

LEARNING OUTCOME 4

Analyse how air transport operators minimise economic and environmental impacts to meet sustainable business growth and objectives

P6:

ANALYSE THE ECONOMIC AND ENVIRONMENTAL FACTORS THAT ARE AFFECTING THE COMMERCIAL AIRLINE INDUSTRY

P7:

APPRAISE THE MEASURES AND INITIATIVES TAKEN BY AIRLINES TO MINIMISE ADVERSE IMPACTS OF ECONOMIC AND ENVIRONMENTAL FACTORS.



LEARNING OUTCOME 4. COURSE CONTENT

Economic And Environmental Impacts Of Aircraft Operations:

- ❑ Positive and negative impacts of aircraft operations

Sustainable Management:

- ❑ Sustainable management approaches/initiatives e.g. carbon footprint offsetting, biodegradable fuels, new fuel aircraft design
- ❑ Sustainable management plans and use of indicators to monitor sustainability

AIRCRAFT OPERATIONS; WHAT IS

Aircraft operations means the airborne movement of aircraft in controlled or noncontrolled airport terminal areas and counts at en route fixes or other points where counts can be made.

There are two types of operations: local and itinerant.

(SCSC Roundtable, 2019)

AIRCRAFT OPERATIONS; WHAT IS

Local operations are performed by aircraft that operate in the local traffic pattern or within sight of the airport, are known to be departing for, or arriving from, local practice areas within a 20-mile radius of the airport.

Also, execute simulated or practice instrument approaches or low passes at the airport. Touch-and-go operations are counted as two local operations

(SCSC Roundtable, 2019)

AIRCRAFT OPERATIONS; WHAT IS

Itinerant Aircraft means air taxi, corporate and private aircraft, military, charter, helicopter, private aircraft and any other Aircraft operations at the Airport, other than by a Signatory Airline, it being understood that, notwithstanding anything to the contrary stated elsewhere in this Agreement.

(Lawinsider, 2019)

AIRCRAFT OPERATIONS; WHAT IS

A limited number of the aforesaid aircraft may be entitled to exemptions from the payment of flight fees for military and/or governmental and/or humanitarian and/or charitable medical flights at the Airport and their weight shall then be excluded in the calculation of Flight Fees.

(Lawinsider, 2019)

AIRCRAFT OPERATIONS; POSITIVES

Aviation provides the only 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.

Air transport may provide the only transportation means in remote areas, thus promoting social inclusion.

(ATAG, 2011)

AIRCRAFT OPERATIONS; POSITIVES

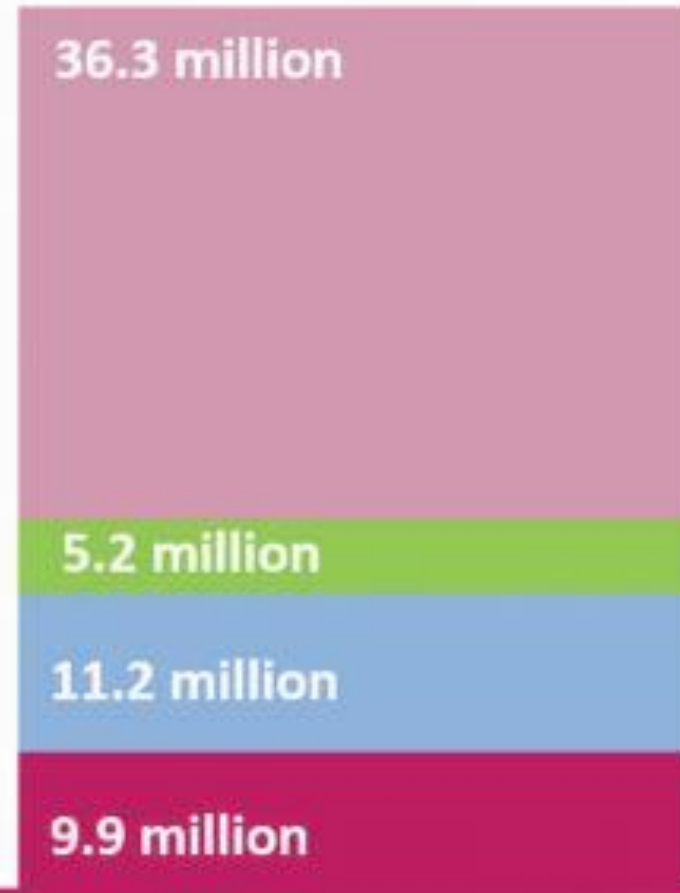
The air transport industry has a substantial economic impact, both through its own activities and as an enabler of other industries.

Its contribution includes direct, indirect and induced impacts, which are related to the total revenues of the air transport industry.

(ATAG, 2011)

Aviation's global employment and GDP impact, 2014²³

62.7 million



**EMPLOYMENT
(JOBS)**

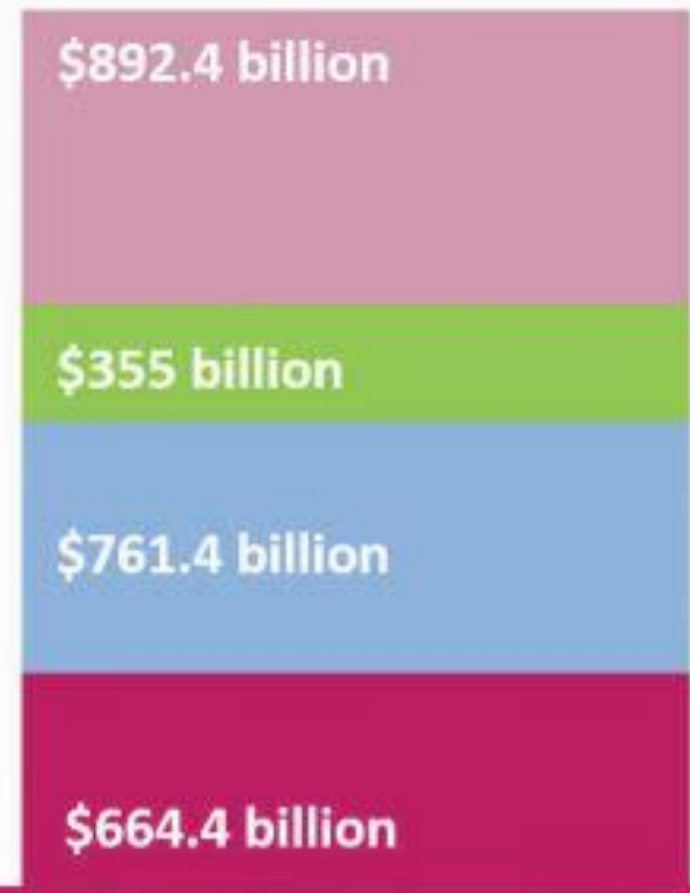
Tourism
catalytic

Induced

Indirect

Aviation direct

\$2.7 trillion



**ECONOMIC BENEFIT
(GDP)**

\$892.4 billion

\$355 billion

\$761.4 billion

\$664.4 billion

AIRCRAFT OPERATIONS; DIRECT ECONOMIC IMPACT

The aviation industry itself is a source of considerable economic activity, creating jobs that directly serve passengers at airlines, airports and air navigation services providers.

These include check-in, baggage handling, onsite retail, cargo and catering facilities. Moreover, aviation directly enables jobs in the manufacturing sector (those companies that produce aircraft, engines and other vital technologies).

(ICAO, 2005)

AIRCRAFT OPERATIONS; INDIRECT ECONOMIC IMPACT

The economic benefits of aviation extend much further than the industry's direct impacts.

The indirect impacts include employment and economic activity generated by suppliers to the aviation industry: aviation fuel suppliers; construction companies that build airport facilities; suppliers of sub-components used in aircraft; manufacturers of goods sold in airport retail outlets; and a wide variety of activities in the business services sector (such as call centers, information technology and accountancy).

(ICAO, 2005)

AIRCRAFT OPERATIONS; INDUCED ECONOMIC IMPACT

The spending of those directly or indirectly employed in the aviation sector supports additional jobs in other sectors such as retail outlets, companies producing consumer goods and a range of service industries (for example, banks, telecommunication providers and restaurants).

Worldwide, over five million induced jobs are supported globally through employees in the aviation industry (whether direct or indirect) using their income to purchase goods and services for their own consumption.

(ICAO, 2005)

AIRCRAFT OPERATIONS; ECONOMIC IMPACTS

As a trade facilitator, aviation increases the global reach of businesses, enabling them to get products to market in a more convenient and quicker way.

It allows businesses to be more responsive to the needs of customers and improves communication between buyers and sellers, including just-in-time inventory management and build-to order production.

(ATAG, 2017)

AIRCRAFT OPERATIONS; ECONOMIC IMPACTS

Lower transport costs and improved connectivity have boosted trade flows by globalizing supply chains and associated investments.

The availability of air transport allows especially LDCs, LLDCs and SIDS to overcome infrequent boat services or poor infrastructure for ground.

(ATAG, 2017)

AIRCRAFT OPERATIONS; ENVIRONMENTAL IMPACTS

Aviation contributes to quality of life – allowing us to visit friends and relatives, to travel, to experience new places, to shrink the world.

Aviation must develop if it is to continue to meet the needs of a growing economy and an expanding population.

At the same time, aviation must be environmentally sustainable, operating harmoniously within the constraints imposed by the need for clean air and water, limited noise impacts, and a livable climate.

(FAA, 2015)

AIRCRAFT OPERATIONS; ENVIRONMENTAL IMPACTS

Aviation affects the environment in many ways: people living near airports are exposed to noise from aircraft; streams, rivers, and wetlands may be exposed to pollutants discharged in storm water runoff from airports; and aircraft engines emit pollutants to the atmosphere.

(FAA, 2015)

AIRCRAFT OPERATIONS; ENVIRONMENTAL IMPACTS

Biodiversity impacts refer to impacts on plants and animals. These include reduction in the type and extent of habitats; bird strike and road kill; disturbance from light pollution, noise and aircraft/vehicle movements; and air pollution.

Habitat loss occurs when previously 'green' areas are built on, destroying the habitats of the plants and animals that live there.

(FAA, 2015)

AIRCRAFT OPERATIONS; ENVIRONMENTAL IMPACTS

Habitat fragmentation happens when a larger area of habitat is split into smaller areas, for instance if it is split by a road or fence.

This can make it difficult for animals to forage for food, breed and migrate. Animals with very consistent foraging patterns (like badgers) or breeding patterns (like toads) may continue to move from one habitat fragment to the other and may be hit by cars.

(FAA, 2015)

AIRCRAFT OPERATIONS; ENVIRONMENTAL IMPACTS

Light pollution from airports and roads can attract animals either directly or indirectly (e.g. they attract insect prey which, in turn, attract bats and birds – and their predators).

This can affect migration patterns where animals travel off-course because they are attracted to light. Once they arrive at the light source, birds may circle the source, become disoriented and exhausted, and collide with structures or other disoriented birds.

(FAA, 2015)

CARBON FOOTPRINT OFFSETTING

Carbon offsetting is a way to reduce the emissions that you can't. It both helps to combat global climate change as well as caring for local communities.

Carbon offsetting is used to balance out these emissions by helping to pay for emission savings in other parts of the world.

(Carbonfootprint, 2018)

BIODEGRADABLE FUELS

Fuel consumption for international aviation could be as high as 852 million tonnes (Mt) by 2050 (ICAO, 2016), and could require 426 Mt of bio-jet to meet the GHG emissions-reduction goals.

(Irena, 2017)

BIODEGRADABLE FUELS

As of May 2016, the American Society for Testing and Materials (ASTM) had certified four different technology pathways to produce bio-jet fuels.

1. Hydroprocessed Esters and Fatty Acids (HEFA bio-jet), using oleochemical feedstocks such as oil and fats.
2. Gasification through the FischerTropsch method (FT), using municipal solid waste (MSW) or woody biomass as feedstock
3. Synthesised Iso-Paraffinic fuels (SIP), formerly known as the direct sugars-to-hydrocarbon route (farnesane)
4. Alcohol-to-jet based on isobutanol (ATJ)

(Irena, 2017)



AIRCRAFT DESIGN

Fuel efficiency refers to how many miles an airplane can travel on one gallon of fuel. This often gets included in discussions about global warming as well as long-term goals of containing average warming below the 2°C limit.

(Kearney, 2016)

AIRCRAFT DESIGN

There are four ways changes in aircraft design are helping reduce fuel consumption:

1. Drag Reduction
2. Wiring
3. New Components, Equipment Designs and Materials
4. Efficient Engines

(Kearney, 2016)

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