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CAPACITY AND EFFICIENCY

AIR NAVIGATION CAPACITY AND EFFICIENCY'S CONTRIBUTION TO THE SUSTAINABLE DEVELOPMENT GOALS (SDGS)

This Strategic Objective is focused primarily on upgrading air navigation and aerodrome infrastructures and developing new routes and procedures to optimize the aviation system and fuel performance. The Global Air Navigation Plan ([GANP](#)) outlines the key activities for global aviation.

The mapping below correlates Air Navigation Capacity and Efficiency activities and deliverables contained in the ICAO Business Plan with the supporting targets of the Sustainable Development Goals ([SDGs](#)). Air Navigation Capacity and Efficiency related activities contribute to 11 out of 17 SDGs and relevant supporting targets.



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AIR NAVIGATION CAPACITY AND EFFICIENCY'S CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOAL 2:

End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Supporting Target(s): 2.1

ICAO Activity

ICAO seeks to ensure the delivery of efficient and comprehensive air navigation services through globally planned initiatives as outlined in the Global Air Navigation Plan ([GANP](#)). The 13th Air Navigation Conference in 2018 developed recommendations across a wide range of technical subjects and agreed to strategies to guide the development and implementation of the GANP. The new version of the GANP takes a more holistic approach towards our aviation systems and provides a roadmap to increase air navigation capacity and efficiency to accommodate rapid growth yet, at the same time, mitigate the risks associated with the operation of more aircrafts within a fixed amount of airspace. The modernization and harmonization of the global air traffic management system improves reliability of flight operations that contributes to SDG 2 by significantly improving accessibility to remote areas and therefore facilitating urgent access to sufficient food to all people, particularly those in vulnerable situations, all year round.

Unmanned aircraft systems (drones) offer multiple applications, some of which go beyond basic surveillance, photography, or videos. For example, unmanned aircraft systems (UAS) and artificial intelligence are being used to improve food quality during crop production or to collect soil samples which will support precision agriculture. While the UAS can bring change in the way we do business to support SDG 2, due regulations are required to fully unleash their potential so that they operate in a safe, secure, efficient and environmentally responsible manner. ICAO - as platform of States for international aviation and through its convening power (e.g. Global Remotely Piloted Aircraft System Symposium and Unmanned Aircraft Systems Industry Symposium) - is ideally positioned to support the development of scalable and interoperable provisions that will accommodate the rapid pace of technological advancement in unmanned aircraft systems.

ICAO supports States' rapid and coordinated response to emergencies through the implementation of its crisis response policy and disaster risk reduction strategy in aviation. ICAO provides urgent assistance to States in the development of contingency plans and measures that ensure the safe and continuous availability of airspace to conduct international civil aviation operations. These activities contribute to SDG 2 by facilitating the delivery of food to all people in the case of an emergency, crisis or disaster, particularly those in vulnerable situations.



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AIR NAVIGATION CAPACITY AND EFFICIENCY'S CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOAL 4:

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Supporting Target(s): 4.4

ICAO Activity

ICAO has numerous training and events focused on assisting States in implementing ICAO Standards and Recommended Practices ([SARPs](#)), policies and programmes. The following activities contribute to SDG 4 by increasing the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship in the world of aviation. ICAO supports human resources development strategies established by Member States to ensure their access to a sufficient number of competent personnel to operate the air transport system based on international standards for all its Strategic Objectives, including Safety. ICAO training activities encompass training development and delivery of courses in areas in which ICAO has intellectual property, such as Global Plans and SARPs, and are accomplished through the TRAINAIR PLUS Programme, ICAO's network of recognized training organizations and industry partners. An ICAO Training Catalogue listing courses under specialized training areas, including air navigation services, is available at <https://www.icao.int/training/Pages/Training-Catalogue.aspx>. ICAO also convenes global and regional aviation training events to exchange best practices in aviation training, discuss opportunities to enhance human resources development, and identify new effective training tools and techniques by leveraging the abundance of data collected to provide optimal training solutions for the future (e.g. Global Aviation Training and TRAINAIR PLUS Symposium). Such efforts contribute to the provision of quality education and promotion of lifelong learning opportunities to all.

ICAO is also supporting SDG4 through its Next Generation of Aviation Professionals Programme ([NGAP](#)) that aims at ensuring that enough qualified and competent aviation professionals are available to operate, manage and maintain the future international air transport system. ICAO is partnering with the United Nations Educational, Scientific and Cultural Organization ([UNESCO](#)), International Labour Organization ([ILO](#)), the International Telecommunication Union ([ITU](#)) and [UN Women](#) to jointly support the NGAP Programme. ICAO and its stakeholders have set up structures and mechanisms to further the work of the Programme.



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AIR NAVIGATION CAPACITY AND EFFICIENCY'S CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOAL 5:

Achieve gender equality and empower all women and girls

Supporting Target(s): 5.5; 5.c

ICAO Activity

ICAO's Gender Equality Programme aims at promoting participation of and enhanced representation of women at all professional posts and higher levels of employment in the global aviation sector. The Programme also urges States, regional and international aviation organizations and the international aviation industry to demonstrate strong, determined leadership and commitment to advance women's rights and to take the necessary measures to strengthen gender equality. In 2018, the South African Civil Aviation Authority (SACAA) and ICAO hosted the first ever [Global Aviation Gender Summit](#). This gathering was supported by the Government of the Republic of South Africa, through the Department of Transport. The Summit was co-organized by SACAA and ICAO, in collaboration with [UNESCO](#). [UN Women](#) supported the development of the Summit's programme. The Summit concluded with the adoption of a communique detailing a set of concrete actions that will advance the implementation of Assembly Resolution A39/30 and globally accelerate gender equality as well as empower women throughout the aviation sector.

ICAO collaborates with Member States, aviation industry partners and professional associations, academia, and United Nations International Organizations on programmes and projects to attract young girls to aerospace and to assist in providing career development opportunities to women working in aviation by undertaking professional assignments at ICAO through which they are able to contribute to specific aspects of the Organization's technical work programmes. These principles are also embedded in the Next Generation of Aviation Professionals Programme ([NGAP](#)). ICAO also hosts networking and promotional events aimed at raising awareness for gender in aviation and the advancement of talented women within the global aviation community. These efforts contribute to SDG 5 by promoting equal leadership opportunities for women and encouraging their full participation in aviation.



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AIR NAVIGATION CAPACITY AND EFFICIENCY'S CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOAL 7:

Ensure access to affordable, reliable, sustainable and modern energy for all

Supporting Target(s): 7.3

ICAO Activity

ICAO seeks to ensure the delivery of efficient and comprehensive air navigation services through globally planned initiatives as outlined in the Global Air Navigation Plan ([GANP](#)). Considerable progress has been achieved with respect to operational improvements, for instance by realizing more efficient take-offs and landings using Performance-based Navigation ([PBN](#)), bringing increased flexibility in our approach to airspace use and route design, and by minimizing congestion around through improved Air Traffic Flow Management. The modernization and harmonization of the global air traffic management system, including the implementation of Performance-based Navigation ([PBN](#)) generates significant benefits which contribute to SDG 7 by improving energy efficiency.



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AIR NAVIGATION CAPACITY AND EFFICIENCY'S CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOAL 8:

Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Supporting Target(s): 8:2

ICAO Activity

ICAO seeks to ensure the delivery of efficient and comprehensive air navigation services through globally planned initiatives as outlined in the Global Air Navigation Plan ([GANP](#)). The modernization and harmonization of the global air traffic management system includes the implementation of Performance-based Navigation ([PBN](#)), optimization of airspace and airport usage as well as departure and arrival rates in all meteorological conditions, improved en-route efficiency operations, enhanced efficiency of terminal control area (TMA) and surface operations in particular at congested aerodromes, and the implementation of operational improvements to reduce fuel burn. These actions create more capacity in the airspace contributing to SDG 8 by promoting higher levels of economic productivity through technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors. The 13th Air Navigation Conference in 2018 developed recommendations across a wide range of technical subjects and agreed to strategies to guide the development and implementation of the GANP. The new version of the GANP takes a more holistic approach towards our aviation systems and provides a roadmap to increase air navigation capacity and efficiency to accommodate rapid growth yet, at the same time, mitigate the risks associated with the operation of more aircrafts within a fixed amount of airspace.

ICAO leads the Next Generation of Aviation Professionals Programme ([NGAP](#)) that ensures that enough qualified and competent aviation professionals are available to operate, manage and maintain the future international air transport system. This initiative contributes to SDG 8 by promoting higher levels of economic productivity and decent employment for all, particularly the youth.



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AIR NAVIGATION CAPACITY AND EFFICIENCY'S CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOAL 9:

Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Supporting Target(s): 9.1; 9.2; 9.4; 9.5; 9.a

ICAO Activity

ICAO seeks to ensure the delivery of efficient and comprehensive air navigation services through globally planned initiatives as outlined in the Global Air Navigation Plan ([GANP](#)). The modernization and harmonization of the global air traffic management system includes the implementation of Performance-based Navigation ([PBN](#)), optimization of airspace and airport usage as well as departure and arrival rates in all meteorological conditions, enhanced efficiency of surface operations, in particular at congested aerodromes. These actions contribute to SDG 9 by promoting the development of quality, reliable, sustainable and resilient infrastructure or fostering its upgrade to make them more sustainable, by promoting inclusive and sustainable industrialization, by enhancing scientific research and by upgrading the technological capabilities of air transport sector in all ICAO Member States, especially in developing countries. The 13th Air Navigation Conference in 2018 developed recommendations across a wide range of technical subjects and agreed to strategies to guide the development and implementation of the GANP. The new version of the GANP takes a more holistic approach towards our aviation systems and provides a roadmap to increase air navigation capacity and efficiency to accommodate rapid growth yet, at the same time, mitigate the risks associated with the operation of more aircrafts within a fixed amount of airspace.

ICAO also supports innovation across the aviation industry forging consensus around new mechanisms for the safe, secure and trusted exchange of critical aviation information amongst all pertinent stakeholders. This is going to be accomplished by the use of already existing global networks such as the Internet with specific standards, procedures and processes to guarantee the confidentiality, integrity and availability of the information being exchanged attending the levels of safety already agreed by the aviation community and accepted by the civil society.

Unmanned aircraft (UA) commonly referred to as “drones” are anticipated to support the development of goods delivery business models, in particular online sale of products and food; inspection of infrastructure and land; monitoring of people, agriculture and the environment; as well as medical logistics and humanitarian activities to name a few. ICAO is both responding to innovations from industry and focusing attention on the need to address the safe, secure and efficient insertion of new types of aircraft (e.g. “drones” and “flying taxis”) accompanied by the introduction of new types of operators and operations. Regarding so-called “urban air mobility” infrastructure, tops of parking garages, existing aerodromes and heliports, and even unused land surrounding highway interchanges could form the basis of a distributed network of dedicated operating sites for “flying taxis”. As the concept for these activities mature, ICAO will continue to facilitate dialogue and cooperation between regulators and industry stakeholders to assist decision-makers in planning for the safe and efficient integration of these new operations within urban ecosystems, which contribute to SDG 9.



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AIR NAVIGATION CAPACITY AND EFFICIENCY'S CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOAL 10:

Reduce inequality within and among countries

Supporting Target(s): 10.3

ICAO Activity

Air navigation capacity and efficiency contributes to the sustainable development of the international civil aviation system. ICAO seeks to ensure the delivery of efficient and comprehensive air navigation services through globally planned initiatives as outlined in the Global Air Navigation Plan ([GANP](#)). The 13th Air Navigation Conference in 2018 developed recommendations across a wide range of technical subjects and agreed to strategies to guide the development and implementation of the GANP. The new version of the GANP takes a more holistic approach towards our aviation systems and provides a roadmap to increase air navigation capacity and efficiency to accommodate rapid growth yet, at the same time, mitigate the risks associated with the operation of more aircrafts within a fixed amount of airspace.

At the recommendation of its Council, ICAO launched the No Country Left Behind ([NCLB](#)) initiative to assist States that continue to face challenges in effectively implementing these SARPs policies, and plans, such as the [GANP](#). The NCLB is implemented through ICAO's day-to-day operations by focusing and expanding assistance so that all States have an equal opportunity for development.

This initiative contributes to SDG 10 in reducing inequalities by promoting appropriate legislation, policies and action for the sustainable and efficient development of an air transport system. These actions are aimed at enabling the sustainable growth of the sector and its associated socio-economic benefits.



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AIR NAVIGATION CAPACITY AND EFFICIENCY'S CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOAL 11:

Make cities and human settlements inclusive, safe, resilient and sustainable

Supporting Target(s): 11.2; 11.3; 11.a; 11.b

ICAO Activity

ICAO seeks to ensure the delivery of efficient and comprehensive air navigation services through globally planned initiatives as outlined in the Global Air Navigation Plan ([GANP](#)). The implementation of the [GANP](#) enables optimized departure and arrival rates in varied meteorological conditions, airspace and airport usage through balancing demand vis-a-vis capacity and implementation of flexible use of airspace ([FUA](#)) and surface operations, in particular at congested aerodromes. These operational improvements contribute to SDG 11 by providing safe, accessible and sustainable transport systems for all especially those in vulnerable situations as well as by enhancing inclusive and sustainable urbanization. The linkages of sustainable aviation development with the [New Urban Agenda](#) along with the effective implementation of the [GANP](#) contribute to this SDG by strengthening of national and regional development planning.

The concentration of population, economic activities, social and cultural interactions in metropolitan areas has a potential positive implication on the growth and development of air transport and cities. It is with this understanding that ICAO and [UN-Habitat](#) forged a partnership specifically examining the synergies between sustainable airports and urban development. The outcome of this partnership was a [joint study report](#) finalized in 2018 titled "Promoting Synergy between Cities and Airports for Sustainable Development". This report reflects in general terms the coordination of activities concerning facilitation, safety and security, airport emergency procedures and response, and the management of air navigation facilities installed in the local area and flight safety in the local airspace.

ICAO supports States' rapid and coordinated response to emergencies through the implementation of its crisis response policy and disaster risk reduction strategy in aviation. ICAO provides urgent assistance to States in developing contingency plans and putting measures in place to ensure the safe and continuous availability of airspace for the conduct of international civil aviation operations when disasters occur. These actions contribute to SDG 11 by facilitating the adoption and implementation of integrated policies that will support populations affected by disasters, in line with the Sendai Framework for Disaster Risk Reduction, thus reducing their impacts and increasing States' resilience.



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AIR NAVIGATION CAPACITY AND EFFICIENCY'S CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOAL 13:

Take urgent action to combat climate change and its impacts

Supporting Target(s): 13.1; 13.2

ICAO Activity

Considerable progress has been achieved with respect to operational improvements, for instance by realizing more efficient take-offs and landings using Performance-based Navigation ([PBN](#)), bringing increased flexibility in our approach to airspace use and route design, and by minimizing congestion around through improved Air Traffic Flow Management. All of these advances support SDG 13.

Scientists around the globe, in their efforts to collect data and monitor the impacts on the environment related to climate change, are increasingly using unmanned aircraft. ICAO has supported these activities through development of regulatory guidance for civil aviation authorities to facilitate their responsibilities in conducting or authorizing unmanned aviation.

ICAO supports States' rapid and coordinated response to emergencies through the implementation of its crisis response policy and disaster risk reduction strategy in aviation. ICAO provides urgent assistance to States in putting measures in place to ensure the safe and continuous availability of airspace for the conduct of international civil aviation operations when disasters occur. These actions contribute to SDG 13 by supporting populations affected by disasters and directly strengthening States' resilience and adaptive capacity to natural disasters and climate related hazards.

ICAO also assists States in the development of impact assessments on operational improvements for the reduction of fuel burn. This action contributes to SDG 13 by fostering the integration of climate change measures into planning strategies of States.



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AIR NAVIGATION CAPACITY AND EFFICIENCY'S CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOAL 16:

Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Supporting Target(s): 16.1; 16.3; 16.10

ICAO Activity

The development of global standards and policies pertaining to global flight tracking and conflict zone risks as well as use of small unmanned aircrafts contribute to SDG 16 by reducing violence and related death rates around the world. Small unmanned aircraft are increasingly used to monitor at-risk societies; to collect data to be used in humanitarian/emergency response; as well as to support delivery of life-saving aid; and to establish land use and mapping surveys.

The functions of the Secretariat of the organization in the legal field, include the provision of legal advice and assistance to ICAO Member States, and the governing bodies of the Organization, the President of the Council and the Secretary General; research and studies in international air law to promote its codification and development; and assistance to the Council in the settlement of disputes between Member States. It also executes depositary and treaty registration functions in relation to certain international agreements which ensures public access to information. In carrying out these functions, ICAO contributes to SDG 16 by promoting the rule of law at the national and international level.



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AIR NAVIGATION CAPACITY AND EFFICIENCY'S CONTRIBUTION TO SUSTAINABLE DEVELOPMENT GOAL 17:

Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

Supporting Target(s): 17.6; 17.8; 17.9; 17.13; 17.14; 17.15; 17.16; 17.17; 17.18; 17.19

ICAO Activity

Following the strategic direction of its Global Air Navigation Plan ([GANP](#)), ICAO guides its Member States on sustainable air transport development between 2016–2030 by leveraging existing technologies and anticipating future developments based on State/industry agreed operational objectives. The operational improvements contained in this plan are accomplished through close coordination among global, regional and national partners as well as through the necessary mobilization and sharing of knowledge, expertise, technology and financial resources.

At the regional level, ICAO supports the development of regional plans for air navigation systems, on the basis of [GANP](#), and the assessment of the progress made is undertaken by six planning and implementation regional groups ([PIRGs](#)). ICAO also reports on the implementation of the [GANP](#) through the [Global](#) and Regional Air Navigation Reports.

The implementation of the [GANP](#) and the international support for the prioritization of aviation contributes to SDG 17 by enhancing policy coordination and coherence while ultimately respecting each country's policy space. ICAO also promotes the optimization of airspace and airport usage through capacity balancing and flexible use of airspace and assists States in implementing relevant policies in close collaboration with the industry. ICAO also assists States in identifying prospective donors and integrating aviation, including air navigation capacity and efficiency improvements, in their national development frameworks. In this respect ICAO developed guidance to support a national aviation planning framework aimed at providing those responsible for sustainable development within a Civil Aviation Authority and other governmental entities with the context required to ensure that all relevant aspects of aviation are included in the strategic planning processes. In coordination with the International Telecommunication Union ([ITU](#)), ICAO also defends the [aeronautical frequency spectrum](#). These activities mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the SDGs in all countries, in particular developing countries.

ICAO is leading actions to face emerging challenges to the aviation sector, including the implementation of a Strategy on Disaster Risk Reduction and Response Mechanisms in Aviation which is closely coordinated with global and regional partners and is supported by the mobilization and sharing of necessary knowledge, expertise, technology and financial resources. The development of provisions to mitigate cyber security risks that may affect air navigation services enhances the use of information and enabling technology.

ICAO leads and participates in numerous partnerships and resource mobilization strategies to assist States addressing air navigation capacity and efficiency needs. This is done through close cooperation with Civil Aviation Authorities and non-State entities involved in civil aviation and by continuously exploring additional sources of funding for technical cooperation and technical assistance projects. The organization thus mobilizes resources from multiple sources and involving multiple stakeholders, including [public- private partnerships](#). The Secretariat developed a Partnership Framework with the aim to provide guidance on the policies, processes and procedures related to ICAO partnership activities in support of the SDGs. ICAO also runs the ICAO Programme for Aviation Volunteers ([IPAV](#)).

Fostering international and regional partnerships and cooperation on air navigation capacity and efficiency contributes to SDG 17 by promoting access to science, technology including environmentally sound technologies and innovation by all and especially in least developed countries. ICAO makes available publications, periodicals and including Annexes, Circulars, the ICAO Journal, and manages <http://www.unitingaviation.com/>. These actions promote international cooperation to foster access to science, technology and innovation and enhance knowledge sharing.

