes than 787s can be expected to serve. They will also offer highly competitive unit costs potentially enabling further stimulation of the LCC long-haul market to levels that 787/A350s alone could not offer.

Bottom Line

As airport management thinks about the best routes to attract and the best airlines to serve those routes, it must consider all of the dynamics occurring in the industry. Understanding the aircraft in use and on order by each airline plays into the evaluation of what routes can be successful at an airport. With the new technology aircraft, international long-haul routes, which were once too thin to command a large widebody, now become a possibility. Staying on top of changes in the aviation industry is paramount to a solid and successful air service program.

About the Author

Rob Walker joined ICF in 2010 and has more than 10 years of direct aviation experience across a wide range of markets and projects. He is an experienced market forecaster in mature and emerging markets producing detailed bottom-up forecasts and longer term econometric-driven demand projections, which often involve airport systems with overlapping catchment areas.

Combining his airline and airport experience, Mr. Walker is an experienced master planner producing detailed traffic forecasts for design day modeling and providing air service marketing capabilities for airports. He regularly uses NetWorks—ICF's network planning model—to provide detailed market and airline traffic analysis for airlines in support of their network strategy and business plans.

Prior to joining ICF, Mr. Walker worked at British Airways and Virgin Atlantic in a variety of commercial positions, including sales and marketing, revenue management, strategy, and network planning. Working closely with other areas, including government and legal affairs and economic forecasting, he has been involved in shaping strategy for work related to growth, mergers, and fleet plans and ensuring sales targets are met.