



Global Market Forecast

Growing Horizons

2017 / 2036

AIRBUS

**“The world is a book
and those who do
not travel read only
one page.”**

Augustine of Hippo

Introduction

With aviation's growth and the shortening of travel times to almost any point on the globe, the world has metaphorically become a much smaller place. Journeys which just a generation ago would have taken weeks can now be achieved in a day or even less. For the passenger however, aviation has provided much more. It has also grown individual horizons, expanding exponentially the places, people, cultures and experiences that travellers can access with just a few clicks to book their flights. The United Nations World Tourism Organisation has shown how travel for tourism purposes has expanded globally: in the 1950's, the top 15 country destinations absorbed 98% of all international tourist arrivals; in the 70's the proportion was 75%, in the new millennium this fell to less than 60% and is sure to fall further. This clearly shows the emergence of new travel destinations, many of them in developing countries.

But does travel grow horizons? A survey¹ carried out in 2016, of people who have taken time from their professional lives to travel, stated that over 80% had learned more about the places, people, and cultures they had visited, more than 80% also said they had new experiences, 60% made new friends, and interestingly nearly 70% said they learned more about themselves.

But we really don't need statistics or surveys to tell us this; we have all experienced the knowledge and personal understanding of the world and it's people that travel and in particular air travel can bring.

We hope that you find the 2017 Global Market Forecast informative and useful. We seek to improve our analyses continually, and your questions, challenges and suggestions help us advance towards this goal. Don't forget you can download our App to your smartphone. It complements the forecast and enables you to have facts, figures and insights at your fingertips wherever you go. If all you want are the numbers, you can also download an excel sheet from Airbus.com.

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01

Executive summary

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Exida
it
alida



Departures

Arrivals

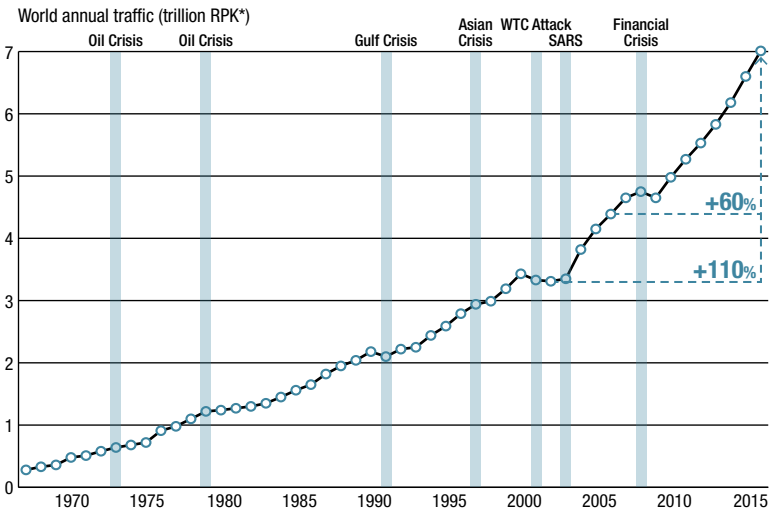


- Strong and resilient passenger traffic growth.
- Air traffic (RPK) doubles every 15 years.
- As air transport develops, drivers evolve, with some becoming more significant, including private consumption.
- Demand for 34,900 new aircraft by 2036:
~34,170 passenger aircraft and 730 freighters
~40% of passenger aircraft demand needed for replacement, and ~60% for growth.
- Single-aisle represent 71% of units, and widebodies represent 54% of value.
- Asia Pacific will account for 41% of the demand, with the US and Europe together representing 36%.

Air transport is a growth market

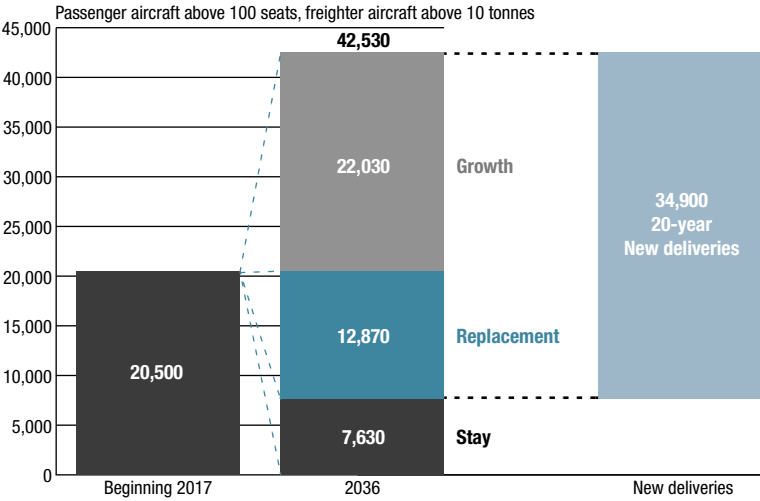
60%
growth over
the last ten years

More than double
since 9/11



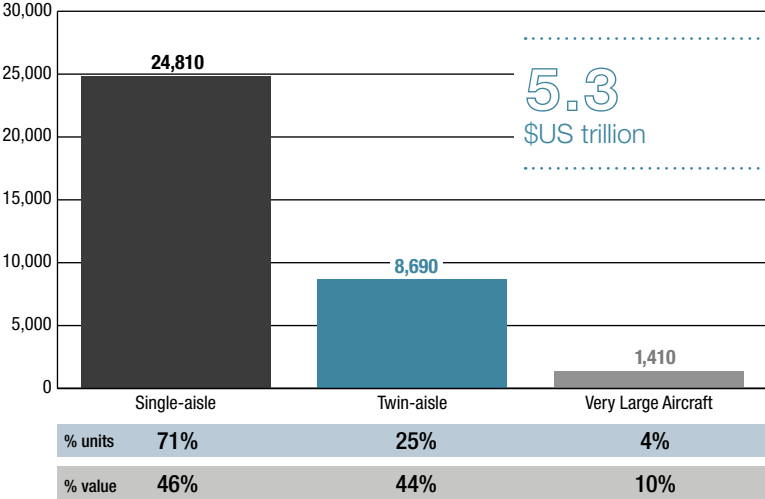
AIR TRAVEL HAS PROVED TO BE RESILIENT TO EXTERNAL SHOCKS

Source: ICAO, Airbus GMF 2017



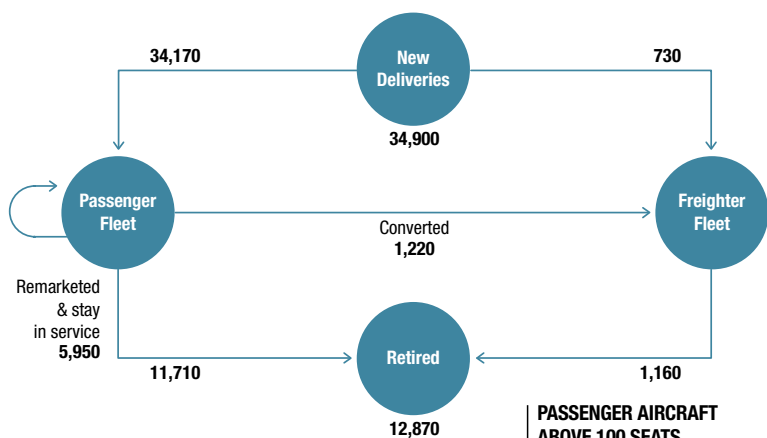
FLEET IN SERVICE EVOLUTION

Source: Airbus GMF 2017
Rounded figures to the nearest 10



20-YEAR NEW DELIVERIES OF PASSENGER AND FREIGHTER AIRCRAFT: 34,900 UNITS

Source: Airbus GMF 2017
Rounded figures to the nearest 10



**PASSENGER AIRCRAFT
ABOVE 100 SEATS
AND FREIGHTER AIRCRAFT
ABOVE 10 TONS**

Source: Airbus GMF 2017
Rounded figures to the nearest 10

	2017 2026	2027 2036	2017 2036	SHARE OF 2017-2036 NEW DELIVERIES
AFRICA	350	700	1,050	3%
ASIA-PACIFIC	6,140	8,140	14,280	41%
CIS	340	860	1,200	3%
EUROPE	2,640	4,180	6,820	20%
LATIN AMERICA	940	1,730	2,670	8%
MIDDLE EAST	1,260	1,270	2,530	7%
NORTH AMERICA	2,360	3,260	5,620	16%
FREIGHTERS	410	320	730	2%
WORLD TOTAL	14,440	20,460	34,900	100%

**NEW AIRCRAFT
DEMAND PASSENGER
AND FREIGHTERS**

Source: Airbus GMF 2017



02

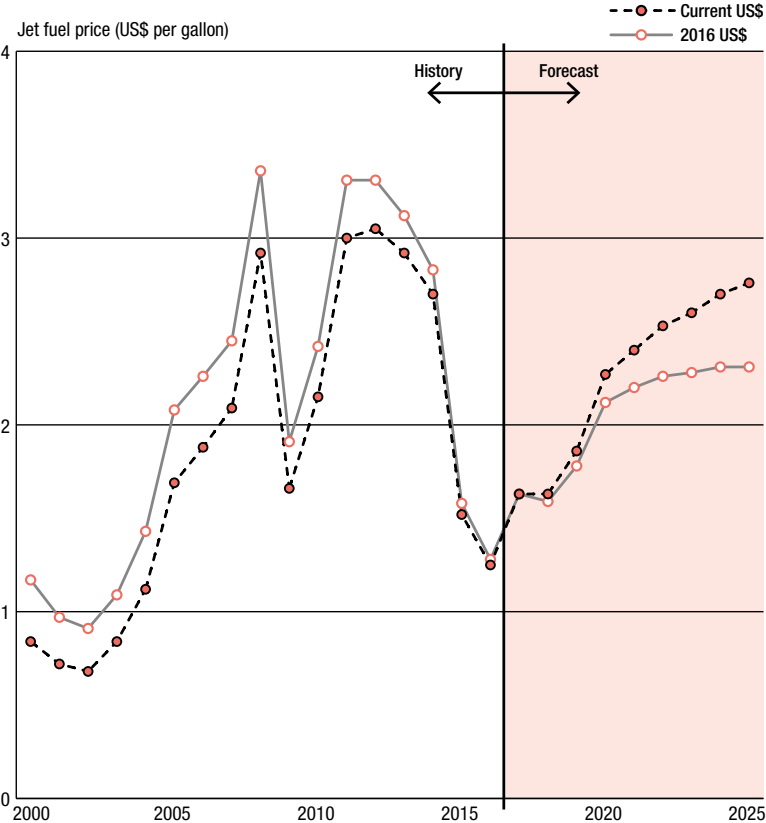
**Demand for
air travel**



THOUGHTS ON THE SHORT TERM

- Oil and jet fuel prices are an important component in airline operating costs, with their relatively low levels, whilst not the whole story, playing a large part in the improved airline profitability during the period. Airlines had an operating result of \$58.3 billion in 2016.
- In the short to medium term, forecasts suggest that oil and jet fuel prices will recover over time, although may not reach the peak levels of the past.

Airlines had an operating result of \$58.3 billion in 2016

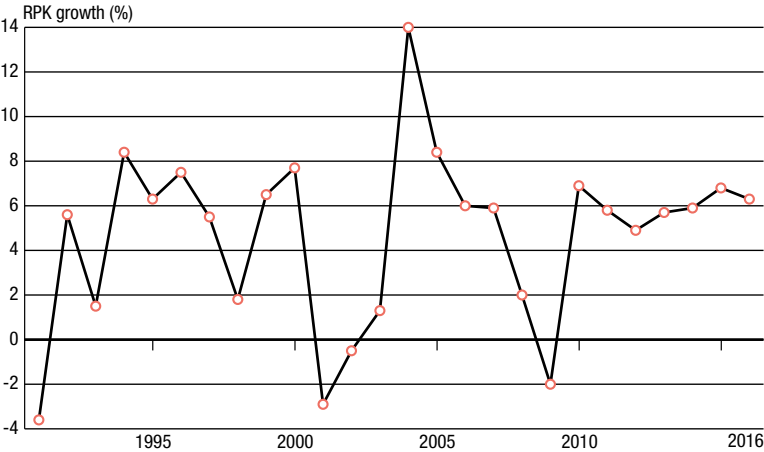


JET FUEL PRICES FORECAST TO RECOVER IN THE MEDIUM TERM

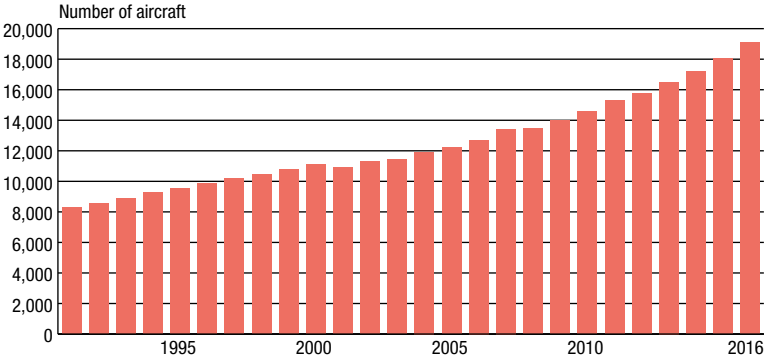
Source: IHS Energy, Airbus GMF 2017

- Passenger traffic grew impressively again in 2016, with 6.3% year over year growth, supporting an increase in the passenger fleet of aircraft over 100 seats to over 19,000 aircraft, and also supporting record levels of deliveries from the manufacturers.

PASSENGER TRAFFIC YEAR-ON-YEAR GROWTH



PASSENGER AIRCRAFT* IN SERVICE



* Western-built passenger aircraft ≥100 seats

- At time of writing, leading indicators for the industry remain positive, with aircraft more productive and the share of stored aircraft in the fleet continuing to fall. Combined with record load factors all are positive signs that supply and demand are currently well balanced and that the airlines and fleet continue to operate more efficiently.

IMPRESSIVE TRAFFIC GROWTH, SUPPORTING MORE AIRCRAFT IN SERVICE

Source: ICAO, Ascend, Airbus GMF 2017

THE LONG TERM

- Whilst GDP remains an important driver for air transport, it is clear that it is not the only factor that drives air traffic growth. In its traffic forecast, Airbus uses as many as 15 different explanatory variables. From the word cloud below you can see many of these different variables, with their size representing the number of times they have been used across the more than 100 traffic flows modelled in the Airbus traffic forecast.
- Other drivers that define where and how air travel will develop are factors such as the evolution of airline business model, liberalisation, and tourism development.



- By examining some real world examples it can be seen how these drivers can shape and influence markets, and will ultimately determine what characteristics such as range and size will be delivered in the future by manufacturers.

THE TRANS-ATLANTIC EXAMPLE

- The trans-Atlantic market is a good example of how several drivers can stimulate growth even on a market which is considered mature. In fact this market has grown 50% in the last 15 years.

- Whilst many of the routes have their origins at the start of the air transportation era, significant growth was enabled by bi-lateral agreements on both sides of the Atlantic. A second period of growth has been enabled by economic growth in both the US and Europe where real GDP has grown ~30% in the last 20 years, but also as new business models like the Low cost Carriers (LCCs) have entered the market.

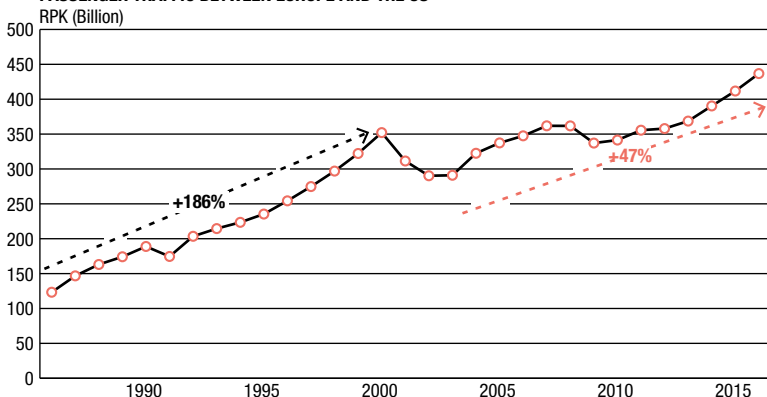
- Taking the London New York route as an example, origin and destination traffic has grown by 25% in the last 3 years. In the first half of 2016, low cost carriers transported 7% of the passengers.

The trans-Atlantic market has grown

50%

in the last 15 years

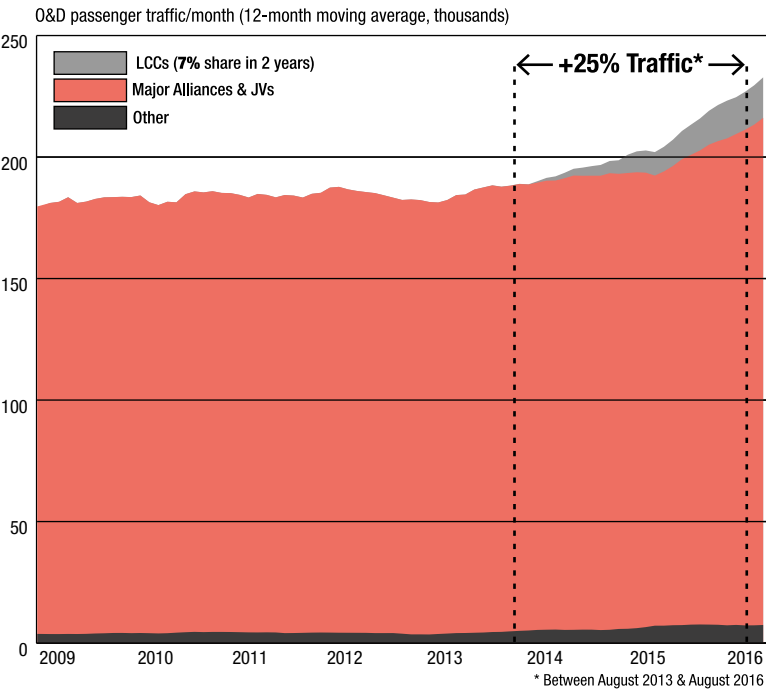
PASSENGER TRAFFIC BETWEEN EUROPE AND THE US



NORTH ATLANTIC TRAFFIC HAS GROWN NEARLY 50% IN THE LAST 15 YEARS

Source: US Bureau of Transportation Statistics, Airbus

- Interestingly the incumbent carriers and alliances have also grown the number of passengers they are carrying.
- These additional passengers, at least in part, have chosen to travel due to the lower prices on offers, which have also resulted in lower yields and a greater focus on operational efficiency and equipment by the airlines in recent years.



**LON-NYC TRAFFIC
STIMULATED BY LCC'S
AND EXISTING OPERATORS**

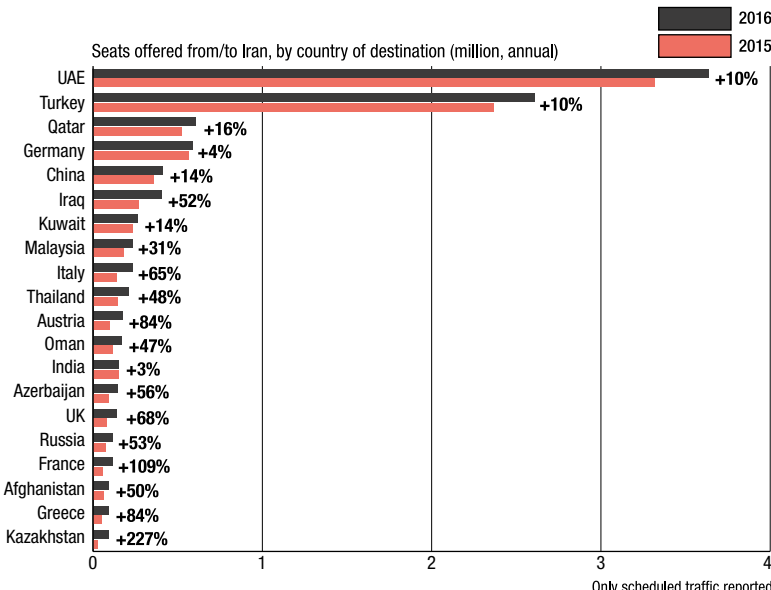
Source: Sabre, Airbus GMF 2017

LIBERALISATION & TOURISM

- As well as growth on existing routes, positive political activity between states can also lead to growth, due to the fact that organic growth has been constrained. Two recent examples are Iran and Cuba.
- Already the agreement with Iran has led to more capacity being added from 2015 to 2016, with 10% more international capacity being added, with double digit growth to many destinations.
- The Iranian government would like to grow tourism, another key driver for aviation growth. Reports have stated that they would like to grow the number of tourism arrivals from 4.8 million in 2014, to 20 million by 2025.
- Already today, tourism infrastructure is being built with three new hotels opening in Tehran since 2015. One major hotel chain's CEO has said given the size of population and economy he sees capacity for a hundred hotels for their chain alone.

International capacity growth in 2016 for Iran

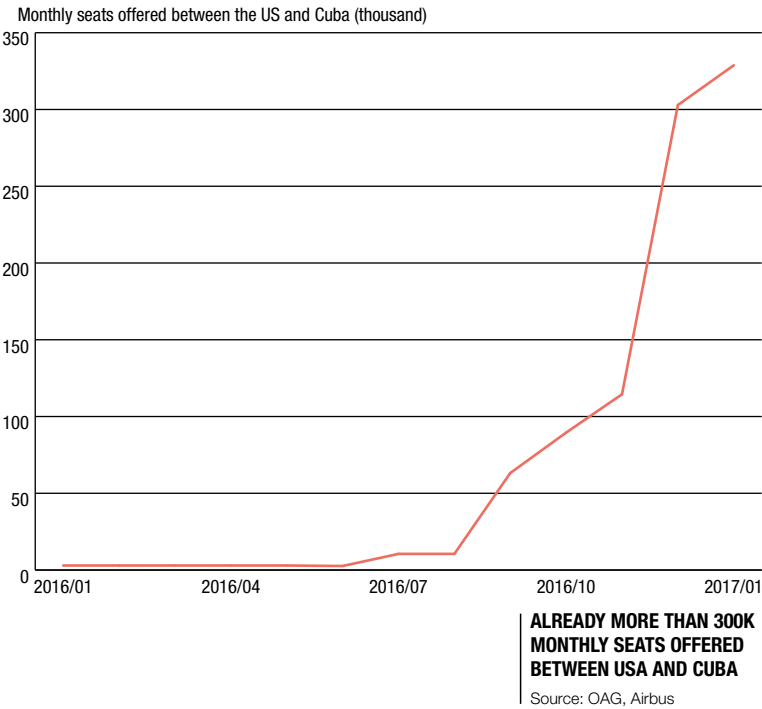
+ 10%



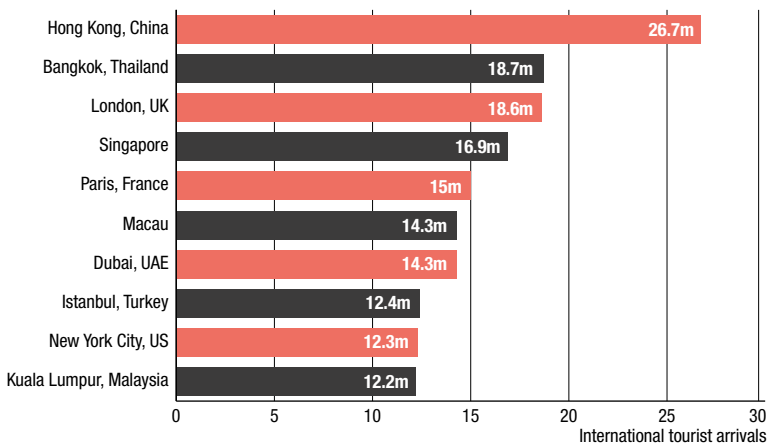
STRONG CAPACITY INCREASE TO ALL MAJOR MARKETS FROM/TO IRAN IN 2016

Source: OAG, Airbus GMF 2017

- Cuba is another example where improving geo-politics has allowed for enhanced air links with ten US airlines starting operations in 2016, and more than 300,000 monthly seats offered today, twice that offered in 2008. Market dynamics will continue to evolve as airlines match capacity to demand, infrastructure for visitors to the island develop and as geo-politics in the region evolves further.

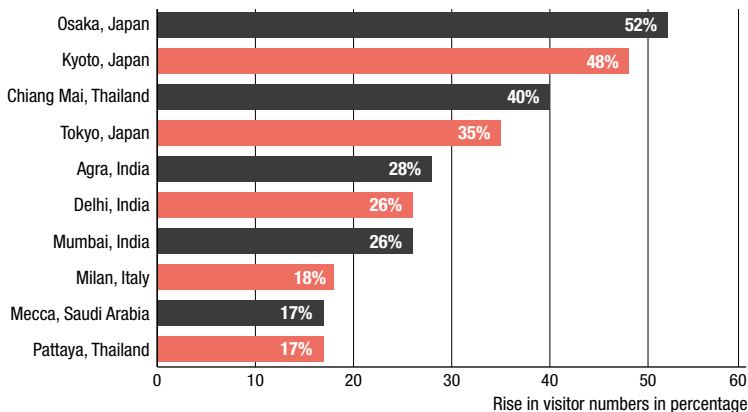


- Aviation mega-cities are an important component of the world's aviation network today and will be a more important part in the future. It is no surprise therefore that Euromonitor data published in 2017, show all but one of the top ten cities in 2015, by visitor numbers is either an Aviation Mega-city today, or in the future.



AT A GLANCE - TOP 10 MOST VISITED CITIES IN 2015

Source: Euromonitor, Jan 2017, Airbus



AT A GLANCE - TOP 10 CITIES WITH LARGEST VISITOR GROWTH IN 2015

Source: Euromonitor, Jan 2017, Airbus

A large commercial airplane is shown from a low angle on a runway. The image has a teal overlay and horizontal motion blur lines. The tail fin is prominent on the left, and the wings and engines are visible. The text '03' is overlaid in the lower-left quadrant.

03

**Network
& Traffic
forecast**



PASSENGER TRAFFIC CONTINUES TO GROW

- **Revenue Passenger Kilometres (RPKs)** grew **6.3% in 2016**, as compared to 2015, according to ICAO figures which were preliminary at the time of writing.
- This represents **an impressive 3.7 billion passengers carried by air in 2016**.
- Over half of the world's tourists who travel across international borders each year are transported by air.
- **Air passengers benefited from oil prices** which remained relatively low, with airlines able to choose between stimulating the market through lower yields and therefore ticket prices, and their margins.
- **Air traffic continues to prove its resilience** to slow economic growth by outperforming global GDP, demonstrating the world's appreciation of the benefits aviation brings.
- For the next 20 years, the **Airbus GMF forecasts a 4.4% global annual air traffic growth**, despite some downward revision of future economic growth by a number of forecasters in several regions of the world. In our forecast the first decade will enjoy a 4.9% increase per year, with 4.1% average annual growth for the last decade, a lower figure but growth in those years based on absolute traffic numbers higher than today.
- **We continue to monitor the reliability and validity of the Airbus GMF forecast.** As an example, our GMF 2000 forecast continues to track the long term trend and our latest forecast, despite significant market perturbations in the years following its production.

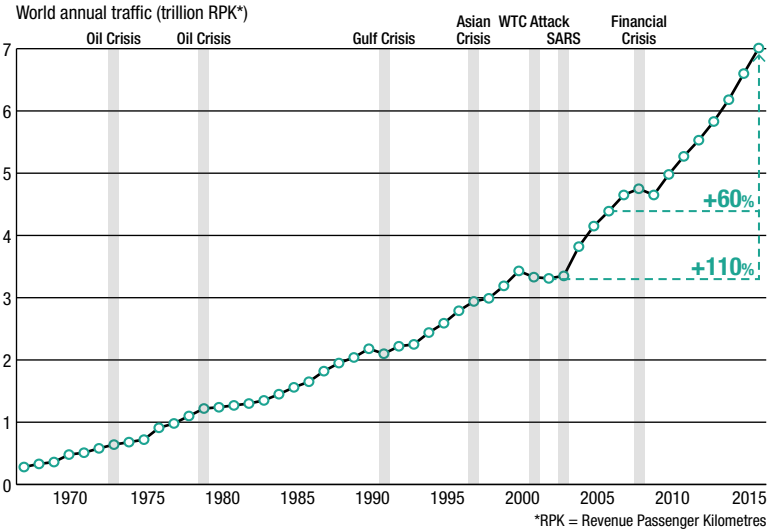
Air transport is a growth market

60% growth over the last ten year

More than double since 9/11

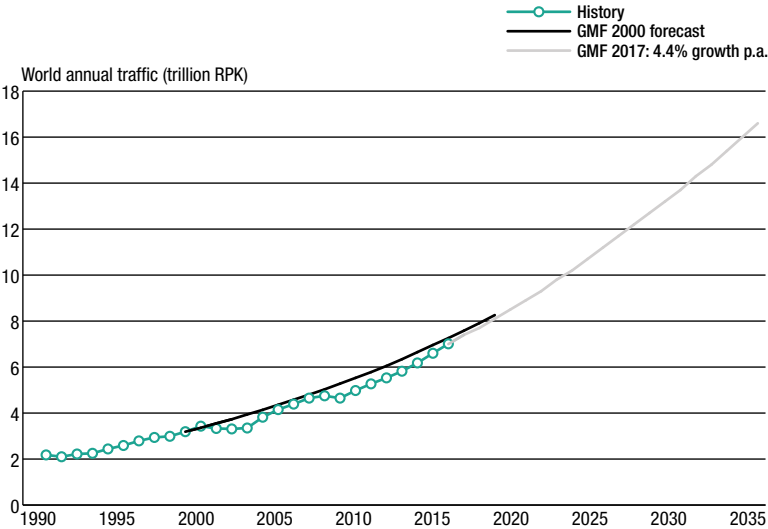
GMF long term validity

GMF 2000 long term forecast is still in line with our latest forecast



AIR TRAVEL HAS PROVED TO BE RESILIENT TO EXTERNAL SHOCKS

Source: ICAO, Airbus GMF 2017

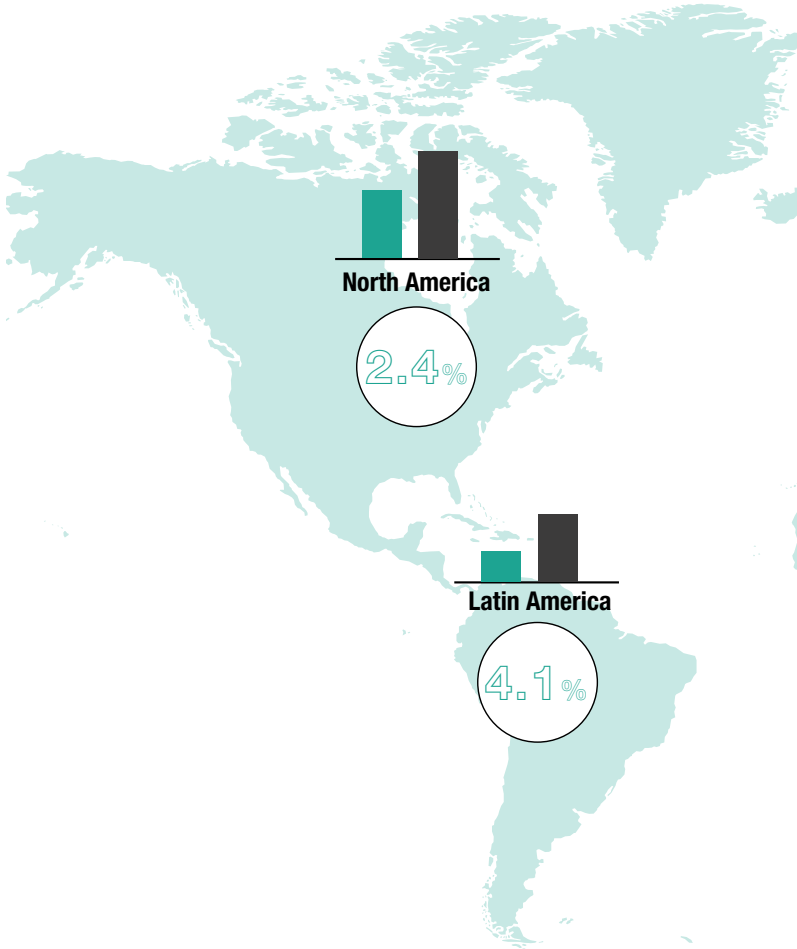


AIRBUS GMF PREDICTING LONG TERM DEMAND

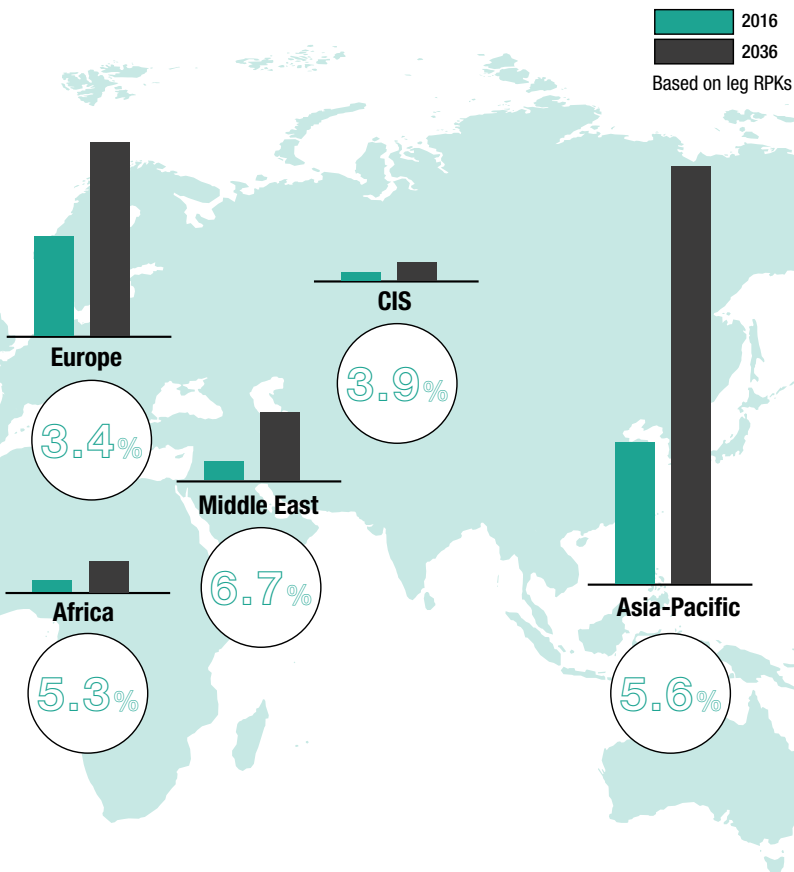
Source: ICAO, Airbus GMF 2017

TRAFFIC FORECAST

- Asia-Pacific will lead world traffic by 2036, with a three fold increase in the traffic serving this region by the end of the forecast period.
- Traffic between emerging countries is forecast to grow at 6.2% per annum, and will represent a growing share of air traffic, from 29% of world traffic in 2016 up to 40% by 2036.

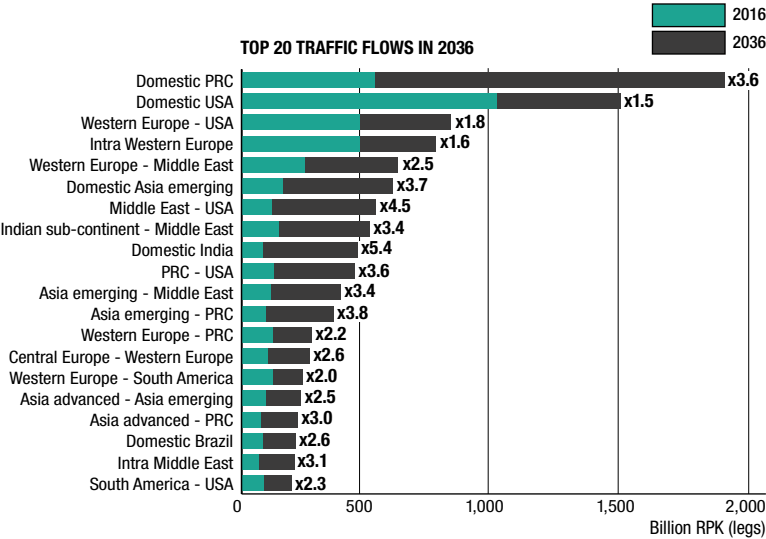
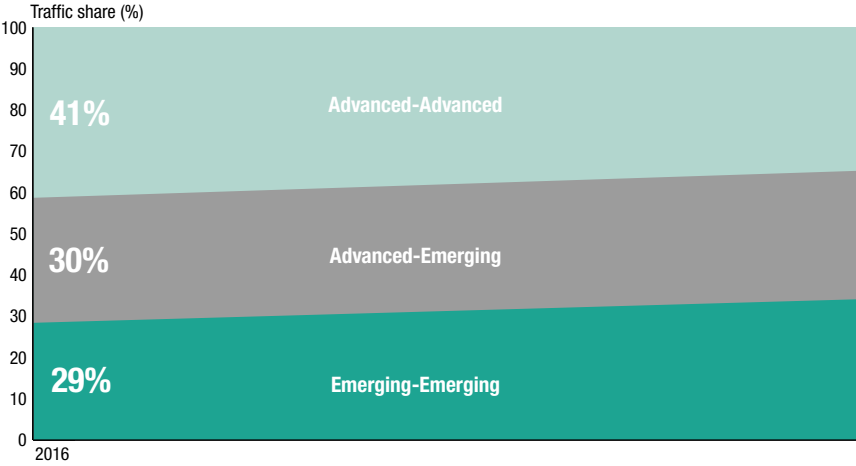


- Domestic China will become the largest traffic flow before the end of the forecast period. Domestic Chinese traffic is forecast to almost quadruple, with Domestic USA increasing by 50% from an already high base.
- The three major flows connecting Western Europe are all expected to develop: Western-Europe – USA, Intra-Western Europe and Western-Europe – Middle East forecast to grow 1.8, 1.6 and 2.5 times respectively.
- Amongst the Top 20 traffic flows, 50% will involve Asia-Pacific and 25% will involve the Middle East.



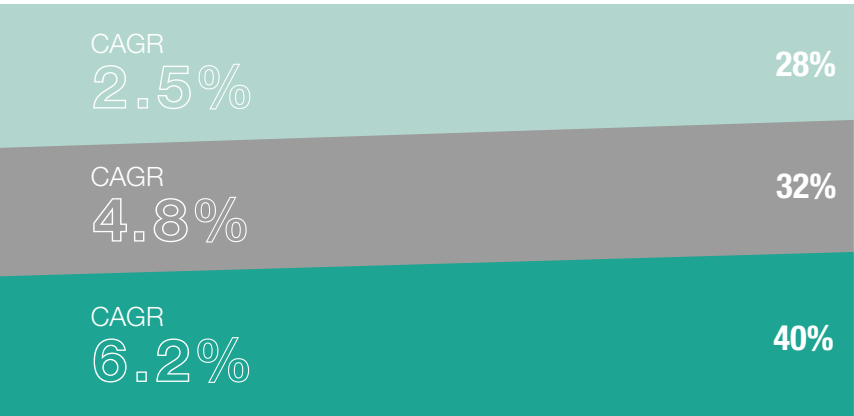
ASIAN TRAFFIC SET TO GROW STRONGLY

Source: Airbus GMF 2017



**DOMESTIC CHINESE TRAFFIC
FLOW TO BE NUMBER ONE**

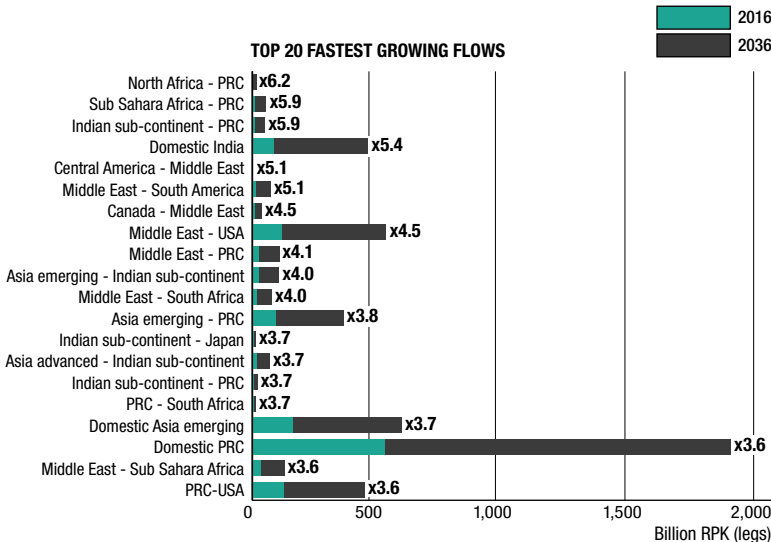
Source: Airbus GMF 2017



2036

**TRAFFIC BETWEEN
EMERGING MARKETS TO
REPRESENT A HIGHER SHARE
OF WORLD TRAFFIC**

Source: Airbus GMF 2017

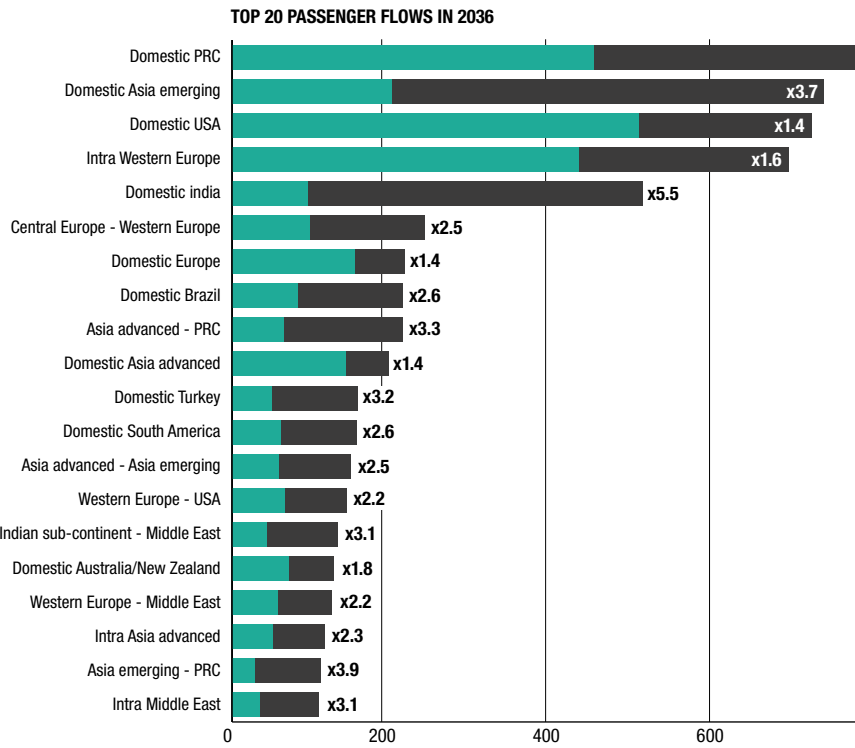


**TOP 20 FASTEST GROWING
FLOWS OVER THE NEXT
20 YEARS**

Source: Airbus GMF 2017

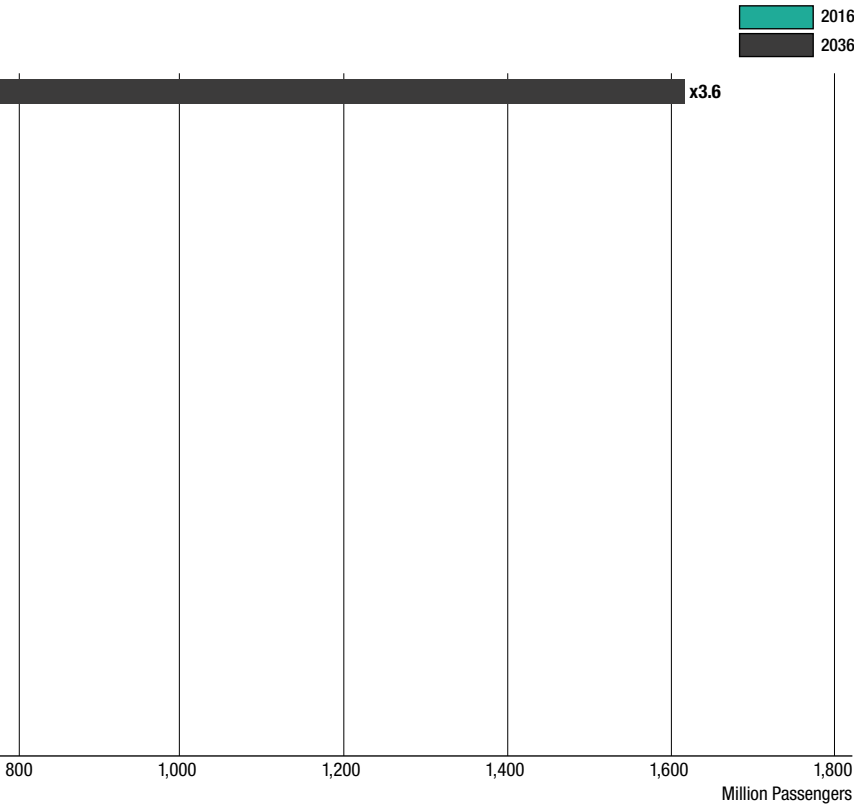
ORIGIN & DESTINATION PASSENGER FORECAST

Taking Origin and Destination passengers gives a better feel for the future volume of passengers by flow as the distance component included in RPKs or RPMs is removed.



In terms of Origin and Destination passengers, some interesting results can be highlighted from our forecast.

- Almost 1.6 billion passengers are expected to travel within China in 2036, almost four times the number of passengers that travelled by air in 2016.
- The number of Domestic Indian passengers is expected to grow almost six times in the next 20 years, reaching the level as Domestic USA is today.



**TOP 20 PASSENGER
FLOWS IN 2036
(ORIGIN & DESTINATION)**

Source: annualised Sept. 2016
data from Sabre, Airbus GMF2017



04

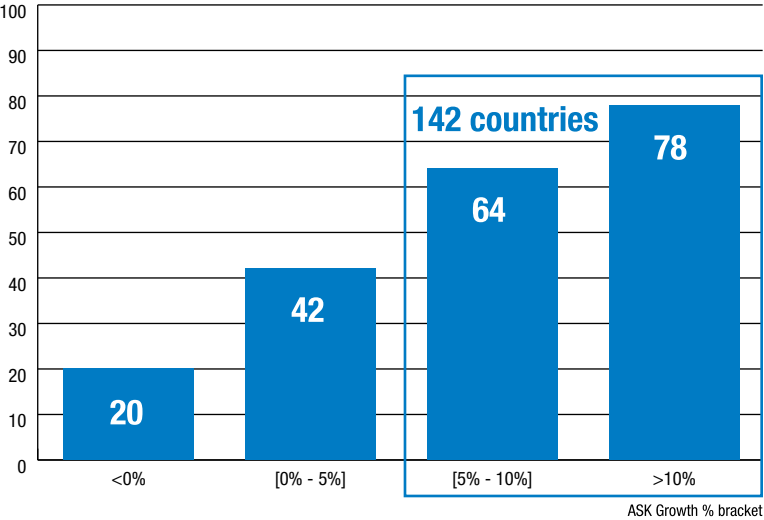
**Demand for
passenger aircraft**



DEMAND FOR PASSENGER AIRCRAFT

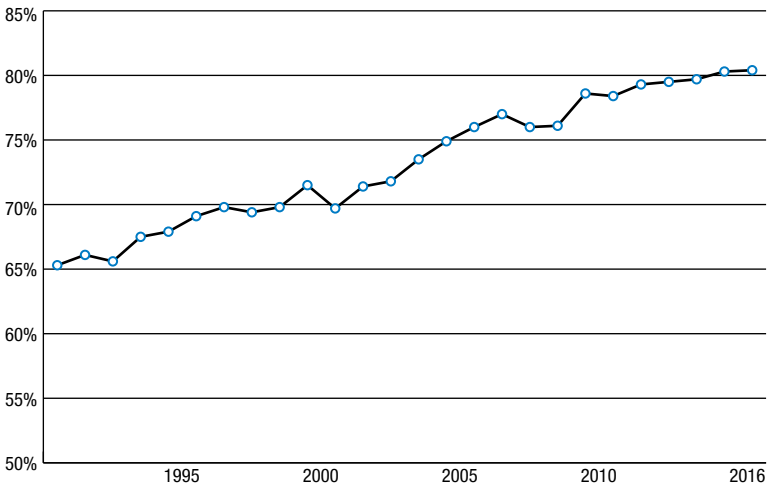
- In 2016, over 140 countries added 5% or more capacity (ASKs) than in 2015. Of these, nearly 80 countries added more than 10%. This combined with traffic growth above the long term trend is driving demand for new aircraft today and into the future.
- More than simply adding capacity, the world's airlines are also increasingly efficient in the way that they are using aircraft. Average load factors, that is the proportion of the seats filled in the aircraft, are at an all-time high at around 80%. Allowing for seasonality it will be difficult to move this mark significantly higher.
- Taking into account growth in average aircraft size, increased average utilization levels as well as higher average load factors, aircraft are an impressive 50% more productive in terms of traffic (RPKs) today than 20 years ago. A significant improvement coming from both the airlines' operational efficiency and the state of the art aircraft being delivered today.

2016 ADDED CAPACITY (ASKs)
Number of countries



LOAD FACTORS

World passenger load factors (%)



- The Airbus forecast for passenger traffic and deliveries by broad seat category e.g. single-aisle, twin-aisle, VLA were detailed earlier. But this top level view hides some of the trends developing for demand in the various aircraft categories.

- For some time now an overlap has existed between operations of twin-aisle and single-aisle aircraft types. For example twin-aisle aircraft are used more often on routes less than 2,000nm than single-aisle types are on the routes longer than 2,000nm.

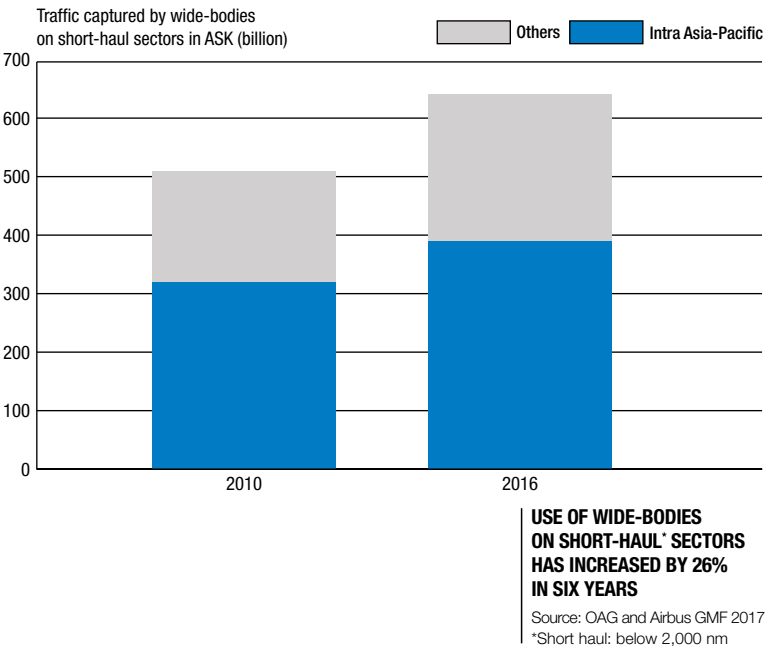
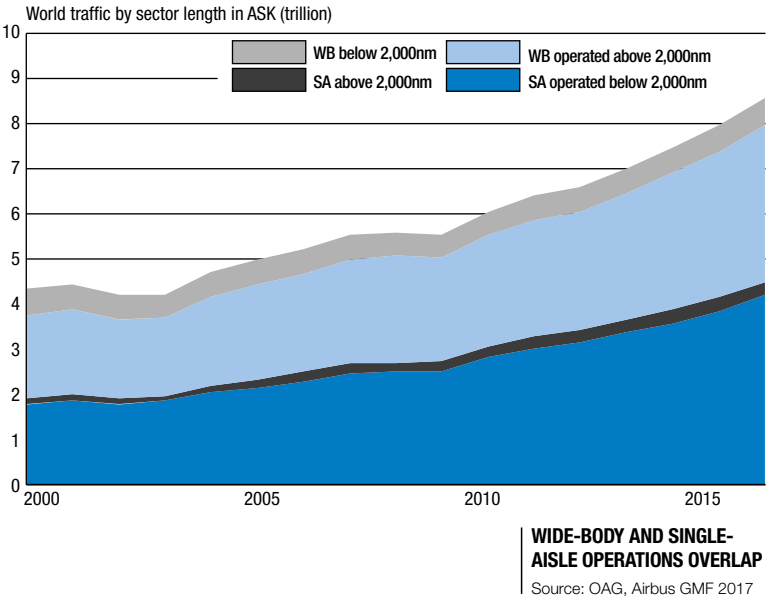
- The use of twin-aisle on short-haul operations, that is routes less than 2,000nm, has increased by 26% in six years.

- In Asia-Pacific 22% of all short-haul operations are performed by wide-body types.

- To complicate the picture whilst twin-aisle use has increased on short-haul routes, their overall share on these routes has decreased.

**IMPRESSIVE AIR TRANSPORT
RESULT IN 2016 WITH MORE
THAN 140 COUNTRIES
ADDING 5% OR MORE
CAPACITY AND LOAD
FACTORS AT A RECORD HIGH**

Source: ICAO, OAG, Airbus



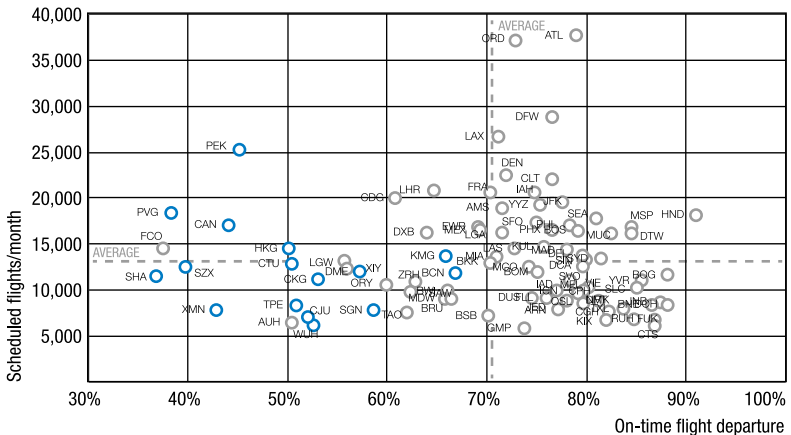
- Clearly capacity needs on these shorter sectors is one of the key drivers for the use of twin-aisle types, but there is also evidence that congestion, particularly in Asia is another, with many airports in the region operationally constrained.

- With new low Direct Operating Cost (DOC) twin-aisle types like the A330neo and larger long range single-aisle types like the A321neo, the boundary between the single-aisle and twin-aisle worlds will continue to blur.

Within Asia Pacific
22%
of short-haul
routes operated by
wide-body aircraft

ON-TIME PERFORMANCE FOR MAIN WORLD AIRPORTS - JULY 2015

○ Airports in Asia-Pacific with above average congestion



- Whilst the performance characteristics of aircraft is important for future aircraft decision making, what is possible in the cabin is increasingly having an influence. The mix of classes, comfort, connectivity, the ability to upgrade, ancillary revenue options, business model characteristics are also key. We asked our cabin experts to give us few pointers to the future.

MANY AIRPORTS IN ASIA-PACIFIC CONGESTED

Source: FlightStats (July, 2015), Airbus GMF 2017

CABIN - WHAT'S TRENDING?

Airline Business Models

Airline groups continue to grow their influence in the market as they evolve to cover different cabin-related airline business models. Hybrid airline business models are also developing, particularly towards medium/ long-range operations as part of growth strategies, including a desire to exploit new market opportunities and a way to effectively differentiate themselves. For example full service carriers adding cabin densification (more seats where possible) and Low Cost Carriers increasingly attracted by business markets and longer range operations.

- **10** out of 30 largest airlines have a LCC in their group
- **9** out of 10 largest LCCs target business travellers

Ancillary Revenues (AR)

The main ancillary revenue developments today are taking place in the US and Europe, with Asia-Pacific following. There is a strong focus on single-aisle aircraft operations, given its importance in the northern hemisphere and extending to twin-aisle operations with an increasing relevance of cabin-related ancillary revenues. Baggage-related elements, flexible seating and catering are all a focus with connectivity likely to be the future core enabler.

- **\$ 59.2** bn ancillary revenues estimated to have been generated in 2015
- **x 2.6** growth of global ancillary revenues since 2007
- **30-40%** of ancillary revenues are generated through the cabin



Connectivity

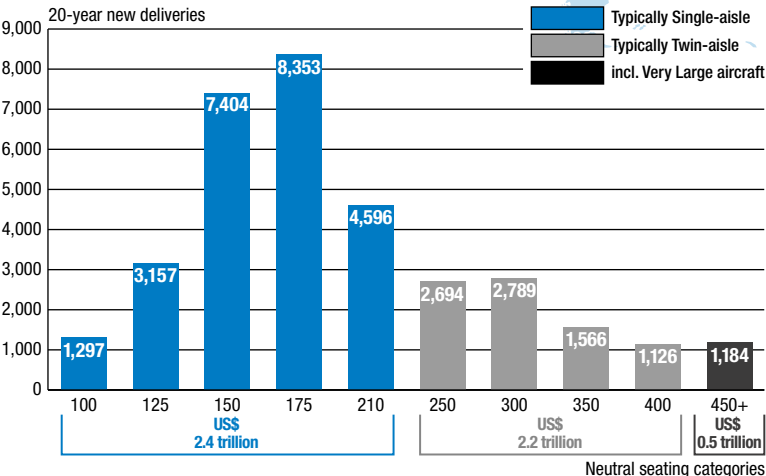
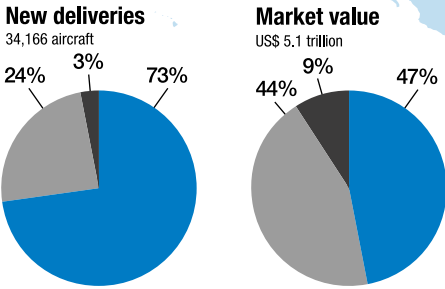
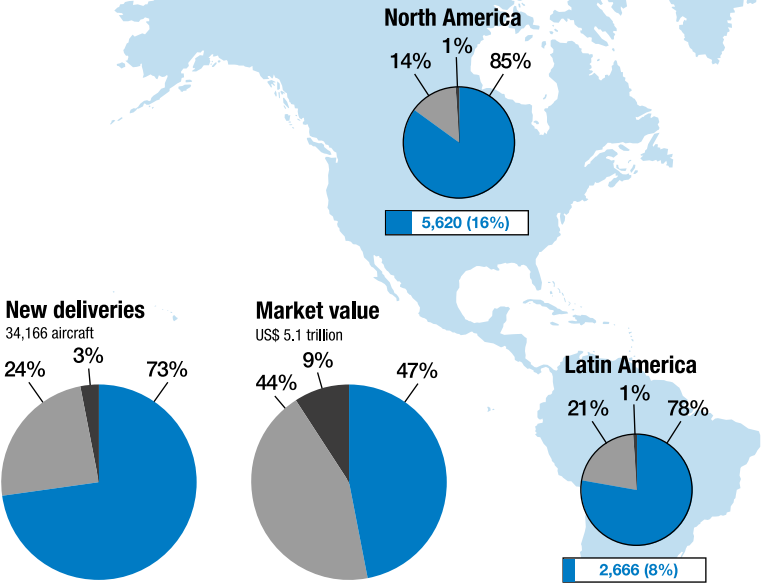
On-board connectivity is reaching a critical mass across both long and short-range aircraft, now moving towards a full broadband capability. Airlines today are increasingly exploring digital business models in order to drive a more personalised passenger travel experience and enhance revenue generation.

- **74** airlines offered in-flight connectivity in 2016
- **More than 16,000** aircraft forecast to be equipped with in-flight Wi-Fi by 2025

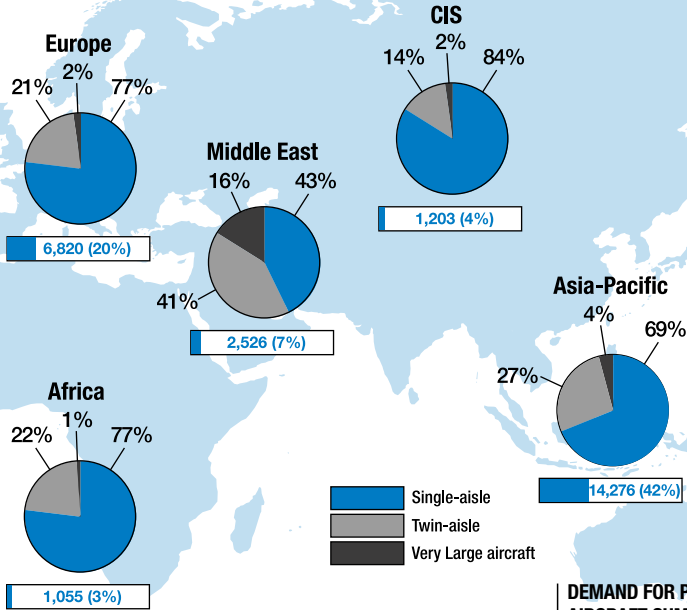
Passenger Landscape

An increasing number of «always-online» digital travellers are demanding connectivity along the entire travel chain. These digital passengers continue to explore and push innovative travel business models which in turn increasingly affects cabin and airline revenue streams.

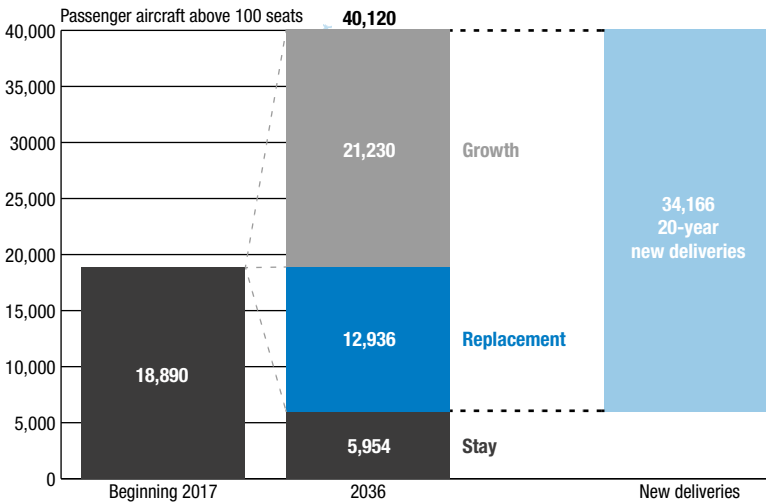
- **100%** smartphone penetration of millennials by 2018, has been predicted
- **15%** of passengers carry three mobile devices today



**GMF 2017 NEW PASSENGER
A/C DEMAND BY NEUTRAL
SEATING CATEGORY**
Source: Airbus GMF 2017




DEMAND FOR PASSENGER AIRCRAFT SUMMARY (EXCL. FREIGHTERS)



PASSENGER FLEET IN SERVICE EVOLUTION 2016-2036


Source: Airbus GMF 2017



←  M0-M1-M2

9 min.

7 min.

→  M3-M4-M5

7 min.

05

**Demand
by region**

←  Puertas 01 to 29

→  Puertas 30 to 59





Asia-Pacific

MORE LIBERALISATION, MORE PASSENGERS,
MORE CONNECTIVITY

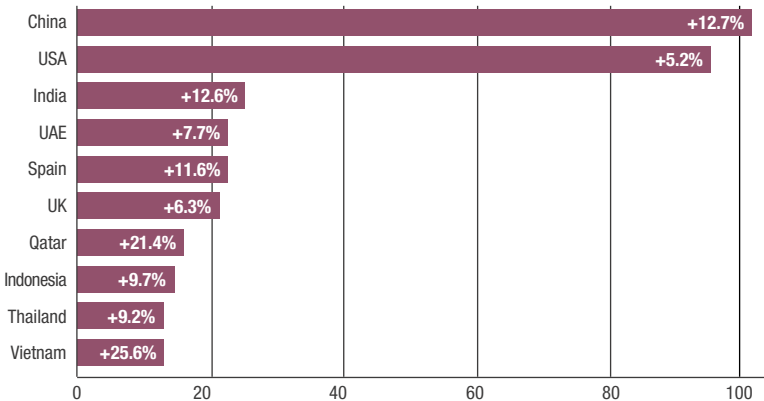
ECONOMY

- Although India is now outpacing China in terms of economic growth, Asia-Pacific economic development remains strongly linked to China and its transition to a service/domestic consumption economy. Meanwhile, new manufacturing hubs such as Vietnam are also emerging in Asia.
- Domestic sources of growth - particularly private consumption - led by China's economic transition to services will play a larger role in coming years.
- Asia-Pacific will continue to lead world economic growth with forecasts suggesting average real GDP growth of **+4.1%** per year over the next 20 years.

TRENDS

- The Asia-Pacific is a diverse and dynamic region, with the evolution of aviation both in the past and future not possible to simply characterise as a whole. From South East Asia with its important global hubs and the influence of deregulation through ASEAN, to North East Asia with its mix of more mature markets and growing LCC presence, all heavily influenced by the burgeoning Chinese aviation markets.
- Another fact is the importance of this region as a whole to the growth of aviation at a global level both today and in the future. As well as the region's airlines leading others in terms of traffic, half of the top ten countries contributing the most traffic growth in 2016, were from Asia-Pacific.

2016 YEARLY CAPACITY GROWTH IN VOLUME (BILLION ASK) AND GROWTH RATE



**FIVE OF THE TOP TEN
CONTRIBUTORS TO
2016 TRAFFIC GROWTH
CAME FROM ASIA**

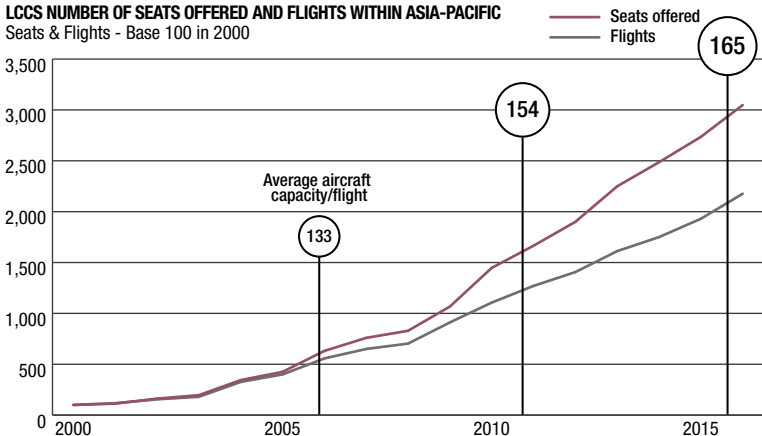
Country of departure; domestic fully counted.
Source: OAG, Airbus GMF 2017

- Helping to drive this growth is the growing presence of the low cost carriers (LCCs) aided by deregulation and a significant intra-regional market.
- As well as significantly growing both seats offered and flights in very few years, it is also clear that the average size of the aircraft offered by these airlines has also grown significantly. In just ten years, average aircraft capacity operated by these airlines has grown from 133 to 165 seats, almost 25%.
- As well as seats, the average distance flown by the LCCs in Asia-Pacific has grown by over 200 km or 21% since 2002, from around 950 to 1,150 km in 2016.

- With these developments the seats offered by LCC's in the region now represents 25% of the seats on domestic and intra-regional flows. This compares to 42% in Europe and the CIS and 31% for North America, suggesting more opportunity.

- Looking at a country level, the diversity of Asia-Pacific is again evident with Thailand, Indonesia, the Philippines and Malaysia at similar levels to Europe in terms of LCC penetration, with China and Japan for example still apparently with room for further development given the right conditions.

LCCS NUMBER OF SEATS OFFERED AND FLIGHTS WITHIN ASIA-PACIFIC
Seats & Flights - Base 100 in 2000



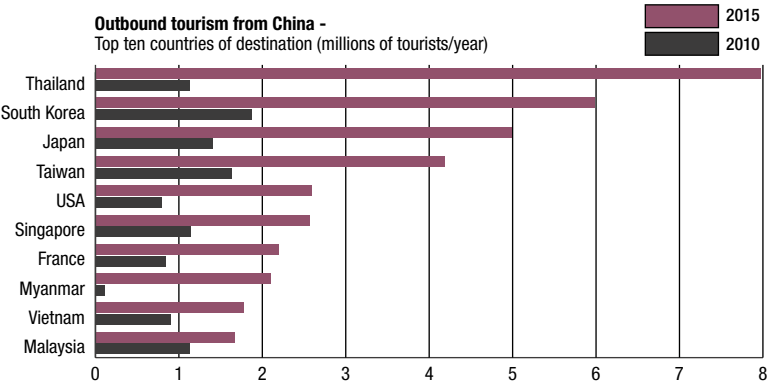
ASIA-PACIFIC LOW COST CARRIERS GROWING CAPACITY FASTER THAN FREQUENCY

Source: OAG – September of each year, Airbus GMF 2017

- China is a key market both at a regional and global level and has seen rapid growth in air service and passenger numbers. Chinese domestic traffic has quadrupled in the last 10 years for example, with international traffic more than doubling.

- Outbound tourism is one such source of growth with the number of Chinese tourists growing rapidly in recent years. Destinations in Asia like Thailand, Korea and Japan figure strongly in the top 10 unsurprisingly. However, destinations further away such as the US and Europe are also increasingly popular, especially with the easing of border procedures in some cases.

- According to some estimates the outbound China market is predicted to double to over 200 million travelers annually by 2020.



**CHINESE TOURIST
HORIZONS GROWING**

Hong Kong and Macau not shown.
Source: UNWTO, Airbus GMF 2017

- With a new open skies agreement, China is Australia’s fastest growing and highest spending international visitor market. More than 1 million Chinese tourists visited Australia 2015-16 (up 22.3% from the year before), and they spent almost US\$7 billion during their stay.
- These tourists and other travellers to and from Australia and China have also benefited from increased connectivity with the number of airport pairs having doubled since 2014.
- It is a similar story between China and the US where the number of airport pairs have doubled since 2013.

“SUPER HUBS” COMING TO CHINA?

By 2030 Shanghai, Beijing and Guangzhou will be firmly placed in the world’s top 10 cities as measured by GDP; economic strength underpinned by the domestic and international connectivity only aviation can bring. Already major hubs, with Beijing for example handling 8.1 million passengers per month compared to Dubai at ~7.0 million, over 90% comes from origin and destination traffic. In the future, there is potential for these airports to become “super hubs” as they develop a greater share of transit traffic to more efficiently connect China to the rest of the world.



Regularly served airport-pairs between China and Australia



2014

**Number of
airport-pairs**

2014-2016
between China
and Australia

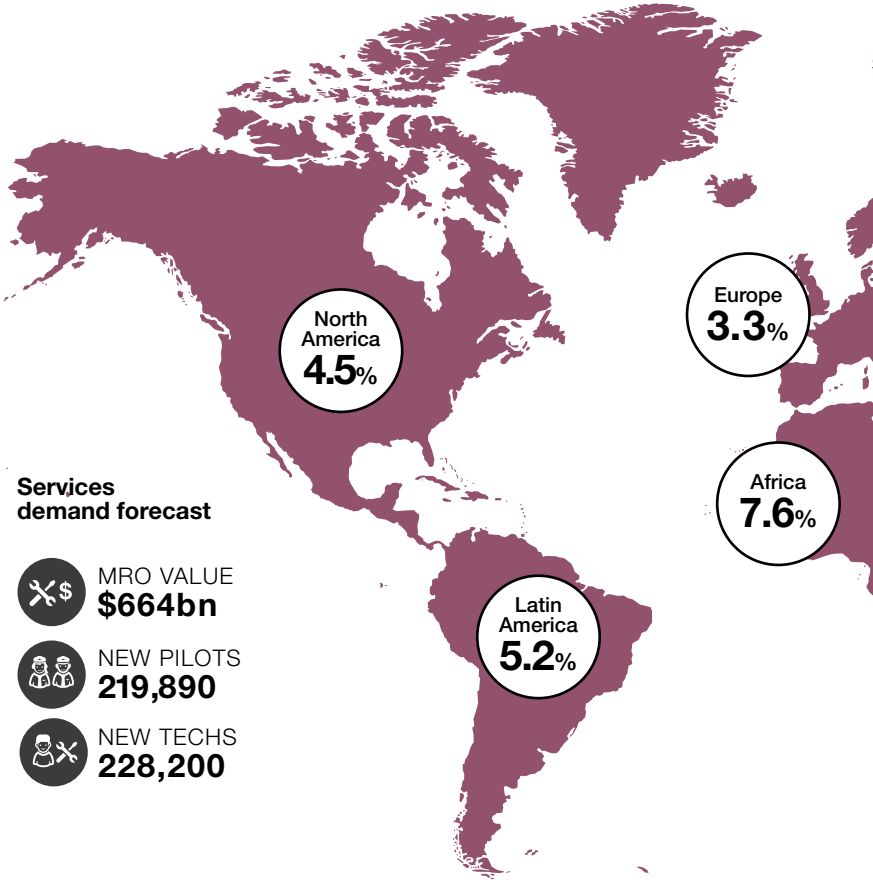
x 2



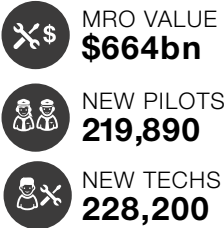
2016

**THE IMPACT OF MORE
OPEN SKIES IS SIGNIFICANT**

Source: OAG (September data),
Airbus GMF 2017



Services demand forecast



MRO VALUE
\$664bn

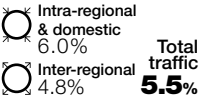
NEW PILOTS
219,890

NEW TECHS
228,200

Economy**

Real Trade 4.3% Real GDP 4.1%

Traffic**



Intra-regional & domestic
6.0%

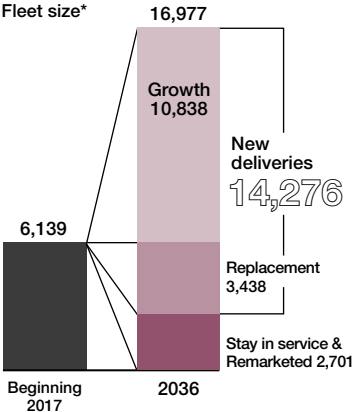
Inter-regional
4.8%

Total traffic
5.5%

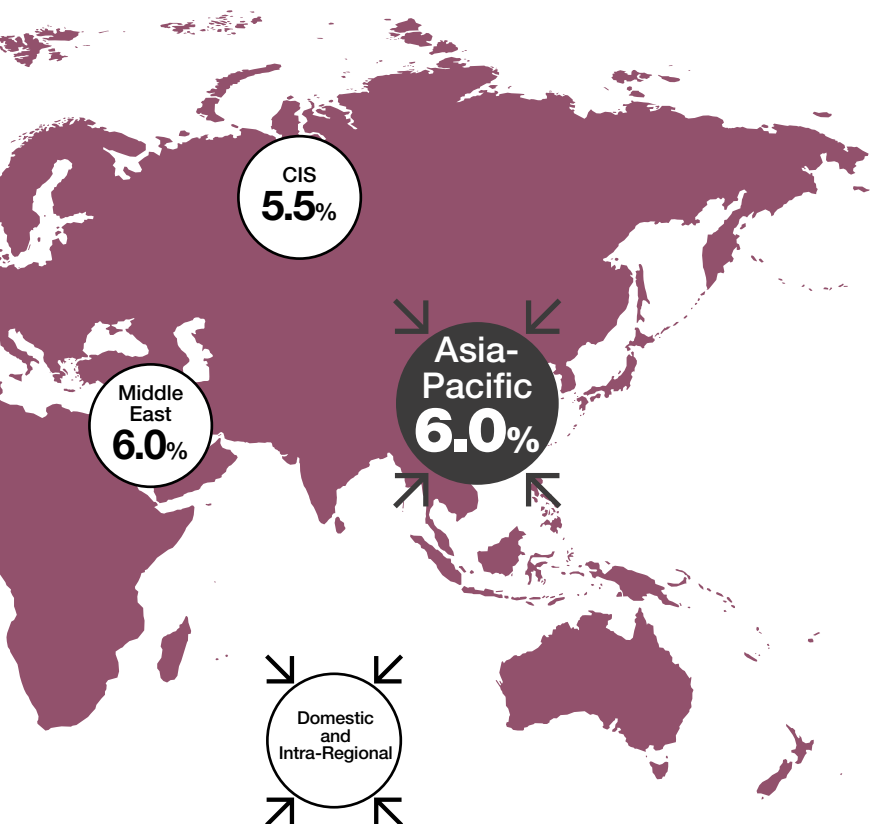
Fleet*

Fleet in service 20 year new deliveries
2016 2036
6,139 16,977 14,276

Fleet in service evolution



* Passenger aircraft ≥100 seats
** 2016-2036 CAGR

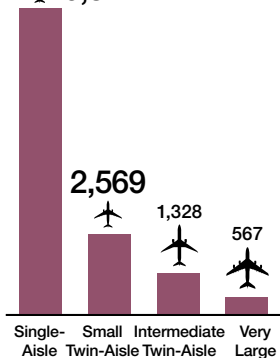


New deliveries by segment

Number of new pax aircraft



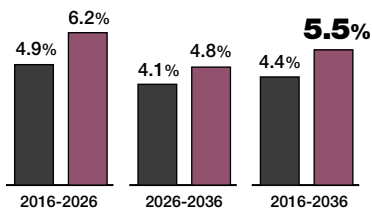
9,812



Total RPK traffic growth

Asia-Pacific

World





Europe

MORE AIR TRAVEL:
MORE FOR PERSONAL REASONS

ECONOMY

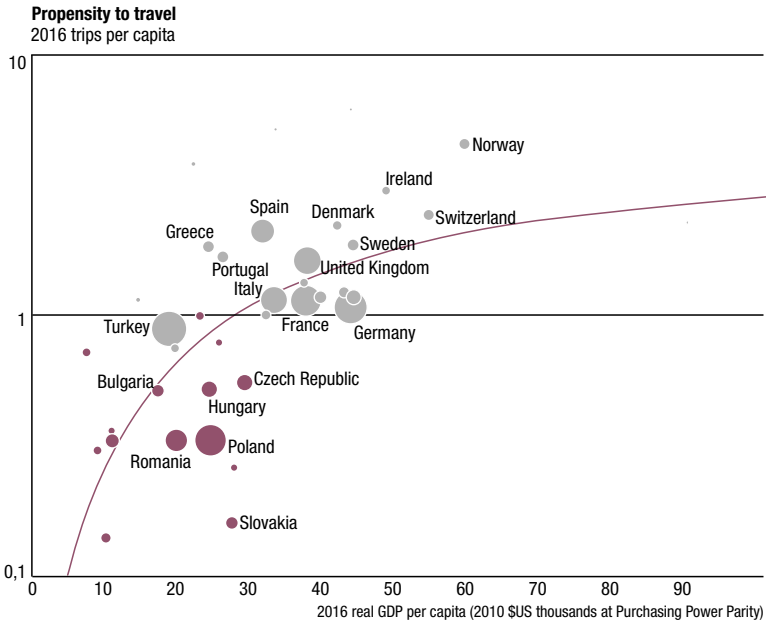
- After a decade of challenges and despite some political uncertainties (e.g. Brexit), European consumer and business confidence are recovering.
- European private consumption to remain the main driver of future economic growth.
- Real GDP growth forecast at **+1.7%** per year between 2016 and 2036.

TRENDS

- Many regions are diverse in terms of their people, economic development and in terms of aviation their propensity to fly. Europe is no exception with some **50 states and more than 200 languages** with their propensity to fly distributed along a significant proportion of the curve, with a spread of countries both above and below the trend line. Those countries positioned further to the left and below the trend line have the potential for more airw travel as GDP per capita develops.
- As a whole **the average European took 1.2 trips per person**, but as can be seen the European picture is more complex than that.

Propensity to travel

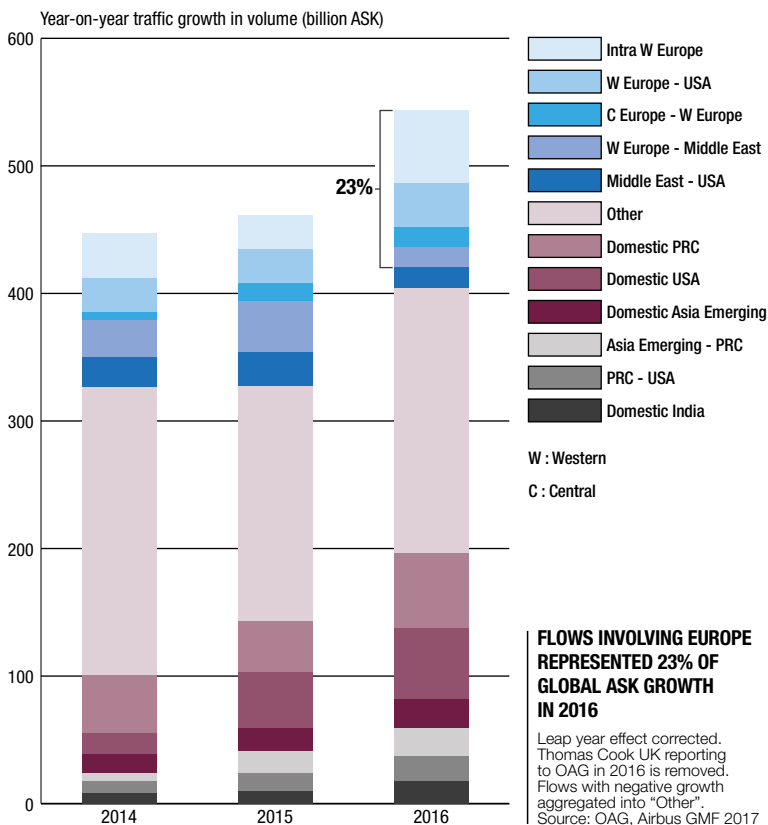
In 2015, each European flew
1.2
trips on average



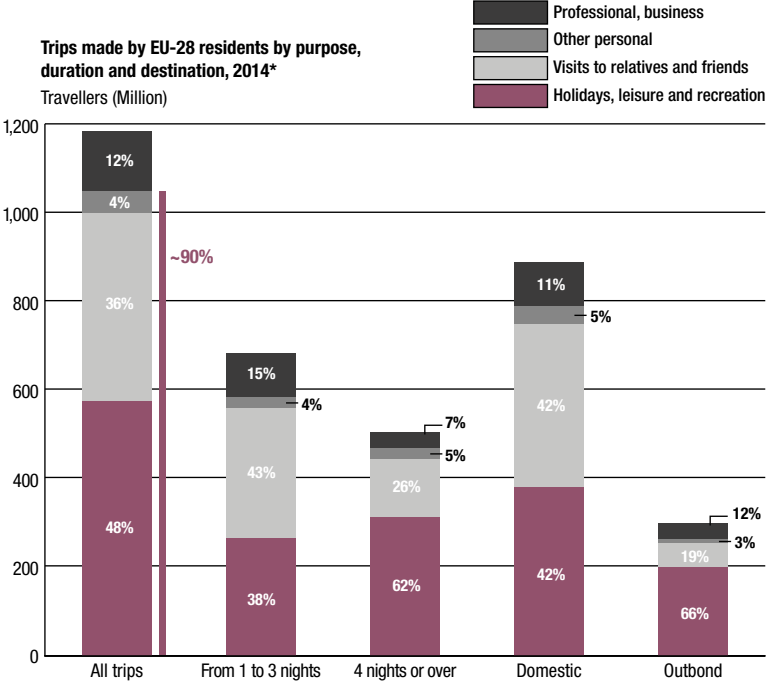
EUROPEANS ARE AT VARIOUS STAGES OF ECONOMIC AND AIR TRAVEL DEVELOPMENT

Notes: Passengers originating from respective country
Bubble size proportional to country population
Nonlinear regression weighted by country population
Sources: Sabre, IHS Economics, Airbus GMF 2017

- Positively, forecasts suggest that the European population will continue to grow in terms of wealth, supporting the private consumption component of GDP which is becoming more important as an explanatory variable for passenger traffic growth.
- European flows accounted for about 23% of global capacity growth in 2016, as compared to 2015, a relatively stable share of the additional growth over the last three years. The trans-Atlantic market often considered mature (see case study in the Demand for Air Travel section) continues to add capacity to the network, with Intra-western Europe stimulated by new flyers and low cost operations the most significant of European flows in 2016 for growth, with about 60% of the European capacity added on this flow.



- Some 90% of European travellers state their purpose of travel is for personal reasons, this compared to the US where ~70% state this reason. Working outside of home countries with the subsequent need to visit friends and relatives (VFR) and a growing culture of short breaks stimulated by the availability of low fares to many city or touristic destinations have helped stimulate intra-European air travel in recent years.



*UK: 2013 data used

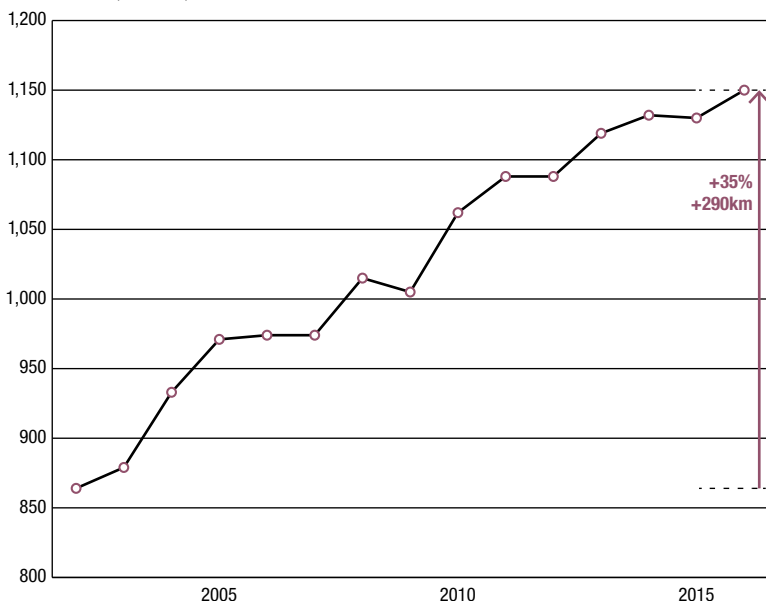
**ALMOST 90% OF TRAVEL
IN EUROPE IS FOR PERSONAL
REASONS**

Source: Eurostat, Airbus GMF
2017

- As part of this evolution, the Low Cost Carriers have gradually increased the average distance of the routes they are flying in Europe. Today, routes are on average 35% longer (+290km) compared to 2002.

Average distance flown by LCCs within Europe

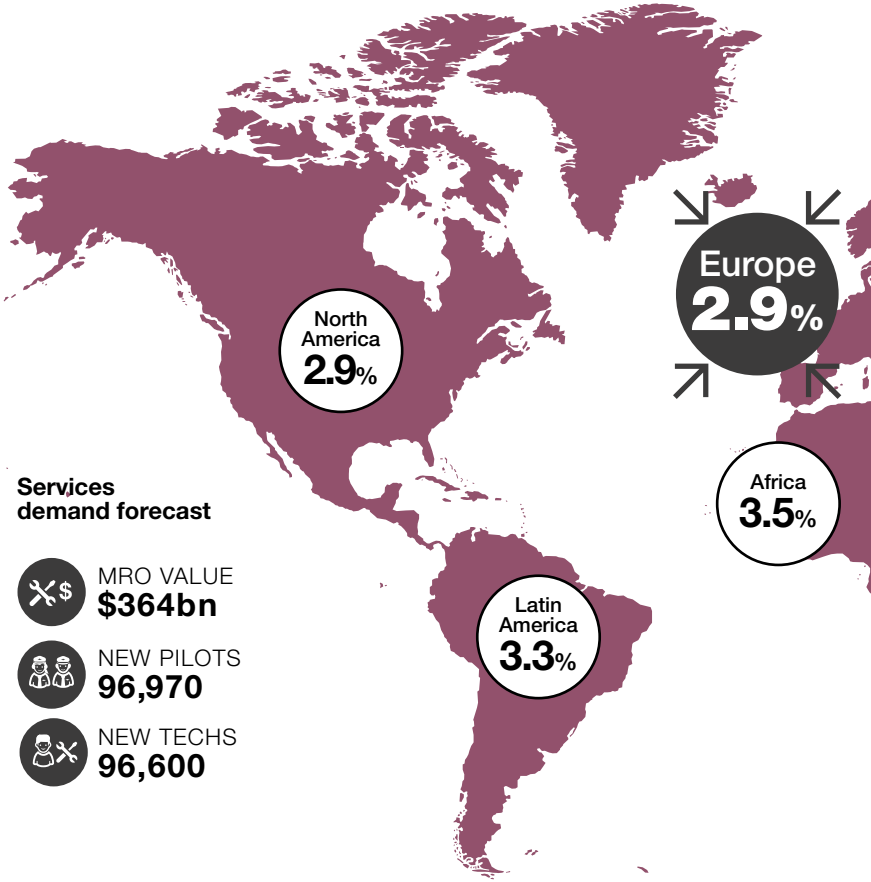
Distance (Kilometer)



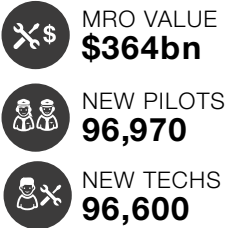
- As well as the average distance for these operations growing, so too is the average capacity operated, growing from 147 seats in 2006 to 165 seats per flight in 2016. This growth in size is largely driven by demand on existing routes.

LOW COST CARRIERS HAVE BEEN OPERATING ON LONGER SECTORS

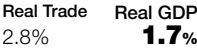
Source: OAG – September of each year, Airbus GMF 2017



Services demand forecast



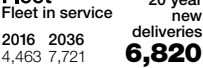
Economy**



Traffic**

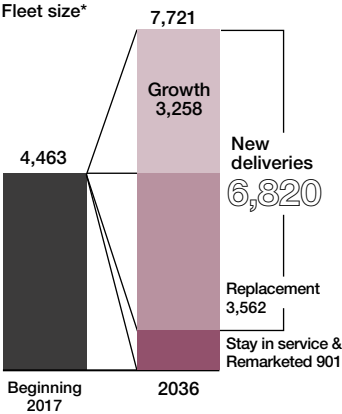


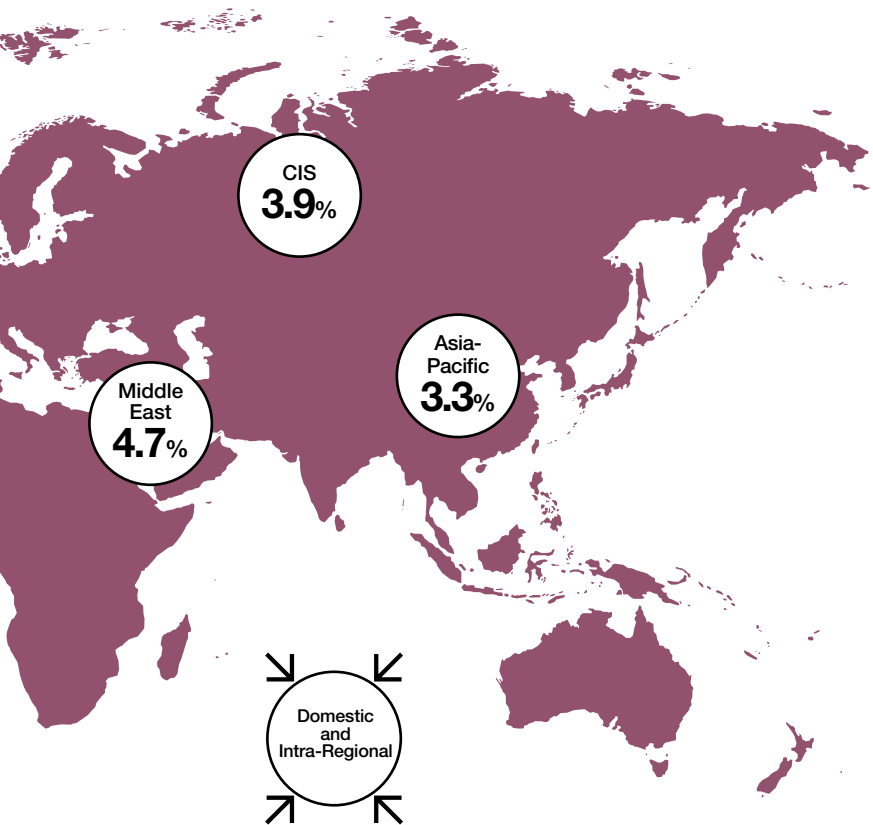
Fleet*



* Passenger aircraft ≥100 seats
** 2016-2036 CAGR

Fleet in service evolution

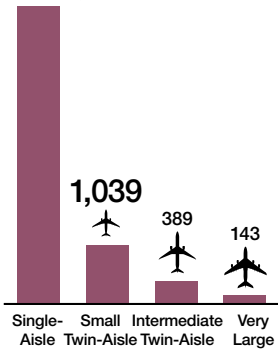




New deliveries by segment

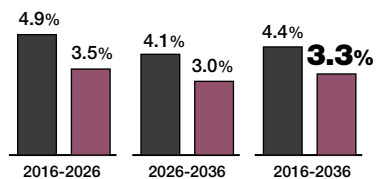
Number of new pax aircraft

✈️ 5,249



Total RPK traffic growth

Europe 
World 





North America

PROFITING FROM GROWTH

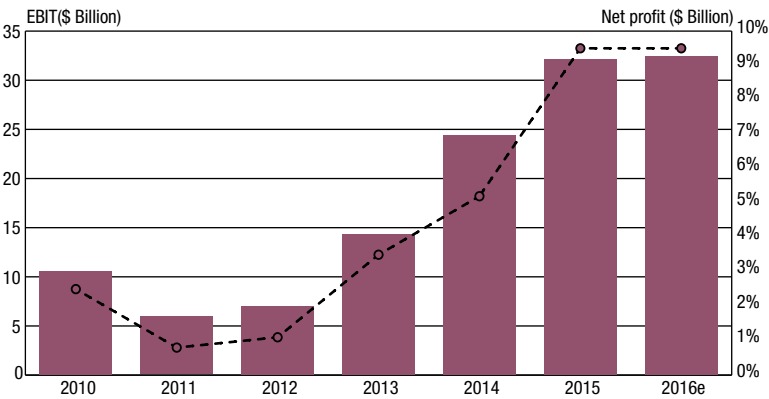
ECONOMY

- US economic expansion is becoming more balanced, with consumer spending, residential construction, business fixed investment and government spending all contributing to economic growth and compensating for a strong dollar impact on trade.
- Consumer spending, supported by growth in employment and real incomes, is compensating for a sluggish global economy, strong dollar and excess inventory headwinds.
- Real GDP growth is expected to hold up reasonably well according to forecasts with an average +2.1% per year in the 2016-2036 period, with greater business fixed investment and R&D spending offsetting the slowdown in labour force growth.

TRENDS

• From the first revenue flight, the first passenger, the low cost revolution and the drive for deregulation through bi-laterals, the region has always been at the forefront of positive developments and innovation in the industry. Today, the US airline industry, a significant part of the region, is also at the forefront of profitability with US airlines responsible for 61% of global airline profitability in 2015, and likely to be prominent again when final figures for 2016 are released.

2015 net profit
North american
61%
of global airline profit



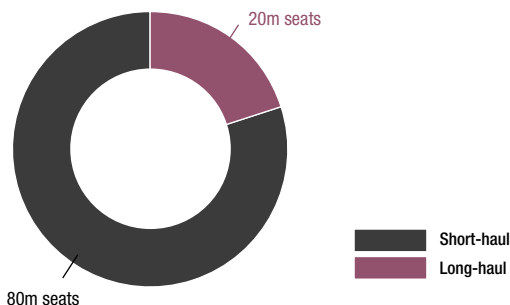
**NORTH AMERICAN AIRLINE
PROFITABILITY HAS
INCREASED SINCE 2011**

Source: ICAO, IATA,
Airbus GMF 2017

- This positive result was in part delivered by low oil prices but also a continued focus on other cost, as well as maintaining/improving revenue through ancillary revenues.
- The airlines in the region have also embarked on significant fleet renewal with the latest generations of aircraft types, which should help them meet increased demand and the need to improve costs in the coming years.
- The short-haul market continues to dominate the North American market, with the US domestic market the world's largest today. However, the long-haul market (routes over 2,000nm) has seen the number of seats offered grow by a third since 2010.

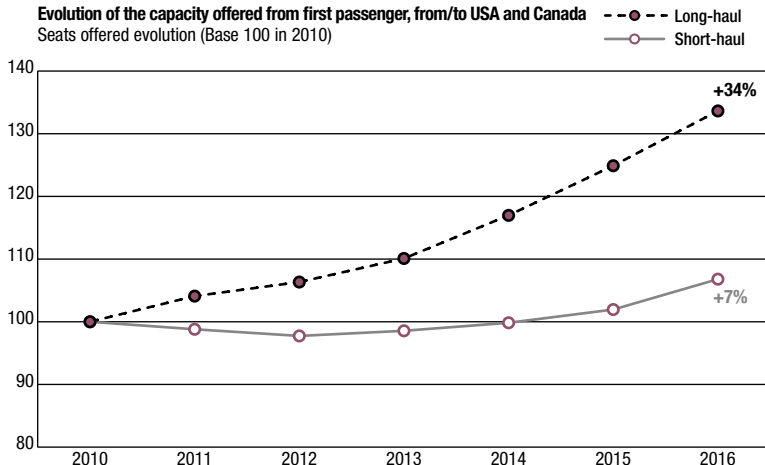
Evolution of the capacity offered from/to USA and Canada

Seats offered distribution in 2016



Evolution of the capacity offered from first passenger, from/to USA and Canada

Seats offered evolution (Base 100 in 2010)

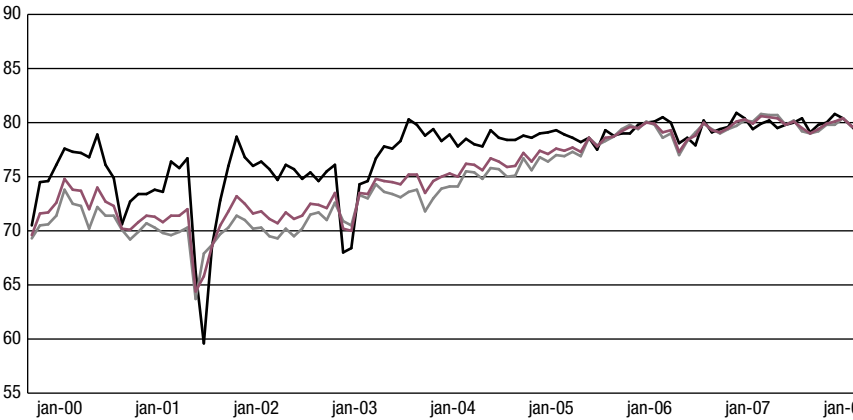


- This additional capacity has been possible with the increase in the propensity to travel of the people in this market. A recent survey for example has highlighted the development of the US market, suggesting that the flying population had grown from 21% in 1971 to 49% in 2016. From these, the average number of trips was just over four per year, with 51% travelling for leisure, 31% for business, 18% for other reasons including VFR (visiting friends and relatives).

SEATS OFFERED ON LONG-HAUL FLIGHTS GREW FASTER THAN ON SHORT-HAUL FLIGHTS

Source: OAG (September data annualised), Airbus GMF 2017
Short haul: below 2,000 nm

US Airlines load factors
Loads Factors (%)

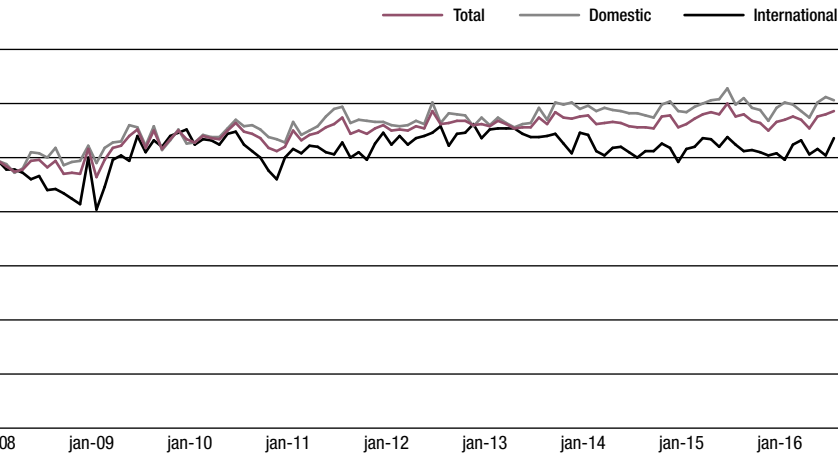


• Today, these passengers are flown in operations which are extremely efficient in terms of aircraft occupancy. In the US domestic market for example load factors are over 85%, whilst for international flights 82% of the seats are filled on average. With seasonality meaning that pushing load factors even higher will be a challenge, larger aircraft is one simple solution. This solution is already in evidence; at time of writing, the number of the larger A321neo ordered by airlines in North America, exceeds the number of A320neo ordered.

• This trend is also evident when the Canadian market is examined, where the seats offered has increased, with flights offered relatively flat, indicating the growth has been achieved through growing aircraft size.

End 2016
load factors

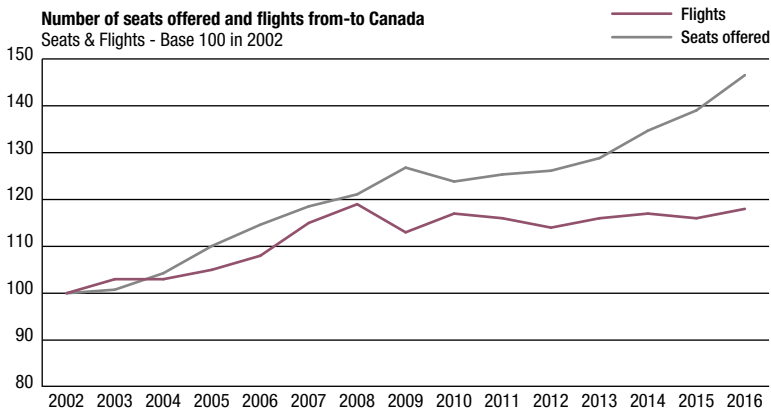
Total:
84.3%
Domestic:
85.3%
International:
81.8%



**US AIRLINE ACHIEVING
WORLD-CLASS LOAD
FACTORS**

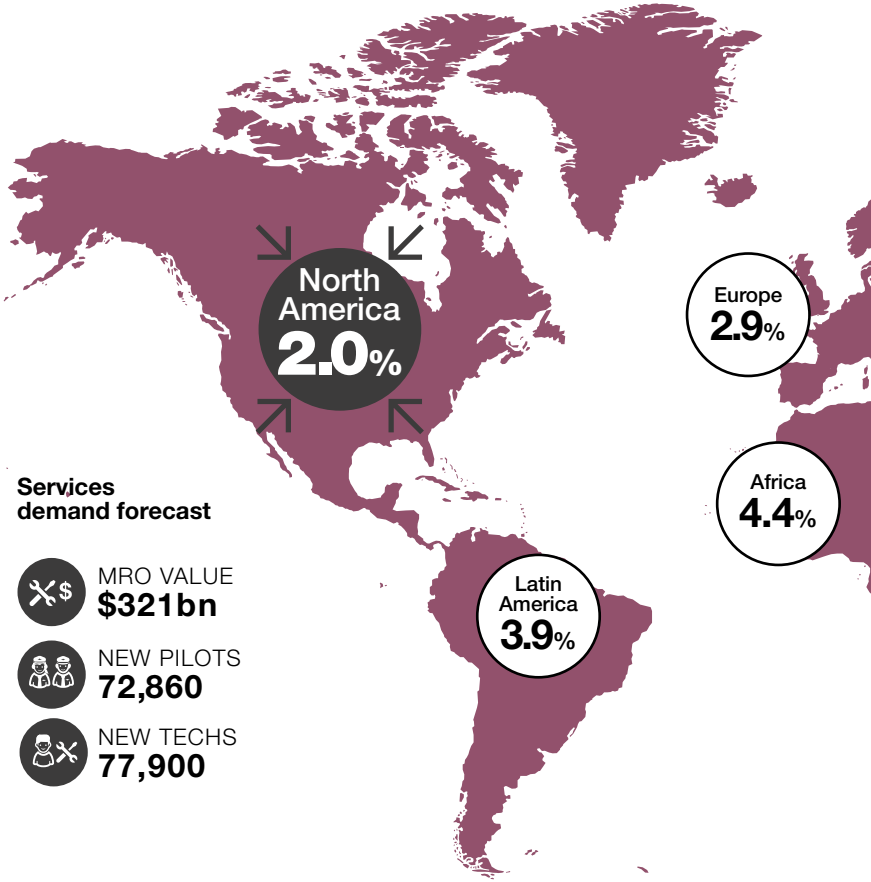
Source: US Bureau of Transportation Statistics, Airbus GMF 2017
Note: Data from all US air carrier domestic and international, scheduled passenger flights

Number of seats offered and flights from-to Canada
Seats & Flights - Base 100 in 2002

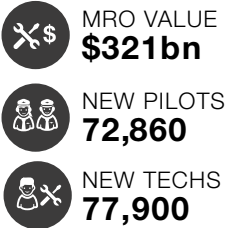


**CAPACITY FROM-TO CANADA
HAS GROWN FASTER THAN
FREQUENCY**

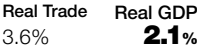
Source: OAG – September of each year, Airbus GMF



Services demand forecast



Economy**



Traffic**

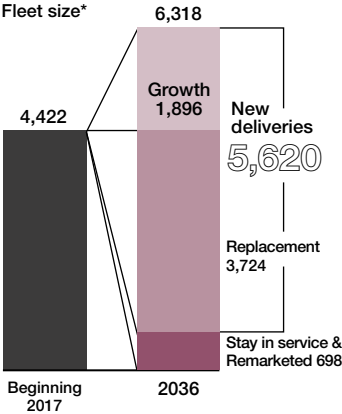


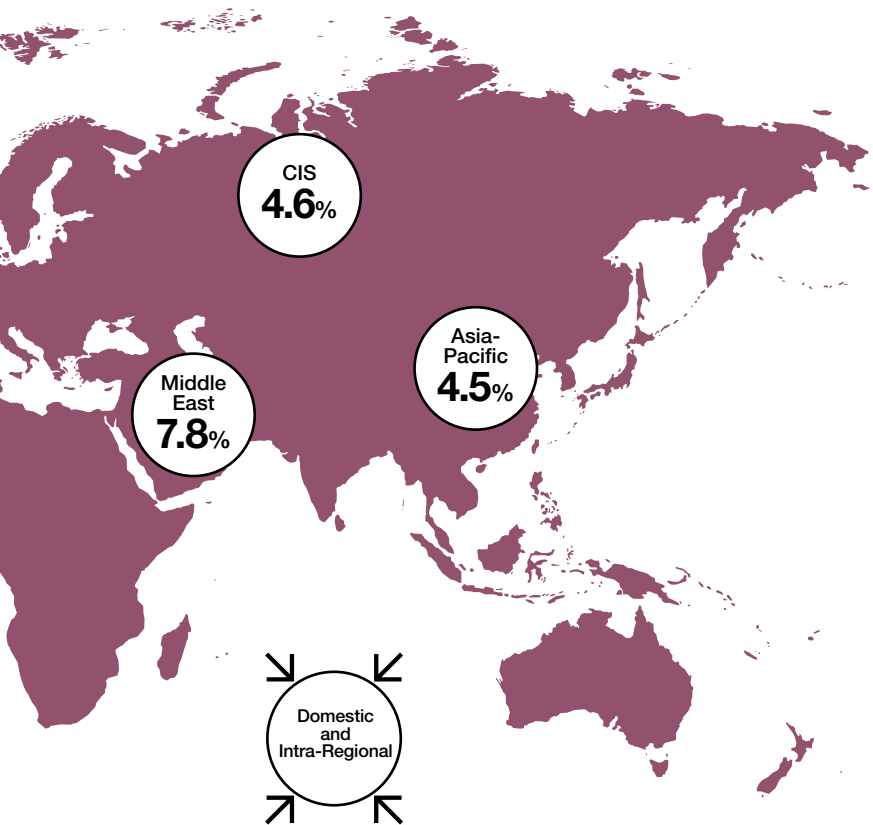
Fleet*



* Passenger aircraft ≥100 seats
** 2016-2036 CAGR

Fleet in service evolution

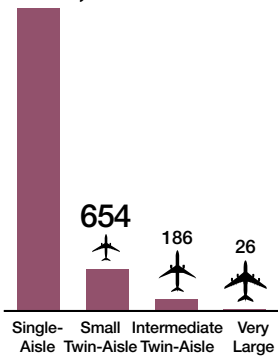




New deliveries by segment

Number of new pax aircraft

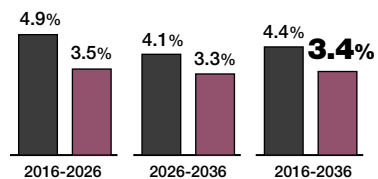
✈️ 4,754



Total RPK traffic growth

North America

World





Middle East

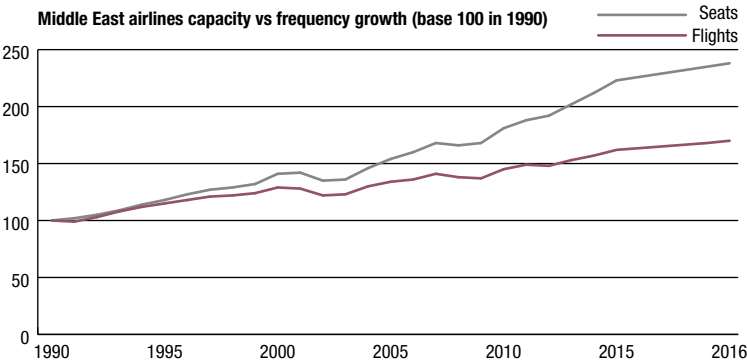
INTRA-REGIONAL GROWTH, WHILST CONNECTING
THE EAST WITH THE WEST

ECONOMY

- Low oil prices and fiscal tightening are currently restraining economic growth.
- However, the Middle Eastern economic outlook remains supported by its substantial petroleum resources, proximity to the energy intensive Asian economies, growing tourism potential and strategically important geopolitical location.
- The region's real GDP is forecast to grow at **+3.4%** per year over the next 20 years.

TRENDS

- It is not news that the Middle East and its airlines have been growing. As well as its large world class airports taking advantage of the regions geographical position by offering connections to destinations around the globe, a location which has put the Middle East at the cross roads of trade and transportation between east and west for centuries, the origin and destination traffic to from and within the region has also grown.
- In Dubai for example, 46% of passenger traffic is origin and destination traffic, with a further 17% intra-regional connecting passengers i.e. the start and end of the journey is in the Middle East.
- As a way meeting this demand airlines in the region not only benefit from new state of the art airports but the latest aircraft as well. They have added frequency over time, but more significant is the growth in the number of seats which indicates a significant growth in aircraft size over time. With aircraft like the A380, A350XWB and 777 prominent in airline fleets.



**MIDDLE EAST AIRLINES
HAVE ADDED CAPACITY
TO THE MARKET**

Source: OAG (Sept. data of each year), Airbus GMF 2017

- At the same time the connectivity to and from the region has grown dramatically over the same period with the number of city pairs more than tripling from nearly 200 in 1990 to more than 700 in 2016. Again due to its location most of the growth in routes has been on routes to and from Asia-Pacific and Europe, although the number of routes connecting Africa has doubled.

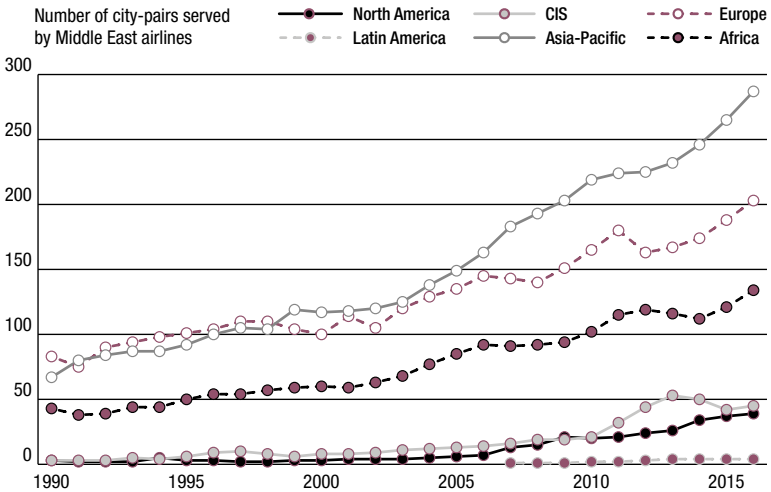
Number of city-pairs with the Middle East

1990:

199

2016:

712



MORE CONNECTIVITY, PARTICULARLY WITH ASIA-PACIFIC

Source: OAG (September of each year), Airbus GMF 2017

- Despite this investment in new aircraft and rapidly growing operations, the region's airlines collectively returned a profit in both 2015 and 2016.
- Geopolitics sometimes means that demand in a region can be constrained, when these are eased or removed air traffic in a country and its region can receive a boost. Something that forecasters must consider when putting together aviation demand forecasts.
- A good case study that has emerged recently in the region is Iran.

- Passenger traffic forecasts very often include the impact of economic growth. The positive developments in Iran have been reflected in the economic development projected for the country. In 2015, the GDP forecast for Iran was +3.3% per annum to 2036. Following well reported positive geopolitical developments involving Iran this forecast rose to +4.1% per annum early in 2017 over the same period. This improvement is likely to positively impact long term demand for aviation from and to the country.
- Already ~40 new routes have started, emphasising the effects that liberalisation can have on markets.

Additional airport-pairs from/to Iran in 2016



.....

**In 2015, the GDP
forecast for Iran
was**

+3.3% per annum to
2036

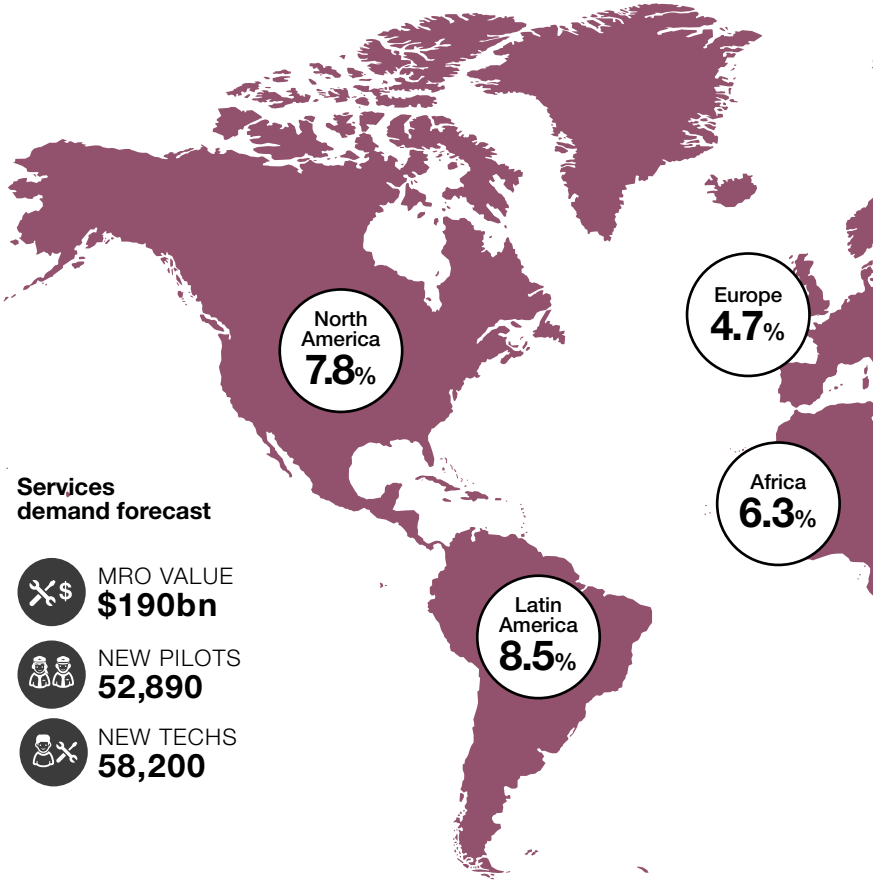
.....

**now
+4.1%**

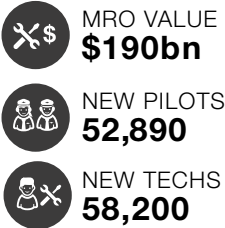


**THE AGREEMENT WITH IRAN
HAS ALREADY LED TO MORE
AIR SERVICES FROM/TO THE
COUNTRY**

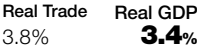
Source: OAG, Airbus GMF 2017



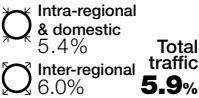
Services demand forecast



Economy**



Traffic**

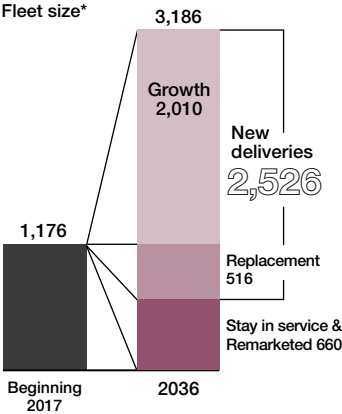


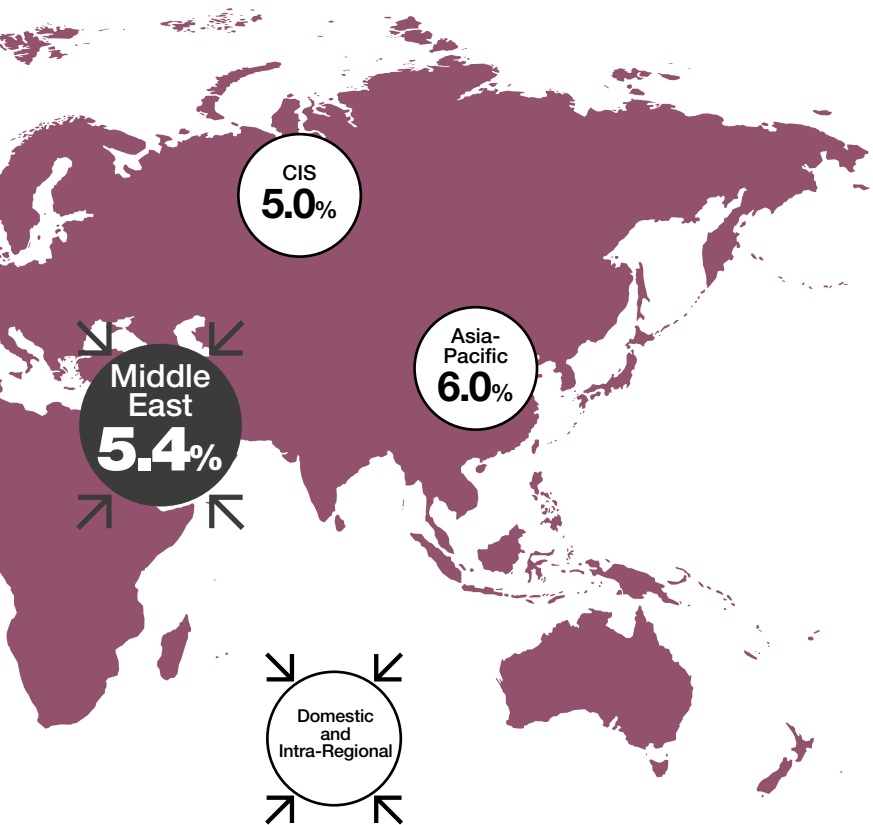
Fleet*



* Passenger aircraft ≥100 seats
** 2016-2036 CAGR

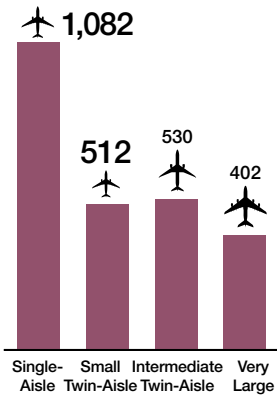
Fleet in service evolution



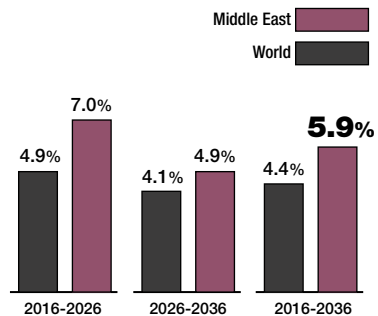


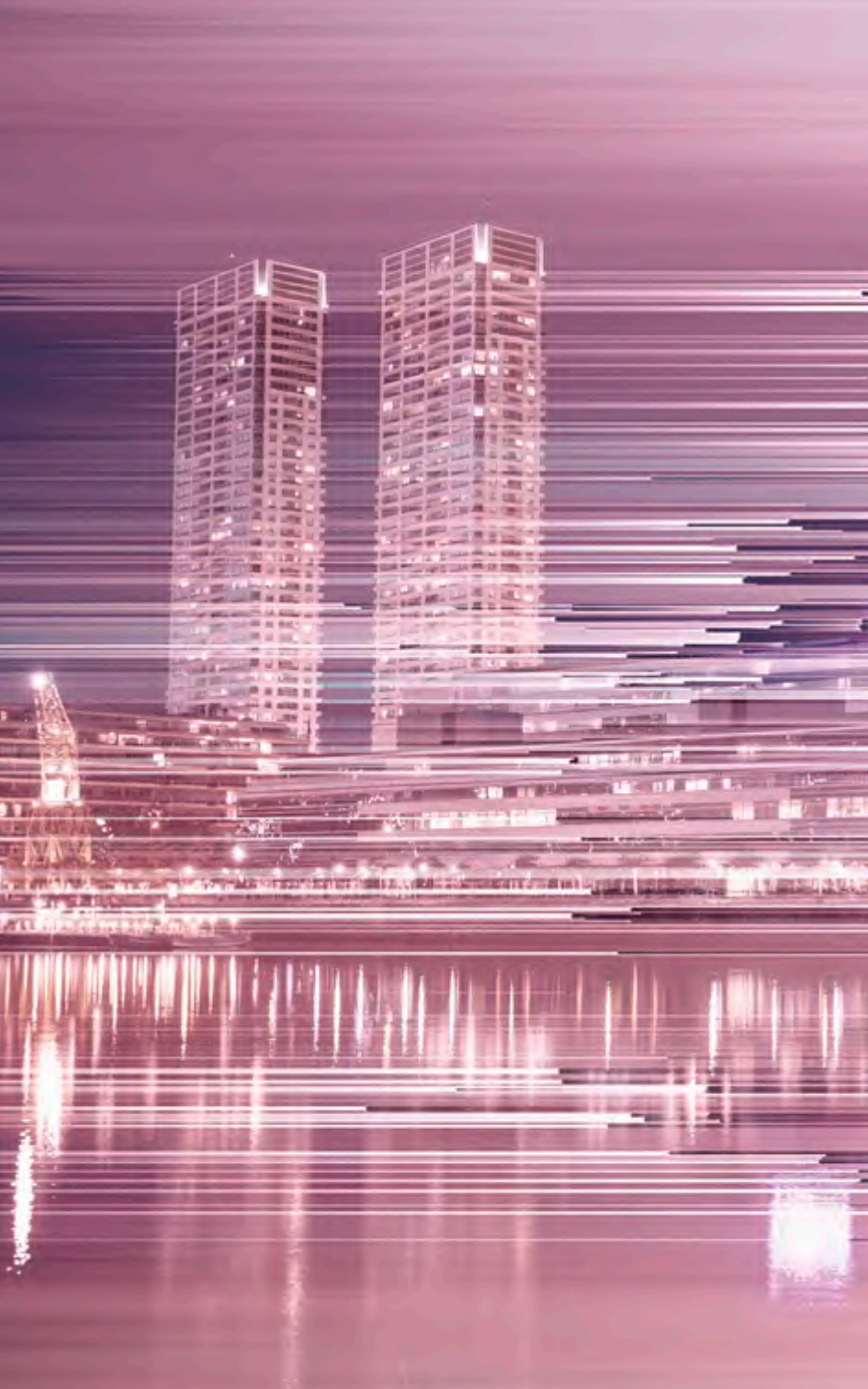
New deliveries by segment

Number of new pax aircraft



Total RPK traffic growth





Latin America & Caribbean

RECOGNISED BENEFITS OF AVIATION HELPING
TO DRIVE GROWTH

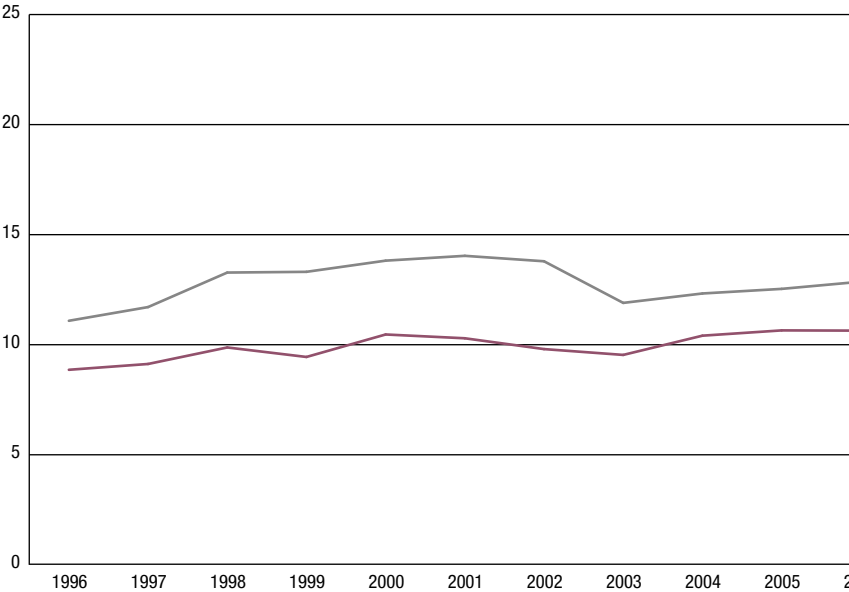
ECONOMY

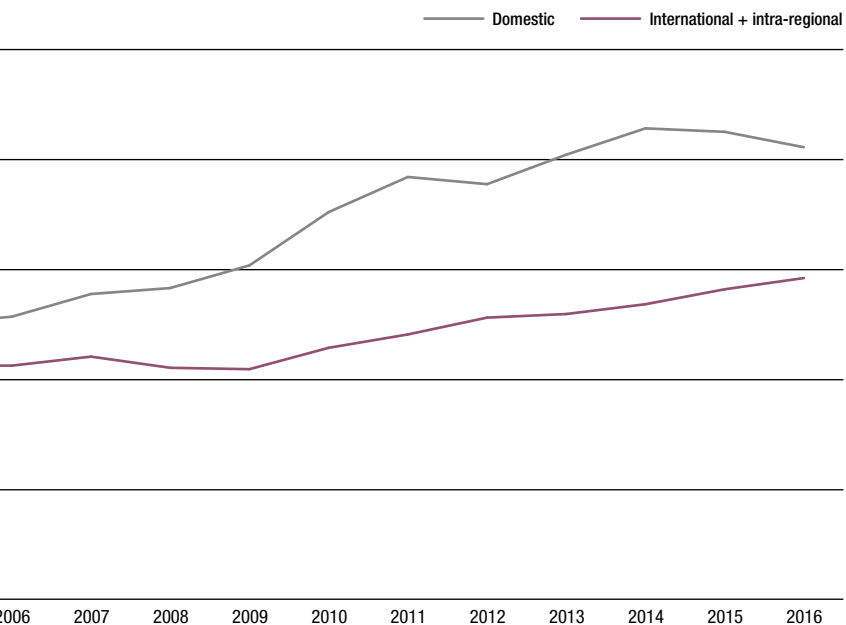
- After two years of contraction the rebound of commodity prices, Brazil's abating recession, as well as Argentinian economic progress is leading South America's slow recovery.
- Despite long-term challenges including inadequate infrastructure, restrictive business environments and income inequality, the long term prospect for Latin America remains positive.
- Real GDP growth is expected to average **+3.0%** per year over the period 2016-2036.

TRENDS

- Despite the economic difficulties faced in the region in recent years, total traffic has grown consistently except for 2016, when the decrease in Brazilian domestic traffic caused an overall decline.
- Other domestic markets in the region continued to grow however, with a 50% increase in traffic in the last 10 years.
- Despite its recent decline, Brazil continues to be by far the largest domestic market in Latin America, double the next biggest market in Mexico.
- The international and intra-regional market from/to/within the region has grown, now 40% bigger than it was in 2009.

Monthly seats offered from/to/within Latin America (million)



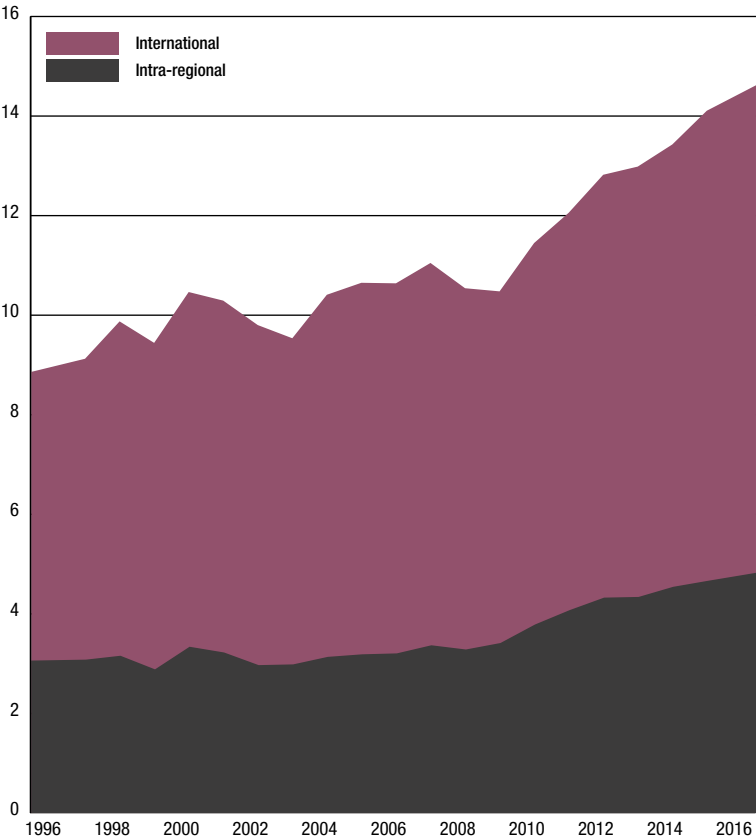


DOMESTIC MARKETS IN LATIN AMERICA REPRESENT 60% OF TOTAL, DESPITE DECREASING IN 2015 AND 2016

Source: OAG (September data), Airbus GMF 2017

- Intra-regional travel has continued to grow. Given the geography of the region and its ground infrastructure constraints today, there appears opportunity for intra-regional to grow its share further.

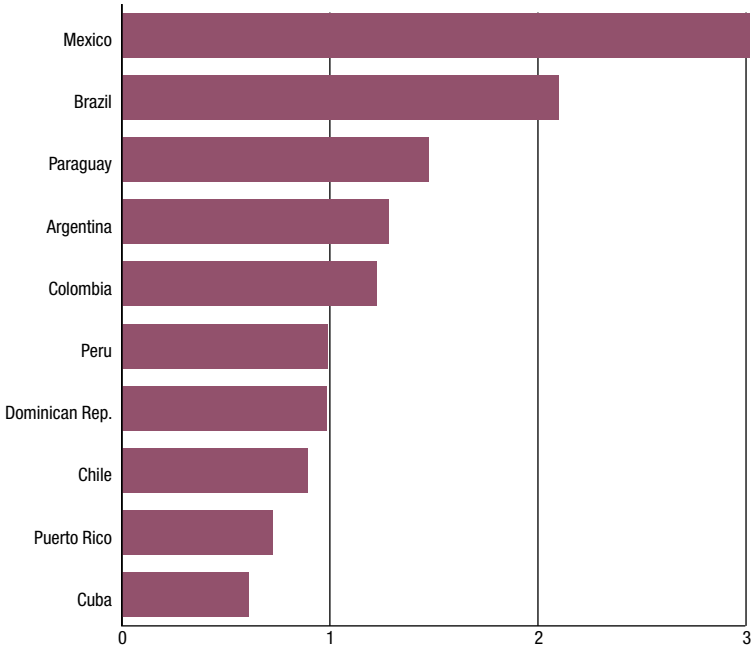
Monthly seats offered from/to/within Latin America (million) excluding domestic traffic



**INTRA-REGIONAL TRAFFIC
GROWING FAST, BUT STILL
ONLY ONE THIRD OF THE TOTAL**

Source: OAG (September data),
Airbus GMF 2017

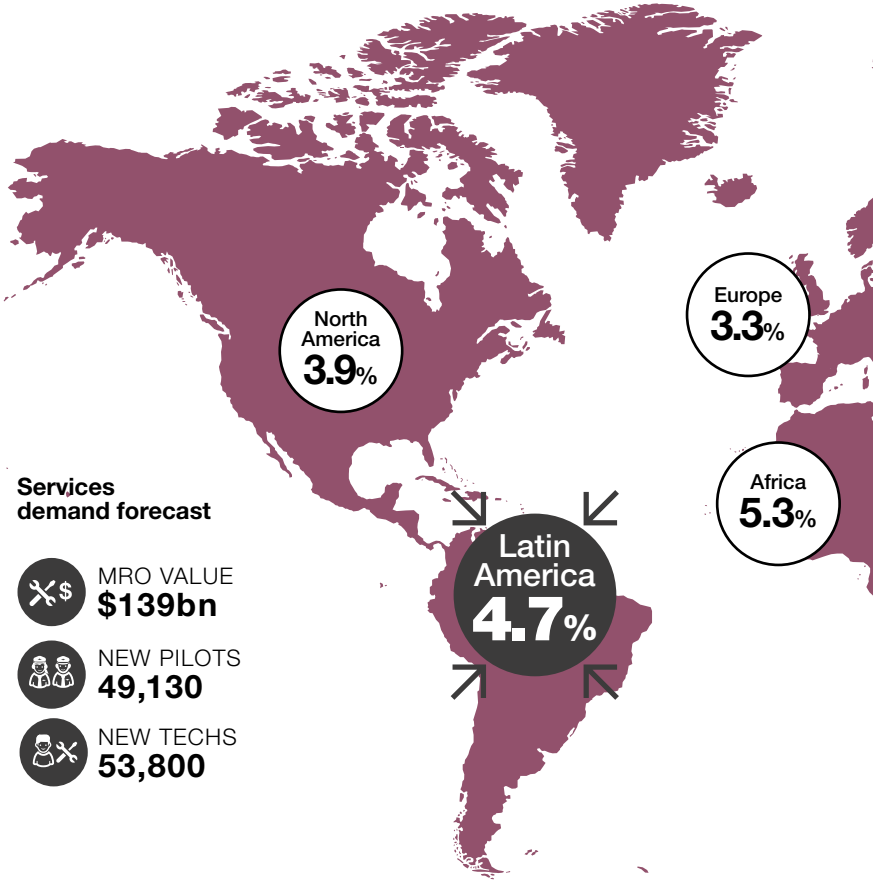
Latin America – top ten countries in international seats offered, in 2016 (monthly, million)



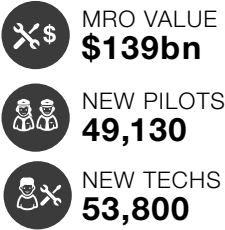
**MEXICO IS THE LARGEST
COUNTRY IN LATIN AMERICA
FOR INTERNATIONAL TRAFFIC**

Source: OAG (September data),
Airbus GMF 2017

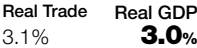
- Mexican international traffic continues to lead the region with about three million monthly seats, followed by Brazil and Paraguay. The strengthening of the market between Mexico and the US and an increasingly more liberalised environment has allowed traffic to grow 50% since 2009.
- Further liberalisation is expected in the region. Argentina for example has conditionally agreed 135 new routes for five airlines. At least one Long-Haul Low Cost airline is expected to request routes to the country in the future.
- Airlines in the region are also increasingly looking to alliances in order to facilitate further growth across the Latin American market and to international destinations.



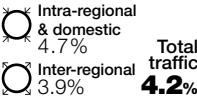
Services demand forecast



Economy**



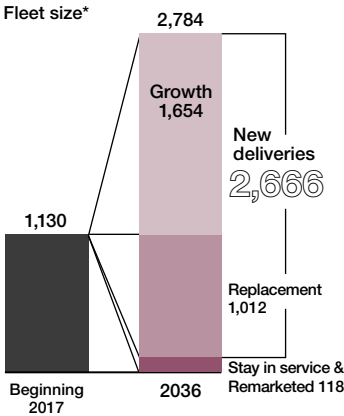
Traffic**



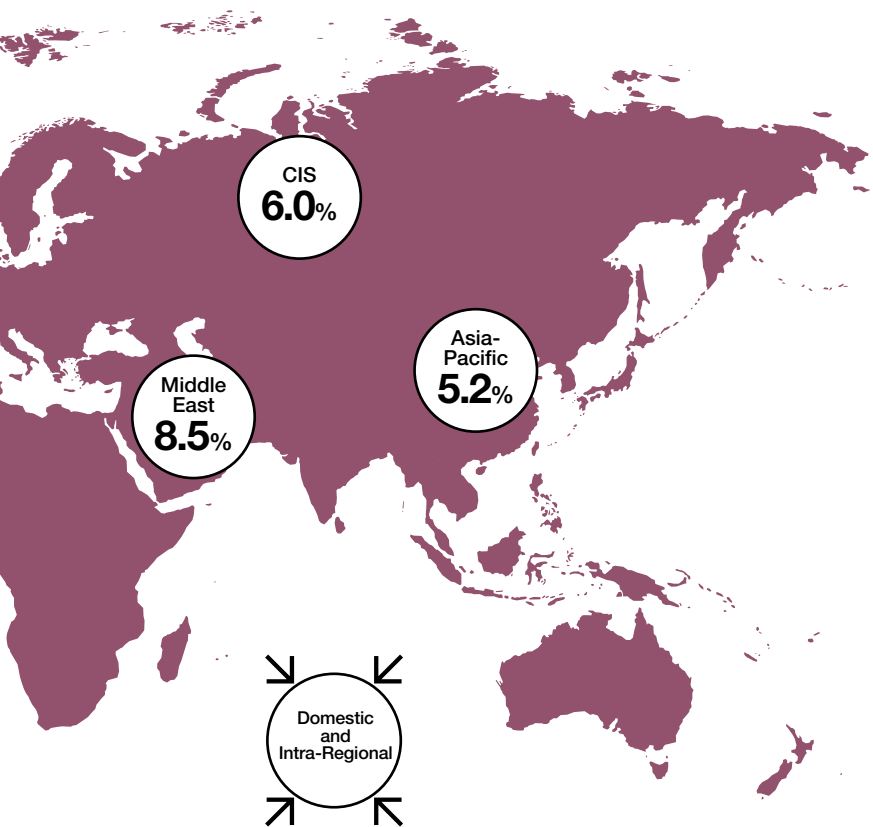
Fleet*



Fleet in service evolution



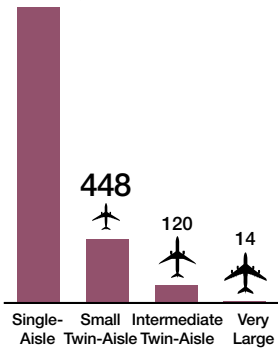
* Passenger aircraft ≥100 seats
** 2016-2036 CAGR



New deliveries by segment

Number of new pax aircraft

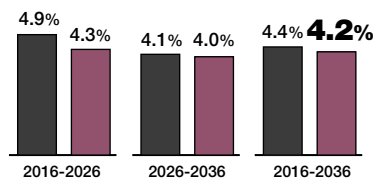
✈️ 2,084



Total RPK traffic growth

Latin America

World





Commonwealth of Independent States

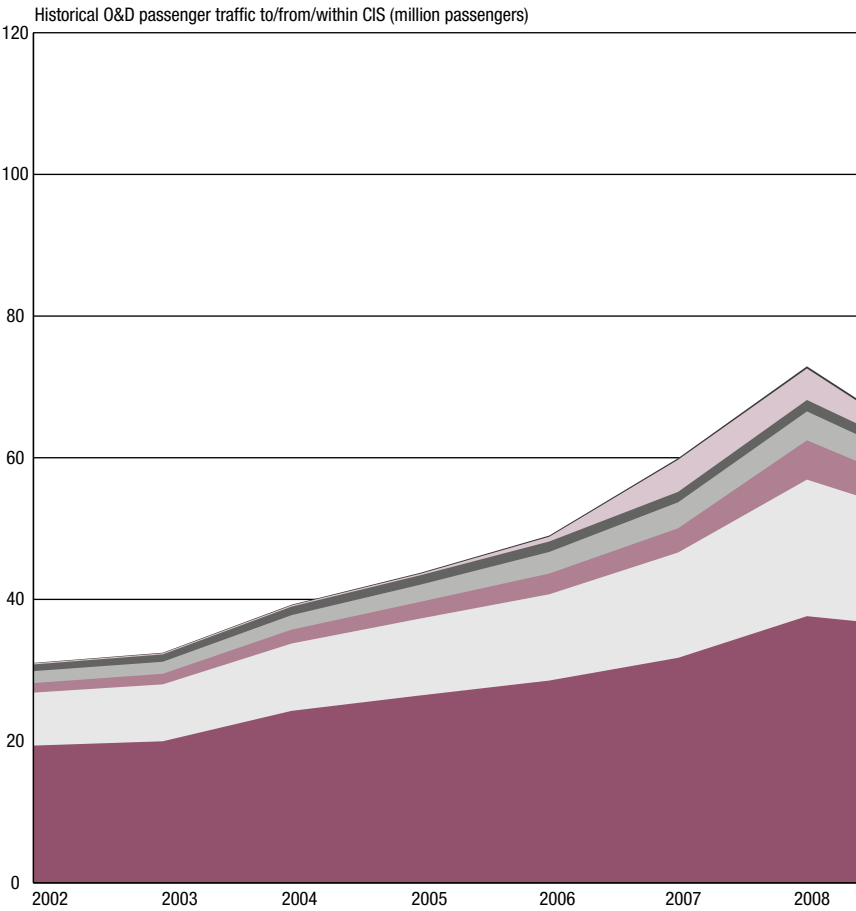
MORE CONNECTIONS, YOUNGER AIRCRAFT

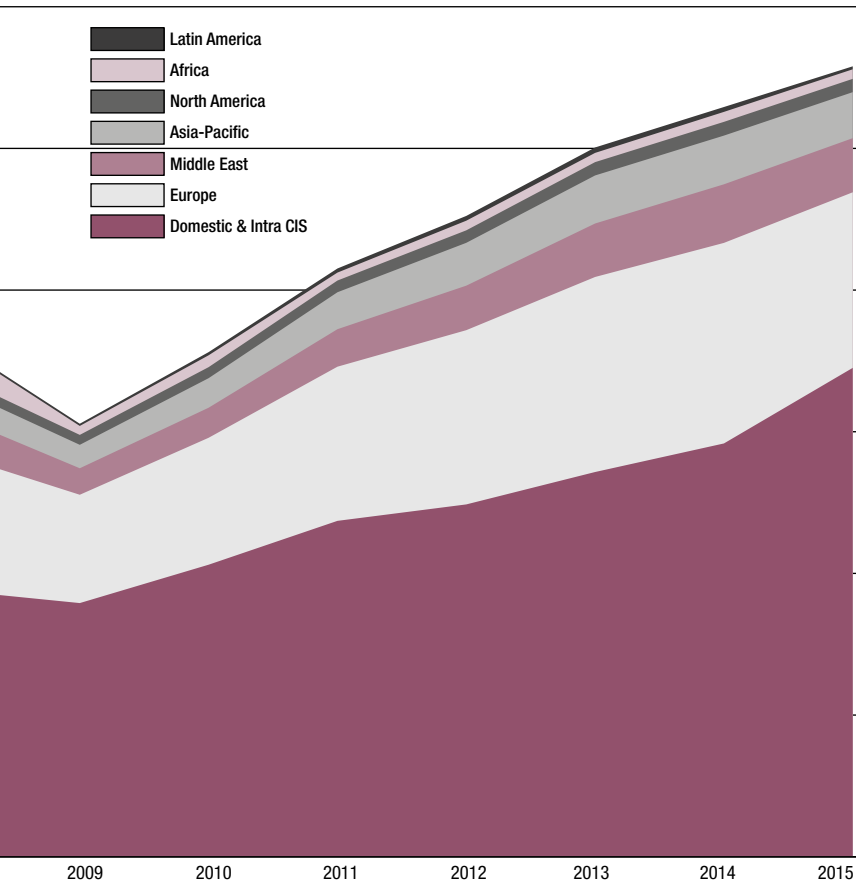
ECONOMY

- A key component of the CIS, the Russian economy, is stabilising after a severe recession triggered by a number of factors including a drop in oil prices. Generating and attracting investment to diversify its economy and sustain robust growth in the CIS will require further structural and institutional reform to improve the business environment.
- The CIS region's real GDP is expected to grow at **+2.0%** per year over the next 20 years.

TRENDS

- Despite the difficulties experienced in the region in recent years, origin and destination passenger traffic has doubled to, from and within the CIS over the last 10 years. Domestic and Intra-regional traffic has been particularly strong as well as traffic to and from Asia-Pacific.

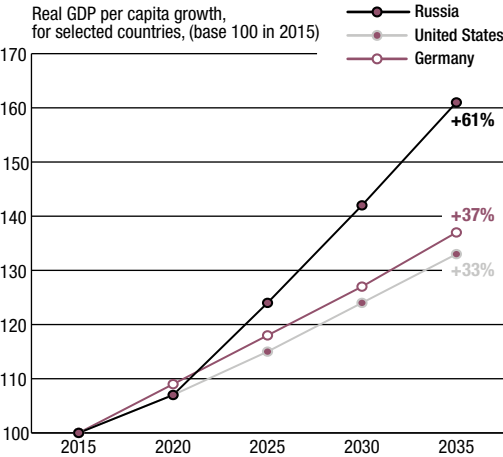




**O&D TRAFFIC TO/FROM/
WITHIN CIS HAS MORE
THAN DOUBLED IN THE LAST
TEN YEARS**

Source: SABRE,
Airbus GMF 2017

- Growth in GDP per capita in Russia is forecast to grow 61% by the end of our forecast period and is expected to help stimulate growth in air traffic in the region.



GDP per capita in Russia will grow

60%

over the next twenty years, driving growth for outbound trips

RUSSIAN WEALTH FORECAST TO GROW

Source: IHS Economics, Airbus GMF 2017

- When demand is challenged, airlines who have more global operations i.e. outside the affected area, can help offset some of the impact. Linked to this and also an enabler, and a benefit for airports, is increased connecting traffic. In Russia, international travel has increased, but so has connecting traffic which represents about 15% of Russian international traffic.



Connecting traffic represents around

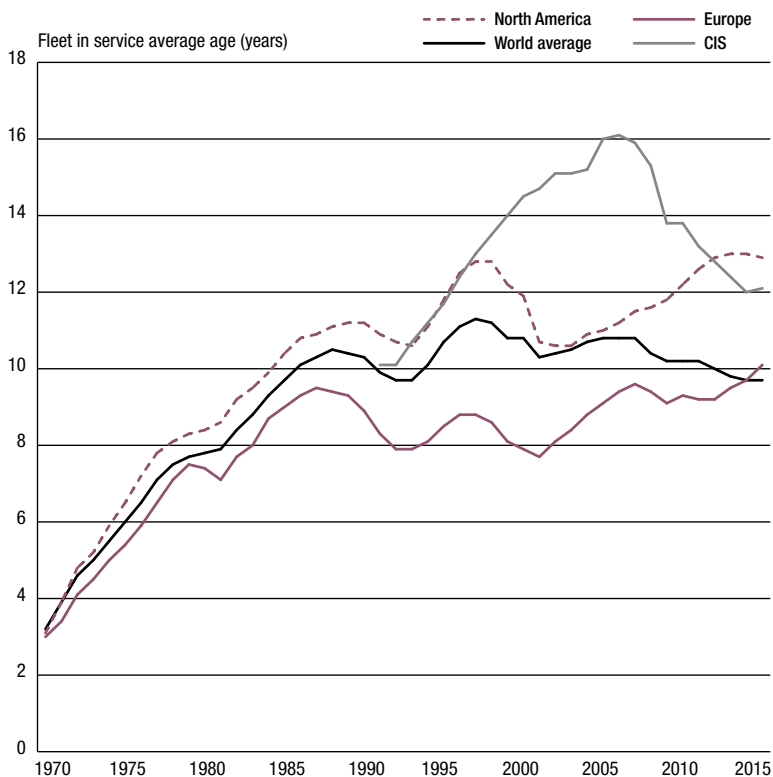
15%

of international traffic of Russian airlines

CONNECTING TRAFFIC HELPING DURING DIFFICULT TIMES

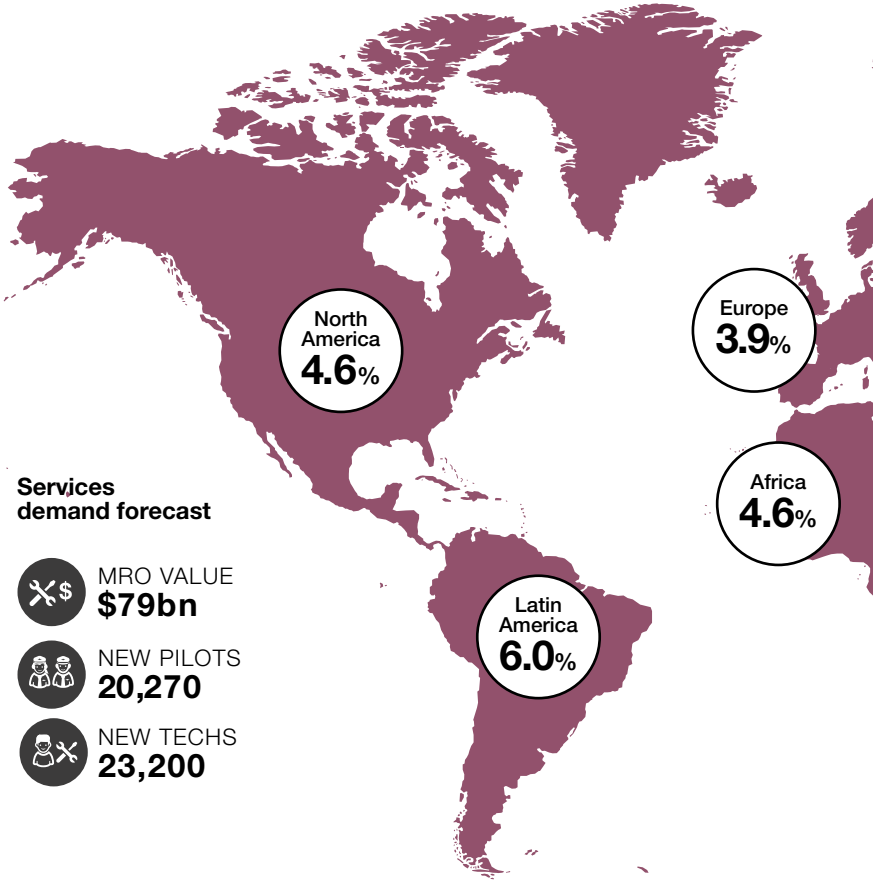
Connecting passengers counted once.
Source: Sabre, Airbus GMF 2017

- Historically, despite the number of aircraft in service in the region, fleet productivity was low and the average aircraft age was high. In 2005, for example, average fleet age was significantly higher than other regions in the world at about 16 years. Today, with the acquisition of the latest generations of aircraft, either directly or through lease, the average age of the CIS fleet has fallen dramatically to ~12 years. This having been said, the average age for the CIS fleet needs to fall further to reach world average levels.

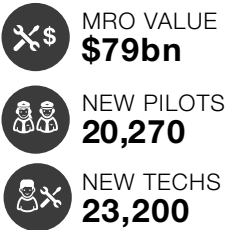


POSITIVE CIS FLEET DEVELOPMENT, MORE TO COME

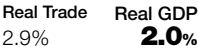
Source: Ascend, Airbus GMF 2017
Notes: As at end of year, 100 seats and above



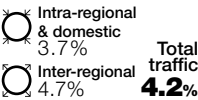
Services demand forecast



Economy**



Traffic**

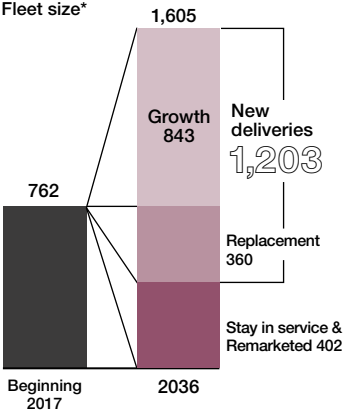


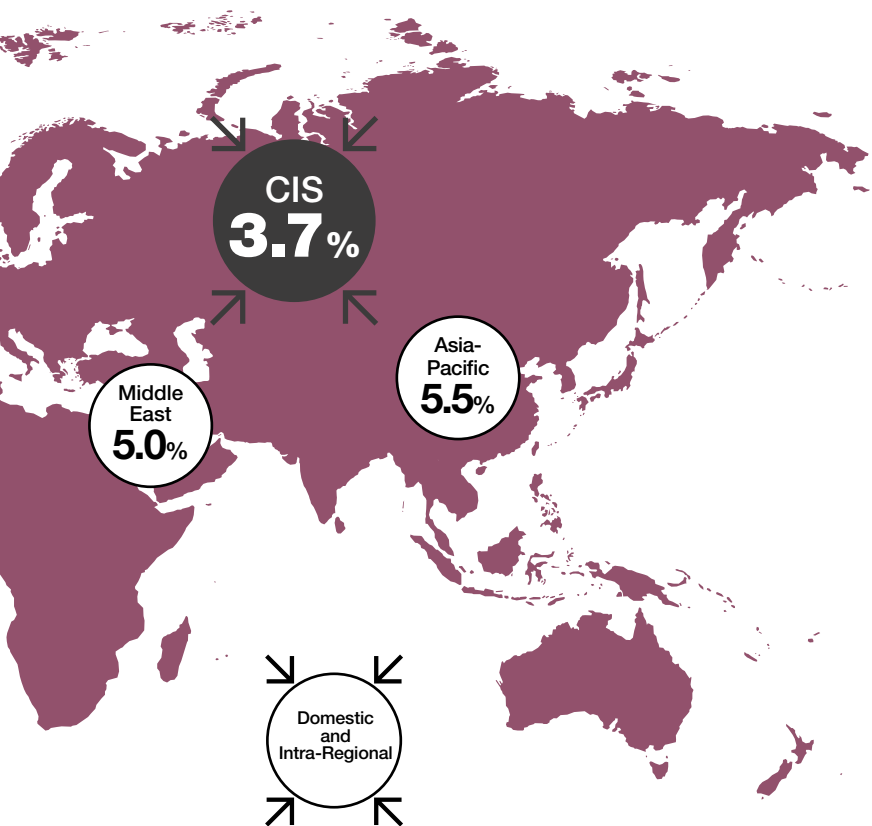
Fleet*



* Passenger aircraft ≥100 seats
** 2016-2036 CAGR

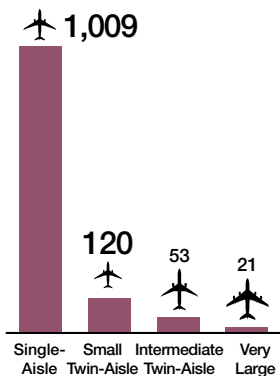
Fleet in service evolution



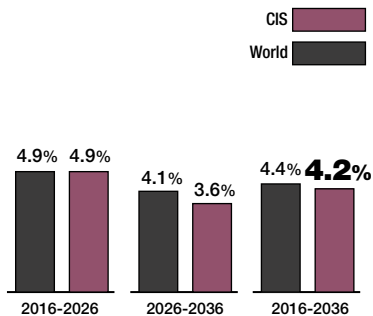


New deliveries by segment

Number of new pax aircraft



Total RPK traffic growth





Africa

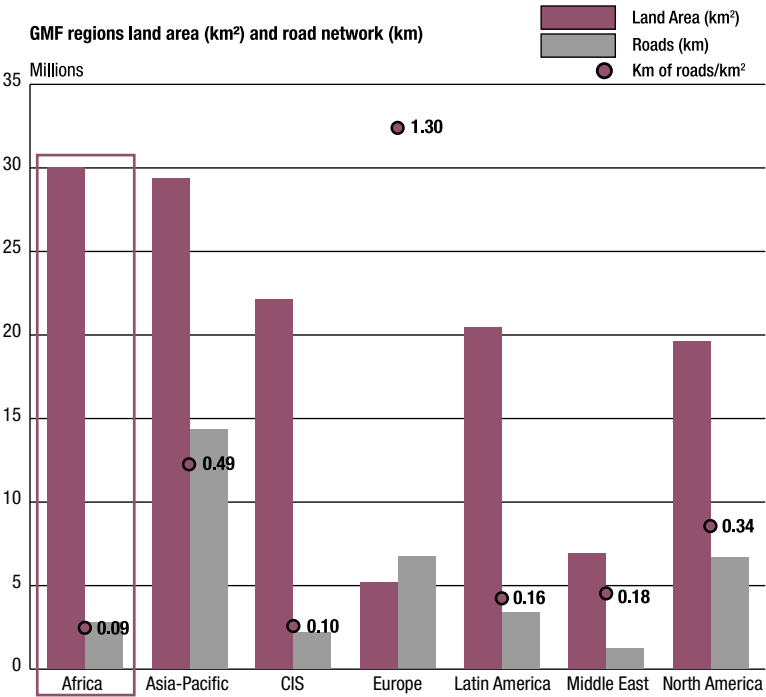
LIBERALISATION, NOW MORE THAN JUST
A GOOD IDEA

ECONOMY

- A rebound in commodity prices and stabilisation in China's industrial sector are expected to revive economic growth.
- Beyond developments in global commodity markets, expanding domestic markets, growing middle-class populations, and regional integration will support long term economic growth.
- African real GDP is expected to grow at **+3.6%** per year over the next 20 years.

TRENDS

- Africa is the largest region on Earth in terms of land area with some 30 million km², that is 20% of the Earth's total land area, but is the poorest in terms of its road network density.
- In terms of the distance between its largest population centres, those over 300,000 people, on average it has the third largest distance between them, only behind Latin America and Asia Pacific.

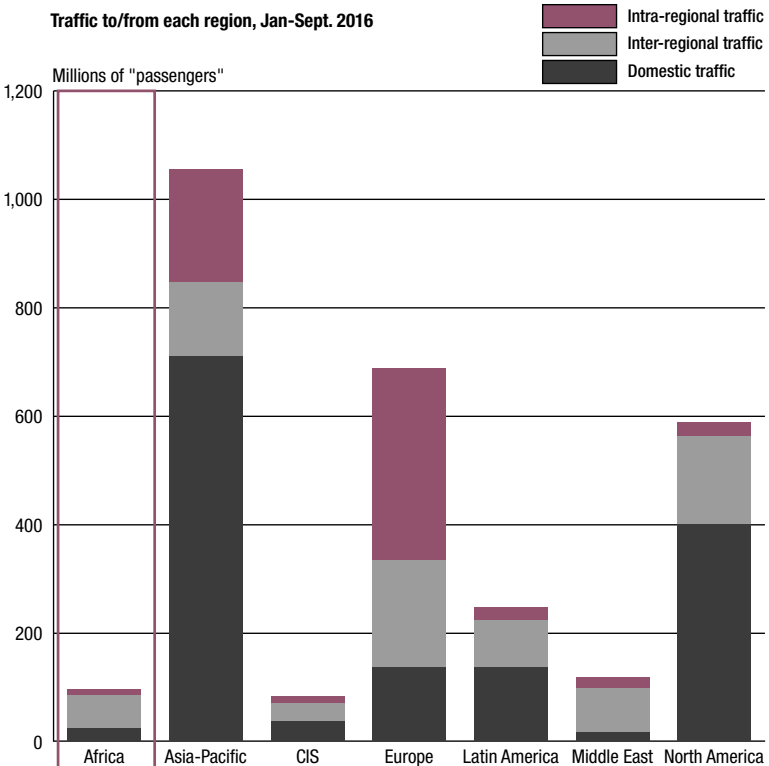


- Given these characteristics intra-regional traffic in particular appears under developed, especially when compared to other regions.

AFRICAN GEOGRAPHY AND EXISTING INFRASTRUCTURE MAKES AVIATION ESSENTIAL FOR THE REGIONS FURTHER DEVELOPMENT

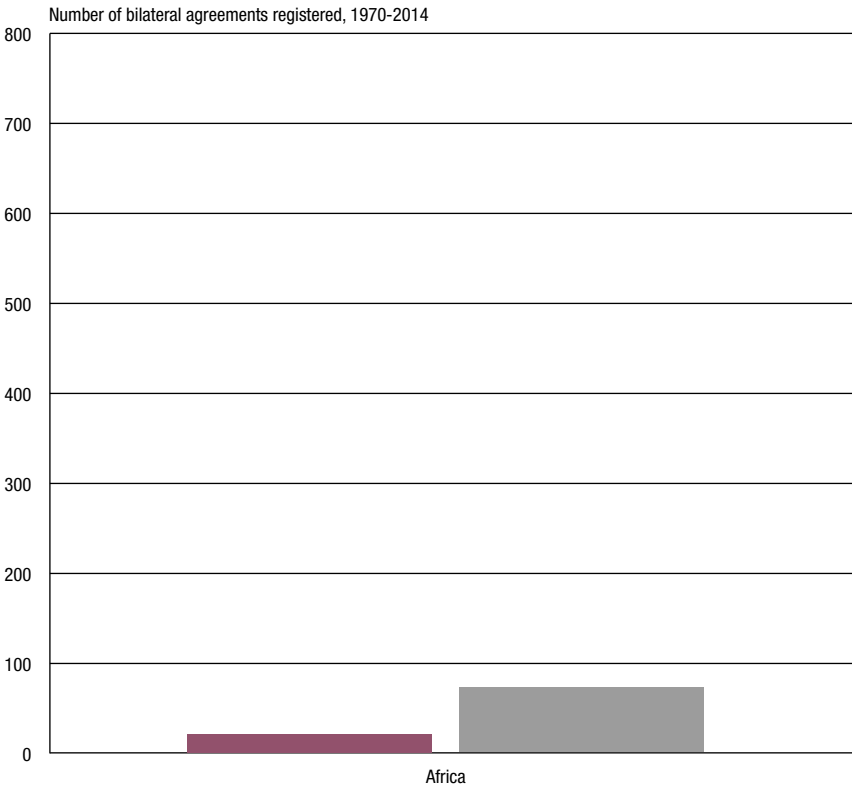
Source: IRF, The World Bank, Airbus GMF 2017

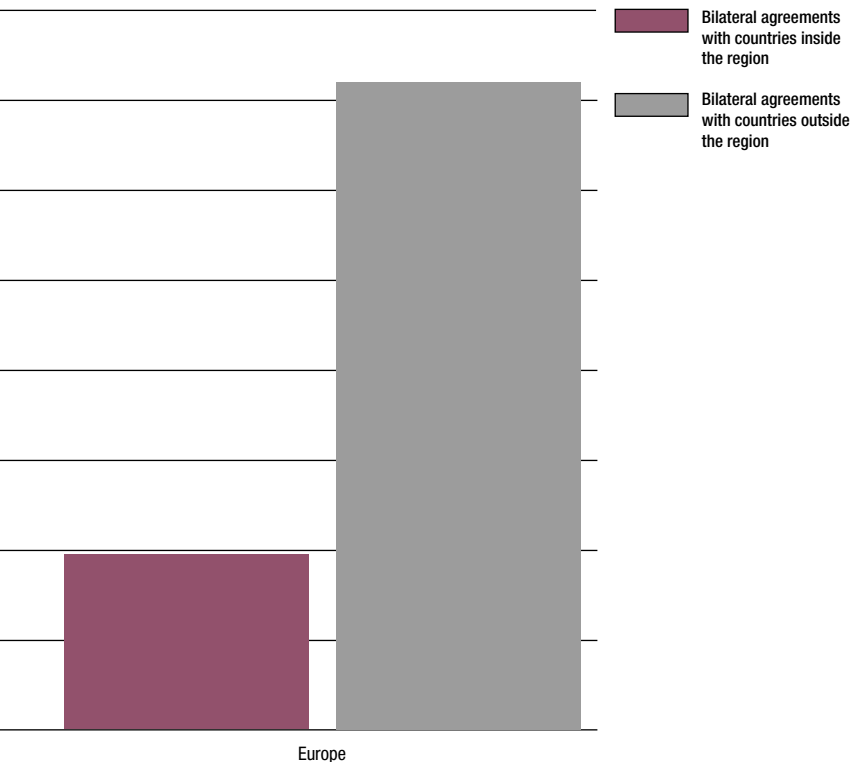
- One significant reason for this has been the slower pace of deregulation Africa has experienced compared to other regions both with countries inside and outside the region.
- This is recognised by both governments and the aviation industry in Africa. It is also recognised that a greater level of deregulation would allow air travel in the region to grow further towards its potential, and allow it to release the economic and social benefits aviation can deliver.



**REGIONAL TRAFFIC IN
AFRICA IS UNDERDEVELOPED**

Source: Sabre, Airbus GMF 2017

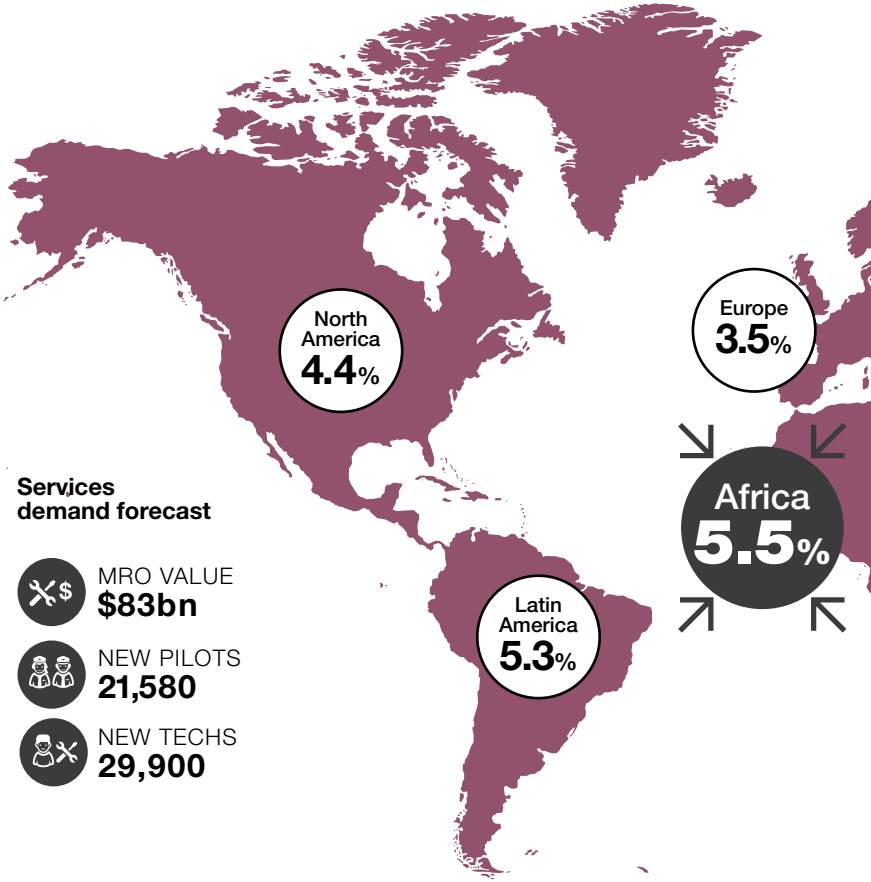




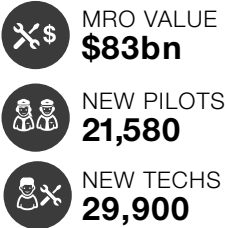
AFRICA LIBERALISATION HAS BEEN SLOW TO TAKE HOLD

Source: World Air Services Agreements database, Airbus GMF 2017

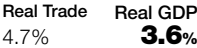
- Positively, 15 African States recently declared their commitment to fully open their skies in accordance with the Yamoussoukro Decision, a move which could act as a catalyst to even greater liberalisation in the region.
- For the passenger, another positive development that will be an enabler for aviation's future growth in Africa, is the launch in 2016, of plans for a new pan-African biometric passport by the African Union (AU). At the beginning of 2018, countries in the region are expected to start issuing the passports to their citizens, building upon the visa simplification efforts of some countries in recent years.



Services demand forecast



Economy**



Traffic**

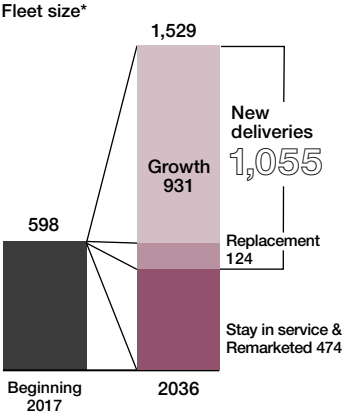


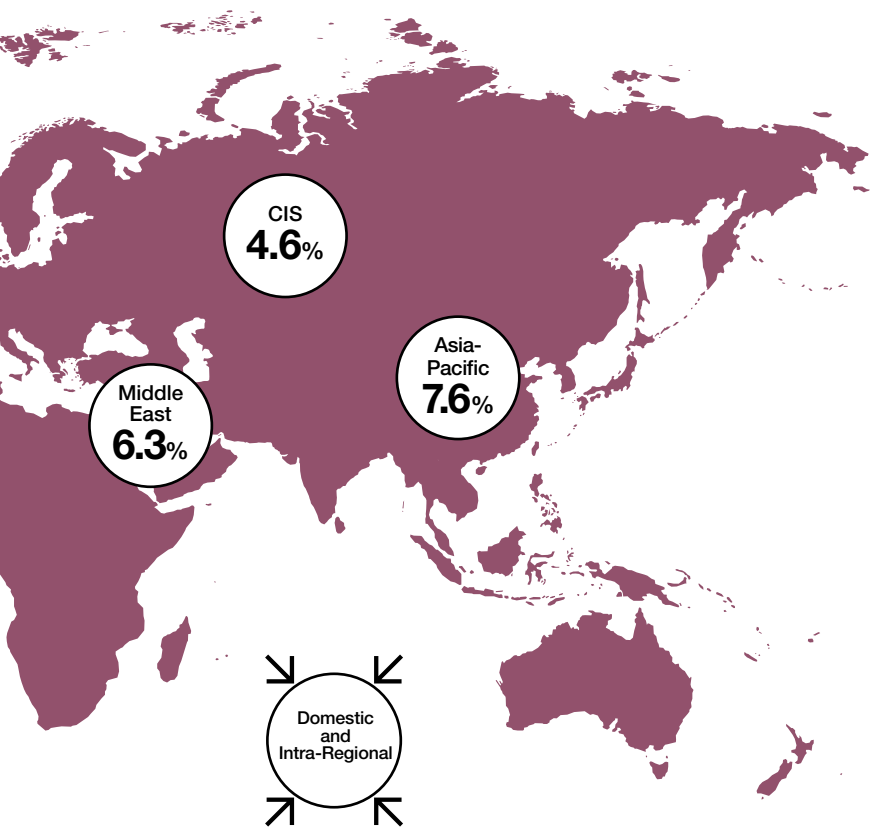
Fleet*



* Passenger aircraft ≥100 seats
** 2016-2036 CAGR

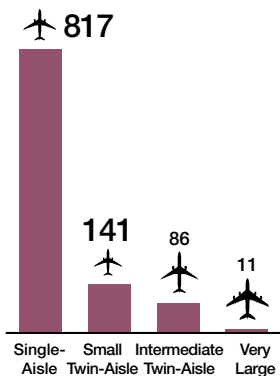
Fleet in service evolution



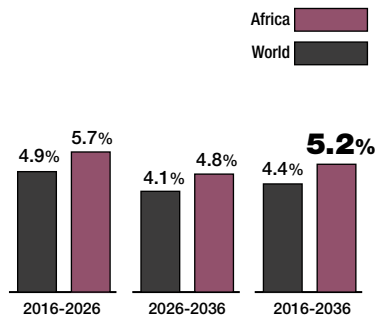


New deliveries by segment

Number of new pax aircraft



Total RPK traffic growth





06

**Freighter
forecast**

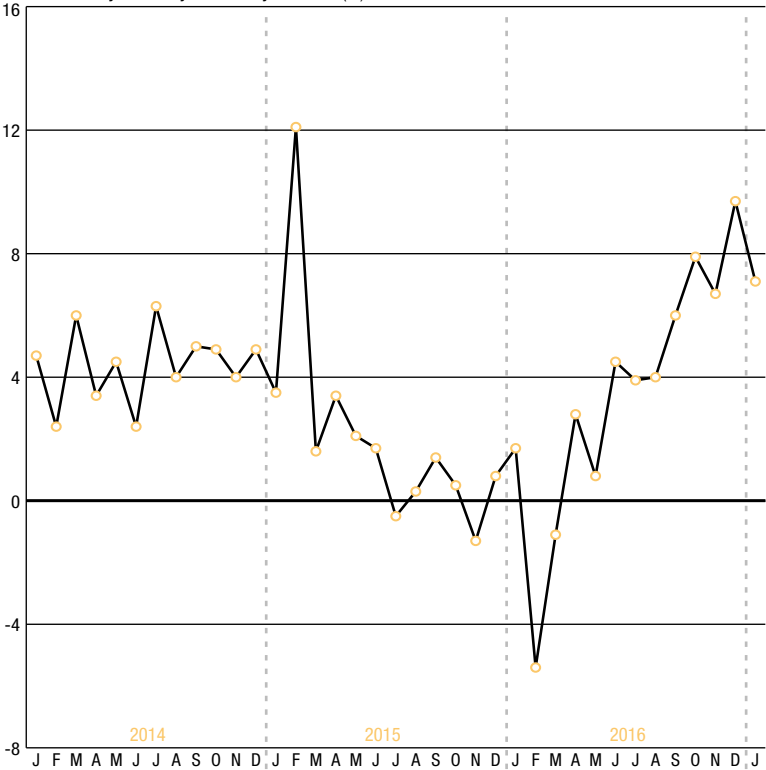


THE SHORT TERM

• With relatively slow trade growth world freight traffic has grown more slowly than passenger traffic. Since 2006, freight has grown at 1.9% CAGR with passenger traffic growing at 4.8% CAGR over the same period. Towards the end of 2016, and at the beginning of 2017, freight traffic growth has picked up even achieving 7.1% year on year growth in January. It remains to be seen if the balance between passenger and freight traffic growth can be re-established in the long term, although forecasts suggest a slightly slower growth for freight.

January 2017
freight traffic up
7.1%

WORLD FREIGHT TRAFFIC
World FTKs year-over-year monthly evolution (%)

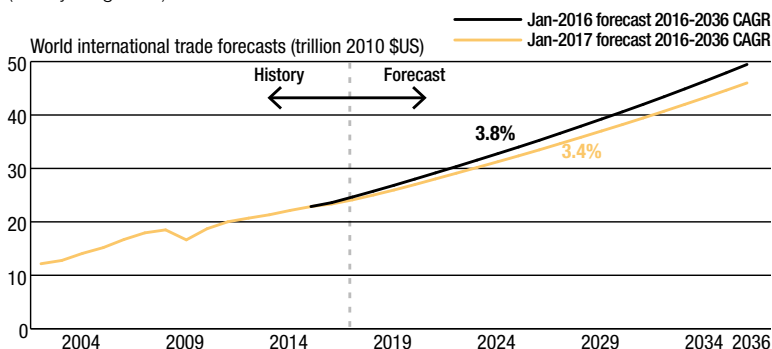


**SOME POSITIVE SIGNS
IN THE FREIGHT MARKET
AT THE END OF 2016**

Source: Airbus GMF 2017

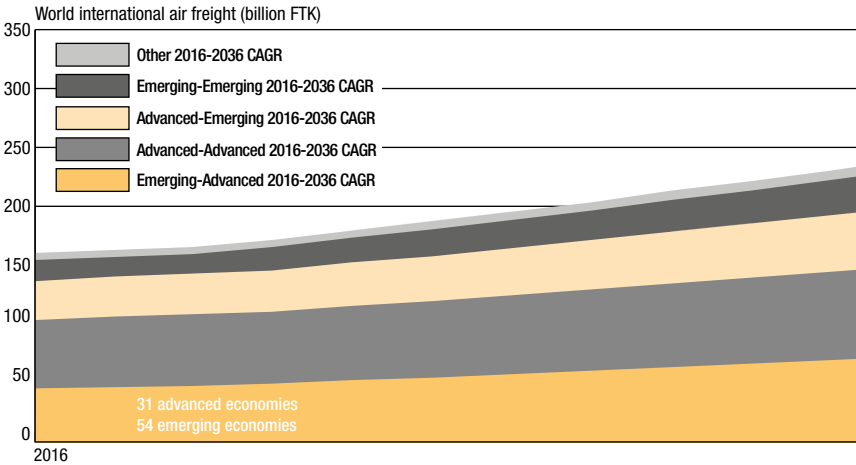
TRENDS AND FORECAST

- Trade forecasts were revised down again in 2017. However, international trade is still forecast to double in the next twenty years.
- The share of air in international trade is set to go up to more than 30% (in nominal \$US).
- Air trade is expected to grow at similar pace as global trade: domestic and international FTKs forecast to grow at 3.8% over the next twenty years, a slightly lower growth rate than last year's GMF.
- Emerging markets will drive growth of international freight traffic. The "emerging to advanced" flow is expected to represent ~30% of world international FTK in 2036.
- Passenger traffic has grown faster than freight traffic in the last few years, and this is expected to continue in the future: 4.4% CAGR for passenger traffic in the next twenty years, 4.6% for belly capacity, dedicated freighter FTKs forecast to grow at 2.6% per year over the next twenty years.
- The dedicated freight aircraft fleet in service is expected to increase by 50% in the next twenty years, mainly driven by Asia-Pacific.
- Demand for ~1,950 freighter aircraft, of which ~730 new build freighter aircraft will be needed by 2036, 55% mid-size, 45% large.
- ~350 new build freighters in North America (mostly for replacement) and ~200 freighters in Asia-Pacific (mostly for growth).



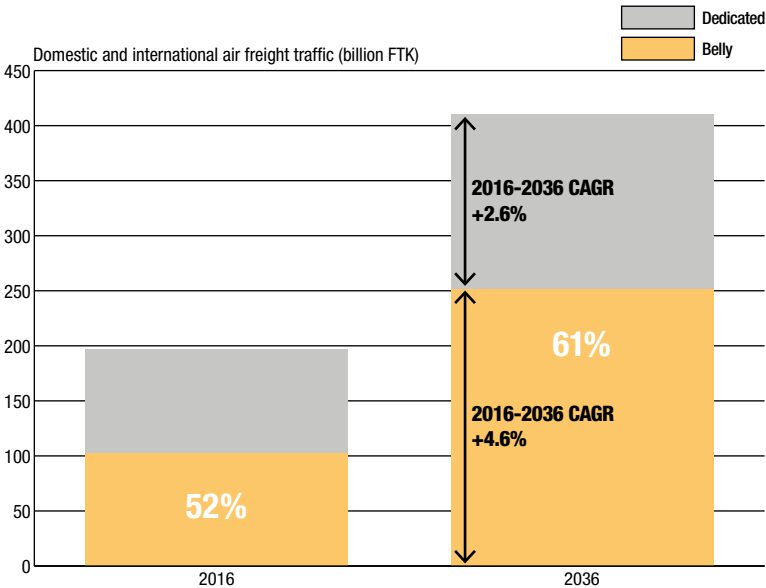
WORLD TRADE FORECASTS HAVE BEEN REVISED DOWNWARDS

Source: IHS Economics,
Airbus GMF 2017



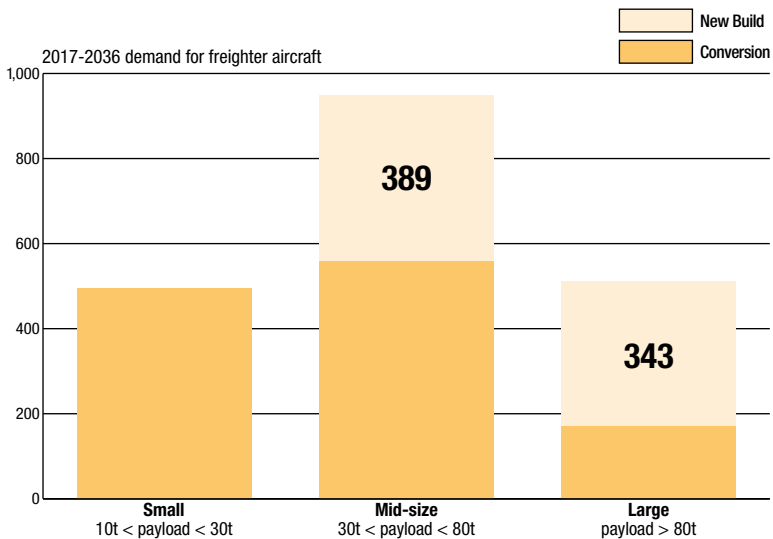
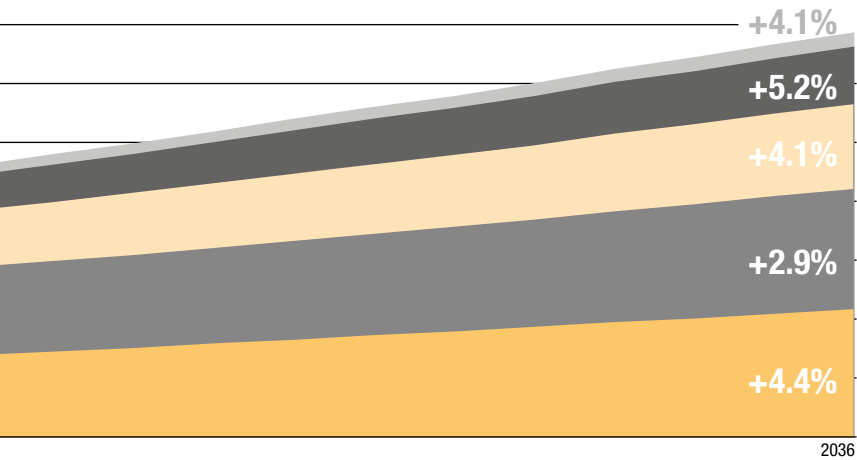
**INTERNATIONAL AIR FREIGHT
TO MORE THAN DOUBLE IN
THE NEXT TWENTY YEARS**

Source: Airbus GMF 2017



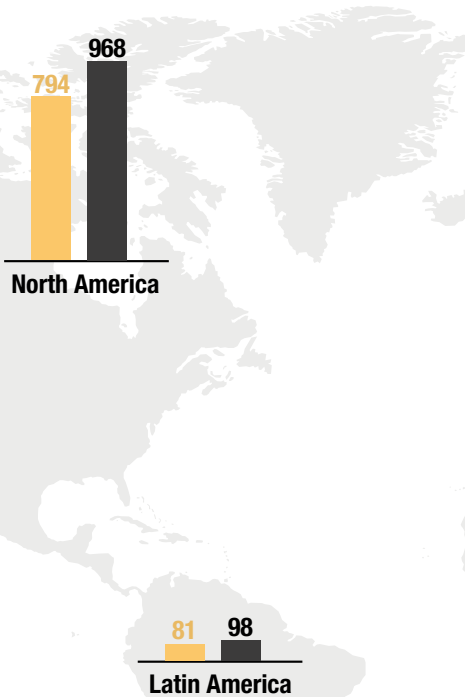
**BELLY TRAFFIC TO REACH
~61% OF WORLD FTK
ASSUMING CONSTANT BELLY
LOAD FACTOR AT WORLD LEVEL**

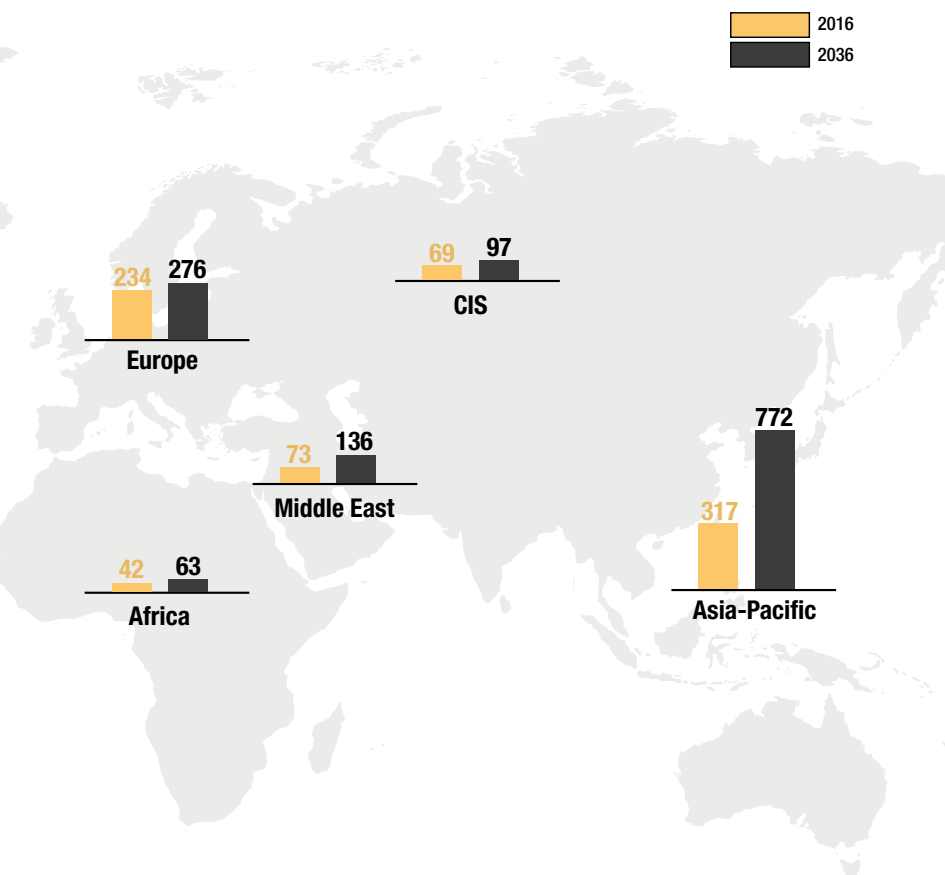
Source: Airbus GMF 2017



**DEMAND FOR MORE
THAN 700 NEW FREIGHTER
AIRCRAFT IN THE NEXT
TWENTY YEARS**

Source: Airbus GMF 2017





**FREIGHTER AIRCRAFT FLEET
EXPECTED TO INCREASE BY
50% IN THE NEXT TWENTY
YEARS**

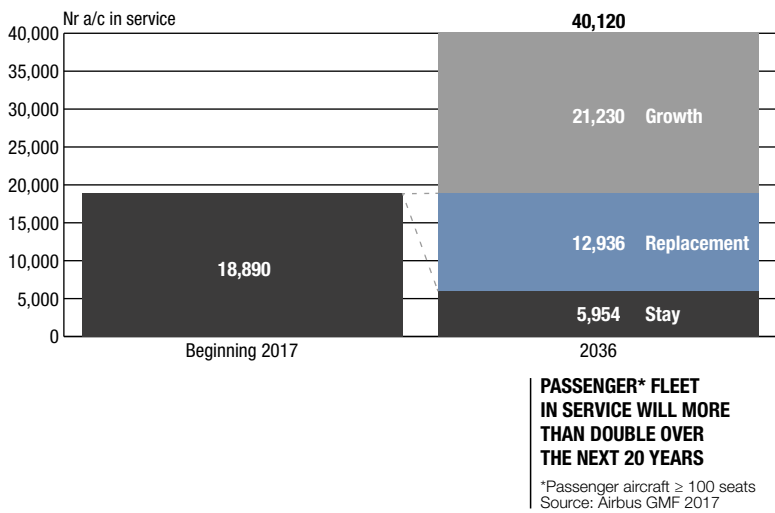
Source: Airbus GMF 2017



07

**Services
forecast**

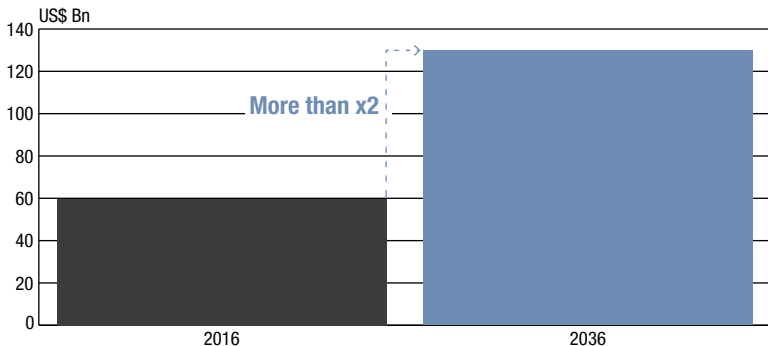




MORE AIRCRAFT MEANS MORE SERVICES

- The Airbus Global Market Forecast is used in a number of ways including as the basis for other forecasts. One such piece of analysis is our Global Services Forecast (GSF) which details a forward view of aspects of the after market. This includes the Maintenance, Repair and Overhaul market (MRO), the need for new pilots and technicians and the market for aircraft upgrades.
- An important input from the GMF into our services forecast is how the fleet will evolve over time, including the size and fleet mix in terms of age and generation. If we want to analyse the upgrades market we also need to know the trends in second hand aircraft by region.
- The commercial passenger aircraft fleet is growing, and our forecast suggested it will continue to grow in terms of the numbers of aircraft over 100 seats in the coming years. In fact the GMF suggests the fleet will more than double from today's level of around 19,000 aircraft to 40,000 in 20 years time.
- This fleet growth will also drive the size of the MRO business, which we also expect to double, US\$60 billion to more than US\$120 billion a year by 2036, or a cumulative US\$1.85 trillion over the same period.
- Unsurprisingly, as the fleet grows in Asia-Pacific so too will its share of the overall MRO business with 36% of the value or more than US\$660 billion over the next 20 years.

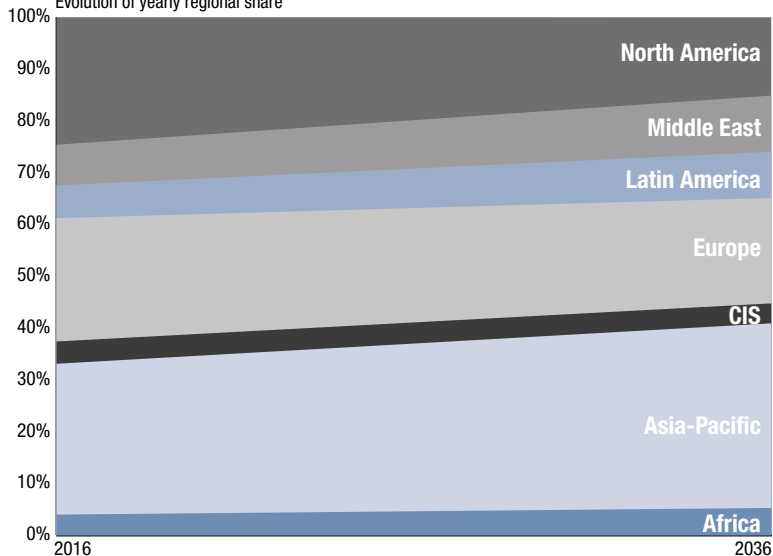
YEARLY MARKET VALUE EVOLUTION



MRO YEARLY DEMAND* WILL MORE THAN DOUBLE OVER THE NEXT 20 YEARS

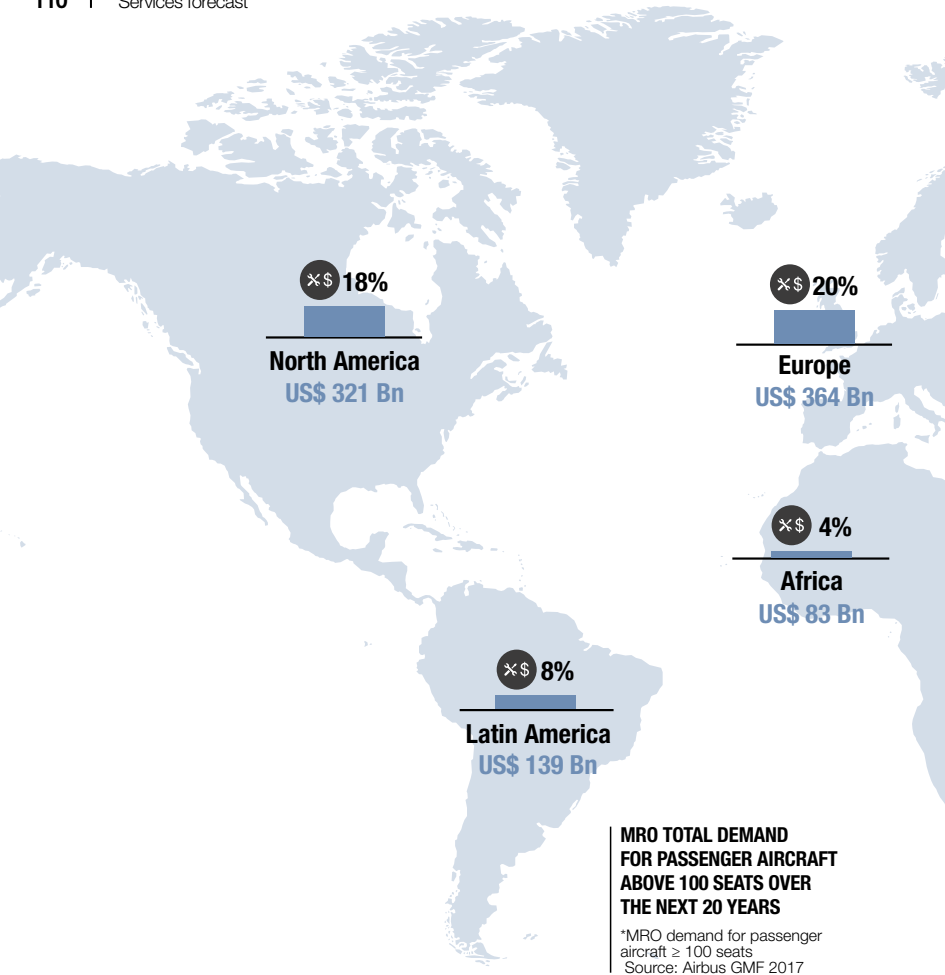
*MRO demand for passenger aircraft ≥ 100 seats
Source: Airbus GMF 2017

Evolution of yearly regional share

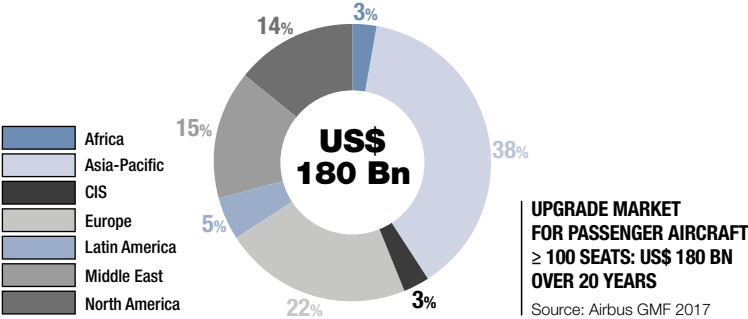


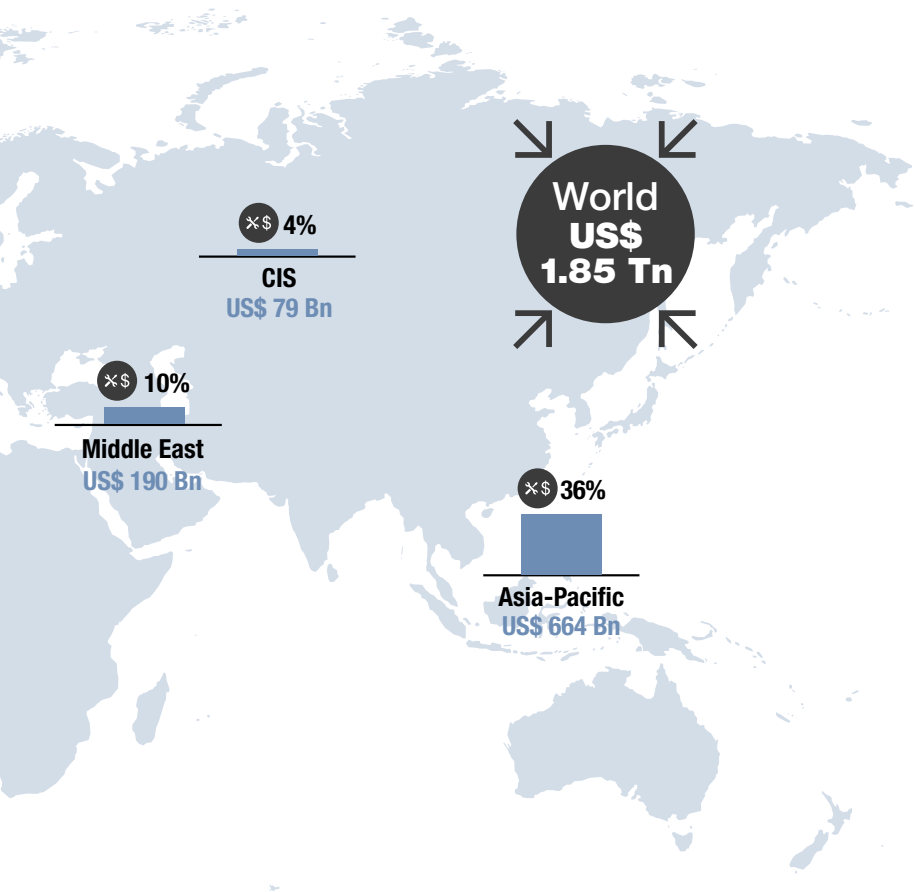
ASIA-PACIFIC WILL SEE THE LARGEST GROWTH IN MRO DEMAND* OVER THE NEXT 20 YEARS

*MRO demand for passenger aircraft ≥ 100 seats
Values for 2016 & 2036
Source: Airbus GMF 2017



CABIN & SYSTEMS UPGRADE MARKET (2017-2036) - % BY REGION

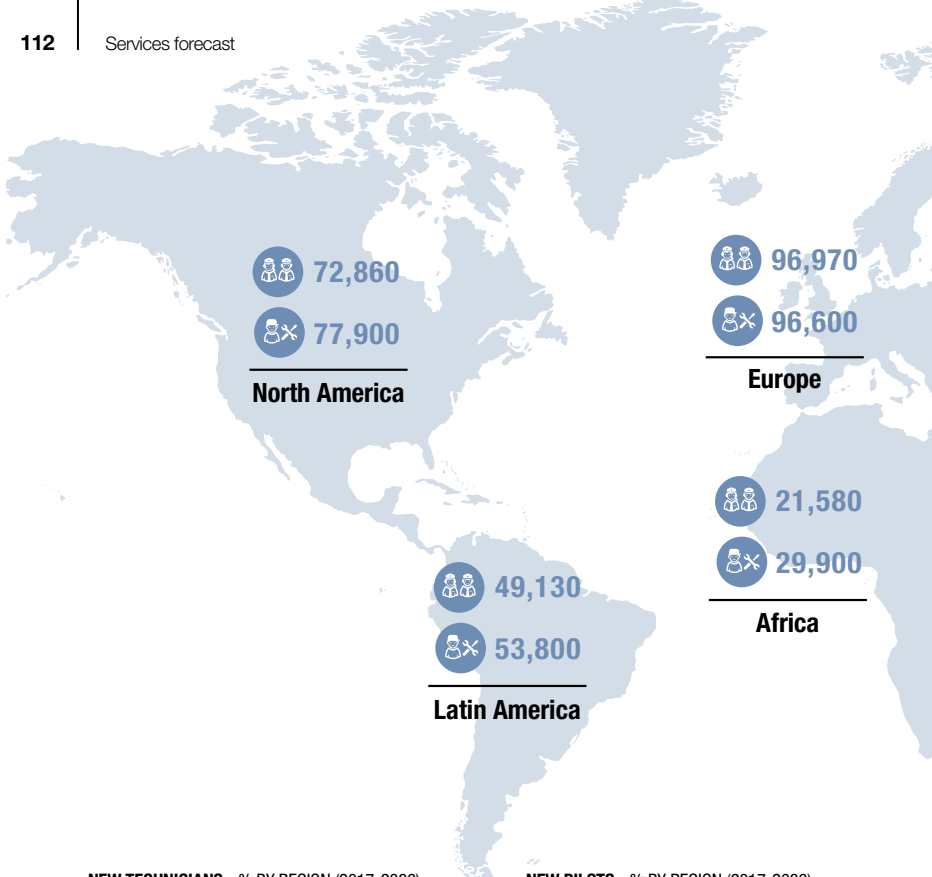




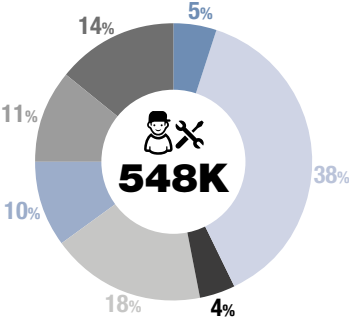
- A new element to this years Global Services Forecast not published last year, is our view of the upgrade market for systems and cabin for passenger aircraft over 100 seats.

- Over the next 20 years, our forecast shows this market to be valued at UD\$180 billion.

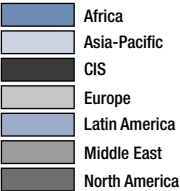
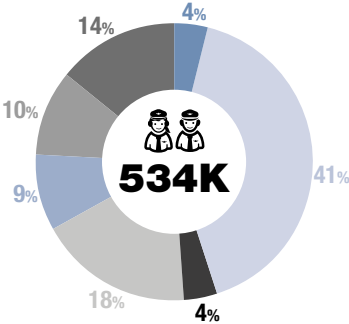
- For aircraft manufacturers, there are times when technology or market demands move faster than the economic lives of our products. We constantly look for opportunities to incrementally improve our line built aircraft, but also systematically look to embody these improvements where possible on our existing in service aircraft. This provides benefits to operators by keeping the product at the latest comfort and technology levels, which can enable cost reductions and/or enhance customer experience. For the manufacturer it keeps our aircraft flying with the latest standards and provides a useful aftermarket revenue stream.



NEW TECHNICIANS - % BY REGION (2017-2036)

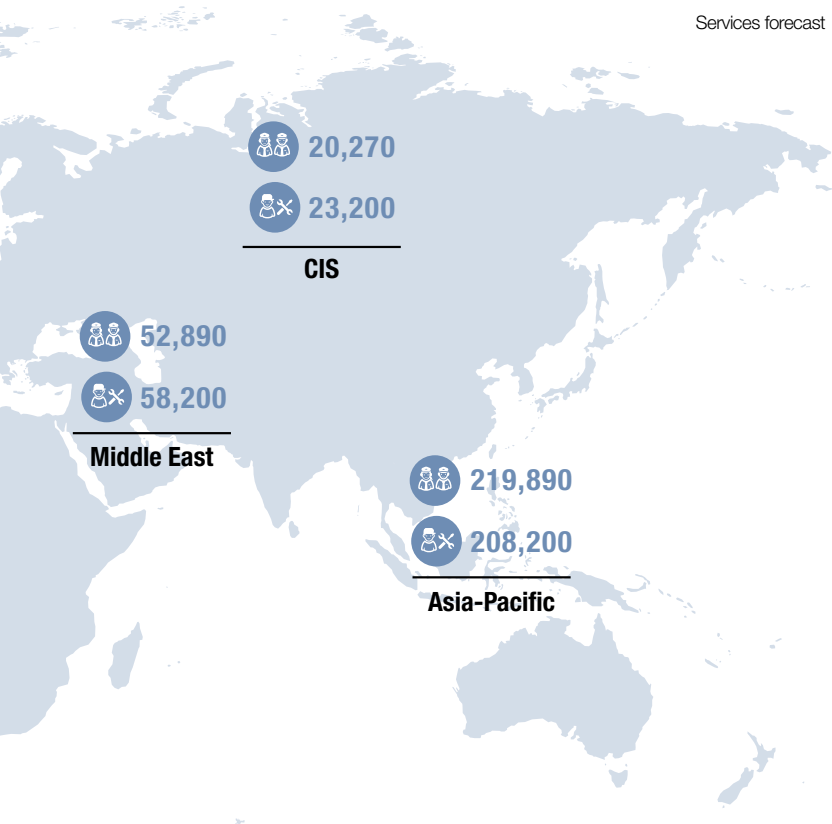


NEW PILOTS - % BY REGION (2017-2036)



NEW PILOTS AND TECHNICIANS DEMAND FORECAST

For passenger aircraft ≥ 100 seats over the next 20 years
Source: Airbus GMF 2017



- As the world fleet grows so too does the need for more pilots and technicians to meet the needs of airlines and passengers. Airbus forecast that over the next 20 years more than a million such professionals will be needed to be trained to the highest levels.

- We are progressively expanding our training network to support fleet growth worldwide and to support our customers by extending our training capabilities locally. In the last 3 years, we have moved from 5 to 15 training locations. We will continue to extend our network and move closer to our customers by proposing local, pragmatic and tailored training solutions. These solutions cover the entire pilot and technician career paths, from cadets to their operational environment.

- In the future, a digital transition will cause a re-evaluation of traditional MRO practices. Today, new generation aircraft can communicate in real time through datalink systems up to 400,000 separate parameters, enabling predictive maintenance to begin to play a key role in aircraft operation and support.

IN THREE YEARS, AIRBUS TRAINING CENTRES HAVE GROWN FROM 5 TO A NETWORK OF 15 WORLDWIDE





**AIRBUS HELPING TO
SUPPORT THE GLOBAL
NEED FOR PILOTS AND
TECHNICIANS**

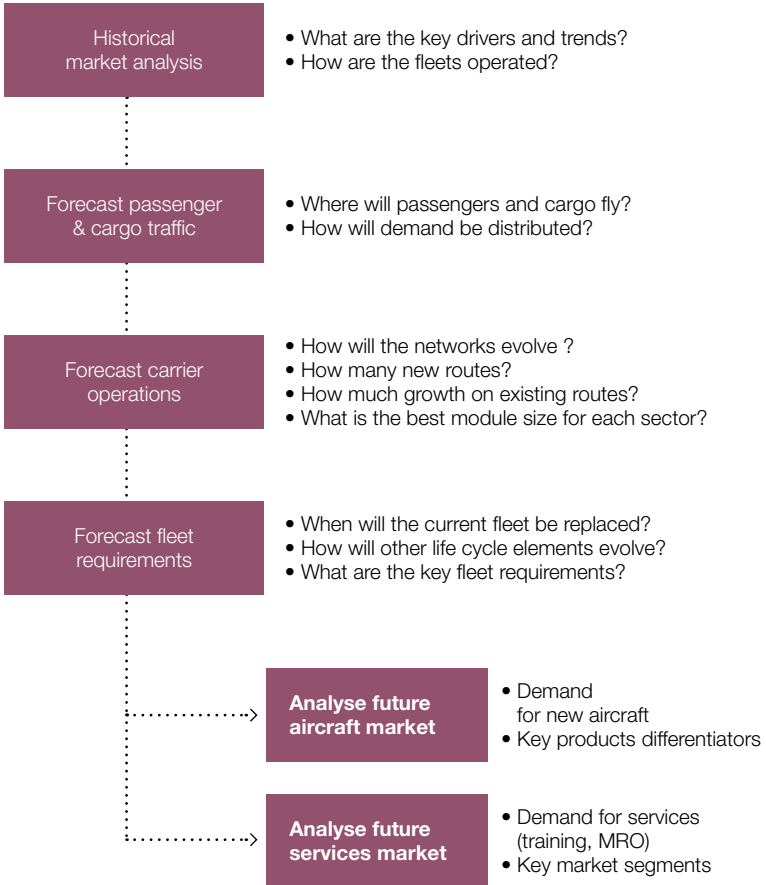
A night cityscape with a glowing orange arc in the sky. The background shows a city at night with many lights and a prominent orange arc in the sky.

08

**Methodology &
summary data**



OUR METHODOLOGY AT A GLANCE



FORECASTING - ASKING THE RIGHT QUESTIONS

Our main data sources:
OAG, Ascend, ACAS, Sabre,
Seabury, IHS Economics,
Oxford Economics, DoT,
Eurocontrol, IATA, ICAO

NEW DELIVERIES 2017-2036

	AFRICA	ASIA-PACIFIC	CIS	EUROPE	LATIN AMERICA	MIDDLE EAST	NORTH AMERICA	TOTAL
SINGLE-AISLE	817	9,812	1,009	5,249	2,084	1,082	4,754	24,807
SMALL TWIN-AISLE	141	2,569	120	1,039	448	512	654	5,483
INTERMEDIATE TWIN-AISLE	86	1,328	53	389	120	530	186	2,692
VERY LARGE AIRCRAFT	11	567	21	143	14	402	26	1,184
TOTAL	1,055	14,276	1,203	6,820	2,666	2,526	5,620	34,166

NEW PASSENGER AIRCRAFT DELIVERIES BY REGION

	AFRICA	ASIA-PACIFIC	CIS	EUROPE	LATIN AMERICA	MIDDLE EAST	NORTH AMERICA	TOTAL
SMALL	-	-	-	-	-	-	-	-
MID-SIZE	7	83	13	24	11	22	230	390
LARGE	3	125	8	44	-	40	123	343
TOTAL	10	208	21	68	11	62	353	733

NEW FREIGHT AIRCRAFT DELIVERIES BY REGION

	AFRICA	ASIA-PACIFIC	CIS	EUROPE	LATIN AMERICA	MIDDLE EAST	NORTH AMERICA	TOTAL
CONVERSIONS	46	463	55	137	59	30	434	1,224

CONVERTED FREIGHT
AIRCRAFT BY REGION

	AFRICA	ASIA-PACIFIC	CIS	EUROPE	LATIN AMERICA	MIDDLE EAST	NORTH AMERICA	TOTAL
SINGLE-AISLE	817	9,812	1,009	5,249	2,084	1,082	4,754	24,807
TWIN-AISLE	235	4,024	189	1,468	579	1,078	1,113	8,686
VERY LARGE AIRCRAFT	13	648	26	171	14	428	106	1,406
TOTAL	1,065	14,484	1,224	6,888	2,677	2,588	5,973	34,899

NEW PASSENGER AND
FREIGHT AIRCRAFT
DELIVERIES BY REGION

Source: Airbus 100+ seats (passenger aircraft) and 10t+ (freighters), Airbus GMF 2017

SAFE HARBOUR STATEMENT

Disclaimer

This presentation includes forward-looking statements. Words such as anticipates, believes, estimates, expects, intends, plans, projects, may, forecast and similar expressions are used to identify these forward-looking statements. Examples of forward-looking statements include statements made about strategy, ramp-up and delivery schedules, introduction of new products and services and market expectations, as well as statements regarding future performance and outlook. By their nature, forward-looking statements involve risk and uncertainty because they relate to future events and circumstances and there are many factors that could cause actual results and developments to differ materially from those expressed or implied by these forward-looking statements.

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