

**55th CONFERENCE OF
DIRECTORS GENERAL OF CIVIL AVIATION
ASIA AND PACIFIC REGIONS**

*Denarau Island, Nadi, Fiji
22 — 26 October 2018*

AGENDA ITEM 7: AVIATION AND ENVIRONMENT

CLIMATE CHANGE ADAPTATION FOR AIRPORTS

Presented by Airports Council International

SUMMARY

This paper presents ACI's initiatives to encourage airports to conduct risk or criticality assessments for their operational procedures and existing infrastructure which considers the risks imposed by more adverse weather events and climate change. The meeting will be invited to take note that resilience and adaptation to climate change should be taken into account in airport master and operations planning especially in long-term planning. The meeting is also invited to refer to ACI Resolution 3/2018 "Encouraging Airports to Take Action on Resilience and Adaptation to Climate Change", and ACI policy brief on resilience and adaptation to climate change. The latter lists out a number of possible changes to climate and their potential impact on airport infrastructure and operations.

CLIMATE CHANGE ADAPTATION FOR AIRPORTS

1. INTRODUCTION

1.1 Climate change and global warming are among one of the most pressing issues in the world today. It is a global problem, felt on local scales, that is expected to be around for decades and centuries to come. Carbon dioxide, the heat-trapping greenhouse gas that has driven recent global warming, lingers in the atmosphere for hundreds of years, and the planet takes a while to respond to warming. So even if we stopped emitting greenhouse gases today, global warming and climate change is expected to continue to affect future generations. In this way, humanity is “committed” to some level to not only reduce greenhouse gases emissions, but also to address the impacts of climate change.

1.2 In dealing with the problem of climate change, mankind applies two types of measures: mitigation and adaptation. The first tries to minimize the change; the second attempts to adapt infrastructure and operations to the change given some degree of change is unavoidable.

1.3 Mitigation measures are those actions that are taken to reduce and curb greenhouse gas emissions, while adaptation measures are based on reducing vulnerability to the effects of climate change. Mitigation, therefore, attends to the causes of climate change, while adaptation addresses its impacts.

1.4 ACI has been promoting climate change mitigation with guidance materials, training, greenhouse gas calculation tool (Airport Carbon Emissions Reporting Tool – ACERT), and airport carbon dioxide reduction recognition programme like “Airport Carbon Accreditation”. This paper describes ACI’s initiatives to urge airports to take action on and adaptation to climate change.

2. DISCUSSION

Climate Change adaptation by aviation industry

2.1 ICAO started to work on the topic of climate adaptation a few years ago, with the objective of having better understanding of the science behind the climate change impacts. This led to the adoption of Assembly Resolution A39-2, which requested the ICAO Council to “identify the potential impacts of climate change on international aviation operations and related infrastructure and to identify adaptation measures to address the potential climate change impacts, in cooperation with other relevant international organizations and the industry”.

2.2 The ICAO Council tasked its advisory body on all matters pertaining to international aviation environmental protection, i.e., the Committee on Aviation Environmental Protection (CAEP), to intensify its activities on the topic of climate adaptation, beyond the collection of scientific information. This resulted in an update of the Airport Planning Manual, Part 2 (ICAO Doc 9184), which is expected to be published soon, including a new Chapter 9 on climate adaptation. This chapter is a useful resource for any airport planner or developer who wishes to understand the basic concepts of climate adaptation and get an overview of the potential impacts that would affect airport infrastructure and operations. Case studies on climate adaptation are also included in the update of the ICAO Doc 9184 that has recently been completed and approved by the CAEP.

2.3 Building upon this piece of work, the CAEP/10 meeting in 2016 resolved to develop and submit for approval by the CAEP/11 meeting (February 2019) a Climate Adaptation Synthesis CAEP Report.

Climate Change adaptation by airports

2.4 An airport is a multimodal transport interchange, employment node and essential piece of regional and national infrastructure for the communities it serves. Its infrastructure and operations must have high levels of availability and reliability, therefore, risks and vulnerabilities to ongoing services from short and longer-term threats must be identified including the effects of climate change.

2.5 The effects of climate change could be:

- a) Changes to Seasonal Precipitation, Increased Heavy Precipitation, Thunderstorms (Increased Lightning; Increased Hail) and Rising Sea Level and Storm Surge could have impacts of Access road flooding, and damage of airports infrastructures from direct lightning strikes and hail etc. implying the need for more resilient infrastructure design factors in planning or retrofit;
- b) Increased Temperatures (Higher Averages; Hotter Extremes), Increased/Variable Visibility Restrictions (Fog, Wildfire Smoke) and Wind (Changes in Prevailing Direction; Speed; Microbursts, Tornadoes, Hurricanes; Typhoons) could affect aircraft performance such as climb rate, aircraft maneuver and safest flight path etc. that could require longer or crossed runways or more advanced equipment to assist aircrafts landing and takeoff.

2.6 It is difficult to quantify changes of each climate condition and their impact on airport operations and infrastructure especially for indirect consequences such as change to tourism and seasonal enplanements, but airports should try to establish plans to adapt and allow for expected changes in their master and operations planning base on their own situation, e.g.

- a) Consider higher sea walls for coastal airports.
- b) More frequent interruptions to operation at airport currently already subject to extreme and adverse weather conditions such as thunderstorms, snows, heatwaves because these conditions will be more frequent resulting in more interruptions. Put in place response and recovery plan. Note ACI is writing a handbook on aerodrome operations under adverse weather.
- c) Lower aircraft climb rate on takeoff may necessitate change to flight path and aircraft noise contour.

2.7 All these have potential impacts to airport operations and planning e.g. that could lead to operation impairment or airport closure.

2.8 Against these effects, a risk assessment including a comprehensive list of risks, threats and vulnerabilities to all aspects of the airport business and operation should be drafted and then prioritized. Those with highest priority or prime concern should be addressed first with detailed investigation of mitigation options and assessment of costs and benefits for the solutions which then form part of the resilience plan for the airport and the wider region.

2.9 ACI has completed a policy brief on resilience and adaptation to climate change for their members with a list of possible changes to climate and their impact on airport infrastructure and operations. This policy brief is a response to ACI Resolution 3/2018 Encouraging Airports to Take Action on Resilience and Adaptation to Climate Change. It is expected to continue to raise awareness on the issue and to encourage member airports to proactively assess their vulnerability and risks associated with climate impacts and to take necessary measures to increase resilience and prevent damage to operations and infrastructure. The ACI Resolution highlights that action at an early stage is more effective to ensure business continuity and reduce the risk of potential damages. See attached resolution.

3. ACTION BY THE CONFERENCE

3.1 The Conference is invited to:

- a) note that resilience and adaptation to climate change should be taken into account in airport master and operations planning especially in long- term planning; and
- b) refer to ACI Resolution 3/2018 “Encouraging Airports to Take Action on Resilience and Adaptation to Climate Change”, and ACI policy brief on resilience and adaptation to climate change, the latter listing out a number of possible changes to climate and their potential impact on airport infrastructure and operations.

— END —

RESOLUTION No. 3

ENCOURAGING AIRPORTS TO TAKE ACTION ON RESILIENCE AND ADAPTATION TO CLIMATE CHANGE

The Twenty-eighth ACI World Annual General Assembly:

Reaffirming ACI Resolution No 3/2015, and continued airports' commitment to reduce their greenhouse gas (GHG) emissions and support international efforts on addressing GHG emissions;

Recalling the International Civil Aviation Organization (ICAO) Assembly Resolution A39-2, 19, n) requesting the Council of ICAO to identify the potential impacts of climate change on international aviation operations and related infrastructure and identify adaptation measures to address the potential climate change impacts, in cooperation with other relevant international organizations and the industry;

Recalling that the recently updated ICAO Airport Planning Manual, Part II has a new chapter (9) on Resilience and Adaptation;

Recalling that the United Nations Framework Convention on Climate Change (UNFCCC) recognizes the need to cooperate in preparing for adaptation to the impacts of climate change;

Recalling Article 7 of the Paris Agreement recognizing that the current need for adaptation is significant, and that the Warsaw International Mechanism for Loss and Damage promotes the enhancement of knowledge and understanding of comprehensive risk management approaches to address loss and damage associated with the adverse effects of climate change, including slow onset impacts;

Recognizing that mitigation measures must be continued, and Airport Carbon Accreditation demonstrates the global commitment of airports in doing so; however, adaptation to climate change has also to be incorporated into airport planning, design, construction, renovation and operations;

Recognizing that even with current global mitigation efforts, climate change impacts are expected to occur and transportation systems worldwide, including airports, are at risk;
Recognizing that airports are already being negatively affected by a changing climate, and need to understand and assess the risks associated with rising sea levels and

storm surge, increased intensity and frequency of storms including extreme precipitation and winds, increased temperatures and humidity levels, more extreme floods and droughts, including slow onset impacts;

Noting that several airports have already conducted climate risk or criticality assessments and implemented adaptation plans;

Noting that assessing possible impacts in advance, including investing in more resilient infrastructure can prevent severe damage, can assure business continuity and can be less expensive than recovery and repairs;

Noting that an airport is a multimodal transport interchange, employment node and critical piece of regional and national infrastructure for the communities it serves;

Noting that airports are expensive to build with infrastructure designed to last for decades, and current infrastructure may be designed to standards that do not consider sea level rise or extreme weather and associated adaptation measures;

Recognizing that airports may be called upon to assist in disaster relief efforts for adjoining areas and communities affected by natural disasters *and* that airports play a critical role in assisting with emergency response and recovery for regions impacted by extreme weather events; therefore,

The General Assembly resolves to:

- a) Consider all practicable steps to reduce their GHG emissions through the use of the Airport Carbon Accreditation programme and by other means;
- b) Support efforts in international forums such as ICAO and the UNFCCC in assessing the potential impacts of climate change on critical infrastructure, including airports;
- c) Encourage member airports to take into consideration the potential impact of climate change as they develop their Master Plans;
- d) Encourage member airports to conduct risk or criticality assessments for their operational procedures and existing infrastructure which considers the risks imposed by more adverse weather events and climate change;
- e) Encourage member airports to develop and incorporate actions in accordance with their risk or criticality assessments at an early stage and in line with their overall business continuity management and emergency planning; and



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- f) Encourage member airports to plan and develop effective communication channels and collaborate with internal airport staff, aviation stakeholders, including airlines, ANSPs, communities and municipality authorities responsible for weather monitoring and disaster management.

END