

Analysing the capacity offered on the world's busiest routes reveals aircraft sizes have changed little over the past five years. Frequency of service are airlines' priority over aircraft size. Continued growth will soon see frequencies optimised, catalysing demand for ultra large aircraft.

Where & when will the A380 & 747-8 be required?

The potential market size for the A380 and 747-8 is less clear than it is for most aircraft types. Views and counter-views on the development of the long-haul market over the long term have been expressed for more than five years, and continue to be debated. The actual outcome will determine the relative market sizes for the 550-seat A380 and 450-seat 747-8. One clue can be provided by an examination of how long-haul routes have developed over the past five years.

Aircraft size requirement

There are already some clear indications of how the market for the A380 and 747-8 could develop, however. Airbus has so far received 134 firm orders for passenger variants of the A380 from 13 airlines and a lessor, and expects to receive orders for 20 more in the second half of 2006 from four airlines, two of which are existing customers. About half

of the current orders are from seven 747-400 customers. The other 70 aircraft have been ordered by airlines that have bypassed the 747 and gone directly for the larger A380.

Boeing has so far received almost 500 orders from 30 airlines for passenger and combi variants of the 747-400. There are also 160 747-200s and -300s still in passenger service. Passenger aircraft all have capacities of 350 to 380 seats, while the combis have 250 to 280 seats. There are 550 passenger-configured 747s with 350 to 380 seats in operation, and 110 combi aircraft with 250 seats.

In addition to the 747s in operation, there are now 170 A340-600s and 777-300s in service, and another 330 are on order. The 777-300 has tri-class capacities of 376 to 390 seats in most cases, and the A340-600 290 to 324.

Most passenger-configured 747s were ordered and delivered more than 10 years ago, and all will need to be replaced over the next 10 to 15 years. The A340-600s

and 777-300s have been used either to provide additional growth on some routes, or downsize from full-capacity 747s on others where the aircraft was hard to fill at an economic yield mix.

The first main issue is whether the 550 or so passenger 747s will need to be replaced with aircraft of a smaller, equal or larger capacity. The fact that most -400s were ordered to replace 747 Classics indicates that they are the right size aircraft for their operators, so aircraft of at least the same size are likely to be needed in the future.

Some A380s have clearly been ordered to replace 747s and other large widebodies on routes with heavy demand. Airlines can substitute three or four daily 747 operations with two or three A380 services.

Large aircraft requirement

The key issue affecting demand for the A380 and 747-8 is how individual routes with the heaviest traffic volumes will develop in terms of passenger numbers, frequencies, and number of operators and their market share, and so which aircraft types they will need to satisfy demand.

Airlines have historically shown a preference for first increasing frequency to a maximum level prior to increasing aircraft size for absorbing growth. Liberalisation and deregulation of markets over the past 25 years has seen airlines maintaining or even reducing their capacity on routes as a result of increased competition, even though total traffic has increased.

Average aircraft sizes used by all airlines on a route will have to increase once frequencies are limited. Most airlines will prefer to offer at least twice-daily services on long-haul routes, and more likely three or even four flights per day. Airlines are therefore only likely to

DEVELOPMENT OF LONG-HAUL MARKETS 2001 TO 2006

Global market	2006 number of routes	2006 annual flights	2006 annual seats	2006 average seats	5-year change flights	5-year change seats	5-year change size
Asia Pacific	78	573,000	181 million	318	+17%	+15%	-1.1%
Transatlantic	31	88,000	27 million	307	+8%	+8%	-0.1%
Europe-Asia	22	81,000	28 million	342	+32%	+28%	-3.0%
Trans-Pacific	32	61,000	20 million	334	+6%	+1%	-4.6%
Middle East-Asia Pacific	26	52,000	15 million	294	+57%	+55%	-1.2%
Middle East-Europe	11	23,000	6.5 million	282	+66%	86%	11.9%

need the 747-8 or A380 when their own one-way daily capacity on a route has reached at least 1,000 seats, and 1,200-1,500 seats in some cases. This is equal to annual one-way capacity of 365,000-550,000 seats for each airline on a route. Some Japanese domestic and other routes have very high frequencies with 747s configured in high-density layouts, and airlines often provide 5,000-7,500 seats each way per day on some routes.

Some long-haul routes are operated at high frequencies. British Airways (BA) operates three daily flights between London Heathrow (LHR) and Hong Kong (HKG) using 350-seat 747-400s. Meanwhile, Singapore Airlines (SIA) operates three flights per day between LHR and Singapore (SIN).

While three daily 747-400 services could be directly replaced with two A380 operations or three 747-8 flights, airlines will want to keep their slots across their networks and so will maintain, or even increase, frequencies. The replacement of aircraft with the larger 747-8 or A380 will therefore be gradual as traffic volumes increase for each carrier.

The world's heaviest routes in terms of total seats, number of airlines and flight frequencies, aircraft types and average aircraft size over the past five years, will be examined to indicate their development over the next five years.

2001-2006

The air transport market has evolved in recent years to the point where there are now six major traffic flows of long-haul routes: intra-Asia Pacific; Europe-Asia Pacific; transatlantic; trans-Pacific; Middle East-Asia Pacific; and Middle East-Europe. The latter two markets have experienced high rates of growth and expansion over the past five years from low bases. This is due to the high growth and development of Emirates at its Dubai hub, and to a lesser extent Qatar Airways at Doha and Etihad at Abu Dhabi.

It can be assumed that the capacity provided by airlines is a close indicator of passenger demand and traffic volumes, although passenger load factors have generally increased by a few percentage points over the past five years. Changes in capacity over the past five years can therefore also be assumed to reflect proportionate changes in demand.

The world's busiest 250 routes, by total annual seats and flights provided by widebody aircraft that are operated by all airlines on each route, have been analysed in these six main markets. Those with the highest changes in the number of annual flights, one-way seats, and average aircraft size are shown (see tables, pages 37 & 41). Routes for each region have also been analysed on a macro level, and a general trend can be observed.

CAPACITY DEVELOPMENT OF MAJOR INTRA ASIA-PACIFIC ROUTES 2001 TO 2006

Route	2006 Annual flights	Annual seats '000s	Average size-seats	5-year Change flights	5-year Change seats	5-year Change seat size
Sapporo-Tokyo, HND	15,718	5,982	381	-1%	-5%	-3.9%
Fukuoka-Tokyo, HND	16,439	5,734	349	16%	1%	-12.6%
Hong Kong-Taipei	14,556	4,710	324	27%	27%	-0.4%
Osaka, ITM-Tokyo, HND	10,222	4,029	394	42%	39%	-1.9%
Okinawa-Tokyo, HND	6,326	2,674	423	4%	15%	10.9%
Bangkok-Phuket	7,669	2,359	308	44%	55%	7.6%
Kagoshima-Tokyo, HND	6,023	1,860	309	33%	21%	-9.5%
Beijing-Shanghai, SHA	6,031	1,774	294	83%	98%	8.3%
Tokyo, NRT-Taipei	4,633	1,529	330	136%	100%	-15.2%
Tokyo, NRT-Seoul, Incheon	5,103	1,511	296	54%	30%	-15.6%
Tokyo, NRT-Hong Kong	4,390	1,479	337	33%	20%	-9.5%
Tokyo, NRT-Bangkok	3,838	1,241	323	45%	36%	-6.2%
Singapore-Seoul, Incheon	3,754	1,218	324	189%	211%	7.4%
Guangzhou-Beijing	3,952	1,137	288	45%	45%	0.0%
Hong Kong-Seoul, Incheon	3,408	1,129	331	46%	53%	4.7%
Tokyo, NRT-Shanghai, PVG	4,348	1,269	292	466%	362%	-18.4%
Hong Kong-Beijing	3,744	1,043	279	78%	68%	-5.4%
Manila-Singapore	3,108	915	294	91%	107%	8.1%
Bangkok-Seoul, Incheon	2,508	882	352	71%	80%	5.5%
Hong Kong-Sydney	2,185	714	327	56%	49%	-4.2%
Taipei-Osaka, KIX	2,007	711	354	11%	29%	16.8%
Taipei-Seoul, Incheon	2,354	687	292	275%	198%	-20.5%
Beijing-Seoul, Incheon	2,119	684	323	89%	95%	3.2%
Bangkok-Kuala Lumpur	2,106	678	322	29%	49%	15.5%
Bangkok-Sydney	1,656	632	382	23%	28%	3.5%
Auckland-Singapore	1,904	631	331	262%	252%	-2.7%
Asahikawa-Tokyo, HND	2,163	591	274	29%	19%	-7.7%
Brisbane-Singapore	1,717	546	318	51%	77%	17.5%
Beijing-Singapore	2,106	531	263	115%	116%	0.4%
Manila-Seoul, Incheon	1,460	483	331	80%	81%	0.5%
Auckland-Melbourne	1,485	468	315	-2%	22%	24.7%
Ho Chi Minh-Taipei	1,654	465	281	34%	44%	7.5%
Kuala Lumpur-Jakarta	1,649	460	279	87%	84%	-1.4%

CAPACITY DEVELOPMENT OF MAJOR TRANSATLANTIC ROUTES 2001 TO 2006

Route	2006 Annual flights	Annual seats '000s	Average size-seats	5-year Change flights	5-year Change seats	5-year Change seat size
London, LHR-Hong Kong	3,331	1,115	335	81%	71%	-5.8%
London, LHR-Singapore	2,597	975	376	6%	6%	-0.3%
London, LHR-Tokyo, NRT	1,868	759	406	-3%	6%	8.0%
London, LHR-Bombay	2,386	688	288	260%	170%	-24.8%
London, LHR-Delhi	1,893	566	299	118%	75%	-19.6%
Frankfurt-Seoul, Incheon	939	325	346	65%	56%	-5.7%
Paris, CDG-Bombay	1,059	315	297	239%	301%	18.2%
Frankfurt-Bombay	740	299	404	18%	70%	43.9%
Frankfurt-Shanghai, PVG	884	298	337	87%	73%	-7.9%
Paris, CDG-Shanghai, PVG	1,030	290	281	93%	94%	0.8%
Paris, CDG-Hong Kong	874	282	322	20%	21%	1.3%
London, LHR-Shanghai, PVG	873	242	277	434%	383%	-9.5%
Amsterdam-Kuala Lumpur	730	232	318	7%	22%	14.3%
Paris, CDG-Seoul, Incheon	666	223	334	66%	75%	5.6%
Frankfurt-Delhi	545	219	401	49%	53%	2.8%
London, LHR-Seoul, Incheon	564	189	335	186%	150%	-12.6%
London, LHR-Beijing	627	167	266	66%	62%	-2.4%
Manchester-Islamabad	410	159	388	87%	92%	2.4%
Munich-Bangkok	420	154	367	95%	108%	6.9%
Stockholm-Bangkok	317	129	405	52%	53%	0.4%
Amsterdam-Osaka, KIX	362	117	322	-1%	15%	15.7%
Paris, CDG-Delhi	365	116	318	-33%	-22%	14.9%
Rome-Tokyo, NRT	312	97	309	197%	184%	-4.5%
Rome-Beijing	268	82	306	241%	242%	0%



Intra-Asia Pacific

This is the largest region of the world, starting with Pakistan and India in the west and extending to China, Indo-China, Japan and Korea, and then south to Singapore and Indonesia, and further to Australasia. This region has a combination of high-density domestic routes in Japan and China and ultra-long-distance routes between major cities such as Auckland and Seoul.

The Asia Pacific is notorious for having the highest-density routes in the world, and creating the highest demand for the largest widebodies. The busiest 77 routes have been examined. Overall, the number of one-way seats available on widebody aircraft from all airlines on these routes has increased by 15.5% from 157 million to 181 million per year. The number of annual services has also increased, however, from 489,000 to 571,000: a rise of 16.8%. The average aircraft size has therefore actually declined slightly to just less than 320 seats (see table, page 36). The 777-300 and 747 are the main aircraft types.

The high density of the routes in this region is illustrated by the number of seats provided each year in each direction. The busiest of all is Sapporo-Tokyo, with nearly 6 million seats each way per year (see table, page 37). This is the highest-density airport-pair in the world. Other routes have similarly high seat volumes. While Tokyo, HND-Osaka, ITM itself has about 4 million seats per year, there are another two airport-pairs for Tokyo-Osaka. All three combined have a total of 5.4 million seats, about 15,000 annual one-way flights, and an average aircraft size of 360 seats.

Even the four routes with the highest

volumes of seat capacity have all matched or exceeded the growth in seats with increased frequencies. Three of these airport-pairs are domestic Japanese routes, and the fourth is Hong Kong-Taipei. The Japanese routes are operated by only three carriers, but now have daily frequencies of more than 35 return flights. In the case of Sapporo-Tokyo, Japan Airlines (JAL) and JAL Domestic combined operate 20 daily flights each way. The average aircraft size on these routes has decreased slightly or remained at 350-400 seats for all operators, with most utilising 747s and 777-200s/-300s in high-density layouts. This suggests the airlines are constrained by aircraft size.

Of the remaining Asia-Pacific routes, there are still many with high frequencies, with the number of daily flights exceeding 10 on most. Many of these have experienced very high rates of capacity increase over the past five years, with some doubling, tripling or even quadrupling in annual seat numbers (see table, page 37). The volume of seats on Tokyo-Shanghai, for example, has increased almost five-fold from 275,000 to 1.27 million. Frequencies have nevertheless increased at a higher rate, so pushing down average aircraft size to less than 300 seats.

Some routes have seen seat volumes increase at a higher rate than frequencies, and aircraft size has consequently increased. In only four cases, Okinawa-Tokyo, Bangkok-Seoul, Taipei-Osaka and Bangkok-Sydney, has this led to aircraft size rising to more than 350 seats. These four routes also have high rates of capacity and traffic growth, and will clearly require ultra-large aircraft if this continues for the next five years.

While many of the other routes in the

Sapporo-Tokyo Haneda is the world's busiest airport-pair, with 6 million seats offered each way per year. Three airlines provide up to 40 flights each way per day, and average aircraft size is 380 seats. Total capacity and frequencies have changed little in five years, suggesting airlines require larger aircraft.

region have smaller average aircraft sizes, they have also had high rates of traffic growth and capacity increase and will start to reach the point of frequency saturation. Many are medium- or long-haul and so will not benefit from ultra-high frequencies.

The average aircraft size would exceed 450 seats on many routes in five years if capacity growth continues without further increases in frequency. Frequency rises will soon be unable to match capacity increases, and so average aircraft size will rise.

Another issue is the possibility of new routes opening in the region with the advent of the 787 and A350, or the alternative aircraft being developed by Airbus. Examples are routes between China and Japan, Korea or New Zealand.

Europe-Asia

The Europe-Asia Pacific market is one of the most mature. London LHR, Paris CDG and Frankfurt remain the three main European hubs for services to the Asia Pacific. A few major routes also operate from Amsterdam, Copenhagen, Rome and Stockholm. Moreover, the major routes in this market have maintained their status, and few new ones have been opened. The economic weakness caused by the SARS epidemic of 2003 must be taken into consideration.

The major changes to the 41 routes in this market since 2001 are a higher rate of increase in flight frequencies than seats, resulting in a small drop in average aircraft size to 342 seats (see table, page 36). This is due to airlines substituting 747s with newly delivered 777s and A340s over this period, and following the policy of increasing frequencies.

The highest-density routes, London-Hong Kong and London-Singapore, have an extremely high number of daily flights, when the distance is considered. BA, for example, has three return flights per day between LHR and Hong Kong. This is probably the limit for routes of this length. Frequencies on the heaviest routes in this market are already close to saturation. The number of frequencies on LHR-HKG has almost doubled over the past five years, for example.

While airlines have introduced 777s and A340s over the past five years, the 747 is utilised on the most services and the average aircraft size is 342 seats (see table, page 37). Since 20-30 of the

heaviest routes are close to maximum frequency, ultra-large aircraft will have to be deployed on many of these routes over the next five to 10 years.

The routes with the highest increases in capacity include LHR-Mumbai, Paris CDG-Mumbai and Frankfurt-Mumbai. This is not surprising given the high rate of economic growth in India. Several new Indian carriers have entered these markets, including Jet Airways, leading to larger jumps in frequencies.

Many other routes from Europe to Beijing or Shanghai have also experienced high rates of growth. Many routes are still young, however, and have a relatively low number of daily flights. Rome-Bangkok and Rome-Beijing, for example, only have about nine and six flights per week. As traffic grows, routes like these will see airlines develop the service until at least two carriers are each operating with two or three daily frequencies before needing to increase aircraft size.

There are, however, other less dense routes with frequencies of only up to three flights per day each way. These are likely to continue to add frequencies up to between four and six per day, although this will become harder as many airports face congestion. The majority will still have to increase aircraft size to at least the 747-400 if traffic continues to increase over the next five years at the same rate it has since 2001.

The advent of the 787 from 2008 is likely, however, to see new routes being opened from other major European airports such as Amsterdam, Madrid and Rome, and will slow traffic growth on current routes.

Transatlantic

The liberalisation of the transatlantic market is well documented, and airlines have had to downsize from 747s to a range of smaller types to adjust to an increased number of operators on almost every route.

The general trend for some of the busiest 30 routes over the past five years has been an 8% increase in annual seats, which has been matched by an equal increase in frequencies (see table, page 36). This low rate of capacity increase is explained by relatively weak traffic growth and airlines accepting higher passenger load factors. The average aircraft size is 307 seats, and the 777 and A340 are the most widely used aircraft. Some transatlantic routes have experienced relatively small falls in traffic and available capacity, while others have seen high rates of capacity growth.

About half these routes still only operate with up to three daily flights. Major European airports are becoming slot constrained, however. The indication is that many routes will have to adopt an

CAPACITY DEVELOPMENT OF MAJOR TRANS-PACIFIC ROUTES 2001 TO 2006

Route	2006 Annual flights	Annual seats '000s	Average size-seats	5-year Change flights	5-year Change seats	5-year Change seat size
Los Angeles-Tokyo, NRT	2,660	903	340	-18%	-25%	-8.9%
Los Angeles-Taipei	2,246	741	330	14%	9%	-4.9%
Los Angeles-Sydney	1,367	519	380	-17%	-18%	-1.0%
Los Angeles-Seoul, Incheon	1,428	482	338	21%	22%	1.0%
Los Angeles-Auckland	1,104	434	393	-13%	-10%	3.4%
Los Angeles-Hong Kong	1,095	420	383	12%	15%	2.7%
San Francisco-Hong Kong	1,095	408	372	0%	14%	14.5%
San Francisco-Seoul, Incheon	1,151	335	291	103%	36%	-33.3%
New York, JFK-Seoul, Incheon	874	301	345	112%	110%	-0.9%
Detroit-Tokyo, NRT	723	292	403	98%	98%	0.1%
Los Angeles-Papeete	940	282	300	38%	42%	3.0%
San Francisco-Beijing	574	191	332	254%	314%	17.0%
Chicago-Hong Kong	522	181	347	43%	43%	0.1%
San Francisco-Sydney	489	175	358	34%	38%	3.4%
Chicago-Seoul, Incheon	522	173	331	108%	95%	-6.4%
Seattle-Taipei	596	163	274	66%	67%	0.6%
Detroit-Nagoya	365	147	403	12%	12%	0.0%
Detroit-Osaka, KIX	365	147	403	3%	3%	0.0%
Los Angeles-Melbourne	368	145	394	-18%	-16%	2.4%
Chicago-Beijing	365	113	310	33%	59%	19.7%
Los Angeles-Manila	240	95	397	1%	6%	4.7%
San Francisco-Manila	212	84	397	7%	19%	11.5%

CAPACITY DEVELOPMENT OF MAJOR MIDDLE EASTERN ROUTES 2001 TO 2006

Route	2006 Annual flights	Annual seats '000s	Average size-seats	5-year Change flights	5-year Change seats	5-year Change seat size
Jeddah-Riyadh	4,342	1,392	321	17%	23%	5.7%
Dubai-Doha	2,391	600	251	59%	56%	-2.0%
Dubai-Cairo	1,037	315	304	50%	53%	1.6%
Dubai-Jeddah	774	250	323	82%	77%	-2.7%
Abu Dhabi-Cairo	643	156	242	169%	153%	-6%
Madinah-Riyadh	330	99	298	307%	228%	-19.4%
Abu Dhabi-Beirut	331	75	227	537%	295%	-38%
Dubai-Singapore	1,409	479	340	43%	44%	0.1%
Dubai-Bangkok	1,362	454	333	99%	108%	4.6%
Abu Dhabi-Bangkok	590	210	356	146%	207%	24%
Dubai-Hong Kong	629	188	299	114%	98%	-7.3%
Abu Dhabi-Colombo	719	187	260	413%	405%	-2%
Dubai-Manila	521	172	330	67%	107%	24.1%
Dubai-Chennai	619	172	277	84%	97%	7.2%
Dubai-Kuala Lumpur	628	171	271	183%	171%	-4.5%
Dubai-Seoul, Incheon	521	144	275	599%	636%	5.2%
Dubai-Shanghai, PVG	365	128	349	N/A	N/A	N/A
Dubai-Beijing	484	118	243	N/A	N/A	N/A
Abu Dhabi-Karachi	411	91	221	272%	271%	0%
Abu Dhabi-Manila	207	72	346	89%	131%	22%
Dubai-London, LHR	3,404	965	284	39%	45%	4.0%
Dubai-London, LGW	1,095	341	311	163%	244%	30.8%
Dubai-Paris, CDG	1,376	350	254	58%	78%	12.9%
Dubai-Frankfurt	1,101	330	300	25%	58%	26.5%
Doha-London, LHR	1,011	274	271	82%	119%	20%
Dubai-Manchester	858	228	265	135%	163%	11.9%
Dubai-Munich	910	227	250	149%	167%	7.2%
Dubai-Istanbul	574	195	340	38%	82%	32.4%
Dubai-Dusseldorf	610	186	304	118%	234%	53.4%
Abu Dhabi-London, LGW	365	127	349	N/A	N/A	N/A
Abu Dhabi-Frankfurt	365	97	266	182%	185%	1%
Abu Dhabi-Munich	288	65	226	476%	306%	-29%
Dubai-Nairobi	1,292	328	254	72%	60%	-7.4%
Dubai-Johannesburg	730	266	364	93%	197%	53.6%
Paris, CDG-Johannesburg	521	177	339	42%	91%	34.2%
Hong Kong-Johannesburg	730	225	308	78%	68%	-5.3%



increase in average aircraft size over the next five years, but only to aircraft of a similar capacity to the 777-300 and 747-400. Continued growth beyond five years will gradually see the 747-8 and A380 being added on more routes.

Trans-Pacific

The trans-Pacific has the longest routes of all the major markets. These limit each airline's daily frequencies on a service to two or three flights. Thirty four major routes have been examined, and the general trend is for only a 1% increase in overall seats on these airport-pairs. This is because the trans-Pacific market is polarised by about half these routes having near-zero or negative capacity growth over this period, and the other half having medium to high rates of growth. Of these 34 routes, 22 are shown (see table, page 41), and most have experienced positive capacity growth.

Many of the routes experiencing negative growth are those operating to and from Tokyo and Taipei. This partially reflects the effects of airlines no longer having to make technical stops in Tokyo, and is also explained by US airlines pulling out of some trans-Pacific routes after failing to make them economic.

Routes with negative growth over the past five years are likely to see low rates of growth before a recovery in traffic volumes is experienced. This will keep the 747 as the mainstay of most routes, but larger types will be needed on the heaviest sectors in the long term.

The other group of routes that has experienced an increase in capacity has seen substantial rises in both available seats and frequencies. Most of these are shown (see table, page 41). Many routes

have seen capacity increase by 50-100%, and frequencies have reached between two and six daily flights in most cases. Traffic and capacity growth over the next five years is likely to match that of the past five, while the airlines operating on each route will probably collectively increase frequencies to between four and six daily flights on many sectors.

Continued traffic growth may also encourage US carriers to attempt to re-enter this market. Airlines will find it easier to compete with the incumbents following the arrival of the 777-200LR and A340-500 in recent years, and later the 787-8/-9. These aircraft will allow frequency growth to remain in line with capacity, meaning that few routes are likely to require aircraft larger than 400 seats. Aircraft size will then rise once frequency saturation is reached. This will stimulate a demand for 747-sized and larger aircraft in the long-term.

Middle Eastern markets

Medium- and long-haul routes from major hubs in the Middle East have experienced the highest growth rates of the world's six major markets. While there are a few intra-Middle Eastern routes with high traffic densities, the two major markets are Middle East-Asia Pacific, with an average increase of 55% in capacity over the past five years, and Middle East-Europe, where capacity has risen by about 86% over the same period (see table, page 36). The most noticeable feature is that in most cases the airlines on each route had increased frequencies at a rate close to capacity. The A330 and 777 are the dominant types in both markets.

This impressive rate of network

Demand for the A380 should increase over the next five to seven years as more routes reach their limit of frequencies and increased aircraft size is the only option for adding capacity.

expansion is mainly due to the rapid development of Emirates, using its Dubai hub to transit traffic from Europe to the Asia Pacific. High rates of network development have also been achieved by Etihad and Qatar Airways.

The rate of increase in traffic has exceeded 100% on half the 37 routes examined, and doubled, tripled or quadrupled in many. It is easy to see why Emirates has placed such a large order for the A380. Average aircraft size is close to 300 seats in both markets, but these are medium- and long-haul routes and daily frequencies have reached at least three flights per day on the busiest half of the airport-pairs. Frequencies are unlikely to increase on many of these routes, and if traffic continues to grow at the same rate for the next five years aircraft size will exceed 400 seats on most.

The increase in capacity on the less dense routes has been the highest, and even if frequencies double, following a similar rate of capacity growth to the past five years, aircraft size will have to increase to that of the 747 or larger on most of the routes.

Summary

It is perhaps surprising that most increases in capacity have been matched by rises in frequency. The only exception is the Middle East-Europe routes. The rise in frequencies on the busiest routes is explained by lack of availability of larger aircraft. Airlines still operate at relatively low frequencies on most long-haul routes, however, and the rises are explained by airlines taking the opportunity to increase services as traffic growth allows them.

If traffic growth in these markets over the next five to eight years is similar to the past five, then many airlines will need more 400-seat and larger types as frequencies start to become saturated or reach their optimum level. At this stage demand for ultra-large aircraft should increase sharply. Besides absolute traffic volumes and flight frequencies, other factors such as operating costs and performance, and aircraft financing terms will determine the dividing line between the 747-8 and A380. One major issue that will be apparent by this time is how much types like the 777-200LR, A340-500 and 787 have stimulated the opening of new routes and what affect these have had on current routes. [AC](#)