ICAO

WINGS OF PROSPERITY: ECONOMIC GROWTH THROUGH AIR TRANSPORT

Economic Development of Air Transport

First Edition – August 2024

Juan Carlos Salazar
ICAO Secretary General

MESSAGE FROM THE SECRETARY GENERAL OF ICAO

Aviation is a global industry, connecting people, cultures and businesses across continents. It is a vital engine for global socioeconomic development as many sectors rely on rapid and reliable air transportation in order to function. Over half of the world's tourists travel by air, and more than one third of global freight by value is carried by air transport.

The sector has continued to expand over the past decades and has weathered many challenges, including economic downturns, natural disasters, public health crises and geopolitical tensions. The recovery from the extreme difficulties amid the COVID-19 pandemic is a testimony of aviation's resilience and adaptability.

The year 2024 marks an important milestone of international civil aviation, as the International Civil Aviation Organization (ICAO) celebrates its 80th anniversary of the signing of the *Convention on International Civil Aviation* (Chicago Convention) on 7 December 1944. As we celebrate this important milestone we must keep reflecting on the encouraging words in opening of the preamble of the Chicago Convention, which states that the ".....future development of

international civil aviation can greatly help to create and preserve friendship and understanding among the nations and peoples of the world".

In the multifaceted progress of global aviation, international cooperation and collaboration among stakeholders across sectors are important key factors that cannot be ignored. As a specialized agency of the United Nations, ICAO has continued to work with its 193 Member States and relevant stakeholders to lead international civil aviation as a key driver of social and economic development and environmental sustainability while enhancing aviation safety, security, and economic development by advancing air law, developing policies, plans and standards, monitoring and auditing, and supporting States' capabilities for the benefit of all nations and people.

In an era marked by unprecedented challenges and opportunities, ICAO has developed its new Long-term Strategic Plan for 2026-2050, which will guide its efforts in leading the aviation sector towards a safe, secure, and sustainable global aviation system that connects the world for the benefit of all nations and people thereby realizing the vision that has underpinned the Chicago Convention.

Aviation development encompasses a wide range of areas, from technological advancement to regulatory frameworks and infrastructure improvements. This brochure reflects the significant achievements of aviation over the decades in the area of economic development and provides crucial insights into the economic prosperity and social well-being delivered by air transport worldwide.

Juan Carlos Salazar
Secretary General
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Mohamed Khalifa Rahma
Director, Air Transport Bureau

FORWARD (DIRECTOR, AIR TRANSPORT)

Global air transport has seen remarkable growth over the years, driven by a combination of economic, technological, regulatory and societal factors. Despite experiencing the severe impact of the COVID-19 pandemic, global air traffic is on course of returning to strong growth momentum. In 2024, all regions are expected to reach or surpass their 2019 traffic levels, with the long-term perspective remaining positive.

In an increasingly interconnected world, global air transport has become a critical enabler of economic activity, international trade and tourism. Prior to the pandemic, aviation contributed US$ 3.5 trillion to global gross domestic product (GDP) and supported 88 million jobs worldwide. As global economic activities continue to expand, the importance of air transport in facilitating global connectivity is expected to grow further in the years to come. This is because future of air transport is dependent upon a vibrant economy, which, in turn, relies on a strong international community and healthy environment capable of supporting over seven billion people. Other factors, such as regulatory regimes, technological improvements, and fuel costs will also impact future growth.

This brochure, which coincides with the 80th Anniversary of the Chicago Convention, provides insights into the importance of aviation in supporting the global economy and in generating social benefits through sustainable air transport solutions. It presents information on the state of air transport and the impact of the COVID-19 pandemic, the socioeconomic contribution of air transport, the progress made in economic regulation, the importance for global practices that facilitate transformation and new technologies, as well as the need for modernization of aviation infrastructure to meet future air traffic demand.

A sound and economically viable civil aviation system forms the basis of sustainable global economic development. In line with the International Civil Aviation Organization (ICAO) Strategic Objective of Economic Development of Air Transport, ICAO's dedicated programmes on air transport policy and regulation, infrastructure management, and aviation data and analysis, as presented in this brochure, will showcase ICAO's efforts in supporting the development and efficiency of international air transport, the growth of global economy and expansion of trade and tourism.

Mohamed Khalifa Rahma
Director, Air Transport Bureau
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STATE OF AIR TRANSPORT

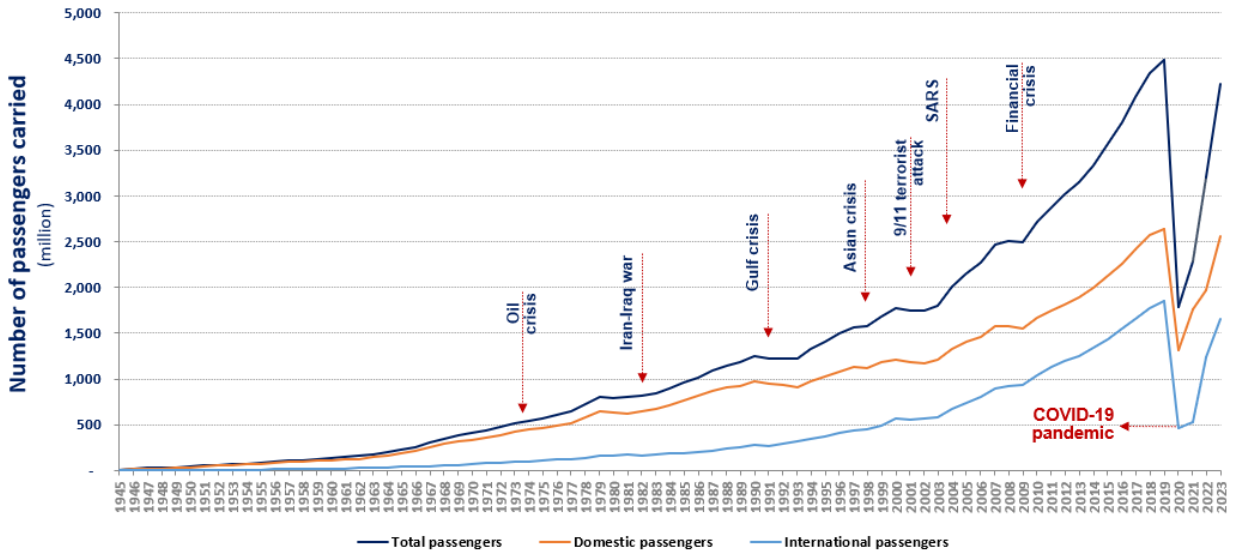
GROWTH OF AIR TRANSPORT

Historically, air transport has doubled in size every 15 years and has grown faster than many other industries. The expansion of air transport has compared favourably with the growth of the world economy, measured in terms of GDP. Technological advancement and the associated investment, combined with increasing demand for air transport services, have served as the main impetus for this exponential growth.

Over the past decades, particularly in the last 20 years, aviation has been broadly impacted by a series of crises and shocks, directly or indirectly related to the sector. These include the 1997 Asian financial crisis, the 9/11 terrorist attacks, the 2002–2004 SARS outbreak, the 2008 global financial crisis, the 2010 volcanic eruptions, and most recently, the COVID-19 pandemic. The air transport sector resisted these recessions precisely because it served as one of the most effective means for ending them.

Prior to the COVID-19 pandemic, air transport carried 4.5 billion passengers globally in 2019, logging 8.3 trillion revenue passenger-kilometres (RPKs). Fifty-eight million tonnes of freight were transported by air, reaching 228 billion freight tonne kilometres (FTKs). Every day in 2019, more than 12 million passengers and US$ 18 billion worth of goods were moved on more than 100 000 flights.

World passenger traffic evolution



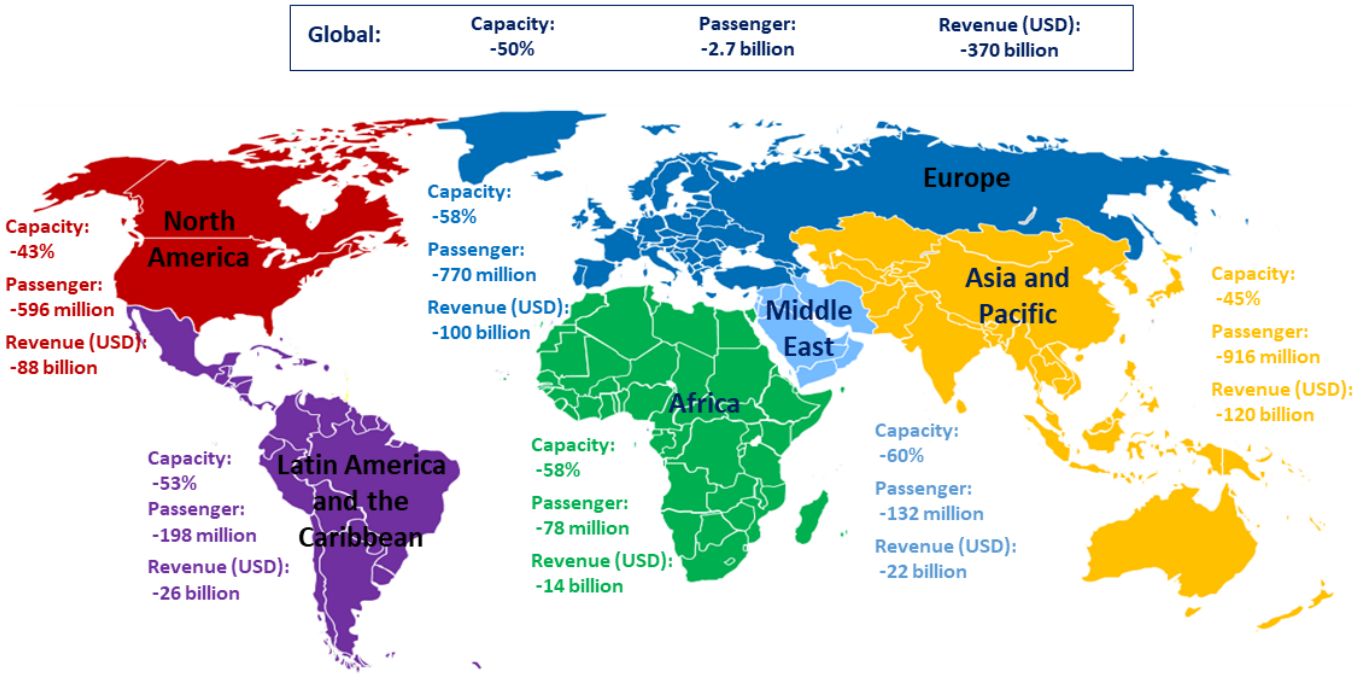
Source: ICAO

IMPACT OF THE COVID-19 PANDEMIC

The COVID-19 pandemic had a dramatic impact on economy and society, causing disruptions to various sectors, globally. Aviation was one of the hardest hit sectors due to the curtail in air travel during the wide-scale lockdowns, border closures and travel restrictions across all regions. The impact of the pandemic on aviation was devastating and unprecedented, far exceeding the effects of previous crises such as 9/11, SARS and the 2008 global financial crisis.

According to ICAO's economic impact analysis of COVID-19 on civil aviation,[1] the first year of the pandemic, 2020, recorded the worst year for aviation in history. Global passenger traffic fell drastically by 60 per cent, the equivalent of a 2.7 billion reduction in number of passengers, compared to the pre-pandemic level in 2019. The decline in international traffic was deeper than in domestic traffic, which experienced a 74 per cent fall and 1.4 billion fewer passengers.

Impact of the COVID-19 pandemic on passenger traffic and revenues in 2020 versus 2019



Source: ICAO economic impact analysis of COVID-19 on civil aviation

[1] https://www.icao.int/sustainability/Pages/Economic-Impacts-of-COVID-19.aspx

In contrast with passenger traffic, air cargo traffic recovered swiftly and exceeded pre-pandemic levels starting at the beginning of 2021. This was owing to demand for transportation of medical supplies and essential goods amid the pandemic, as well as congestion in the global supply chain, which caused a temporary shift of cargo volumes from surface to air transport. Cargo tonne-kilometres fell by 12 per cent in 2020, and surged by 18 per cent in 2021, compared to 2019.

The financial consequences of this precipitous decline in traffic were far reaching. It created severe liquidity strains for the industry, placing its financial viability at risk and threatening millions of jobs. According to ICAO's analysis, the plunge in passenger traffic in 2020 translated into a fall in airline gross operating revenues by US$ 370 billion. The loss in revenues of airports and air navigation services providers (ANSPs) reached US$ 115 billion and US$ 13 billion, respectively. All aviation stakeholders, including airlines, airports, ANSPs and aerospace manufacturers, and those throughout the value chain, confronted challenges to their financial stability and business continuity.

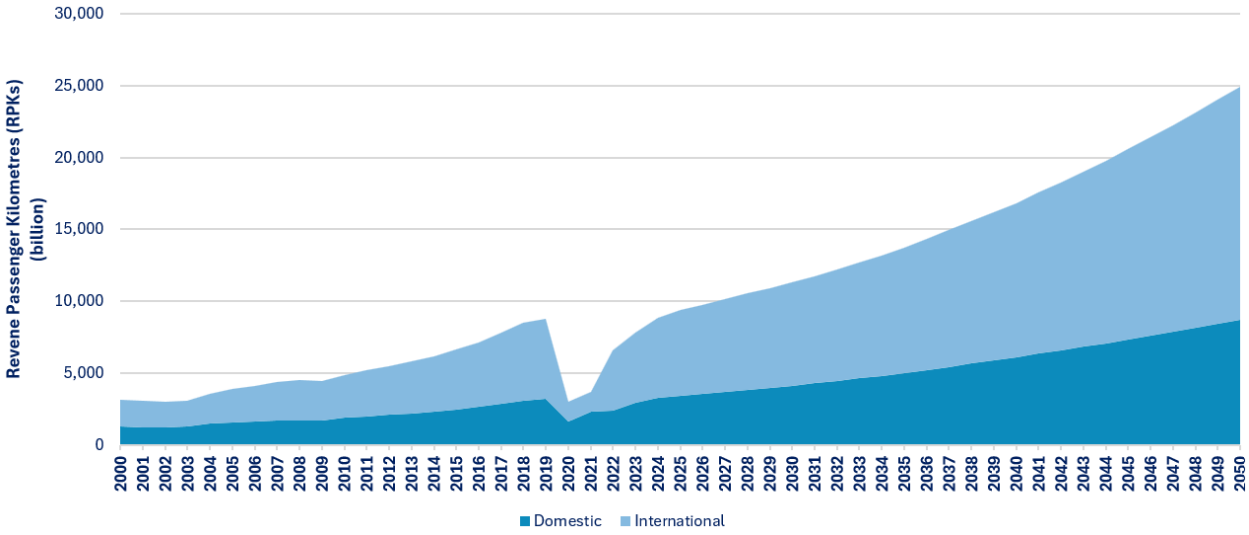
POST-PANDEMIC OUTLOOK

The recovery of the industry was vulnerable and volatile during the early years of the pandemic, being hampered by resurging outbreaks across regions and strict travel restrictions. With the gradual ease of containment measures and travel restrictions starting in the second half of 2022, air travel rebounded and returned to over 90 per cent of pre-pandemic 2019 levels by the end of 2023. In 2024, global air passenger traffic in RPKs is expected to be around 3 per cent above the 2019 levels and could reach 4 per cent if the pace of recovery strengthens in the routes that have not yet reached pre-pandemic levels.

Air cargo performed robustly in 2021; however, it faced considerable challenges starting in 2022, including macroeconomic headwinds, a slowdown in global trade and economic growth, and geopolitical tensions. Global demand expressed in FTKs has been forecasted to be around 2 per cent below 2019 levels for the full year 2024.

Over the long horizon, global air passenger traffic in RPKs and air cargo traffic in FTKs have been forecasted to grow at a compound annual growth rate of 4 per cent and 3 per cent over the period 2024-2050, respectively. To put this growth in perspective, both global passenger and cargo traffic are expected to more than double in the next two decades.

Long-term passenger traffic forecast



Source: ICAO Long-term Traffic Forecasts

BENEFITS OF AIR TRANSPORT

The aviation industry plays a pivotal role in driving economic prosperity and global GDP. For many States, aviation is placed at the centre of national strategic planning and serves as an instrument of national policy due to its direct contributions to States' income and importance in supporting other economic sectors such as tourism and international trade. The economic expansion generated by aviation improves living standards, alleviates poverty and sustains prosperity.

Economic benefits of air transport prior to the COVID-19 pandemic

11.3 million

direct jobs *supported by aviation worldwide*

87.7 million

jobs *supported by aviation worldwide*

US$ 961.3 billion

direct *global* ***economic impact***

US$ 3.5 trillion

global ***economic impact***

Source: Aviation Benefits Beyond Borders – Air Transport Action Group (ATAG)

The industry also acts as a catalyst for economic growth by directly creating employment opportunities within airport operators, airlines, civil aerospace and ANSPs. The industry also generates vast employment within a wide range of aviation supply chains and other economic industries such as fuel suppliers, construction companies, information technology, travel agencies, logistics and hospitality.

The world GDP growth rate can predict the growth rate of world air freight (and vice-versa) with

98 per cent accuracy

Source: World Bank, World Development Indicators

Air transport is known for its speed, security and reliability, making it a preferred mode of transport for sectors like e-commerce, equipment, consumer electronics, pharmaceuticals, health care and retail products. Air cargo has revolutionized the shipping industry by reducing shipping times for freight across the world compared to alternatives such as trucks and boats.

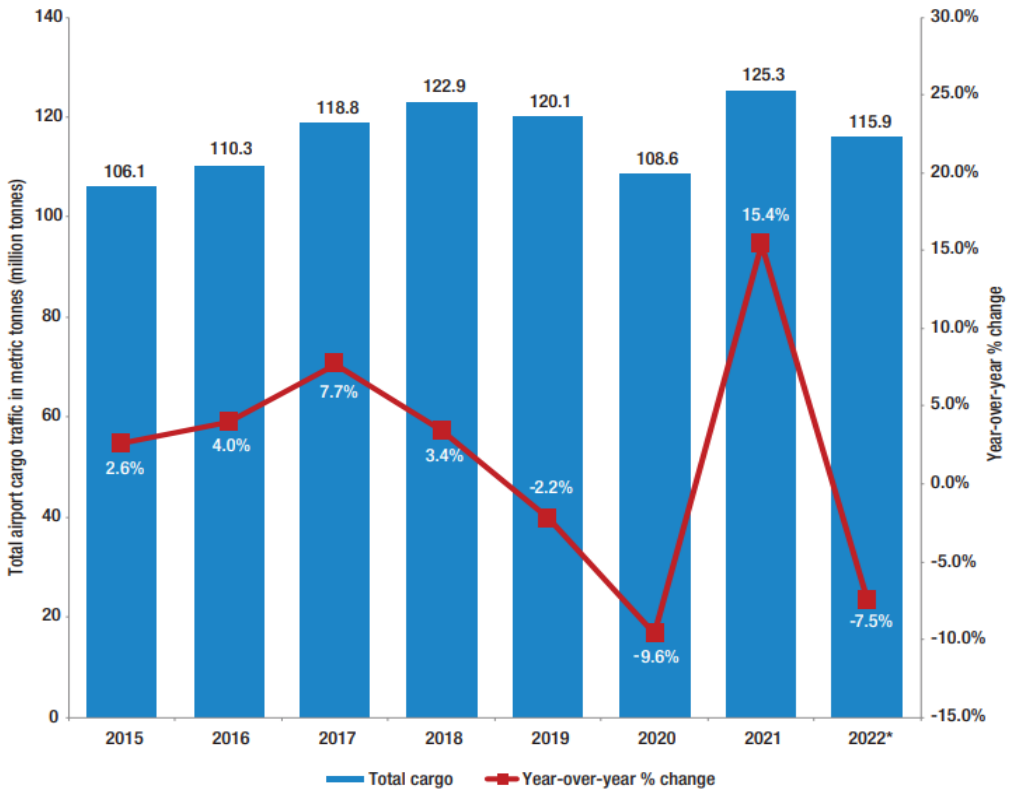
In 2019, almost 56 million kilometres were flown by airlines – equivalent to travelling

from Earth to Venus.

Source: ICAO, Annual Report of the Council

This has allowed companies around the world to access supplies that were once impossible for them to access due to time or price constraints. Air transport also connects markets and industries across borders and reduces supply chain bottlenecks. As a result, international trade has grown globally, benefiting both developed and developing economies.

Evolution of global airport cargo traffic
(million tonnes, 2015–2022)*



Source: Airports Council International (ACI) world annual traffic database

** Preliminary figures*

Air transport can also shape the economic ties between States and regions by supporting mutual interests and prosperity. The competition derived from air transport growth promotes efficiency, innovation and liberalization, resulting in increased connectivity and enhanced benefits for consumers. All these aspects have forged stronger economic ties and collaboration among States and regions.

Countries with well-connected airports and strong networks are more attractive to multinational corporations and see greater foreign direct investment (FDI). This investment creates jobs, stimulates economic growth and promotes technology transfer. Meanwhile, the construction of airports as a direct investment in the regional economy generates on-site employment with cascading impacts on local and regional economic growth.

"The industry is returning to **profitability in 2023**, only three years after the historic loss of nearly USD 140 billion in 2020. … Total airline **revenue** is expected to reach **107%** of 2019 earnings, with operating profits of USD 41 billion."

Source: International Air Transport Association (IATA) Global Outlook for Air Transport, December 2023

Air transport is also a critical enabler of connectivity and socioeconomic development for landlocked developing countries (LLDCs), least developed countries (LDCs) and small island developing States (SIDS), whose geographical constraints and remoteness create many challenges. Low transport connectivity, for example, results in lower levels of trade for these countries compared to transit countries and the world average. Given their geographical isolation and dispersion, these countries often rely on air transport as the only viable and efficient means of transportation that allows them to connect with the rest of the world and integrate into regional and global value chains and markets. This connectivity plays an important role in promoting sustainable development.

The world's freighter fleet is estimated to grow to

3 610 aircraft by 2041

from roughly 2 010 airplanes in 2019.

Source: Boeing, World Air Cargo Forecast 2022–2041

Air transport and diplomacy are closely intertwined. Aviation has revolutionized not only the way in which people travel, but also the way in which countries interact and negotiate on the global stage. It has become a vital tool in shaping international relations and diplomacy, encouraging States to include aviation as a foreign policy tool for promoting their international image and aviation sector as diplomatic actors. The development of international air transport has greatly helped to create and preserve international ties and has fostered activity and understanding among countries.

As a critical driver of globalization, aviation has also had a profound social impact worldwide. It has revolutionized the way in which humans interact and has shaped the global social fabric in numerous ways, allowing for cultural exchange, education and knowledge-sharing, access to health care services in different parts of the world, and migration. In these ways and more, aviation continues to strengthen the global community and its interconnections.

AVIATION AND TOURISM

The air transport industry also stimulates the tourism and hospitality industries, which are major economic components for many countries. Aviation is an efficient means of transportation that connects long-distance destinations and enables unparalleled global connectivity. Moreover, aviation facilitates the growth of the tourism industry in remote island regions that are otherwise difficult to access. It allows these areas to attract tourists from all over the globe, boosting local economies and promoting cultural exchange.

Source: UN Tourism

Through its synergetic relationship with aviation, tourism serves as a vital generator of global economic activity and is becoming one of the largest and fastest growing economic sectors in the world. Growth in tourism has been driven by a strong global economy and affordable travel, among other factors. Without strong air networks, tourism cannot thrive.

Modern aviation and the accompanying influx of leisure travellers require substantial infrastructure outlays and operational capacities. Concurrently, moves towards openness and the expansion of low-cost carriers have afforded more travellers an additional means of transport, opening new markets and making aviation the preferred mode of transportation chosen by 59 per cent of all tourists,[2] and up to 80 per cent of visitors to certain small island States.

*Some **4.7 billion people** are expected to travel in 2024, a **historic high** that exceeds the pre-pandemic level of 4.5 billion recorded in 2019.*

Source: IATA

Travel and tourism were two of the hardest hit sectors amid the COVID-19 pandemic. International travel plunged by 72 per cent in 2020, the worst year on record for tourism, resulting in 1.1 billion fewer international tourists worldwide (overnight visitors) and putting traveller numbers back to levels of 30 years ago.[3] However, according to UN Tourism, travel and tourism have shown a unique ability to bounce back, with arrivals reaching close to, or even above, pre-pandemic levels in many places.

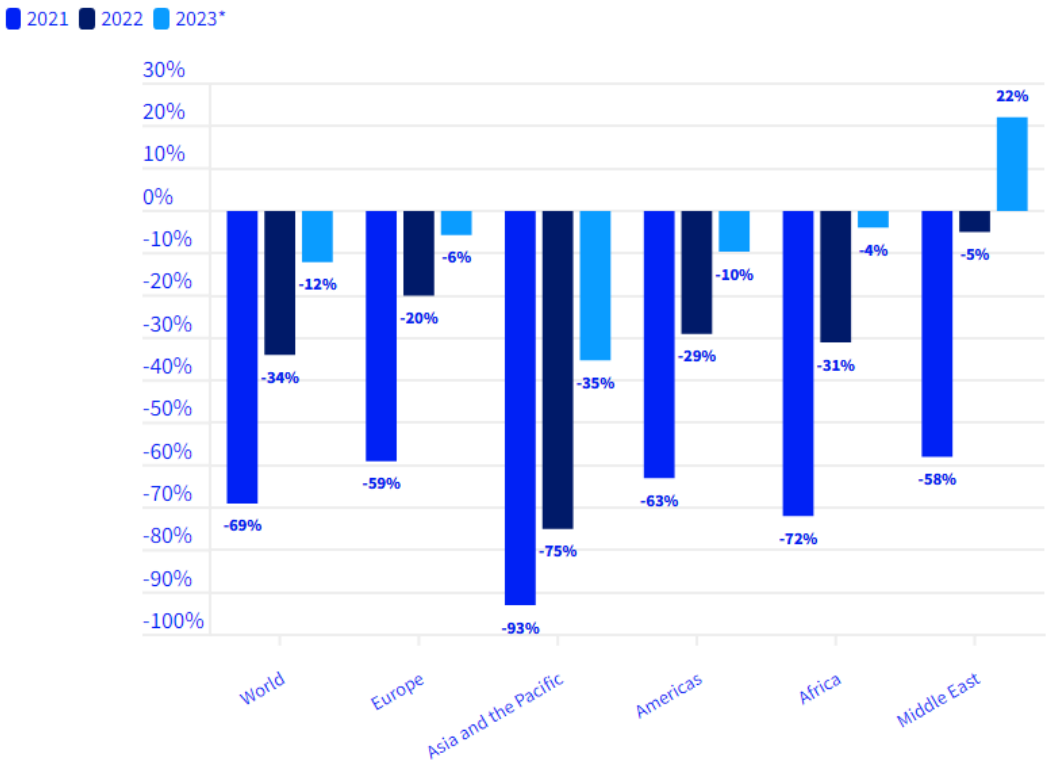
Based on the UN Tourism forecast,[4] international tourist arrivals were predicted to reach 80 to 95 per cent of pre-pandemic levels in 2023, with more than 900 million tourists travelling internationally in 2022, which was double the number recorded in 2021. This positive recovery has put the industry back on track to transport 1.8 billion travellers by 2030, achieve 3.3 per cent growth per year, and experience a substantial increase in long-haul, worldwide travel, relative to intraregional voyages.[5]

Source: UN Tourism, Tourism Towards 2030

[2] UN Tourism International Tourism Highlights, 2020 Edition
[3] Impact assessment of the COVID-19 outbreak on international tourism (unwto.org)
[4] Tourism Set to Return to Pre-Pandemic Levels in Some Regions in 2023 (unwto.org)
[5] International tourists to hit 1.8 billion by 2030 (unwto.org)

In January 2024, UN Tourism reported that international tourism had reached 88 per cent of pre-pandemic levels by the end of 2023, with an estimated 1.3 billion international arrivals. The unleashing of remaining pent-up demand, increased air connectivity, and a stronger recovery of Asian markets and destinations, are expected to underpin a full recovery by the end of 2024.[6]

International tourist arrivals (% change over 2019)



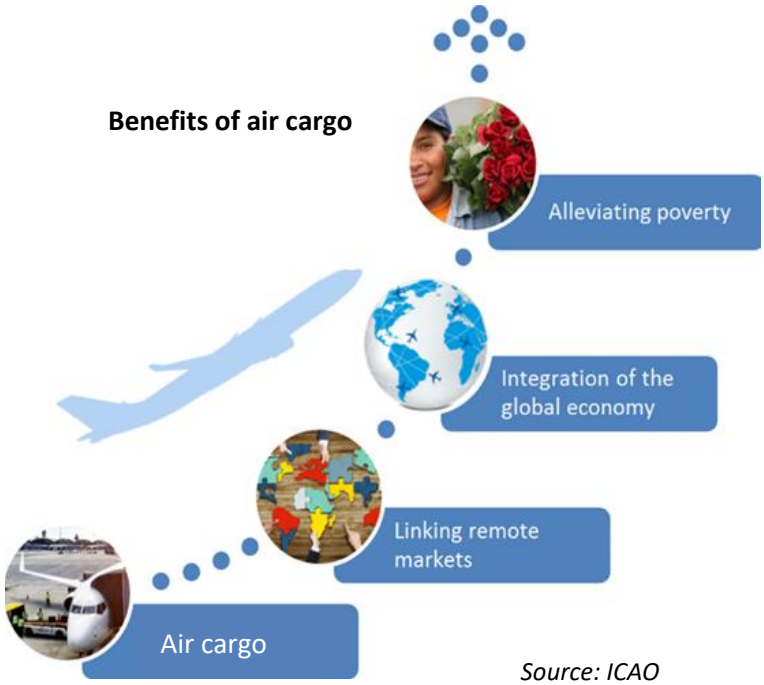
Source: UN Tourism | World Tourism Organization © • % change over 2019 | *Preliminary figures
Data as collected by UN Tourism, January 2024. Published: 19/01/2024

According to UN Tourism, this development underscores tourism's resilience and rapid recovery. Its rebound to pre-pandemic levels is already having a significant impact on economies, jobs, growth and opportunities for communities everywhere. These numbers also highlight the critical task of boosting sustainability and inclusion in tourism development.

[6] https://www.unwto.org/news/international-tourism-to-reach-pre-pandemic-levels-in-2024

AIR CARGO

Globally, air freight constitutes more than 34.6 per cent of world trade by value, but only 1 per cent by volume. Air cargo transport empowers countries, whatever their geographic location, to connect to distant markets in an efficient and reliable manner. In particular, air cargo enables tremendous economic progress for SIDS, LLDCs and LDCs, as air service allows them to overcome poor infrastructure or infrequent boat services. High-value electrical components and perishable products such as food and flowers are transported all over the world through the efforts of cargo integrators, providing steady employment and economic growth to regions benefiting from such trade.



Source: ICAO

52 million metric tonnes

Goods

US$ 6.8 trillion

Worth of goods

US$ 18.6 billion

Goods per day

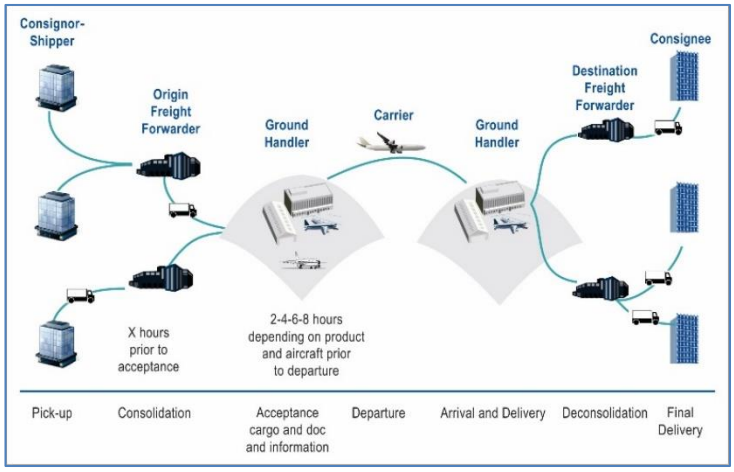
10.8%

Surge of demand in December 2023 compared to 2022

Source: IATA, 2023 Trends – Cargo operations

Additionally, having substantial air freight capacity has a number of social benefits, given that air cargo is uniquely able to respond quickly to distant natural disasters. Air drops are among the first responses of aid agencies to stem humanitarian crises. Air cargo also plays a vital role in the worldwide rapid delivery of medical supplies, organs for transplantations, and essential supplies and equipment for emergency and humanitarian aid relief.

Air cargo movement overview



Source: ICAO

During the pandemic, demand for global air cargo surged ahead of the already robust pre-pandemic projections, increasing by 9 per cent in February 2021, compared to February 2019.[7] The COVID-19 pandemic had the immediate effect of curtailing in-person market transactions due to restrictions on the movement of people, imposed by governments to minimize transmission of the virus.

As air cargo and other transport modes faced the initial brunt of movement restrictions, the month-on-month decline in world trade that occurred in March 2020 stood at 11.7 percent.[8] Approximately 50 per cent of global air cargo capacity provided by the cargo compartments ("bellies") of passenger aircraft had suddenly disappeared.[9] The initial response to this disruption was to bring stored freighters back into service, as well as to reconfigure idle passenger aircraft to carry cargo on the passenger deck, enabling the provision of all-cargo services.[10] This

[7] IATA Air Cargo Market Analysis (https://www.iata.org/en/iata-repository/publications/economic-reports/air-freight-monthly-analysis---february-2021/)
[8] CPB Netherlands Bureau for Economic Policy Analysis, World Trade Monitor December 2023 (https://www.cpb.nl/en/worldtrademonitor)
[9] Effects of Novel Coronavirus (COVID-19) on Civil Aviation: Economic Impact Analysis (19 May 2020). (https://www.eraa.org/sites/default/files/icao_covid_2020_05_19_economic_impact.pdf)
[10] Effects of Novel Coronavirus (COVID-19) on Civil Aviation: Economic Impact Analysis (22 May 2020). Slide 73. Found at: https://www.icao.int/sustainability/Documents/COVID-19/ICAO%20COVID%202020%2005%2022%20Economic%20Impact.pdf

contributed to the recovery experienced in June 2020, and more largely, an overall increase in global trade by 7.3 percent.

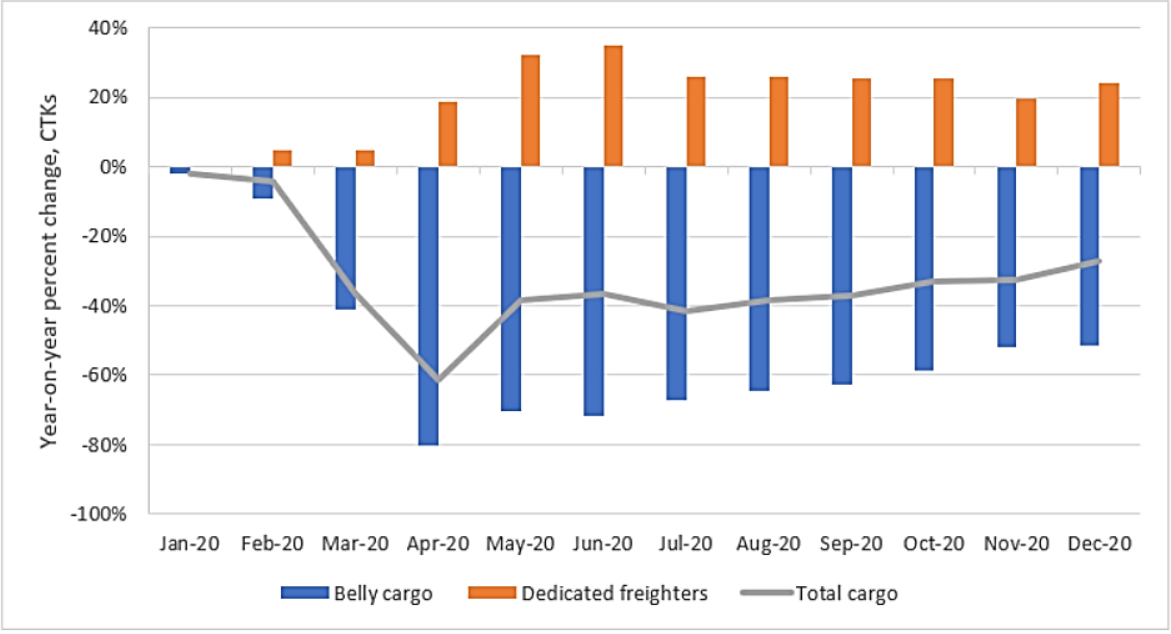
The COVID-19 pandemic was a driving force in the evolution of supply chains. In the years immediately prior to the pandemic, geopolitical tensions had been prompting world leaders to secure their supply chains for necessary intermediate and finished consumer goods. With the pandemic, countries faced the added need to transport personal protective equipment (PPE), vaccines and associated medical goods, while e-commerce became a greater economic driver due to restrictions on in-person retail operations.

Air cargo as a critical mode for relief efforts

Source: ICAO

The dynamism displayed during the early years of the pandemic was not a new phenomenon; rather, it reflected long-established and unique characteristics of air cargo. Air cargo proved to be responsive to economic shocks, as well as market demands, and continues this responsiveness now, with fluctuations in the demand for tangible goods being reflected in the demand for air cargo services. Although demand for air cargo services must be met with efficiency, safety and security requirements must be maintained, and, with the COVID-19 experience in mind, resilience to future major disruptions must be strengthened.

Year-on-year percentage change in cargo tonne-kilometres (CTKs) for belly cargo, dedicated freight and total air cargo, 2020 compared to 2019



Source: IATA, Air Cargo Market Analysis, December 2020

CONNECTING TO THE UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

AVIATION AND SUSTAINABILITY

The Secretary-General's High-level Advisory Group, in its report Mobilizing Sustainable Transport for Development, recognizes sustainable transport and the provision of services and infrastructure for the mobility of people and goods as "advancing economic and social development to benefit today and future generations— in a manner that is safe, affordable, accessible, efficient, and resilient, while minimizing carbon and other emissions and environmental impacts."

The transport sector as a whole is a cross-sectoral accelerator of the achievement of the *2030 Agenda for Sustainable Development* and its 17 Sustainable Development Goals (SDGs) which include the promotion of inclusive economic growth,[11] and the building of resilient infrastructure and ecological industrialization, as well as advancement of technological innovation.[12] While some SDGs are directly connected to sustainable transport, other SDGs indirectly benefit from the enabling role of sustainable transport. It is estimated, for instance, that sustainable and resilient infrastructure—including but also going beyond transport—will have an impact on the achievement of up to 92 per cent of all SDG targets. Likewise, the attainment of other SDGs and related targets can facilitate the building of sustainable transport systems and improve access to them.[13]

Aviation, as one of the main modes of transport, is a nexus to global sustainable socio-economic development as it generates economic growth, creates jobs, and facilitates international trade by providing the only rapid worldwide transportation network. Consequently, aviation is an enabler for the achievement of the 2030 Agenda and its Goals.

While aviation stimulates economic development, a vibrant economy is essential for the development of aviation. A thriving economy can only be achieved through a strong international

[11] United Nations Sustainable Development Goal 8 – Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. Goal 8 | Department of Economic and Social Affairs (un.org)
[12] United Nations Sustainable Development Goal 9 – Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation. Goal 9 | Department of Economic and Social Affairs (un.org)
[13] *Sustainable Transport, Sustainable Development*, Interagency Report of the Second Global Sustainable Transport Conference, available at: https://sdgs.un.org/sites/default/files/2021-10/Transportation%20Report%202021_FullReport_Digital.pdf

community and healthy environment capable of supporting more than 8 billion people. In securing human development and supporting the natural ecosystem's ability to continue providing economic resources, sustainability serves as the foundation for further growth, including in aviation.

Source: The Center for Open Data Enterprise, Strategies for SDG National Reporting

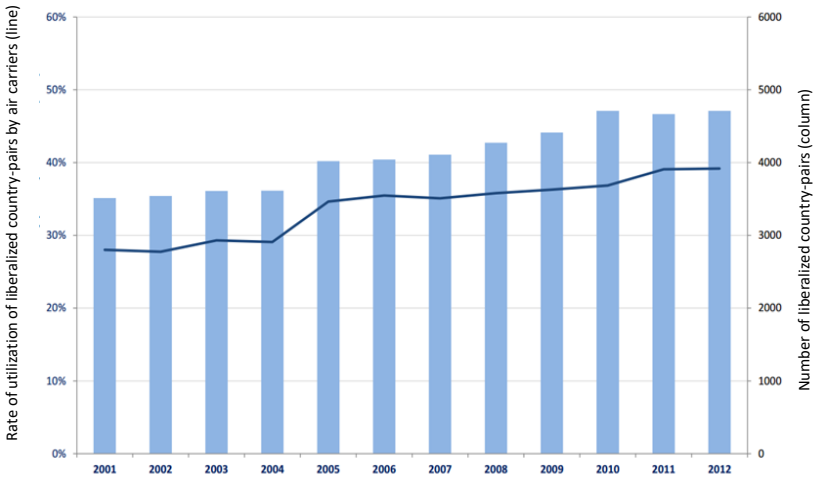
According to the United Nations, data and analysis are critical for long-term forecasts and planning towards the achievement of the SDGs. By following a data-driven approach, the air transport industry can demonstrate how it supports the SDGs through job creation, promotion of local cultures through tourism, connection of rural producers to global markets, improving food security and access to health, education, and innovative technologies, and greater understanding between societies.

Source: Moldova in 2030 — the future people want, by UN Moldova, UN Moldova Magazine

ICAO is fully committed to working in close cooperation with States, United Nations bodies and other stakeholders to support the achievements of the SDGs targets. ICAO is also an official observer of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators and is the custodian agency of global indicator 9.1.2 (Passenger and freight volumes, by mode of transport) under the 2030 Agenda for Sustainable Development. ICAO actively takes part in monitoring efforts under the 2030 Agenda and other development frameworks, as appropriate.

CONNECTIVITY AND THE SDGS

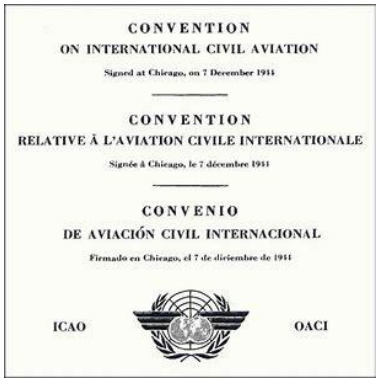
A utilization rate of connectivity opportunities at the global level



The SDGs include Goals to end poverty, promote long-term economic growth and ensure that sufficient social and environmental resources exist in order for future generations to thrive. As a United Nations specialized agency, ICAO is keen to support the achievement of these Goals, cognizant of the challenges and opportunities that they pose for the aviation community. The Organization further acknowledges the synergies and interlinkages between aviation and different SDGs and targets, in addition to the interdependencies among countries and stakeholders, which must be considered in planning, investment, and implementation actions by multiple stakeholders to accelerate progress towards attaining the SDGs. Working with States and international partners, ICAO remains committed to improving connectivity, aviation infrastructure, as well as compliance with Standards and Recommended Practices (SARPs) and policies, since these measures provide for inclusive and productive employment and serve as the basis for further sustainable growth.

GLOBAL REGULATORY FRAMEWORK FOR AIR TRANSPORT

INSTITUTIONALIZATION OF ECONOMIC REGULATION FOR THE AIR TRANSPORT INDUSTRY


CONVENTION
ON INTERNATIONAL CIVIL AVIATION
Signed at Chicago, on 7 December 1944
CONVENTION
RELATIVE À L'AVIATION CIVILE INTERNATIONALE
Signée à Chicago, le 7 décembre 1944
CONVENIO
DE AVIACIÓN CIVIL INTERNACIONAL
Firmado en Chicago, el 7 de diciembre de 1944
ICAO
OACI

Air transport economics refers to the commercial aspects of air transport, as distinguished from the technical aspects including navigation, safety and security. Economic regulatory frameworks are aimed at regulating the business and commercial side of the industry, which is often motivated by rationales and objectives that vary from one regulator to another. Common drivers for developing such frameworks are the capitalization of air transport to advance economic development, meet social needs and fulfil policy goals, the promotion of effective competition and protection of consumer rights.

A central pillar of modern international civil aviation is Article 1 of the *Convention on International Civil Aviation* (the Chicago Convention), signed in 1944, which recognizes a State's complete and exclusive sovereignty over the airspace above its territory. Article 6 of the Chicago Convention lays down more fundamentals underpinning the uniqueness of international air transport, stating that operations of scheduled international air service require special permission or other authorization of a State. Following the signing of the Chicago Convention, the market access for international air transport became a crucial commodity from an economic perspective, and eventually became heavily regulated by States.

PREAMBLE

WHEREAS the future development of international civil aviation can greatly help to create and preserve friendship and understanding among the nations and peoples of the world, yet its abuse can become a threat to the general security;

MARKET ACCESS: MORE COMMERCIAL FREEDOM

In subsequent years, air traffic grew and brought more benefits to national and regional development. This also led to an increased yearning for commercial freedom by industry operators. Efforts to deregulate and liberalize the industry through bilateral, and occasionally multilateral, agreements have since intensified to fully leverage the socioeconomic benefits of air transport.

Bilateral liberalization. Access to international air transport markets through bilateral arrangements has remained the primary approach for most States since the Bermuda I Agreement, which was signed in 1946. A turning point was the conclusion of the first open skies agreement between the Netherlands and the United States in 1992, which allowed for the multiple designation of operators, unlimited capacity and frequency, as well as free pricing schemes. Since the early 1990s, States have concluded a substantial number of open skies arrangements.

Multilateral liberalization. Regional multilateralism is becoming more widely accepted by States as an approach to reach common goals. Although the modalities, pace, size and level of development of liberalization varies from one region to another, regions share a common objective, which is to harmonize regulatory approaches and allow for better access to the shared market. This is accomplished through regional common participation and with the goal of sharing socioeconomic prosperity.

Unilateral liberalization. In addition to bilateral and multilateral efforts, liberalization is also being pursued unilaterally by States by opening their markets to foreign airlines without the requirement of reciprocity.

OTHER ASPECTS OF AIR TRANSPORT

Hard rights: Over the years, progressive deregulation has also expanded to hard rights[14] by including other operational measures such as rights for third party code-sharing, co-terminal arrangements, and lenient tariffs measures of either dual disapproval or free pricing.[15] The number of air services agreements (ASAs) containing these liberalized measures are projected to continue to steadily increase over the next several years.

Competition: As a result of growing competition, the industry requires improved access to capital markets to meet its financial obligations and implement its business strategies. The relaxation of ownership and control under States' regulatory regimes is a significant indicator of their openness to liberalization, which allows for cross-border investments. Improved access to capital sources would provide airlines more and better options in running their businesses.

[14] Hard rights refer to market access, particularly the nine Freedoms of the Air.
[15] Dual disapproval or free pricing refers to tariffs that must be disapproved by both States concerned to prevent them from coming into effect.

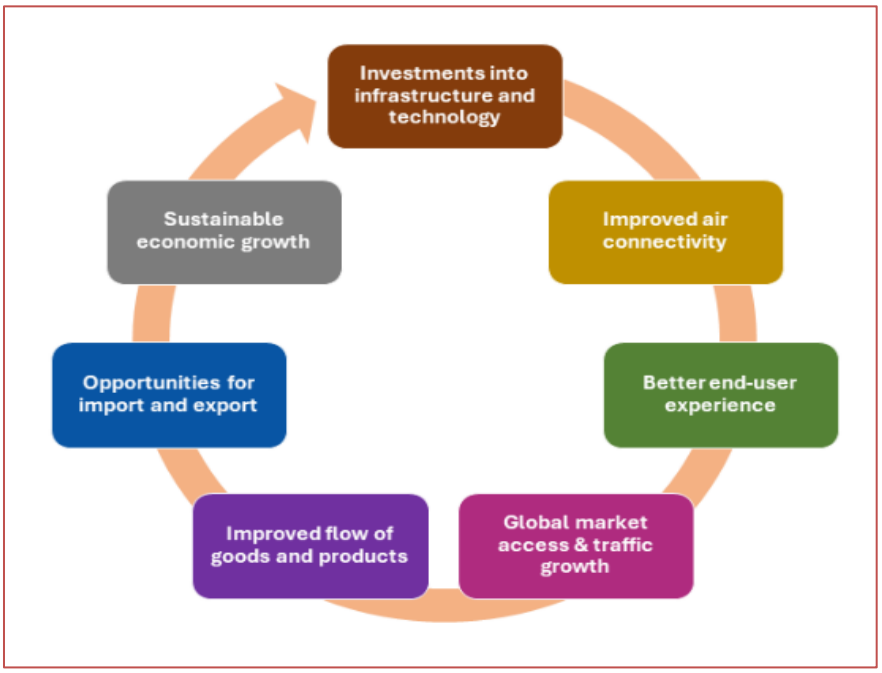
Foreign investment: Foreign investment in airlines has been happening through various measures such as privatization of formerly owned national airlines, purchase of equity and cooperative airline joint ventures (franchising, mergers and alliances) that involve an exchange of ownership and control.

MODERNIZING AVIATION INFRASTRUCTURE

FUNDING AND FINANCING FOR INFRASTRUCTURE DEVELOPMENT

Over the long horizon, air traffic will continue to expand and is expected to more than double by 2050. To foster this projected growth in a sustainable manner, large-scale investments in the modernization and expansion of quality aviation infrastructure, which are in line with the ICAO Global Air Navigation Plan (GANP) and related policies, will be required over a long period to ensure that the capacity of the global aviation system can meet future demand, and that expanding traffic can be accommodated safely, efficiently and sustainably, while ensuring public confidence and satisfaction.

Prior to the COVID-19 pandemic, the global investment needs for airport expansion and construction, for example, were estimated at US$ 1.8 trillion from 2015 to 2030. In addition, new requirements for the development of aviation infrastructure have emerged with an increasing number of technological advancements, as the industry focuses on long-term resilience and environmental sustainability.



Unlike other transport industries, the aviation industry has been paying the vast majority of its own infrastructure costs (runways, airport terminals, air traffic control centres, etc.), rather than

being financed through taxation, public investments, or subsidies. User charges (airport and air navigation services charges) have been among the main sources to cover infrastructure costs and are an important element of the aviation ecosystem for infrastructure development.

To achieve sustainable funding and financing for aviation infrastructure development, it is vital to have a global policy framework, enhanced cooperation among all conventional and non-conventional stakeholders, diversified funding sources, and an elevated role of the private sector, including through private investment, private finance initiatives and public-private partnerships (PPPs).

EMERGING INFRASTRUCTURE FUNDING AND FINANCING NEEDS

- **Unmanned aircraft systems (UAS).** The operation of UAS continues to grow rapidly across various domains in both the commercial and recreational markets. As the pace of UAS integration accelerates and the number of users increases exponentially, practical and sustainable funding and financing mechanisms should be in place to support the operation of UAS. The development and expansion of UAS operations will require investment to upgrade existing infrastructure or build new aviation infrastructure, and additional service provisions from airports and ANSPs.

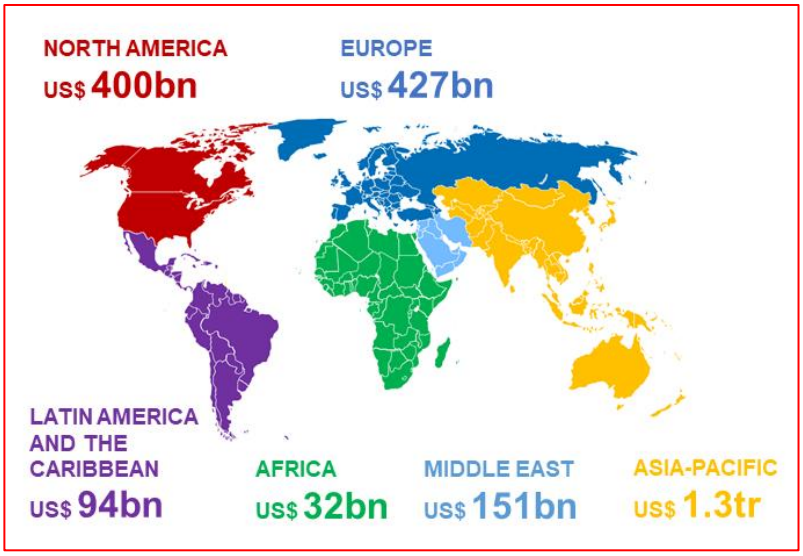
The global market for transport and logistics supported by unmanned aircraft systems (UAS) is expected to **grow** from US$ 11 billion in 2022 to **US$ 29 billion by 2027**.

Source: ICAO

- **Advanced air mobility (AAM).** AAM is expected to be a transformative force in transportation, as it is poised to redefine mobility through innovative aviation technologies and beyond. It encompasses an array of solutions, including UAS and electric vertical take-off and landing (eVTOL) aircraft, with the overarching goal of enhancing accessibility and revolutionizing transportation norms. As AAM is implemented globally, complex infrastructure will have to be put in place to support its operation.

AIRPORT DEVELOPMENT AND EXPANSION

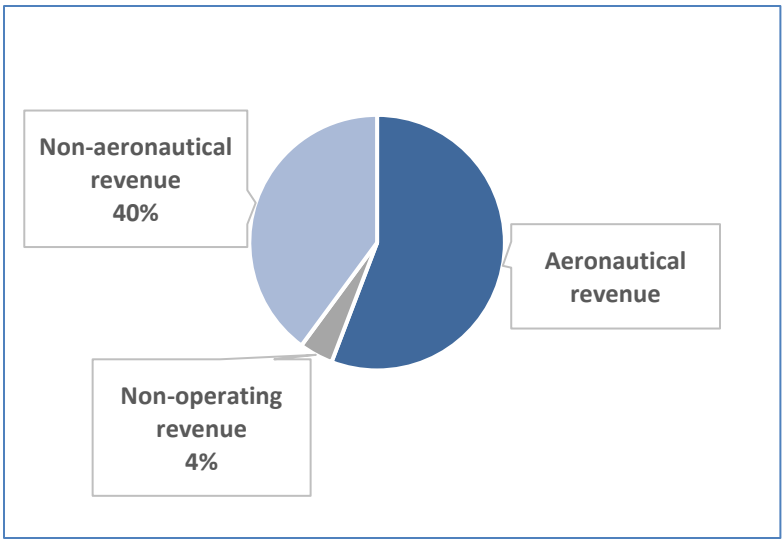
Global airport capital expenditure needs 2021–2040



Source : ACI

Airports worldwide will need to accommodate growing air traffic each year, and it is crucial that airport infrastructure keeps pace with projected growth in demand and capacity needs. According to Airports Council International (ACI) projections, between 2021 and 2040, approximately US$ 2.4 trillion in airport total capital investments will be needed to address the long-term trend in passenger demand. Of this, 30 per cent of capital expenditure needs are for new airport construction, representing US$ 731 billion. Failure to meet projected traffic demand will have real socioeconomic consequences: for example, ACI has predicted that, in 2040, for every 1 000 000 passengers foregone due to airport capacity constraints, the global air transport industry will support 10 500 fewer jobs, resulting in a loss of US$ 346 million in GDP.

World airport revenues in 2019 – US$ 172.2 billion



Source: ACI

Aeronautical and non-aeronautical revenues generated by airports play a crucial role in the development and maintenance of airport infrastructure. Charging schemes should be designed to strike a balance between the interests of airport and aircraft operators. In this regard, ICAO has developed policies on charges for airports and air navigation services, as well as relevant guidance for implementing these policies.

Airports play an important role within their surrounding communities (job opportunities, improved local transport infrastructure, etc.), at the national level (local air connectivity), and at the regional and international levels (hubs, supporting trade). Appropriate expansion and development plans, including efforts to attract additional operators and flights, allow for the maximization of airports' commercial potential and the strengthening of their role as significant drivers and facilitators of regional and global economies.

INVESTMENT IN AIR TRAFFIC MANAGEMENT

The upgrading and modernization of air traffic management (ATM) is vital considering projections for traffic growth and the pressing need for more determined and effective sustainability-related stewardship. In many regions of the world, mid-20th century technology is still being used to direct air traffic, with aircraft needing to zig-zag between ground-based radar posts throughout their journey.

Technology can help to make ATM more efficient by increasing airspace capacity, reducing congestion and delays, improving safety and reducing aviation's environmental impact. Satellite-based surveillance and the tracking of aircraft, for example, will enable surveillance in oceanic and remote areas not currently covered by radar, and, combined with greater automation, will allow planes to safely fly closer together and increase capacity.

Initiatives to invest in the ATM system are observed in different regions. For example, in the Asia and Pacific Region, the upgrading of air navigation services is expected to increase aviation's overall contribution to regional GDP from US$ 470 billion in 2010 to US$ 2.36 trillion by 2030. In Europe, the Single European Sky Air Traffic Management Research (SESAR) 3 Joint Undertaking, in 2023, launched 48 research projects with a view to making air traffic management in Europe smarter and more sustainable. The projects represent a total investment of EUR 350 million by the aviation industry and the European Union through Horizon Europe.[16] In North America, the Federal Aviation Administration (FAA) of the United States, in 2022, started investing the first US$ 1 billion of US$ 5 billion into the country's air traffic control system in order to sustain, repair or replace hundreds of buildings and pieces of equipment. These projects will create jobs for local suppliers, construction workers and communities nationwide.[17]

[16] https://www.sesarju.eu/news/onwards-and-upwards-new-projects-invest-eur-350-million-digital-european-sky
[17] https://www.faa.gov/newsroom/faa-begins-investing-1b-bipartisan-infrastructure-law-funding-air-traffic-control-system

Investment in ATM infrastructure requires a long-term planning horizon, considering the long lead times for procuring new equipment such as air traffic control centres and the latest surveillance equipment. It is the role of States to ensure that improvements in ATM infrastructure are properly financed in collaboration with airports, airlines and ANSPs.

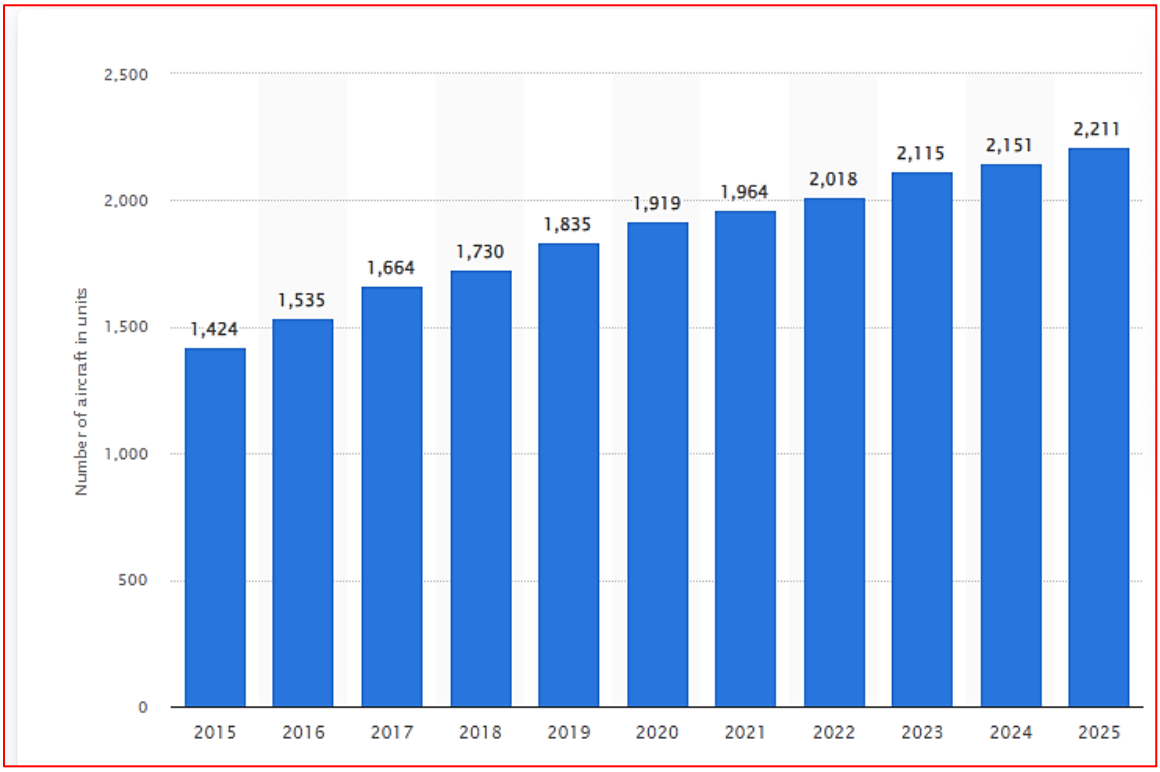
CHANGING AIRCRAFT TRENDS

Over the past decades, large manufacturers have focused on consolidation, while smaller manufacturers have expanded into sizable firms in the short- and medium-range markets. Today's aerospace and aircraft manufacturing industry seeks to produce more efficient aircraft and to expand in order to accommodate demand, while leveraging digital technologies, adopting strategies for sustainable growth, and bolstering supply chain resiliency.

Increased demand for new aviation technologies has resulted in a higher number of aircraft orders. As a result, the air transport industry has established links with research organizations, which have developed quieter, more fuel efficient and powerful engines, and aircraft designs that incorporate new, lightweight materials. On the other hand, the number of aircraft deliveries has been limited and facing delays as a result of the ongoing supply chain disruptions and manufacturers grappling with parts shortages. The delay in aircraft deliveries limits the ability of the industry to deploy capacity to meet the increasing demand, which may have contrasting impact on the growth of air transport and the expansion of air connectivity.

Over the past decades, highly sophisticated aircraft components and equipment, as well as substantial communications improvements, have been introduced, and the continued demand for new technology has nurtured the development of clusters of specialized parts manufacturing worldwide. These growing clusters have created a constant demand for highly skilled technicians and designers from local communities, which has improved the educational, career and wage prospects of residents, and their quality of life.

Projected production of large commercial aircraft from 2015 to 2025



Source: Statista 2023

The aerospace industry is experiencing a technological revolution. For example, an increasing number of electric vertical take-off and landing (eVTOL) aircraft are being developed by aviation companies and start-ups, based on the experiences of legacy original equipment manufacturers (OEMs) or as a means for aviation enthusiasts to explore new forms of mobility. Some of these new aircraft will be ready to enter into service by 2025;[18] however, more work is needed to develop a globally harmonized regulatory framework to support these operations.

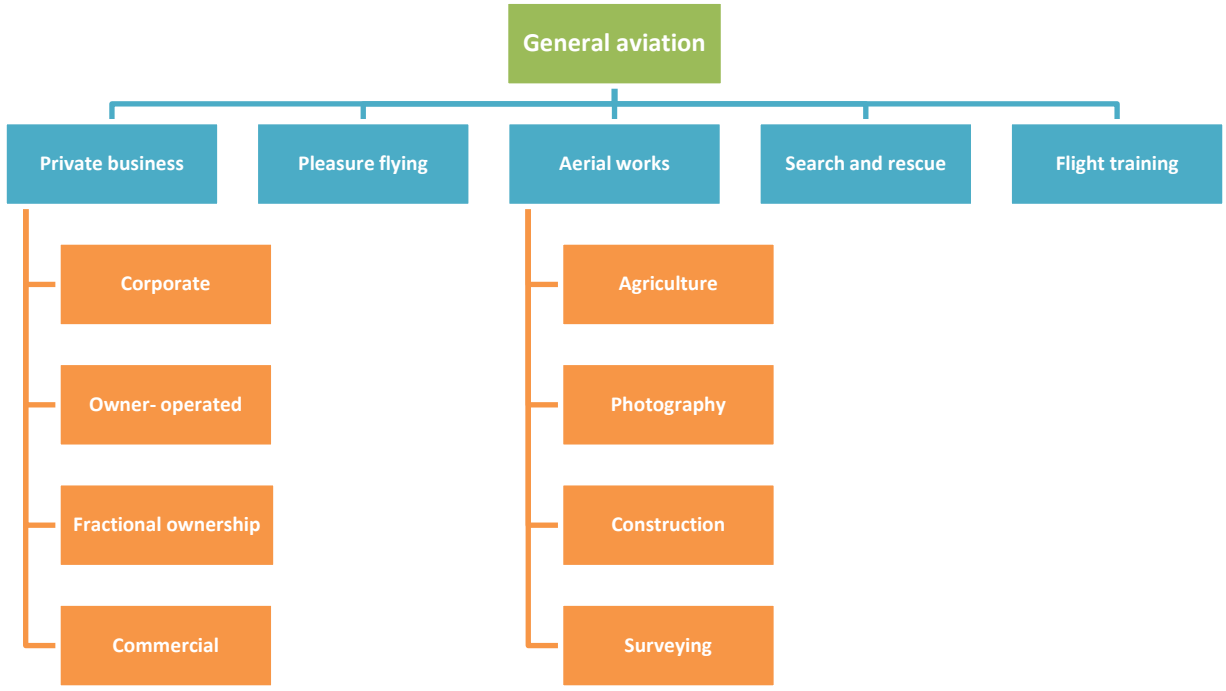
With the aspirational goal of achieving net-zero CO_2 emissions by 2050, the industry is developing innovative designs and sustainable propulsion technologies. Companies are setting targets to reduce greenhouse gas emissions, water waste and energy use as they work towards meeting their interim 2030 sustainability targets.

[18] Challenges and Opportunities for Electric Vertical Takeoff and Landing (eVTOL) Aircraft in South America (icao.int)

ACCESSIBILITY FOR ALL: GENERAL AVIATION

The ICAO *Airport Economics Manual* (Doc 9562) defines general aviation as all civil aviation operations other than scheduled air services and non-scheduled air transport operations for remuneration or hire.

Categories of general aviation

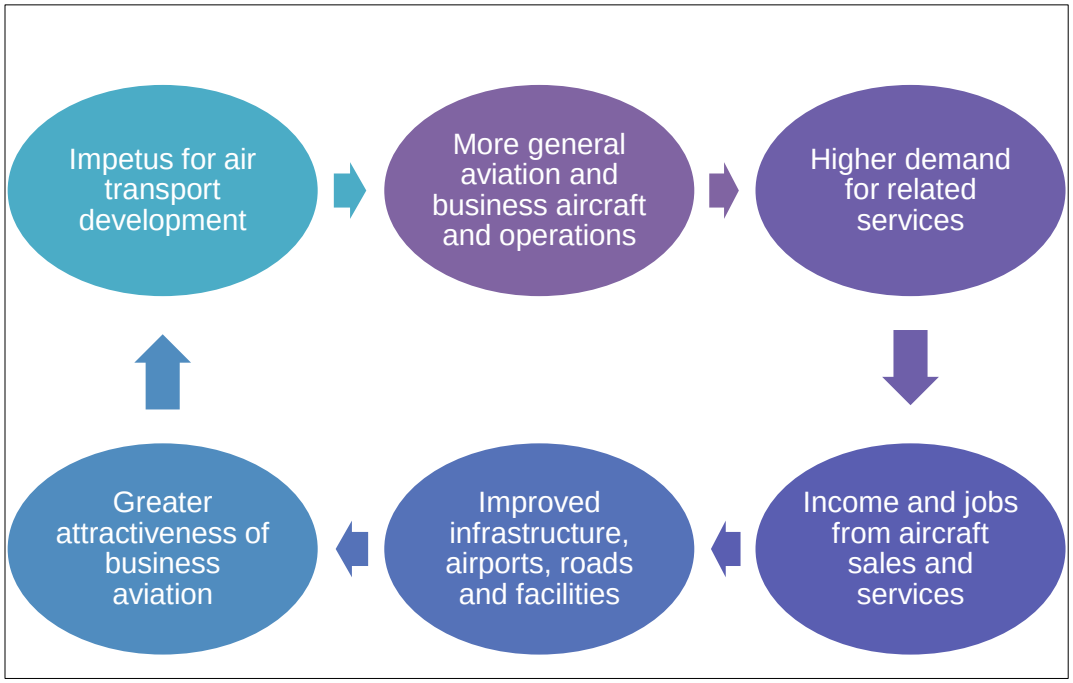


Source: ICAO

General aviation is a vital component of the aviation industry, encompassing a wide range of aircraft and operations, including recreational flying, agricultural work, search, and rescue missions, and essential services such as disaster relief and medical care. The industry supports job creation and generates significant revenue for the global economy, and is often the only option for fast, reliable and flexible air transportation to remote communities, serving as a lifeline for small and medium-sized businesses. A sizeable portion of general aviation also involves non-commercial business aviation, which provides flexibility and efficiency for businesses.

General aviation operations contribute nearly US$ 246 billion to the economy every year.[19] In 2022, overall general aviation shipments and billings saw increases for all aircraft segments, and preliminary aircraft deliveries were valued at US$ 27.4 billion, an increase of 6.3 per cent compared to 2021.[20]

General aviation as a key component of air transport development



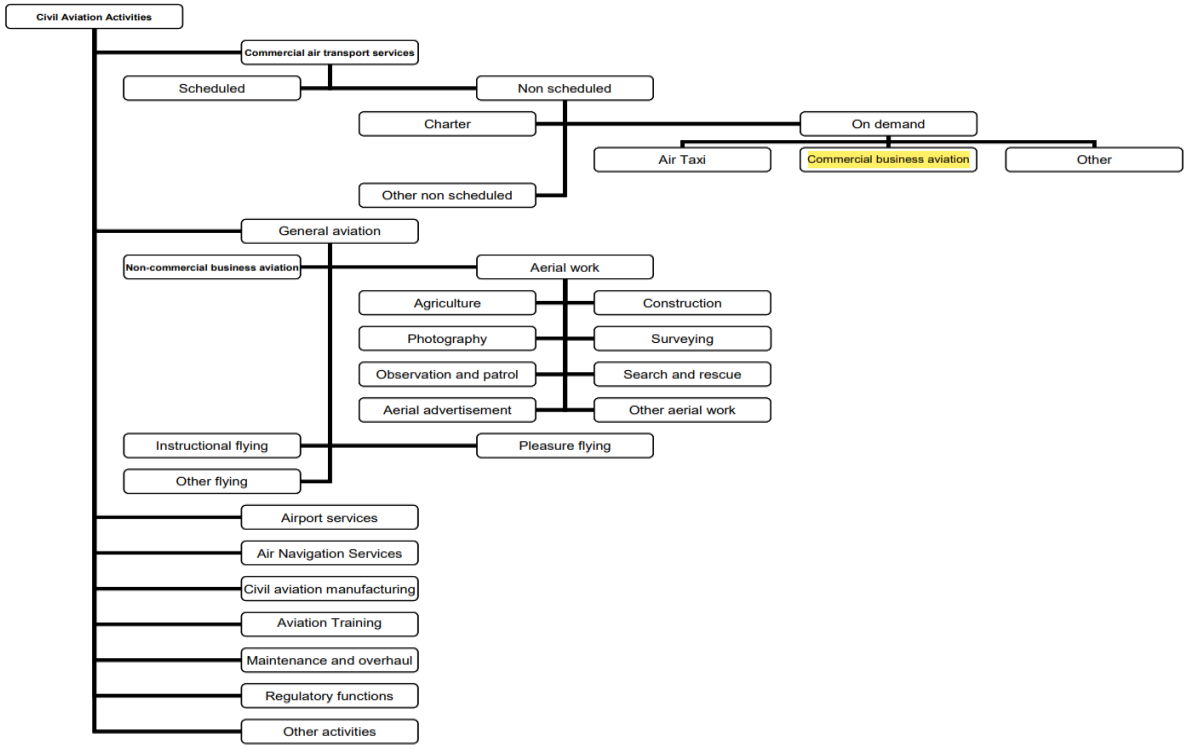
Source: ICAO

[19] The impact — and importance — of general aviation, General Aviation News
[20] 2023 Annual Data, GAMA

COMMERCIAL BUSINESS AVIATION: A PRODUCTIVE BOOSTER

ICAO categorized commercial business aviation as *non-scheduled on demand* civil aviation activity and is another crucial component of the industry. Commercial business aviation plays a vital role in today's economy by providing personalized and flexible transportation options, that bridges the gap between corporate needs and efficient travel. In 2020, Business aviation accounts for 38,000 turbine-powered aircraft flying globally, which together constitute a wide range of more than 21,000 operators.[21]

Classification of civil aviation activities



Source: ICAO

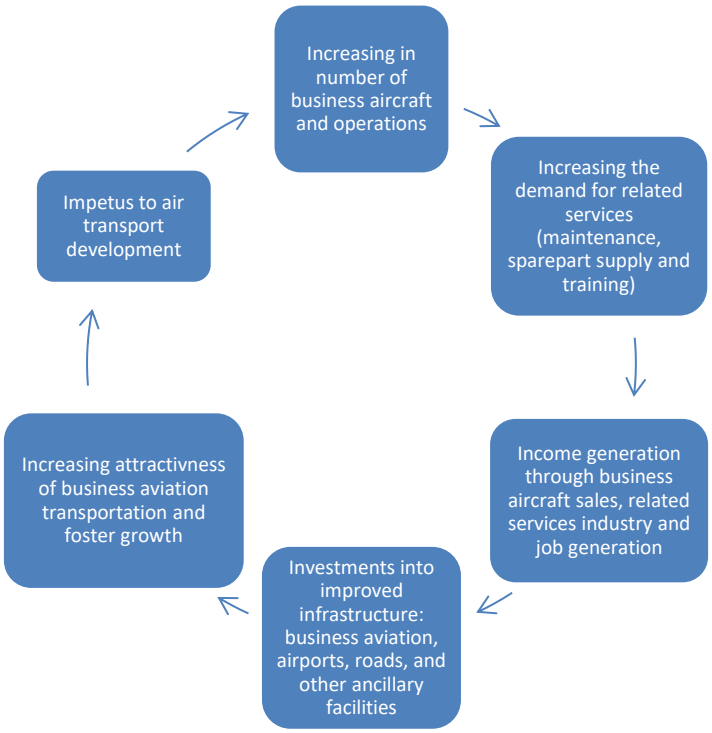
Business aviation is a productive tool for companies to build, operate and manage their business. The majority of business aviation flights is operated by a broad cross-section of entities, including governments, universities, charitable organizations, and private businesses.

The value of the products flexibility is immense, as business aviation users can control virtually every aspect of their travel plans. The business aviation industry brings opportunities for

[21] ANC Talks: How does business aviation contribute to economic and societal development? - Uniting Aviation

economic development and increases productivity of business aviation users. The direct benefits include not only flexible operations, but also time and cost optimization, enhanced corporate security and the possibility of immediate response by business aircraft.

Business aviation provides benefits for every party involved in the value chain of air transport. Any entity in the value chain of the business aviation industry, such as airports, major operators, business aircraft manufacturers, business flight pilots, major service providers and business aviation users, can benefit from growing business aviation traffic and its wider effect on a region.



Source: ICAO

ICAO AND THE DEVELOPMENT OF INTERNATIONAL AIR TRANSPORT

As a specialized agency of the United Nations, ICAO has built 80 years of success in fostering the safe and orderly development of civil aviation worldwide. ICAO works with its 193 Member States and relevant stakeholders to lead international civil aviation as a key driver of social and economic development and environmental sustainability while enhancing aviation safety, security and economic development by advancing air law, developing policies, plans and standards, monitoring and auditing, and supporting States' capabilities.

In an era marked by unprecedented challenges and opportunities, ICAO has developed its new Long-term Strategic Plan for 2026-2050, which will guide our efforts in leading the aviation sector towards a safe, secure and sustainable global aviation system that connects the world for the benefit of all nations and people thereby realizing the vision that has underpinned the Chicago Convention.

To foster air connectivity and the continued development of an economically viable civil aviation system, ICAO:

- contributes to producing a coherent and synchronized global regulatory framework;
- reduces regulatory costs for its 193 Member States, lowers barriers to sustainable growth and provides a forum for maximizing aviation's contribution to development;
- improves States' access to funds for aviation infrastructure;
- assists governments in their oversight of airports and ANSPs;
- promotes the efficient use of resources and technologies, and provides guidance on implementation to ensure a smooth adaptation to changes in civil aviation and global markets;
- researches and implements solutions to overcome infrastructure and airspace capacity constraints, and improves organizational efficiencies and corporate governance;
- encourages greater cooperation and transparency among States and aviation stakeholders;
- produces accurate, reliable and consistent aviation data to improve States' decision-making and accountability;
- develops and improves the availability of tools and forecasts needed to measure and, where possible, predict, the various aspects of civil aviation development;

- offer self-paced online training as well as joint training course in partnership with industry organizations on air transport economics, economic regulation and oversight, and airport charges; and
- provide capacity building support to States to enhance their implementation of ICAO's policies in the economic area of air transport.

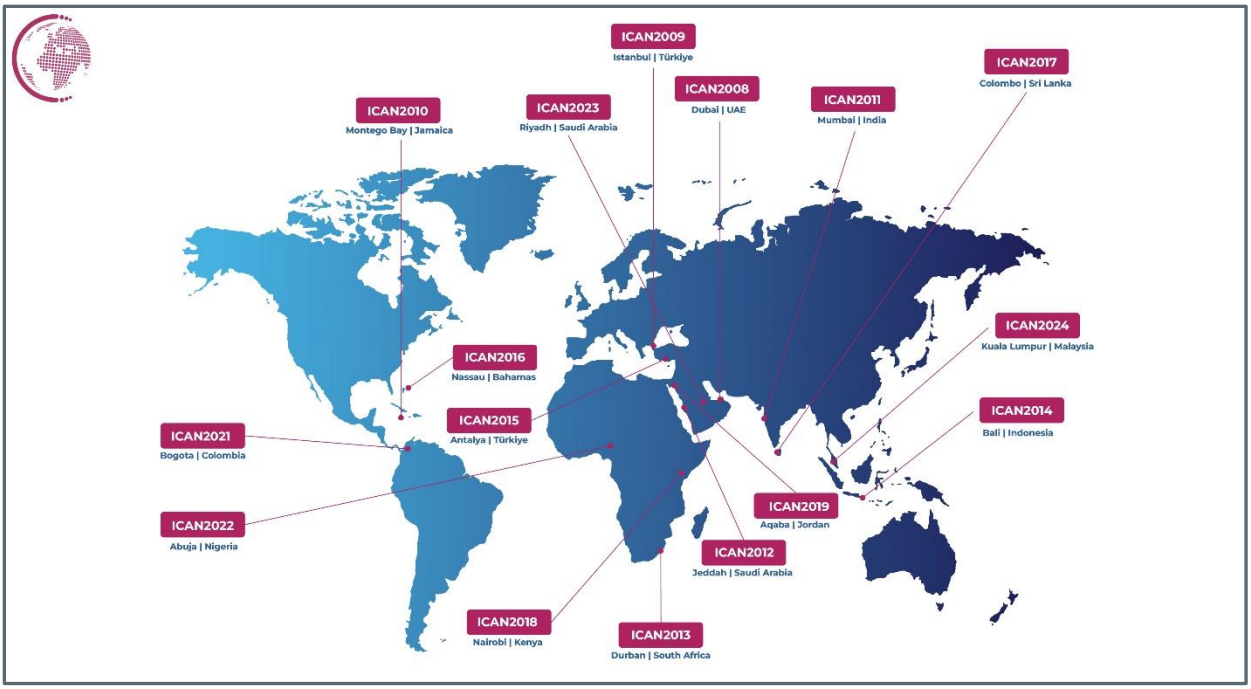
AIR TRANSPORT POLICY AND REGULATION

The ICAO Air Transport Economic Regulatory Framework programme is central to the Organization's vision of achieving sustainable growth in the international civil aviation system. By promoting greater connectivity, increased consumer choices and benefits, reduced regulatory costs and a more competitive market, ICAO seeks to improve the aviation industry and prepare it for future development.

Under the programme, ICAO develops policies and guidance to harmonize global air transport regulations, provides practical solutions to address emerging global regulatory challenges, and works to enhance the sector's transparency via information dissemination and exchange. Taking into account States' different social, political and economic characteristics, and need for flexibility, ICAO has developed high-level principles on consumer protection and competition.

Additionally, ICAO facilitates governments' air services negotiations and business-to-business networking through the ICAO Air Services Negotiation Event (ICAN), which serves as a global forum for cooperation and joint action.

ICAN events

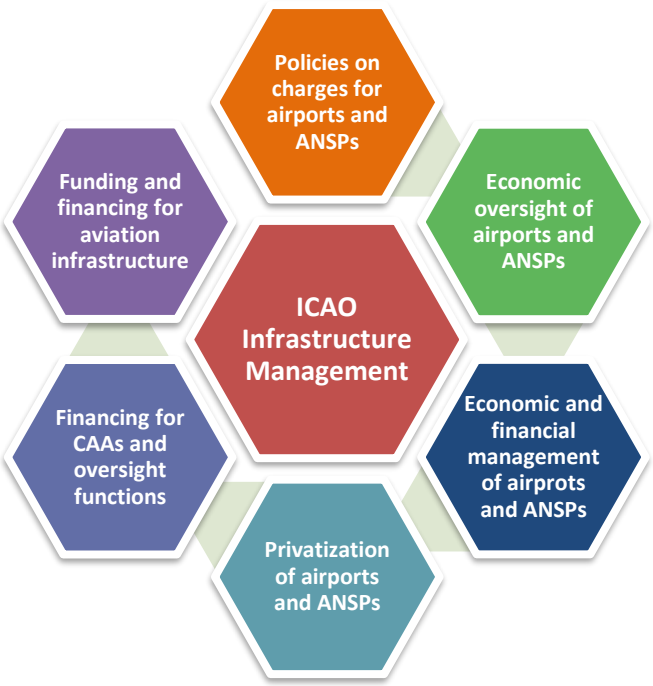


Source : ICAO

AVIATION INFRASTRUCTURE MANAGEMENT

ICAO's infrastructure management programme contributes to the development of a sound and economically viable civil aviation system by promoting the efficient development of aviation infrastructure. As part of these efforts, the Organization provides solutions for the economic and financial management of airport and air navigation services, as well as for the sustainable funding and financing for the modernization and expansion of aviation infrastructure.

Under the programme, ICAO develops policies on charges for airports and air navigation services in relation to the dynamic economic situation of service provision in international civil aviation. It also provides States, airports, ANSPs and regulatory authorities with guidance on the implementation of its policies on charges, as well as guidance on cost recovery for the provision of services and infrastructure financing. In addition, the programme addresses funding and financing aspects of emerging issues such as advanced air mobility (AAM).



The ICAO infrastructure management programme aims to:

- improve the organizational and managerial capabilities of airports and ANSPs;
- reduce the financing burden on governments;
- balance the interests of service providers and users;
- protect the interests of end users;
- allow for early benefits of new technologies; and
- facilitate access to funding for long-term investment needs.

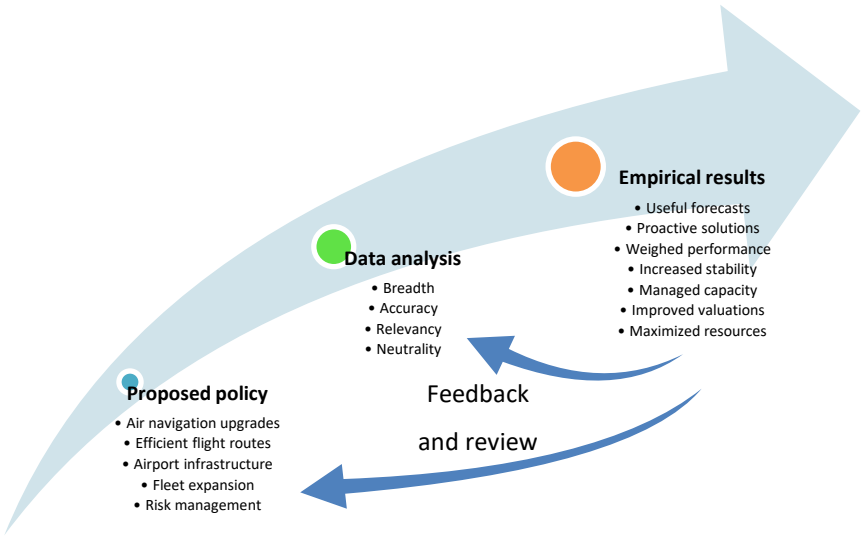
AVIATION DATA AND ANALYSIS

Informed decision-making is the foundation on which successful businesses are built. In a fast-growing industry such as aviation, planners and investors require the most comprehensive, up-to-date and reliable data and analyses. The tasks under the ICAO aviation data and analysis programme are rapidly becoming more predictive and proactive. Since ICAO is a specialized agency of the United Nations, the results remain independent and free of outside influences.

The aviation data and analysis programme provides accurate, reliable and consistent figures to facilitate projections, control costs and risks, improve business valuations, react to current and potential shocks, and benchmark performance. It also provides analytical support for air transport development, efficiency implementation and traffic forecasts, as well as measurements of civil aviation's contribution to world and national GDP, economic sectors such as tourism and trade, and social welfare.

These analyses are expected to drive policy-making in key areas such as:

- economic environmental analysis;
- regional and global infrastructure planning; and
- aviation's economic impact on the State.



Source: ICAO

ICAO VOLUNTARY AIR TRANSPORT FUND

The Voluntary Air Transport Fund allows ICAO to improve its service to the global community by expanding beyond its regular scope and budget and serving a greater need for information, analysis and guidance.

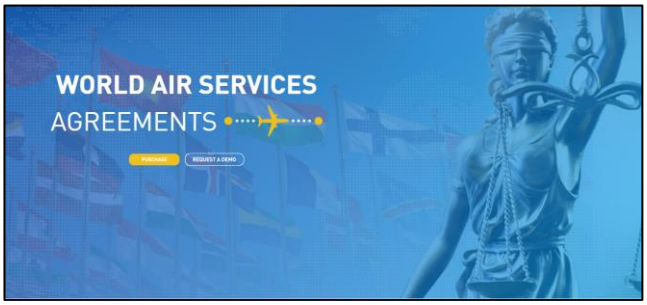
States and other donors are encouraged to contribute to the Fund. The contributions will be leveraged to support States in responding to the new and evolving realities of air transport through integrated data, readily accessible information and enhanced guidance. More information can be obtained by contacting ecd@icao.int.

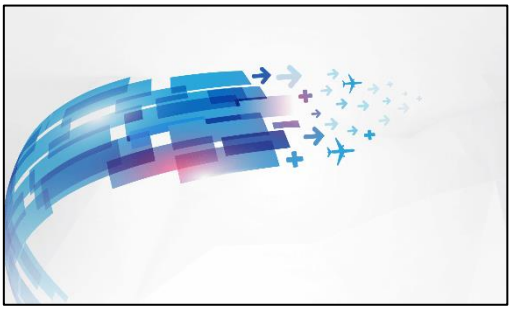
ICAO POLICIES AND GUIDANCE ON AIR TRANSPORT

- Doc 9587 – *Policy and Guidance Material on the Economic Regulation of International Air Transport*
- Doc 8632 – *ICAO's Policies on Taxation in the Field of International Air Transport*
- Doc 9082 – *ICAO's Policies on Charges for Airports and Air Navigation Services*
- Doc 9626 – *Manual on the Regulation of International Air Transport*
- Doc 9562 – *Airport Economics Manual*
- Doc 9161 – *Manual on Air Navigation Services Economics*
- Doc 9980 – *Manual on Privatization in the Provision of Airports and Air Navigation Services*
- Doc 10170 – *Manual on Economic and Financial Analyses for Aviation Infrastructure Projects*

ICAO PRODUCTS

- World Air Services Agreements (WASA)
- ICAO Dashboards
- Aero Tariffs
- ICAO Data+ applications





ICAO TRAINING COURSES ON AIR TRANSPORT

Self-paced online training courses:

- Air Transport Regulation (ATR)
- Air Transport Regulation Issues (ATRI)
- Air Transport Economics (ATE)
- Air Transport Economics for Airport Professionals
- Introduction to Air Cargo Economics

Self-paced Training
Air Transport Economics (ATE)

Self-paced Training
Air Transport Economics for Airport Professionals

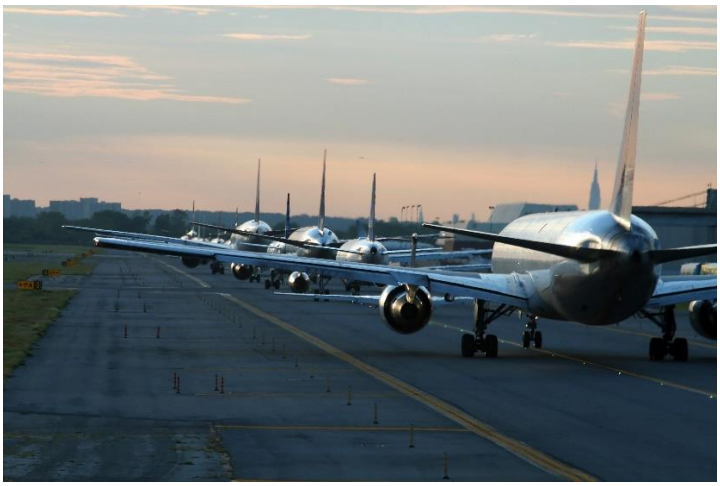
Self-paced Training
Air Transport Regulation (ATR)

Self-paced Training
Air Transport Regulation Issues (ATRI)

More information could be obtained by contacting ecd@icao.int.

Training course in partnership with other organization:

- ✈ Joint ACI - ICAO Training on Airport User Charges



Instructor-led (In-person and Virtual)
ACI - ICAO Airport User Charges
English - 5 Days

More information could be obtained by contacting ecd@icao.int.

SUMMARY

Aviation makes the dream and desire of being able to fly a reality. It is in the business of connecting people, overcoming oceans and borders, and generating significant economic growth and creating jobs. The vast worldwide connectivity that air transport provides is essential for global business and is at the centre of development of international tourism and trade.

Aviation also supports the expansion of the ability of local communities and businesses to access foreign supplies and markets. It plays an essential role of linking many coastal areas and communities in hinterland, many of which are not easily accessible by any other means of transportation. Air Transport provides invaluable opportunities for cultural and social exchange; and enhances emergency and humanitarian response capabilities during crises, and public health emergencies.

Both air passenger traffic and air cargo traffic are projected to more than double in the next two decades. This growth holds tremendous potential socio-economic benefits and at the same time presents enormous challenges and opportunities for international civil aviation as it strives to accommodate the increased demand. ICAO has developed its new Long-term Strategic Plan for 2026-2050, which lays out an ambitious agenda to guide its efforts in leading the sector towards a safe, secure and sustainable global aviation system that connects the world for the benefit of all nations and people, leaving no country behind.

The future of aviation is dependent upon a vibrant economy, regulatory regimes, infrastructure modernization and technological advancement. ICAO is committed to work with Member States and all aviation stakeholders to harmonize economic policies, improve air connectivity and modernize infrastructure for a sound and economically viable civil aviation system, which forms the basis of sustainable global economic development.

— END —