

**AVIATION
BENEFITS
BEYOND
BORDERS**

Global summary

Powering global economic growth,
employment, trade links, tourism
and support for sustainable
development through air transport

April 2014

1,397

Commercial airlines

\$6.4

Trillion dollars worth of cargo handled by air in 2012

3,864

Airports with scheduled commercial flights

52%

of international tourists travel by air

173

Air navigation service providers

35%

Air transport carries around 35% of world trade by value and only 0.5% by volume

25,332

Number of commercial aircraft in service

High value, time sensitive

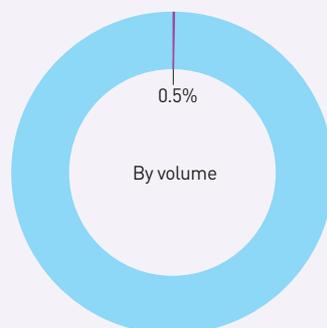
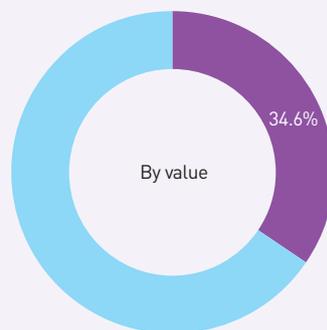
Proportion of global trade transported by air

49.2

Million tonnes of freight handled by air in 2012 (in 2013, 49.8 million tonnes were handled)

688,739,000 tonnes of carbon dioxide (CO₂)

emitted by airlines (in 2013, it was 705 million tonnes). This is 2% of the global human emissions of 36 billion tonnes. Around 80% of aviation CO₂ is emitted from flights over 1,500 kilometres in length, for which there is no practical alternative form of transport



Climate targets

Improve 1.5%

Aviation will improve its fleet fuel efficiency by an average of 1.5% per annum between 2009 and 2020.

Stabilise

From 2020, net carbon emissions from aviation will be capped through carbon-neutral growth.

Reduce 50%

By 2050, net aviation carbon emissions will be half of what they were in 2005.

Environmental progress

The air transport industry has made significant progress in reducing its environmental impact:

CO₂ emissions per seat kilometre

▼ **70%+ since first jet aircraft.**

Perceived noise

▼ **75%+ since first jets.**

» Over five billion tonnes of CO₂ avoided since 1990 through airlines spending \$3 trillion on 25,000 new aircraft.

» The industry has invested in new technology, better operations and infrastructure improvements.

» Civil aerospace spends \$20 billion per year on R&D, 70% for fuel reduction technology.

» Sustainable aviation fuels could reduce CO₂ footprint by 80%, over 1,500 commercial flights have taken place so far.

» Air traffic management modernisation could save millions of tonnes of CO₂.

Fast facts

The world of air transport

58.1

million jobs supported by aviation worldwide

\$2.4

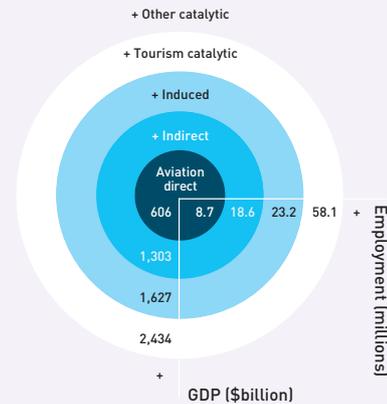
trillion dollars of aviation's global economic impact (including direct, indirect, induced and tourism catalytic)

2.97

billion passengers carried by airlines (in 2013, it was 3.1 billion)

Beyond the industry

Aviation's global employment and GDP impact



3.4%

of global GDP is supported by aviation

49,871

routes served globally

21st

If aviation were a country, it would rank 21st in size by GDP

\$210

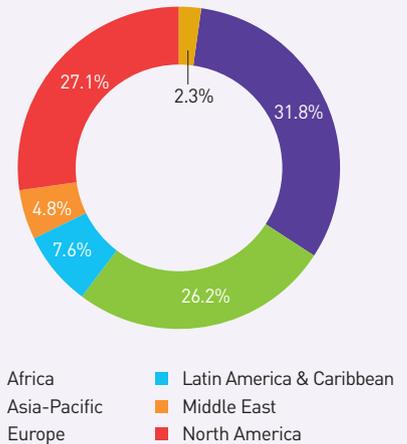
billion is the amount the world's airlines paid for fuel (in 2013, it was \$211 billion)

3.6x

Aviation jobs are, on average, 3.6 times more productive than other jobs. By opening markets, enabling knowledge transfer and other catalytic effects, aviation also makes jobs in other sectors more productive.

Asia-Pacific in front

Regional passenger traffic split



Direct employment:

470,000

Airport operators
(work for the airport operator)

4,602,000

Other on-airport
(retail, car rental, government agencies such as customs and immigration, freight forwarders and some catering)

2,272,000

Airline staff
(flight and cabin crews, executives, ground services, check-in, training, maintenance staff)

1,203,000

Civil aerospace staff
(engineers and designers of civil aircraft, engines and components)

195,000

Air navigation service providers
(air traffic controllers, executives)

These figures represent the benefits that aviation activities deliver to the global economy. They do not include other economic benefits of aviation, such as the jobs or economic activity generated when companies or whole industries exist because air travel makes them possible, or the intrinsic values that the speed and connectivity of air travel provides. Nor do they include domestic tourism and trade. Including these would increase the employment and global economic impact numbers several-fold.

A global industry

Aviation's global economic, social and environmental profile in 2012, summary

This report provides a global view of one of the most global industries. Oxford Economics analysed the economic and social benefits of aviation at a national level in over 50 countries and used the results of that assessment to build the most comprehensive global picture of air transport's many benefits.

Working with partners across the industry, the Air Transport Action Group (ATAG) has expanded the analysis to build a unique view of the air transport system that provides jobs, trade, connectivity, tourism, vital lifelines to many remote communities and rapid disaster response.

Every day...

- » 8.6 million passengers
 - » 99,700 flights
 - » \$17.5 billion worth of goods carried
- The full *Aviation: Benefits Beyond Borders* report can be found at www.aviationbenefits.org

Air transport is a major contributor to global economic prosperity

Aviation provides the only rapid worldwide transportation network, which makes it essential for global business and tourism. It plays a vital role in facilitating economic growth, particularly in developing countries.

Airlines transport over three billion

The global air transport industry supports 58.1 million jobs worldwide and contributes \$2.4 trillion (3.4%) to global GDP

passengers annually with revenue passenger kilometres (RPK) totalling nearly 5.5 trillion in 2012.

Nearly 50 million tonnes of freight were carried by air in 2012, amounting to 185 billion freight tonne kilometres (FTK).

Air transport facilitates world trade, helping countries participate in the global economy by increasing access to international markets and allowing globalisation of production. The total value of goods transported by air represents 35% of all international trade.

Aviation is indispensable for tourism, which is a major engine of economic growth, particularly in developing economies. Globally, 52% of international tourists travel by air.

Connectivity contributes to improved productivity by encouraging investment and innovation; improving business operations and efficiency; and allowing companies to attract high quality employees.

Aviation's global economic impact (direct, indirect, induced and tourism catalytic) is estimated at \$2.4 trillion, equivalent to 3.4% of world gross domestic product (GDP).

These figures do not include other economic benefits of aviation, such as the jobs or economic activity that occur when companies or industries exist because air travel makes them possible, or the intrinsic value that the speed and connectivity of air travel provides. Nor do they include domestic tourism and trade. Including these would increase the employment and global economic impact numbers several-fold.

Nearly 1,400 airlines operate a total fleet of over 25,000 aircraft. They serve almost 4,000 airports through a route network of several million kilometres managed by 173 air navigation service providers.

Air transport is a major global employer

The air transport industry generates a total of 58.1 million jobs globally.

It provides 8.7 million direct jobs: airlines, air navigation service providers and airports directly employ nearly three million people and the civil aerospace sector (manufacture of aircraft systems, frames and engines) employs 1.2 million people. A further 4.6 million work in other on-airport positions.

There are 9.8 million indirect jobs generated through purchases of goods and services from companies in its supply chain.

Industry employees support 4.6 million induced jobs through spending.

Aviation-enabled tourism generates around 35 million jobs globally.

Air transport invests substantially in vital infrastructure

Unlike other transport modes, the air transport industry pays for a vast majority of its own infrastructure costs (runways, airport terminals, air traffic control), rather than being financed through taxation and public investment or subsidy (as is typically the case for road and railways).

In 2012, airports invested \$19.3 billion in construction projects, creating jobs and building new infrastructure.



The benefits to society of research and development spending by the aerospace industry are estimated to be much higher than in manufacturing as a whole – every \$100 million of spending on research eventually generates additional GDP benefits of \$70 million year after year.

Air transport provides significant social benefits

Air transport contributes to sustainable development. By facilitating tourism and trade, it generates economic growth, provides jobs, improves living standards, alleviates poverty and increases revenues from taxes.

Increasing cross-border travel is a reflection of the closer relationships developing between countries, both from an individual perspective and at a country level. In the same way, eased restrictions on the movement of goods and people across borders facilitates the development of social and economic networks that will have long-lasting effects. This improved flow of people and goods benefits both the host and the

originating countries, encouraging increased social and economic integration.

Air transport offers a vital lifeline to communities that lack adequate road or rail networks. In many remote communities and small islands, access to the rest of the world – and to essential services such as health care – is often only possible by air.

Aviation's speed and reliability are perhaps most immediately apparent in the delivery of urgently needed assistance during emergencies caused by natural disaster, famine and war. Air services are particularly important in situations where physical access is problematic.

Air transport is working to mitigate its environmental impact

Airline operations produced 689 million tonnes of carbon dioxide (CO₂) in 2012 (and 705 million tonnes in 2013), just under 2% of the total human carbon emissions of over 36 billion tonnes.

The aviation industry agreed in 2008 to the world's first set of sector-specific climate change targets. The industry is already

delivering on the first target – to continue to improve fleet fuel efficiency by 1.5% per year until 2020. From 2020, aviation will cap its net carbon emissions while continuing to grow to meet the needs of passengers and economies. By 2050, the industry has committed to reduce its net carbon footprint to 50% below what it was in 2005.

Companies across the sector are collaborating to reduce emissions using a four-pillar strategy of new technology, efficient operations, improved infrastructure and market-based measures to fill the remaining emissions gap.

Modern jet aircraft are 75% quieter than the first models that entered into service and each new generation of aircraft continues this downward trend.

Over 1,500 passenger flights operating partially on sustainable biofuels have taken place so far. It is expected that carbon reduction from moving to these fuels could be up to 80% compared with traditional jet fuel.

Regional and group analysis

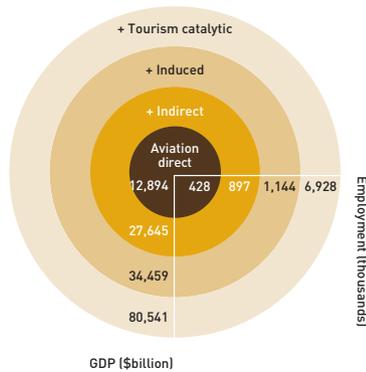
Aviation benefits around the world

Africa

Air transport supports 6.9 million jobs and \$80.5 billion in GDP in Africa



Total jobs and GDP generated by air transport in Africa, 2012

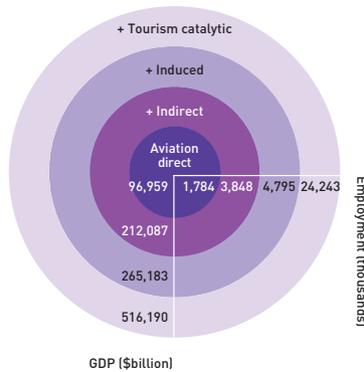


Asia-Pacific

Air transport supports 24.2 million jobs and \$516 billion in GDP in Asia-Pacific



Total jobs and GDP generated by air transport in Asia-Pacific, 2012

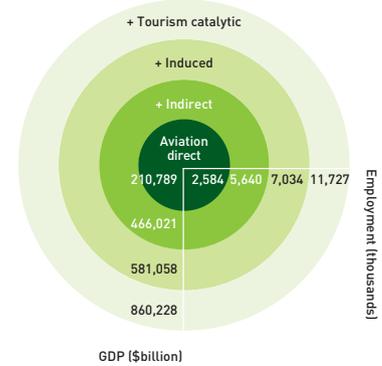


Europe

Air transport supports 11.7 million jobs and \$860 billion in GDP in Europe



Total jobs and GDP generated by air transport in Europe, 2012



APEC economies

Air transport supports 23.3 million jobs and \$1.3 trillion in GDP in the APEC economies

European Union

Air transport supports 9.3 million jobs and \$658 billion (€512) in GDP in the EU28

Small island states

Air transport supports 1.7 million jobs and \$37 billion in GDP in small island states

Developing countries

Air transport supports 36.9 million jobs and \$656 billion in GDP in developing countries

OECD countries

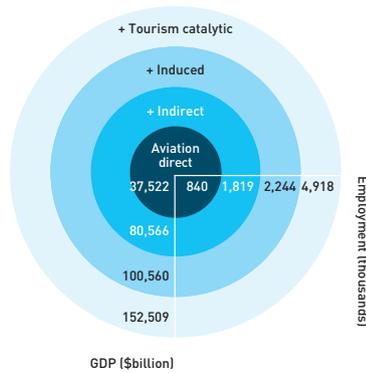
Air transport supports 20.8 million jobs and \$1.7 trillion in GDP in the OECD

Latin America and the Caribbean

Air transport supports 4.9 million jobs and \$153 billion in GDP in Latin America and the Caribbean



Total jobs and GDP generated by air transport in Latin America and the Caribbean, 2012

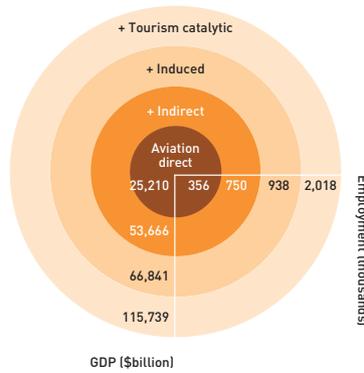


Middle East

Air transport supports two million jobs and \$116 billion in GDP in the Middle East



Total jobs and GDP generated by air transport in the Middle East, 2012

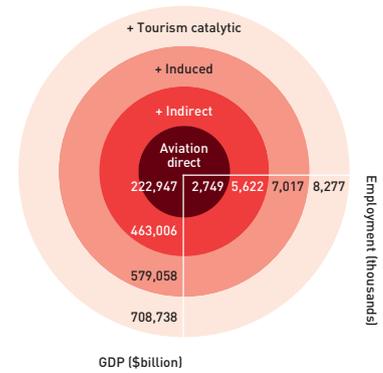


North America

Air transport supports 8.3 million jobs and \$708 billion in GDP in North America

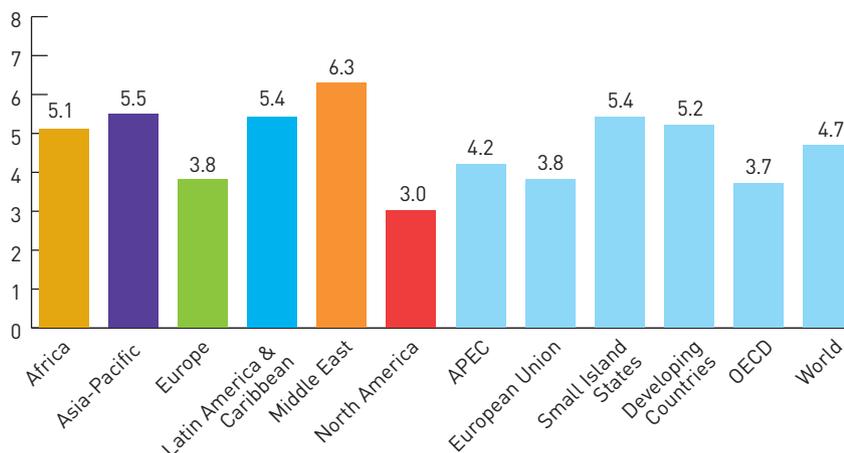


Total jobs and GDP generated by air transport in North America, 2012



Emerging fast

Projected annual growth rate for international traffic by region, 2012 - 2032



A growth industry

A century of commercial aviation and a look towards the next 20 years

The past...

2014 marks the 100th anniversary of the first commercial airline flight which took place between St Petersburg and Tampa, Florida on 1 January 1914. It was the start of a hugely important industry that helped shape and define the modern world. In the first 100 years of commercial aviation, 65,327,000,000 passengers have boarded flights. It is predicted the next 65 billion passengers will take off before 2030.

The first flight was a distance of 30 kilometres across Tampa Bay (and it stopped halfway to fix the engine). Today's modern jets can fly up to 15,200 kilometres... non-stop. On that first day for the industry in 1914, one passenger flew. On the same day 100 years later, eight and a half million passengers took to the skies. The cost of flight has also come down significantly: a New York to San Francisco flight in 1930 cost \$3,629 (in 2014 dollars). Today, the same ticket will cost under \$300.

Whereas in 1965, it is estimated that around 20% of Americans had flown at least once in their life, today it is estimated that over 80% of the US adult population has flown at least once. In 1948, the average number of flights across the Atlantic in a week was 120. Today there are 1,200 every day in the North Atlantic airspace alone. The last century has created an industry that not only provides a valuable service to the millions of passengers who interact with aviation daily, but a wider benefit to economies and society the world over.

2012	2.97 billion passengers	58.1 million jobs supported	\$2.4 trillion economic impact
2032	6.63 billion passengers	103.1 million jobs supported	\$5.8 trillion economic impact

... and the future

Air transport is forecast to support 103 million jobs by 2032

It is estimated that in 2032 the air transport industry will contribute:

- » 13.9 million direct jobs and \$1.4 trillion of GDP to the world economy;
- » Including indirect and induced contributions, 36.7 million jobs and \$3.8 trillion in GDP;
- » Once the impacts of global tourism are taken into account, a total of 103 million jobs and \$5.8 trillion in GDP.

The impact of lower growth: a sensitivity analysis

As a result of any number of unexpected events, demand for air transport over the next 20 years may diverge from current expectations. How would the economic contribution of aviation change if global demand for air transport proves to be lower than expected? A sensitivity analysis can help to answer this question.

For example, if the average annual growth in passenger numbers for each region covered in this report turns out to be one percentage point lower than currently expected between 2012 and 2032, then in 2032:

- » Worldwide, there would be 1.4 million fewer direct jobs in the air transport sector.

- » Taking into consideration the direct, indirect, and induced impacts, there would be 3.7 million fewer jobs supported by air transport.
- » Once the impacts of tourism are included, the air transport sector would support a total of 12.4 million fewer jobs than would otherwise be the case under the baseline scenario.
- » Worldwide, the direct, indirect, and induced GDP for air transport would be \$661 billion (2012 prices) lower and an additional \$352 billion would be lost reduction in tourism activity.

© Air Transport Action Group, 2014
33 Route de l'Aéroport
1215 Geneva 15 Airport

Switzerland

+41 22 770 2672

www.aviationbenefitsbeyondborders.org

www.atag.org



For references to the facts outlined in this summary version of the 2014 *Aviation: Benefits Beyond Borders* report, please refer to the full report at www.aviationbenefits.org

The air transport industry is the global network of commercial aircraft operators, airports, air navigation service providers and the manufacturers of aircraft and their components. It is responsible for connecting the global economy, providing millions of jobs and making modern quality of life possible. The Air Transport Action Group (ATAG), based in Geneva, Switzerland, represents the full spectrum of this global business. ATAG brings the industry together to form a strategic perspective on commercial aviation's sustainable development and the role that air transport can play in supporting the sustainability of other sectors of the economy. ATAG's Board of Directors includes: Airports Council International (ACI), Airbus, ATR, Boeing, Bombardier, Civil Air Navigation Services Organisation (CANSO), CFM International, Embraer, GE Aviation, Honeywell Aerospace, International Air Transport Association (IATA), Pratt & Whitney, Rolls-Royce and Safran.