Global Market Forecast

Flying on demand 2014 2033





Introduction

2014 dollars.

The same journey took two hours by boat, 4-12 hours by train or up to 20 hours by road. The economic benefits of air transport were clear. Thomas Benoist, the builder of the airboats, said, «Someday, people will be crossing oceans on airliners like they do on steamships today.» As a twenty-year forecast it was not far off the mark! Today, the global airline industry performs around 32 million commercial flights a year, transporting 3 billion passengers and 50 million tonnes of freight. Tampa International Airport handled 17 million passengers in 2013, an incredible evolution in the relatively short time since this first commercial air service. New, emerging markets continue to drive impressive growth, their airlines cutting journey times massively for millions of new travelers.

The benefits are also clear for millions of passengers flying every day, with aviation playing a key role in lives which are increasingly driven by a global society. In our forecast we take the very latest economic and market data and apply a forecasting methodology developed and refined over decades to give us an insight into future developments. We challenge our analysts to consider how factors such as demographics, trade and tourism flows, oil price, environmental issues and competition will define our future industry and in turn this helps us define our forecast.

We chose the title "Flying on Demand" for this year's Global Market Forecast to reflect the fact that for an increasing number of people, flying is no longer a dream but an expectation. An expectation of the availability of air transport, an expectation of a satisfying passenger experience and an expectation of what constitutes value for money. New and evolving technologies continue to make travel simpler, from the booking process to the airport experience and of course, on the aircraft itself. In mature markets flying is now taken for granted, which is not the case for forecasters and planners helping to ensure that air transport can continue to fulfil its potential.

We hope that you find the 2014 Global Market Forecast informative and useful. We seek to improve our analyses continually, and your questions, challenges and suggestions help us in that aim. Don't forget you can download our App in several formats from tablet to smartphone. It complements the forecast and includes more interactive information than ever before.

As usual this is best read on a long flight. Enjoy !

2014, MARKED THE CENTENARY OF COMMERCIAL FLIGHT

OPERATIONS, with the first scheduled flight taking off in January 1914. This airboat service carried passengers, one-by-one, between St Petersburg and Tampa in Florida. It took 23 minutes and cost five dollars one way, the equivalent of \$116 in

In the year that has passed since our last forecast, aviation has continued to deliver growth and prosperity both locally and globally. ATAG (the Air Transport Action Group) recently assessed the industry's global economic impact at \$2.4 trillion annually, providing employment for nearly 60 million people. Affordable air transport is not purely a consequence of economic growth but is one of its great enablers.



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Executive summary

Context

IN 2013, AIRLINES CONTINUED

THEIR IMPRESSIVE STORY, growing global traffic 5.7% compared to 2012. With this growth, aviation continues to provide "real benefits for real people", with more services, and connectivity, with more airline and airport combinations each year. However, for international travel, it is where people live and work, the World's major urban agglomerations, which will remain the big points for aviation travel. Forty two of these are already Aviation Mega-Cites, with another forty nine major cities forecast to join them over the next 20 years. Together, they will fly 2.2 million long haul passengers a day. This is enough people to fill 2014's World Cup final venue, the Estadio do Maracana, 30 times over. How airlines meet the demand from these cities, in terms of aircraft types and service level

will continue to be a balance between efficiency, competition and passenger requirements. Positively the trends driving aviation are not short term in nature, and range from global economic and population growth, to growing individual wealth, disposable income and private consumption. These trends will form the basis on which aviation will continue to grow in the coming 20 years, with aviation becoming increasingly accessible to people around the globe. Each year, Airbus forecasters take the best macro-economic and operational data and combine it with a forecasting methodology developed over 20 years, performing more than 200 traffic flow forecasts, modelling over 300,000 Origin and Destination (O&D) city-pairs and analysing demand from nearly 800 individual airlines in order to deliver the forecast.

GMF 2014

NEW AIRCRAFT DEMAND PASSENGER AND FREIGHTER

	2014-2023	2024-2033	2014-2033	
Africa	459	514	973	
Asia/Pacific	5,107	7,146	12,253	
CIS	620	598	1,218	
Europe	3,135	3,032	6,167	
Latin America	1,011	1,252	2,263	
Middle East	1,039	1,109	2,148	
North America	2,816	2,717	5,533	
Freighters	452	351	803	
World	14,639	16,719	31,358	

SINGLE-AISLE: 70% OF UNITS; WIDE-BODIES: 55% OF VALUE Source: Airbus

20-year new deliveries of passenger and freighter aircraft



Passenger aircraft (≥ 100 seats) and jet freight aircraft (>10 tons)

Highlights

THE EMERGING MARKETS AS A

WHOLE, with their economic growth, large populations and growing middleclasses, continue to be strong drivers in the forecast. Asia-Pacific is forecast to become more significant over time in terms of new aircraft deliveries, for both passenger and freighter types. The Single-Aisle market continues to be the most significant in terms of volumes. However, within this segment the evolution in terms of aircraft size continues. The largest segments, the 175 and 210 seat categories, with demand met by aircraft such as the A321 today, are forecast to take 46% of all Single-Aisle demand, with the largest demand expected to remain in the 150 seat segment. The forecast for larger Twin-Aisle categories, including the Very Large Aircraft, remain robust, driven by growth of significant existing city pairs, hubs and development across all regions, but in particular Asia.

Traffic

TODAY, AIR PASSENGER TRAFFIC,

in terms of RPKs, is ten times greater than it was 40 years ago. RPKs have roughly doubled every 15 years at the World level: from 1998 to 2013, the industry grew by 96%. Last year, 2013, was again positive for air transport as scheduled and non-scheduled passenger traffic, measured in Revenue Passenger Kilometres (RPKs), increased by 5.7%, this above the 4.7% longterm trend which we forecast. The distribution of global traffic growth by region will continue to evolve. Origin-anddestination traffic from/to/within Asia-Pacific will remain the largest, accounting for more than 40% of the World traffic in 2033, ahead of Europe and North America combined (37%). Emerging regions will therefore represent almost two thirds of World traffic in 2033. With traffic more than tripling for these regions over the next twenty years, Middle East, Africa, CIS and Asia-Pacific will be the fastest growing regions.



DEMAND FOR MORE THAN 31,000 NEW AIRCRAFT



Passenger aircraft (≥ 100 seats) and jet freight aircraft (>10 tons)

Fleet and Deliveries

BY 2033, THE FLEET OF PASSENGER

aircraft (with 100 seats or more) and freighter aircraft (10 tonnes or greater), will be 37,463 aircraft, more than doubling the fleet in service today. Single-Aisle passenger aircraft represent the largest segment of the new deliveries with 22,071 over the next 20 years. The demand for Twin-Aisle aircraft will require 7,726 new passenger aircraft and 530 freight aircraft. Due to the growth in traffic demand in Asia-Pacific, it is no surprise that 48% of the demand for very large passenger aircraft (VLA) will be within this region. It is equally important to note that over 38% of all new aircraft deliveries over 100 seats will be within North America and Europe. Much of this demand, especially in North America, is for new, more fuel efficient aircraft to replace older less eco-efficient types. By 2033, the world's airlines will take delivery of more than 31,350 new passenger and freighter aircraft worth US\$ 4.6 trillion at current list prices.



Demand for air travel

Economy

At the time of writing, most of the previously identified economic threats, such as a Eurozone setback, a Chinese hard landing, a US debt default or an energy price shock have as yet not materialised, with the risk of these occurring now also thought to be at a reduced level. As a result, passenger air transportation has again shown its resilience with impressive 2013 operating results.

2013

YEARLY TRAFFIC GROWTH (in RPKs)

-5-2 / YEARLY CAPACITY GROWTH (in ASKs)

Passenger load factor growth at

PERCENTAGE POINT (up to 79.7%)



GROWTH IN PASSENGER AIRCRAFT PRODUCTIVITY

measured in average ASKs produced per individual aircraft in service



DESPITE SOME IMPROVEMENTS in the second half of 2013, air freight markets have yet to fully recover due to slow world trade growth, strong modal competition and high fuel prices. This resulted in mixed freight traffic results in 2013:



POINT in 2013 (down to 46.9%)



Year-over-year quarterly evolution (%)





are apparently reducing, and despite the potential for some new turbulence due to such events as the widely reported geo-political issues in the world today, world economic growth is expected to gradually pick up. This the result of an ongoing recovery in the developed world, together with sustained growth in the emerging markets. This is illustrated by the acceleration in world real GDP and real trade growth even though the multiplier between global trade growth and economic growth, which used to be higher than 2 in the past, is now expected to gradually converge towards 1.5.

UNUSUALLY IN THE CONTEXT

of the last decade, and perhaps due to their previously below par performance, the drivers of the improved growth are forecast to be the advanced economies with:

- US expansion gaining momentum thanks to improved household finances, strengthening private investment and reduced fiscal drag
- Western Europe's slow recovery gaining traction as credit conditions ease and capital spending accelerates
- Japan's economy remains on a slow strength including but not limited to export recovery

DESPITE THE HYPE OF RECENT

YEARS and although remaining impressive from an "advanced standard" point of view, economic growth prospects in some big emerging markets are currently reflecting a less positive view. As a consequence, the economic growth delta between emerging and advanced economies which reached 6 percentage points in 2007 (8.5% economic growth for emerging economies to compare with 2.5% for advanced economies), has gradually decreased, to the point where this delta could be as low as 2.5 percentage points in 2014 (4.5% economic growth for emerging economies to compare with growth path, but has some underlying 2% for advanced economies). However, this delta has been forecast to gradually grow again in the medium term to reach 4 percentage points by 2020.



Growth Delta between Emerging and Advanced economies











economies).



ALTHOUGH REMAINING STRONG in comparison to more mature markets, the short term economic outlook in emerging markets has slowed due to a number of cyclical forces (withdrawal of policy stimulus and capital rotation as US bond yields rise) and structural forces (slower labor force growth, slower pace of globalisation and the end of commodity price super cycle). This was recently reflected in financial markets with the depreciation of several emerging markets currencies.

Consequently, the economic growth delta between emerging and advanced countries has recently been revised downwards. In GMF 2013, the 20-year real GDP yearly growth delta between emerging and advanced countries was equal to 3.2 percentage points (5.2% economic growth for emerging economies to compare with 2% for advanced economies) but this has slightly reduced to 2.9% in GMF 2014 (5% economic growth for emerging economies to compare with 2.1% for advanced

THE WORLD OF 2033 WILL BE VERY DIFFERENT FROM TODAY Source: IHS Global Insight, Airbus

2013	2023	2033
<u>1</u> US	<u>1</u> China	<u>1</u> China
<u>2</u> China	<u>2</u> US	<u>2</u> US
<u>3</u> Japan	<u>3</u> India	<u>3</u> India
4 Germany	<u>4</u> Japan	<u>4</u> Japan
5 France	5 Germany	<u>5</u> Brazil
<u>6</u> UK	<u>6</u> UK	6 Germany
<u>7</u> Brazil	7 France	<u>7</u> UK
<u>8</u> Russia	<u>8</u> Brazil	<u>8</u> Russia
<u>9</u> Italy	<u>9</u> Russia	9 France
<u>1</u> 0 India	<u>1</u> 0 Italy	10 Indonesia

GDP ranking based on nominal GDP expressed in US\$

HOWEVER, there is no question we will still have a two-speed economic world with emerging markets prospects remaining bright and still delivering the best growth opportunities in the long term. Their economic growth will continue to be fuelled by an emerging middle class which is expected to double at world level or even quadruple in Asia-Pacific over the next 20 years.

AS A RESULT, the economic world of 2033 will be very different from today. For instance, China, currently the 2nd largest world economy is expected to become the largest world economy by 2023. India, currently the 10th largest world economy is expected to become the 3rd by 2023. However, taking population into account, the story looks very different on a per capita basis with China being the 63rd largest world economy by 2033, on a GDP per capita basis and India the 120th. However, rather than being a problem, this helps to demonstrate the huge remaining potential for further economic development in the emerging economies.

World Population





ANOTHER IMPORTANT ELEMENT

which is also expected to stimulate the economic growth in many countries is the development of tourism. It is worth highlighting how the development of tourism can be closely linked with the development of the economy for many countries, acting as an "economic growth catalyst". Similarly, it is worth noting how the development of tourism can be closely linked with the development of aviation in many countries, acting as an "air transport growth catalyst".

TOURISM, AN "ECONOMIC GROWTH CATALYST" AND AN "AIR TRANSPORT A GROWTH CATALYST" FOR MANY COUNTRIES Source: IHS Global Insight, World Tourism Organisation, OAG, Airbus





Economic growth catalyst



Air transport growth catalyst





2012

1,035 million

tourists

58%

Worldwide international arrivals by type of border crossing



Road **36**%

THIS IS EVEN MORE SIGNIFICANT

if we take into account transport modal competition. Over the last 17 years, aviation has been the first contributor to international tourist arrival growth with a 5.5% yearly average growth of tourists arriving by air (compared with 4.1% for road transport, 2.3% for sea transport and 1.5% for rail transport). As a result, the share of tourists travelling to their final destination by air has grown from 45% in 1995 to 58% in 2012. Aviation is expected to further benefit from the growth prospects for tourism development. According to "Tourism 2020 Vision", the World Tourism Organisation's long term forecast, the number of tourists is expected to grow from 1.1 billion tourists currently up to 1.6 billion by 2020. This corresponds to an impressive 5.7% compound annual growth rate over the next 7 years.

45% 58%

TOURISTS TRAVELLING TO THEIR FINAL DESTINATION

International tourist arrivals (million) 1,800 1,600 1.400 1,200 1,000 800 600 400 200 1995 2000 2005

INTERNATIONAL TOURIST ARRIVALS EXPECTED TO REACH 1.6 BILLION BY 2020 Source: World Tourism Organisation, Airbus

This impressive tourism development, and more particularly tourists travelling by air, has been achieved while energy costs have grown at a rate not experienced before. In the Energy section of this report, how this achievement has been possible will be examined.

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Energy

As recently as the beginning of this century, oil prices were around US\$25 per barrel. In 2013, a relatively short period of time later, oil prices averaged US\$110 per barrel, a 340% increase. Despite this growth, passenger air traffic grew 70% between 2000 and 2013.These figures help to illustrate the tremendous improvements in the efficiencies achieved by the air transport industry since the beginning of this century, and the importance people place on flight. Given its importance it was thought of interest to examine some of the arguments and factors linked to fuel price, in terms of supply and demand, and what this means for aviation, in terms of both cost and response.

FROM 2000 TO 2013

OIL PRICES PER BARREL (in US\$)

PASSENGER AIR TRAFFIC



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The long term fundamentals: oil supply versus oil demand

THE OIL DEBATE ON THE SUPPLY SIDE concerns the opposing forces between the effects of physical depletion and stimulation effects of higher prices on output:

- The geological view: a future where geological limits dominate oil output. As oil reserves are ultimately finite, easy-to-access oil is extracted first with oil becoming harder and more expensive to produce as the cumulative output grows. This supports the argument of the oil "pessimists" who believe that future oil output and prices will be largely determined by geological factors.
- The technological view: a future of plentiful oil supplies through innovation and investment. Higher oil prices will have a decisive effect on output, as this will stimulate new discovery, the enhanced recovery of conventional oil and the development of non-conventional resources, such as oil sands or tight oil. This is illustrated by potential resources estimated at 9 trillion barrels of oil, to compare with around 1 trillion already extracted. Such is the view of the "optimists" who believe that liquid fuels production will be sufficient to meet global demand well into the 21st century.

Although eclipsed by the supply debate, there is also considerable debate brewing on the demand side, which relates to the extent to which we could substitute away from non-renewable sources of energy such as oil to renewables, or even more broadly, to other sources of energy in order to sustain economic activity.

- The high substitution view: a future less reliant on oil. The idea is that almost all kinds of natural capital, including oil, can be substituted with man-made capital.
- The low substitution view recognises the limits to substitution. In this view, the natural resource stock of fossil fuels, representing millions of years of accumulations of solar energy, as well as many natural ecological functions, are irreplaceable.

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Source: Airbus



OIL PRICES MULTIPLIED BY 4 SINCE THE BEGINNING OF THE CENTURY Source: IEA. IHS Energy, Airbus

Brent oil price per barrel (\$)



OPEC SPARE CRUDE OIL CAPACITY: THE 3 MILLION BARRELS PER DAY THRESHOLD

Source: IHS Energy, Airbus

Barrels per day (million)



Historical oil price analysis

IN RECENT YEARS, worldwide oil demand has increased in response to global economic growth, although supply has not fully kept pace due to lack of investment. Exogenous geopolitical events such as military conflict or civil unrest have also triggered supply disruptions on a more consistent basis in various parts of the world. In parallel, growing demand from China, India and other emerging markets has added to the global appetite for crude oil. Finally, the increasing marginal cost of oil production has also played a decisive role. As a consequence, crude oil prices have multiplied four times, in nominal terms, since the beginning of the century. On the supply side, an interesting element, which has driven the evolution of past oil prices, has been OPEC's spare crude oil capacity. There is a threshold of 3 million barrels spare capacity under which oil prices have decreased and above which they have increased.

What range of oil prices can we expect in the future?

IT IS A WELL-KNOWN FACT that forecasting oil price is extremely challenging, this being especially true in the very short term where most forecasts have been regularly proved wrong. This is also an ambitious exercise when looking at the longer term, although the "fundamentals" previously described are expected to play an important role into longer term price determination.

AS A RESULT, there are quite different outcomes for their respective long term oil prices forecasts. IHS Energy draws Being a global issue, there is much analysis available of oil price the most optimistic outlook with the lower long term oil price trends, with three of the most respected studies being: around US\$160 per barrel by 2030 (in nominal terms) which • The International Energy Agency (IEA), which paints corresponds to around \$4 per US gallon for jet fuel (\$3 in real a healthy outlook for the oil market, provided required terms). On the more negative side, the IMF draws a more investments are forthcoming. pessimistic conclusion with long term oil prices above US\$300 per barrel by 2030 in nominal term or \$8 per US gallon for jet fuel (\$6 in real terms).

Brent oil price (nominal US\$ per bbl)



ternational Energy IHS Energy International Monetary Fund (IMF) ency (IEA)

HIGH OIL PRICES HERE FOR THE LONG-TERM, BUT DIFFERENCES UPON FORECASTS (CURRENCY IN NOMINAL TERM)

Source: IEA, IHS Energy, IMF, Airbus

- The International Monetary Fund (IMF) shows a worrying future for oil supply dominated by strong geological forces.
- IHS Energy suggests growing supply from non-conventional resources then decline of oil demand because of increasing substitution.





Historical oil price impact on air transport

AIRLINES SPENT MORE than US\$200 billion on jet fuel in 2013, representing more than 30% of their total costs, to compare with "only" US\$46 billion in 2000 (14% of their total costs). Airline fuel expenses have almost multiplied five times in 10 years.

As a result, airlines have striven to improve jet fuel efficiency, as unlike other modes of transport, they had no alternative source of energy available. Airlines have saved fuel in many different ways, including reducing and more accurately measuring on board weight, cruising at higher altitudes, making greater use of flight-management systems and conducting more in-depth analyses of weather conditions. In addition, airlines are modernising their fleets with more fuel-efficient airplanes, purchasing larger modules together with "densifying" their cabin layouts, enhancing their operations by increasing load factors and utilisation, redesigning hubs and schedules to alleviate congestion and pooling resources to purchase fuel in bulk through alliances with other carriers.







COST PER RPK (INFLATION REMOVED) HAS DECREASED AT A YEARLY AVERAGE OF 0.6% SINCE 2000 Source: ICAO. Airbus

EARLY IN THE LAST DECADE, it would have been very challenging to conclude that with oil prices constantly above US\$100 per barrel, demand for air travel would have continued life cycle analysis for the complete production process that is to grow at a very sustained pace. This has been possible thanks to tremendous airline achievements in terms of cost reduction combined with increasing fuel efficiency. The increase in fuel cost per unit of traffic (+6.5% yearly average since 2000 in real term) has been more than compensated by the decrease of the other costs (-2.5% yearly average since 2000 in real term). As a result, the cost per unit of traffic has even slightly decreased (-0.6% yearly average since 2000 in real term).

From a demand for air transport point of view, it is true to say that the oil price surge since the beginning of the century had a far lower impact than what could have been feared. One of the main explanations is the tremendous productivity improvements achieved but is there a limit to productivity improvements or is there still have some margin?

WHILST NOT DIRECTLY REDUCING fuel consumption, sustainable aviation fuel can help to reduce overall CO_o footprint through its total lifecycle and help to balance the supply issues sometimes experienced with fuel derived from crude oil. Airbus believes sustainable fuel should be primarily reserved for aviation as there are no other viable alternative energy sources

- available for aircraft in the foreseeable future.
- Sustainable fuels are synthetic fuels that have a net carbon significantly less than fuels derived from petroleum sources. These fuels may be derived from renewable biomass or could be from other domestic or industrial waste streams.
- Airbus' sustainable aviation fuel strategy is focused around three central principles:
- To support the qualification and certification of sustainable aviation fuels
- To support the large scale use of these fuels
- And to ensure the sustainability of the solutions.

Promising feedstock options include algae, woodchip waste, camelina, halophytes such as salicornia (plants growing in salt water). In the longer term waste produce and yeast are other options. With adequate feedstock to be able to produce commercial quantities of sustainable aviation fuel and with support from governments, Airbus believes that by 2030, up to a third of aviation fuel could come from non-fossil sources.



Productivity improvement

In order to tackle the cyclicality of both demand and capacity in an increasingly competitive landscape with the emergence of new entrants such as the LCCs or the Gulf carriers, together with the high and sometimes volatile cost of fuel, airlines have achieved tremendous efficiency improvements largely through the aircraft they operate, and how they operate them. The ultimate objective behind these productivity improvements is to secure and improve long term profitability, a situation which the past has shown us can be challenging. With the large steps that have been taken in the past, particularly in terms of fuel burn, it is not unreasonable to consider where the limit to such productivity improvement is, also its future pace and level?

Still some margin for cabin use and aircraft size

IN 2013, AVERAGE PASSENGER load factors for all airlines reached almost 80%, more than 17 percentage points higher than in the early 80s. Higher load factors resulting from improved scheduling, fleet assignment practices and revenue management techniques. With a large portion of the increase occurring in the last decade, the shape of the improvement suggests that the plateau has still not quite been reached. This means there is still some margin, as illustrated by the 83% load factor level reached for the domestic US traffic flow in 2013.

Similarly, the average number of seats per flight has continuously grown since the early 80s according to the OAG (Official Airline Guide), adding 38 seats per flight on average taking into account all aircraft operating scheduled service. Interestingly, a large portion of this increase has also occurred in the last decade. This results from a combination of larger aircraft, a different mix of aircraft, together with the airlines consciously adding more seats to the aircraft cabins of their existing fleets. With an average of 134 seats per flight in 2013, this suggests the potential for further increases is still significant.





Source: ICAO, Airbus





Still some margin regarding aircraft utilisation

AIRLINES HAVE CONTINUOUSLY TRIED to improve the way they operate their aircraft by using this asset more efficiently. As a result, they have succeeded in increasing the average aircraft utilisation by flying them more often over longer routes. For instance, whilst the number of yearly offered seats per aircraft has also increased over the last 30 years, this is also the case for the number of offered ASKs per aircraft. This greater productivity has been augmented by the emergence of Low Cost Carriers (LCCs), which as part of their business model tend to use their aircraft very efficiently (fast turnaround times, scheduling optimisation, etc.) With growing market shares for LCCs, together with remaining potential from legacy carriers, who are also making strides, it appears likely improvement in this area is also possible.



Source: OAG, Ascend, Airbus





OFFERED ASKS PER AIRCRAFT Source: OAG, Ascend, Airbus

LOAD FACTORS

AIRCRAFT SIZE AND CABIN DENSIFICATION Source: OAG, Airbus

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Still some margin regarding airport use

ANOTHER VERY IMPORTANT ELEMENT of productivity improvement, relates to how air transport infrastructure is used, the main efficiency objective being to drive economies of scale. Looking for instance at how airports have developed since the early 80s, they are much more efficiently used now than 30 years ago. The average number of movements per airport has grown from 8,000 yearly movements by 1980 to more than 18,000 currently, 2.4 times growth. Similarly, airport connectivity has significantly increased with around six different destinations offered on average, per individual airport by 1980, increasing to 12 different destinations currently. These economies of scale are essential, as they allow the overall air transport infrastructure to be more efficiently used. Looking historically, the trend in such an evolution suggests there is no sign of a plateau in developments, just yet.

Still some margin for fuel consumption and CO₂ emissions

IN THIS SECTION, a number of productivity improvement elements have been identified and measured, showing how efficient aircraft operations have become. Apart from making the air travel experience much more convenient and customised, the ultimate consequence of all these improvements has been to dramatically reduce fuel consumption, and therefore CO₂ emissions. Since the beginning of the century, the average fuel consumption per individual passenger trip has reduced from about 100 kilograms down to around 70 kilograms currently, an impressive 31% decrease. The same tremendous achievement has been obtained for CO₂ emissions, confirming how motivated the air transport industry has been to tackle this very important and sensitive issue.





FUEL CONSUMPTION Source: ICAO, IATA, Airbus

Cents per RPK in 2013 US\$



Avg. number of destinations per airport



Avg. number of movements per airport



MOVEMENTS

PER AIRPORT











have also helped to make air transport more affordable for every individual passenger. World inflation adjusted average yield decreased significantly in the 80's and 90's, but have stabilised at around 10 cents per RPK. The main reason being that most of efficiency improvements have been needed to compensate for the huge increase in oil price which multiplied by five over this period.

WORLD INFLATION ADJUSTED AVERAGE YIELD STABILIZING AFTER STRONG DECREASE IN THE 80s AND THE 90s

Source: ICAO, IATA, Airbus

Market drivers

Since 1945, when more than 50 countries signed the **Convention on International Civil Aviation in Chicago, the** World and our industry have dramatically changed. In the 1970's, 75% of worldwide air passenger capacity originated within the top ten countries, almost all of the traffic belonging to North America, Western Europe and Japan. By 2013, the top 10 share had decreased to below 60%, with worldwide traffic now more equally distributed.

The World's economic centre of gravity has moved South and East, with aviation also subject to this phenomenon. In the economy chapter, many of the economic indicators that provide for the opportunities and challenges of our industry were covered in detail, but there are many other socio-economic indicators that mitigate some of the challenges our industry faces and importantly increases the potential for solid growth.



More people

BETWEEN 1950 AND TODAY, the World's population almost tripled, now totalling more than seven billion people. Asia has been the biggest contributor, accounting for 60% of global population growth between 1950 and 2010. In their baseline scenario, analysts from the United Nations Population Division expect global population to increase by 35% to 2050; growing at a slower pace than in the past, as most of the regions have now started their demographic transition. The only exception to this rule is Africa, whose young and quickly growing population will more than double by 2050, reaching 2.2 billion, and contributing 50% of the World's population growth between 2010 and 2050. The third emerging region, Latin America and the Caribbean, is expected to overtake Europe with 750 million people by 2050. Population growth is significant for many reasons, but, in the context of the GMF, it can be a descriptive variable used when forecasting aviation traffic growth.

WORLD POPULATION EVOLUTION, BY REGION

Source: UN population division, Airbus

Oceania	Europe	Africa
Nothern America	Latin America and the Caribbean	Asia

The World is more populated

More urbanisation

URBAN AGGLOMERATIONS are one example of a more efficient society, provided negative externalities such as congestion and pollution are efficiently managed: they concentrate activities in a relatively small area, provide economies of scale. lower transportation costs and enable the dissemination of goods and services.

Due to productivity improvements in the agricultural sector which have led to a rural exodus in many countries, but also more recently thanks to organic growth of cities, the increasing urbanisation phenomenon has been observed globally over the last 70 years: 30% of the World's population lived in urban agglomerations in 1950, with more than 50% today. The United Nations project this trend continuing, with two thirds of the World's population expected to be living in urban

agglomerations by 2050. Asia will remain the main contributor to urbanisation, as many of its countries have relatively low levels of urbanisation today, accounting for more than 50% of the World urban population growth to 2050; followed by Africa and Latin America, respectively contributing by 32% and 7% of the World urban population growth.

URBANISATION WILL CONTINUE to accompany air traffic growth: new potential air transport consumers from the middle classes will emerge from urban agglomerations, where workers are able to earn higher wages and as the majority of major urban agglomerations already have good levels of aviation infrastructure in place.







Concentration index of the World GDP



MORE COUNTRIES HAVE INTEGRATED GLOBALISATION Source: WTO LIN Airbus

More globalised

OVER THE LAST 70 YEARS, the benefits of trade specialisation and the international division of labour have been adopted by more and more countries, which themselves have joined international organisations tasked with ensuring fair and peaceful exchanges between countries, such as the World Trade Organisation (WTO) or the United Nations (UN), respectively composed of 160 and 193 members in 2013. Thanks to the greater integration of countries, globalisation favoured economic development. In 2013, World GDP per capita reached 10,000 \$US per person, having increased by 70% in real terms over the last 30 years. Emerging countries have developed faster than advanced countries, especially during the last 15 years, a period testifying not only to the rapid development of the BRICS (Brazil, Russia, India, China, South Africa), but also countries classified in the emerging category, 54 in total. This has led to a World with less inequality between countries, as shown by the concentration index of the World GDP, which has decreased by almost 40% over the last 30 years.

THE WORLD ECONOMY IS LESS AND LESS CONCENTRATED Source: IHS Global Insight, Airbus

Mobility is key

EFFICIENT INTERNATIONAL

MOBILITY has become necessary in a more globalised World, with the motivation for trips multiplied: professional (15% of total in 2012). leisure (51%), visiting friends and relatives (27%) are the three main categories defined by the UN World Tourism Organisation. The visiting friends and relatives category has been particularly resistant to crises, as unsurprisingly people consider it necessary to meet their closest relations in person. Driving these types of trips, the number of international migrants has increased from around 150 million in 1990 to 230 million in 2013, representing more than 3% of the World population and growing faster than total population development. Migrants primarily come from advanced economies, but the share of migrants coming from less developed economies has increased recently,

to reach 41% in 2013. The younger generation has also understood the benefits of having international experience in a more globalised World. The number of international students has tripled over the last 20 to 25 years, according to data from the OECD, again growing faster than the World's population. The needs for international mobility, as well as communication at a global level are reflected in the World consumption structure evolution: the share of transport and communication in total consumption has increased from 9% in 1990 to 13% in 2013, while total consumption increased by 89% in real terms.









1%_		
4 /0		
2% -		
270		
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6% -		
4% -		
2% -		
0% -		1
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TDA		0.000

FRANSPORT AND CON Source: EIU, Airbus

Number of international migrants and share of World population

Source: UN DESA, IHS Global Insight, Airbus

Number of international students and share of World population



IMUNICATION NOW REPRESENT 13% OF TOTAL CONSUMPTION













MORE AND MORE AIR PASSENGERS ORIGINATING FROM EMERGING COUNTRIES Source: Sabre GDD (September data of each year), Airbus

2002 - 2013

INTERNATIONAL TOURISTS **INCREASED BY**

Air transport, globalisation catalyst or facilitator for globalisation?

PROBABLY A LITTLE OF BOTH. World air passenger traffic, measured by revenue passenger kilometres (RPK), has multiplied by 10. Air transportation sector liberalisation has occurred in several regions and the number of bilateral air service agreements between countries has increased to more than 2,500 today. Hence, along with more capable aircraft and more economically viable markets, the number of international countrypairs served by regular flights increased progressively to reach almost 2,450 at the end of 2013.

Thanks to this increasing number of services around the World, international connectivity was improved by air transport. On average, each country in the World was connected by at least one city-pair to 41 other countries in 2002 and today is connected to 44. Better connectivity enabled by air transport has increased the market share of aviation compared to other modes of transportation. During the period 2002-2013, the number of international tourists increased by 55%, whilst the number of international air passengers increased by 90%. The emerging economies share of international tourism is becoming increasingly important, as shown by the share of passenger tickets issued in emerging countries, growing from 25% in 2002 to 35% in 2013.

Cities infrastructure at the heart of globalisation

High-quality telecommunications, transport and energy infrastructure are necessary for urban agglomerations to fully benefit from the economic potential of urbanisation, to efficiently harness globalisation and to accommodate increasing international mobility. The idea of leapfrogging technology in the emerging markets has been widely discussed, especially in the telecommunications industry. This can be seen by the fact that while the infrastructure in emerging markets is still lagging behind advanced markets, the former are rapidly catching up. On a scale from 1 (low quality) to 10 (high guality), while the rating of advanced countries was stable at around 9 over the last 15 years, the rating of emerging countries increased from 4 in 1998 to 6 in 2013, and is expected to reach 7 around 2020.

Infrastructure rating* in advanced and emerging regions (1-low, 10=high)



INFRASTRUCTURE QUALITY IN EMERGING COUNTRIES HAS INCREASED Source: EIU, Airbus

Airports capacity* utilisation in 2011 and 2020



CONGESTION SLOWS THE PACE OF GROWTH IN SEVERAL AIRPORTS Source: Airbus GMF forecasts

In the case of air transport, a lack of good airport infrastructure has at times prevented some cities from having access to the full benefits brought by aviation, not only emerging but also some advanced countries. Airport modernisation will be necessary to accommodate traffic growth in a sustainable way. In a recent study, Airbus estimated the airport capacity (as defined in terms of the theoretical maximum daily flights that an airport can handle), of more than 300 selected airports in Europe and in some emerging countries. A significant number of airports are already at more than 60-70% of their maximum capacity. This is already generating issues in terms of flight scheduling, especially during peak hours. Assuming that airport capacity remains the same until 2020, the GMF forecasts that around 30 airports may surpass the 100% threshold, with 50 airports at more than 80% of capacity. It is important to point out however, that improvement in Air Traffic Management (ATM) systems have up until now allowed airlines to surpass 2018 the theoretical 100% capacity utilisation in the past. We believe that advances in Air Traffic Management over time will occur to assist, although investment and will at the highest levels will be needed to achieve the best solutions.

* 2011 estimated capacity in more than 300 airports in several emerging countries and Europe ** Airports ranked by 2020 capacity utilisation

North America

2.53 airports per million inhabitant

The accessibility to aviation in emerging regions has yet to reach the levels of the advanced regions, where the number of airports per capita respectively passes 2.5 and 1 per million inhabitants in North America and in Europe respectively. In comparison, Emerging Asia, Africa, PRC and Indian Sub-Continent all have less than 0.4 airports per million inhabitants. Globally there are more than 50 urban agglomerations with more than 750,000 inhabitants which do not have an airport within 40 km. The majority of these are in Asia-Pacific where the fastest growth in urbanisation and a burgeoning middle class are developing. Of the cities without airports, 38 are in China and 7 are in India. Investments in infrastructure development will help these countries to fully benefit of their huge growth potential in aviation which in turn will create new economic opportunities.

Number of urban agglomerations of more than 750,000 inhabitants without an airport*

* At less than 40km



MANY MAJOR URBAN AGGLOMERATIONS **STILL DO NOT HAVE AN AIRPORT** Source: Airbus

> NUMBER OF AIRPORTS PER INHABITANT IN 2013 Source: OAG, Airbus

Latin America

0.81 airports per million inhabitant

Europe 1.01 airports per million inhabitant

Asia Advanced 0.51 airports per million inhabitant CIS 0.67 airports per million inhabitan PRC 0.13 airports per million inhabitant Indian Sub-Continent 0.08 airports per million inhabitant Middle East 0.50 airports per million inhabitant **Asia Emerging** Africa 0.39 airports per million inhabitant 0.28 airports per million inhabitant the

These socio-economic indicators are the real drivers of our industry and are leading to greater connectivity, more access to aviation and more liberalisation. All of this together will allow for more growth in our industry.

Global Market Forecast

043

Network development

The aviation network is constantly evolving. Its size and development are driven by such factors as legislation/liberalisation, competition, demographics, aircraft capability (size, range, speed), tourism trends, governmental policy and airline models to name a few. It is also a key driver for the past and future growth we forecast.

If the aviation network was fixed, aviation would not have reached the levels experienced today.

In fact, only 40% of todays ASK are flown on routes that were operated 20 years ago. However, this share is now relatively stable, suggesting new route driven fragmentation has matured over time. This network stability is also the result of the airlines ability to better assess the impact of network development decisions and to focus onprofitable, "hereto-stay" routes. Future growth is expected to be met increasingly with aircraft size and frequency rather than new routes.



MOST OF THE NETWORK FRAGMENTATION IS DRIVEN BY LCCS AND MIDDLE EAST CARRIERS Source: OAG

Network growth: a must in fast changing environment

HISTORICALLY, A LARGE PART OF THE NETWORK

backlogs, preparing for more growth in capacity and new route evolution can be attributed to newer airlines that have greater opportunities in the coming years. One result will no doubt ambition in the market and a desire to grow their presence. be increased competition. As well as the positive effects of Two groups of airlines have contributed significantly to past giving greater choice and value to passengers, this will also network growth, namely the Low Cost Carriers and the have the effect of further driving code-shares, alliances and dynamic airlines from the Middle East. It is no surprise therefore Joint Ventures (JVs). The desire of airlines to further develop/ strengthen their hubs, augmenting and securing feed into them that many of these airlines have continued to look for new growth opportunities, as underlined by their current order will also be evident.

000

2001

666

002

2003

004

2005 2006 010

Middle East

2008 2009

007

Different growth strategies

A MAJOR REASON AIRLINES have grown their networks is to keep pace with their passengers' growing propensity to travel by air. Code sharing agreements emerged more than 20 years ago as an affordable and risk-free way to offer destinations beyond an airline's physical network, and now represent up to 45% of the total flights on offer through airline schedules. When analysing the trends on network development, it is important to differentiate these "ghost flights" from those actually performed. Another tactic airlines have adopted is the setting-up or joining of worldwide airline alliances, enabling a multiplication of origin/destinations served under a single "umbrella" brand and significant cost reductions for frequent flyer programs and airport lounges. To date, the three big alliances combined represent about 64% of the total ASK offered and 76% of long-haul ASK.

So far, the ultimate and strongest level of co-operation between airlines before merger and acquisition is set-up of joint ventures (JVs), involving revenue and cost sharing agreements. All major alliances have created such JVs on trans-continental markets, enabling improved scheduling, pricing and inventory control management, and importantly a greater level of market access. Top 3 Alliances represents:

ASKs OFFERED

64%

LONG-HAUL ASKs

10%



TWO TYPES OF NEW MARKET

OPENINGS, can be distinguished. These essentially depend on the airline business model:

• Point-to-point airlines will tend to focus on creating new services on high volume origin/destinations or on smaller origin/destinations that are not currently being operated, using either a primary airport or a substitute in the same catchment area. Success depends essentially on the new entrants ability to capture market share from the incumbent and to stimulate traffic with lower fares. This is the typical low cost carrier (LCC) expansion scheme, which has been heavily used on short and medium haul markets. More recently, a few airlines have also entered into the long-haul low-cost business.

• On the other hand, hub and spoke carriers, obviously try to serve as many large spokes as possible, and can also afford to open markets with significantly lower direct traffic potential. It is the extent of the connections on offer beyond the airline hub that enables the build-up of passengers beyond the profitability threshold. Once a hub has achieved a critical size, adding new destinations becomes easier, as witnessed by the growing importance of the share of connecting traffic for Gulf carriers. LONG-HAUL 0&D CITY-PAIRS IN SERVICE AND WITH NO DIRECT SERVICE Source: Sabre GDD

Pax per day each way on long-haul O&D





DISTRIBUTION OF SHORT-HAUL 0&D BY LOCAL MARKET SIZE - 2013 Source: Sabre GDD

Where are the opportunities?

THE VERY FIRST THING an airline wants to assess when evaluating the opportunity of launching a new route, is the size of the locally targeted market. Not surprisingly, almost all the short haul markets having more than 100 passengers a day each way are already served with a direct service, with the feasibility threshold appearing to start at about 50 passengers a day.

Using Airbus' Origin/Destination forecast data, we can see that almost 5,000 origin and destination (O&D) combinations surpass 50 pax per day, opening the door for many more new direct flight opportunities. About two-thirds of these O&Ds involve an emerging country, which doesn't come as a surprise since this is where a significant amount of new growth is coming from. Combined with the prospects of increasing air transport liberalisation, it can be expected that the majority of new short haul routes will be opened in Asia, Africa and South America.

0&D city-pairs





ON LONG-HAUL MARKETS, the feasibility threshold is closer to 150 passengers per day, with 91% of all long-haul O&Ds over 150 passengers being operated. The remaining 9% is mostly constituted of ultra-long range missions, with the top four linking the UK to Australia.

Amongst the O&Ds below 8,000 nm not served directly today, some 3,000 will cross the 150 passengers per day by 2033. It is clear therefore that while fragmentation has played a very important role to date and will continue to impact the future growth of our industry, it is highly unlikely that the industry will continue its growth in new routes at or above the historical trend. With new passengers and traffic largly focused on the existing routes including the aviation mega-cities.

No direct service	
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Direct service

2013 AVIATION MEGA-CITIES Source: Airbus Market Research and Forecasts



DAILY PASSENGERS: Long Haul traffic to/from/via Mega Cities

OF LONG-HAUL TRAFFIC ON ROUTES to/from/via 42 cities



AVIATION

to/from/via 91 cities

Cities with more than 10,000 daily long-haul passengers, Long-haul traffic: flight distance >2,000nm, excl. domestic traffic

Source: Airbus Group

Aviation mega cities

BY OUR DEFINITION, Aviation Mega Cities are cities where more than 10,000 daily long-haul passengers are handled. In 2013, there were 42 of these cities, which represent the core of the air transport system as 94% of long-haul travelers fly from, to or through one of those cities.

These 42 cities aren't all connected, with about two-thirds of the 705 long-haul pairs possible being served direct today. This proportion has increased slowly in the past, with most of the missing pairs not operated with a direct service as they are out of range even for the most modern aircraft.

These routes carry a massive amount of traffic, with on average, the top 100 forecast to have close to 2,500 pax per day each way in twenty years from now. These routes are the home to the VLA, with for example 85% of all A380 flights operating on routes to and from today's Aviation Megacities, with the remaining 15% operating from these to another city not in the 42. Real evidence today, and a real indicator for the future.

2033 AVIATION MEGA-CITIES Source: Airbus Market Research and Forecasts

MEGA-CITIES

DAILY PASSENGERS: Long Haul traffic to/from/via Mega Cities

OF LONG-HAUL TRAFFIC ON ROUTES





WE HAVE OBSERVED over the past 30 years significant levels of fragmentation. However, the trend is slowing, with code-shares and alliances an effective way to expand airline networks.

Further analysis shows that fragmentation potential seem to be limited on long-haul markets, whereas more network changes will arise on short-haul markets of emerging economies, partly driven by the deployment of currently on order aircraft and the evolution of the low cost models in these regions.

On the long-haul,

the vast majority of the traffic will continue to flow through the routes between aviation megacities, which concentrates half of the total traffic.



Traffic forecast

Air transport has increased its presence globally. A number of demand related factors have enabled the sector to develop, such as global economic development, growing populations, growing urbanisation, a growing middle class and globalisation. This part of the GMF will focus on the main factors impacting our industry, both in terms of passenger and freight air traffic, detailing our forecast traffic view for the next twenty years.

Passenger traffic

2013 was again positive for air transport, as scheduled and non-scheduled passenger traffic, measured in Revenue Passenger Kilometres (RPKs), increased by 5.7%, above the 4.7% long-term trend which we forecast. Over the last ten years, RPKs have increased by 73%, despite the different crises the World has faced during this period. The resilience of air passenger traffic is one of the most important features of our industry, indicating the importance people place on air travel. Most economic crises have had a very limited direct impact on air travel demand as generally there are a significant number of people who consider travelling as essential, especially for the purpose of visiting friends and relatives (VFR) and for business purposes.

GROWTH THROUGH MULTIPLE CRISES OVER THE LAST TEN YEARS

AIR TRAVEL HAS PROVED TO BE RESILIENT TO EXTERNAL SHOCKS Source: ICAO, Airbus

World annual traffic (RPKs - trillions)



059 Global Market Forecast



EMERGING REGIONS 39% / 52%2003 | 2013 SHARE OF WORLD RPKs

GROWTH IN THE EMERGING MARKETS has also been **TODAY**, air passenger traffic, in terms of RPKs, is ten times an important element. Over the last decade, origin-andgreater than it was 40 years ago. RPKs have roughly doubled destination traffic from/to/within emerging regions (Asia-Pacific, every 15 years at the World level: from 1998 to 2013, the Latin America, Middle East, Africa and CIS) grew faster than industry grew by 96%. In its forecast of passenger air traffic, in advanced regions (Europe and North America). In 2003, Airbus divides the World into twenty regions composed of emerging regions represented 39% of World RPKs, dramatically homogeneous countries in terms of geographical position, level increasing to 52% in 2013. Asia-Pacific became the largest of economic development, air transport maturity, for example. region in terms of traffic in 2010, and now accounts for almost Dedicated econometric models are developed to forecast one third of the World RPKs. Asia-Pacific is followed by Europe air traffic on each flow linking these 20 regions. Economic and North America, which combined still represent 48%. theory and historical data show that two main drivers explain Middle East and CIS were the fastest growing regions, air traffic growth: economic growth and the cost of travelling with their traffic almost tripling in ten years. for passengers. To represent these factors, Airbus takes into account more than 30 socio-economic variables.

MORE THAN HALF OF WORLD TRAFFIC FROM/TO/WITHIN EMERGING REGIONS Source: ICAO, Sabre GDD, Airbus

World share of annual RPK by region

wond shale of annu								
100%								
90%								
80%								
70%								
60%								
50%								
40%								
30%								
20%								
10%								
0%								
2002	2003	2004	2005	2006	2007	2008	2009	2010

061



PASSENGER TRAFFIC was severely impacted by the financial crisis in 2008/2009, but the recovery over the period 2009-2013 has proven its resilience. We expect passenger traffic to recover to the long-term trend, forecast in our GMF in 1999. This re-enforces the robustness of our traffic forecast methodology, and its long term capability to evaluate demand even in the face of the severe events experienced since 2000. Our latest traffic forecast suggests that World RPKs will again double over the next 15 years. This represents a 4.7% yearly average growth over the next twenty years, 5.2% over 2013-2023 and 4.2% over 2023-2033.

WORLD PASSENGER TRAFFIC WILL RECOVER THE LONG-TERM TREND



Historical

and GMF 2014 forecast

GMF

1999

2013-2023 2023-2033





* Revenue Passenger Kilometres





DOMESTIC PRC WILL BE THE LARGEST 0&D TRAFFIC FLOW IN 2033 Source: Airbus GMF 2014

THE RANKING OF THE LARGEST

origin-and-destination traffic flows analysed in GMF 2014 has only changed slightly from GMF 2013. Domestic PRC will still be the largest flow by 2033, representing 11% of World RPKs, ahead of Domestic USA (8%), Intra Western Europe (5%) and Western Europe – USA (4%). Among the top 20 largest traffic flows in 2033, seven of them will be between/within emerging regions and 10 between advanced and emerging regions. Interestingly, four domestic flows will appear in the top ten largest traffic flows as of 2033 (PRC, USA, India, and Brazil).



DOMESTIC INDIA WILL BE THE FASTEST 0&D TRAFFIC FLOW Source: Airbus GMF 2014



DOMESTIC INDIA will be the fastest growing origin-and-destination traffic flow until 2033, growing at 9.5% yearly on average, followed by the Indian Sub-Continent – PRC (9.5%), North Africa – PRC (8.9%) and Sub-Sahara Africa – PRC (8.6%). Unsurprisingly, all the top 20 fastest growing origin-anddestination traffic flows are between/ within emerging regions.



THE DIFFERENT REGIONS in the World have various levels of connectivity. The share of domestic and intra-regional traffic as a percentage of the total origin-and-destination traffic from/to/ within the region has reached 50% in Asia-Pacific, followed by North America (44%), CIS (40%), Latin America (30%), Europe (27%), Middle East (14%) and Africa (12%). Over the last ten years, the share has dramatically increased in Asia-Pacific and Latin America, remained fairly stable in Europe, Middle East and

INTERNATIONAL LONG-HAUL TRAFFIC WILL STILL REPRESENT THE LARGEST SHARE OF TRAFFIC WORLDWIDE

Source: ICAO, Sabre GDD, Airbus GMF 2014

International short-haul Domestic International long-haul

LOOKING AT THE DISTRIBUTION of World traffic based on range and the distinction between long-haul and short-haul (which we consider at 2000 NM or ~3700 km), international long-haul traffic accounts for the largest share in 2013 (40% of World RPK), followed by Domestic (34%) and international short-haul (26%). This segmentation hides some detail as it aggregates markets with different growth rates. For example, in the domestic market, India and PRC differ from more mature USA and Europe. In the international short-haul category, the expanding intra-Asian market contrasts with more advanced intra-Western Europe; or in the international long-haul category, Africa – Asia is very different from Western Europe – USA. However, our forecasts show that international long-haul will remain the largest segment in 2033, still representing 40% of World RPK in 2033.



DIFFERENT EVOLUTION OF DOMESTIC AND INTRA-REGIONAL BY REGION Source: Sabre GDD, Airbus GMF 2014



Africa, and decreased in North America and CIS. Our forecasts show that the upward trend in Asia-Pacific and Latin America will continue from 50% to 55%, and from 30% to 35% respectively, over the next 20 years. The share of domestic and intra-regional traffic will continue to decrease in Europe, North America (advanced markets). It will remain fairly stable in Africa and Middle East, as the huge potentials for both inter-regional and intra-regional flying means that all segments will grow impressively.


Trips* per capita



IN ANY GIVEN MARKET, propensity to fly is defined as the number of trips per capita. There are many different and interrelated forces affecting propensity to fly, for example, the economy's health (and personal income levels), demographic changes, the affordability of air travel, geographical features, etc. Measuring propensity to fly, with trips per capita against GDP per capita, gives a picture of where countries are in relation to the people's use of air transport, and shows their potential to grow as wealth increases.

Source: Sabre (annualized September 2013 data), IHS Global Insighqt, Airbus

TODAY, NORTH AMERICANS AND EUROPEANS

- 2033

are the most likely to take the plane, when they need to travel. However, in the future, more and more people all over the world will be able to fly more often. People from other regions, including Asia/Pacific and Latin America are also expected to grow their propensity to fly.

Robust economic expansion, growing competition (especially in Asia-Pacific where the presence of LCCs stimulates the propensity to fly as it makes air travel more affordable) and geographical considerations are some of the factors driving this positive outlook.

REGION

Africa Asia/Pacific CIS Europe Latin America and the Caribbean Middle East **North America**

100,000

120,000

2013 GDP per capita (\$US)

2013 average trips per capita	2033 average trip per capita
•	
0.06	0.13
0.24	0.69
0.25	0.76
0.99	1.87
0.36	0.87
0.38	0.92
1.59	2.14



Sha



are	of region-pair premium p	bassengers	on total pre	mium pas	ssengers*				
[%] 7									
0/									
% -									
<u>%</u>					<u> </u>				
<u>%</u>									
% -									
%									
% -									
0 4	2006	2007	1	2008	2009	2010	2011	2012	2013
	SHARE OF PREMIUM P Source: IATA	ASSENGER	S STABLE			* Selected	region pairs, with share >	-1%. Based on monthly	data as of September each year
	Within Europe	North /	Atlantic		Within Far East	Europe-Far East	North and	Mid Pacific	Europe-Middle East
	North America Central America	Africa	Europe		Far East-Middle East	South Atlantic	North Ame South Ame	rica erica	

WE ALSO FOCUS on premium passengers, that is, first and business class passengers. Premium passengers account for 9% of total passengers today, slightly below the 11% they represented in 2004.

The average share of premium passengers distributed by region pairs has been relatively stable since 2007. The main exception is premium passengers within Europe, which was negatively impacted by the last financial crisis. Since 2009 though, the share of premium traffic within Europe has been more stable at ~23% of total premium passengers, followed by North Atlantic, with a ~18% rate over the same period.

Freight traffic

THE PROCESS FOR FORECASTING AS WITH PASSENGER TRAFFIC,

FREIGHT TRAFFIC is not dissimilar to forecasting passenger traffic, although there are some significant differences, not least the descriptive variables used. One of the key drivers for the forecasting FTKs are forecast to expand at 4.5% of the air freight market is trade volume. Trade was more severely impacted than GDP during the last financial crisis: from a 5.9% annual increase over 2000-2008, trade growth has decelerated to a 2.8% annual rate from 2008 to 2013. In turn, over the crisis period, GDP grew at a 2.1% annual pace, 1.1 percentage points the 4.6% annual expansion forecasted last below the annual expansion observed during the period 2000-2008.

dedicated econometric models are used to forecast air freight traffic over the next 20 years. Our traffic forecast methodology reveals that from 2013 to 2033, World annually, below the 4.8% forecast last year over the period 2012-2032. The reason behind this slightly lower outlook is a general downward revision in the forecast for trade we use in our modelling. This downward revision implies that trade will increase at 4.3% rate per year, below year, with all the regions being negatively impacted, apart from the Middle East.

TRADE GREW AT A



TRADE MORE IMPACTED THAN GDP DURING THE LAST ECONOMIC CRISIS Source: IHS Global Insight, Airbus





WORLD TRADE FORECASTS HAVE BEEN REVISED DOWNWARDS COMPARED TO PREVIOUS GMF Source: IHS Global Insight, Airbus





AS FOR THE PASSENGER TRAFFIC VIEW, much of the future development in the air freight market will be driven by the dynamism of the emerging economies. Today, air freight traffic between advanced economies represents the largest share on total traffic (34% as of 2013), traffic from emerging to advanced economies and traffic from advanced to emerging will lead air freight traffic in 2033 (representing 30% and 28% of total freight traffic, respectively). Traffic between advanced economies will become the third largest segment, with a still significant 24% share in 2033.

FREIGHT TRAFFIC BETWEEN EMERGING ECONOMIES

will be the fastest growing (6.2% annual expansion over the period 2013-2033), traffic between advanced economies will be the slowest growing increasing at 2.7% annually over the same period.

Emerging-Emerging CAGR 6.2%

Advanced-Advanced CAGR 2.7%

Advanced-Emerging CAGR

4.9%

Emerging-Advanced CAGR 5.0%

EMERGING MARKETS WILL REPRESENT 3/4 OF TOTAL AIR FREIGHT TRAFFIC IN 2033 Source: Seabury, Airbus

Air freight evolution (billion FTK)



CONSISTENT WITH THE PREVIOUS FORECAST, the

breakdown by region-pairs shows that the top five largest freight traffic flows involve emerging economies, PRC, and two mature regions, North America and Europe. More specifically, air freight traffic from PRC and North America leads today (7% in 2013) and will continue to lead total traffic in the future (9% in 2033). This flow is followed by PRC-Europe (with a 6% and 8% in 2013 and 2033, respectively) and Europe-PRC (4% and 6% respectively).

PRC – NORTH AMERICA WILL BE THE LARGEST FLOW IN 2033 Source: Airbus GMF 2014







Demand for passenger aircraft



Passenger aircraft demand

Today, there are more than 16,860 passenger aircraft in service, with more than 800 airlines globally. By 2033, this will grow to reach more than 34,800 aircraft. One of the main goals of the GMF is to look at how each of these airlines are using these aircraft in terms of configurations, range and utilisation. We also examine many other historical statistics to understand what will be the future requirements of the aircraft in service, to be delivered and to be developed over the next 20 years. Across the spectrum of aircraft use

by distance of operation, there are clear core segments of the market where airlines prefer one aircraft type over another, either based on range or types of operations. Today, more than 75% of Singleaisle aircraft are operating at less than 1,300 nautical miles; 4,800 nautical miles for Twin-aisle aircraft and 5,900 nautical miles is the equivalent for VLA aircraft. This does not mean there is no overlap; for example, nearly 20% of the twin-aisle market is operated under 2,000 nautical miles and around 20% is over 5,000 nautical miles.

CLEAR SHIFT IN AIRCRAFT-TYPE DEPLOYMENT AROUND 2,000 NAUTICAL MILES Source: OAG, Airbus Market Research and Forecasts





Short-hau

Of the fleet-in-service today, 78% are single-aisle aircraft (in the seating categories between 100 and 210 seats). These are the workhorses of the industry, representing 60% of all distance flown in 2013, even though their core market remains short-haul. Of the 13,208 aircraft in service today, 9,600 will need to be replaced over the next 20 years and there will be further growth of 12,500 aircraft, which will result in the overall fleet of single-aisle aircraft growing to 25,702 aircraft.

A large number of these deliveries will come from the new, more fuel efficient single-aisle aircraft like the A320neo or 737max. The A320neo is scheduled to enter service shortly, and delivers 15% lower fuel burn through continuing application of new technology at the right time, specifically in aerodynamics and engine improvements. Airbus is also dedicated to continually increase the per seat economics of its fleet through driving innovation in cabin improvements.

ONE OF THE MAIN TRENDS OF THE SINGLE-AISLE

market over the last two decades, is the densification of the cabins. In 1993, the average seat count of a single-aisle aircraft was around 129 seats. Since this time, there has been impressive push by airlines to increase the capacity of singleaisle aircraft, largely driven by Low Cost Carriers (LCCs), to the extent that today the average seat count on a single-aisle aircraft is around 155 seats, right in the center of the offering of the A320Family. This has been accomplished through upgauging from smaller aircraft such as the A318 and A319 to larger aircraft like the A320 and A321 as well as through cabin innovations such as using slim-line seats and/or the Space-Flex system, the optimised rear galley & lavatory configuration. We expect this trend to continue further in the coming years, with the industries continuing drive for efficiency.

DENSIFICATION OF SINGLE-AISLE AIRCRAFT Source: OAG, Airbus Market Research and Forecasts

Average seats per single-aisle flight



089

IN TERMS OF THE FUTURE DEMAND. of 22,100 single-aisle aircraft over the next 20 years, 44% will be within Europe and North America. These two mature markets are highly driven by replacement demands. In fact, 57% of the 9,600 single-aisle aircraft to be replaced in the next 20 years will come from these two markets. When it comes to growth, unsurprisingly the emerging markets are driving demand. Asia-Pacific represents 37% of all single-aisle demand over the next 20 years, of which 58% is for growth in these markets. As mentioned, the short-haul market is not just a single-aisle market. There are a significant amount of operations on trips under 2.000 nautical miles undertaken by aircraft in the twin-aisle categories. These are often driven by high levels of demand on sectors that either already have very high frequencies or on routes where one or both of the airports are constrained. A clear example of a market that sees the value of using twin-aisle aircraft on short-haul markets is on Domestic Chinese routes where there are some 50 short-haul routes operated by twin-aisle aircraft.

The Airbus A330Regional has been specifically designed for these operations, representing a huge advantage for airlines by providing 10% lower trip cost compared to two single-aisles, also offering more than twice the capacity.

20-YEAR GROWTH IN AVERAGE SINGLE-AISLE SEATS

Long-hau The right product for the right market

Aviation Mega-cities (AMCs) represent the core of the long-haul market (traffic over 2,000 nautical miles). In fact 49% of all long-haul O&D passenger trips begin or end at AMCs and another 22% of longhaul O&D trips are between these 42 cities of today. In the future, the 42 cities of today will maintain their importance, while at the same time an additional 49 cities will grow to become AMCs. An important distinguishing factor of these cities, is the presence of wide-body types as part of their operations. Today, 95% of all long-haul wide-body flights operate to, from or between AMCs; something that has been

an enduring trend for these top 42 long-haul airports. This statistic has remained stable at around 95% every year for a decade. The distribution across aircraft types also differs, with the largest aircraft types focused more on AMC traffic than other sizes (like the A380 at 100% of flights, the 777-300/-300ER at 98% and the 747 at 95%). The smaller end of the twinaisle segment has only a slightly less focus on AMCs (97% of 787s, 94% of 777-200/-200ER/-200LR, 93% of 767's and A330's are to/ from/between AMCs).

WIDE-BODY FOCUS ON THE AMCs

95% of long-haul wide-body flights are to/from or between aviation mega-cities

THE LARGER THE AIRCRAFT THE HIGHER THE FOCUS ON AMCs Source: OAG (Sept 2013)



WIDE-BODY AIRCRAFT represent nearly 30 percent of all aircraft utilisation. These aircraft types are highly focused on routes to or from Aviation Mega-Cities and connecting secondary cities. The bulk of the demand in the twinaisle market is in the smaller seating categories (250 and 300-seaters) which represent nearly 70% of the demand for twin-aisle aircraft. This is the core market of the highly efficient A350XWB as well as the A330 and the latest offering by Airbus, the A330neo.

The demand for the larger category aircraft such as A330Regional and the A350-1000WXB will still be competing in a large market of more than 2,300 aircraft demand over the next 20 years. Overall, the twin-aisle fleet represents more than 3,500 aircraft today and will grow to reach more than 7,800 aircraft in 2033. From the demand for 7,260 aircraft, 2,900 aircraft will be for the replacement of ageing aircraft and more than 4,300 will be for growth. On a regional basis,

Asia-Pacific and the Middle East will drive the growth in the twin -aisle market representing 63% of the demand over the next 20 years.



Between secondary cities



AT THE LARGEST END OF THE MARKET, Very Large

Aircraft represent the biggest "bang for buck" for both airlines and passengers; providing the lowest cost per seat available to airlines and the most comfortable experience for passengers. Since the entry into service of the A380, operators have efficiently used the aircraft for three key reasons: 1) to reduce the number of aircraft movements needed to transport a large number of passengers, 2) to secure growth at the right times of the day and/or 3) to free up slots for other growth opportunities. with these opportunities set to grow over the next five. Today, the deployment of A380's has been fairly well split between high growth markets, moderate growth markets and reducing the number of frequencies required for a given market. Obviously, these types of deployments are dependent on the airline's business model and how their relationships in alliances and/or JVs are structured. Part of this strategy for efficiently using capacity is also focused around the right times for deploying higher capacity, especially for premium traffic. This is why on many routes where the A380 is operating, airlines often operate other aircraft types at non-peak hours. In fact, 50% of the airline airport-pairs operating the A380 have another aircraft type in operation. This allows airlines to target the right capacity at the right time of the day and to minimise spill. This has been validated by the market, with the majority of A380 customers also having A350XWB aircraft in backlog. Even though the core of the VLA market is long-haul markets between AMCs, both today and in the future, there is a strong demand (and use

today) of A380s within Asia-Pacific. These types of operations represent 25% of all seat capacity deployed on the A380. Very Large Aircraft excel in markets where you have a combination of some or all of the following: high and/or stable growth, infrastructure and/or time channel constraints, spill capture and/or market expansion and a clear benefit in providing product segmentation.

These characteristics define the ideal environment for VLAs, 10 and 20 years.

From today until 2033, we forecast the demand for nearly 1,230 VLA globally. The two largest markets are Asia-Pacific and the Middle East. Asia-Pacific will represent 47% of the demand for VLA over the next 20 years which can be clearly seen by the large number of VLA today flying to from and within Asia-Pacific followed by the Middle East which today has the largest fleet and largest backlog.

GLOBALLY, the demand for passenger aircraft will represent 30,555 aircraft over the next 20 years to absorb the 4.7% annual growth in traffic over the forecast period. This demand represents \$4.4 trillion at book value over the next 20 years. Of this demand for passenger aircraft, 40% will be for the replacement of ageing, less fuel efficient aircraft and 60% of the demand will be for growth.

New deliveries by region



New deliveries by neutral category



Fleet evolution









New deliveries

30,555 aircraft



Market value

US\$ 4.4 trillion 43% 47%



Demand by region

Asia-Pacific Old Demand, New Demand

The Asia-Pacific region is a diverse mix of countries, people and aviation requirements, and over the next 20 years will be responsible for more growth and aircraft deliveries than any other region. This should not be a surprise, after all it is home to more than 60% of the world's people, geographically is characterised by the world's largest continent covering 44 million square kilometres. Culturally it is rich and diverse, with the people of Indonesia for example, speaking more than 600 languages.

The need to travel to, from and within Asia is by no means a modern phenomenon; people from Europe have explored and traded with the region as long ago as 500 BC, with the Romans even trading with China at the time of Augustus, exporting goods such as glass and importing silk, which even then was the height of fashion. Today, people still want and need to travel to the region, and flying makes it much more straight forward. Asia is unquestionably a key element in future global economic and air transportation growth.





AVERAGE AIRCRAFT CAPACITY GROWTH SINCE 2000

54%

LCC Seats Offered and Flights, *base year 2000 = 100** 2,000 1,500 500

LCCs IN ASIA-PACIFIC CONTINUE TO BOOM Source: OAG, Airbus Market Research and Forecasts

001

Note: Includes all intra-regional and domestic traffic

NETWORK DEVELOPMENT AS MORE HAVE ACCESS TO AVIATION Source: GMF 2014



2009

008

--- LCC Seats Offered

Asia-Pacific's Economy will drive aviation growth

ASIA'S ECONOMIC PERFORMANCE remains very dependent on exports, but domestic sources of growthparticularly private consumption-will play a larger role in coming years. Among emerging/market regions, Asia-Pacific, led by the highly dynamic Far East, will continue to have the highest economic growth rates. As in past decades, this is mainly due to the region's combination of openness to trade, high domestic-saving rates, and a relatively well-educated and committed work force. Thanks to these favourable factors, Asia-Pacific will continue to attract the bulk of global foreign investment flows, much heading to emerging markets in the region. Furthermore, it is destined to become the world's dominant manufacturing centre and the main consumer of non-oil primary commodities. The longer-term outlook for Asia's external balances depends crucially on the region's ability to push through macro-economic policies aimed at boosting consumption and lowering savings rates. Asia-Pacific will lead world economic growth, both in real GDP with an average of 4.6% per year and in trade with an average of 5.7% per year.



CHINA'S DEMOGRAPHIC CONCENTRATION COULD LEAD TO MORE CONGESTION Source: Populationlabs.com, Airbus Market Research and Forecast

China, matching demand with capacity

THERE IS NO DOUBT that China is and will be the key market in Asia-Pacific. In the coming years it is set to become the world's largest economy, and will be home to the World's largest domestic aviation market. By 2033, it will be more than 60% larger in terms of passengers, than today's largest market in the US. Domestic air travel is very important for China's aviation development with ~50% of all Chinese traffic flown within the country. So far, much of this traffic has been focused in the east, and even though this is expected to remain true over the forecast period; further economic development in western and central China means that traffic is slowly but surely developing to the west and north.

Whilst the Low Cost Carrier (LCC) model has seen rapid development in South East Asia, Northern Asia, and especially China, appears to have a large remaining potential. Recently, the Chinese authorities have shown a willingness to explore the stimulus effects LCCs can bring by encouraging mainline airlines to investigate LCC subsidiaries, allowing new airlines to be created, by the adjustment of guidelines on fleet caps for LCCs and even potentially cutting airport charges in third and fourth tier cities. Whilst these moves are expected to help in meeting the need for further aviation development, one aspect of aviation in China will remain true: congestion is a problem. Today, nearly 80% of the Chinese population and

economy is within a range circle of about 2,000 km; this coupled with extremely high average daily aircraft movements at the major cities, high growth in traffic and LCC operations and other airspace constraints, means that congestion is not an issue that can be quickly resolved. Even with the large investment in infrastructure and Air Traffic Management (ATM) improvements, airlines will need to continue to increase their average aircraft capacity. In some instances, this will mean an increase from smaller singleaisle aircraft to larger single-aisle aircraft as well as increasing the number of widebody aircraft on short-haul sectors above today's levels.









Europe In it for the long and the short haul

After a difficult period the European economy is gradually recovering, driven by rising consumer and business confidence, low interest rates, improving export markets and pent-up demand for durable goods. In our forecast we assume annual average European real GDP growth to average 1.8% per year. Europe will still represent 20% of the world economy by 2033. On these positive economic developments, in recent months, the European air traffic market has not only recovered but is showing strong signs of growth. Overall, air traffic in Europe, expressed in ASKs, is 15% larger than the peak pre-crisis in 2007/2008. On short-haul markets (less than 2,000 nautical miles) traffic grew by 7% in the first half of 2014 vs the first half of 2013, thanks largely to intra-European traffic. Long-haul markets have seen 4.4% growth over the same period, with the highest performers coming from Europe – North America (+5.7%) and Europe Middle East (12.9%).



Year-on-year ASK traffic growth (quarterly data), from/to Europe



The diversity of Europe will lead to diverse sources for future aviation growth. In the emerging European markets, higher growth opportunities and new market models will help to drive growth, not only for the airlines domiciled in these markets, but also for foreign carriers who are already increasing their presence. In the more mature markets, slow or moderate growth is still to be expected, but given the overall size of these markets, an incremental change in growth rates can have a high impact on the absolute number of travellers. To put it in perspective, a growth of 1% in the number of origin and destination passengers for Europe is equivalent to 7 million new passengers per year.

Short-haul Markets

THE DEVELOPMENT of the Low Cost Carrier (LCC) network in Europe has been impressive. It can be argued that it is new home of the LCC business model. Whilst the US saw the models creation, Europe's LCCs continue to grow and find new markets to explore. Today, 45% of all seats offered within Europe are on an LCC flight and there have been significant increases in LCC traffic to/from other regions such as CIS, Northern Africa and the Middle East. But, LCC development has not been homogenous across the region. Short-haul traffic to/from the UK and Spain has the highest market share for LCCs, with others still with room to grow.

In 2013, only three countries had LCC traffic that represented less than 20% of short-haul seats

LCC MARKET SHARE IN EUROPE PER COUNTRY, 2013 BY SEATS OFFERED ON SHORT-HAUL ROUTES Source: OAG Airbus Market Research and Fore

60% _ LCC Market Share in number of flight



Bubble diameter proportional to total number of seats offered per country

THOUGH, IT IS NOT ONLY THE LCCs who are benefitting from the continued development of short-haul traffic in Europe. Short-haul traffic that is connecting to long-haul flights will largely remain the core market of the major international carriers in Europe. Today, there are more than 50 million monthly passengers that are connecting to long-haul flights. This is a market segment that will continue to grow over time, especially as the growth in long-haul origin and destination markets in Europe will grow faster than domestic and intraregional routes, resulting in more and more passengers feeding the growth of long-haul markets.

Long-haul markets

and over 50% of long-haul seats offered are with the region. For by 2.6% between 2013 and 2014, there will be an additional the Airbus A380 alone, 51% of all flights are to or from Europe making it the number one destination for the type. In 2013, long-haul seats offered between Europe and North America represented 41% of all long-haul seats offered to/from/within Europe; this is down from 48% of all long-haul seats offered in 2003. But, even though traffic between Europe and North America is declining in terms of share, it has continued to grow at 2.6% per year over the last 10 years. Due to its already massive proportions, a small annual growth actually results in massive amount new seats. As an example, if the number of

TODAY, nearly 50% of all long-haul flights connect with Europe seats offered between Europe and North America again grows 6,600 seats offered per day. That's equivalent to more than 12 daily A380 flights between the two continents. Asia-Pacific, the second largest long-haul market to/from Europe has grown at 4.5% per year over the last ten years, but the growth has not been consistent across the region. Capacity offered between Europe and China has grown at nearly 10% per year; and within that traffic flow, capacity between Central Europe and China has grown at an astonishing 33% each year. Despite increased international competition on long haul routes, European airlines still offer 53% of all long-haul seats offered

to/from and within the Region; this just one percentage point lower than a decade ago. Despite this small change, European airlines have grown in capacity more than 4% per year over the same period.

ANOTHER KEY ASPECT of the development of traffic in Europe has been the continued growth in the average aircraft size. While the majority of the growth has come from the shorthaul market, which has grown by 75% in the last ten years; the long-haul market has also seen impressive growth of 45% over the same period. Overall, for the next 20 years, long-haul passenger traffic will grow slightly faster than short-haul traffic at 3.9% per year vs 3.8%.

OVER THE LAST TEN YEARS, EUROPEAN LONG-HAUL CAPACITY HAS GROWN BY MORE THAN 50% Source: OAG, Airbus Market Research and Forecasts

Millions of long-haul (≥ 2,000 nautical Miles) seats offered per market



LONG-HAUL FLIGHTS:

CONNECTED WITH EUROPE

	>	
 Latin America	+84	%
CIS	+40	%
Africa		
Intra-Regional	+58	%
Middle East	+202	
	_	
Asia-Pacific	+55	%
North America		
	+29	%
2012		





Total RPK traffic growth





Fleet in service evolution



Real GDP 1.8%

Real Trade 3.7%

& domestic 3.2% Inter-regional 4.1%

RPK traffic growth from/to Europe by region



New deliveries by segment



Fleet*

Intra-regional Total traffic 3.9%

3,891 In 2033 7,065

Fleet in service 20 year new deliveries 6,167



North America Where mobility equals opportunity

Mobility is as much a fact of life in North America today, as it was three centuries ago. Each year, millions of Americans move across this vast continent, for reasons ranging from education, jobs or family. Those from outside the continent also continue to arrive in North America in their hundreds of thousands each year. Whatever the reason and destination, the underlying motivation has always been the same - in search of better opportunities, to move closer to or visit friends and family members, to enjoy a particular lifestyle, or simply to visit and experience what the region has to offer.



Aviation plays a major role in enabling mobility in the modern era, as trains and ships did for the migrants of the 19th and early 20th centuries. The importance of aviation in North America is hard to deny. In 2013, there were 810 million passengers that flew to/ from/within North America and this trend is forecast to continue to grow at 3.4% per annum for the next 20 years. The resilience of air traffic, amidst a long economic recovery, is testament to the value that aviation brings to the region. A healthy outlook for the North American economy combined with the region's diversity and core strengths will ensure that mobility will continue to forge ahead in the future. In North America, using the extensive aviation network is nothing unusual, for many in the region it's like getting on a very fast and efficient bus.

Economy

AFTER THE DIFFICULTIES at the end of the last decade, improved household finances, a housing market recovery and reduced fiscal drag are driving the US economic recovery and expansion.

AMONGST MATURE, advanced economies, North America will remain the growth leader, thanks to a combination of favourable factors, including abundant natural resources, highly developed financial institutions, rapid immigrant absorption, huge market size, and science and technology leadership in many fields. These factors, coupled with a highly entrepreneurial culture, create the right conditions for commercial success.

US real GDP growth is forecast to average 2.5% per year in the 2013-2033 period, with greater business fixed investment and R&D spending offsetting the slowdown in labour force growth. By 2033, North America will still account for 22% of the global economy (in real terms).

THE RETURN OF NORTH

AMERICAN growth prospects to positive territory is not the only reason airlines can feel upbeat. After years of painstaking restructuring, many are starting to feel the benefits of a period of increased consolidation.



Market trends

Consolidation Effects

AS A NUMBER OF THE LARGER **NETWORK** carriers in North America consolidate their new businesses, reorganisation costs have started to come down and some capacity rationalisation has started to bring positive returns. Despite weather related disruptions in the first guarter of 2014, many airlines reported strong financial results, aided by lower oil prices and growing ancillary revenues. Traditionally a mainstay of low cost carriers, ancillary sales have become a focus of the legacy

carriers as well, generating a remarkable \$4 billion for US airlines in the 1st quarter of 2014 alone.

The recent wave of consolidation has contributed to airline profitability, but the benefit of strict capacity management has its limit. In the first guarter of 2014, load factors remained above 80%. At near historical efficiency levels, airlines will need to consider expanding capacity through frequency increases or "upgauging" to larger aircraft in order to accommodate future growth.

THE LATEST VERSION of the GMF

forecasts origin and destination (O&D) traffic to/from North America to grow at an average of 3.4% for the next 20 years. Domestic and intra-regional flows will constitute the bulk of the passengers carried in the region, with a growth rate of 1.9% due to the region's maturity. The rest of the O&D traffic flows with North America are forecasted to grow at 4.2% per year on average, which is close to the global average of 4.7%

International Students, Immigrants, and Mobile Citizens

NORTH AMERICA CONTINUES to be a draw for both international students and migrants. According to 2012 UNESCO data, the US remains the top destination of internationally mobile students attracting more than 18% of the roughly four million studying abroad. Internationally Mobile Student arrivals to North America have grown at annual rate

of 2.8% in the last decade, with the top originating countries in Asia, accounting for more than half of arrivals. A survey on student mobility reveals that the most cited reason for choosing the host institution is international recognition of qualifications. The US, with its world-renowned institutions, tops the list of the most popular host countries.



DIVERSITY OF NORTH AMERICAN MIGRANTS CONTRIBUTE TO ROBUST VFR TRAFFIC Source: United Nations Population Division, Airbus

Migrants in North America

THE ECONOMIC OPPORTUNITIES

and rich cultural offerings in North America are strong attractions that draw immigrants in large numbers. As of 2013, the region was home to 53 million immigrants and their number continues to grow at an average rate of 2.8% per year. Those from Latin America constitute the largest group at 49% followed by 26% Asians, and 14% Europeans. The growth in arrivals is highest from Africa at 5.3%, Asia 3.9%, Latin America and the Caribbean 3.6% and Middle East 3.1%. As migrants ascend the economic

ladder, their new found strength will translate into more trips to their homelands, as they maintain ties with family and friends abroad. This ethnic and cultural diversity in North America will contribute to robust Visiting Friends and Relatives (VFR) traffic to/from this region in the coming years.

INTERNAL MIGRATION within North America is another important driver for VFR travel. A recent US Census Geographical Mobility Report estimates that 35.9 million people or 11.7% of

200		2013	
	_		
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the population moved between 2012 and 2013. The latest five year survey reports 35.4% of the population lived in a different residence five years ago, of which 16% moved to a different state. The primary reasons provided by respondents are housing-related (48%), followed by family (30%), and employment (20%). The flexibility of the job market in the U.S. and the geographic mobility of its citizens facilitate movement to regions where opportunities abound.

An Opportunity to Invest

IN ORDER TO MEET THE GROWTH

in traffic and a need to replace an increasingly ageing fleet, the GMF estimates that North American carriers will need 4.730 aircraft over the next 20 years.

The annual retirement trend of passenger aircraft (>=100 seats) in North America is on an upward trajectory, with a 10-year CAGR of 6.8%. If the trend stabilises at the 10-year average of 160 aircraft per year, the size of the retired fleet will reach 3,200 over the next two decades. Meanwhile, backlog for the same period currently stands at 2,500 aircraft - well

below the demand for replacement and growth combined. Airlines/lessors will either have to order new aircraft, source from the second hand market (for which North America has been a key market in the past) or extend the use of existing fleet beyond the typical life.

WHILST GROWTH ON THE WHOLE

is beneficial, it can lead to some difficulties if infrastructure and pilot training for example are unable to keep pace. One outcome in the region has been increasing congestion at a number of key airports.

The Federal Aviation Administration (FAA) estimates that airport congestion and delays cost the economy \$22 billion in 2012, which could escalate to \$63 billion in 2040.

One tactic which is helping to alleviate some of the effects today is the use of larger aircraft. Passengers flying internationally from some of the US's major airports, including LAX and JFK, can see an increasing number of Very Large Aircraft (VLAs) at airport gates, these operated by airlines flying to all corners of the globe.



Results





Fleet in service evolution



RPK traffic growth from/to North America by region



New deliveries by segment



Fleet*

Total traffic

3.4%

In 2014 4,181 In 2033 6,114

Fleet in service 20-year new deliveries 5.533

Middle East aviation, going global

The Middle East has experienced impressive changes in recent years, through tremendous economic development and massive investments.

Symbols of this evolution include the world's tallest skyscraper, sports sponsorship, international investment and even artificial islands. At the same time the Middle East has also become a major centre for air transport, one of growing global importance.



MIDDLE EAST FLEET IN SERVICE IS GROWING FASTER THAN GLOBAL FLEET IN SERVICE

Source: Ascend (end of each year)



SHARE OF GLOBAL TWIN-AISLE FLEET IN MIDDLE EAST CARRIERS

ECONOMIC GROWTH IN THE REGION will continue but pace will be mixed depending on the socio-political situation/ position of the country. The region's medium-term economic outlook remains supported by its substantial petroleum resources, growing tourism potential, and strategically important geopolitical location.

The oil producers must continue to address their oil dependence by fostering development and activity in the nonoil sector, and it's working. According to the UAE General Civil Aviation Authority, the aviation industry currently contributes almost 12% of UAE GDP and targets a 15% contribution by 2016. Over the longer term, Middle Eastern GDP growth is forecast to average about 3.8% per year.

IN TERMS OF AVIATION, the growing weight and influence of Middle Eastern carriers is immediately apparent. In order to foster continued economic development of the region, particularly non-oil related, to encourage more tourism and to transport business travellers, the Middle East region is establishing an impressive fleet of passenger aircraft. In fact, the share of passenger aircraft in the world operated by the regions carriers has doubled in 10 years.

Examining the split between single-aisle and wide-body fleets, Middle Eastern carriers preference for large aircraft is clear. While 4% of the global population live in the region, 14% of all wide-body aircraft are operated from there. This is actually the only region in the world where the wide-body fleet is larger than single-aisle. As well as long-haul traffic development, Middle Eastern carriers are developing more connectivity to local destinations and intra-regional routes. A dedicated single-aisle fleet is being built to fulfil this purpose: the Middle East singleaisle fleet has multiplied by three in the last ten years.

GLOBALLY, AIR TRAFFIC HAS DOUBLED every 15 years; in the Middle East, ASKs have multiplied three and a half times between 2003 and 2013. Whilst the regions large hubs are an obvious facilitator of this growth, tourism, often overlooked is another factor helping to drive growth. In the last ten years, the number of tourists visiting the Middle East has doubled, with Saudi Arabia, United Arab Emirates, Jordan, and Iran being amongst the countries in Middle East welcoming higher number of tourists. More and more citizens from the Middle East are living and working abroad, with Middle Eastern universities fully integrated in the global network of universities allowing student exchanges and even more demand for air travel.

FROM ABU DHABI SHARE OF GLOBAL URBAN **POPULATION* IN A RANGE** CIRCLE OF 15,000 KM AROUND ABU DHABI *Based on cities with more than 750k habitants

 O_{M}



ABU DHABI, NO OTHER CITY HAS A LARGER **URBAN POPULATION WITHIN** A 15,000KM RANGE CIRCLE Source: UN data

THE REGION'S AIRLINES ARE USING THEIR GEOGRAPHIC ADVANTAGE WITH GREAT EFFECT.

with a direct flight. with greatest efficiency.



MIDDLE EAST TODAY FOCUSED ON TRAFFIC TO EUROPE AND ASIA-PACIFIC Source: OAG - September of each year

Short and Medium-Haul markets are also full of opportunities

THE LARGEST MIDDLE EAST

CARRIERS are focused on strong positions in long-haul markets, but the region can also rely on other markets, full of new opportunity with high growth potential. Short-haul and medium-haul possibilities are numerous: to and from the Indian Sub-continent for example, where the number of expatriates in the region is high and with their home market accessible with single-aisles

Taking Abu Dhabi as an example, 99.9% of the global urban population is included within a range circle of 15,000 km centred on the city. In other words, a VLA like the A380 could be used to connect 99.9% of urban people from Abu Dhabi

Abu Dhabi is the most "central" city in the world according to this definition. But if we look at the top ten cities worldwide for their central position to urban populations, seven of them are part of the Middle East region. Unsurprisingly therefore, medium and long-haul routes between Middle East on one side and Asia-Pacific or Europe on the other side constitute the core growth markets for traffic. These are routes where the wide-body aircraft Middle Eastern carriers favour in their fleet mix can be used

ASK evolution (Billions of available seats kilometre) between Middle-East and other regions



SHARE OF ASK FROM/TO/WITHIN MIDDLE EAST THAT INCLUDES EUROPE OR MIDDLE EAST

> like the A320 from many airports. In addition, air traffic is about to take-off between Africa and the Middle East, which is ideally positioned to connect the African continent to the rest of the world - especially with the Asia-Pacific. Last but not least, much traffic growth should be expected for inter and intraregional traffic, with the development of low-cost carriers helping to further stimulate demand.

LOW-COST PRESENCE IN MIDDLE EAST IS CURRENTLY INCREASING Source: OAG (September of each year)

Share of ASK* operated by Low-Cost carriers in Middle East



* Routes from/to/within Middle-East below 2,000nm

23%

IN 2013

SHARE OF ROUTES FROM/TO/WITHIN MIDDLE EAST BELOW 2,000NM OPERATED BY A LOW-COST CARRIER

SINCE 2007, THE ASK MARKET

share of low-cost carriers on Middle Eastern short-haul markets has increased significantly, reaching nearly 23% today. The routes served by low-cost carriers also highlight an interesting insight into their target markets: 65% of low-cost carriers' capacity is flying from Middle East to another region, mainly to Europe and to India. This highlights both the growing diversity of the regions flows and the opportunities for short and mediumhaul markets to and from the region.

Middle East has reached its current status in the aviation industry focusing on its premium position on long-haul markets. And future wide-body deliveries will enable the airlines to connect growing urban populations all over the world. In the same time they are looking more and more at local opportunities and, indeed, short and medium haul markets will play a big role in future region growth.

Future aircraft demand in Middle East is actually highlighting the regions future challenges: developing local and regional markets while reinforcing its global position.



Results

Total RPK traffic growth



Fleet in service evolution



* Passenger aircraft ≥100 seats ** 2013-2033 CAGR

RPK traffic growth from/to Middle East by region



New deliveries by segment



Fleet*

al Total traffic 6.2%

Fleet in service In 2014 971 In 2033 2,687 20 year new deliveries 2,148

Latin America and Caribbean



Economy and air traffic

THANKS TO KEY AVIATION DRIVERS, such as sound macro-economic fundamentals, an expanding middle class and a significant urban population, the region's current and future outlook remains positive. The GMF forecasts 4.9% annual air traffic growth over the next 20 years, for the region, which continues to outperform the 4.7% global average traffic growth.

IN TERMS OF THE ECONOMY, most Latin America economies will accelerate from their performances recorded in 2013, driven by a more favourable external environment. Domestic economies in the so-called LATAM 5 (Brazil, Mexico, Colombia, Peru and Chile) enjoy sound macroeconomic fundamentals: effective monetary management, fiscal prudence, low external debt, higher stock of international reserves, fiscal and current account surpluses. Overall, compared with the pre-Asian crises years when the region also posted strong economic growth, the macro-economic fundamental conditions have improved substantially. The long-term prospects for the Latin American economies remain positive, providing they can address structural issues that could impact growth sustainability, among them inadequate infrastructure.

The region's real GDP growth is expected to average 3.9% per year in the 2013-2033 period, above world average of 3.2%, and helping to stimulate air travel.

International/long-haul market

INTERNATIONAL/LONG-HAUL TRAFFIC has grown impressively in recent years, and continues to show positive growth potential. When comparing the current and future (2013 and 2033, respectively) top twenty largest traffic flows, two of them are international traffic flows linked to Latin America and the Caribbean: Western Europe - South America, with an expected annual growth of 4.6% and South America - USA, with an average annual expansion of 5.2%. The fact that passengers from the region travel further, together with the evidence that there are now stronger trade links with other emerging markets such as China, help to support our positive outlook. This so-called South-South trade link, both in goods and capital flows has grown significantly over the last 10 to 15 years, partially stimulated by an increase in free trade agreement-led cooperation with Asian countries since 2000.

HOWEVER, the market share of Latin American and Caribbean carriers on international long-haul routes is still relatively low, compared to European and American airlines. The example of Brazilian domestic low-cost carriers (LCCs) announcing commencment of long-haul services to the US by 2015, could be a pre-cursor to greater involvement from Latin American and Caribbean carriers on these flows in the future.

WORLD GDP GROWTH

LATIN AMERICA GDP GROWTH

ONE OF THE KEY PARAMETERS

when analysing the region's air transport is its people's propensity to travel. There are several factors which directly affect this, including:

- Economic stability and an expanding middle class
- Growing and significant urban population
- Strong and/or growing competition
- High levels of immigration
- Lack of extensive train networks in the region
- And geographical features (large distance between population centres and the presence of continental mountains or large bodies of water)

Significantly, many of these factors are present in the region and will serve to shape the way air transport will grow there in the coming years. Starting from a regional average of 0.5 trips per capita, we foresee that on average, Latin America and the Caribbean will reach ~1 trip per capita per year by 2033. In addition, in countries such as Chile, Brazil and Colombia, the propensity to travel is expected to reach the levels currently observed in many mature economies by 2033, between ~1.5 and 2.





* Passengers originating from respective country

MORE PEOPLE FLYING FROM LATIN AMERICA

Source: Sabre (annualized September 2013 data), IHS Global Insight, Airbus





80,000

2013 GDP per capita (\$US)

100.000

2003-2013

CAPACITY INCREASE



AVERAGE FREQUENCY/ROUTE



INCREASE IN ROUTES



INTRA-REGIONAL TRAFFIC WIIL LEAD BY 2033 Source: OAG. Airbus GMF

2013 2033



SHARE ON SHARE ON 2013 RPK 2033 RPK Domestic & Intra 35%)0/ North America 31% R4%Europe 28% 24%Asia-Pacific 7% 5% CIS % Middle East 1% % Africa 1% % 0 8 00 00t 000 000 800

Intra-regional and domestic market

TRAFFIC WITHIN THE REGION is expected to lead over the next 20 years, representing 35% of total RPK traffic in 2033, above the 30% in 2013. Looking at the way airlines will accommodate this traffic growth, we expect that airlines will require larger single-aisle types for existing and new routes. This is consistent with the evolution over the last 10 years: over the period 2003-2013, airlines have accommodated air traffic growth within the region through larger aircraft (with an annual capacity increase of 2.4%), greater than the increase in the average frequency per route (with an annual expansion of 1.6%) and through an increase in the number of non-stop city pairs (+1.0% since 2003).

ANOTHER TREND throughout Latin America and the Caribbean has been the strong growth in domestic markets, even beyond the two largest markets, Brazil and Mexico. For example, over the last ten years the double digit annual growth rate in Chile was matched in Colombia and Peru.

THIS ENCOURAGING **DEVELOPMENT** is expected to

continue to hold into the future, as domestic markets become more resilient and structural factors will continue to support this trend. For example, the need for transport is accentuated by Latin America and Caribbean's geography, with the longest continental mountain range in the world, "los Andes". Like other developing markets, another structural factor is the expanding middle

Potential for LCCs to increase intra-regional integration within regions

2013 LCC MARKET SHARE ON INTRA-REGIONAL TRAFFIC PER GLOBAL REGION (SEATS OFFERED) Source: OAG



GMF 2014 airline segmentation



class in the region, which offers significant growth opportunities for both legacy airlines and LCCs. Looking at the latter in particular, their growth has been highly concentrated on the two largest domestic markets to date. Indeed, five out of the six existing Latin America and Caribbean LCCs are based in Brazil and Mexico, representing ~50% of their domestic markets, in 2013. The sixth LCC is domiciled in Colombia.

Domestic: traffic within the count Intraregional: traffic etween the countries **TO MEET THE REGION'S DEMAND** for air travel, the region's fleet of passenger aircraft is significantly younger relative to the world average, with the exception of the Caribbean. This is true for both legacy and LCCs, showing the airlines' clear preference for younger and more fuel efficient aircraft in this region, something that is expected to continue as this dynamic region goes from strength to strength.

Latin America

— World average

THE AVERAGE AGE OF THE CURRENT FLEET IN LATIN AMERICA IS BELOW THE WORLD AVERAGE Source: ASCEND, Airbus





Fleet in service evolution



7 Inter-regional 4.5%



New deliveries by segment



Number of new aircraft



CIS -The CIS, even more reasons to fly

The Commonwealth of Independent States (CIS) is one of the largest regions in the world, departing from St Petersburg in Russia, it would take almost 9 hours flying to reach its most eastern city. Undeniably aviation is one of the key enablers to connect people across this vast and diverse collection of countries. Over the last decade, traffic to/from/within CIS has grown on average 11% a year in terms of Available Seats Kilometers (ASKs), twice as fast as the world average of 5.1%. In addition, airlines from the region are close to transporting 90 million passengers once again.

Economic outlook

THE GROWTH OF THE ECONOMY OF THE CIS will

continue to be dominated by trends in Russian GDP, which in 2012 accounted for 76.3% of aggregate GDP of the region. The Russian economy, significantly on its energy sector, and developments in world-market energy prices to drive its growth. Thus, accelerated investment is the key to diversifying the Russian economy and sustaining robust growth. In turn, generating and attracting that investment will require further structural and institutional reform to improve the business environment.

FOR THE REGION AS A WHOLE, real GDP growth will average 3.2% per year, in line with World average growth, over the next 20 years.

$\frac{\text{CIS}}{\text{GDP}}_{\text{GROWTH}} \longrightarrow \frac{\text{WORLD}}{\text{GDP}}_{\text{GROWTH}}$

CIS air transport industry indicators are in the green





CIS AIRLINES' AIRCRAFT UTILISATION Source: ASCEND, Airbus







The regions progress best described as positive

TRAFFIC GROWTH, load factors, aircraft productivity, revenue and profitability are all moving in a direction the airlines in the region will be pleased to see. Even though economic growth is not outperforming world growth, (especially with Russia included, only 1.4% GDP growth in 2013), other factors, such as progressive liberalisation of the industry, the easing of the visa procedures and an increasing appetite of Russian tourists for sunny holiday destinations are feeding the demand. In 2013, traffic growth reached 7.0%, dramatically outpacing economic activity, aviation's traditional driver for growth.

As mentioned, tourism has been a major driver of this impressive growth: not just from the CIS, but in both directions, tourism is booming. An easing of visa procedures has no doubt helped. The number of arrivals in CIS countries has increased by 50% over the last 10 years; in 2013, CIS countries welcomed over 55 million visitors. However the biggest impact has come from departures which doubled between 2003 and today. More than 80 million outbound tourists from the CIS travelled abroad in 2012.

CIS AIRLINES MARKET SHARE

CIS airlines market share





THIS SURGE IN DEMAND, and improved airline productivity have occurred simultaneously. The share of older. less efficient eastern built aircraft in the fleet, above 100 seats, has reduced in 10 years from 86% in 2003, to only 12% today. The resulting productivity gains have helped the region's airlines to compete more effectively with foreign competitors in an increasingly liberalised market, improving their share of ASKs to well over 70%. This strategy has also paid off in terms of utilisation which has increased by 30% over the last 10 years, with load factors also gaining 5 percentage points in 5 years, compared to 2.5 points globally.

In 2013, Russia authorised the establishment of Low Cost Carriers by relaxing some legislation – notably regarding the obligation to refund ticket fares, checked luggage and in-flight service. This change will likely lead to an even bigger stimulation of the traffic in the region. Already two airlines are set to begin or have already begun operations at time of writing. Foreign low cost carriers have also started operations in the country. In September 2013, their market share in the CIS reached 5% from 0% a few years ago.

CIS AIRLINES TRANSPORTED

N 2013



SHARE OF SEATS OFFERED ON TRAFFIC WITHIN CIS COUNTRIES

Links with remote CIS cities are strong thanks to air traffic

CIS is the largest region in the world

THE FURTHEST EASTERN CITIES in

CIS show the highest propensity to travel per inhabitant close to that of the busiest and richest city of the region: Moscow. This is driven by the economic and social links that need to be maintained with the regional hubs situated at the farthest reaches of the region such as the eastern region of Russia, Primorsky, very rich in raw materials. A HUGE SURFACE AREA, combined with wide-spread and diverse natural resources, has resulted in pockets of population in medium sized cities in some cases far from the large economic and heavily populated hubs of Moscow, Kiev or St Petersburg. To reach Vladivostok, the biggest eastern city in Russia from St Petersburg, no less than seven flying hours are required. These cities, located at the geographic extremes of the continent are strategic, with links to capital's or other economic hubs strong. This is reflected through their traffic, which is equivalent to Moscow's in terms of ASKs per inhabitant. To a lesser extent, cities located in the geographic centre of the region, such as Almaty, also enjoy an above than average level of air traffic.

AIR TRAFFIC IN CIS BY CITY INHABITANTS IN 2013 Source: OAG, World Bank

ASKs / CityPopulation



Bubble proportiona to city population

Thanks to successful changes the CIS air transport industry engaged and continue to implement, air traffic has boomed during the last 10 years at the impressive rate of 11% a year in terms of ASKs, and Airbus expect this trend to continue over the next 20 years with a 5.8% yearly growth rate.

Therefore to accommodate this demand, domestic traffic today represents 53% in terms of seats offered in the CIS and, although not growing at the same pace as international traffic, it has still posted an 8.6% yearly growth rate over the last 10 years. This trend can only be helped by the development of LCCs in the region.







Fleet in service evolution



Economy**

Traffic**

Real
GDPReal Trade
3.7%3.2%



5.2%

141

RPK traffic growth from/to CIS by region



Asia-Pacific 6.9%

Africa 6.7%

Middle East 7.6%

Latin America 5.2%

North America 4.3%

Europe 5.8%

New deliveries by segment



Fleet*

Intra-regional & Total traffic 5.2% 5.8%

Fleet in service In 2014 880 In 2033 2,044

20 year new deliveries 1,218
Africa's people to passengers





Africa																						15%
Asia			I											Π	Π	Π	Π	Π	Π	Π	Π	
Europe																						10%
Latin America																						10%
North America																						
Oceania																						5%
	0-4 -	- 6-2	10-14 -	15-19 -	20-24 -	25-29 -	30-34 -	35-39 -	40-44 -	45-49 -	50-54 -	55-59 -	60-64 -	65-69 -	70-74 -	75-79 -	80-84 -	85-89 -	90-94 -	95-99 -	100+ -	

People

100+ 95-99 90-94 85-89 80-84 75-79 70-74 65-69 60-64 55-59 50-54 45-49 40-44 35-39 30-34 25-29 20-24 15-19 10-14 5-9

AS WELL AS HAVING great natural wealth, one of Africa's greatest assets is bringing Africa an important source of its people. Estimated at 1.1 billion people workers and consumers. The continent in 2013, it is expected to increase by more than 50% to reach a total of 1.7 billion inhabitants in 2033 – half of whom The youth of the continent represents will living in urban areas - surpassing the both a challenge and an opportunity: expected population in China or India. Half of the African population is under 20 absorb 10 million new entrants to the years old, making Africa the youngest continent in the world. When looking at the current and future composition of the growing middle class are also potential age pyramid, this predominance of youth new air passengers.

will continue over the next 20 years, is expected to have the world largest workforce by the end of our forecast. a challenge for African economies to labor force every year and an opportunity as these new consumers coming from a

100

50

0-4

POPULATION DISTRIBUTION BY FIVE-YEAR AGE GROUP AND CONTINENT IN 2013 Source: Airbus, UN

	AGE PYRAMID IN AFRICA Source: Airbus, IHS Global	- 2013, 2023, 2033 Insight
	Population (million)	
•	Female pop. in 2013	Male pop. in 2013
•	Female pop. in 2023	Male pop. in 2023
	Female pop. in 2033	Male pop. in 2033
		_



SHARE OF INTRA-REGIONAL TRADE OF EACH REGION IN 2012 Source: Airbus, WTO



VALUE ADDED (% OF GDP) IN SUB-SAHARAN AFRICA Source: OAG, World Bank

Services

Industry

Agriculture

Africa's growing attractiveness

A YOUNG POPULATION with an increasing level of education is without doubt one of Africa's main assets, and one of the key components of the continent's attractiveness. But it is not the only one: several studies (The Africa Competitiveness Report 2013 - WEF, Investment attractiveness - EY survey) highlight the economic potential of Africa. Strengthening entrepreneurship, travel and tourism, regional integration... are often listed as just a few of the drivers of sustainable growth in Africa. The travel and tourism industry already contributes to 10% of Africa's GDP, and the number of foreign tourist arrivals has increased by 50% in just 15 years, reaching a total of 63 million people in 2013. Outbound tourism is also booming with almost 30 million international tourists originating from Africa in 2011, compared to 20 million in 2005 (UNWTO). Greater regional integration, lead by the 11 African countries belonging to the emerging countries category, has huge potential in terms of economies of scale, increased competition, economic diversification and finally improvement of the continent's competitiveness. Economic diversification has already started, with a progressive increase of the share of Services in African GDP; these developments will likely lead to more and more business travelers to, from and within Africa.



2013 SHARE OF INTRA-REGIONAL PASSENGER TRAFFIC OF EACH REGION Source: Airbus, Sabre GDD, OAG



2013 SHARE OF LCCs IN DOMESTIC AND INTRA-REGIONAL ASK TRAFFIC, BY REGION Source: Airbus, Sabre GDD, OAG

Economic Outlook

NEAR-TERM GROWTH PROSPECTS for Sub-Saharan Africa remain favourable. Developments in global commodity markets will continue to be a major driver of macro-economic activity in Sub-Saharan Africa in the medium and long terms. Emerging drivers include secondary and tertiary sector activities e.g. telecommunications, financial services, tourism, agroprocessing and light manufacturing, and call centers/customer service outsourcing.

The fast-growing middle classes in the region will help boost consumer spending with positive impact on economic growth. Long-term economic progress will require medium term political stability. Continued debt forgiveness in the region will bode well for the growth environment in the medium-to-long term. Over the 2013-2033 period, Africa is forecast to reach similar economic growth as Asia-Pacific, with average real GDP growth of 4.6% per year or trade growth of 5.5% per year.



Air traffic potential

THANKS TO ITS GROWING ATTRACTIVENESS, Africa was

relatively unscathed by the recent global economic crisis, with a positive impact on the evolution of air traffic in the region, increasing year-on-year for the last 10 years, (with the sole exception being 2011, the year of the Arab Spring). In terms of traffic, intra-regional development also represents a huge potential for air transport in Africa, as the share of intra-regional passenger traffic is far below observed levels in Asia-Pacific, the Americas or Europe.

THIS INTRA-REGIONAL TRAFFIC

could also be met by low-cost carriers, which have a high growth potential when compared to the LCC penetration levels of other regions. On the long-haul markets, Asia-Pacific has surpassed North America as the fourth largest origin and destination market to Africa. But the most impressive shift has come from traffic with the Middle East which represented more than 17 million passengers in 2013.

Going forward, the continued economic ties between Africa and Asia-Pacific and Africa and the Middle East means that these traffic flows will continue to grow in importance providing a clear opportunity for future long-haul growth.



1.4.

Total RPK traffic growth



Fleet in service evolution











New deliveries by segment



Fleet*

Intra-regional Total traffic 5.5%

In 2014 616 In 2033 1,513

Fleet in service 20 year new deliveries 973



Demand for freighters

Air freight A key enabler for economic growth

Today, 1,600 dedicated freighters are flying cargo around the World They are the backbone of world trade, with air cargo as a whole transporting 33% of total world trade by value in 2013. This clearly underscores the important role that air freight plays in the world economy – transporting high-value products that demand fast, secure, and reliable service.

AIR CARGO TRANSPORTED



OF TOTAL WORLD TRADE BY VALUE IN 2013 DEMAND FUNDAMENTALS REMAIN STRONG in the long term, despite some difficulties in recent years. Global trade is forecast to develop at 4.3% per year for the next 20 years, following the rebound in world GDP, which is forecast to grow on average at 3.3% per year. Freight market dynamics have changed however. Historically, cargo traffic grew twice as fast as GDP, but the freight/ GDP ratio has reduced between 2008 and 2013. This is partly due to the evolving competitive landscape coming from the previous economic crisis, as well as changing business practices in terms of inventory management and manufacturing. Cargo airlines are therefore adapting their business models using various approaches to tackle these changes. As examples, some are acquiring new, more efficient aircraft, such as the A330-200F, capable of delivering more than 10% fuel burn improvement over its competitors; other airlines are focusing only on their belly capacity, whilst some are replicating the passenger hub and spoke model, which continues to demonstrate its ability to generate efficiency and cost reductions.

Challenged but set to grow

Airbus continues to see air freight as a growth market, with a 4.5% yearly growth rate over the next 20 years, several reasons explain why the demand for dedicated freighters has been revised:

OVER THE NEXT 20 YEARS, passenger traffic will grow at 4.7%, this higher than expected freight traffic growth of 4.5% per annum. With this extra belly capacity and the airlines desire to use it, the share of freight traffic carried by dedicated freighters will slightly decrease compared to previous estimates.

CARGO AIRLINES and especially express airlines are increasing the capacity of their mid-size aircraft. Therefore less aircraft are required to satisfy the demand. For example, in North America, within the mid-size segment (30 to 80 tonnes), the share of the more than 45 tonnes payload aircraft is at 18%. Airbus estimates that this will reach 30% by 2033.

AIRBUS also forecasts that the mid-size segment will concentrate the highest requirement in terms of aircraft demand, with 49% of the total deliveries or conversions satisfying growing express services and regional traffic. Medium haul routes are experiencing rapid growth, with mid-size aircraft offering unmatched flexibility allowing carriers to maximize revenue while at the same time reducing the risk of low load-factors inherent in the use of larger freight aircraft. Today, 61% of wide body operations under 3000 nm are performed by these mid-size freight aircraft.

Source: OAG, DoT, Eurocontrol





Results

Despite the challenges facing the air cargo market, the long-term prospects remain positive, with freight traffic set to double over the next 20 years, with demand for nearly 800 new build freighters over that time.

> **AIRLINES** will continue to require a range of aircraft types either as new or converted freighters. With the evolving market and the growing importance of regional operations, Airbus forecasts that the highest demand in terms of volumes, both new and converted, will come from the mid-size freighter category with 1,145 aircraft (414 new and 731 converted). Airbus also sees a demand for 612 small freighters <30 tonnes. This demand will be met through conversions as the feedstock of suitable conversion candidates builds.







THE FUTURE FREIGHTER FLEET DISTRIBUTION WILL REFLECT THE GROWING INFLUENCE OF EMERGING MARKETS Source: Airbus GMF 2014, ASCEND

World fleet evolution



AT A REGIONAL LEVEL, while the US and Europe largely remain a replacement market, Asia-Pacific and the Middle East will be the main growth regions with their fleets almost tripling in size by 2033.

North America fleet is mainly a replacement market

The Asia-Pacific fleet is set to triple



Summary & methodology

Summary of results



Passenger Traffic Flow

Passenger Traffic Flow	CAGR 2013-2033
Asia advanced - Asia emerging	5.6%
Asia advanced - Australia/NZ	3.9%
Asia advanced - Canada	3.5%
Asia advanced - Caribbean	3.4%
Asia advanced - Central America	3.0%
Asia advanced - Central Europe	3.9%
Asia advanced - CIS	6.1%
Asia advanced - Indian SC	7.4%
Asia advanced - Japan	2.5%
Asia advanced - Middle East	5.3%
Asia advanced - North Africa	5.5%
Asia advanced - Pacific	3.9%
Asia advanced - PBC	6.1%
Asia advanced - Russia	6.8%
Asia advanced - South Africa	6.5%
Asia advanced - South America	6.6%
Asia advanced Sub Sabara Africa	5.0%
Asia advanced - Sub Sanara Amca	0.970
Asia advanceu - USA	0.0%
Asia advanced - Western Europe	3.6%
Asia emerging - Australia/NZ	5.9%
Asia emerging - Canada	4.0%
Asia emerging - Caribbean	3.8%
Asia emerging - Central America	3.7%
Asia emerging - Central Europe	5.4%
Asia emerging - CIS	6.3%
Asia emerging - Indian SC	8.4%
Asia emerging - Japan	3.5%
Asia emerging - Middle East	6.8%
Asia emerging - North Africa	6.7%
Asia emerging - Pacific	6.0%
Asia emerging - PRC	7.5%
Asia emerging - Russia	6.5%
Asia emerging - South Africa	6.7%
Asia emerging - South America	8.2%
Asia emerging - Sub Sahara Africa	6.6%
Asia emerging - USA	4.0%
Asia emerging - Western Europe	4.0%
Australia/NZ - Canada	3.6%
Australia/NZ - Caribbean	3.7%
Australia/NZ - Central America	3.4%
Australia/NZ - Central Europe	4.6%
Australia/NZ - CIS	5.8%
Australia/NZ - Indian SC	5.0%
Australia/NZ - Japan	3.5%
Australia/NZ - Middle East	5.2%
Australia/NZ - North Africa	5.0%
Australia/NZ - Pacific	3.9%
Australia/NZ - PRC	5.9%
Australia/NZ - Russia	5.3%
Australia/NZ - South Africa	6.5%
Australia/NZ - South America	6.6%
Australia/NZ - Sub Sahara Africa	6.2%
Australia/NZ - USA	3.3%
Australia/NZ - Western Europe	4.6%
Canada - Caribbean	5.5%
	5.2%
Canada - Central America	3,4%
	1.00/
Vanaua - VIJ	4.0%

Passenger Traffic Flow	CAGR 2013-2033
Canada - Indian SC	5.8%
Canada - Japan	2.5%
Canada - Middle East	5.5%
Canada - North Africa	4.7%
Canada - Pacific	2.5%
Canada - PRC	6.3%
Canada - Russia	4.0%
Canada - South Africa	4.1%
Canada - South America	5.6%
Canada - Sub Sahara Africa	3.7%
Canada - USA	2.6%
Canada - Western Europe	2.9%
Caribbean - Central America	4.5%
Caribbean - Central Europe	3.2%
Caribbean - CIS	3.9%
Caribbean - Indian SC	4.9%
Caribbean - Japan	2.3%
Caribbean - Middle Fast	4.7%
Caribbean - North Africa	3.8%
Caribbean - Pacific	2.8%
Caribbean - PRC	5.7%
Caribbean Russia	5.1%
Caribbean South Africa	0.470
Caribbean South America	5.0%
Caribbean - South America	0.2%
Caribbean - Sub Sanara Airica	4.9%
Caribbean - USA	2.5%
Caribbean - Western Europe	3.5%
Central America - Central Europe	3.2%
Central America - CIS	3.6%
Central America - Indian SC	5.2%
Central America - Japan	3.6%
Central America - Middle East	5.1%
Central America - North Africa	3.8%
Central America - Pacific	1.9%
Central America - PRC	6.1%
Central America - Russia	5.2%
Central America - South Africa	4.4%
Central America - South America	6.8%
Central America - Sub Sahara Africa	4.5%
Central America - USA	4.9%
Central America - Western Europe	3.7%
Central Europe - CIS	6.1%
Central Europe - Indian SC	6.4%
Central Europe - Japan	4.4%
Central Europe - Middle East	7.6%
Central Europe - North Africa	5.5%
Central Europe - Pacific	3.5%
Central Europe - PRC	6.4%
Central Europe - Russia	6.1%
Central Europe - South Africa	5.3%
Central Europe - South America	4.4%
Central Europe - Sub Sahara Africa	5.6%
Central Europe - USA	3.5%
Central Europe - Western Europe	5.4%
CIS - Indian SC	6.5%
CIS - Japan	5.0%
CIS - Middle East	7.0%
CIS - North Africa	5.8%

CAGR 2013-2033
4.1%
7.9%
6.1%
6.7%
5.8%
6.8%
4.4%
5.8%
1.3%
6.9%
3.0%
6.0%
2.5%
1.7%
2.0%
4.2%
6.1%
9.5%
4.9%
1.3%
4.7%
3.2%
5.3%
2.4%
7.1%
4.7%
5.2%
5.6%
6.6%
6.9%
1.9%
1.9%
5.9%
6.8%
6.0%
4.4%
9.4%
9.5%
7.2%
6.7%
8.4%
6.9%
6.4%
4.8%
4.4%
7.5%
2.7%
1.6%
4.6%
4.4%
6.1%
5.0%
6.2%
5.2%
2.3%
5.0%
6.3%

Passenger Traffic Flow

CAGR 2013-2033

Intra Western Europe	2.9%
Japan - Middle East	6.7%
Japan - North Africa	6.9%
Japan - Pacific	3.2%
Japan - PRC	3.9%
Japan - Russia	3.9%
Japan - South Africa	7.0%
Japan - South America	6.2%
Japan - Sub Sahara Africa	6.8%
Japan - USA	2.6%
Japan - Western Europe	3.2%
Mexico - USA	3.7%
Middle East - North Africa	5.8%
Middle East - Pacific	4.7%
Middle East - PBC	7.6%
Middle East - Russia	8.3%
Middle East - South Africa	7.0%
Middle East - South America	7.8%
Middle East - Sub Sabara Africa	8.0%
Middle East - USA	6.6%
Middle East - Western Europa	4.6%
North Africa Decific	4.0%
North Africa - Pacific	4.1%
North Africa - PRC	0.9% 6.7%
North Africa - Russia	0.7%
North Africa - South Africa	6.7%
North Africa - South America	6.0%
North Africa - Sub Sahara Africa	6.5%
North Africa - USA	4.4%
North Africa - Western Europe	4.5%
Pacific - PRC	6.0%
Pacific - Russia	3.5%
Pacific - South Africa	6.0%
Pacific - South America	6.2%
Pacific - Sub Sahara Africa	5.5%
Pacific - USA	2.0%
Pacific - Western Europe	3.2%
PRC - Russia	7.8%
PRC - South Africa	6.7%
PRC - South America	6.9%
PRC - Sub Sahara Africa	8.6%
PRC - USA	6.6%
PRC - Western Europe	5.6%
Russia - South Africa	6.9%
Russia - South America	4.9%
Russia - Sub Sahara Africa	6.9%
Russia - USA	4.3%
Russia - Western Europe	5.8%
South Africa - South America	5.6%
South Africa - Sub Sahara Africa	6.8%
South Africa - USA	4.7%
South Africa - Western Europe	4.7%
South America - Sub Sahara Africa	5.7%
South America - USA	5.3%
South America - Western Europe	4.3%
Sub Sahara Africa - USA	4.4%
Sub Sahara Africa - Western Europe	4.3%

Freight Traffic Flow

CAGR 2013-2033

Freight Traffic Flow

Africa to Asia advanced	4.8%
Africa to Asia emerging	4.8%
Africa to Central America	5.6%
Africa to CIS	5.6%
Africa to Europe	3.9%
Africa to Indian SC	6.7%
Africa to Japan	4.8%
Africa to Middle East	5.6%
Africa to North America	3.9%
Africa to Pacific	3.6%
Africa to PRC	6.1%
Africa to South America	5.6%
Asia advanced to Africa	4.5%
Asia advanced to Asia emerging	5.1%
Asia advanced to Central America	4.1%
Asia advanced to CIS	4.5%
Asia advanced to Europe	3.3%
Asia advanced to Indian SC	4.9%
Asia advanced to Japan	2.4%
Asia advanced to Middle East	4.5%
Asia advanced to North America	2.9%
Asia advanced to Pacific	3.7%
Asia advanced to PRC	4.3%
Asia advanced to South America	3.9%
Asia emerging to Africa	4.5%
Asia emerging to Asia advanced	3.2%
Asia emerging to Central America	6.3%
Asia emerging to CIS	4.5%
Asia emerging to Europe	4.0%
Asia emerging to Indian SC	6.1%
Asia emerging to Japan	3.2%
Asia emerging to Middle East	4.5%
Asia emerging to North America	4.3%
Asia emerging to Pacific	5.4%
Asia emerging to PRC	6.0%
Asia emerging to South America	6.1%
Central America to Africa	5.3%
Central America to Asia advanced	4.3%
Central America to Asia emerging	6.5%
Central America to CIS	4.3%
Central America to Europe	4.0%
Central America to Indian SC	6.8%
Central America to Japan	4.3%

Freight Traffic Flow	CAGR 2013-2033
Central America to Middle East	5.0%
Central America to North America	1.5%
Central America to Pacific	4.4%
Central America to PRC	7.6%
Central America to South America	6.0%
CIS to Africa	4.5%
CIS to Asia advanced	4.1%
CIS to Asia emerging	4.1%
CIS to Central America	2.8%
CIS to Europe	3.0%
CIS to Indian SC	5.7%
CIS to Japan	4.1%
CIS to Middle East	2.1%
CIS to North America	3.5%
CIS to Pacific	5.1%
CIS to PRC	6.7%
CIS to South America	2.8%
Domestic Brazil	3.6%
Domestic India	7.3%
Domestic PRC	6.9%
Domestic USA	1.7%
Europe to Africa	4.2%
Europe to Asia advanced	4.5%
Europe to Asia emerging	5.8%
Europe to Central America	4.1%
Europe to CIS	4.6%
Europe to Indian SC	6.7%
Europe to Japan	1.8%
Europe to Middle East	3.8%
Europe to North America	2.9%
Europe to Pacific	3.5%
Europe to PRC	6.4%
Europe to South America	4.3%
Indian SC to Africa	5.9%
Indian SC to Asia advanced	4.9%
Indian SC to Asia emerging	7.0%
Indian SC to Central America	6.8%
Indian SC to CIS	7.0%
Indian SC to Europe	5.0%
Indian SC to Japan	4.9%
Indian SC to Middle East	7.0%
Indian SC to North America	3.6%
Indian SC to Pacific	5.6%

Freight Traffic Flow	CAGR 2013-2033	Freight Traffic Flow
Indian SC to PRC	6.9%	North America to Ind
Indian SC to South America	6.8%	North America to Ja
Intra Africa	4.2%	North America to M
Intra Asia advanced	2.4%	North America to Pa
Intra Asia emerging	5.2%	North America to PF
Intra Central America	6.0%	North America to So
Intra CIS	3.9%	Pacific to Africa
Intra Europe	3.5%	Pacific to Asia adva
Intra Indian SC	7.0%	Pacific to Asia emer
Intra Middle East	2.0%	Pacific to Central Ar
Intra North America	3.0%	Pacific to CIS
Intra Pacific	1.3%	Pacific to Europe
Intra South America	5.6%	Pacific to Indian SC
Japan to Africa	4.5%	Pacific to Japan
Japan to Asia advanced	2.4%	Pacific to Middle Ea
Japan to Asia emerging	5.1%	Pacific to North Ame
Japan to Central America	4.1%	Pacific to PRC
Japan to CIS	4.5%	Pacific to South Am
Japan to Europe	2.3%	PRC to Africa
Japan to Indian SC	4.9%	PRC to Asia advance
Japan to Middle East	4.5%	PRC to Asia emergi
Japan to North America	2.2%	PRC to Central Ame
Japan to Pacific	3.7%	PRC to CIS
Japan to PRC	5.1%	PRC to Europe
Japan to South America	3.9%	PRC to Indian SC
Middle East to Africa	4.5%	PRC to Japan
Middle East to Asia advanced	4.1%	PRC to Middle East
Middle East to Asia emerging	4.1%	PRC to North Ameri
Middle East to Central America	4.4%	PRC to Pacific
Middle East to CIS	5.2%	PRC to South Amer
Middle East to Europe	2.9%	South America to At
Middle East to Indian SC	5.7%	South America to A
Middle East to Japan	4.1%	South America to A
Middle East to North America	3.4%	South America to C
Middle East to Pacific	5.1%	South America to C
Middle East to PRC	6.7%	South America to E
Middle East to South America	4.4%	South America to In
North America to Africa	4.0%	South America to Ja
North America to Asia advanced	3.5%	South America to M
North America to Asia emerging	4.2%	South America to N
North America to Central America	2.2%	South America to Pa
North America to CIS	4.8%	South America to Pl
North America to Europe	3.2%	

Freight Traffic Flow	CAGR 2013-2033
North America to Indian SC	6.1%
North America to Japan	1.4%
North America to Middle East	4.3%
North America to Pacific	3.3%
North America to PRC	6.1%
North America to South America	4.1%
Pacific to Africa	5.4%
Pacific to Asia advanced	1.1%
Pacific to Asia emerging	3.4%
Pacific to Central America	5.0%
Pacific to CIS	4.8%
Pacific to Europe	1.1%
Pacific to Indian SC	4.7%
Pacific to Japan	1.1%
Pacific to Middle East	4.8%
Pacific to North America	2.0%
Pacific to PRC	4.3%
Pacific to South America	5.0%
PRC to Africa	6.5%
PRC to Asia advanced	4.7%
PRC to Asia emerging	5.1%
PRC to Central America	6.8%
PRC to CIS	6.5%
PRC to Europe	6.3%
PRC to Indian SC	6.7%
PRC to Japan	3.4%
PRC to Middle East	6.5%
PRC to North America	6.0%
PRC to Pacific	6.0%
PRC to South America	6.8%
South America to Africa	5.3%
South America to Asia advanced	4.3%
South America to Asia emerging	6.5%
South America to Central America	6.0%
South America to CIS	4.3%
South America to Europe	3.7%
South America to Indian SC	6.8%
South America to Japan	4.3%
South America to Middle East	5.0%
South America to North America	4.0%
South America to Pacific	4.4%
South America to PRC	6.4%

Summary Data

NEW PASSENGER AIRCRAFT DELIVERIES BY REGION

	Africa	Asia- Pacific	CIS	Europe	Latin America & Caribbean	Middle East	North America	TOTAL
Single-Aisle	734	8,066	1,036	4,895	1,784	826	4,730	22,071
Small Twin-Aisle	158	2,510	132	754	349	481	569	4,953
Intermediate Twin-Aisle	54	1,055	25	368	102	500	199	2,303
Very Large Aircraft	27	622	25	150	28	341	35	1,228
TOTAL	973	12,253	1,218	6,167	2,263	2,148	5,533	30,555

CONVERTED FREIGHT AIRCRAFT DELIVERIES BY REGION

	Africa	Asia- Pacific	CIS	Europe	Latin America & Caribbean	Middle East	North America	TOTAL
Small	39	311	7	81	82	6	86	612
Mid-size	23	116	22	123	37	24	386	731
Large	10	73	13	27	-	16	73	212
TOTAL	72	500	42	231	119	46	545	1,555

TOTAL FREIGHT AIRCRAFT DELIVERIES BY REGION

	Africa	Asia- Pacific	CIS	Europe	Latin America & Caribbean	Middle East	North America	TOTAL
Small	39	311	7	81	82	6	86	612
Mid-size	28	188	35	159	67	53	615	1,145
Large	17	220	23	77	1	81	182	601
TOTAL	84	719	65	317	150	140	883	2,358

NEW PASSENGER & FREIGHT AIRCRAFT DELIVERIES BY REGION

	Africa	Asia- Pacific	CIS	Europe	Latin America & Caribbean	Middle East	North America	TOTAL
Single-Aisle	734	8,066	1,036	4,895	1,784	826	4,730	22,071
Small Twin-Aisle	162	2,535	134	763	356	486	709	5,145
Intermediate Twin-Aisle	57	1,147	39	410	125	543	320	2,641
Very Large	32	724	32	185	29	387	112	1,501
TOTAL	985	12,472	1,241	6,253	2,294	2,242	5,871	31,358

NEW FREIGHT AIRCRAFT DELIVERIES BY REGION

	Africa	Asia- Pacific	CIS	Europe	Latin America & Caribbean	Middle East	North America	TOTAL
Small	-	-	-	-	-	-	-	-
Mid-size	5	72	13	36	30	29	229	414
Large	7	147	10	50	1	65	109	389
TOTAL	12	219	23	86	31	94	338	803



Passenger methodology

The making of the Airbus Global Market Forecast follows a process that has been continuously improved for more than 20 years. Each major change in the industry (such as the appearance of low cost business models or the strong development of hub and spoke operations) has been the occasion for Airbus to refine and improve its modelling in order to best identify and forecast current and future trends.

Forecasting traffic

THE OBJECTIVE OF THE TRAFFIC FORECAST is to assess the quantity of passengers travelling by air. Initially, all countries are grouped into 19 traffic regions, based on geographical proximity and level of socio-economic development. Each region pair defines a non-oriented traffic flow, assuming that outbound and inbound passenger traffic is balanced. Whenever a part of a traffic region develops very differently from the rest of the region, a new, specific flow is created, taking into consideration some more country-related specific characteristics. This process resulted in 208 flows for the GMF 2013. The main input data for the traffic forecast are historical traffic volumes as well as large sets of historical and forecast socio-economic data from external data providers. For each traffic flow several socio-economic variables are selected and fed into econometric equations to identify the one set or combination of variables that explains best the historical traffic evolution. Once the model and variables with the best fit are identified, economic forecast data is used to derive future traffic volume.

Forecasting the network

AIRLINE NETWORKS evolve over time and airlines keep on adding and removing routes from their network, changing the supply of travel from the passenger standpoint. The evolution of the network, with new opened and closed routes, shifts the demand from one routing to another. The impact sometimes even visible at a level as high as the traffic flow. Furthermore, new routes tend to fragment the market as they partially absorb traffic from the existing network and, therefore, impact the route-per-route traffic evolution. The network forecast aims to quantify these impacts. Among the very large set of potential new routes, a subset of reasonable candidates is devised for each airline, based on the carrier's current network and the potential size of new markets. This set of routes is fed into a 'Quality of Service Index'- based model, which determines for each new route the traffic potential and the point in time when it could be opened.



GMF PROCESS STEPS

THE GMF PROCESS consists of three main steps: the traffic forecast giving the overall shape of traffic evolution, the network forecast identifying the future evolution of the airlines networks, and the demand forecast estimating the number of aircraft required to accommodate the traffic growth.

Forecasting aircraft demand

the number of aircraft that will be required over the next 20 years to satisfy production availability, etc.) are made. the world's airline needs. The new demand identified by the Airbus GMF (on results can be used to consider such top of current fleet and known orders) is expressed in neutral seat categories. The use of such virtual aircraft allows a market at a route by route and airline view of future demand unconstrained by the product supply. This theoretical demand represents a solution that would discussions with airlines to our supplier best match the airlines needs in terms

THE DEMAND FORECAST estimates of aircraft size, if no considerations of supply (specific product performance, Based on this undistorted view, the things as new product introduction, size requirements and timing. Examining the by airline level then also supports a large number of other activities from partners for example.





(existing product)

Global Market Forecast | 175



The airline calibration process

AS A FIRST STEP and for each of these airlines, a dedicated calibration process is carried out. It aims to take the best of several sources of information concerning the airlines in order to understand how an airline is operating each of its aircraft. Precise fleet data allows us to calibrate the detailed operations of a given airline (either scheduled or unscheduled) and, therefore, deduce which type of aircraft has been flying on which sector for a particular month of the year. This detailed adjustment allows us to determine the way an airline utilises its aircraft on their network.

The Airbus GMF 2014 covers 799 passenger airlines and their subsidiaries world-wide.

799 AIRLINES AND THEIR SUBSIDIARIES ARE ANALYZED - AIRLINES DISTRIBUTION PER TYPE



799 AIRLINES AND THEIR SUBSIDIARIES ARE ANALYSED - AIRLINES DISTRIBUTION PER REGION



Airline operation forecasts

ONCE THE CALIBRATION OF AN

AIRLINE has been carried out, real aircraft are converted into virtual aircraft in a way that keeps the overall number of seats in the fleet constant. The whole forecast is then based on neutral seat categories e.g. 100, 125, 150, 210 for Single-Aisle types. Traffic growth rates are applied to each airline's routes, also taking into consideration future developments, as anticipated in the network forecast process. There are few ways an airline can accommodate traffic growth: load factor improvement, improvement of its aircraft utilisation, frequency or capacity increase. The split between frequency increase and/or capacity increase is one of the most important factors influencing the shape of the future demand. A dedicated model (the Airbus Capacity/Frequency

Model) has been developed to address this issue. The general principle is that airlines grow on a route by adding frequencies up until a minimum level of service is reached. Beyond this minimum level airlines grow with a mix of both frequency and capacity increase, until the maximum level of service is reached, above which time differentiation through additional frequencies does not bring any further value to the passenger. Above this maximum service level the most efficient way to accommodate further growth is to increase the average aircraft size to achieve lower costs per aircraft seat. Each market in the world has its own characteristics. Passengers in North America for instance, are used to a high level of service (i.e. very frequent flights between two airports) which is not true for other regions in the world. A market

in this case can be defined as a set of routes on a given traffic flow for a certain type of airlines business model. For each of these markets one or more airlines may compete and each route might have a different length. Taking all this into account allows us to specify how frequencies and capacity will develop over time, for a given traffic growth.

THE CALIBRATION OF THIS MODEL

has to be reviewed each year based on the market definitions and in light of any market evolution (e.g. infrastructure development plans). As a result, the airline operation forecast outputs year by year, the demand in terms of aircraft numbers (yearly utilisation, flight frequencies and capacity) expressed in neutral categories for the complete network of each airline.

Airline fleet build-up

ONCE THE OVERALL NEUTRAL

demand is forecast, each airline fleet build-up can be carried out. This demand is reallocated to the existing fleet and the known orders. Generic assumptions are made for each region regarding the retirement age of the fleets adapted for each airline. Elements such as replacement plans (new aircraft replacing older types), end of contract lease, airline business models or economic and financial environment have to be taken into account in determining replacements.

The remaining demand, which cannot be satisfied by the current fleet or the known orders, corresponds to the open market. As well as identifying demand, the GMF also allows us to extract all forecast operational detail e.g. traffic flow, route, frequencies, utilisation, load factors, etc.

A DEDICATED MODEL HANDLES THE FREQUENCY AND/OR CAPACITY SPLIT

Traffic (RPK index 100 = year)



Typical evolution on a route enjoying growth:

Remarketed aircraft

THE FINAL STEP OF THE GMF PROCESS is estimating remarketed deliveries, which account for a significant share of the total demand. Survival curves applied to the GMF start fleet and backlog per aircraft type, allow identification of the gap between the statistical world fleet attrition and the shape of those that stay in service from the GMF fleet build-ups. The delta corresponds to the maximum potential for remarketed aircraft. In parallel to this, candidate aircraft are identified amongst the existing fleet and reallocated as deliveries to another airline if the corresponding demand exists. This study is carried out on a world-wide basis and then refined by region and by airline. At the end of the process, these remarketed deliveries are subtracted from total deliveries, leaving only the new deliveries which are the figures given in this publication.



Freight forecast methodology

The freighter GMF has been part of the Airbus forecasting process for more than ten years and is constantly enhanced to account for all the key aspects of the cargo market, as well as their evolution. It is closely linked to the GMF passenger forecast, drawing on results from this forecast to derive future belly hold capacity.

THE FREIGHTER FORECAST

process can be divided into three main steps: the traffic forecast resulting from econometric projections for each directional flow, the integration of the belly traffic co-ordinated with the passenger aircraft forecast and the demand forecast evaluating how many freighters will be needed in the next 20 years (and whether they will be new build or converted freighters).

THE FREIGHTER FORECAST PROCESS



TRAFFIC FORECAST METHODOLOGY



Traffic forecast

ONCE THE CALIBRATION OF

AN AIRLINE has been carried out, the first step in the traffic forecast is assessing the relationship between macro-economic trends and the cargo traffic. GDP, Real Income, Investments, Exports/Imports, industrial production and many other parameters are used in our econometric models to assess the best comparison to growth in traffic. Alongside these macro-economic factors, the analysis of historical data allows us to identify and understand the multiple trends involved in the evolution of the market, such as modal shifts for certain commodities.



Belly capacity and base year calibration

ONCE THE TRAFFIC FLOW FORECASTS have been established. It is important to split the future demand between belly capacity and the dedicated freighters. Thanks to the passenger aircraft GMF, it is possible to estimate the belly capacity each airline will offer on its network. In addition, Airbus at the best estimate of airlines' network, aircraft utilisation and monitors how airlines use their belly holds to carry cargo to establish trends in belly capacity load factors. As a result, the combination of the airlines' passenger network

development and the cargo hold load factor evolution gives an

estimation of the share of freight transported on the passenger aircraft belly on each flow.

In parallel, a calibration is conducted on today's freighter fleet. An assessment of multiple data sources is performed to arrive load factors for the base year. Projections based on historical data collected for more than a decade with current market perspectives gathered from stakeholders across the industry to ensure the latest data and trends are incorporated.

AIR FREIGHT INDUSTRY IN 2013 World figures 2013



Freighter forecast

THE FREIGHTER FORECAST for the next 20 years estimates the number of aircraft required to accommodate the cargo traffic growth. The demand is divised into four neutral size categories strarting at ten tonnes, including new build and converted aircraft. Thanks to these virtual categories, it is possible to assess witch aircraft size, on which flow, best suits the market.

Our freighter forecast is the result of the analysis of the behaviour of nearly 200 different airlines. When forecasting an airline's choice of new build or converted freighters, a detailed study of historical trends is used to identify the trend in activity per aircraft size category. On top of using historical trends, an analysis of current and future fuel pricesis performed to simulate their effect on this decision making process.

Domestic express analysis

TO ADDRESS THE SPECIFIC QUESTION OF THE DOMESTIC EXPRESS MARKET, a dedicated

EXPRESS MARKE I, a dedicated forecast model has been developed and deals with four countries: the US, which today is the largest player in express traffic, as well as Brazil, India and China, who are all expected to become large consumers of express services over the next 20 years. This model analyses a distinctive set of parameters to understand the customers' need for express services resulting from well-known or new behaviours, such as online purchasing, next-day delivery for business purposes, service reliability and traceability.

The model for domestic express consists in two parts. The first estimates the US express traffic and fleets based on a 40 years historical data to identify the main drivers of growth. The second, used for the emerging markets, takes US express development as a benchmark, while taking into account the unique characteristics of each country including infrastructure development, labour costs, internet penetration, for example.

FREIGHTER DELIVERIES WILL EXCEED 2,300 AIRCRAFT IN THE NEXT 20 YEARS

Freighter deliveries over the next 20 years







CAPACITIES

						\nearrow	/			
-										
787-8 767-400ER A340-200 A330-200	767-300 A340-300 A330-800neo	A300-600 A300-600 7475P	A300-600R 777-200LR DC-10	747-400C	787-9 MD-11ER A340-600	A330-900neo A350-900 L1011	777-300ER 787-10 777-200 A350-1000	747-8 747-400ER 747-400	747-100 747-100 747-200 747-200	A380-800



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- The outcome of political and legal processes, including the availability of government financing for certain programmes and the size of defence and space procurement budgets;
- Research and development costs in connection with new products;
- Legal, financial and governmental risks related to international transactions;
- Legal and investigatory proceedings and other economic, political and technological risks and uncertainties.

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Reference D14029463. September, 2014. Printed in France by Art & Caractère.

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