



# ***Global Market Forecast 1997 - 2016***

***Confirming  
Very Large Demand***



***March 1997***





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Airbus Industrie's Global Market Forecast projects the evolution of the world's jetliner fleet over the next twenty years, in response to growing demand for air travel as well as the need to replace ageing aircraft. The GMF predicts the demand for deliveries of passenger and Combi aircraft with at least 70 seats to the world's largest 246 airlines, which account for 98% of the currently active passenger fleet. Since the methodology of the Global Market Forecast cannot be applied to the airlines of the CIS, the CIS region will be analysed separately at a later date.

**The Global Market Forecast is a forecast of demand, not a delivery forecast. The extent to which any available aircraft type will penetrate the projected demand will depend on its performance, economic and environmental characteristics compared with those of its competitors.**

Among the 246 airlines covered, Airbus Industrie predicts that from end 1996 to end 2016:

→ **Worldwide demand for air travel will continue to grow strongly.** During the forecast period, passenger traffic (revenue passenger-kilometres) will almost triple, growing at an average annual rate of 5.2%. During the ten years to 2006, RPK growth will average 5.9% per year, but during the next ten years average annual growth will decline to 4.6% as markets approach maturity.

→ **Air travel growth will vary from region to region.** The mature US domestic air passenger market will grow at an average annual rate of only 1.9%, while annual growth in several markets serving the dynamic Asia-Pacific region will average over 7%. Air travel within the People's Republic of China is expected to multiply roughly six times during the next twenty years, growing at nearly 10% per year.

→ **Total fleet capacity will more than double.** Despite increases in average passenger load factor and aircraft productivity, the number of seats in service with the GMF airlines will rise from 1.7 to 4 million in order to accommodate this traffic growth, representing an average annual capacity growth rate of 4.5%.

→ **The active fleet will grow from 9,400 to 17,100 aircraft.** This represents an increase of 83%. Increasing operational efficiency will allow a marginal increase in the number of flights made by each aircraft per year, so this will translate into a slightly higher increase in flight frequencies.

→ **The world's airport and air traffic system will have to accommodate an 84% increase in numbers of flights.** The increase in flight frequencies which will result from spreading liberalisation and continuing origin-&-destination fragmentation will stretch the capacity of the infrastructure despite the building of new airports and progressive implementation of the Future Air Navigation System (FANS).



→ **Average aircraft capacity will increase from 179 to 235 seats.** The proportion of wide-bodied aircraft in the fleet will grow from just over a quarter (28%) to nearly half (44%).

→ **A substantial requirement will develop for a new type of aircraft larger than anything flying today.** To prevent demand for air travel being strangled by infrastructure capacity limitations, the airlines will need more than 1,400 aircraft in size categories above 400 seats, the size of the 747-400.

→ **86% of the current passenger jet fleet will be replaced.** Reductions in productivity and increased operating costs of ageing aircraft, as well as more severe environmental regulations, will result in the retirement and replacement of more than 8,000 jetliners.

→ **To renew their fleets as well as accommodate traffic growth, the airlines will take delivery of almost 16,000 new and used passenger aircraft.** This will include some 8,500 basically single-aisle aircraft with fewer than 210 seats, and 7,300 larger wide-bodies. About half these aircraft will be acquired to accommodate traffic growth, and half to replace ageing aircraft.

→ **An "open market" opportunity exists for delivery of 13,500 aircraft.** At end 1996 a backlog of almost 1,800 aircraft were on firm order by airlines, and a further 500 on firm order by leasing companies but not yet allocated to airlines. The remaining 13,500 aircraft that will be needed represent an opportunity for new aircraft sales, although historical experience suggests that as much as 15% of this demand is likely to be satisfied by used aircraft.

→ **The share of the capacity of the world passenger fleet operated by the airlines of North America will decrease from 39% to 28%.** At the same time the share of world seats operated by the airlines in the Asia-Pacific region and the PRC will increase from 25% to 32%, while the share of the airlines in Europe will grow from 25% to 29%. This is of obvious significance to Airbus Industrie as a non-US supplier.

→ **Most demand for small jetliners will come from Europe and North America; most demand for very large aircraft from Asia-Pacific.** Almost 70% of demand for 70- and 100-seaters will come from the airlines of Europe and North America, and only about 12% from airlines in Asia-Pacific and the PRC. In contrast, demand for aircraft with more than 400 seats will be very largely driven by this latter group, which will account for almost 54% of deliveries in this category.

## Global Market Forecast highlights



Airbus Industrie's 1997 Global Market Forecast (GMF) predicts that during the period end 1996 to end 2016 the world's major airlines will need to acquire nearly 16,000 passenger jetliners (of at least 70 seats) to accommodate traffic growth and replace ageing aircraft.

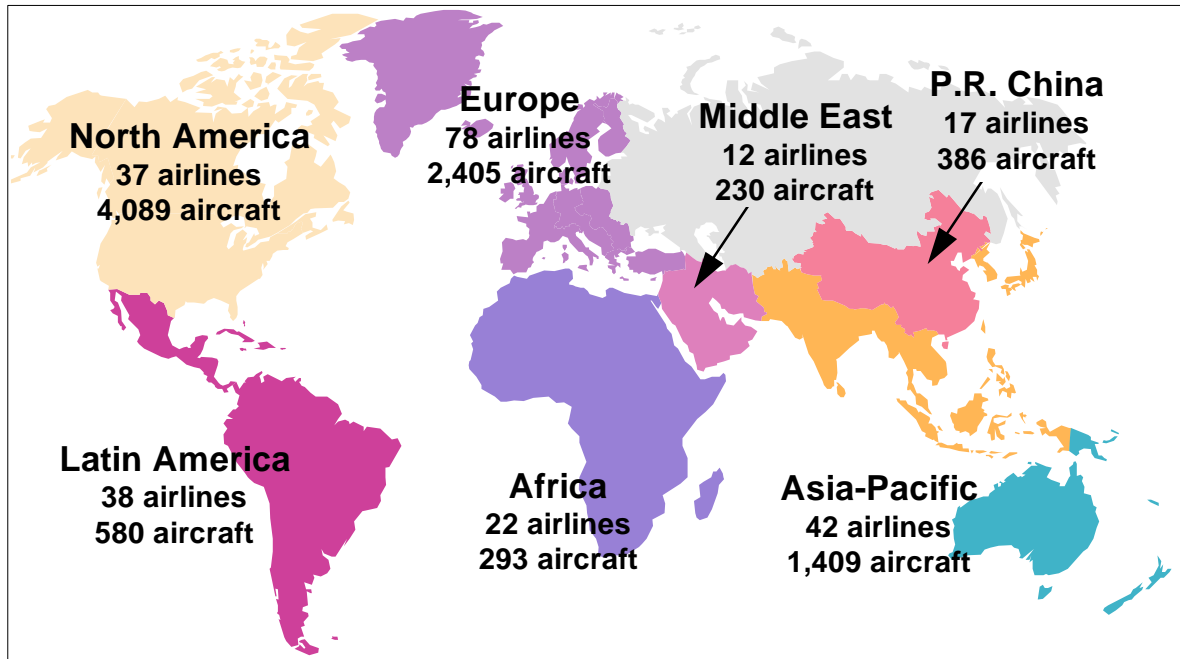
Recognising that traffic in 2015 and 2016 will be substantially greater than in 1995 and 1996, the overall results broadly confirm the projections in the previous (1995) GMF:

	GMF 97	GMF 95
Number of airlines studied	246	214
Average annual traffic growth (RPK)	5.2%	5.1%
Average annual capacity growth (seats)	4.5%	4.7%
Number of aircraft delivered	15,784	14,937
- single-aisles	8,496 (54%)	7,669 (51%)
- wide-bodies	7,288 (46%)	7,268 (49%)
Number of aircraft retired and replaced	8,032	7,281



## Introducing the Global Market Forecast

Airbus Industrie's Global Market Forecast (GMF) projects the evolution from end 1996 to end 2016 of the fleets of the world's largest 246 airlines, domiciled in seven geographical regions.



The GMF covers only passenger and combi jet aircraft of 70 seats and above. Historical experience suggests that these will account for over 96% of new aircraft deliveries.

To facilitate comparison with other forecasts, the results are consolidated into five groups:

- 70 & 100-seaters;
- 125, 150 & 175-seaters;
- 210 & 250-seaters;
- 300, 350 & 400-seaters;
- Larger than 400-seaters.

The smallest group does not measure total demand for small jetliners, since many are likely to be needed by airlines not covered by GMF.

The GMF is the product of a "bottom-up" micro analysis, comprising independent forecasts of passenger traffic growth, productivity changes, and flight frequency/aircraft size relationships in each of 81 domestic and international air service submarkets.

The GMF is a forecast of **demand**. The extent to which any individual aircraft type will satisfy this demand will depend on its performance, economic and environmental characteristics relative to those of competing types.



# Forecast methodology

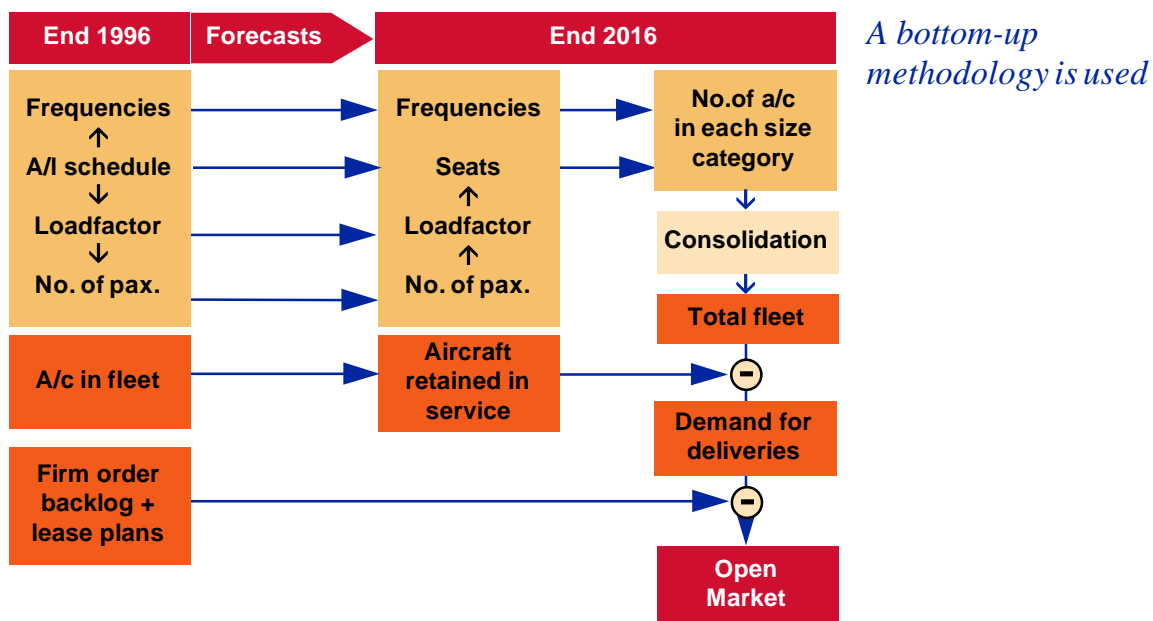


The traffic forecasts are based on secular trends. No attempt is made to forecast the timing of the economic or business cycles. Traffic forecasts in the previous GMF were derived from econometric models using GDP and real fares as variables. Since then Airbus Industrie's forecasters have become aware of the limitations of this technique, especially when applied to maturing markets. Consequently, for a number of markets, the 1997 GMF uses a new forecasting method developed by Airbus Industrie which relates demand for air travel to a population's distribution of income. In addition, in order to better understand the dynamics of demand for air travel, the forecast has been extended from 52 submarkets to 81.

The base status of the world passenger fleet is defined by the September 1996 Official Airline Guide flight schedules, corrected as necessary and adjusted to the end 1996 fleet and orderbook. Each airline's future seat requirements are projected as a function of traffic growth and aircraft productivity development.

The seat requirements are allocated to the various aircraft size categories as a function of flight frequency development. The impact of new route development on airline fleet evolution is simulated in the GMF by the flight frequency development model. The resultant aircraft requirements are partially filled by the current (end 1996) fleet, reduced by planned or projected aircraft phase-outs, and partly by aircraft on firm order at end 1996. The remaining demand in each aircraft size category constitutes the "open market", to be satisfied by future firm orders for new aircraft, operating leases, purchases of second-hand aircraft available after phase-out from their previous operator, or a delay of planned aircraft phase-out by the current operator.

This process enables Airbus Industrie to target future business opportunities with each airline in each aircraft size category. The total demand projected in the GMF is the sum of the individual requirements of the 246 airlines covered.







## Traffic growth and aircraft productivity

The forecast average annual growth of 5.2% in worldwide air passenger traffic (RPKs) will result in traffic almost tripling during the twenty-year period of the forecast.

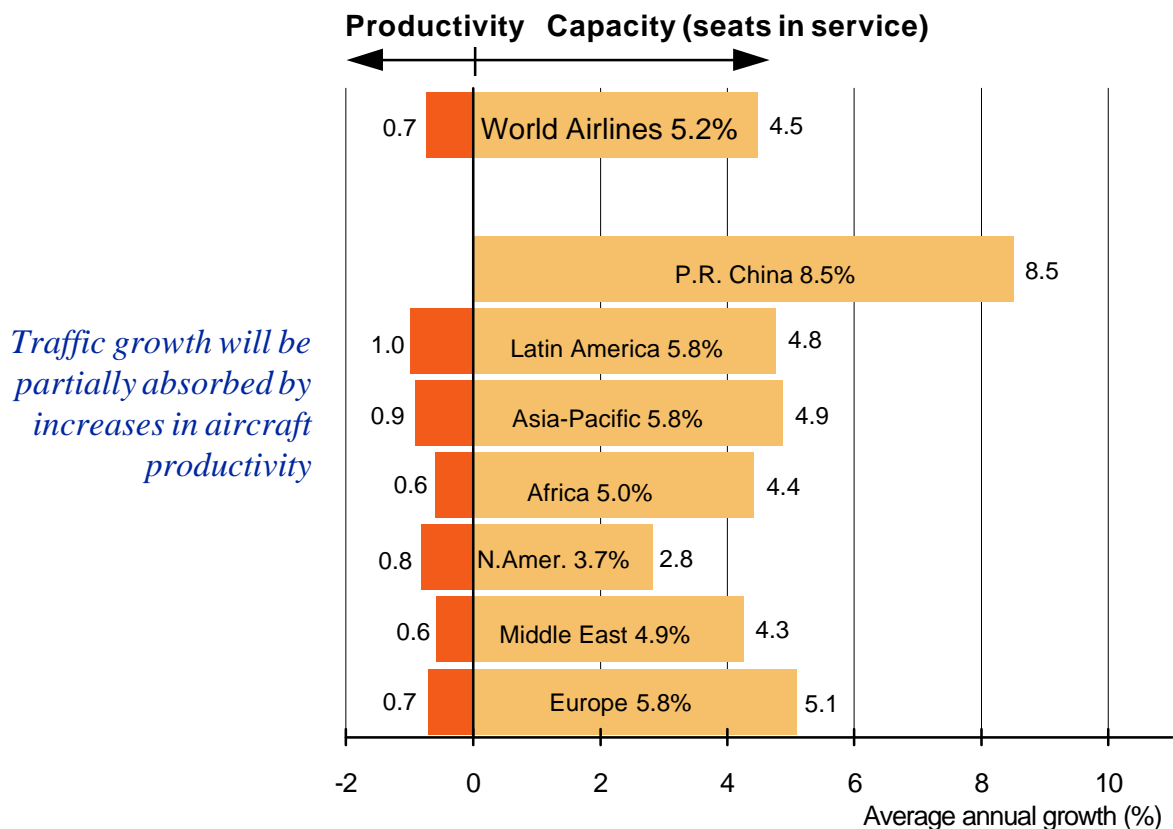
The global average embraces substantially different growth rate projections in the different submarkets, ranging from 1.9% in the mature domestic US market to 9.6% in the emergent PRC market. Appendix 1 lists Airbus Industrie's forecasts of traffic growth for the 81 submarkets analysed.

The traffic growth forecasts for the airlines resident in each geographical region are made up of the growth predicted in each of the submarkets which they serve.

This growth in passenger traffic will be accommodated partly by increases in aircraft productivity (improved airline efficiency, higher speed and utilisation resulting from longer average flight distances and shorter stops, and improvements in scheduled passenger load factors), and partly by increases in fleet capacity (number of seats).

Projected aircraft productivity growth is relatively high for Asian and American airlines, where the potential exists for further increases in passenger load factor. In contrast, utilisation improvements by the PRC domestic airlines are expected to exactly balance the stabilisation of their load factors at normal levels.

Average annual productivity growth of 0.7% leaves a requirement for an average annual increase of 4.5% in fleet capacity. As a result, the capacity of the world passenger fleet will grow by 140% during the forecast period.



# Aircraft replacement and retirement



History shows that at end 1996 95% of all jetliners more than 33 years old had been definitively withdrawn from passenger service.

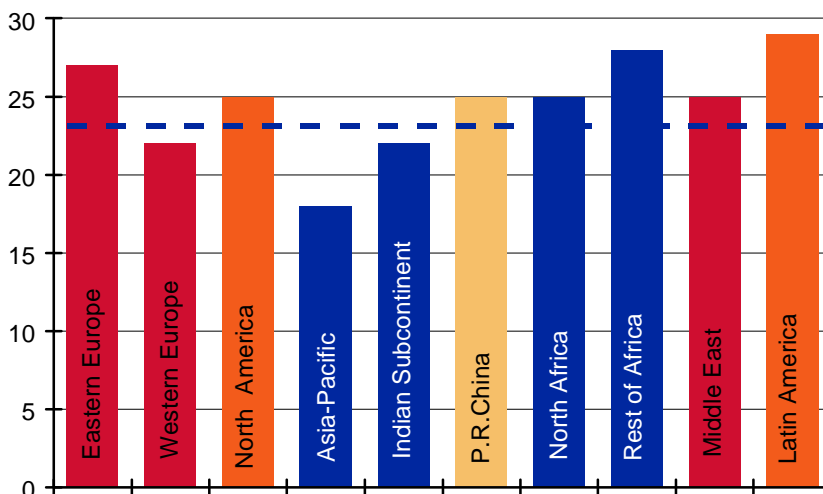
An in-depth analysis of aircraft phase-outs shows a significant recent change in airline behaviour, and that airlines in the different regions behave differently. From 1987 the airlines of Asia-Pacific and Europe have initiated a major fleet renovation process, which has stabilised the average age of their fleet at 8 and 9 years respectively. Consequently Airbus Industrie has changed its aircraft replacement methodology to reflect these new realities.

The GMF takes into account individual airline attitudes to fleet life extension or fiscally-driven fleet roll-overs. Where no specific airline practice is apparent, aircraft are assumed to be retired from passenger service with their first operator at an age which varies from 18 years for airlines in Asia-Pacific to 28 and 29 years for airlines in Africa and Latin America respectively. The expected age at replacement is 22 years for Western European airlines and 25 years for the more conservative airlines of North America.

The overall result is a replacement age of about 23 years worldwide after which these aircraft become available as competitors to new aircraft to satisfy the needs of any airline willing to acquire used aircraft. Historical experience suggests a fleet-wide average of three additional years in passenger service, leading to an average age of around 26 years before costs finally rise above revenues, and the aircraft are converted to cargo, military or other use outside the field of the GMF.

Historically, aircraft have spent on average a further 7 years in less productive non-passenger service before being finally withdrawn from service, resulting in an average operational life of about 33 years. To date, wide-bodied aircraft have on average been retired or converted earlier than single-aisles.

Default replacement age



*On average, aircraft are expected to be replaced at an age of 23 years*

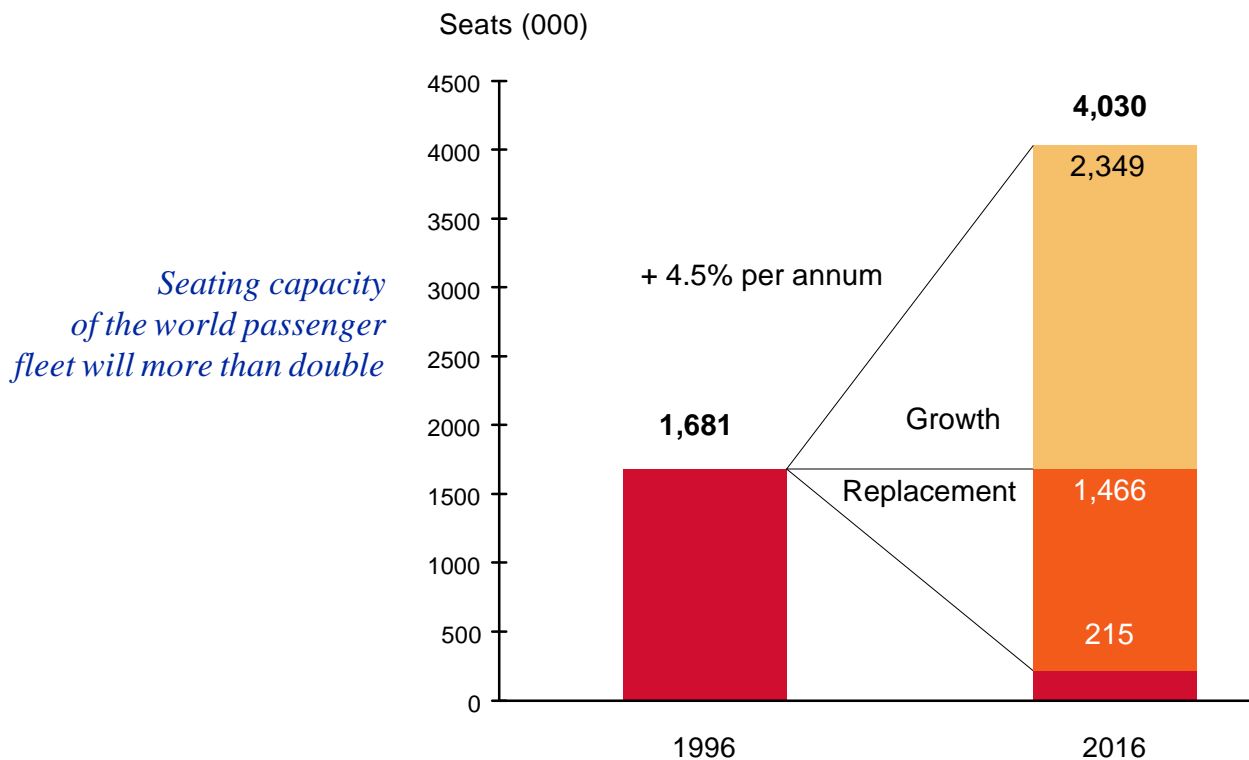


## 20-year world capacity changes

The total capacity of the passenger jetliner fleet covered by the GMF will grow from 1,681,000 seats at end 1996 to 4,030,000 seats at end 2016; an increase of 140%.

Of the 3,815,000 seats acquired during the period, 2,349,000 (62%) will be to accommodate traffic growth, and 1,466,000 (38%) to replace ageing aircraft withdrawn from passenger service.

31% (1,178,000) of seats acquired will be in single-aisle aircraft (basically, aircraft with fewer than 210 seats), and 69% (2,637,000) in larger wide-bodies.



# Capacity/fleet and aircraft size growth

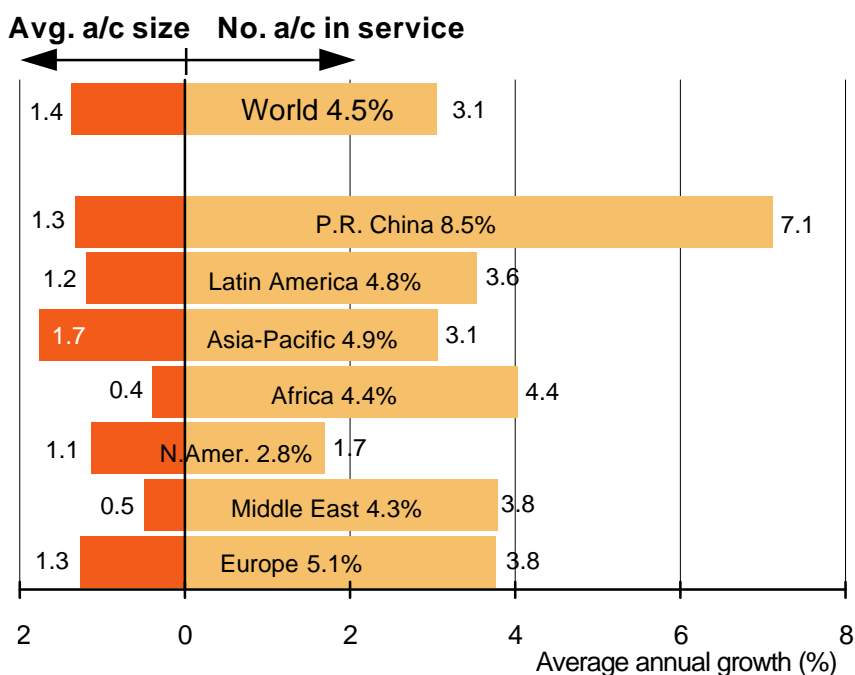


The 140% increase in passenger seats projected over the forecast period will be provided partly by increases in the number of aircraft, and partly by increases in average aircraft seating capacity.

The GMF takes a liberal view of frequency development. Driven by air travel demand, service between individual airport-pairs is allowed to grow to as many as 60 flights per day in short-haul markets, or up to 8 flights per day on long-range routes. The overall result is a projected 20-year growth of 84% in number of flights, an average annual increase of 3.1%. This will present a major challenge to the airports and air traffic management systems. Progressive implementation of the satellite-based Future Air Navigation System (FANS) will ease congestion en-route, but not at airports or in the terminal area, and its contribution will be limited by intercontinental flight scheduling constraints.

Limited potential exists for aircraft to make more flights per year as a result of increased airline efficiency and reduced turnaround times, and this is largely counterbalanced by a progressive increase of some 7% in average flight distance during the forecast period. The net result is a requirement for 83% more aircraft.

To provide the required increase in capacity, the average number of seats offered per flight will have to increase from 158 today to 203 by end 2016. In general, smaller aircraft operate more, shorter flights than larger, longer-range aircraft. To achieve the required numbers of seats per flight, the average capacity of aircraft operated by the world's airlines will have to increase by some 30%, an average annual increase of 1.4%.



*Capacity growth will be provided by increases in aircraft size and numbers of aircraft*



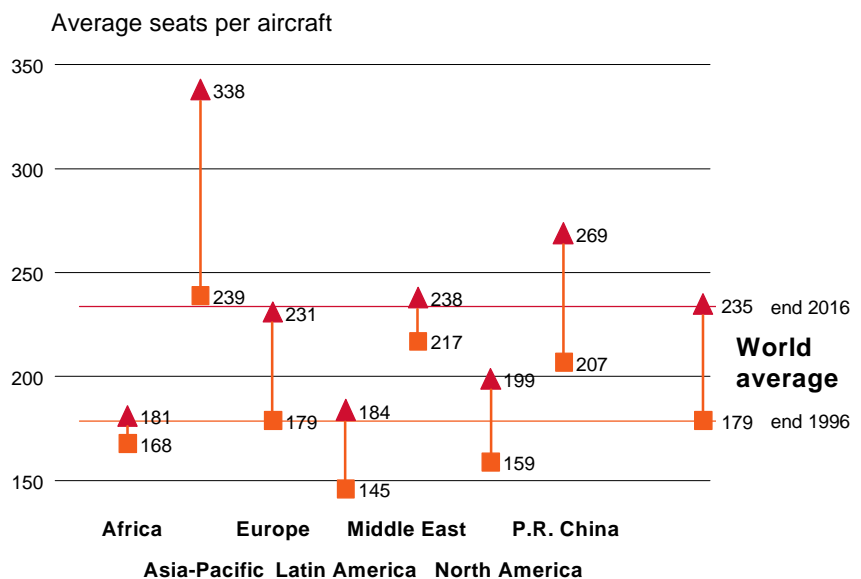
Once again, the global average embraces a wide range of regional variations. 7.1% annual fleet growth among the airlines of the PRC will result in their operating almost four times as many aircraft in twenty years' time as today, while the airlines of North America will increase their fleet by over 40%, at an average annual growth of 1.7%. Higher-than-average aircraft size growth (1.7% per year) is projected for the airlines of Asia-Pacific, with much lower aircraft size growth for the airlines of Africa (0.4%) and the Middle East (0.5%).

As a result, the average capacity of aircraft operated by the world's major airlines will increase from 179 seats at end 1996 to 235 at end 2016.

Aircraft size development among the airlines of most geographical regions will be relatively close to the global average, but continuing high growth among the dynamic Asia-Pacific airlines, whose current average aircraft capacity of 239 seats is already above the projected world average in 2016 (!), will drive their average aircraft size to 338 seats; equivalent to an A330.

To achieve this 100 seat increase in average aircraft size, the Asia-Pacific airlines will have to acquire significant numbers of aircraft larger than anything flying today.

*Asia-Pacific airlines  
will continue to dominate  
the market for large aircraft*



## 20-year world fleet changes

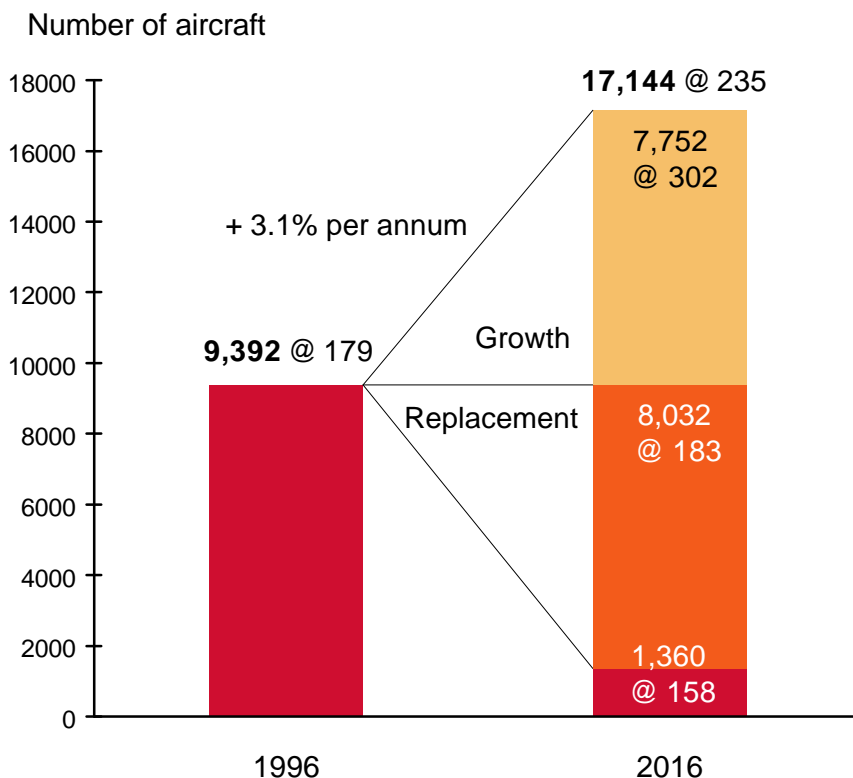


The number of passenger aircraft operated by the airlines covered by the GMF will increase from 9,392 at end 1996 to 17,144 at end 2016.

During this period, 8,032 ageing aircraft (86%) of the currently active fleet will be either retired from passenger service or replaced by more modern types, with 1,360 remaining in service with the same operator at end 2016. The replacement aircraft will have an average capacity of 183 seats, compared with the average 158 seats in the aircraft which will remain in service.

An additional 7,752 aircraft, with an average capacity of 302 seats, will be acquired to accommodate traffic growth. Thus, of the total of 15,784 aircraft acquired during the forecast period, 49% will be to accommodate growth and 51% to replace ageing aircraft withdrawn from passenger service.

The average capacity of aircraft acquired will be 242 seats, equivalent to an A300-600 or an intercontinental A330-200.



*The world passenger fleet will grow by almost 83%*



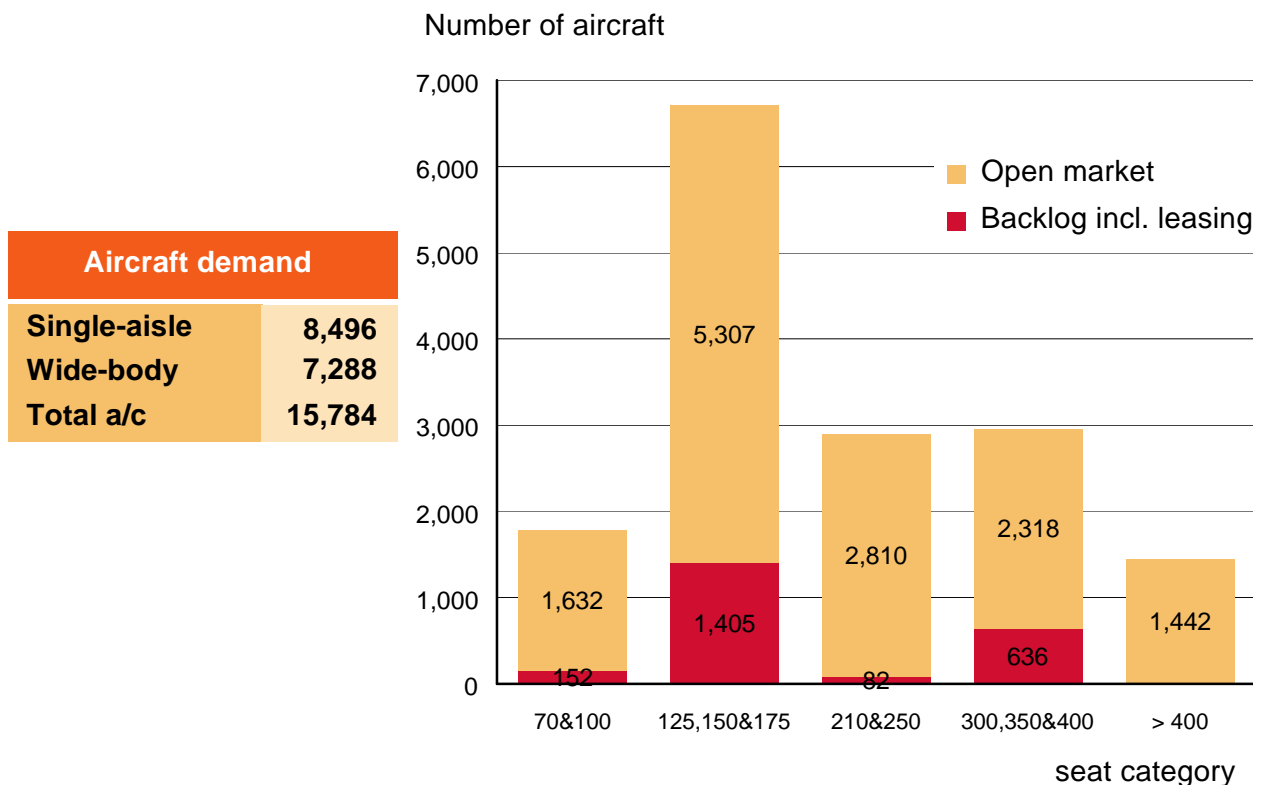
## Demand for deliveries

During the 20-year period, the world's major airlines will require delivery of 15,784 aircraft in size categories from 70 to 1,000 seats. This includes 8,496 single-aisle aircraft (54%) and 7,288 wide-bodies (46%).

The greatest single demand will be for single-aisle aircraft in the 125- to 175-seat categories, where the A320 family is making inroads into what has traditionally been Boeing and Douglas territory.

The forecast demand for 1,784 70- & 100-seaters does not represent the total market potential for aircraft in these size categories, since substantial demand can be expected from smaller airlines whose needs are not included in the GMF.

At the other end of the scale, Airbus Industrie's prediction that infrastructural constraints will prevent flight frequencies growing as rapidly as traffic demand leads inevitably to a substantial need for very large aircraft; the GMF predicts delivery through end 2016 of 1,442 aircraft in size categories above 400 seats, the size of the current 747-400.



# Demand for seats

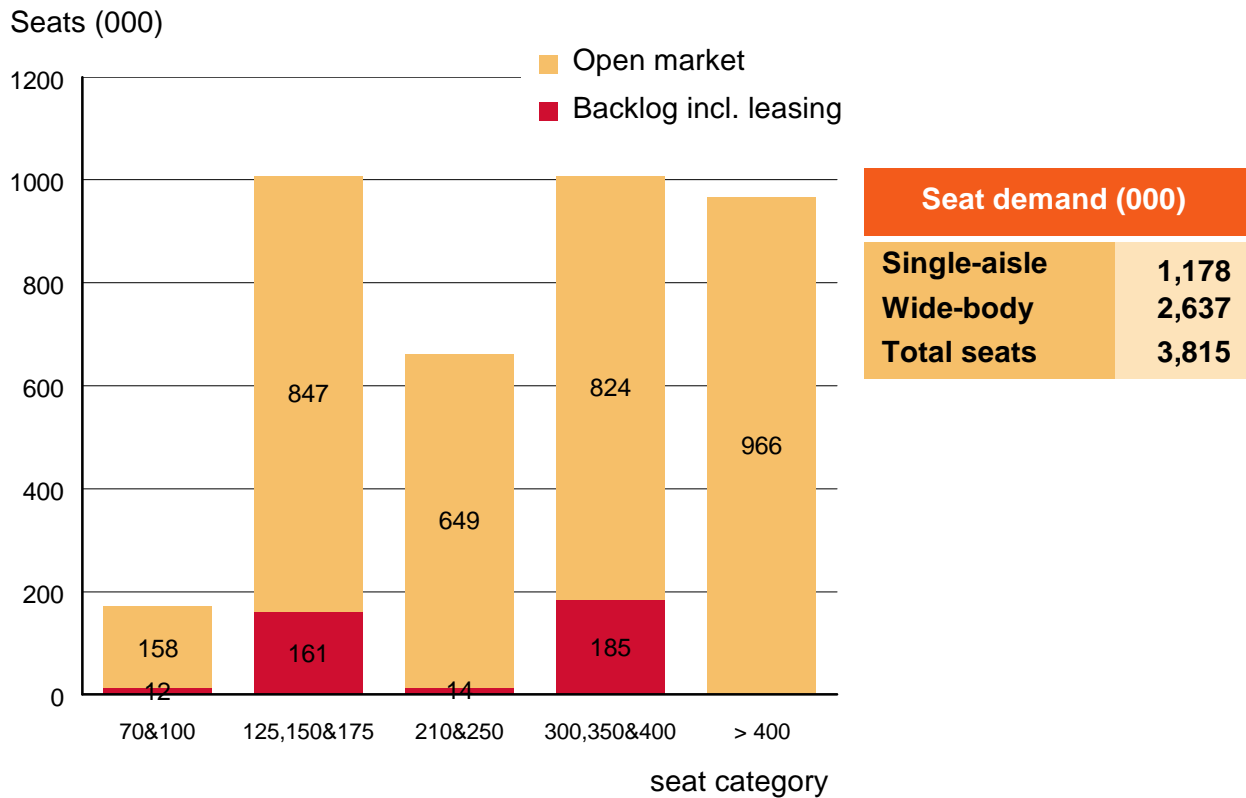


Number of seats may be taken as an approximate indicator of dollar value, so representing the GMF demand forecast in terms of number of seats indicates the relative volumes of business to be expected in the different aircraft size categories.

Compared with the demand for numbers of aircraft, the distribution is skewed heavily to the right.

In total, the world's major airlines will take delivery of 3,815,000 seats, including 1,178,000 (31%) in single-aisle aircraft and 2,637,000 (69%) in wide-bodies.

The forecast requirement for some 966,000 seats in very large aircraft of more than 400 seats (i.e. larger than the 747-400) represents 25% of the total projected business volume.







## **“Open market” opportunity**

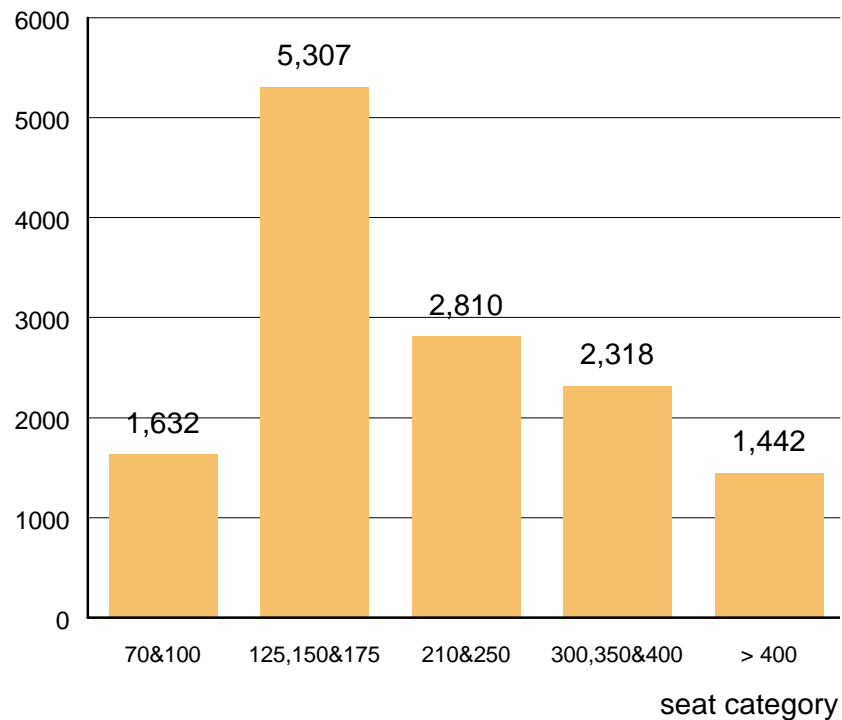
At end 1996, of the 15,784 aircraft delivered during the forecast period:

- 1,792 were on firm order by or for GMF airlines with defined delivery schedules;
- 483 were on firm order by leasing companies, but not yet allocated to airlines

The remaining 13,509 represent an opportunity for sales of new aircraft, although approximately 15% of this demand is likely to be satisfied by used aircraft being recycled back into the world passenger fleet after retirement from their first operator.

Number of aircraft

“Open” demand	
Single-aisle	6,939
Wide-body	6,570
Total a/c	13,509

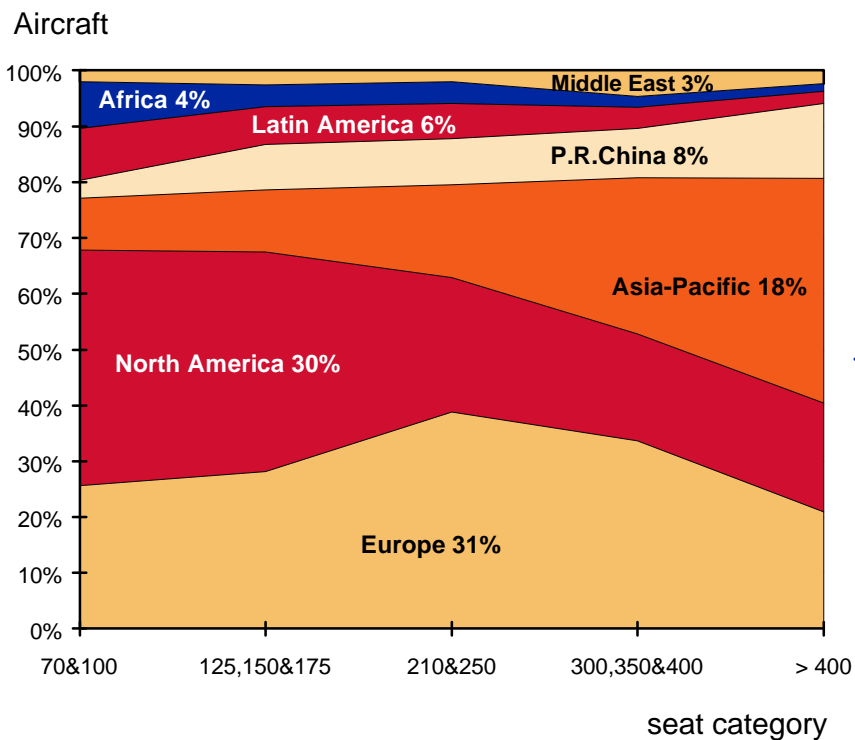


## Regional distribution of aircraft demand



The airlines in North America and in Europe will take respectively 30% and 31% of all aircraft delivered during the forecast period, the airlines of the Asia-Pacific region and the PRC 26%.

Recognising that the GMF does not embrace the total market in the smallest size categories, some 68% of GMF demand for 70- and 100-seaters will come from major airlines in Europe and North America. Only 12% of GMF demand for these categories is accounted for by the major airlines in Asia-Pacific and China. At the other end of the scale, demand for aircraft larger than the 747 will be very largely driven by the airlines of the dynamic Asia-Pacific region and the PRC, which will account for 54% of aircraft to be delivered in this category.



*Demand for smaller aircraft will be dominated by Europe & North America, for very large aircraft by Asia-Pacific & the PRC*



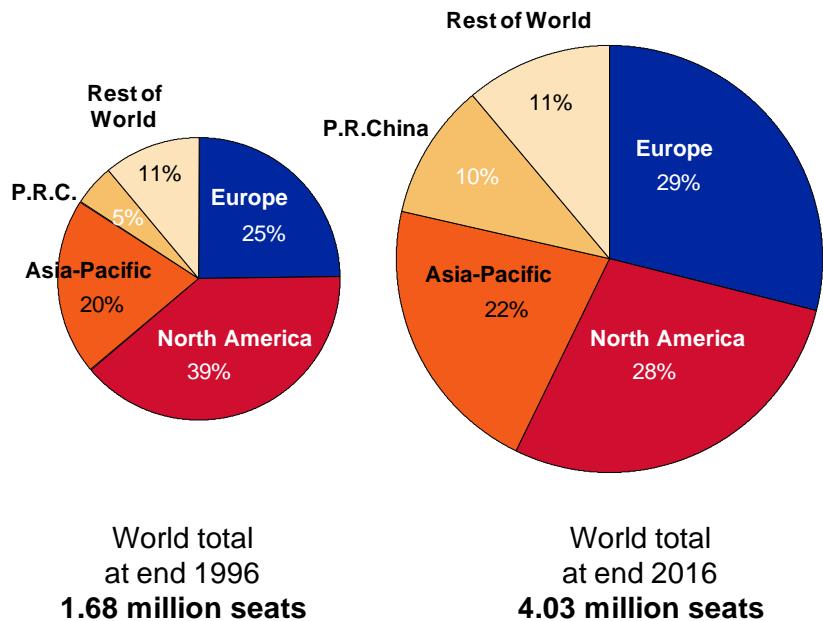
## World fleet development by major region

Higher-than-average traffic growth for the Asia-Pacific and European airlines will result in a significant geographical redistribution of the world's air transport capacity.

During the next twenty years the share of world passenger seats operated by the airlines of North America will fall from 39% to 28%. This is obviously significant to Airbus Industrie as a non-US supplier.

At the same time the Asia-Pacific/PRC airlines will become the world's largest regional group in terms of capacity, with 32% of world seats, while the European airlines' share (29%) will also exceed that of the airlines of North America.

*Capacity of the European and the Asia-Pacific/PRC passenger fleets will overtake that of North America*







## Appendix 1: 81 submarket traffic growth forecasts



Submarket	% of world RPK	Avg. annual growth (%)		
		1996 -2006	2006 -2016	1996 -2016
Domestic USA	22.39%	2.6	1.3	1.9
Europe - USA	9.95%	5.8	4.8	5.3
Asia - USA	6.13%	7.5	5.6	6.6
Europe - Asia	5.48%	8.7	7.4	8.1
Intra Europe	5.29%	6.1	5.1	5.6
Intra Asia	3.50%	7.1	5.8	6.4
Domestic Asia	3.03%	3.3	2.4	2.8
Domestic Japan	2.24%	3.3	2.4	2.8
Pacific - Asia	2.16%	7.1	5.8	6.4
USA - Central America	2.09%	7.0	5.8	6.4
Africa - Europe	1.94%	5.3	4.4	4.8
Domestic Europe	1.92%	6.1	5.1	5.6
Domestic P.R.China	1.91%	13.2	6.2	9.6
Latin America - Europe	1.59%	8.2	6.4	7.3
Canada - Europe	1.40%	5.8	4.8	5.3
USA - Latin America	1.37%	7.0	5.8	6.4
Europe - Middle East	1.37%	5.9	4.3	5.1
Central America - Europe	1.36%	5.8	4.6	5.2
Domestic Pacific	1.07%	5.8	4.6	5.2
Domestic Latin America	1.04%	4.5	4.6	4.5
USA - Canada	1.03%	2.9	1.6	2.2
Intra CIS	1.02%	6.1	4.7	5.4
Europe - Indian Subc.	1.00%	5.9	4.3	5.1
Europe - Pacific	0.97%	5.9	4.3	5.1
Pacific - USA	0.96%	7.6	6.4	7.0
Domestic Canada	0.77%	6.1	5.1	5.6
Middle East - Indian Subc.	0.75%	5.9	4.3	5.1
Canada - Asia	0.75%	7.5	5.6	6.6
CIS - Europe	0.74%	6.1	4.7	5.4
Middle East - Asia	0.74%	4.7	4.0	4.4
P.R.China - Asia	0.62%	7.1	5.8	6.4
Domestic Indian Subc.	0.56%	7.8	4.5	6.1
Domestic Brazil	0.56%	5.6	6.6	6.1
Domestic Central America	0.52%	4.5	4.6	4.5
Intra Middle East	0.50%	5.0	4.7	4.9
Domestic Mexico	0.49%	3.0	0.8	1.9
Indian Subc. - Asia	0.40%	7.1	5.8	6.4
Domestic Middle East	0.39%	4.7	4.0	4.4
Intra Pacific	0.36%	5.8	4.6	5.2
Europe - P.R.China	0.34%	8.7	7.4	8.1
Domestic CIS	0.29%	6.1	4.7	5.4
Intra Latin America	0.29%	4.5	4.6	4.5

continued ...



Submarket	% of world RPK	Avg. annual growth (%)		
		1996 -2006	2006 -2016	199 -201
Latin America - Asia	0.28%	5.8	4.6	5.2
Middle East - USA	0.24%	5.8	4.6	5.2
P.R.China - USA	0.22%	7.5	5.6	6.6
Intra Africa	0.21%	5.2	3.9	4.5
Africa - Asia	0.20%	7.2	5.4	6.3
Domestic Africa	0.20%	5.2	3.9	4.5
Latin America - Central America	0.20%	5.8	4.6	5.2
CIS - USA	0.17%	6.1	4.7	5.4
Africa - USA	0.13%	5.3	4.4	4.8
CIS - Asia	0.13%	6.1	4.7	5.4
Africa - Middle East	0.12%	7.8	4.5	6.1
Domestic - Colombia	0.11%	5.9	6.6	6.2
Central America - Asia	0.08%	5.8	4.6	5.2
Africa - Pacific	0.07%	7.2	5.4	6.3
Middle East - Pacific	0.07%	4.7	4.0	4.4
Africa - Indian Subc.	0.07%	7.8	4.5	6.1
Intra Central America	0.07%	5.8	4.6	5.2
Central America - Canada	0.07%	7.0	5.8	6.4
CIS - Middle East	0.06%	6.1	4.7	5.4
Intra Indian Subc.	0.06%	7.8	4.5	6.1
Latin America - Canada	0.05%	7.0	5.8	6.4
CIS - P.R.China	0.05%	6.1	4.7	5.4
Latin America - Africa	0.04%	5.8	4.6	5.2
CIS - Indian Subc.	0.04%	6.1	4.7	5.4
Canada - P.R.China	0.03%	7.5	5.6	6.6
Canada - Middle East	0.03%	5.8	4.6	5.2
Latin America - Pacific	0.03%	5.8	4.6	5.2
CIS - Latin America	0.02%	6.1	4.7	5.4
Pacific - P.R.China	0.02%	7.1	5.8	6.4
CIS - Africa	0.02%	6.1	4.7	5.4
Pacific - Indian Subc.	0.02%	5.8	4.6	5.2
CIS - Central America	0.01%	6.1	4.7	5.4
Canada - CIS	0.01%	6.1	4.7	5.4
Africa - P.R.China	0.01%	7.2	5.4	6.3
Middle East - P.R.China	<0.01%	4.7	4.0	4.4
P.R.China - Indian Subc.	<0.01%	7.1	5.8	6.4
Central America - Africa	<0.01%	5.8	4.6	5.2
Canada - Pacific	<0.01%	7.6	6.4	7.0
Charter		6.3	4.2	5.4
<b>Total world</b>		<b>5.9</b>	<b>4.6</b>	<b>5.2</b>

## Appendix 2: Airlines analysed



### 78 European Airlines

AAN	Oasis International Airlines	CTN	Croatia Airlines	LIT	Air Littoral
ACF	Air Charter	CYP	Cyprus Airways	LOT	Polish Airlines
ADR	Adria	DLH	Lufthansa	LTU	LTU + LTS + LTE
AEA	Air Europa	DMA	Maersk Air	MAH	Malev Hungarian Airlines
AEF	Aerolloyd	EBA	Eurobelgian Airlines	MON	Monarch Airlines
AEL	Air Europe SPA	EEZ	Eurofly SPA	MPH	Martinair
AFR	Groupe Air France	EIN	Aer Lingus	OAL	Olympic Airways
AIH	Airtours	ELY	EI AI	OHY	Onur Air
AIZ	Arkia	EWG	Eurowings	PGA	Portugalia
AMC	Air Malta	FIN	Finnair	PGT	Pegasus Airlines
AMM	Air 2000	FUA	Futura International Airways	ROT	Tarom
AOM	AOM French Airlines	GBL	GB Airways	RYR	Ryanair
AUA	Austrian Airlines	GMI	Germania	SAB	Sabena
AYC	Aviaco	HLF	Hapag Lloyd Flug	SAS	SAS
AZA	Alitalia Group	IBE	Iberia	SLR	Sobelair
BAL	Britannia Airlines	ICE	Icelandair	SPP	Spanair
BAW	British Airways	ISS	Meridiana Spa	SWR	Swissair
	+ BAG + TAT+ BAB	IST	Istanbul Airlines	SXS	Sunexpress
BER	Air Berlin	JAT	JAT Yugoslovenski Aerotransp.	TAP	Air Portugal
BMA	British Midland Airways	JEA	Jersey European Airways	THY	Turkish Airlines
BRA	Braathens Safe	KLM	Royal Dutch Airlines	TRA	Transavia
BWL	British World Airlines		+ CityHopper	TSW	TEA Switzerland
CFG	Condor Flugdienst	LAZ	Balkan Bulgarian Airlines	TWE	Transwede
CKT	Caledonian Airways	LDA	Lauda Air	VIR	Virgin Atlantic Airways
CRL	Corsair	LEI	Leisure International Airways	VIV	Viva Air
CRX	Crossair	LGL	Luxair	VKG	Premiair
CSA	Czech Airlines	LIB	Air Liberte		

### 37 North American Airlines

A6T	Airtran	DAL	Delta	TOW	Tower Air
AAH	Aloha Airlines	FFT	Frontier	TSC	Air Transat
AAL	American Airlines	GRA	Great American Airways	TWA	Trans World Airlines
ACA	Air Canada + Air BC + Air Nova	HAL	Hawaiian Air	UAL	United Airlines + Air Wisconsin
AMT	American Trans Air	JEX	Midway Airlines	USA	USAir
ASA	Alaska + Horizon Air	KIA	Kiwi International Airlines	USS	USAir Shuttle
ASE	Atlantic Southeast	MEP	Midwest Express	VCT	Viscount Air Service
AWE	America West	NWA	Northwest Airlines	VDG	Vanguard Airlines
CAA	Carnival Air Lines	ROA	Reno Air	VLJ	Valujet
CDN	Canadian Inter'l + feeders	SCX	Sun Country Airlines	WOA	World Airways
CLI	Air Club International	SOZ	Air South	WPZ	Western Pacific Airlines
CMM	Canada 3000 Airlines	SWA	Southwest Airlines		
COA	Continental Airlines	SWG	Spirit Airlines		

### 42 Asia-Pacific Airlines

AAA	Ansett Australia + Subsidiaries	FJI	Air Pacific	MKG	Uni Air
AAR	Asiana Airlines	GIA	Garuda Indonesian	MNA	Merpati
AIC	Air India	HVN	Vietnam Airways	MUQ	Air Macau
ALK	Air Lanka	IAC	Indian Airlines	PAL	Philippine Air Lines
ANA	All Nippon Airways	JAA	Japan Asia Airways	PIA	Pakistan International Airlines
ANG	Air Niugini	JAI	Jet Airways	QFA	Qantas
ANK	Air Nippon	JAL	Japan Airlines	RBA	Royal Brunei Airlines
ANZ	Air New Zealand	JAS	Japan Air System	RNA	Royal Nepal Airlines
BBC	Biman Bangladesh Airlines	JTA	Japan Transocean	RSO	Aero Asia
BOU	Bouraq Airlines	KAL	Korean Air	SAH	Sahara India Airlines
CAL	China Airlines + Mandarin	MAS	Malaysia Airlines	SIA	Singapore Airlines + Silkair
EVA	Eva Airways	MDL	Mandala Airlines	SSR	Sempati Air
EWA	East-West Airlines	MDT	Modiluft	THA	Thai International
FEA	Far Eastern Air Transport	MGL	Mongolian Airlines	TNA	Transasia





## 17 Airlines in the People's Republic of China

CBF	China Northern	CSC	Sichuan Airlines	CXJ	China Xinjiang Airlines
CCA	Air China	CSH	Shanghai Airlines	CXN	China Southwest Airlines
CES	China Eastern	CSN	China Southern Airlines	CYH	Yunnan Airlines
CHH	Hainan Airlines	CSZ	Shenzen Airlines	CYN	Zhongyuan Airlines
CNW	China Northwest	CWU	Wuhan Airlines	HDA	Dragonair
CPA	Cathay Pacific	CXA	Xiamen Airlines		

## 22 African Airlines

AGN	Air Gabon	KQA	Kenya Airways	RAM	Royal Air Maroc
AZW	Air Zimbabwe	LAM	Lineas Aereas de Mocambique	RKA	Air Afrique
BOP	Sun Air	MAU	Air Mauritius	SAA	South African Airways
CAW	Comair Commercial Airways	MDG	Air Madagascar	SUD	Sudan Airways
DAH	Air Algerie	MSR	Egyptair	TAR	Tunis Air
DTA	TAAG	NGA	Nigeria	UYC	Cameroun Airlines
ETH	Ethiopian Airlines	OKJ	Okada Air		
GHA	Ghana Airways	QNK	Kabo Air		

## 12 Middle Eastern Airlines

GFA	Gulf Air	KAC	Kuwait Airways	RJA	Royal Jordanian Airlines
IRA	Iran Air	MEA	Middle East Airlines	SVA	Saudi Arabian Airlines
IRC	Iran Asseman Airlines	OAS	Oman Air	SYR	Syrian Arab Airlines
IYE	Yemenia	QTR	Qatar	UAE	Emirates

## 38 Latin American Airlines

ACN	Aero Continente	EEA	Ecuatoriana	SAM	SAM Colombia
AES	Aces	GUG	Aviateca	SER	Aerocalifornia
AJM	Air Jamaica	ICT	Intercontinental Colombia	SET	SAETA
AMX	Aeromexico	LAN	Lan Chile	SVV	Servivensa
ARG	Aerolineas Argentinas	LCO	Ladeco	TAE	Tame
ARU	Air Aruba	LLB	Lloyd Aero Boliviano	TAI	TACA International Airlines
AUT	Austral	LPR	LAPA Lineas Aereas Privadas	TAM	TAM Linha Aerea Regional
AVA	Avianca	LRC	Lacsa	TBA	Transbrasil
AVE	Avensa	MXA	Mexicana	TEJ	TAESA
BWA	BWIA	PLI	Aeroperu	VIA	Viasa
CFP	Faucett	PUA	Pluna	VRG	Varig
CHP	Aviacsa	RPB	Aerorepublica Colombia	VSP	VASP
CMP	Copa Panama	RSL	Rio Sul		





## Appendix 3: GMF results by size category

### Single-aisle categories 70 - 175

Aircraft Type	1996 in service	2016	Replacements	Deliveries
<b>70 &amp; 100</b>		<b>1632</b>		<b>1632</b>
AVRO 100	31	23	8	
AVRO 70	8	4	4	
AVRO 85	32	41	6	15
BAC1-11	47		47	
DC-9-10	71		71	
DC-9-20	4		4	
F28	82		82	
F70	32	34	14	16
TU-134	25		25	
737-100	17		17	
737-600		114		114
BAE146	122	7	115	
CONCORDE	6		6	
DC-9-30	415	1	414	
F100	254	123	138	7
<b>125, 150 &amp; 175</b>		<b>5307</b>		<b>5307</b>
727-100	119		119	
737-200	814	21	793	
737-300	885	311	709	135
737-500	309	186	188	65
A319-100	18	138		120
DC-9-40	43		43	
DC-9-50	81		81	
MD-80-81	122	3	119	
MD-80-82	545	25	521	1
MD-80-83	206	77	144	15
MD-80-87	79	12	67	
707	14		14	
727-200	585		585	
737-400	379	79	347	47
737-700		217	1	218
737-800		179	6	185
A320-100	18		18	
A320-200	517	434	343	260
MD-80-88	143	36	112	5
MD-90-30	38	115	25	102
TU-154	34	1	33	
757-200	634	312	421	99
757-300		12		12
A321-100	56	101	32	77
A321-200	2	66		64
IL-62	2		2	

<b>Open Market</b>				<b>6939</b>
<b>Backlog</b>				<b>1557</b>
<b>Total SA</b>	<b>6789</b>	<b>9611</b>	<b>5674</b>	<b>8496</b>

### Wide-body categories 210 - 1000

Aircraft Type	1996 in service	2016	Replacements	Deliveries
<b>210 &amp; 250</b>		<b>2810</b>		<b>2810</b>
767-200	118	4	114	
767-200ER	114	19	98	3
A310-200	54		54	
A310-300	128	27	105	4
767-300	87	19	83	15
767-300ER	291	153	190	52
A300-600	33	5	28	
A300-600R	152	29	129	6
A300B4	126		126	
A340-200	19	10	11	2
<b>300, 350 &amp; 400</b>		<b>2318</b>		<b>2318</b>
747SP	21		21	
777-200A	44	40	37	33
777-200B		31	2	33
777-200B+		134	24	158
A300B2	32		32	
A330-200		33	2	35
A340-300	68	111	42	85
DC-10-30	127		127	
DC-10-40	38		38	
L1011	136		136	
MD-11	125	54	78	7
747-200	237	6	231	
747-300	75		75	
A330-300	48	78	48	78
DC-10-10	63		63	
IL-86	3		3	
MD-11ER	3		5	2
747-100	84		84	
747-400	357	171	342	156
777-300		39	10	49
<b>&gt; 400</b>		<b>1442</b>		<b>1442</b>
747SR	16		16	
747-300SR	4		4	

<b>Open Market</b>				<b>6570</b>
<b>Backlog</b>				<b>718</b>
<b>Total WB</b>	<b>2603</b>	<b>7533</b>	<b>2358</b>	<b>7288</b>

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