

The Eco-Airport Toolkit e-Collection

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Introduction

Airports have a critical role to play in the sustainable development of the aviation eco-system. Understanding the importance of this role, the airport industry committed to reach net zero carbon emission by 2050 in June 2021. Concurrently, the 31st ACI World Annual General Assembly approved a Resolution that supports the integration of sustainability at the core of airports' business strategies.²

With the devastating impacts of the COVID-19 pandemic, most sectors have had to rethink business strategies and models. Sustainability is no longer an option that is 'nice to have' – it must be an integral part of every facet of an organization. On one hand it is the right thing to do, and on the other, stakeholders are expecting it: customers, passengers, shareholders, investors, regulators, and governments, are looking at airports and expecting them to reduce their environmental impacts and increase socioeconomic benefits.

Airports have been working tirelessly to limit and repair the economic damages brought on by the pandemic, while also ensuring and promoting the wellbeing of employees and passengers and delivering positive impacts on the communities they serve.

Innovation is taking place around the globe as airports seek to expand the services they can provide to customers while ensuring their activities align with the social, environmental, and economic pillars of sustainability. Creative solutions have been seen in airport sustainability, making facilities

resilient to climate impacts, reducing fuel burn through operational efficiencies, and much more.

The Eco-Airport Toolkit

In order to amplify the benefits of this innovation, ICAO established a task group to identify examples of airport environmental leadership and share these successes worldwide. This Eco-Airport Toolkit task group sits under Working Group 2 – Airports and Operations, within ICAO's Committee on Aviation Environmental Protection (CAEP). The Eco-Airport Toolkit E-collection is a series of short publications accessible from ICAO's Environment website that have a quick turnaround between report production and dissemination.³ The papers in the toolkit are a set of practical and ready-to-use information documents to support the planning and implementation of airport infrastructure projects that promote significant environmental benefits.

To date, seven papers have been published on the website, each focused on a specific example of environmental planning at airports. Most of the papers also include case studies that provide real-life examples to illustrate the topics. The e-collection began during the CAEP/11 cycle with four e-publications:

1. A Focus on the production of renewable energy at the Airport site
2. An Environmental Management System for Airports
3. Waste Management at Airports
4. The Eco Design of Airport Buildings

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² ACI World renews its commitment to the sustainable development of the aviation ecosystem at 31st WAGA, 25 November, 2021. Online: <https://aci.aero/2021/11/25/aci-world-renews-its-commitment-to-the-sustainable-development-of-the-aviation-ecosystem-at-31st-waga/>.

³ See: <https://www.icao.int/environmental-protection/Pages/Ecoairports.aspx>

Website analytics showed these pages were among the most accessed on the ICAO system. As a result, the CAEP/11 meeting approved another four e-publications to be developed in the CAEP 12 cycle (2019-2021), on the following topics:

1. Climate Resilient Airports
2. Water Management at Airports
3. Air Quality Management at Airports
4. Sustainable Considerations for Airport Surface Access

1. Climate Resilient Airports

Climate change presents many challenges for aviation, and the impacts of changing climate are felt at airports worldwide. Strengthening airports to be more resilient to the impacts of climate change has become a major theme of airport planning. A climate resilient airport is one that has taken steps to prepare for the challenges that climate change and severe weather bring. ICAO's Climate Change Synthesis describes at least nine primary climate impacts that can affect airports. Many airports have undertaken a climate risk assessment to understand their vulnerabilities and prioritize, using a number of methods to assess climate risks and develop a plan of action for future improvements and upgrades. The Master Plan is commonly used for planning and offers an excellent format for studying climate resilience actions. Consult this publication for additional resources and guidance on how to assess risks, plan and prioritize facility upgrades, and build resilience to climate impacts. The case studies from Canada, Mexico, France, Netherlands, and others, provide rich detail.

2. Water Management at Airports

Water is a critical resource with many environmental implications. Safe aircraft operation requires effective water management practices. Airports must use water and must be good stewards of water resources at their facility and within their region. Water considerations vary from supply issues, to managing stormwater and storm surge events, to the responsible disposal of water back into the watershed. Airport siting and the design of drainage systems will have a large influence on how efficiently water is managed and used at a facility. Good planning for water management in the initial stages of airport development can significantly reduce potential future environmental

impacts. Airports may choose to follow proven programs, such as the Integrated Water Resources Management (IWRM) approach, or the Water Sensitive Airport framework, to reduce impacts and costs. There are many options to ensure water leaving the facility is clean. Limiting the use of contaminants and pollutants is a major first step. Good management of de-icing fluids during operations is another, along with proper spill prevention and effective on-site water treatment facilities. Many areas have regulations that require water quality monitoring and sampling on a regular basis, and airports can save time and money if it is accomplished efficiently and easily. Examples of good practices come from Malaysia, China, India, Cambodia, Canada, Brazil, Spain, and Portugal.

3. Air Quality Management

Air quality is one of the most important environmental issues for airport operators. Aircraft engine emissions are a large source of air pollutants, however emissions also come from power generation, motor vehicles and ground support vehicles, fuel handling and storage, and other sources. Air quality is often regulated by states, and a systematic air quality management plan can help reduce major sources of pollutants while also helping the operator successfully meet their regulatory compliance requirements. Several options exist to improve local air quality, from technological changes like electrifying vehicles, to more efficient airfield operations that reduce fuel burn. A valuable first step towards managing emissions is to have an inventory of emission sources at the airport. With this information, a plan can be developed to manage and/or minimize the emissions. Many airports have an air quality management plan that lays out the measures they are taking to improve their local air quality. Innovations at airports in terminal heating and cooling, water management, and waste treatment also have a positive effect on reducing pollutant emissions. Read about examples from Turkey, Australia, India, China, Netherlands, and more. In addition to this publication, several other resources and guidance documents are available, such as the ICAO Document 9889: Airport Air Quality Manual, to facilitate successful airport air quality management, reduce emissions, and improve local air quality.

4. Sustainable Considerations for Airport Surface Access

Customers appreciate convenient, affordable, and accessible means to access and leave the airport. Increasingly, they also expect airports to operate sustainably. Surface movement to, from, and around the airport is critical, but it also has several environmental impacts including water runoff, noise from road and rail traffic, and air pollution. Strategic planning and implementation of surface access is therefore an important consideration for mitigating environmental impacts and bring social and economic advantages. Surface access is also a primary consideration in the airport Master Planning process, which will generally consider the needs for access to the terminal curb, parking, rental car facilities, and other capacity constraints. Several sustainable solutions address the issues associated with airport surface access. For instance, many methods have emerged to reduce driving times at the airport, thereby reducing engine emissions. Where traffic congestion is a problem, creative tactics have been used to reduce the number of single-occupant private vehicle trips and encourage low-emission vehicles. Many airports are also working to improve public transportation connection, in some cases building and operating rail lines themselves. Other considerations include the materials that road surfaces are constructed with and that can make a difference, for example porous asphalt or recycled pavement. In terms of innovation, there are many examples for moving people, bags, and cargo around an airport in a swift and sustainable manner, and new digital tools continue to transform surface access, for example by allowing drivers to find open parking spaces quickly, customers to hail rideshare services, and more. Examples are provided from Belgium, UK, US, France, Switzerland, and Colombia.

Future Developments

While the first part of the Sixth Assessment Report from the IPCC released in 2021 emphasized the increased urgency of taking action to tackle climate change globally, the second part of the report, published in February 2022, assesses the impacts of climate change through ecosystems, biodiversity, and human communities at the global and regional levels. This highlights the pressing need for increased collaboration between all aviation and non-aviation stakeholders. As this ecosystem faces a continuously accelerating pace of change, a systemic approach is crucial. Governments and regulators must recognize and enable the vital role of aviation in the sustainable development of their nations, public-private partnerships need to be more frequent and stimulate innovation. In addition, interconnected sectors such as transport, energy, hospitality, destination management, etc., should work together on finding long-term solutions.

One of the greatest challenges for aviation is decarbonization, something that airports have been, and continue to address with recognized leadership. The Airport Carbon Accreditation programme⁴ and the ACI World global net zero goal by 2050⁵ are excellent demonstration of this commitment. However, more work needs to be done. For instance, by continuing the research on the impacts of integrating new sustainable aviation fuels at the airport or exploring ways to produce renewable energy onsite.

Other essential topics of interest to the airport community include emerging technology aircraft and their environmental and social impacts at and around airports, the protection of biodiversity, and the use of nature-based solutions to mitigate and adapt to climate change.

Finally, the role of innovation and technology should not be underestimated by the industry. Paired with true collaboration and transparency, these two enablers have the potential to help airports and all their stakeholders be more resilient, limit their footprint on the environment, and serve their customers and communities in the best and most sustainable way possible.

4 Airport Carbon Accreditation. Online : <https://www.airportcarbonaccreditation.org/>

5 <https://aci.aero/2021/06/08/net-zero-by-2050-aci-sets-global-long-term-carbon-goal-for-airports/>