

Seat capacity on long-haul flights has grown by nearly 50% over the past 10 years. The number of seats provided by 747 operations has reduced in favour of twin-engined widebodies, although average aircraft size is unchanged. Trends in long-haul capacity deployment are examined here.

Long-haul market developments

Seat capacity on all global long-haul services increased by nearly 50% from 2004 to 2013. The aircraft types used to operate these routes have changed over the past decade, with the introduction of new widebody types including the 777-300ER, A380 and 787. Over the next 10 years new members of the 787 family, along with the A350 XWB and 777X, will enter service.

Aircraft Commerce has analysed schedule and capacity data from 2004 and 2013. It has identified capacity growth and trends on long-haul markets, and on the main long-haul routes.

This analysis shows which markets have seen the most expansion. It also suggests which aircraft will be required in specific markets, on particular routes.

Manufacturer's perspective

Josh Myers, manager of market research at Airbus, explains that origin and destination (O&D) passenger flows are linked to emerging economies. "The most dynamic growth is likely to be on routes between two emerging economies," he explains.

"Routes linking developed and emerging economies will provide the next highest growth potential," he says. "Services linking two developed economies are likely to demonstrate more conservative growth."

Myers suggests that airlines will initially develop routes by increasing frequencies on a service: "Once frequencies have reached a satisfactory level the airline may look to increase capacity by introducing larger aircraft."

Airbus claims the A380 is well suited for flying services on mature routes between large hubs, while the A330 and the A350, when it enters service, will be better options for new or developing long-haul routes. These might connect hubs with secondary cities, or connect two secondary cities.

"About 85% of A380 flights are between aviation mega cities (AMCs)," claims David Prevor, head of market research and forecasting at Airbus.

Airbus defines an AMC as a city with more than 10,000 daily long-haul passengers. It defines long-haul routes as those longer than 2,000 nautical miles (nm), and excluding domestic traffic.

Examples of AMC routes include London-Singapore and London-New York. "There are 42 AMCs," says Prevor. "About 93% of long-haul flights travel to, from, or via an AMC. By 2032 we estimate there will be 89 AMCs, and that 99% of long-haul traffic will travel to, from, or via them. Most of the new AMCs will be in developing economies, including in the Asia Pacific."

While the A380 might be used to link hubs between AMCs, Airbus's other widebodies could be used for new or developing long-haul routes.

The introduction of the 787 and imminent arrival of the A350, with their reduced operating costs, could open new point-to-point route opportunities for airlines. Despite this, Airbus believes hub traffic will continue to grow.

"We foresee growth both at hubs and on new point-to-point services," says Myers. "New long-haul routes normally go to, from, or via a hub because airlines need connecting traffic to fill seats."

Airbus sees a demand for 1,300 very large aircraft (more than 450 seats) over the next 20 years. It also forecasts demand for up to 6,800 250-400-seat, twin-aisle aircraft over the same period.

Long-haul definition

For this analysis long-haul routes are those longer than 2,500nm.

Schedule data used for analysis only include direct, non-stop routes.

The global market has been divided into regions. For purposes of analysis, Asia includes countries from central,

southern and western Asia, including India and Pakistan.

The Asia Pacific group includes countries from eastern and south-eastern Asia and Oceania, including Australia and the Pacific Islands.

New routes are categorised as airport-pairs in operation in 2013 and opened since 2004.

Global long-haul capacity

There were more than 344 million seats available globally on long-haul services, in both directions, in 2013 (see table, page 14). The largest origin long-haul market was Europe, followed by the Asia Pacific and North America.

All of the global regions witnessed an increase in originating seats and flights from 2004 to 2013. The largest percentage increase in capacity was on flights departing the Middle East, followed by those from Central and South America. This shows how routes from developing economies can experience the most dynamic growth.

In most regions, the number of departing long-haul flights has increased at a higher rate than seat capacity over the past 10 years. This indicates that airlines are operating more services with smaller aircraft.

From 2004 to 2013 the only regions with an increase in average aircraft size were Europe, the Middle East and South America. The largest increase in average aircraft size was on flights serving the Middle East.

In 2004 variants of the 747 provided about one-third of all long-haul capacity, the largest portion by a single aircraft type. By 2013 the 777 family provided the most long-haul seats, followed by variants of the A330. Older aircraft were withdrawn from long-haul services over the past decade.

Long-haul routes can be categorised into major markets. The five largest ones

SCHEDULED NON-STOP FLIGHTS OVER 2,500NM 2004 - 2013

Origin Region	2004			2013			Difference 2004-2013		
	Seats	Flights	Av Seats	Seats	Flights	Av Seats	Seats	Flights	Av Seats
Africa	9,083,900	32,068	283	14,147,418	50,671	279	56%	58%	-4
Asia	5,037,414	17,498	288	7,165,798	26,292	273	42%	50%	-15
Asia Pacific	61,882,938	195,577	316	89,994,705	296,562	303	45%	52%	-13
Caribbean	4,381,286	13,231	331	4,756,286	15,513	307	9%	17%	-24
Central America	1,652,458	6,880	240	3,787,492	16,731	226	129%	143%	-14
Europe	76,821,730	273,534	281	103,667,629	366,902	283	35%	34%	2
Middle East	10,287,716	35,787	287	33,205,325	101,827	326	223%	185%	39
North America	56,923,808	208,407	273	72,010,069	267,702	269	27%	28%	-4
South America	8,576,982	35,475	242	15,688,571	62,937	249	83%	77%	7
Total	234,648,232	818,457	287	344,423,293	1,205,137	286	46.78%	47.24%	-1

include: transatlantic; Europe to the Asia Pacific; trans-Pacific; trans-Asia; and services to and from the Middle East.

Transatlantic market

The transatlantic is the largest of the five main long-haul markets. There were nearly 53 million one-way seats available on transatlantic services originating from Europe in 2013; an increase of 21% compared to 2004. (See table, page 16).

Transatlantic services operate between Europe and the Caribbean, and Central, North and South America. Services from Europe to North America make up the largest segment of this market, but it was capacity to Central and South America that saw the largest percentage growth.

Europe-North America

There were more than 38 million one-way seats available on flights from Europe to North America in 2013 (see table, page 16). The number of flights and seats grew at a similar rate from 2004 to 2013. This resulted in only a minor reduction in average aircraft size in this market from 265 to 264 seats.

The United Kingdom (UK) has historically been the largest European origin market for flights to North America, with London the biggest departure city. In 2013 the UK had the largest one-way capacity of any European country to North America. It offered the most capacity to the United States (US) and Canada, and was the only European departure point for services to Bermuda.

Despite this, capacity from the UK to the US declined by about 4% from 2004 to 2013. It is possible that this capacity has been lost to hub airports in Germany, France and the Netherlands. These countries all saw an increase in capacity to the US from 2004 to 2013.

London Heathrow (LHR) is the main departure point for flights from Europe to North America, with over twice the departing capacity of any other European

airport. Eight of the top 10 routes from Europe to North America originated from LHR. The busiest route in 2013 was LHR-JFK, with 6,892 flights and 1.941 million seats. JFK was the largest North American destination for flights from Europe in 2013.

The carriers with the most capacity from Europe to North America in 2013 were Delta Air Lines, United Airlines and British Airways (BA). Turkish Airlines experienced the largest percentage increase in capacity in this market from 2004 to 2013.

BA has historically provided the most capacity on routes from Europe to North America from its LHR hub. By 2013 BA had been marginally overtaken by Delta and United. The number of seats provided by the two US carriers has increased as a result of the mergers between Delta and Northwest Airlines, and United and Continental Airlines.

Some airlines reduced the average capacity on services from Europe to North America over the decade to 2013.

Amsterdam Schiphol (AMS), formerly a hub for Northwest Airlines, is Delta's largest European base for flights to North America. LHR and Paris Charles de Gaulle (CDG) are Delta's next largest departure points. United's main European hub for North American services is LHR.

The 767 family provided the highest portion of all capacity on services between Europe and North America in 2004, followed by the 747 and 777.

From 2004 to 2013 the capacity offered by 747s declined. The capacity provided by 767s and 777s remained fairly constant, while there was a large increase in the services operated by A330s. The A330 family provided the most capacity in this market during 2013. There is evidence of many carriers consolidating and simplifying their fleet strategies in this market.

BA and United maintained the level of capacity offered by 747-400s, and added seats with smaller aircraft. Both airlines have introduced the 787 on flights from

Europe to North America in recent years, while BA has also introduced the A380.

The merger with Continental saw United offer more services with 757s and 767-400s, and reduce the number of 777-200 flights.

BA marginally reduced the seats offered on 777 services, but increased the number of flights operated by 767s.

Virgin reduced the number of 747-400 and A340-300 flights, increased services with A340-600s and introduced A330s to its transatlantic network.

On some routes BA kept frequencies fairly constant, but increased the percentage of flights operated by smaller aircraft. For example in 2004 it operated 364 flights on its LHR-Baltimore (BWI) route, with 302 rotations operated on 767s and the remainder on 777s. In 2013, the route had the same number of flights, but all were operated by 767s.

There were also airlines that reduced both aircraft size and frequencies on certain routes. In 2004 Virgin operated 419 flights from LHR-Boston (BOS), half of which were flown with 747-400s and half with A340-300s and -600s. In 2013 on this route Virgin provided 352 frequencies, all with A330s.

Other carriers, such as Lufthansa and Delta, increased their average capacity on flights from Europe to North America from 2004 to 2013.

Following the Northwest merger, Delta has withdrawn Northwest's 747-400s and DC-10s on North Atlantic services. The merged carrier has grown its average capacity by reducing frequencies with 767-300s, and increasing services with A330-300s and 767-400s. Lufthansa has also increased the services flown by A330s between Europe and North America, and slightly increased the number of seats operated by A340s. While capacity offered on 747-400s was reduced in 2013, some of this was replaced by 747-8Is, which operate services between Frankfurt (FRA) and major US hubs.

Lufthansa also flies the A380 between

ONE-WAY CAPACITY ON SCHEDULED NON-STOP FLIGHTS OVER 2,500NM

Long-haul Market	Seats	2004		2013		Difference 2004-2013			
		Flights	Av Seats	Seats	Flights	Av Seats	Seats	Flights	Av Seats
Transatlantic									
Europe - Caribbean	4,328,378	13,010	333	4,553,225	14,486	314	5.19%	11.35%	-19
Europe - Central America	1,081,739	3,763	287	2,052,987	6,569	313	89.79%	74.57%	26
Europe - North America	33,840,120	127,717	265	38,769,024	146,983	264	14.57%	15.08%	-1
Europe - South America	4,529,057	16,948	267	7,435,555	26,149	284	64.17%	54.29%	17
Total	43,779,294	161,438	271	52,810,791	194,187	272	20.63%	20.29%	1
Europe - Asia & Asia Pacific									
Europe - Asia	4,340,808	14,846	292	5,252,209	18,866	278	21.00%	27.08%	-14
Europe - Asia Pacific	15,922,911	49,959	319	21,844,206	71,670	305	37.19%	43.46%	-14
Total	20,263,719	64,805	313	27,096,415	90,536	299	33.72%	39.71%	-14
Trans-Pacific									
Asia Pacific - Central America				56,845	254	224			
Asia Pacific - North America	15,336,217	47,708	321	19,234,791	64,861	297	25.42%	35.95%	-24
Asia Pacific - South America	74,467	293	254	219,531	784	280	194.80%	167.58%	26
Total	15,410,684	48,001	321	19,511,167	65,899	296	26.61%	37.29%	-25
Trans-Asia									
Asia Pacific - Asia Pacific	12,863,366	40,559	317	16,085,921	54,174	297	25.05%	33.57%	-20
Asia - Asia Pacific	394,264	1,450	272	918,403	4,021	228	132.94%	177.31%	-44
Total	13,257,630	42,009	316	17,004,324	58,195	292	28.26%	38.53%	-23
Middle East									
Middle East - Africa	549,352	2,162	254	3,005,982	9,381	320	447.19%	333.90%	66
Middle East - Asia	140,107	519	270	232,139	789	294	65.69%	52.02%	24
Middle East - Asia Pacific	3,918,349	12,986	302	13,994,667	41,376	338	257.16%	218.62%	36
Middle East - Europe	4,754,252	16,905	281	12,023,030	37,749	318	152.89%	123.30%	37
Middle East - North America	925,656	3,215	288	3,581,122	11,258	318	286.87%	250.17%	30
Middle East - South America				368,385	1,274	289			
Total	10,287,716	35,787	287	33,205,325	101,827	326	222.77%	184.54%	39
Other									
Europe - Africa	6,407,427	22,352	287	7,439,337	27,038	275	16.10%	20.96%	-12
South America - North America	3,034,086	13,654	222	5,408,085	23,151	234	78.24%	69.55%	12
Africa - Asia Pacific	866,886	2,979	291	1,662,178	5,640	295	91.74%	89.33%	4
Central America - South America	518,520	2,752	188	1,383,217	8,203	169	166.76%	198.07%	-19
North America - Africa	487,332	1,711	285	1,088,795	4,163	262	123.42%	143.31%	-23

Europe and North America.

Despite a trend towards widebody twin-engined types, with no change in average aircraft size, more than one million of the 39 million one-way seats in the Europe-North America market were provided by A380 services operated by flag carriers on Europe-North America routes in 2013. These were all flown between major hubs, such as LHR and CDG-LAX, and FRA and CDG-JFK. In many cases, A380s have replaced capacity offered by 747-400s. Some airlines operate them alongside twin-engine widebodies.

In 2004 Air France operated 652 flights on CDG-LAX, with 384 flown by 747-400s and 268 by 777s. In 2013 Air France operated 645 services to LAX, 357 flown by A380s and 288 by 777s.

The type of airlines operating 787s between Europe and North America, and the routes are more varied.

In 2013, 787 operations were flown by national flag carriers linking two hub

airports, such as BA operating LHR-EWR. Others were flown by leisure carriers linking two secondary airports, such as Thomson Airways flying between East Midlands (EMA) in the UK and Orlando-Sanford (SFB).

There were 141 new routes opened in the Europe to North America market over the decade to 2013 (see table, page 19). The average aircraft size on new routes was 242 seats.

New routes with the most capacity in 2013 were LHR to Houston (IAH), Dallas (DFW) and Atlanta (ATL). These, and other North American destinations, were previously served from London Gatwick (LGW) due to the previous bilateral air service agreement. When this changed, operators chose to transfer most of these services to LHR, leaving LGW with mainly leisure-based destinations.

Three of the top 10 new routes were operated by Turkish Airlines from its Istanbul (IST) hub, flown in 2013 by 777-300ERs, A340-300s and A330s.

Europe-South America

One-way seat capacity from Europe to South America grew by 64% to about 7.4 million from 2004 to 2013 (see table, this page). The number of flights increased by 54% to 26,149, leading to an average aircraft size of 284 seats, an increase of 17 seats since 2004.

This level of growth might be explained by emerging economies such as Brazil, which is the main South American destination for flights from Europe.

Spain is the main European origin country for flights to South America, and Madrid (MAD) is the single largest departure point. MAD was the origin for six of the top 10 routes from Europe to South America in 2013.

Services from Rome (FCO) witnessed some of the strongest growth from 2004 to 2013. There was also growth in the flights offered from CDG, Lisbon (LIS), FRA, AMS and LHR.

The largest route from Europe to



South America in 2013 was MAD-EZE, despite a 10% reduction in one-way seat capacity from 2004 to 2013. MAD-LIM was one of the fastest growing routes.

The South-American destination served by the most capacity from Europe in 2013 was GRU.

Iberia, Air France and TAP Air Portugal provided the most seats on services from Europe to South America in 2013. TAM had the largest percentage increase in capacity from 2004 to 2013. All of these airlines increased the average aircraft size deployed in this market.

Iberia's pre-eminence between Europe and South America, combined with BA's strong network from the UK to North America, means that the International Airlines Group (IAG) provides the most capacity on transatlantic services.

A340s and A330s provided the most seats between Europe and South America in 2013. Older types that operated in this market in 2004, including the MD-11 and 747-300, were no longer being used in 2013. The capacity offered by 747-400s increased from 2004 to 2013 due to increased services from BA, Lufthansa and Air France.

Iberia removed the limited remaining 747-300 capacity between Europe and South America from 2004 to 2013, and based its operation around the A340-300 and -600.

In 2004 Iberia operated 370 flights on MAD-LIM, mainly using A340-300s. In 2013 it operated 393 frequencies, with most flown by A340-600s.

Air France increased the flights operated by A330s, A340s, 747-400s and 777s from Europe to South America. TAP reduced the number of flights operated by A310s and A340s in favour of A330s.

TAM increased flights offered by

A330s, 767-300s and 777-300s. LAN, on MAD-SCL, was the only carrier to operate the 787 in this market in 2013.

There were 31 new routes opened in this market, with an average aircraft size of 280 seats (*see table, page 19*). This is slightly less than the average capacity on the more established routes. The new routes with highest capacity in 2013 were LHR-Rio De Janeiro (GIG) and EZE, AMS-LIM and Quito (UIO), CDG-SCL, and FRA-BOG. BA, KLM and Air France have opted to use 777s on these new routes from their respective hubs, while Lufthansa used A340-600s on FRA-BOG.

Europe-Caribbean

Flights from Europe to the Caribbean had the lowest rate of growth in the transatlantic market from 2004 to 2013. One-way capacity increased by 5% to about 4.5 million seats (*see table, page 16*). Flight numbers increased by 11%, resulting in a 19-seat reduction in average aircraft size, from 333 to 314 seats.

France was the largest European origin market for flights to the Caribbean in 2013. Much of this traffic includes flights to overseas territories, such as Guadeloupe and Martinique. The UK was the second largest origin market. The Caribbean destination with the most capacity on flights from the UK in 2013 was Barbados.

Flights from Europe to the Caribbean generally have a high proportion of leisure travellers. The main departure points are Paris-Orly (ORY) and LGW.

The Dominican Republic and Cuba were served by the most capacity from Europe in 2013. The Dominican Republic also witnessed the largest growth in capacity from Europe. Other more

The A330 provided the most capacity on trans-Asia long-haul services in 2013. Qantas is replacing 747s with A330s on flights between Australia and Asia.

established country markets including Guadeloupe, Martinique, Barbados and Jamaica saw capacity remain static or reduce slightly from 2004 to 2013.

In 2004 variants of the 747, and in particular the 747-300, provided the most capacity on flights from Europe to the Caribbean. By 2013 the A330 and 777 were providing the most seats.

Air France provided more than twice the capacity of any other carrier on flights from Europe to the Caribbean in 2013. The next largest airlines in the market were BA, Virgin and Air Caraïbes.

Air France and Virgin both reduced their average capacity on flights to the Caribbean from 2004 to 2013.

Air France has withdrawn 747-200s and -300s and reduced the services operated by -400s. It has replaced this capacity with 777-300ERs, and in some cases, has slightly increased frequencies.

In 2004 the airline operated 1,079 combined flights on ORY-FDF and to PTP using 747-200s, -300s and -400s. In 2013 Air France operated 1,185 combined flights on these services, all of which were flown by 777-300ERs.

Virgin has increased the percentage of seats flown on smaller aircraft in this market segment by introducing the A330.

BA and Air Caraïbes both increased their average capacity on services from Europe to the Caribbean.

BA increased the capacity offered on 777s, while Air Caraïbes reduced the number of flights operated by A330-200s in favour of larger A330-300s.

There were 73 new routes from Europe to the Caribbean, with an average aircraft size of 304 seats, 10 less than established services (*see table, page 19*).

Europe-Central America

Europe to Central America represents the smallest segment of transatlantic traffic, but it had the highest growth rate in this market over the 10 years to 2013. One-way capacity increased by 90% to more than 2 million seats in 2013 (*see table, page 16*). Flight numbers increased by 75%, leading to an increase in average aircraft size from 287 to 313 seats.

Mexico, another emerging economy, is the main destination country, and Mexico City (MEX) and Cancun (CUN) are the most popular arrival points. Spain and the UK were the largest European

origin countries for flights to Central America in 2013.

The routes with the most one-way capacity in 2013 were MAD and CDG-MEX and LGW-CUN. The airlines with the most seats on the Europe-Central America market in 2013 were Iberia, KLM, Air France and Aeromexico.

Variants of the 747 still provided the most capacity on flights from Europe to Central America in 2013. The capacity provided by 777s, A340-600s and A330s increased from 2004 to 2013.

There were 20 new routes from Europe to Central America with an average aircraft size of 319 seats, (see table, this page). Most of the new routes were operated to Cancun, and many originated from UK regional airports. In 2013 these flights were operated by Thomson Airways using 767s and 787s, or Thomas Cook with A330s.

Europe-Asia & Asia Pacific

One-way capacity from Europe to Asia and the Asia Pacific totalled more than 27 million seats in 2013, an increase of 34% compared to 2004 (see table, page 16). The number of flights increased by 40%, leading to a 14-seat reduction in average aircraft size to 299 seats.

The largest European origin markets for flights to Asia and the Asia Pacific are the UK and Germany. The largest destination countries were India in Asia, and China in the Asia Pacific.

Japan has historically been the largest destination market in the Asia Pacific. China, which saw the largest growth in capacity, and Thailand, have superseded Japan, evidence of dynamic capacity growth taking place on routes linked to emerging economies.

Six of the top 10 routes from Europe to Asia and the Asia Pacific in 2013 originated from LHR.

The top seven destinations in this market in 2013 were all in the Asia Pacific region: Bangkok (BKK), Singapore (SIN), Beijing (PEK), Tokyo (NRT), Hong Kong (HKG), Shanghai (PVG) and Seoul (ICN). The top destinations in Asia were Delhi (DEL) and Mumbai (BOM).

While LHR-HKG and LHR-SIN were the routes with the most capacity in 2013, LHR-DEL and LHR-BOM were the top 10 routes with the highest percentage increase in capacity from 2004 to 2013.

Some routes from Europe to the Asia Pacific serve a dual function. They satisfy point-to-point demand, but also act as stopover locations on services linking Europe to Australasia. Airlines such as BA and Qantas have historically operated between the UK and Australia via hubs such as HKG and SIN. This may explain why services on LHR-HKG and LHR-SIN have historically provided some of

ONE-WAY CAPACITY ON NEW SCHEDULED NON-STOP FLIGHTS OVER 2,500NM

Long-haul Market	New Routes	Seats	2013 Flights	Av Seats
Trans-Atlantic				
Europe - Caribbean	73	822,516	2,705	304
Europe - Central America	20	582,335	1,824	319
Europe - North America	141	6,257,898	25,868	242
Europe - South America	31	1,850,057	6,607	280
Total	265	9,512,806	37,004	257
Europe - Asia & Asia Pacific				
Europe - Asia	39	1,321,456	5,106	259
Europe - Asia Pacific	96	3,815,616	13,554	282
Total	135	5,137,072	18,660	275
Trans-Pacific				
Asia Pacific - Central America	2	56,845	254	224
Asia Pacific - North America	36	2,852,432	10,396	274
Asia Pacific - South America	3	99,355	320	310
Total	41	3,008,632	10,970	274
Trans-Asia				
Asia Pacific - Asia Pacific	39	1,939,577	7,278	266
Asia - Asia Pacific	19	316,014	1,578	200
Total	58	2,255,591	8,856	255
Middle East				
Middle East - Africa	21	1,414,306	4,678	302
Middle East - Asia	1	15,654	52	301
Middle East - Asia Pacific	62	3,899,957	13,507	289
Middle East - Europe	34	3,570,566	12,156	294
Middle East - North America	27	2,278,95	7,246	315
Middle East - South America	4	368,385	1,274	289
Total	149	11,547,813	38,913	297

the largest volumes of capacity between Europe and the Asia Pacific.

In 2013 Qantas introduced a new strategy for its flights between Europe and Australia. "As a result of our partnership with Emirates we shifted our transit hub for European flights to Dubai in 2013," explains Thomas Woodward, strategic communications manager at Qantas. "This is the biggest change we have made to our long-haul network in recent years." Moving to Dubai allows Qantas and Emirates to connect networks for flights from Europe, the Middle East, and North Africa to Australia.

This change in strategy has resulted in Qantas reducing capacity from Europe to Asia and the Asia Pacific by about 81% from 2004 to 2013.

The airlines offering the most seats in this market in 2013 were Lufthansa, Air France, BA, Singapore Airlines (SIA), KLM and Thai Airways. All of these carriers increased their capacity from Europe to Asia and the Asia Pacific from 2004 to 2013. Lufthansa, Air France and KLM all increased the average aircraft size on services in this market while BA, SIA and Thai Airways reduced average capacity per flight.

On a regional level, Lufthansa and Air France increased their average aircraft size on routes to the Asia Pacific, but reduced it on services to the rest of Asia.

KLM increased capacity, while BA

reduced average aircraft size.

In 2004, the 747-400 provided the most capacity on services from Europe to Asia and the Asia Pacific. By 2013 variants of the 777 were offering the most seats in this market.

Examples of this shift are apparent among the main airlines. Air France, All Nippon Airways (ANA), Japan Airlines (JAL), Malaysia Airlines and SIA withdrew 747-400s from services to Asia or the Asia Pacific. Lufthansa, KLM, BA and Thai Airways reduced flights offered by 747 variants. All of these carriers increased the portion of seats provided by 777 variants on these routes.

Some airlines replaced 747 capacity with smaller types, such as the 777. Others turned to the larger A380. A small group of carriers used a combination of both. In some, but not all cases, the transition to smaller aircraft led to an increase in service frequencies.

SIA provided 1,098 flights with 747-400s on LHR-SIN in 2004. By 2013 it was offering 1,412 flights, with 946 flown by A380s and 466 by 777-300ERs.

Air France, BA, Lufthansa, Korean Air, Malaysia Airlines and SIA introduced the A380 on flights between Europe and the Asia-Pacific. All services were flown between major hubs. In 2013 there were no scheduled A380 services to Asia. This could change following the Indian government's decision to lift a ban



imposed on A380s.

There were 135 new routes from Europe to Asia and the Asia Pacific (see table, page 19). Services to the Asia Pacific accounted for 96 of these routes, with an average aircraft size of 282 seats. Services to Asia saw 39 new routes, with an average aircraft size of 259 seats. In both cases the average aircraft size was less than for the established routes.

IST-SIN was the largest new route in terms of 2013 capacity. IST and Helsinki (HEL) featured prominently as origin points for new routes. These were operated respectively by Turkish Airlines with A330s, A340s and 777s, and by Finnair with A330s and A340s.

Transpacific

There were about 19.5 million one-way seats available on transpacific flights originating from the Asia Pacific in 2013 (see table, page 16). This is an increase of 27% compared to 2004. During the same period the number of flights increased by 37%, resulting in a decline in average aircraft size from 321 to 296 seats.

Trans-Pacific services are operated between the Asia Pacific region and North, South and Central America. The number of seats available from the Asia Pacific to each of these regions increased from 2004 to 2013.

Services from the Asia Pacific to North America account for most of the transpacific capacity, but routes to South America experienced the largest percentage growth from 2004 to 2013.

Asia Pacific-North America

The Asia Pacific to North America accounted for more than 19 million one-

way seats in 2013, an increase of 25% since 2004 (see table, page 16). During this period the number of frequencies grew at a faster rate than capacity, resulting in a decline in the average aircraft size from 321 to 297 seats.

Routes linking Japan to the US are the most established in this market. Japan had the most departing traffic, and NRT was the origin point for five of the top 10 city-pairs from the Asia Pacific to North America in 2013. Despite this, capacity from Japan and NRT to Honolulu (HNL), LAX, JFK, ORD and SFO declined from 2004 to 2013.

The decline in capacity serving Japan is due to relaxed bilateral agreements between countries in the Asia Pacific and North America. These have allowed new point-to-point services to be launched from developing economies. At the same time, aircraft capable of operating these routes non-stop have been introduced into service. Air Canada, for example, has opened new routes between YYZ, and PEK and PVG. These are operated with 777-300ERs and -200LRs.

The fastest growing origin markets from the Asia Pacific to North America from 2004 to 2013 were China, Australia and South Korea. The fastest growing routes were Sydney (SYD) to Vancouver (YVR), ICN-HNL and PEK-SFO.

United, Delta, Korean Air Lines, JAL, Cathay Pacific Airlines and Air Canada each provided more than 1 million seats on services from the Asia Pacific to North America in 2013. All six increased their capacity from 2004 to 2013.

Delta saw the largest percentage increase in capacity as a result of its merger with Northwest. Only Delta and Air Canada increased their average aircraft size on flights in this market

Variants of the 777 provided about half the capacity on services between the Asia Pacific and North America in 2013, more than any other aircraft type.

segment. United, Korean Air Lines, JAL and Cathay Pacific Airlines all reduced their average capacity per flight.

In 2004 the 747 provided the most capacity from the Asia Pacific to North America. By 2013 the number of seats flown on 747 variants had more than halved. The amount of capacity provided by A340s also declined from 2004 to 2013, while DC-10s and MD-11s had been removed from operations in this market. Variants of the 777 provided by far the most capacity from the Asia Pacific to North America in 2013, operating about 50% of all seats flown.

Some operators reduced the number of flights operated by 747s. Others, such as ANA, JAL, SIA and Thai Airways, withdrew their 747s.

In many cases, 747 capacity has been replaced by 777s. On certain routes this has led to increased frequencies. Cathay Pacific operated a double daily service from HKG-LAX in 2004. About 75% of the flights were operated by 747-400s and the rest by A340-600s. By 2013 both types had been replaced by 777-300ERs operating at an increased schedule, averaging nearly three flights per day.

The A380 and 787 have also been introduced to this market.

A380s are now operated on trans-Pacific services by China Southern Airlines, Korean Air Lines, Qantas and SIA. A380s are operated on pre-established hub-to-hub routes, and in most cases have replaced 747s. In 2004 SIA operated a daily 747 frequency on HKG-SFO. By 2013 this frequency was being flown by a 777-300ER or an A380.

787s are now operated by Hainan Airlines, ANA, JAL and United from the Asia Pacific to North America. They have been used to serve new routes and to replace capacity on established services. United operated a daily 747 frequency from NRT-LAX in 2004. In 2013 this was flown by either 777s or 787s. United also used its 787s on a new route from NRT-Denver (DEN) in 2013.

There were 36 new routes from the Asia Pacific to North America with an average aircraft size of 274 seats, 23 fewer than the established services (see table, page 19). The new route with the most capacity in 2013 was Tokyo-Haneda (HND) to HNL. It was operated by multiple airlines, including JAL with 767s and 777s, Air Japan with 767s and Hawaiian Airlines with A330s.



Asia Pacific-South America

There were only 220,000 one-way seats on services from the Asia Pacific to South America in 2013, but this represented a near 200% jump from 2004 (see table, page 16). The average aircraft size in this market increased to 280 seats in 2013. New Zealand and Australia were the main origin markets, while Chile was the largest destination in 2013.

The main routes are from Auckland (AKL) to Santiago de Chile (SCL) and SYD-SCL. Variants of the A340 provided the most capacity in this market in 2004 and again in 2013.

LAN Airlines provided the most capacity from the Asia Pacific to South America in 2013, with A340 services on AKL-SCL. The increase in average aircraft size in this segment of the trans-Pacific market can be explained by the introduction of regular Qantas services on SYD-SCL using 747-400s.

There were three new routes between the Asia Pacific and South America with an average aircraft size of 310 seats (see table, page 19).

Asia Pacific-Central America

This is the smallest segment of the trans-Pacific market, with a one-way capacity of about 57,000 in 2013 and an average aircraft size of 224 seats (see table, page 16).

There were no services between the Asia Pacific and Central America in 2004. Aeromexico has since introduced flights on NRT-MEX and PVG-Tijuana (TIJ).

In 2013 Aeromexico operated a mix of 767s and 787s on NRT-MEX and 777s on PVG-TIJ.

Trans-Asia

Long-haul flights between countries in the Asia Pacific, and between that region and Asia accounted for about 17 million one-way seats in 2013 (see table, page 16). This was an increase of 28% from 2004. The number of one-way flights increased by 39% over the same period, resulting in a reduction in average aircraft size from 316 to 292 seats.

Flights between countries in the Asia Pacific region accounted for most of the trans-Asia capacity in 2013. Services between the Asia Pacific and Asia saw the highest percentage growth in the trans-Asia market from 2004 to 2013.

SIA, Qantas, Thai Airways and Cathay Pacific provided the most capacity on trans-Asia services in 2013.

The trans-Asia route with the most capacity in 2013 was BKK-NRT. SIN-NRT and SIN-ICN were also high capacity sectors. Seven of the top 10 routes were to or from an Australian city.

“Economic growth in Asia is driving demand for travel both to and from Australia,” claims Woodward. Qantas has moved its stopover hub for European services to Dubai. It previously operated via SIN and HKG. “This has allowed us to refine our schedule and network into Asia and to focus more strongly on the regional business market,” says Woodward. “On point-to-point routes into Asia we are moving away from 747s and increasing the use of A330s.”

In 2004 Qantas operated a daily 747-400 rotation from MEL-SIN and up to double daily with the same aircraft type from SYD-SIN. By 2013 75% of the daily MEL-SIN operation was being flown by A330s and the rest by A380s. One of the double daily SYD-SIN 747 frequencies

The A380 has replaced 747-400s on a large number of routes. In some cases, A380s are used together with large widebody twins to provide the correct overall seat capacity.

had also been replaced by A330s, with the other still flown by 747s or A380s.

Qantas’s aircraft deployment strategy mirrors a wider trend in the trans-Asia market. In 2004 variants of the 747 provided the most capacity. By 2013 the A330 was the dominant type, followed by 777 variants. The transition to smaller aircraft has corresponded with an increase in frequencies on some routes.

There were 1,695 flights providing 523,400 seats from SIN-ICN in 2004. These were flown by 747-400s, 777s and 767s. By 2013 this route was supporting 2,618 annual flights, which offered 746,502 one-way seats. SIA, Asiana Airlines and Korean Air were all operating a mix of A330s and 777s on these services. A330s operated 60% of the flights from SIN-ICN in 2013.

China Southern Airlines, SIA, Thai Airways and Qantas all deployed A380s in the trans-Asia market in 2013. Most A380 routes were between two major hubs such as SYD-SIN, MEL-SIN and SIN-NRT. In many cases they were used to replace capacity that had been provided by 747s in 2004.

China Southern Airlines, Air India, ANA and JAL all introduced the 787 to their trans-Asia networks. These were deployed on established routes, such as SIN-NRT; and on new routes, such as SYD-DEL and HND-SIN.

There were 39 new routes between countries in the Asia Pacific with an average aircraft size of 266 seats (see table, page 19). There were another 19 new routes between Asia and the Asia Pacific with an average aircraft size of 200 seats. The new route with the most capacity in the trans-Asia market in 2013 was SIN-HND, which was operated by 767s, 777s, 787s and A330s.

The Middle East

The Middle East has seen some of the strongest growth in long-haul traffic over the past 10 years. Middle Eastern carriers, including Emirates, Etihad Airways and Qatar Airways, have expanded to take advantage of their geographical position. They have developed large hubs at their respective bases in Dubai (DXB), Abu Dhabi (AUH) and Doha (DOH).

Each carrier has a strong long-haul focus. Emirates has an all-widebody fleet of more than 200 aircraft. More than half



are 777s, but it is also the world's largest operator of the A380 with 45 active aircraft. It also operates A330s and A340s.

Etihad and Qatar both operate narrowbody aircraft, but more than half their fleets are widebodies. Their widebody fleets both include 777s, A330s and A340s. Qatar also operates 787s.

The number of seats offered on long-haul services originating in the Middle East increased by more than 200% from 2004 to 2013 (see table, page 16). In 2013 there were more than 33 million one-way seats on these long-haul services. The number of flights did not increase as fast as capacity, with the Middle Eastern carriers choosing to introduce larger aircraft. The average aircraft size in this market subsequently increased from 287 to 326 seats over the decade to 2013.

The average aircraft size on services serving the Middle East was among the largest on any long-haul market.

The Asia Pacific and Europe are the largest destination markets for services from the Middle East. The strongest growth from 2004 to 2013 was evident on routes from the Middle East to Africa and North America.

Since it is home to both Emirates and Etihad, it is unsurprising that the United Arab Emirates (UAE) was the main origin market for long-haul services from the Middle East in 2013.

DXB provided over twice as many one-way long-haul seats as the next largest hub in 2013. Eight of the 10 busiest long-haul routes departing the Middle East originated from DXB. The route with the most capacity was DXB-LHR.

Emirates, Qatar and Etihad provided the most capacity on long-haul routes

from the Middle East in 2013. BA provided the most capacity by a carrier based outside the Middle East.

The 777 has been the dominant long-haul aircraft for services from the Middle East over the past 10 years. In 2013 variants of the 777 provided nearly three times more capacity on long-haul services than the next largest contributor, the A330. The rise in average aircraft size on services from the Middle East can be explained in part by the widespread adoption since 2004 of the largest 777 variant, the -300ER, and Emirates' development of its A380 fleet.

There were more than four million seats offered on A380 services from the Middle East in 2013. Most of these services were operated by Emirates from DXB to various global hubs, including LHR, CDG, AMS, BKK, PVG and YYZ. Qantas also used A380s to connect the UK to Australia via DXB.

In some cases Emirates used A380s to increase capacity on services previously operated by 777s. In 2004 it operated 1,373 flights and 549,921 seats on DXB-LHR using 777s and A330s. In 2013 it offered 1,825 flights, the equivalent of five per day, all of which were flown by A380s providing 841,731 seats.

Qatar Airways was the largest 787 operator from the Middle East in 2013. It flew about 100,000 seats on its 787s between DOH and LHR, Brussels (BRU) and Oslo (OSL). The latter two are new routes that were not served in 2004.

There were 149 new long-haul routes from the Middle East with an average aircraft size of 297 seats (see table, page 19). Two of the largest new routes by capacity in 2013 were DXB-Hamburg (HAM) and MAD. Both were operated by Emirates using 777s.

787s have entered service on long-haul service over the past few years. They have been deployed on new and existing routes. Qatar Airways is the largest operator of 787s in the Middle East.

Other markets

Of the smaller long-haul markets, the largest in terms of 2013 capacity was Europe-Africa. LHR to Johannesburg (JNB) had the most capacity.

In 2004 most frequencies on this route were operated by 747s. In 2013 A330s and A340s were used for more than half of the flights linking these hubs.

Summary

The number of long-haul seats and routes continues to grow. There has been a decline in 747 operations in favour of more fuel-efficient aircraft. Twin-engine widebodies, in the 250-400 seat category and in particular the 777 and A330, now provide the most long-haul capacity.

Some carriers have based their fleet developments around twin-engine widebodies, while others have introduced a mix of these aircraft and larger A380s.

Where there has been a transition from 747s to twin-engine widebodies, some routes have witnessed an increase in frequencies, but not a universal strategy.

A380s have mainly been used on routes between major hubs, and in many cases have replaced 747-400s. Transition from 747s to twin-engine widebodies has resulted in a reduction in average aircraft size in some areas and particularly in mature markets with a high proportion of services between developed economies.

Long-haul markets with the highest rates of growth from 2004 to 2013 often had origins or destinations in developing economies. Services in these regions were more likely to have seen an increase in average aircraft size.

The average aircraft size on new long-haul routes was generally less than that for established services. This indicates that airlines establish a route with smaller aircraft before adding capacity. Twin-engine widebodies were mainly used on new routes.

It is likely that hub-to-hub routes will continue to be operated by a mix of large aircraft and twin-engine widebodies. Services linking hubs and secondary cities, or two secondary cities, are likely to be dominated by widebody twins. **AC**

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