The Asia Pacific is a vast market. Growth on international routes has been modest, and large twinjets account for the majority of capacity. Domestic markets are divided between mature and fast-developing route networks. Some countries have seen a quadrupling of traffic over the past 10 years.

The Asia Pacific: growth, capacity development & fleet requirements

The Asia Pacific includes some of the world's largest countries and economies, and a large number of small countries with weak economies. The whole Asia Pacific region covers an immense geographical area, and its large conurbations, and the long distances between them, necessitate the use of air transport. The Asia Pacific is dominated by large national carriers operating from large hubs, giving rise to the use of widebodies. A characteristic of the Asia Pacific is that the group of dominant countries is split between mature and emerging economies, and it is the emerging economies that have had a major influence on the development of the region over the past 10 years.

Demographics

There are 13 dominant countries and economies in the Asia Pacific, including Japan, South Korea, Taiwan, Singapore, Australia and New Zealand. The emerging economies are China, Vietnam, Indonesia and the Indian sub-continent (which includes Bangladesh, India, Pakistan, Sri Lanka and the Maldives).

The majority of the traffic in the region operates between these countries. Traffic growth rates have been at their highest levels over the past 10 years.

The small countries and weak economies include Papua New Guinea, the Solomon Islands, French Polynesia, Laos, Cambodia, Myanmar and Fiji.

A third group of countries that can be regarded as part of the Asia Pacific include the Russian Far East, and the eastern member states of the Commonwealth of Independent States (CIS): Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan and Uzbekistan.

While the majority of air traffic in the Asia Pacific is accounted for by the dominant countries, high traffic growth rates have been prevalent across the region for the past 10 years. This has resulted in increased seat capacity and a demand for aircraft in all countries in the region.

Operations and the fleet in the Asia Pacific are characterised by large widebodies operating the busiest routes, including international ones, and those on the busiest domestic markets.

Narrowbodies are used where traffic volumes are lower. The narrowbody fleet has grown, particularly in the Chinese, Indian and Indonesian domestic markets, all of which have experienced high rates of traffic growth.

The utilisation of narrowbodies has also increased in mature and established markets. The use of aircraft types and average aircraft size on many routes has changed. Where widebodies dominated on many routes in the past, the introduction of new operators and a higher level of competition have seen a reduction in the utilisation of widebodies and in average aircraft size overall, in particular on many Japanese domestic routes. Capacity has also increased, mainly using narrowbodies, on many Chinese domestic routes, so that service frequencies have increased almost in proportion with total capacity. Many of the busiest, high-density short-haul and domestic routes in the region are operated with high-frequency narrowbody services.

Market development

Passenger traffic across the whole of the Asia Pacific grew at about twice the rate of traffic in the rest of the world between 2000 and 2010. Absolute traffic in the Asia Pacific, expressed in revenue passenger kilometres (RPks), grew from about 440 billion RTks in 2000 to 920 billion RTKs in 2010; an increase of 110%. This includes Chinese domestic traffic, which more than quadrupled over during the same period.

Excluding the domestic Chinese market, traffic for the region increased by 60% between 2000 and 2010. RPKs rose from about 367 billion in 2000 to 600 billion in 2010. This is equal to an average annualised growth rate of 5%.

Traffic growth was not positive throughout the period. Traffic declined in 2003 with the SARS crisis, and again in 2009 following the credit crunch of 2008. Traffic growth was high in other years. It increased by 9.7% in 2010, although the Asia Pacific had lower traffic growth rates than Africa and the Middle East, but higher than the industry average.

Airline capacity has grown over the same period, but by a smaller extent, so that passenger load factor has increased by about five percentage points.

Despite continued growth, major airports and airlines continue to dominate the market. The major cities and airports for international traffic between countries in the region include: Bangkok, Kuala Lumpur, Singapore, Jakarta, Denpasar, Hong Kong, Beijing, Taipei, Manila, Seoul, Osaka, Tokyo and Sydney. The past 10 years have also seen Shanghai and, to a lesser extent, Guangzhou and other Chinese cities become important international hubs. Delhi, Mumbai and Chennai in India have also started to become important international hubs for the region, as have Ho Chi Minh and Hanoi in Vietnam.

Similarly, the airlines that continue to dominate the higher-density routes to and from these major airports and others are

Thai International, Malaysian, Singapore Airlines (SIA), Cathay Pacific, Korean Air, Asiana, China Airlines, Evergreen, Air China, China Eastern, China Southern and Qantas.

Few new airports have been opened, and few are being built or developed. Traffic growth in the region has therefore been confined mainly to existing routes, although some new international ones have been opened. The implications for the high rates of traffic growth are that the capacity added to absorb higher passenger numbers was generated by: higher passenger load factors; higher service frequencies; the utilisation of larger aircraft on existing routes; or two or all of these factors. Passenger load factors have increased by about five percentage points, but this has only absorbed a minimal portion of the traffic increase. Service frequencies and larger aircraft have been the main means to absorb higher traffic volumes.

Another factor in fleet development and capacity strategies is how the number of airlines operating on each route changes. Increased competition through more airlines operating on a route will result in all carriers concerned, including incumbents, switching to smaller types.

The market is divided between international and domestic routes, and is further sub-divided between mature and emerging markets. A general trend on international routes has been for service frequencies to increase at a higher rate than total capacity, so average aircraft size has decreased. Large widebodies, in particular the four-engined 747, have been replaced by smaller aircraft. The number of widebody twin-engined aircraft has increased over the past 10 years. The A330-200, A330-300, 777-200 and 777-300 have become the dominant widebodies on the majority of regional international routes operated between the major hubs. These same routes have also seen an increase in the use of narrowbodies.

The development of domestic markets across the region has seen a mix of mature markets with little traffic growth, and young emerging markets with high rates of traffic growth and capacity development.

Japan, for example, has seen some of its traffic and capacity increase on its domestic airport-pairs over the past 10 years, and decline on others. In both cases, service frequencies have risen overall, due partly to incumbents using fewer 747s and changing to smaller aircraft, and new entrant carriers utilising narrowbodies. The overall result has been a decline in average aircraft size by more than 70 seats.

Other domestic markets are a mixture of mature routes with low growth rates, and young routes with high growth rates.

INTRA-ASIA PACIFIC CAPACITY DEVELOPMENTS

Route	2010 annual flights	Annual seats	Aircraft size -seats	10-year difference -flights	10-year difference -seats	10-year difference -size
Hong Kong,HKG-Taipei, TPE	12,836	4,084,489	318	17.8%	13.4%	-12
Seoul,GMP+ICN-Tokyo,NRT	8,281	2,589,711	313	17.8%	13.4%	-46
Jakarta,CGK-Singapore,SIN	11,976	2,584,386	216	70.8%	47.1%	-35
Kuala Lumpur,KUL-Singapore,SIN	10,974	1,934,219	176	70.8%	47.1%	-16
Bangkok,BKK-Hong Kong,HKG	6,034	1,898,894	315	8.3%	1.9%	-20
Hong Kong,HKG-Singapore,SIN	5,912	1,784,464	302	18.6%	5.6%	-37
Seoul,GMP/ICN-Tokyo,NRT	5,238	1,483,608	283	38.1%	8.8%	-76
Hong Kong,HKG-Manila,MNL	5,894	1,586,438	269	55.5%	23.6%	-69
Bangkok,BKK-Singapore,SIN	6,241	1,569,292	251	8.6%	-6.5%	-41
Tokyo,NRT-Taipei,TPE	4,711	1,387,518	295	157.4%	90.7%	-103
Tokyo,NRT-Shanghai,PVG	4,617	1,257,456	272	376.0%	191.7%	-172
Hong Kong,HKG-Tokyo,NRT	3,588	1,214,049	338	8.8%	-15.3%	-96
Osaka,KIX-Seoul,GMP/ICN	5,584	1,210,771	217	64.0%	28.0%	-61
Seoul,ICN-Hong Kong,HKG	3,752	1,164,011	310	39.2%	33.5%	-13
Manila,MNL-Singapore,SIN	5,016	1,074,875	214	176.4%	129.1%	-44
Kuala Lumpur,KUL-Jakarta,CGK	5,957	1,051,378	176	255.2%	285.9%	14
Kuala Lumpur,KUL-Bangkok,BKK	5,099	1,019,338	200	182.6%	108.8%	-71
Seoul,ICN-Shanghai,PVG	4,569	1,004,115	220	11,615.4%	10,856.0%	-15
Bangkok,BKK-Tokyo,NRT	3,264	1,000,023	306	19.3%	-4.2%	-75
Seoul,ICN-Beijing,PEK	4,231	950,301	225	198.2%	141.9%	-52
Bangkok,BKK-Taipei,TPE	3,139	917,152	292	-2.0%	-10.6%	-28
Sydney,SYD-Singapore,SIN	2,497	879,427	352	4.3%	10.7%	21
Seoul,ICN-Bangkok,BKK	3,105	865,912	279	85.3%	80.7%	-7
Tokyo,NRT-Singapore,SIN	2,858	858,116	300	14.9%	-18.0%	-121
Denpasar Bali,DPS-Singapore,SIN	3,504	838,035	239	99.0%	69.1%	-42
Macau,MFM-Taipei,TPE	4,639	830,296	179	-7.8%	-8.2%	-1
Shanghai,PVG-Singapore,SIN	2,770	810,993	293	278.4%	270.1%	-6
Hong Kong,HKG-Kaohsiung,KHH	3,084	796,137	258	18.4%	23.5%	11
Hong Kong,HKG-Kuala Lumpur,KUL	2,905	785,231	270	45.2%	38.2%	-14
Shanghai,PVG-Osaka,KIX	3,650	747,954	205	242.1%	109.4%	-130
Hong Kong,HKG-Sydney,SYD	2,224	712,233	320	52.1%	39.9%	-28
Tokyo,NRT-Beijing,PEK	3,156	709,228	225	100.9%	13.5%	-173
Seoul,ICN-Taipei,TPE	2,404	703,441	293	180.2%	139.8%	-49
Ho Chi Minh City,SGN-Singapore,SIN	3,262	692,293	212	115.2%	108.5%	-7
Melbourne,MEL-Singapore,SIN	1,841	679,780	369	-0.9%	1.3%	8
Manila,MNL-Seoul,ICN	2,584	678,695	263	149.2%	101.8%	-61
Bangkok,BKK-Sydney,SYD	2,023	632,318	313	34.1%	16.4%	-47
Perth,PER-Singapore,SIN	2,372	605,859	255	27.5%	16.3%	-25
Chennai,MAA-Singapore,SIN	3,016	582,670	193	166.0%	77.8%	-96
Brisbane,BNE-Singapore,SIN	1,909	573,692	301	146.6%	148.6%	3
Bangkok,BKK-Ho Chi Minh City,SGN	2,495	573,387	230	158.8%	211.6%	39
Bangkok,BKK-Guangzhou,CAN	2,552	570,943	224	377.0%	447.0%	29
Osaka,KIX-Taipei,TPE	2,027	546,157	269	21.6%	-8.9%	-91
Kuala Lumpur,KUL-Melbourne,MEL	1,661	542,914	327	353.8%	284.3%	-59
Penang,PEN-Singapore,SIN	3,409	534,863	157	38.8%	20.7%	-23
Seoul,ICN-Qingdao,TAO	2,958	524,227	177	304.1%	268.9%	-17
Seoul,ICN-Singapore,SIN	1,660	511,130	308	1.4%	10.2%	25
Hong Kong,HKG-Osaka,KIX	1,612	505,150	313	-20.9%	-17.7%	12
Taipei,TPE-Singapore,SIN	1,825	500,715	274	-6.8%	-19.9%	-45
Beijing,PEK-Singapore,SIN	1,814	499,209	275	63.4%	86.3%	34
Phuket,HKT-Singapore,SIN	3,225	496,198	154	162.8%	136.1%	-17
Bangkok,BKK-Delhi,DEL	2,050	495,932	242	267.4%	183.0%	-72
Seoul,ICN-Fukuoka,FUK	1,834	495,222	270	67.0%	62.0%	-8
Jakarta,CGK-Hong Kong,HKG	1,636	494,653	302	191.1%	318.7%	92
Mumbai,BOM-Singapore,SIN	1,944	491,077	253	165.9%	135.1%	-33
Bangkok,BKK-Manila,MNL	2,034	485,931	239	82.7%	47.1%	-59
Denpasar Bali,DPS-Perth,PER	2,736	476,017	174	298.3%	278.2%	-9
Melbourne,MEL-Hong Kong,HKG	1,461	475,683	326	91.0%	132.2%	58
Kathmandu,KTM-Delhi,DEL	3,149	474,336	151	213.6%	141.6%	-45
Denpasar Bali,DPS-Kuala Lumpur,KUL	2,547	467,978	184	387.0%	220.0%	-96
Manila,MNL-Tokyo,NRT	1,460	467,674	320	-6.4%	-24.3%	-76
Seoul,ICN-Nagoya,NGO	1,825	466,395	256	66.2%	53.2%	-21
Yangon,RGN-Bangkok,BKK	2,250	445,976	198	44.6%	46.3%	2
Hong Kong,HKG-Ho Chi Minh City,SGN	1,462	439,958	301	79.2%	144.4%	80
HO Chi Minh City,SGN-Taipei,TPE	1,605	436,047	272	12.6%	39.9%	53
Bangkok,BKK-Shanghai,SHA/PVG	1,651	431,809	262	121.6%	106.1%	-19
Tokyo,NRT-Shanghai,SHA	1,460	421,234	289	81.4%	74.7%	-11
Kuala Lumpur,KUL-Ho Chi Minh City,SGN	2,546	420,477	165	559.6%	640.2%	18
Bangkok,BKK-Mumbai,BOM	1,969	411,091	209	786.9%	384.4%	-173
Nagoya,NGO-Shanghai,SHA/PVG	2,366	409,053	173	310.8%	172.8%	-87
Kuala Lumpur,KUL-Taipei,TPE	1,360	406,793	299	31.1%	52.6%	42
Colombo,CMB-Male,MLE	1,648	383,287	233	36.1%	35.0%	-1
Manila,MNL-Taipei,TPE	1,681	374,502	223	276.9%	197.1%	-60
Colombo,CMB-Singapore,SIN	1,118	369,168	330	49.7%	54.0%	9
Bangkok,BKK-Hanoi,HAN	1,626	365,764	225	122.1%	149.4%	25
Bangkok,BKK-Phnom Penh,PNH	2,539	344,310	146	0.6%	1.0%	11
Ho Chi Minh City,SGN-Tokyo,NRT	1,388	334,479	241	7,611.1%	3,303.3%	-305
Dhaka,DAC-Kuala Lumpur,KUL	1,565	332,169	212	199.8%	109.4%	-92
Nagoya,NGO-Taipei,TPE	1,323	330,037	249	20.5%	12.7%	-18

Fleet development

A summary of the fleet in 2000 and 2010, plus outstanding firm orders for airlines operating in the region, reflects the general trend of increasing capacity through higher service frequencies with smaller aircraft. The active fleet of regional jets and jetliners in 2000 totalled almost 2,000 aircraft, increasing to 3,830 by 2010 *(see table, page 9)*.

The number of widebodies in the fleet declined from 47% in 2000 to 30.5% in 2010, and was replaced almost exactly with narrowbodies. While a lot of this is explained by high rates of capacity growth in the Chinese domestic market, another indication of fleet planning policy by airlines of other Asia Pacific countries, is the portion of the fleet accounted for by large or ultra-large widebodies. There were 369 777-300s and 747s in 2000. These were added to by A340-600s and A380s in the interim to 2010, but the absolute number of aircraft in this category has remained the same *(see table, page 9)*. The portion of the fleet accounted for by large widebodies has therefore fallen from 19.2% to 9.6%.

The absolute number of smaller widebodies increased by 264 in the same period. In particular, the A330 and 777-200 fleets have increased by 350, while the portion of smaller widebodies in the fleet has declined from 27.9% to 20.9%.

A more detailed analysis shows that in 2000 there were 95 747-200s/-300s, most of which were used on high-density, regional routes. This fleet has declined by 84 aircraft, and the 747-400 fleet has shrunk by 50. Over the same period, the 777-300 fleet has grown by 119 aircraft. Most remaining 747-400s, and all A340-600s and A380s, are used for intercontinental operations. The 747 is therefore used only in small numbers on regional routes, and the 777-300 has become the main large type for these missions with most airlines in the region. The 777-300's smaller seat capacity, compared to the 747, partly explains the decline in average aircraft size over the past 10 years.

Outstanding firm orders for aircraft held by airlines in the region further indicate the pattern of fleet development and capacity planning strategies. There are 2,150 aircraft on firm order *(see table, page 9)*, comprising: 1,400 narrowbodies, many for Chinese carriers; 720 widebodies; 150 large types; and 571 medium-sized aircraft. The 787 accounts for 302 orders and the A350 has 94 orders. There are also 155 orders for A330s and 777-200s. This clearly indicates that the general trend of using medium-sized widebodies at high-service frequencies is set to continue.

International routes

Examination of the capacity deployed on the busiest 80 international routes in the region reveals that most have seen large increases in capacity, but an overall higher increase in service frequencies. The result has been a reduction in the average size of aircraft used on most routes *(see table, page 9)*, despite the operation of 14 A380s by airlines in the region. The number of 747s and A380s operated by airlines in the region has declined from 340 to 220 since 2000.

Most of these routes are to and from the major hubs described, although routes serving a few secondary hubs have emerged as some of the busiest airport-pairs over the past 10 years.

Japan

Eighteen of the 80 busiest international routes serve hubs in Japan. Eleven of the 18 serve Tokyo, and one-third of the 18 have seen a drop in capacity. Japan has lost a lot of connecting intercontinental traffic over the past 10 years, resulting in a cut in capacity on routes between Japan and

other major cities in the region.

Other international routes have seen large increases in capacity, notably between Shanghai and Japan's four major international hubs: Tokyo, Osaka, Fukuoka and Nagoya. The new Ho Chi Minh-Tokyo route has also grown to become a major international airport-pair.

Despite the loss of traffic on some routes, the 18 routes have experienced an overall increase in capacity of 34% over the past 10 years. All of these routes serving the Japanese market have seen average aircraft size reduce, in some cases by almost 200 seats, as operations have switched from pure 747 services to a mix of smaller widebodies and narrowbodies.

Seat capacity has increased by 34%, as airlines deploy smaller types at higher frequencies, which have increased by 78%. Average daily frequency has increased from 4.7 to 8.5 flights. This rise in frequencies is mainly explained by incumbents increasing their service levels. Most routes have seen the number of operating airlines increase by about one, but the frequencies provided by each operator have still risen. Airlines have therefore reduced average aircraft size.

International routes serving all other major hubs and markets have seen aircraft seat numbers reduce on a cumulative basis. Closer examination reveals that a minority of routes have increased capacity through the use of larger aircraft. These are generally those airport-pairs where traffic levels in 2000 did not warrant the use of the largest widebodies.

Hong Kong

Thirteen routes serving Hong Kong had high average aircraft size in 2000, with the 747 dominating operations. The change to the new airport with two runways has allowed Cathay Pacific, and other operators, to create a schedule with more frequencies and potential connections. The airline has swapped the use of 747s on these routes for A330-300s and 777s. Average daily frequency on these 13 routes rose from 8.7 to 11.0 from 2000 to 2010, indicating a desire for high frequency services.

Routes to Kaohsiung, Osaka, Jakarta, Melbourne and Ho Chi Minh have seen moderate increases in aircraft size. These were lower density routes in 2000, and operated with medium widebodies at the time.

Hong Kong has always been a major hub in the region, and traffic and capacity growth has therefore been moderate over the past 10 years. Although capacity increased by 17.4% on these 13 routes, the number of airlines on them has actually declined. Frequencies have been raised at a higher rate than seat capacity, with aircraft size declining as a result.

Singapore

Routes serving Singapore have developed in a similar way. Singapore is another leading hub of the region, and traffic densities on routes serving it have always been high. Twenty-one of the top 80 international routes operate to and from Singapore, making it the most dominant hub. These 21 routes comprise: 15 with moderate rates of capacity growth over the past 10 years; and six with a high increase in capacity.

The 15 mature routes include operations to Jakarta, Kuala Lumpur, Hong Kong, Bangkok, Sydney, Tokyo, Perth, Seoul, Taipei and Beijing. Airlines serving these routes had an average aircraft size of 270 seats in 2000. SIA had a fleet dominated by the 747-400, which it used on higher-density regional routes. Many other airlines also used the 747 on routes serving Singapore. Six of these 15 routes had average aircraft sizes of more than 300 seats in 2000.

As well as being a major hub, Singapore is also a mature market. Rates

INDONESIA DOMESTIC CAPACITY DEVELOPMENTS

Route	2010 annual flights	Annual seats	Aircraft size -seats	10-year difference -flights	10-year difference -seats	10-year difference -size
Jakarta,CGK-Surabaya,SUB	13,633	2,446,272	179	76.5%	187.3%	69
Jakarta,CGK-Medan,MES	10,171	1,890,085	186	218.0%	384.6%	64
Jakarta,CGK-Denpasar Bali,DPS	9,920	1,863,479	187	184.9%	111.6%	-66
Jakarta,CGK-Ujung Pandang,UPG	8,379	1,456,716	174	391.4%	495.6%	31
Jakarta,CGK-Yogyakarta,JOG	7,664	1,388,730	181	257.6%	586.1%	87
Balikpapan,BPN-Jakarta,CGK	5,818	1,089,608	187	198.7%	342.7%	61
Jakarta,CGK-Palembang,PLM	6,317	1,088,548	172	234.2%	467.2%	70
Jakarta,CGK-Semarang,SRG	6,751	993,702	147	203.1%	355.4%	49
Balikpapan,BPN-Surabaya,SUB	4,910	824,468	168	255.5%	451.1%	60
Jakarta,CGK-Pekanbaru,PKU	4,517	800,075	177	224.3%	495.5%	81
Jakarta,CGK-Padang,PDG	4,426	794,014	179	303.1%	623.6%	79
Batam,BTH-Jakarta,CGK	4,228	721,773	171	169.8%	333.6%	65
Surabaya,SUB-Ujung Pandang,UPG	5,067	749,432	148	155.4%	265.6%	45
Banjarmasin,BDJ-Jakarta,CGK	3,415	656,957	192	211.0%	487.1%	90
Jakarta,CGK-Ponkianak,PNK	4,411	608,128	138	155.4%	296.4%	49
Surabaya,SUB-Banjamasin,BDJ	3,749	569,920	152	260.1%	401.9%	43
Denpasar Bali,DPS-Surabaya,SUB	4,307	567,673	132	116.9%	158.7%	22
Balikpapan,BPN-Tarakan,TRK	2,766	486,927	176	1,029.0%	1,907.5%	77
Jakarta,CGK-Pangkalpinang,PGK	3,682	469,330	127	314.6%	493.1%	38
AMQ,Ambon, -Ujung Pandang,UPG	2,402	439,351	183	1,321.3%	2,526.0%	84
UPG,Ujung Pandang, -Palu,PLW	2,980	429,057	144	650.6%	889.7%	35
Mataram,AMI-Surabaya,SUB	2,813	416,421	148	378.4%	629.1%	51
SOC,Solo City, - Jakarta,CGK	2,497	405,024	162	227.3%	493.9%	73
Banjarmasin,BDJ-Surabaya,SUB	3,749	569,920	152	271.6%	418.6%	43

PHILIPPINES DOMESTIC CAPACITY DEVELOPMENTS

Route	2010 annual flights	Annual seats	Aircraft size -seats	10-year difference -flights	10-year difference -seats	10-year difference -size
Manila,MNL-Cebu,CEB	8,175	1,603,023	196	21.5%	36.0%	21
Manila,MNL-Davao,DVO	4,866	988,892	203	46.5%	76.9%	35
Manila,MNL-Ilo Ilo,ILO	4,849	793,358	164	20.3%	71.5%	49
Manila,MNL-Bacolod,BCD	4,305	686,898	160	11.8%	53.9%	44
Manila,MNL-Cagayan De Oro,CGY	4,098	670,753	164	44.9%	92.9%	41
Manila,MNL-Kalibo,KLO	5,690	575,606	101	143.0%	114.0%	-14
Manila,MNL-Caticlan,MPH	11,979	557,630	47	596.5%	2,469.0%	34
Manila,MNL-Tacloban,TAC	3,095	495,890	160	12.9%	59.1%	46
Manila,MNL-Puerto Princesa,PPS	2,601	475,804	183	255.3%	229.0%	-15
Cebu,CEB-Davao,DVO	2,057	302,596	147	79.0%	129.9%	32
Manila,MNL-Legaspi,LGP	1,695	284,802	168	105.7%	195.6%	51
Manila,MNL-Zamboanga,ZAM	1,631	242,385	149	0.1%	23.8%	29
Manila,MNL-General Santos,GES	1,121	231,552	207	67.8%	62.1%	-7
Manila,MNL-Dumaguete,DGT	1,459	207,186	142	32.9%	59.9%	24
Manila,MNL-Butuan,BXU	1,109	174,833	158	203.0%	319.0%	44
Manila,MNL-Naga,WNP	1,928	140,312	73	491.4%	316.3%	-30
Cebu,CEB-Ilo Ilo,ILO	1,895	137,586	73	246.4%	125.8%	-38
Manila,MNL-Busuanga,USU	1,699	117,057	69	315.4%	2,537.6%	58
Manila,MNL-Cota Bato,CBO	769	116,828	152	56.6%	103.4%	35
Manila,MNL-Dipolog,DPL	785	109,060	139	150.8%	205.6%	25
Manila,MNL-Tuguegarad,TUG	795	65,966	83	406.4%	268.6%	-31
Cebu,CEB-Zamboanga,ZAM	650	46,754	72	55.5%	-3.6%	-44
Davao,DVO-Zamboanga,ZAM	511	37,086	73	225.5%	93.6%	-49
Manila,MNL-Masbate,MBT	595	31,455	53	829.7%	1,128.7%	13
Manila,MNL-Virac,VRC	468	29,855	64	317.9%	200.2%	-25

VIETNAM DOMESTIC CAPACITY DEVELOPMENTS

Route	2010 annual flights	Annual seats	Aircraft size -seats	10-year difference -flights	10-year difference -seats	10-year difference -size
Hanoi,HAN-Ho Chi Minh City,SGN	9,124	2,051,759	225	171.5%	274.1%	62
Ho Chi Minh City,SGN-Da Nang,DAD	4,674	870,684	186	387.4%	542.7%	45
Hanoi,HAN-Ho Chi Minh City,SGN	2,919	546,011	187	298.8%	437.5%	48
Ho Chi Minh City,SGN-Hue,HUI	1,845	292,866	159	255.5%	345.4%	32
Ho Chi Minh City,SGN-Haiphong,HPH	1,739	267,356	154	568.8%	588.0%	5
Ho Chi Minh City,SGN-Nha-Trang,NHA	1,438	222,238	155	69.0%	268.1%	84
Ho Chi Minh City,SGN-Phuquoc,PQC	3,293	217,338	66	986.8%	1,080.3%	5
Hanoi,HAN-Nha-Trang,NHA	1,132	178,134	157	217.1%	579.5%	84
Hanoi,HAN-Hue,HUI	1,124	176,463	157	95.1%	230.4%	64
Ho Chi Minh City,SGN-Dalat,DLI	828	114,786	139	126.8%	376.5%	73
Ho Chi Minh City,SGN-Quinhon,UIH	432	59,844	139	118.2%	303.0%	64
Hanoi,HAN-Dien Bien Phu,DIN	729	48,114	66	364.3%	364.3%	0
Ho Chi Minh City,SGN-Pleiku,PXU	702	46,332	66	315.4%	315.4%	0

of traffic, and therefore capacity, growth on these 15 routes have been low over the past 10 years compared with routes serving the other major hubs. Capacity has increased by only 17.4%. The 747 has been dropped on many routes, but SIA has replaced it with the 777-300. Average aircraft size has dropped moderately. Average daily frequency has increased from 8.3 to 11.1 flights over the past 10 years, while the number of operators has changed little since 2000.

The other six routes that have experienced high rates of traffic and capacity growth are operations to Manila, Shanghai, Saigon, Brisbane, Phuket and Mumbai. The capacity of the Shanghai route has increased almost fourfold. Capacity on all five routes has increased by a factor of 2.5, compared to service frequency rising by a factor of 2.65 over the same period. The number of airlines on each of these five routes has also increased by about one. Despite this, aircraft size has only decreased slightly by 17 seats to 228. Medium-sized widebodies provide most of the capacity on these operations.

Taiwan

The fourth hub with a mature market is Taipei. Twelve of the top 80 international routes serve the hub, and these experienced a capacity increase of 20% from 2000 to 2010. Average daily frequency was 7.3 flights, increasing to 9.3 flights in 2010; a rise of 27%. This increase in service levels is almost purely due to incumbents raising their frequencies, since there has only been a small overall change in the number of airlines operating. Average aircraft size has declined slightly by 15 to 278 seats.

Thailand

The fifth mature market is Bangkok. Bangkok is similar to Singapore, with 10 routes serving the hub being established, and showing relative signs of maturity. Capacity increase over the past 10 years has been moderate, and has even declined on three routes. Overall capacity on the 10 routes has only increased by 13%; the lowest level of capacity increase on routes serving a major hub in the region. The number of airlines has declined on these airport-pairs, while daily frequencies on each route have increased from 7.5 to 9.8, and average aircraft size has declined by 40 seats to 260.

A similar pattern of development has been seen on established routes serving Seoul. Only moderate rates of capacity increase have occurred on established routes, while smaller aircraft have been deployed.

The overall pattern of small capacity route development in these five markets

The average rate of increase in seat capacity for Indonesia's top 23 routes over the past 10 years is 333%; more than a quadrupling of capacity.

over the past 10 years shows that airlines have, nevertheless, increased frequencies by higher levels, even though there has been little change in the number of airlines operating. This indicates that although the markets are the most mature of those analysed, they have still not reached maturity in terms of typical capacity development. Aircraft size will therefore increase once frequency levels have been saturated.

Malaysia & Korea

Kuala Lumpur and Seoul are two of the other major hubs in the region, but many routes serving them have experienced higher rates of capacity development than more mature markets over the past 10 years. Capacity growth on some routes serving these two hubs has seen total seat numbers double or even quadruple in some cases.

Capacity on the eight main routes serving Kuala Lumpur has increased by about 50%, with frequencies growing at a slightly higher rate. The number of airlines operating on each route has increased by about one, but the frequencies offered by each carrier have also risen since 2000.

The pattern of development is different on younger international routes serving the region, including: China's main international hubs of Beijing and Shanghai; Ho Chi Minh and Hanoi in Vietnam; India's main hubs of Mumbai, Delhi and Chennai; routes from Indonesia's hubs of Jakarta and Denpasar; and younger and less developed routes serving Singapore and Bangkok.

The characteristics of these routes are: high rates of capacity growth, with seat numbers doubling or even trebling since 2000; an increase in the number of airlines; and carriers generally increasing their service frequencies at least by a factor of two, and up to three, between 2000 and 2010.

Routes serving Vietnam are mainly to Ho Chi Minh, from the main hubs of Bangkok, Singapore, Hong Kong, Kuala Lumpur and Tokyo. These have had the high rates of capacity growth, with annual seat numbers trebling since 2000. More airlines have entered the market, and unlike many other markets aircraft size has increased slightly. Like all other routes, medium widebodies are the dominant provider of capacity.

China

Routes serving China's international hubs have experienced similar levels of capacity growth, with seat numbers increasing by 165% since 2000. Most serve Shanghai from Tokyo, Osaka, Nagoya, Singapore, Seoul and Bangkok. The one mature route is Beijing-Tokyo. Airline numbers on these routes have only increased moderately, while average daily frequencies have increased from 2.4 to 8.2. This has caused aircraft size to fall sharply by more than 70 seats.

India

Some of the least developed routes are those serving India. Capacity has increased by almost 100%, a near doubling since 2000 on the seven top routes. The number of airlines per route has also increased by an average of two, from about three to five operators per city-pair. Frequencies have also more than doubled, and aircraft size declined.

Others

There are also groups of young and less developed routes from Singapore and Bangkok in the top 80 international airport-pairs. Capacity has almost doubled on six routes serving Singapore to Manila, Shanghai, Ho Chi Minh, Brisbane, Phuket and Mumbai over the past 10 years, while it has almost quadrupled on Singapore-Shanghai. The number of airlines has been added to, while frequencies have increased from 3.1 to 8.3 per day. Aircraft size has declined moderately while airlines develop capacity on these routes.

Similar rates of development are seen on seven routes serving Bangkok. Capacity has, on average, tripled, while the number of airlines on each route has risen from about three to five.

Domestic markets

There are a large number of domestic markets in the Asia Pacific. The ones that account for the largest portions of traffic are China, India, Japan, Australia, New Zealand, Indonesia, Korea, Vietnam, Taiwan and Malaysia. The Indian and Chinese markets will be analysed in future issues of *Aircraft Commerce*.

The Japanese domestic market is one of the most extensive and the most mature in the region. There are a large number of routes, but few have required any capacity increase or growth over the past 10 years.

The dominant domestic airlines were Japan Airlines (JAL), All Nippon Airways (ANA), and Japan Air System (JAS). The three were the only carriers on the majority of Japan's highest-density domestic routes, but in 2001 JAL acquired JAS, the third largest airline in Japan's domestic network.

Other airlines are JAL Express and Japan Transocean Air, which are subsidiaries of JAL. Hokkaido International and Skymark are the only other independent airlines. Hokkaido operates groups of routes from Tokyo Haneda and Sapporo. A few routes have three or four operators.

The Japanese domestic network has some of the region's busiest routes. Tokyo Haneda-Sapporo is not only the region's busiest airport-pair, but also the busiest route in the world. The top 40 domestic

Unlike many domestic markets in the Asia Pacific, Thai accounts for the majority of capacity in its home market. Traffic volumes are high enough on some domestic routes for the airline to operate large widebodies, despite the sectors being just a few hundred miles in length.

routes in Japan can be divided between those that have experienced capacity growth, and those that have seen a reduction in seat numbers but, overall, there has been little change in capacity since 2000. Despite this, operating frequencies have increased by about one-third since 2000 to an average of 14 flights per day.

In 2000, many of the busiest Japanese domestic routes had operations with 747s configured in high seating densities. Average aircraft size exceeded 350 on the top five busiest routes. Apart from Haneda-Osaka, average aircraft size has dropped below this level. Most 747s used on Japanese routes have been phased out.

Average aircraft size on all routes has declined by an average of 78 seats down to 236. The small changes in overall capacity and the need to increase frequencies, following the retirement of four-engined 747s, and their replacement with smaller twin-engined aircraft, indicates this is a mature market.

Other mature domestic markets are Australia, New Zealand and Thailand. Capacity has increased at a low rate overall in Australia and New Zealand, although there is a clear divide between routes with low or even negative capacity growth, and those that have seen capacity rise at least twofold since 2000.

The busiest routes are some of the highest-density city-pairs in the world. Melbourne-Sydney and Brisbane-Sydney have annual one-way seat capacities of 4.56 million and 2.52 million, respectively. Brisbane-Melbourne and Adelaide-Melbourne have annual one-way seat volumes of 1.65 million and 1.55 million *(see table, page 9)*. These top four routes are comparable with the busiest international routes in the region.

Routes that have experienced a high rate of growth are airport-pairs that were small compared to the dominant routes in 2000. Since then, low-cost airlines Jetstar Airways and Virgin Blue have entered the market and are present on virtually all major routes. Their low fares have contributed to high rates of traffic growth.

These two airlines, like incumbents Qantas and Air New Zealand, use Airbus and Boeing narrowbodies for most of their capacity. This has changed little over the past 10 years.

Thailand is a market where domestic routes are mainly mature, and have experienced low rates of growth since 2000. Many of the busiest routes operate with large aircraft, with about half of them having an average aircraft size in excess of 200 seats. Four routes, including three from Bangkok to Koh Samui, Krabi and Nakhon Si Thammarat, have had high rates of growth, with capacity increasing by 120- 470%.

Unlike other markets, there are few operators. Thai Airways accounts for most of the capacity on these services, using medium and large widebodies, even though most of these routes have mission lengths of just a few hundred miles. Even on the lower-density routes where there are two to four daily flights, widebodies still provide some of the capacity.

The Malaysian domestic market is divided between mature and younger routes with rates of traffic and capacity growth. Capacity has actually declined on many mature routes, and increased at only moderate rates since 2000.

In 2000 the dominant airline was Malaysian, which operated the majority of airport-pairs with a mixture of Fokker 50s and 737-400s. Since then low-cost airline Air Asia has become a dominant carrier in the Malaysian domestic market. The airline operates with A320s, and is present on virtually every domestic route. In many cases it operates at high frequencies, and accounts for more capacity than Malaysian. Air Asia provides most of the capacity on many routes. Despite the change over the past 10 years, aircraft size has changed little. Malaysian still operates with a mix of Fokker 50s, ATR72s and 737-400s, while Air Asia operates the A320.

High rates of capacity growth have been experienced on 15 routes on Malaysia's top 25 domestic airport-pairs. These include some routes which were already established in 2000. Capacity has increased by 80-500% over the past 10 years. As with the mature routes, many were dominated by Malaysian and operated with a mix of Fokker 50s and 737-400s. The rate of growth means that Malaysian now: uses fewer turboprops on many routes, although they are still used on some; continues to operate 737s; and has also increased the proportion of capacity provided by widebodies (A330s and 777-200s). Widebodies have been used in particular longer routes. Aircraft size has therefore increased by an average of 30 seats on these routes.

The top 25 domestic routes in the Philippines exhibit similar characteristics to the Malaysian market. These routes have had modest rates of capacity growth since 2000. The majority serve Manila, but a few also service Cebu and Davao.

The smaller group of mature routes has seen capacity increase by 43%, while frequencies have increased at a lower rate. The Philippine domestic market has several carriers on each route, most of which operate with narrowbodies and turboprops *(see table, page 12)*. Mature routes have high service frequencies, with some having 10-20 daily flights. The high level of frequencies on these routes has seen the need for larger aircraft, and average size has increased by 30 seats.

Another group of 15 routes has had high rates of expansion, with capacity growing by 70-2,500% since 2000. Two routes between Manila, and Malay and Busuanga have had the highest rates of capacity growth. These were operated by small turboprops in 2000, and have grown to high-frequency services utilising medium-sized and large turboprops.

Other routes with high rates of

Vietnam's Hanoi-Ho Chi Minh route has grown to such an extent that it has a highger annual one-way seat capacity of more than 2 million seat. This makes it a busier route than London Heathrow-New York JFK. Vietnam Airlines uses A330s and 777-200s on the route.

capacity expansion have seen increases of 70-1,100%. Unlike other markets of young and fast-growing routes, the service frequencies on these airport pairs have matched rises in seat numbers of about 142% over the past 10 years. This is explained by the need of many operators to take advantage of traffic growth by upgrading to larger equipment to achieve lower costs per seat. Average aircraft size is 116 seats, with services being operated by a mix of turboprops and smaller narrowbodies.

Indonesia and Vietnam have had the highest rates of route and domestic network expansion over the past 10 years *(see tables, page 12)*. Vietnam's top 13 domestic routes have seen annual seat capacity rise by at least 230%, and by as much as 1,080% since 2000. The range of capacity growth is wider in Indonesia, but rates were between 111% and 2,500% over the same period.

Vietnam's top 13 routes are divided between the top five that have always operated with jets, and the remaining eight which utilise a mixture of jets and turboprops. The three shortest are operated exclusively with turboprops.

Capacity growth rate for the other 10 routes has averaged 340% since 2000. High rates of growth have been followed by slightly lower rates of frequency rises, so that average seat size has increased. On the top five routes that utilised jets in 2000, the use of widebodies has increased, and average aircraft size has grown to 198 seats.

The next five routes were operated mainly with large turboprops, particularly the ATR72, in 2000. Capacity has grown to the extent that narrowbodies account for the majority of capacity. ATR72s are still used on some of the shorter routes by Vietnam Airlines, while it also uses A330s and 777-200s on the busiest routes. Average aircraft size has increased by 46 to 198 seats on these five routes.

Hanoi-Ho Chi Minh is the heaviest, and had an annual one-way capacity of more than 2 million seats, making it busier than London-New York, as well as the fourth largest domestic route in the Asia Pacific.

The next five routes are those that operated with a mixture of large turboprops and jets in 2000, and growth in capacity has led to airlines swapping to almost all-jet operations over the past 10 years. Frequencies have therefore increased at only half the rate of total seat numbers, so average aircraft size has increased by 75 to 152 seats.

While many other domestic markets are divided between moderate routes with mature growth rates, and younger airport-pairs with high growth rates, all major routes in the Indonesian domestic market have had high rates of capacity expansion since 2000. The average rate of increase in seat numbers for the top 23 routes is 333%.

Most of these routes serve Jakarta, while smaller numbers also serve Jurambaya and Denpasar. One route with a low rate of growth is Jakarta-Denpasar (CGK-DPS). This is explained by several international carriers in the past using both Denpasar and Jakarta to serve Indonesia. Several intercontinental routes have opened to serve Jakarta direct since 2000, so a lot of large widebody capacity has been taken off the CGK-DPS route. Despite this, a lot of capacity has been added with narrowbodies. Average aircraft size has therefore declined to 187 seats.

High growth rates on all other routes have been followed by increases in service frequencies, but at a lower level. The top seven routes have annual one-way seat capacities of between 1.1 million and 2.5 million. Frequencies on all routes have reached at least seven per day, and are as high as 37 per day on Jakarta-Surabaya. Average daily frequency on the 23 routes has trebled over the past 10 years to 15 services.

The high rate of increase is accompanied by the entry of two new airlines into the Indonesian market: Lion Air and Mandala Airlines. Despite these frequency rises and the introduction of new airlines, aircraft size has increased by 49 seats to 169.

Future growth

Despite the high rates of growth over the past 10 years, many areas of the region are not fully developed and still have a lot of growth potential, including Vietnam and Indonesia, and smaller markets, such as Papua New Guinea, Laos and Cambodia.

Traffic growth is forecast to be about 7% per year, which will stimulate a demand for about 4,600 new aircraft over the next 10 years. This is split between 220 regional jets, 3,020 narrowbodies, 1,280 widebodies and 135 large aircraft.

These numbers compare to the 2,150 aircraft that airlines in the region have on firm order.

Summary

The Asia Pacific has clearly moved away from the era of a small number of national airlines dominating the market on trunk routes with the largest aircraft.

The past 10 years have seen more airlines enter the market, with increased competition as a result. Service frequencies have also grown, and some airlines still seek to increase service levels on a large number of routes. This will result in small changes in aircraft size, which is reflected in the outstanding aircraft orders and market forecasts. AC